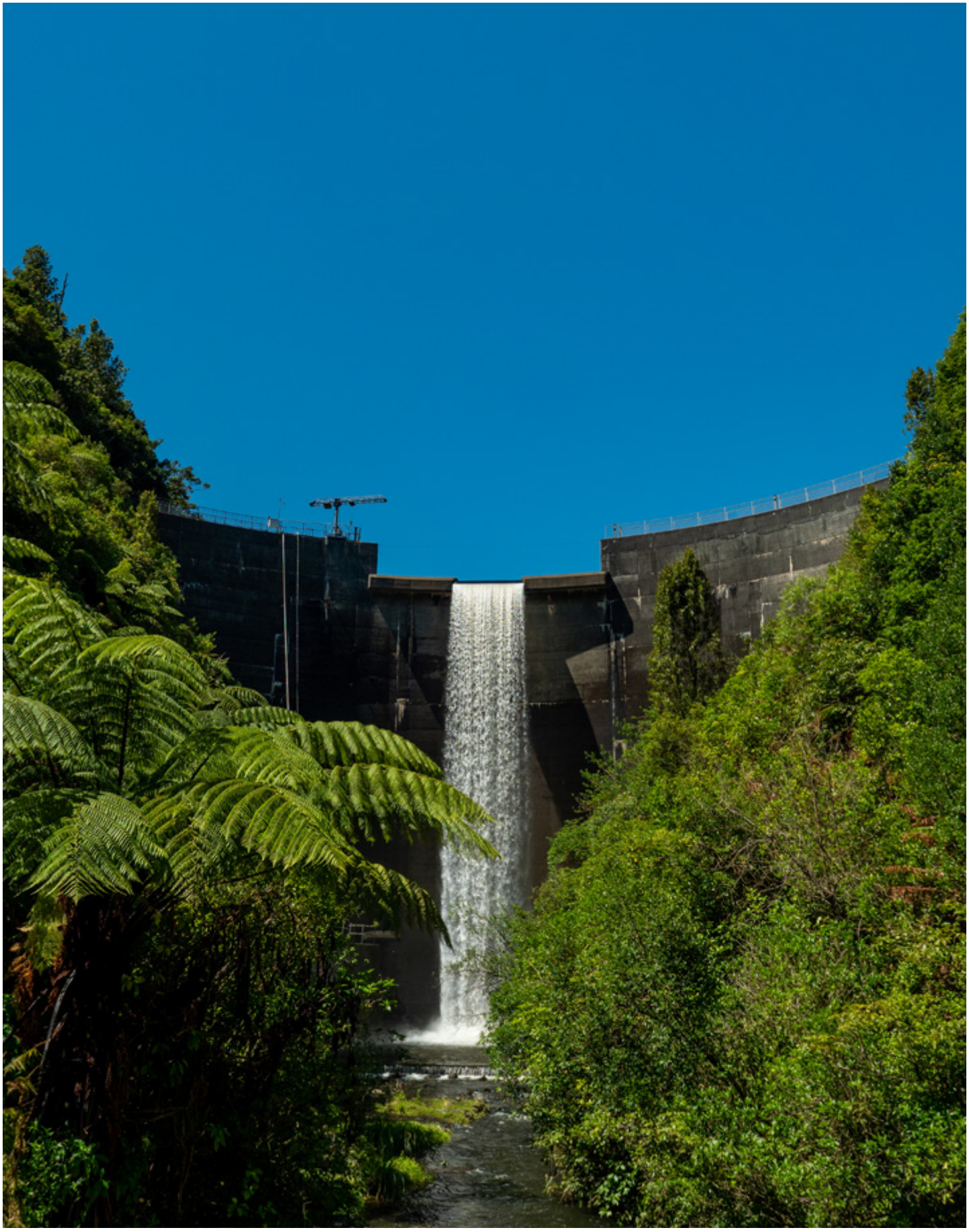


Asset Management Plan

Water

PAPAIOEA
PALMERSTON
NORTH
CITY

Our Asset Management Plans for water were created prior to the October 2023 Government election. We will follow government guidance as it is released

Asset Management Plan
Executive Summary

Water

Manaaki whenua, manaaki tangata, haere whakamua. Tihei mauri ora!

No reira, e te haukainga Rangitāne, nei rā te mihi nui ki a koutou e pupuri nei i te mauri o te whenua me ngā wai e rere atu e rere mai.

Tēnā koutou, tēnā koutou, tēnā tātou katoa.

Water is a taonga and in Palmerston North we are fortunate to have a variety of sources from which we supply safe drinking water to our communities.

We provide high-quality water supplies to residential, industrial and commercial properties in Palmerston North, Ashhurst, Bunnythorpe, Longburn and Linton.

The majority of the drinking water we supply meets the new Drinking Water Quality Assurance Rules. The way we treat water hasn't changed, but the new rules require us to have reservoirs or ultraviolet (UV) treatement at our bores to store water for a period of time before it enters the city water pipes. Like most Council's around the country, we do not have these in place but are planning work to meet these new requirements.

The supply of drinking water is undergoing significant change across New Zealand, through Three Waters reform. Coupled with a growing population, the water space is expected to undergo significant change in the short to medium term.

Taumata Arowai became New Zealand's dedicated regulator of drinking water, when the Water Services Act came into effect on 15 November 2022. In 2024, it will also assume oversight for wastewater and stormwater networks, becoming the three waters regulator for Aotearoa.

The Government is progressing three waters reforms so that three waters services will be provided by ten publicly-owned water service entities by July 2026. The reforms are designed to protect public health and wellbeing, improve environmental outcomes, economic growth and job creation, housing and urban development, adaptation to the impacts of climate change, building resilience to natural hazards, and upholding iwi/Māori rights and interests relating to water services.

Under the National Policy Statement for Freshwater Management 2020, we must give effect to the hierarchy of obligations and six principles of Te Mana o te Wai.

Rangitāne O Manawatū expresses this in their Te Mana o te Wai statement and objectives. The Te Mana o te Wai statement is:

The most significant quality that flows through wai is mauri. The mauri is generated throughout the catchment and is carried through the connected tributaries, groundwater, wetlands and lagoons. It is the most crucial element that binds the physical, traditional and spiritual elements of all things together, generating, nurturing and upholding all life, including that of Rangitāne o Manawatū. The health and well-being of Rangitāne is inseparable from the health and well-being of wai. The Manawatū Awa, its catchment, tributaries and connections, wetlands and lagoons are taonga and valued for the traditional abundance of mahinga kai and natural resources.

This Asset Management Plan outlines how we will manage and invest in our water assets for the next 30 years

Scope of this plan

This Plan informs our 10 Year Plan, Financial Strategy and 30 Year Infrastructure Strategy. It supports us in the management of our water supply assets to:

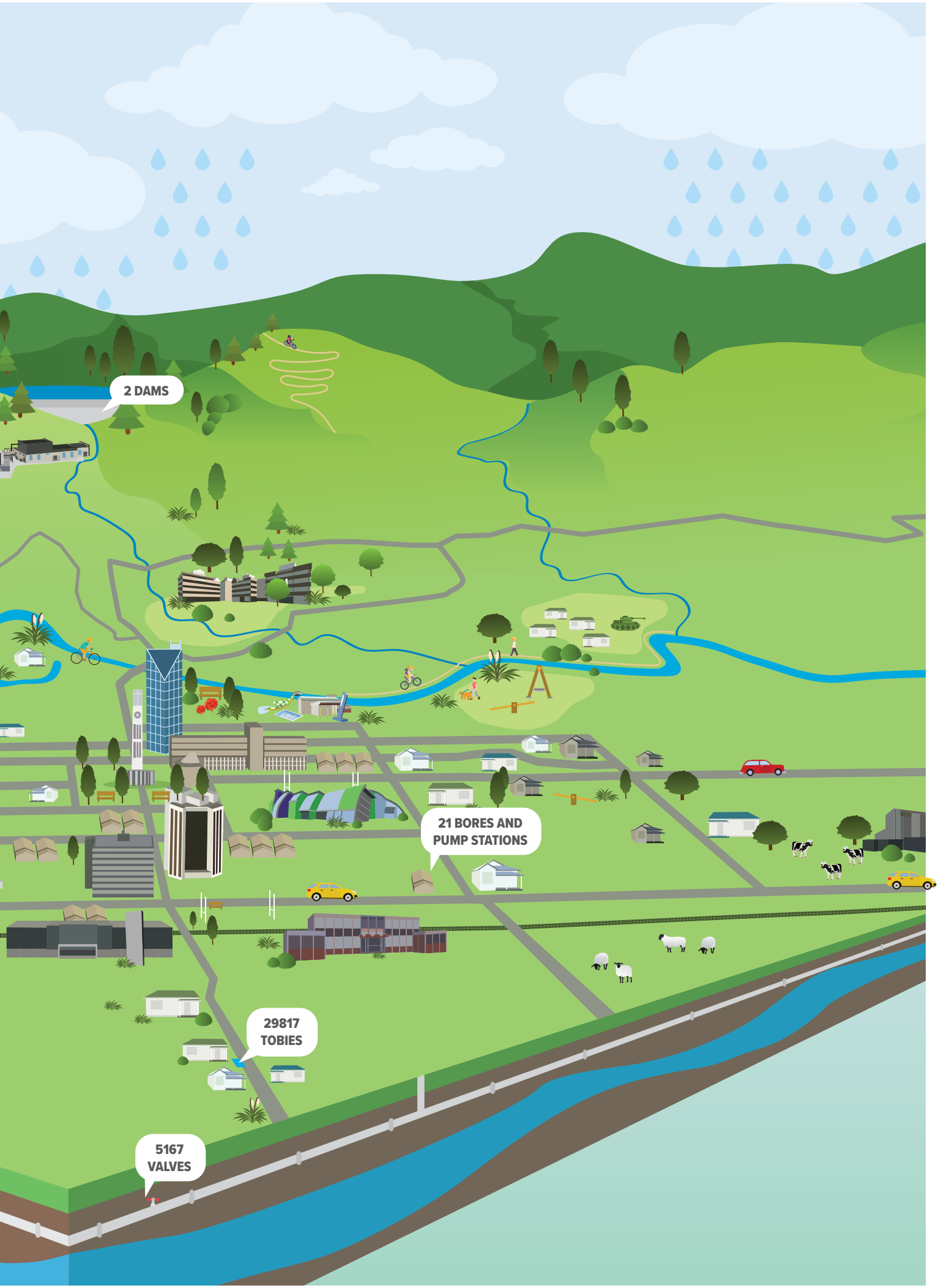
- Provide safe drinking water to our communities
- Achieve our strategic outcomes as set by Goal 4: A sustainable and resilient city
- Meet the agreed levels of service,
- Plan for growth and other drivers such as new legislation and climate change,
- Improve asset knowledge and monitor performance,
- Minimise risk
- Plan operations

What we provide

We supply more than 10 trillion litres of safe drinking water to our community each year. We manage water for our city in what we call four key supply areas - Palmerston North City, Ashhurst, Bunnythorpe and Longburn. We also provide a dedicated filling station for water tankers, located in Roslyn.

There are more than 3,000 fire-hydrants located throughout the city, that provide water for putting out fires in our city.

We have a number of bores dotted around the city already and are planning to construct several new bores to ensure we continue to have enough and a resilient supply as our city grows.


2 DAMS
21 BORES AND PUMP STATIONS
29817 TOBIES
5167 VALVES

Everyone is a customer

Residential

Visitors

Industrial

Rural

Education sector

Fire and Emergency New Zealand

Healthcare

Council

Developers

Commercial

Our customers value having access to a safe and readily available drinking water. They want to be able to turn on the tap and have safe water to go about their daily activities.

Each day Palmerston North, Bunnythorpe, Ashhurst and Longburn uses up to 30 million litres of water – that is enough to fill the outdoor pool at The Lido almost 12,000 times! Two-thirds of our water comes from the Turitea Dam, and the remainder from several groundwater bores.

We supply water to the boundary of homes and businesses, fire-fighting capacity from hydrants, and a filling station for rural tankers and construction work. We also promptly respond to breaks, leaks and quality issues with the service..

Currently we supply drinking water to Palmerston North City, Ashhurst, Bunnythorpe and Longburn. Properties outside these areas supply their own services and this includes some areas of Massey University and the Linton Army Camp, which is currently connecting to the our water supply.

Our customers approval rating is consistently high. In 2022 water service complaints were slightly higher than our target with the majority of complaints relating to tobies and water clarity.

We have a strong partnership with mana whenua Rangitāne o Manawatū. Our stakeholders include; regulators (Public Health, Horizons and Taumata Arowai), Manawatū River leadership, adjoining councils and communities and central government.

We have some challenges + risks

New Drinking Water Quality Assurance Rules came into effect in November 2022.

Changes require water suppliers to undertake the following:

- Tighter regulation of treatment plant performance and monitoring;
- Increased design standards for bore supplies, which may result in higher treatment requirements
- Specific residual disinfectant standards in the network.

To maintain compliance with the new rules we need to invest in treatment assets, bores, systems and staff resources.

Our infrastructure is aging

Our water supply infrastructure is aging, which is leading to an increasing backlog of assets requiring renewal. About 8% of pipes have a condition rating of poor or worse.

There are gaps in our asset information including condition and value. This can make it difficult to prioritise our work programme. There is currently a high risk of failure for some of our aging assets.

A programme is being developed to improve information on asset condition. This will in turn provide a renewal programme to address risk in the short to medium term.

Some assets are vulnerable

We have been improving the resilience of the water supplies but there are still actions to progress, including:

- Improve compliance of our water bores
- Continue with seismic strengthening at the Turitea Water Treatment Plant
- Investigate options to rehabilitate or replace one of the water mains from the Turitea Lower Dam to the water treatment plant,
- Investigate the provision of UV treatment contact tanks and/or storage at our bore sources, to achieve compliance with dissinfection rules.

Growth

Our current Water Supply Development Plan is an essential tool for planning residential and industrial growth areas. We also need to align this to the Government's National Policy Statement for Urban Development.

In order to cater for growth, resilience and new legislative requirements for dissinfection we have included seven new bores sites in the 30-year plan.

Fire fighting

Modelling has identified several areas of the network that do not meet fire-fighting levels of service and require capacity upgrades.

Sustainability

We need to consider sustainability in:

- Turitea Reserve Management Plan and the enhancement of biodiversity in the Turitea Reserve,
- The operation of a fish capture and transfer facility in partnership with Rangitāne o Manawatū,
- Implementation of the Water Conservation Management Plan,
- Management of a global water-take Resource Consent approach which covers all the city water bores to manage water takes on a holistic basis and in balance with the Turitea water take,
- Optimisation of the operation for the Water Treatment Plant, bores, and pump stations.
- Signalling pressure reduction in the future to help reduce water loss through leaks, saving energy and extending asset life.

What's our plan?

Improve compliance with the new dissinfection Rules

In order to improve compliance with the new Drinking Water Quality Assurance Rules, we have budgeted for:

- Treatment upgrades,
- New or updated resource consents,
- Water quality improvements in Ashhurst and Bunnythorpe,
- Water contact tanks/reservoirs and/or UV treatment at our groundwater bore sites.

Collect condition and performance data

More investment is required to better understand the condition and performance of our assets to enable optimised capital decision making. Capital is where we borrow money for large or expensive upgrades and pay that debt off over time – just like a homeowner with a mortgage. The following initiatives are planned:

- Investigate district metering areas for installation and utilising specialist software for pressure and flow management to reduce leaks,
- Installing smart meters for our larger commercial customers to understand water consumption patterns and manage demand,
- Continued development of our modelling to improve understanding of operational performance and growth planning,
- Develop and implement a condition assessment programme for network assets to better inform our upgrades and renewals programme.

Maintain existing levels of service

We plan to keep operating the existing services at the same level our residents and businesses are used to, while continuing to look for ways to improve operational efficiencies.

To respond to gaps in the fire fighting space, we are planning upgrades in some locations.

Asset condition and criticality data will be used to develop our prioritised asset renewals programmes.

Climate Change

Our three climate change priorities are:

- Adapt to the predicted effects of climate change,
- Reduce emissions as efficiently as possible,
- Comply with changing regulations.

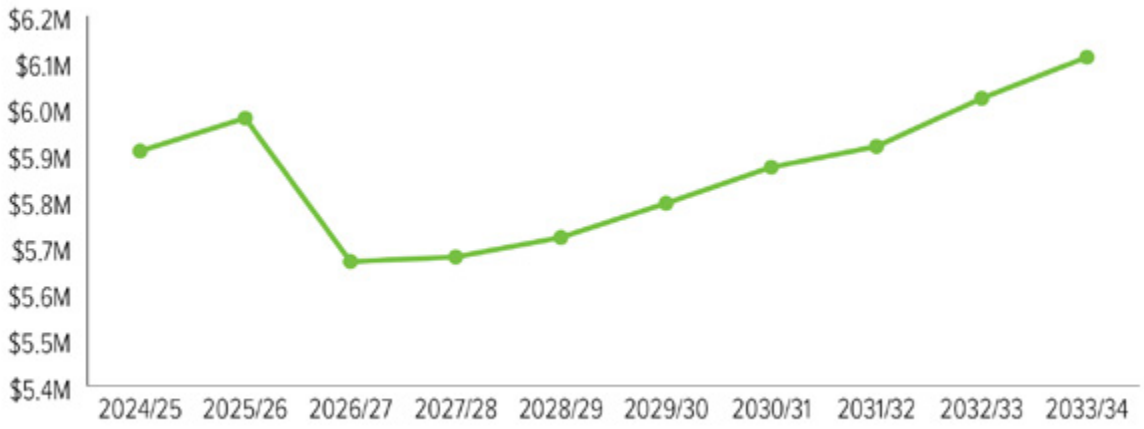
Resilience

- Ongoing seismic strengthening of our water treatment plant,
- Improved water bore security and performance,
- Rehabilitate raw water mains from the Turitea Lower Dam to one of the water treatment plants.

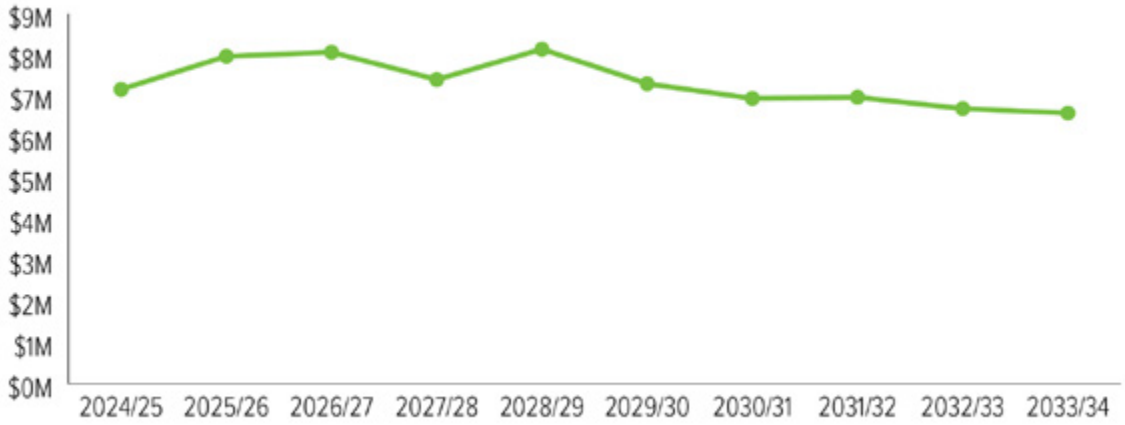
How much will it cost?

Operations and Maintenance

The largest proportion of operational expenditure is spent operating and maintaining our existing assets. Consequential operational expenditure (from the creation of new assets) increases steadily over the next decade due to the projected high volume of growth. Overall operations and maintenance expenditure is proposed to increase with most costs in water treatment.



Renewals

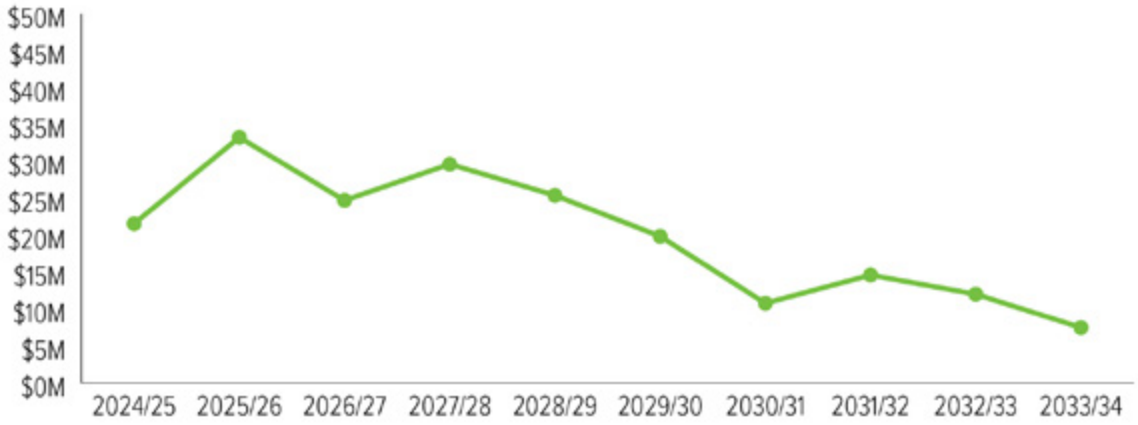


The majority of proposed expenditure is for replacement of our pipe network and other network assets. A couple of years ago we installed a duplicate main next to the original water main pipe to build resilience.

We are now looking to renew a section of the original water main so we can add extra resilience to our water network. We are also renewing the aging pipe networks in Longburn and Bunnythorpe.

Increased investment in renewal of water supply bore infrastructure is planned for the first three years to meet drinking water rules and improve bore head security.

Capital new



A large portion of our capital new budget will be targeted at ensuring we comply with the new Drinking Water Regulations.

To align with Drinking Water Regulations, we need to replace our existing tobies with manifolds and upgrade our water supply bores and improve bore head security within the next three years.

Turitea Dams and the Turitea Water treatment plant will also be upgraded to improve resilience in the event of a natural disaster. Over the next 10 years we are proposing to spend at least $10 million, and up to $30 million, per year to ensure our water assets continue to provide the intended level of service.

This document was prepared by:

Palmerston North City Council | Infrastructure | Asset and Planning Division.

Version No.	Reason for Amendment	Date
0	DRAFT TO SUPPORT 10 YEAR PLAN CONSULTATION	12 Apr 2021
1	FINAL	23 Jul 2021
1.1	2022 Draft Update	31 May 2023
1.2	2023 Draft Update	31 August 2023
1.3	2023 - Final Version 2023	November 2023
1.4	2024 Addendum Update	June 2024

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1 Introduction

1.1 He Mihi

Manaaki whenua, manaaki tāngata, haere whakamua. Tihei mauri ora!

No reira, e te haukainga Rangitāne, nei rā te mihi nui ki a koutou e pupuri nei i te mauri o te whenua me ngā wai e rere atu e rere mai.

Tēnā koutou, tēnā koutou, tēnā tātou katoa.

Our matawhānui Papaioea, vision for Palmerston North, is "he iti rā, he iti pounamu | small city benefits, big city ambition", where our community enjoys the benefits of living in a small city yet has the advantages of a big city. The city is fortunate to have a range of quality assets that are managed in a way that supports this vision and provides our community with essential services, including the Water Activity.

At Palmerston North City Council, we provide a good-quality water supply that meets the Drinking Water Standards for New Zealand in a sustainable and responsible way.

1.2 Our Partnership with Rangitāne o Manawatū

In our commitment to fostering and strengthening our partnership with Rangitāne o Manawatū, we aim to ensure:

- Rangitānenuiarawa[1] is reflected in the city's approach to water supply; and
- Rangitāne o Manawatū have opportunities for early involvement in all water supply projects and initiatives.

1.3 Activity Successes and Challenges

Our successes in the last three years and ongoing key challenges are outlined below.

1.3.1 Key Successes

Key successes for the Water Activity in the last three years have been:

- **Summer Water** – we successfully implemented our Summer Water campaign which asks the community to adhere to summer water conservation guidelines between December and April. We have not had to apply mandatory restrictions since 2020
- **Resilience** – we have improved our service resilience by upgrading the backup power supply to our treatment plants and pump stations. We have carried out seismic strengthening of critical infrastructure at the Turitea Water Treatment Plant. Key water trunkmains have been duplicated or reconfigured to improve supply resilience.
- **Upgrades** – A new bore and reservoir at Railway Road will provide a new water source, additional storage and improve compliance.
- **Water clarity and safety** – we have upgraded water treatment plant processes to improve water clarity and improved quality monitoring and started further drinking water quality upgrades.
- **Taste** – in 2023, Palmerston North's Turitea water treatment plant water was voted as 3rd best tasting water in country in a national competition run by the New Zealand Water Industry Operations Group.

[1] Rangitānenuiarawa is the Rangitāne expression of Kaitikitanga, or customary authority and guardianship, and affirms their customary leadership in ensuring the health and regeneration of their tribal rohe.

1.3.2 Key Challenges

Table 1 contains a description of the major challenges and their impact on the Service. These are based on the objectives of the national Three Waters Reform programme.

Table 1: Service Delivery Challenges

Challenge	Challenge Description	Impact on Service
Protecting te Mana o te Wai	Te Mana o te Wai ensures that the first right to the water goes to the water. Wai provides us with a koha to enable sustainable use.	Rangitāne o Manawatū have a significant interest in Te Mana o te Wai and seek to partner with us to manage the water sources.
Safe drinking water	Taumata Arowai is the water regulator and is in the process of updating Drinking Water Standards and regulations. Maintaining safety and quality of drinking water services.	Increased investment is required to maintain the safety and quality of our drinking water services.
Equitable access	Other suppliers within our boundary and neighbouring communities may benefit from the scale of our services. Ensuring all New Zealanders have equitable access to affordable drinking water services.	We may be required to take over other water supplies expanding our supply area.
Limited service delivery resources	We are competing regionally and nationally for staff, consultants and contractors to deliver our services. The Water Reform recognises the need to improve resource coordination and unlock strategic opportunities.	There is a risk of increased costs to procure specialist services if we fail to consider infrastructure needs at a larger scale and improve resource coordination. We will need to consider infrastructure needs at a larger scale.
Disaster preparedness	We have a responsibility to prepare for disasters. Risks and events that could disrupt our services are short-term and long-term.	Large disaster events could impact water supply to the community.
Aging infrastructure	Our infrastructure is aging. Asset condition, criticality and performance needs to be better understood to prioritise renewals and reduce our renewal deficit.	Failure of the water supply network could see a loss of service to the community. There is an accumulated infrastructure deficit that could expose us financially (service failure and insurability).
Transparency	We are accountable to our customers and need to demonstrate that we are providing value for money.	We participate annually in the three waters National Performance Review and provide information in response to requests.

1.4 Our Asset Management Framework

We have adopted an Asset Management Framework, as shown in Figure 1, from the International Infrastructure Management Manual (IIMM) 2020 (which broadly aligns with the international asset management standard ISO550001), in order to standardise our approach to asset management and grow it as an organisational practice.

Asset management planning is not only an output of lifecycle planning processes but relies on having a clear understanding of our current and future requirements, and is enabled through leadership, continuous improvement and other asset management elements.

The Framework is based on best practice and therefore helps define both the scope of the Asset Management Plan and its structure.

This AMP documents the key outcomes of each step of our Asset Management process to provide better accountability, sustainability, risk management, service management and financial efficiency.

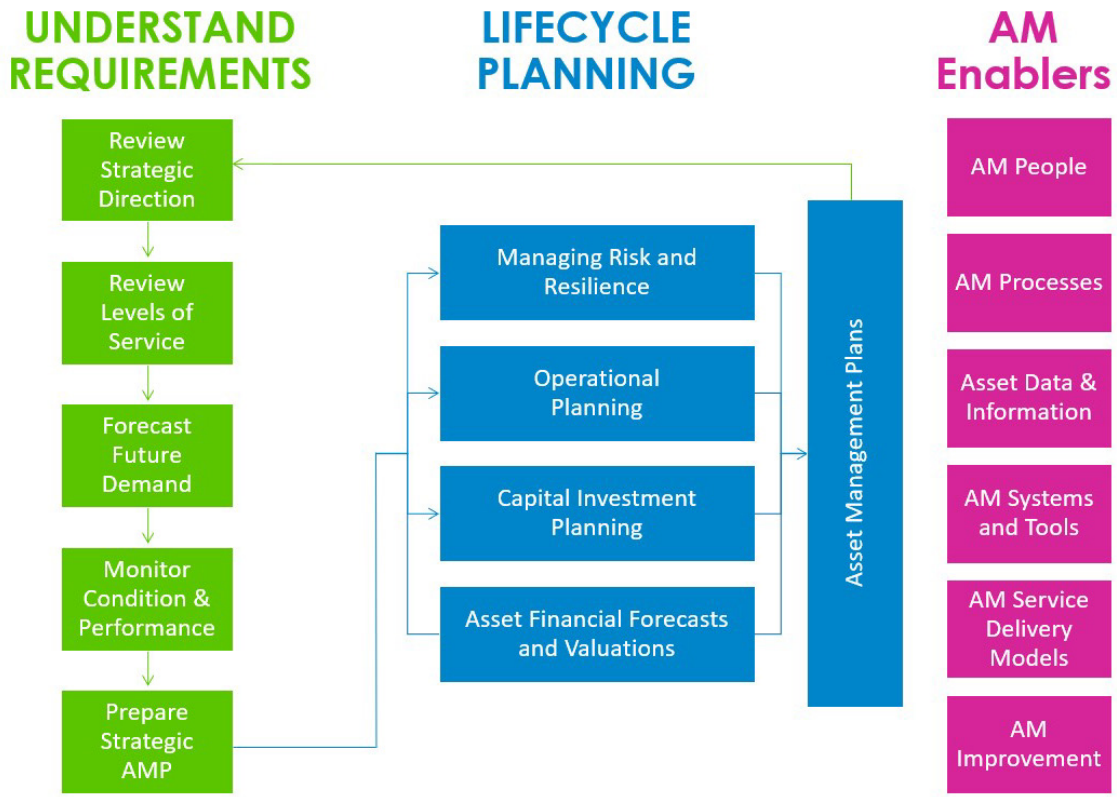


Figure 1: Asset Management Framework

1.5 Purpose and Scope of this Asset Management Plan

The purpose of this Asset Management Plan (AMP) is to document our intended programmes and budgets for the management of the Water Activity based on our understanding of service level requirements, future demand, asset performance and risks.

This plan should be read in conjunction with the Strategic Asset Management Plan (SAMP).

The SAMP includes the overall strategic approach to managing our assets and overarching issues, practices and systems. The SAMP reflects our aspiration to lift the standard of asset management planning throughout the organisation and its purpose is threefold:

- To effectively define the Asset Management System (including giving effect to our Asset Management policy);
- To establish how Asset Management Objectives are linked to our organisational objectives; and
- To provide direction to our Asset Management Plans

This document, the Water AMP provides detail on how our strategic asset management planning is applied to the Water Activity. In this context, the objective of the AMP is to translate our Strategic Vision and Goals into Activity strategies and action plans in order to provide supporting evidence for the Long Term Plan and 30 Year Infrastructure Strategy[2]. The AMP achieves this by:

- Explaining how our strategic direction impacts on the management of our infrastructure assets specific to this Activity;
- Summarising our services and customers including agreed levels of service and performance;
- Forecasting future demand for our services and associated need for assets;
- Reporting on asset condition and performance;
- Highlighting the key risks (including sustainability, climate change and criticality considerations) and how they are incorporated into investment decisions that ensure our infrastructure is resilient;
- Summarising the basis of operational and maintenance programmes, including how interventions (inspections, assessments and renewals) help optimise planned and reactive maintenance in the operational planning;
- Justifying the business cases for capital new and renewal programmes including prioritisation of projects;
- Proposing long term financial forecasts that are used to inform the development of the draft Long Term Plan;
- Explain how asset management for this Activity is specifically enabled through people, processes, asset data and systems, and service delivery; and
- Demonstrate how the Activity is prioritising and improving its asset management maturity as part of its commitment to operational excellence.

[2] AMP demonstrates regulatory compliance with section 93(7) & 94(1) of the Local Government Act (LGA) 2002 which in summary requires the Long-Term Plan (LTP) to be supported by the information required by Part 1 of Schedule 10

1.6 Relationship with other plans

Figure 2 shows the relationships between our key planning documents.

This section outlines the relationships between the Water AMP and other Council AMPs. These other plans are available on our website.

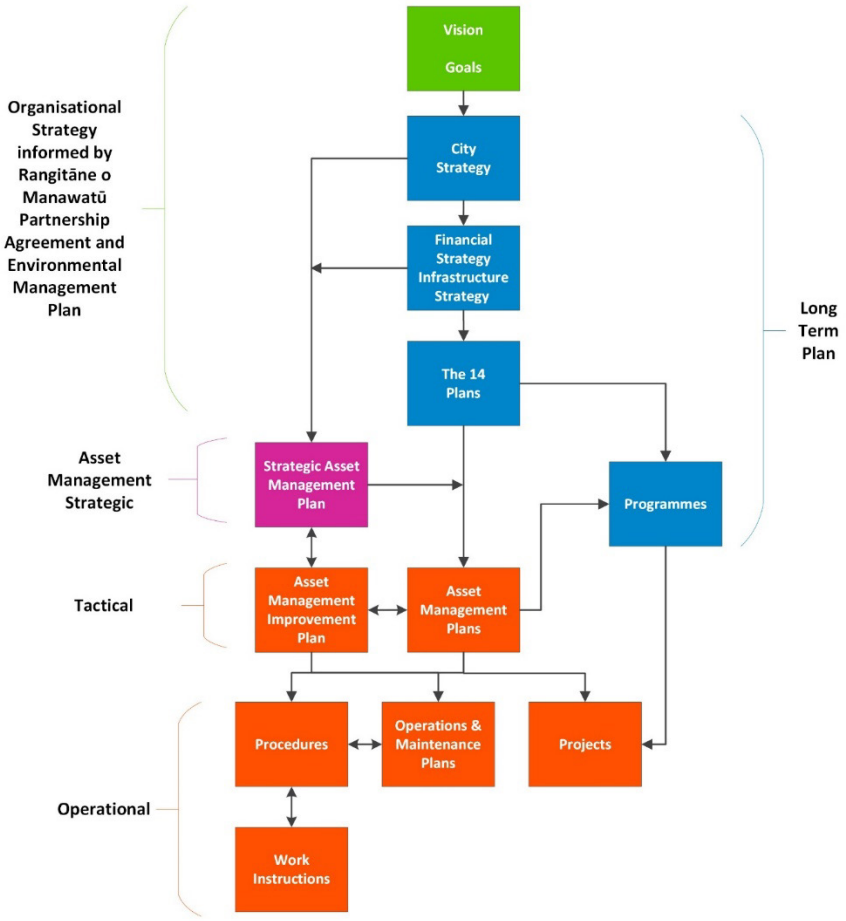


Figure 2: AMP and Key Documents in our Management Framework

1.6.1 Relationship to the Water Conservation Management Plan

The Water Conservation Management Plan details what Palmerston North City Council is doing, and will do, to be responsible stewards of our water resources as they relate to water supply. Initiatives described in this plan include:

- Education
- Operational practices
- Programmes requiring capital and/or ongoing operational expenditure

For this reason, it is important that this AMP refers to, and is consistent with, the Water Conservation Management Plan. Analysis of demand patterns, supply availability, costs and other aspects of the Asset Management Plan should feed into the water conservation practices we adopt. Conversely, the needs of our demand management programmes must be reflected in their importance, funding and resourcing in the AMP.

1.6.2 Relationship to Other Asset Management Plans

The following relationships between this AMP and other AMPs have been identified:

- Property AMP: The Property activity manages all the Water facilities and treatment plant buildings as a specialist support function. The Property AMP covers the strategies and work programmes needed to identify the required management and investment in property to support the Water activities.
- Parks and Reserves AMP: these activities rely on our water supply networks.
- Resource Recovery AMP: water supply and firefighting service to the Material Recovery Facility.
- Wastewater AMP: this activity provides sewer connections to Water property.
- Transport AMP: Transport assets such as bridges carry critical water assets.

1.7 Key Partners and Stakeholders

Table 2 contains a summary of stakeholders that we regularly engage with on water supply issues. The level of engagement (whether we inform, consult, involve, co-operate with or empower) depends on how significant the issue is and who is ultimately responsible for resolving the issue.

Table 2: External Partners and Stakeholders

Name	Description
Customers	People or businesses connected to one of our four water supplies (Palmerston North, Ashhurst, Bunnythorpe or Longburn) with metered or unmetered connections.
Consumers	Anyone using water from one of our water supplies, whether for consumption, hygiene or other purposes. Consumers may also be customers, but not necessarily.
Tangata Whenua	Tangata whenua, most often represented by iwi, have a role as kaitiaki (guardians) of water resources. The partnership between iwi and the Crown established with the Treaty of Waitangi is enshrined in the Resource Management Act 1991 and Local Government Act 2002. Iwi with mana whenua in the Palmerston North City Council area are represented by Rangitāne o Manawatū.
Taumata Arowai Ministry of Health	Taumata Arowai became the national drinking-water regulator when the Water Services Act 2021 came into effect in late 2021. The Ministry of Health maintains a role in managing drinking water policy.
Horizons Regional Council	The Manawatū-Whanganui Regional Council trading as Horizons manages land, air, and the quantity and quality of water in our lakes and rivers. Horizons is also responsible for biodiversity, regional parks, flood protection, emergency management and regional transport.
FENZ	Fire and Emergency New Zealand (FENZ) safeguard life and property from the effects of fire. Functional water supplies are a big part of their ability to respond and reduce harm.
Contractors	The Water Supply activity relies on contractors to complete non-routine or specialised work, or to provide surge capacity when internal resources are not available. Contractors may also be customers of the Water Supply activity.
Consultants	Likewise, specialist advice or additional capacity is brought in when appropriate.
Suppliers	There is a large supply chain behind the Water Supply activity, providing everything from testing equipment to large diameter pipelines.
Developers	Urban development requires access to high quality, reliable water supply at a flow and pressure sufficient to meet the needs of the customer.

Name	Description
Mercury Energy	With wind farm construction currently underway adjacent to the Turitea Reserve, Mercury Energy have become a stakeholder with interest in the water supply catchment for Palmerston North.
Forest & Bird	Maintaining and enhancing the environment in Turitea Reserve has substantial positive benefits for birdlife. Likewise, failure to control predator numbers would have an adverse effect and undo some of the gains that have been made so far in the biodiversity of this taonga.

1.8 Improvement Actions

There are no improvement actions for this section.

2 Strategic Context

2.1 Our Strategic Direction and Priorities

Our vision for Palmerston North is:

He iti rā, he iti pounamu - Small city benefits, big city ambition

The Oranga Papaioea City Strategy and the series of plans that sit beneath it, describe the actions we will take to achieve our four goals:

- Goal 1: An innovative growing city
- Goal 2: A creative and exciting city
- Goal 3: A connected and safe community
- Goal 4: A sustainable and resilient city

To achieve our City's vision, we have aligned the Water Asset Management Plan (AMP) with Goal 4 : A sustainable and resilient city, and notably the Waters Plan.

2.1.1 Goal 4: A sustainable and resilient city

Our goal is for Palmerston North to have healthy natural environment and resilient urban system that sustains everyone, now and in the future. We understand that Palmerston North has a responsibility to respond to climate change for the benefit of everyone. We want Palmerston North to reduce carbon emissions and our overall ecological footprint. We want to protect and enhance our natural and built environments, regenerate our native biodiversity, increase and support more resilient and sustainable lifestyles. We are committed to contributing to a thriving climate-resilient, low-emissions, low-waste city.

We understand the value of collaborating with our partners and communities to achieve a more sustainable and resilient future. We recognise the connection between our goal for a sustainable and resilient city and the Rangitāne o Manawatū Environmental Management Plan. We also recognise the interdependencies between environmental sustainability and the social, economic and cultural wellbeing of our citizens.

Objectives

We want our communities to have:

- a sustainable, low-emissions city;
- a resilient city and communities, prepared for the impacts of climate change;
- a circular economy with more resource recovery and less waste;
- a healthy, thriving ecosystem, including native biodiversity and food security;
- the Manawatū River and waterways restored to a healthy, respected and connected state;
- sustainable urban planning with a low carbon built environment;
- a safe, affordable and resilient water supply;
- access to relevant information and education to support more sustainable choices; and
- opportunities to be involved and contribute to decision-making about environmental wellbeing.

Strategic Priorities - Waters Plan

Our Waters Plan outlines our strategic priorities for our three waters services and is guided by the following:

We want our city to have a safe and readily available water supply and to be safe from flooding. We want our wastewater to be safely collected, treated and disposed of.

- provide wastewater services for the safe collection, treatment and disposal of the city's wastewater;
- provide water services for the provision of safe and readily available water; and
- provide stormwater services to protect buildings from inundation from flooding in major events.

2.2 Relationship with Rangitāne o Manawatū

In recent years Council has made a series of considered decisions to uphold the mana of Te Tiriti o Waitangi. These include signing the Partnership Agreement with Rangitāne o Manawatū in 2019 and establishing a standing committee to consider matters of strategic significance to Māori.

Rangitāne O Manawatū have an operational Environmental Management Plan. This is equivalent to an Iwi management plan under the RMA and therefore provides insights into how we will:

- Work in partnership with Rangitāne o Manawatū on projects and initiatives of agreed priority (e.g. Te Motu o Poutoa)
- Encourage and enable Māori participation in Council decision-making and activities, and
- Support and embed a Whānau Ora approach in Council activities

The relationship with Rangitāne o Manawatū and our commitment to this partnership is reflected in our Waters Plan. Specific Rangitāne o Manawatū (RoM) outcomes relevant to our three waters activities are:

- RoM participate in 3 waters governance and technical decision-making processes.
- E. coli, nitrogen, phosphorous, sediment runoff and plastic pollution are reduced to levels that protect contact recreation, ecological communities and cultural health.
- Whānau can sustainably harvest mahingakai in sufficient quantities, and that kai is free from the risk of contracting gastric disease.
- There is a formal cultural monitoring framework in place for freshwater monitoring that is properly resourced and enables a whānau and RoM-based response.
- All fish barriers are systematically removed, all new stream and river works require fish pass installation in consultation with RoM.
- RoM fish plan is recognised and provided for.
- Wetlands of scale need developing in partnership with RoM, in regionally strategic locations to protect urban and rural water quality and provide for biodiversity.
- Establish forest and wetland nodes within all urban suburbs to treat stormwater.
- Future-proofing water supply is seen as important.
- Climate change resilience is factored into water supply availability.
- Water use information should be publicly available.
- Water use is sustainable.
- Rainwater collection encouraged for urban development.

2.3 Te Mana o te Wai

Under the National Policy Statement for Freshwater Management 2020, we must give effect to the hierarchy of obligations and six principles of Te Mana o te Wai.

The hierarchy of obligations prioritises the following in order:

1. the health and well-being of water
2. the health needs of people (such as drinking water)
3. the ability of people and communities to provide for their social, economic and cultural well-being.

The National Policy Statement requires local authorities to take in an integrated approach to freshwater management and to actively involve tāngata whenua (to the extent they wish to be involved) in freshwater management (including decision-making processes). The RoM Environmental Management Plan gives effect to this with the following Te Mana o te Wai statement:

> *The most significant quality that flows through wai is mauri. The mauri is generated throughout the catchment and is carried through the connected tributaries, groundwater, wetlands and lagoons. It is the most crucial element that binds the physical, traditional and spiritual elements of all things together, generating, nurturing and upholding all life, including that of Rangitāne o Manawatū. The health and well-being of Rangitāne is inseparable from the health and well-being of wai. The Manawatū Awa, its catchment, tributaries and connections, wetlands and lagoons are taonga and valued for the traditional abundance of mahinga kai and natural resources.*

The objective the Te Mana o te Wai statement as stated in the Environmental Management Plan is:

1. Land and freshwater within the Manawatū will be managed in a way that gives effect to Te Mana o Te Wai by:
    1. Protecting and restoring the mauri of the Manawatū Awa and costal lagoons, their tributaries and connections so they can again physically, traditionally and spiritually sustain Rangitāne by ensuring:
        - the quality and quantity of water is sufficient to support all species that would be expected to be present in that place, including plants, birds, aquatic insects, mollusks, kōura and fish
        - rivers and streams have sufficient room on their flood plains to express their natural character, including changing course and connecting to wetlands
        - waterbodies have natural rhythm, geomorphology, hydrology and character
        - mahinga kai species and freshwater resources are healthy, resilient, abundant, and safe to harvest and eat.
    2. Recognising and providing for the relationship of Rangitāne o Manawatū with their waters by ensuring:
        - Rangitāne o Manawatū are enabled to undertake their kaitiakitanga duties, including decision-making, management, restoration and monitoring
        - Rangitāne o Manawatū can meaningfully exercise their mana whakahaere
        - Rangitāne o Manawatū cultural practices and tikanga tuku iho can be carried out, shared with the community and passed on to future generations, for example rāhui
        - the mātauranga of Rangitāne o Manawatū is recognised, its development and transmission is provided for.
    3. Recognising water as an interconnected whole by ensuring:
        - ephemeral and permanent waterways, from the smallest creeks, puna and wetlands to the largest lakes, groundwater bodies, rivers and coastal waters are provided for
        - when providing for social, economic and cultural well-being (2c), the way water is taken and disposed of is integrated.
2. To give effect to Te Mana o te Wai, all management of fresh water in the Manawatū FMU shall prioritise:
    1. firstly, the health and well-being of waterbodies and freshwater ecosystems, and the ability of mana whenua to uphold these
    2. secondly, the health and well-being of people interacting with water through ingestion (such as drinking water, water for essential washing and cleaning (but not its disposal) and consuming harvested resources) and immersive activities (such as harvesting resources and recreation)
    3. thirdly, the ability of people and communities to provide for their social, economic and cultural well-being, now and in the future.

Rangitāne o Manawatū are actively involved in the planning and delivery of infrastructure that will have an impact on water. This process is yet to be formalised and a timeframe is not available yet for reviewing the District Plan against the new Freshwater NPS. However, we will update infrastructure planning to give effect to any future freshwater management agreements or Plan Changes.

2.4 Three Waters Reform Programme

2.4.1 Overview

All New Zealanders need safe, reliable drinking water, wastewater and stormwater - the three waters services. We depend on these for the health and wellbeing of our communities and our environment. Local government is facing significant challenges in managing drinking water, stormwater and wastewater services. To address this, the Government is progressing reforms so that three waters services would be provided by ten publicly-owned water service entities by July 2026.

These reforms were to ensure public health and wellbeing, environmental outcomes, economic growth and job creation, housing and urban development, adaptation to the impacts of climate change, building resilience to natural hazards, and upholding iwi/Māori rights and interests relating to water services.

The change in government in October 2023 meant that these reforms were halted and asociated legislation repealed. The new government intends to introduce new legislation by mid-2024 in line with its Local Water Done Well proposal.

2.4.2 Legislation Pre 2023 General Election

Three new Acts were passed in 2022 and 2023; they were;

1. The Water Services Entities Act 2022

   Established water services entities, including legal form, ownership structure, objectives, functions, operating principles and service area

2. Water Services Legislation Act 2023

   Established the powers, functions, and duties of the new water services entities, enabling them to deliver water services to communities, while also including provisions for the transfer of assets and liabilities from local government and making amendments to local government and water services legislation.

3. The Water Services Economic and Consumer Protection Act 2023

   Established an economic regulation and consumer protection regime as part of water services reform.

2.4.3 Post 2023 General Election

With the change in Government in October 2023 the legislation has been repealed via The Water Services Acts Repeals Act 2024. This passed all stages of parliament and received royal assent on 16 February 2024.

The Repeal Act essentially returned the provision of water services back to the arrangement which existed prior to the Water Services Entities Act 2022. The Government further announced that it would be bringing legislation to the house under its Local Water Done Well proposal in mid-2024. This intends to enable territorial local authorities to set up stand-alone water entities and has removed requirements around mandated iwi involvement within an entity.

2.4.4 Water Sector Regulators

Taumata Arowai was established as a Crown entity in March 2021 and became New Zealand's dedicated regulator of drinking water, when the Water Services Act came into effect on 15 November 2021. In 2024, it will assume responsibility for wastewater and stormwater networks, becoming the three waters regulator for Aotearoa.

Three waters activities and services provided by the new entities will be regulated via Taumata Arowai, Commerce Commission and regional councils.

Regional councils will continue to develop and implement regional policy statements and plans that guide land use, resource management, and environmental protection for three waters activities. They will continue to monitor and enforce regional rules and resource consent compliance.

2.5 Regulatory and Policy Context

Table 3 below contains a summary of legislation and policies that govern the Water Activity.

Table 3: Legislation that Governs the Water Activity

Legislation	Description	Implications
National Policy Statements	Relevant policy statements: • National Policy Statement on Freshwater Management 2020 • National Policy Statement on Urban Development 2020	Govern how we manage our services in relation to freshwater and also plan for urban development. Palmerston North is a tier 2 urban development centre.
National Environmental Standards	Current standards which may affect our water services are: • National Environmental Standards for Air Quality 2004 • National Environmental Standard for Sources of Drinking Water 2007 (update expected in 2023) • National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011 • National Environmental Standards for Freshwater 2020	Regulations which prescribe technical standards, methods or requirement for specific activities which affect the environment.

Legislation	Description	Implications
Local Government Act 2002	The Local Government Act empowers councils to promote the well-being of communities. The purpose of local government is to: • enable democratic local decision-making and action by, and on behalf of, communities • promote the social, economic, environmental, and cultural well-being of communities in the present and for the future. The Act empowers Council to make bylaws to protect its assets and services. The Local Government Act also requires territorial local authorities to "inform themselves about the access that each community in its district has to drinking water services by undertaking an assessment of drinking water services" at least once every 3 years. Territorial authorities are also obliged to work with Taumata Arowai and drinking water suppliers facing significant problems to remedy the problem and/or temporarily or permanently provide water to affected consumers if required.	The Water Activity is identified as a core service to be considered by a local authority. PNCC must complete a drinking water service assessment once every three years.
Health Act 1956	This gives the Council a general responsibility "to improve, promote and protect public health within its district." This involves identifying potential health risks and ensuring that these risks are managed to within acceptable levels. This responsibility extends to water supplies because of their important role in providing for public health.	

Legislation	Description	Implications
Water Services Act 2021	This Act, which is regulated by Taumata Arowai, establishes drinking water standards and regulates all persons and organisations that supply drinking water. This includes: **Drinking Water Quality Assurance Rules** – which provide the minimum requirements drinking water suppliers must comply with to demonstrate they are supplying safe drinking water and include monitoring and reporting requirements. **Drinking Water Standards for NZ 2022** – which set Maximum Acceptable Values for contaminants in drinking water. **Drinking Water Aesthetic Values** – which are measured by the look, taste and odour of the water.	Regulation of our drinking water quality Requirements for water safety plans
Resource Management Act 1991	Requires us to: • Sustain the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations • Comply with the District and Regional Plan • To avoid, remedy, or mitigate any adverse effect on the environment • Take into account the principles of the Treaty of Waitangi in exercising functions and powers under the Act relating to the use, development, and protection of natural and physical resources. • Consider the effects of natural hazards and climate change (including greenhouse gas emissions)	Affects how we manage and deliver the water activity. The government is undertaking resource management reform with three new pieces to legislation proposed covering: • Natural and Built Environments • Strategic Planning • Climate Change Adaptation
Health and Safety at Work Act 2015	Provision of a framework to secure the health and safety of workers and work.	Sets out the principles, duties, and rights in relation to workplace health and safety.

Legislation	Description	Implications
Civil Defence and Emergency Management Act 2002	The Act aims to improve and promote sustainable hazard management for the well-being and safety of the public and property, facilitate emergency planning, response, and recovery, mandate coordination of Civil Defence Emergency Management (CDEM) among local authorities through regional groups, align local and national CDEM planning, and foster cooperation among various agencies responsible for emergency prevention and management.	Responsibilities to plan for and act in case of civil emergency
Resource Management (Measurement and Reporting of Water Takes) Regulations 2010	This regulation ensures that large water takes are accurately measured in order to better manage water resources.	Measurement of our water takes
Climate Change Response (Zero Carbon) Amendment Act 2019	The provides a framework for the development of climate change policies which contribute to the Paris Agreement (to limit the global average temperature increase to 1.5° Celsius above pre-industrial levels) and allow New Zealand to prepare for, and adapt to, the effects of climate change.	Council is required to align with emissions and carbon reduction targets
Building (Dam Safety) Regulations 2022	New dam safety regulations will take effect on May 13, 2024, requiring dam owners to assess their potential impacts and to submit a Dam Safety Assurance Programme to the regional authority. Medium and high-risk dams are required to submit a programme 12 months and 2 years after registration, respectively, while low-risk dams will be reassessed every 5 years.	Our dams will need to comply with these regulations
Manawatū-Whanganui Regional Plan (One Plan	Horizons (Manawatū-Whanganui Regional Council) has the One Plan which sets out requirements for environmental management within the region.	Our water takes and associated land use and discharge activities must comply with the requirements of the One Plan.
Water Supply Bylaw and Administration Manual	Water Supply Bylaw 2015 and Administration Manual which includes technical and operation information to inform how the bylaw is applied. The manual may be review and updated more frequently than the bylaw.	The Water Supply Bylaw protects our water supply infrastructure by controlling who can access our water supply, including the Turitea Water Catchment Area, and how people can make connections to our water supply.

2.6 Improvement Actions

There are no improvement actions for this section.

3 Description of the Water Supply Activity

3.1 Scope of our Services

We are proud to provide a safe and reliable water supply that complies to the Drinking Water Standards for New Zealand 2022 (including new Water Services Regulations) and we are in the process of several improvements for full compliance to the Drinking Water Quality Assurance Rules of 2022.

Our supply is serviced in a sustainable and responsible way to residential, industrial and commercial properties in the following four areas within the city boundary:

- Palmerston North;
- Ashhurst;
- Bunnythorpe; and
- Longburn.

Broadly, our services are arranged under three sub-activities:

- Water collection;
- Water treatment; and
- Water distribution.

3.1.1 History of our Palmerston North Water Supply

In 1885 we identified the Turitea stream as a drinking water source. Without storage though, this was unable to meet peak demand 15 years later and we turned off the supply at night. This nearly led to tragedy when a hotel caught fire at night. The first Turitea dam was built in 1907 and raised in 1913 to provide this much needed storage.

In 1930 a significant amount of watermains were constructed as a response to the Great Depression. So much, that this met the infrastructure needs of the city for the next two decades.

The Turitea water treatment plant was upgraded and the Turitea upper dam was completed in the late 1950s, providing a significant store of water for periods of drought.

In 1974 storage was constructed at Ngahere Park to improve the resilience of supply to the city in the event of a treatment plant outage or similar.

The late 1990s saw an increase in height of the Turitea lower dam and improved spillway to better maintain minimum stream flow conditions.

Over the past few decades, groundwater bores have been developed across Palmerston North city to supplement the water supply from the Turitea Stream.

3.1.2 Water Supply Areas

The water supply areas are shown in Figure 3 below. Properties outside these areas self-supply their own water services or are provided with extra-ordinary connections as per the PNCC Water Supply bylaw. The city supply has agreed trickle-feed supplies to assist with water supply in Linton and along Kingsdale Park Road.

The water supply to the main urban area of Palmerston North is sourced from the Turitea Stream and is supplemented by four bore sites at Papa-i-oea Park, Takaro Park, Keith Street and Roberts Line. A new bore site and reservoir are being developed at the junction of Railway Road and Roberts Line is intended to service industrial development in the north-eastern part of the city. There are two storage dams in the Turitea Valley that provide approximately 60 days of storage at average day demand.

Water treatment of the Turitea dam source water involves coagulation, flocculation, clarification, rapid sand filtration and disinfection using chlorine. Groundwater is from sourced from artesian aquifers under the city and is typically of high quality. Groundwater is treated with chlorine to remove small amounts of ammonia and manganese and provide a disinfectant residual. UV treatment has been constructed in 2020 to the Papa-i-oea Bore Site to provide an additional disinfection barrier. Fluoride is added to the surface and groundwater supplies as a dental health measure, as recommended by the Ministry of Health.

Treated water from the Turitea Water Treatment Plant (WTP) is stored in three reservoirs. The water supply distribution network servicing the main urban area comprises pipelines, pressure booster pumping stations and pressure management stations.

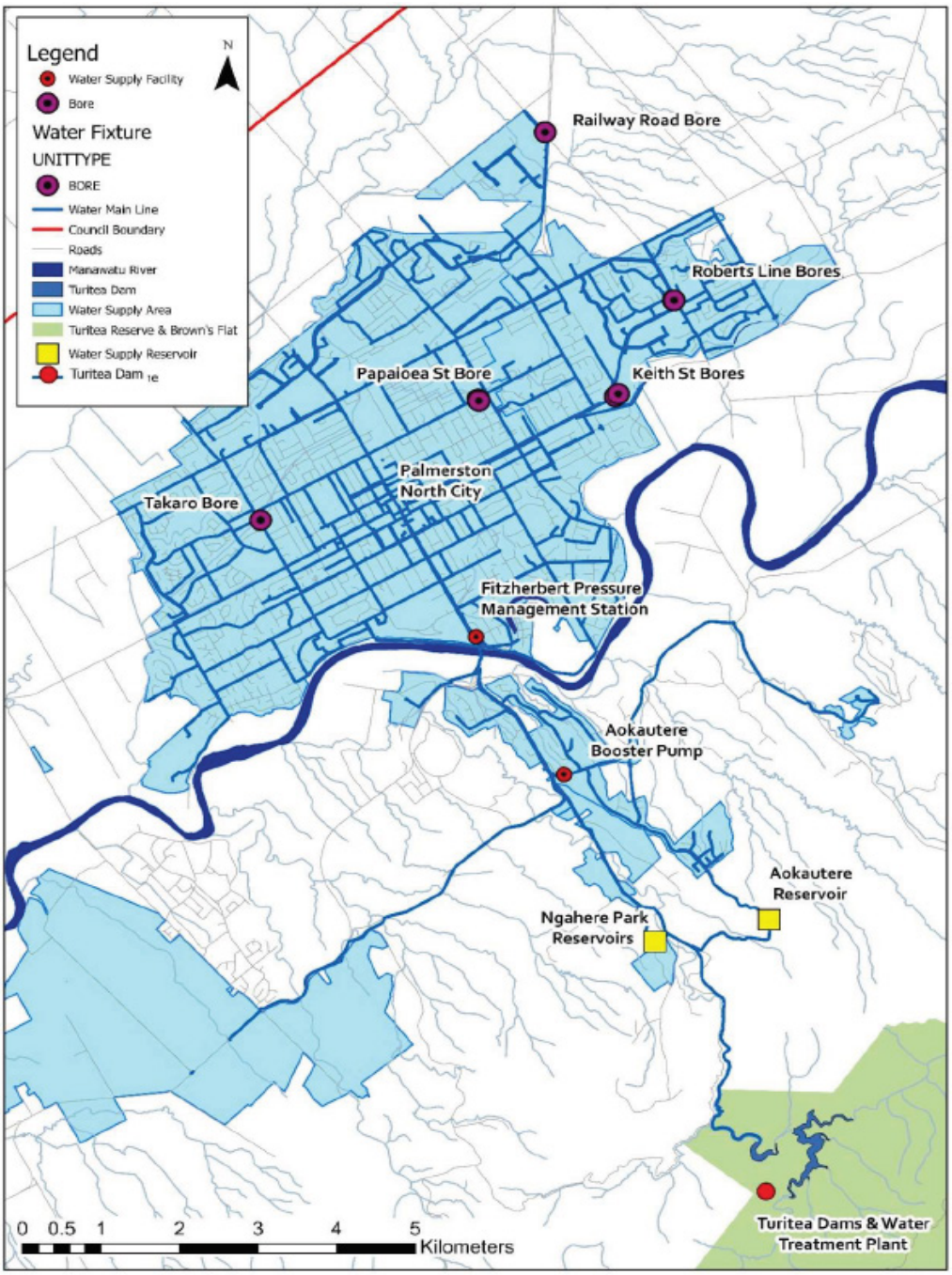


Figure 3: Our Water Supplies and Zones

3.1.3 Hinekōrako Water Supply Registration

Table 4 contains a summary of our water supplies and their components as registered with Taumata Arowai on Hinekōrako. The zone, source and treatment plant codes are used as identifiers for drinking water samples. Water is tested by a contracted lab, Central Environmental Laboratories and monitoring results submitted regularly to Drinking Water Online (Taumata Arowai's Hinekorako web portal).

Table 4: Water Supplies Registered with Taumata Arowai

Supply (Code)	Component	Name	Code
Palmerston North City (PAL001)	Zone	Aokautere (3,563 population)	PAL001AO
		Fitzherbert West (450 population)	PAL001FW
		Kelvin Grove (11,859 population)	PAL001KG
		Palmerston North City (56,412 pop.)	PAL001PC
	Plant	Turitea WTP	TP00147
		Keith Street Bore Station	TP02023
		Roberts Line Bore Station	TP00150
		Railway Road Bore Station	TP04022
		Papaioea Park Bore Station	TP00148
		Takaro Bore Station	TP00149
Palmerston North City (PAL001)	Source	Turitea Dam	S00082
		Keith Street Bore 1	G01208
		Keith Street Bore 2	G03051
		Roberts Line Bore 1	G00106
		Railway Road Bore	G03043
		Roberts Line Bore 2	G01736
		Papaioea Park Bore 1	G00104
		Papaioea Park Bore 2	G01412
		Papaioea Park Bore 3	G03035
		Takaro Bore	G00105
Ashhurst (ASH001)	Zone	Ashhurst (2,800 population)	ASH001AS
	Plant	Ashhurst Bore Station	TP00158
	Source	Ashhurst Bores	G00110
Bunnythorpe (BUN001)	Zone	Bunnythorpe (493 population)	BUN001
	Plant	Bunnythorpe	BUN001BU
	Source	Bunnythorpe Bore Station	G00914
Longburn (LON001)	Zone	Longburn (350 population)	LON001
	Plant	Longburn	LON001LO
	Source	Longburn Bore	G00259

3.2 Out of Scope

Buildings owned by this activity are included in the financial expenditure and forecasts but are managed by our Property department. The scope of this AMP does not include water services provided by others and assets not owned by Council. For example, privately owned water tanks.

3.3 Rationale and Variation with Water and Sanitary Services Assessments

Council provides water services for the provision of safe and readily available water.

There is no significant variation between this AMP and Council's Water and Sanitary Service Assessments.

3.4 Significant Negative Effects

Table 5 contains a summary of the significant negative effects for the Activity and how we mitigate them. All these potential negative effects are managed as part of the day to day operation of the Water Activity.

Table 5: Mitigation of Significant Negative Effects of the Water Activity

Significant Negative Effect	Description of Effect	Mitigation
Public health	The effect on public health and quality of life should the water supply not meet water quality standards. Risks from natural events such as large earthquakes and significant floods.	Water quality from the Treatment Plant is strictly controlled with a certified Quality Assurance process in place. The Water Safety Plan (Public Health Risk Management Plan) ensures the risks in providing drinking-water have been identified and mitigation measures are in place. The Three Waters Business Continuity Plan (BCP) ensures strategies are in place to enable prioritised resumption of critical activities in the event of business disruption.
Property damage	Property damage resulting from mains failures.	Renewal programmes minimise the incidence of infrastructure failures.
Environmental impact	The effect on the environment of damming and extraction of water from the Turitea Stream.	The damming and extraction of water from the Turitea Stream is regulated by conditions of resource consents to ensure that potential adverse effects are managed to acceptable levels.
	The effect on the environment of discharges of chlorinated water from maintenance activities or pipeline failures.	Discharges of chlorinated water are of short duration, chlorine levels in the water are low, and any effects are likely to be localised and relatively minor.
	The effect on the environment of disposal of water supply treatment by-products.	The discharge of water treatment by-products is covered by the resource consent and have a less than minor impact.

3.5 Improvement Actions

There are no improvement actions for this section.

4 Levels of Service

A key objective of this AMP is to ensure that assets support delivery of the agreed levels of service in the most cost-effective manner. This requires a clear understanding of levels of service, now and in the future.

The process for the development and monitoring of levels of service is outlined in the SAMP. This section of the AMP documents each of these steps for Water and identifies any issues or service gaps and the plans to address them.

The figure below outlines the three main inputs into the established levels of service for Water.

Figure 4: Level of Service Components

4.1 Performance Against Existing Levels of Service

Performance against the levels of service statements informs our investment, particularly where measures are not currently being met. The table below provides a summary of our performance against the levels of service for the previous three years.

Table 6: Performance Against Existing Levels of Service

Levels of Service Statements	Customer Performance Measures	Target	Performance 2020/21 2021/22 2022/23
We provide water services for the provision of safe and readily available water.	Compliance with Part 4 (bacteria compliance criteria) of the Public Health Act 1956 (as amended by the Health (Drinking Water) Amendment Act 2007).	100%	
	Compliance with Part 5 (protozoal compliance criteria) of the Public Health Act 1956 (as amended by the Health (Drinking Water) Amendment Act 2007).	100%	
	The number of complaints per 1,000 connections relating to clarity, taste, odour, continuity of water supply, drinking water pressure or flow, and our response to any of these issues.	No more than 40	

Levels of Service Statements	Customer Performance Measures	Target	Performance 2020/21 2021/22 2022/23
	Average consumption of drinking water per day per resident.	No more than 360 litres per person per day	
We provide water services for the provision of safe and readily available water.	Median response time for urgent callout attendance.	2 hours or less	
	Median response time for resolution of urgent callouts.	7 hours or less	
	Median response time for non-urgent callout attendance.	10 hours or less	
	Median response time for resolution of non-urgent callouts.	75 hours or less	
	Percentage of real water loss from the water reticulation network.	Less than 20%	
*We provide water infrastructure to support growth.	A 30-year Asset Management Plan is in place for water and major AMP projects approved in the 10 Year Plan are achieved.	Renewals as a group	
We manage our Water Activity in a financially sustainable way.	Major services and projects are provided within budget.	Within budget	

Key:

Target met  **Target not met** 

* This measure was removed from the 2021 Long Term Plan and subsequently not reported in the last Annual Report

4.2 Customer Expectations and Feedback

4.2.1 Customer Expectations

The way our customers utilise our water service depends on the nature of their premise/industry. The table below provides the user and stakeholder groups for each of the sub-activities which will be used to target the levels of service and assess whether the performance measures are being met. Where there are specific large scale and/or critical users of the activity, these have been listed out within in each user group where appropriate.

Through the water supply activity, Council provides the following services:

- Water supplied to the boundary of homes and businesses (including a fluoride-free service provided at the Papaioea Bore Station during the day)
- Firefighting flow capacity for supplying hydrants
- Bulk supply point for rural water tankers and construction work
- Prompt response to breaks, leaks, and quality issues with the service
- Preparedness for emergency water supply after a natural disaster

Table 7: Water Users and Stakeholders

Sub-Activity	Customers	Partners	Other Stakeholders
Water Collection	• Residents • Local businesses and commercial premises • Large water users (typically also Trade Waste customers) • Rural residential • Visitors • Fire and Emergency New Zealand • Water tankers • Developers • Council services (buildings, parks and reserves, swimming facilities, Tōtara Road Wastewater Treatment Plant	• Rangitāne o Manawatū	• Department of Conservation • Horizons Regional Council • Ministry of Health • Department of Internal Affairs • Taumata Arowai • Massey University (researchers) • Fish and Game • Forest and Bird • Mercury Energy
Water Treatment			• Ministry of Health • Department of Internal Affairs • Taumata Arowai
Water Distribution			• Horizons Regional Council • Ministry of Health • Department of Internal Affairs • Taumata Arowai • Developers • Fire and Emergency New Zealand (FENZ)

What is Important to our Customers?

Based upon customer feedback through customer surveys and Long Term Plan engagement, our customers want:

Access to safe, clean and readily available drinking water.

Users want to be able to turn on the tap at home or at their business and have enough water available to go about their daily lives.

When a disaster occurs, our customers expect water to be available. These user values and expectations have been formulated from Council staff and experience in the delivery of the water supply activity. They reflect the feedback we receive from users, and from also being users of the activity themselves.

What is Important to our Stakeholders?

Stakeholders will often agree with users on many aspects of LoS, for example, regulatory requirements will be broadly supported by residential user expectations. There will be key differences and tension between some stakeholder groups in some areas (regulatory requirements versus developer costs, for example).

Developers: The main way developers influence the water activity is through the RMA planning process in addition to the extension or upgrade of infrastructure to provide water supply services for their development. Developers want a quick planning / consenting process and need clear guidance on minimum engineering standards.

Regulators: Regulators have a legal responsibility to enforce government legislation through regulatory oversight. For the water supply activity this is primarily enacted by Taumata Arowai and Ministry of Health (Drinking Water Standards, Drinking Water Quality Assurance Rules, and Aesthetic Values, 2022) which work in tandem with the National Environment Standards (NES) to provide a multiple barrier approach to providing safe drinking water.

The Health (Fluoridation of Drinking Water) Amendment Act 2021, allows the Director-General of Health to direct local authorities to add – or not to add – fluoride to a drinking-water supply. All PNCC water supplies are fluoridated.

Other Government agencies such as the Department of Internal Affairs (DIA) provide regulatory oversight through the mandatory reporting of various performance measures as part of LGA requirements.

Horizons: The regional council is responsible for, among other things, managing discharges to the environment, water takes and water quality in the Manawatū catchment. Horizons influences the activity through setting regional policy under the RMA, including ensuring water allocations are reasonable and justifiable.

Limitations to Meeting Expectations

We recognise that the expectations of our users cannot always be met and that there are often conflicting desires and values within the broader activity user group. In addition to this, there are regulatory and technical considerations that often take precedence over user expectations. The following limitations and/or exceptions to LoS are acknowledged:

- The water supply activity is required to meet certain objectives and standards of regulatory authorities, relevant laws, local government by-laws and central government. These are considered non-negotiable and set a base LoS independent of our users' expectations and values (although they often will align with these);
- Extreme events will occur that will result in the expected LoS not being met, whether temporarily or for a longer duration. It is impractical and prohibitively expensive to implement a water supply activity that will cater for all known extreme events or unknown events that may occur. The Council therefore takes an evidence-based, risk-based approach to providing the water supply activity;
- The distribution system side of the water supply activity refers to those assets that are wholly owned and/or operated by Council. There are privately owned components of the water supply network such as the private lateral from the point of supply to the user that are not included when considering the LoS of the activity. These privately owned components may result in degradation of service or failure, and consequently complaints by the user.
- The views of various stakeholders and users are often in conflict making it difficult to find win-win solutions.

4.2.2 Customer Feedback

Annual Residents' Survey

We carry out an annual survey of residents to gain an independent understanding of how residents view the Council and its services. The figure below shows the 2023 results in comparison with 2022 and the table shows how satisfaction has changed over the last five years.

The key findings from the 2023 survey for Water-related infrastructure were:

- Almost eight out of ten residents (76%) are satisfied with our water supply services
- Overall satisfaction in 2023 has decreased slightly from previous years
- Residents in village-rural areas are the most likely to be dissatisfied with their water supply

Figure 5 below shows a summary of the latest Residents' Survey results and Table 8 which shows a summary of the past 5 years.

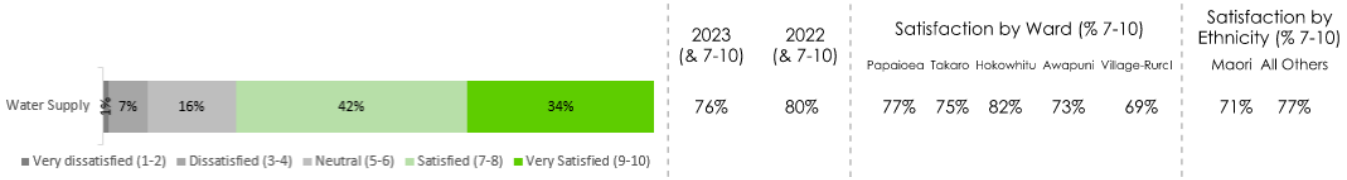


Figure 5: Customer Satisfaction Survey Results for Water Supply

Table 8: Resident Survey Overall results

Scores with % 7-10	% Point Change (2023-2022)	Percentage of Respondents Satisfied or Very Satisfied				
		2023	2022	2021	2020	2019
Water-related Infrastructure	-4%	68%	72%	77%	72%	76%
Water Supply	-4%	76%	80%	84%	82%	82%

He Aha Ra Nga Whainga Matua (What Really Matters)

https://www.pncc.govt.nz/files/assets/public/documents/council/research/what-really-matters-march-2023.pdf

Following the 2022 council election, sector lead organisations were asked about what really matters to them for our district's future, in preparation for the 2024 Long Term Plan. At the same time, students from Massey University were tasked with conducting two distinct research projects to gather the perspectives of young people in Palmerston North.

He Aha Ra Nga Whainga Matua (What Really Matters) captures the viewpoints of these contributors for Council to refer to and address during the Long-Term Plan process.

Feedback directly relevant to three waters is summarised below:

Table 9: He Aha Ra Nga Whainga Matua (What Really Matters) Three Waters Feedback

Contributor	Feedback
Environment Network Manawatū	• Increased programmes, education, infrastructure and investment in ensuring a significant reduction in plastic and litter entering local waterways • Recognition of the need for a dedicated staff member to monitor and manage the litter and plastic pollution in urban streams and waterways supported by PNCC • Increased artworks, signage depicting educational or historical information, accessibility and overall beatification of urban streams and waterways.

Contributor	Feedback
	• Increased collaboration in campaigns to showcase and promote sustainable practices in housing, gardening, energy efficiency, 3-waters efficiency, permaculture design, waste-free living, new technologies and environmental education. Tangible goals to achieve sustainability would be agreed for each campaign in consultation with Council.
Manawatū Business Chamber	• 3 Waters – what does this mean for PNCC, the City and our wider region? Does Council have a view on alternative funding models? It is a Public Private Partnership an option, and if so what might that look like?

4.3 Level of Service Gaps

4.3.1 Existing Levels of Service Gaps

Annual Reports

In general, our water supplies comply with the Drinking Water Standards for New Zealand. In 2020/21, there was one instance of bacterial non-compliance (result of a plant fault) and one of protozoa non-compliance (when scheduled sampling was missed on the Bunnythorpe and Longburn bores).

In 2021/22, a total of 1318 complaints were received about the quality of our water supplies (42.91 complaints per 1000 connections). This is slightly higher than our maximum target of 40 complaints per 1,000 connections and has been at around this level for the last three years. The highest proportion of compliants relate to toby faults, followed by water clarity, then continutity of supply and water pressure.

Actual water consumption in 2021/22 was estimated to be 238 litres per person per day. This is well under the maximum target of 360 litres per day and has been for more than three years. This target is higher than the national average and could be reduced further to demonstrate our commitment to water conservation.

Median attendance to urgent callouts were well below the 2 hour target. The median resolution time for urgent callouts was 6.25 hours which is less than the maximum target of 7 hours.

Real water loss from the water distribution network was calculated at 8.5% for 2021/22, less than the targeted 20%. This calculation is much lower than in previous years and requires checking.

4.3.2 Forecast Levels of Service Gaps

The most likely customer performance measure that is not going to be met in the future is provision of our services within budget. This is mainly due to existing budgets no longer being enough, as follows:

There is a medium risk that maintenance and renewal budgets previously set under the 10 Year Plan 2021-31 become inadequate as our assets age. This issue is dealt with in more detail in Section 9.

4.4 Improvement Actions

- Water consumption target – this is higher than the national average and could be reduced further to demonstrate our commitment to water conservation
- 2021/22 real water loss calculation requires checking as significantly lower than previous years

5 Future Demand and Impact of Drivers

The following drivers/significant issues are described in the SAMP and flow from the Infrastructure Strategy.

The key issues correlate to the significant issues highlighted within our Infrastructure Strategy which are:

1. Growth and changing expectations on levels of service – this links to affordability, liveability and a well-functioning urban environment.
2. Deterioration of Infrastructure Assets – there is a disconnect between agreed and expected levels of service funding. This also affects meeting an increasing cost of renewals (based on condition, age, performance).
3. Risks, resilience and compliance

The key issues which are described in the following subsections are:

- Our Strategic Direction
- City Growth – Population and Growing Urban Environment
- Sustainability and the effects of Climate Change, Natural Hazards, and Adverse Weather Events
- Technology Advances
- Customer Expectations
- Legislation Changes, Policy, and Guidelines
- Resilience
- Liveability (Demand Trends and Management)

5.1 Growth

Population projections for Palmerston North can be found in the SAMP.

Moderate residential, rural-residential and industrial development is proposed to occur within the district over the short, medium and long term. New infrastructure will therefore need to be provided in development areas, some of which may need to be forward funded to enable the development to occur.

Water supply's current approach is to regularly maintain and update the water supply model to understand the effect of the projected growth and development scenarios.

5.1.1 Residential growth

The development scenario for residential growth is based on scenarios detailed in the SAMP that seek to meet the needs of a growing population. To provide water to growing residential areas, there will be a need to expand the network and enhance the capacity of water sources. It is assumed rural-residential subdivision will occur in locations which do not require us to fund substantial upgrades to the water network in order to facilitate the subdivision.

Proposed Plan Change 1: Medium Density Residential Zone

We need more housing and have a responsibility under the requirements of the National Policy Statement - Urban Development Capacity to provide sufficient housing and business land development capacity to meet the demand for housing and residential sections.

Kākātangiata

Kikiwhenua is the first stage of the Kākātangiata urban growth area, which will enable about 220 new homes to be built in the western side of Palmerston North. We plan to install two new groundwater bores, with associated treatment and storage and service this new development and connect to our existing network.

Whakarongo

Whakarongo is made up of 62 hectares surrounding James Line, Napier Road and Stoney Creek Road – between Palmerston North and Ashhurst. Development has begun in this area with 700 to 900 homes eventually planned. As this development progresses, extensions to the Palmerston North water supply network will be needed to service new homes.

Ashhurst

Growth in Ashhurst is planned for the medium term (next 4-10 years). We have modelled this planned growth and existing networks appear to be sufficient but that a new groundwater bore (with associated treatment and storage) is needed on the northern side of Ashhurst to improve resilience.

Aokautere

This is a proposed plan change to allow for up to 1,000 new homes in Aokautere in the medium term. Based on projected demand we have planned for a second reservoir to be constructed on existing land owned by Council.

Longburn

As Kākātangiata progresses, it is expected that Longburn may be connected to our network. This will provide additional resilience to the existing Longburn water supply network.

Existing and Proposed Future Water Supply Bores

The figure below shows the location of existing (yellow) and proposed future (red) groundwater supply bores to meet project growth demands and improve resilience. New bores would require land purchase, treatment, contact time and storage improvements.

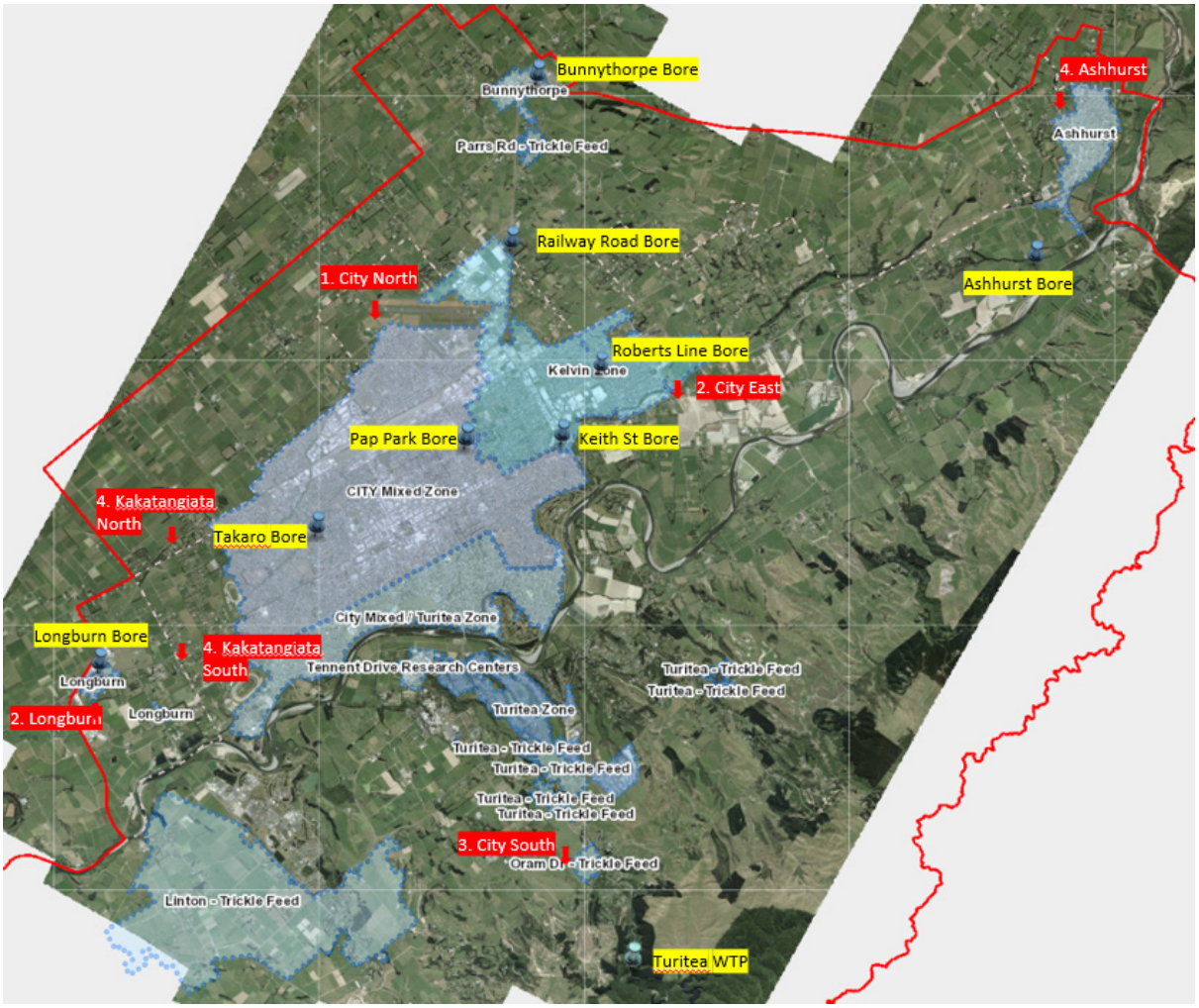


Figure 6: Existing and Proposed Future Bores (Source: Input to draft 2024 LTP)

5.1.2 Industrial growth

North East Industrial Zone

To mitigate downstream capacity constraints in the wastewater system the North East Industrial Zone (NEIZ) and the NEIZ Extension Area is specified as a pressure sewer area. The effect of this specification is to restrict the type of development that can occur to predominantly dry industries, such as warehousing and logistics. This will, in turn, impact the water demand in this area. We will continue to monitor the type of industry going into the NEIZ.

Te Utanganui Central New Zealand Distribution Hub

Te Utanganui is a 2020 strategy administered by the Central Economic Development Agency and developed in collaboration with iwi, central and local government stakeholders. Its purpose is to create a primary distribution and transport hub for central New Zealand. There are several infrastructure projects which sit under Te Utanganui which are in various stages of development. The proposed KiwiRail Regional Freight Hub is an expansion of the NEIZ. We are currently planning the proposed infrastructure response to service this new hub.

Longburn Industrial Park

Longburn is considered a suitable location for wet industry. However, the services in the Longburn Industrial Park are provided privately by the landowner and do not meet our Engineering Standards for Land Development. This places a constraint on the range of industrial activities that can occur in the area. We are working with the landowner to resolve the issue. Further development will require the privately owned infrastructure to be upgraded to meet our Engineering Standards.

Allowance for upgrading to service this industrial park would require network improvements to ensure that flow, pressure, quality and firefighting capacity meet agreed levels of service.

5.2 Resilience and Reliability

The SAMP describes common aspects of resilience and reliability affecting Council – which includes natural hazards and adverse weather events, biological hazards/pandemics, cyber security, security risks and economic risks.

There is a potential short-term cost implication for the activity in that a push for greater resilience will increase demand on the type of pipes and components selected when renewing or constructing new infrastructure assets. The need for increased operational flexibility in the network will also increase costs for both capital and operational expenditure. Spending on resilience, however, makes networks more reliable and in general can reduce lifecycle costs, particularly during recovery from damaging events.

Improving resilience and service reliability is incorporated into our capital and operational improvement programmes as part of our usual business practice. However, we also have some key programmes focussed on improving resilience.

- **Turitea WTP** – rehabilitation of the 1957 steel main from the lower dam to Ngahere Park reservoirs. Renewal of the critical raw water main to the WTP and various resilience improvements with the WTP itself.
- **Trunkmains** – provides improvements or extensions to trunk mains to reinforce the Palmerston North water supply network, particularly within the CBD area.
- **Seismic resilience of bores** – seismic strengthening of water supply bore facilities to ensure they remain operational following a major earthquake
- **Security of supply** – works to protect vulnerable infrastructure against seismic events. Includes connection to the Massey University water supply and a new bore to the south of the Manawatu River.
- **Ashhurst Rising Main Renewal** - continuing replacement of the rising main between the Hacketts Rd bore and the reservoirs. Final stage, between Winchester St and North St.
- **Reservoir Renewa**l – continued renewal of reservoir assets. Planned improvements include re-coating the roof of the Ngahere Park rectangular reservoir and eventual replacement of roofs for other reservoirs. Replacement of Bunnythorpe reservoir which is near the end of its asset life.

5.3 Climate Change

5.3.1 Predicted Climate Change Effects

Climate change is predicted to increase the intensity of rainfall events and have longer dry/drought periods. For water supply, this will mainly affect the quality and quantity of water available and also increased risk of erosion and flooding of infrastructure.

5.3.2 Climate Action Plan

The SAMP describes Council's participation in the regional Climate Action Joint Committee and its 2023 Joint Climate Action Plan which is about understanding how we will respond to climate change in the Manawatū-Whanganui region and working together to reduce potential harm.

Actions from the Plan which are specifically relevant to our three waters activities are:

- Prioritise nature-based solutions in response to flooding, stormwater, and erosion.
- Review planning provisions to encourage on-site stormwater management.
- Assess and manage climate related risks to local services and critical infrastructure.
- Redouble efforts to address existing issues that will be exacerbated by climate change such as freshwater health, biodiversity loss, flooding and erosion.
- Measure and reduce emissions from council activities.
- Incorporate carbon emissions and a preference for nature-based solutions into council procurement policies.

5.3.3 Long Term Plan Climate Change Priorities

Our three climate change priorities as set out in the proposed draft 2024 Long Term Plan are:

- Reduce emissions as efficiently as possible
- Adapt to the known effects of climate change
- Comply with changing regulations

We propose to implement these priorities through our design budgets and programmes as outlined below.

Investment to minimise greenhouse gas emissions as efficiently as possible over the whole life of an asset.

Council has committed to a 30% reduction by 2030 and net zero by 2050 (as reflected in the strategic direction of the 2024 Long Term Plan). Our understanding of how best to achieve this is continuing to evolve, especially as costs of many technologies fall, and new opportunities become available.

Plans should:

- Consider options to reduce carbon
- Analyse options in terms of their net present (whole of life) cost, their emissions impact, and the cost per tonne saved
- Allocate resources to projects/options that deliver emission reductions most efficiently

Investment to include consideration of the likely impact of climate change on weather patterns and operation of facilities.

Recent NIWA projections estimate an approximate 15% decrease in summer rainfall and an approximate 15% increase in winter rainfall by 2050. Recent experiences in Europe and North America indicate that extreme heat events in the summer are likely to pose a significant public health hazard as is winter flooding. This has impacts for utilities assets but also design of occupied or publicly accessible assets in terms of maintaining an operational temperature range and providing resilience.

Investment to include consideration of the likely impact of legislative and behavioural changes related to climate change.

Proposed government legislative programmes such as Building for Climate Change will affect legislative conditions around the Building Code, site waste management and where government subsidies are likely to be available. Forward planning should ensure future projects are viable this context.

Technological change including the adoption of electric vehicles, movement away from HCFC22 (R22) refrigerants, the increased use of pump variable speed drive (VSDs), microgeneration and microgrid effect on the electricity distribution system, the adoption of smart city principles and large scale data gathering will all result in changes to how assets are operated and planned.

5.3.4 Climate Change Aspects

While the predicted effects of climate change are a key consideration in our three waters planning, there are no specific projects to with regard to climate change or improvements proposed in terms of reducing capital or operational carbon emissions for renewals or new assets.

Proposed works programmes will need to incorporate the design budget and programme practices described above to align with Council's strategic priorities.

5.4 Sustainability

The potential impacts of sustainability drivers are related to water abstraction, energy use of the activity, and sustainable management of Turitea Reserve.

A greater upfront investment in new technologies and infrastructure (as discussed in Section 0) will impact the activity over the long term with greater energy efficiencies.

Reducing the energy consumption of the network, at the Water Treatment Plant, will mean less reliance on the national energy grid. The mini-hydroelectric plant could then potentially provide a greater proportion of the energy consumption at the Water Treatment Plant than it already does.

Less water loss in the network will lead to a lower water abstraction per capita.

Key sustainability issues and mitigations for the water supply activity are identified as follows:

- Control of pests and weeds in Turitea Reserve from which water is collected. Managing the environment in the Reserve to improve the biodiversity by maintaining and monitoring its ecological condition.
- Encourage fish population by creating a fish trap and transfer programme for the Turitea Dams with Rangitāne o Manawatū as part of their Rangitāne (North Island) Iwi Fisheries Plan.
- Monitoring water quality in Turitea Lakes and Turitea Stream. Minimise the impact to the water bodies from damming activities and from treatment plant by-product discharge.
- Managing water use to reduce energy consumption for water treatment and distribution.
- Managing water use to reduce or delay the need for abstracting more groundwater and further infrastructure upgrades due to inadequate capacity of assets.
- Minimising the inputs required by the operator, particularly electricity and chemicals, by optimising the operations.
- Operating the mini–hydroelectric plant in an efficient way to produce renewable energy and reduce the electricity input from the grid.
- Manage water abstraction in such a manner as to minimise electricity usage while ensuring demand is met.
- Identify and explore water sharing initiatives with other large bore owners such as Massey to preserve the overall water resource.

Our approach to these sustainability considerations is to incorporate them into the AMP process through the following mechanisms:

- Turitea Reserve Management Plan and the enhancement of biodiversity in the Turitea Reserve.
- The operation of a fish capture and transfer facility in partnership with Rangitāne o Manawatū.
- Implementation of the Water Conservation Management Plan.
- Adoption of a global water-take Resource Consent approach which covers all the city water bores to manage the ground water takes on a holistic basis and in balance with the Turitea water take.
- Optimisation of the operation for the Water Treatment Plant, bores, and pump stations.
- Signalling pressure reduction in future to reduce water leakage, save energy and extend asset life.

5.5 Legislative Changes

Broad proposed legislative changes affecting Council are outlined in the SAMP. Waters specific legislation is described in section 2 and in more detail below.

An important driver for the water supply activity is the changes to the Drinking Water Standards and the effects on the level of treatment that will be required. In addition, the wider Three Waters reform will likely result in new ways of regional collaboration and a new water regulator is in place.

5.5.1 Three Waters Reform

As of August 2023, the Government has confirmed that a new entity will take over our water functions before 2026. All three water services provided by Council will be owned, operated and maintained by the new entity. New non-financial and financial performance reporting will be required to key stakeholders, and regulators (Taumata Arowai and Commerce Commission).

5.5.2 New Rules, Drinking Water Standards and Acceptable Solutions

As mentioned, new Drinking Water Standards were set by the Minister of Local Government and came into effect on 14 November 2022. Similarly, new Aesthetic Values for drinking water were set by Taumata Arowai and came into effect on 14 November 2022.

For both the new standards and aesthetic values, registered drinking water supplies are required to comply with the new reporting requirements from 1 January 2023. Currently unregistered supplies need to be registered with Taumata Arowai by November 2025 and be fully compliant by November 2028.

The new Drinking Water Quality Assurance Rules set out how drinking water suppliers can demonstrate compliance with the Drinking Water Standards. Some of the key differences from the previous Drinking-water Standards for New Zealand (DWSNZ) is that the new rules have:

- Different levels of complexity to match the complexity of supplies;
- A new format, grouping rules into modules to make it easier for suppliers to find the rules that apply to their supplies;
- A greater emphasis on testing to identify and reduce risks;
- New requirements for source water testing and distribution system monitoring;
- New rules for very small (<50 people) and small (50-500 people) supplies
- Discontinued the DWSNZ secure bore water criteria. All water supplies will need some form of treatment unless an exemption is granted by Taumata Arowai; and
- A new chemical compliance section for large (>500 people) supplies.

5.5.3 National Policy Statement for Freshwater Management and Horizons Regional Council One Plan

The health of our freshwater is vital for the health of our people, environment, and economy. However freshwater quality is declining. It is being impacted by urban development, agriculture, horticulture, forestry and other activities. Current regulation has not been able to halt the decline in many of our catchments.

To address these issues, the Ministry for the Environment, under their Essential Freshwater Plan, is working towards these three objectives, all of which will have an impact on the Water Supply Activity:

- **Stopping further degradation and loss** – taking a series of actions now to stop the state of our freshwater resources, waterways and ecosystems getting worse (i.e. to stop adding to their degradation and loss), and to start making immediate improvements so that water quality is materially improving within five years.
- **Reversing past damage** – promoting restoration activity to bring our freshwater resources, waterways and ecosystems to a healthy state within a generation, including through a new National Policy Statement for Freshwater Management and other legal instruments.
- **Addressing water allocation issues** – working to achieve efficient and fair allocation of freshwater and nutrient discharges, having regard to all interests including Māori, and existing and potential new users.

As part of this plan the New Zealand Government introduced a new National Policy Statement for Freshwater Management (NPSFM) in 2020 (see section 0). It is expected that Horizons Regional Council (HRC) will amend the Regional Plan (The One Plan) in response to the NPSFM. It is anticipated that this will at least include:

- Heightened expectation that Council achieves meaningful improvements in discharge quality.
- Implications for the level of water take allocations that Council have from both groundwater and surface water sources.

We also participate in discussions with Rangitāne o Manawatū. This occurs at all levels of the organisation and allows us to prepare, influence and adapt to pending changes before they are implemented.

The One Plan already sets water quality targets and allocation limits for major river catchments, including the Manawatū River. The One Plan also sets out a framework for determining what is the efficient and justifiable water needs of a municipal water supply and sets rules for determining the peak day water demand that can be consented. This includes an allowance for growth that is available for use now. Water demand management may become more critical in the future if peak demand nears the consented limit. We will continue to work proactively with Horizons and Rangitāne o Manawatū to identify the best means of achieving allocation limits, in a way that is both practical and cost-effective.

5.5.4 Building (Dam Safety) Regulations 2022

New dam safety regulations will take effect on May 13, 2024, requiring dam owners to assess their potential impacts and to submit a Dam Safety Assurance Programme to the regional authority. Medium and high-risk dams are required to submit a programme 12 months and 2 years after registration, respectively, while low-risk dams will be reassessed every 5 years. Our dams will need to comply with these requirements.

5.6 Technology Advances

The SAMP describes our Council's commitment to using digital transformation and smart new technology to bring about greater organisational proficiency.

We already utilise SCADA and telemetry systems to monitor the performance of our three waters activities. We also model our water supply network to plan for network improvements and upgrades.

To help us better understand water use patterns and network performance, we propose the following improvements:

- **District Metering Areas (DMAs)** – investigation and installation of DMAs and utilising specialist software for pressure management to reduce leakage.
- **Smart metering** – installing smart meters for our larger commercial customers to understand water consumption patterns and manage demand

5.7 Demand Trends

Water demand can be broadly broken down into the following groups:

- Domestic consumption, including garden irrigation, car washing etc;
- Non-domestic consumption, including industrial, commercial, accommodation, educational, hospitals, laundries, parks, nurseries etc; and
- Water losses or unaccounted for water, including leakage etc.

Water consumption patterns are influenced by:

- Public perceptions and social habits around water use, in particular washing and irrigating;
- Whether water-saving devices are in use;
- Whether water can be recycled or reused onsite;
- Seasonal and climatic influences, including daily temperature variations;
- Operational settings, such as zone pressure, water restrictions etc; and
- Technologies to improve water efficiency on industrial/commercial/recreational sector.

5.7.1 Water Production

Overall domestic consumption trends are assessed from a sample of metered properties that are manually read every two months. Non-domestic (industrial and commercial) consumption figures come from the significant users who are metered and charged per cubic metre of water used. We are among the large water consumers, primarily for our parks and gardens but also other utility services.

Water supplied from all Council's supplies (including water consumed and water lost through leakage or other means) from the past five years is shown below. This is as provided to the Water New Zealand National Performance Review. The data shows that over this period total water production has remained relatively steady.

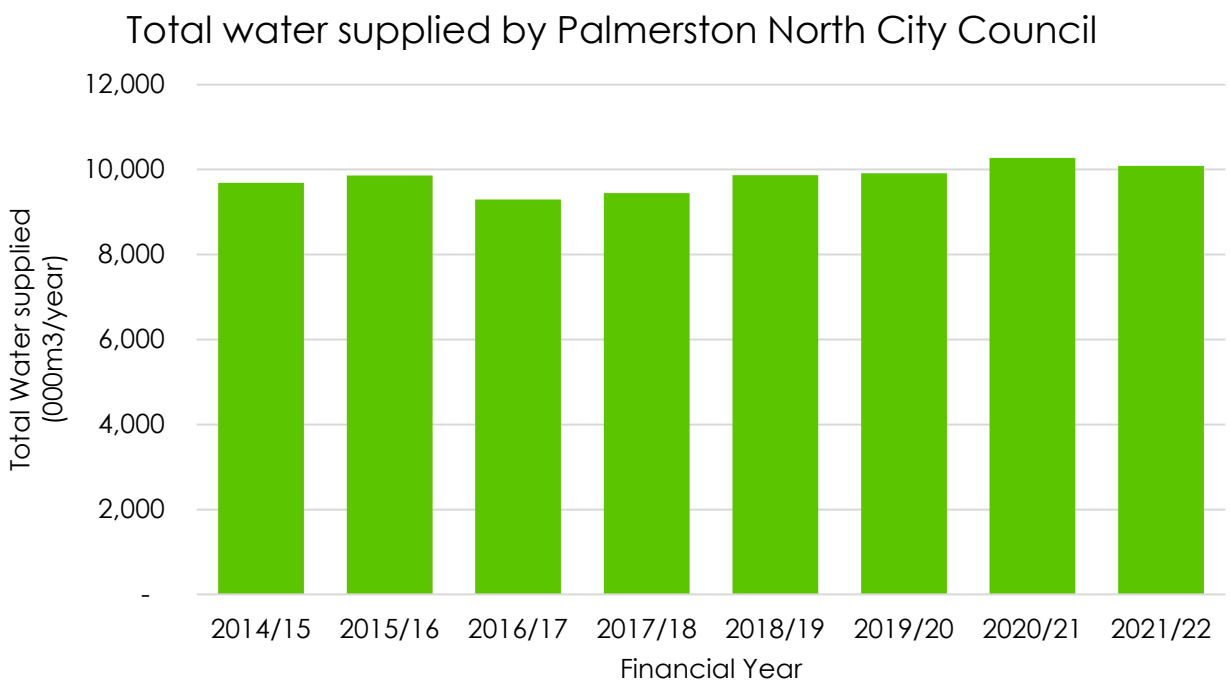


Figure 7: Historical Yearly Water Supplied for all Palmerston North City Supplies

5.7.2 Water Losses

Trends in estimated unaccounted for water over the last decade and provided to the Water New Zealand National Performance Review are shown below. As not all water customers are metered, water loss is estimated rather than calculated on actual volumes. Overall, the trend shows water loss increasing and that we are below the national median. The 2021/22 value seems unusually low and may be incorrectly estimated.

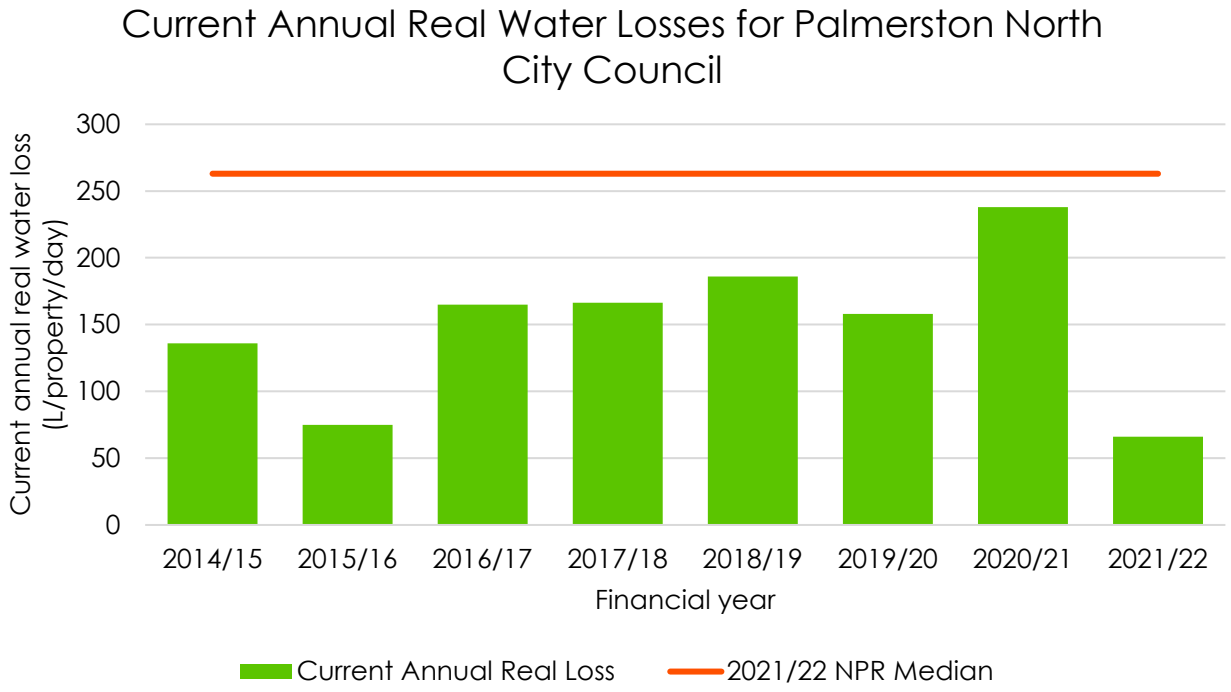


Figure 8: Historic Unaccounted for Water Loss for all Palmerston North City Supplies (Source: NPR 2021/22 Submission)

The Water Conservation Management Plan aims to minimise losses from the Palmerston North water supply system. In addition to replacing pipes as they reach the end of their useful life, initiatives to manage leakage include pressure reduction, zone management, water demand auditing and monitoring, identification and repair of leakage sources and system optimisation.

5.7.3 Total Water Demand Projections

The figure below shows the estimated future water demand in Palmerston North. This forecast was developed as part of the global bore consent application, Abstraction of Ground water from Bores for Palmerton North City Municipal Supply Purposes, 2019. It was used to demonstrate that the water demand is reasonable according to the Regional One Plan policy and was based on projected changes in population and assumed water consumption patterns. The projection assumes that:

- Domestic water usage per head of population remains at the same level;
- Industrial water usage remains at the same level;
- Unaccounted for water percentage remains at the same level; and
- Water usage due to climatic changes increases by 1.4% in the 30 years (based on central government predictions)

Although some of the assumptions will need to be revised in the next iteration of the forecast the conclusions effectively remain the same. That is that the cumulative effect of the growth in water demand will eventually necessitate the development of an additional water source or sources. The increase in water demand from the various sources outlined over the 30-year period considered in the WSDP is summarised below.

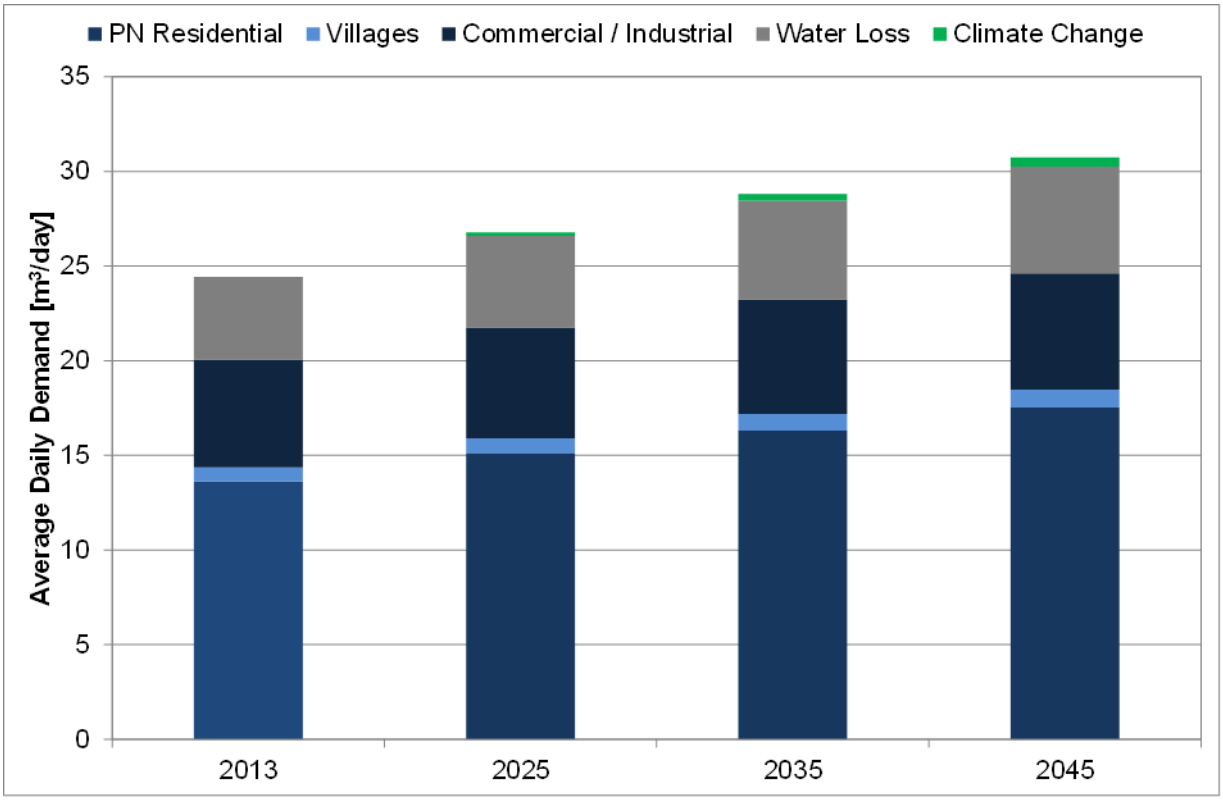


Figure 9: Average Daily Demand Projection (Source: Abstraction of Groundwater from Bores for Palmerton North City Municipal Supply Purposes, 2019)

5.8 Demand Management

5.8.1 Water Conservation Management Plan

We recognise that water is a valuable resource which should be used in an efficient and justifiable manner. The Water Conservation Plan contains the initiatives and actions that we have adopted to help achieve the goals of the Eco City Strategy.

The Water Conservation Management Plan's target is to maintain future water demand at or below the current per capita level. That is, at worst case, water demand is expected to increase directly proportional to the population increase.

This strategic document encompasses the main tools that we employ to manage water demand. These tools and how they are used are summarised below.

Table 10: Water Demand Management Tools

Tool	Demand Management Function
Water Supply Bylaw	Defining the water supply area where customers may or may not be connected Defining extraordinary customers for metering, which provides a financial incentive to minimise waste Regulating unauthorised use Outlining the Water Restriction Levels Allowing for designated areas of restricted flow supply
District Plan	Seeks to guide development whilst protecting the water supply's LoS Directing "wet" industries to specific areas Restricting connections where critical infrastructure is not yet in place

Tool	Demand Management Function
Leadership by Council	Reporting on water use Considering water conservation in design Encouraging Council staff to conserve water
Education by Council	Promoting water conservation at community events and to the business community
Efficiently and sustainable operation of the water supply	Monitoring the capacity and performance of the water supply network Reducing water leakage Implementing pressure management Optimising water supply operational settings

5.8.2 Demand Management Options

The Water Activity contributes to managing base demand through the efficient operation of the water distribution system. Other demand management options involve physical works, such as the installation of meters, rainwater tanks or grey water reuse systems.

Pressure Management (Reduction)

A significant reduction in on-demand water and leakage was achieved in 2004 when the main Palmerston North zone pressure was reduced. The establishment of smaller zones for further pressure management has been investigated. We propose the installation of DMAs to better understand water use and manage pressure within our water network.

Leakage Detection & Reduction

Intensive leakage detection and reduction is an expensive exercise and is currently considered uneconomical given the very low marginal cost of the city water. It is recommended that leakage is reviewed and calculated on a periodic basis to confirm that the current range of measures is sufficient to maintain leakage at or below levels of 20% of average daily demand (based upon industry benchmarking standards). If consumptive water use rises above consented levels, then investment in active leakage may be required to ensure consent compliance, however it is assumed that at this stage this is not required.

Universal Metering & Smart Meter Options

Universal water metering could result in reductions in per capita water demand. However, implementation of universal metering is costly both to implement and to maintain and operate. We are not proposing universal metering at this time.

For existing metered customers, there are a small number of large consumers who represent a significant portion of total water demand and exert a significant local effect on the network. In order to provide real time information on water use and better manage the effect of these large takes on the network, Council is looking to invest in a smart meter rollout for the largest customers.

Rainwater Tanks

Rainwater tanks may somewhat mitigate water requirements for garden irrigation and swimming pool use, but more importantly they can provide a valuable emergency water supply in the event of major seismic or other natural hazard which results in an extended loss of supply. Council is supporting a voluntary scheme where householders install water tanks by supplying the tanks at cost price.

Grey Water Recycling

Several water supply authorities who have regular and persistent water shortages have permitted or mandated the installation of grey water treatment and re-use systems in new and existing dwellings. The systems can significantly reduce water consumption by replacing toilet flush water and some of the outside water used for irrigating gardens and lawns. Such systems are typically expensive and require active management. They are generally only practical on a private dwelling with good soil conditions.

Fully reticulated recycled water supply schemes while widely implemented in dry countries such as Australia are prohibitively expensive compared to the alternatives. Grey water recycle systems will be limited to private, on-site systems for the foreseeable future. There are also hygiene and backflow concerns with respect to recycled grey water and there is yet no national regulatory framework.

Summer Water Use

Adoption of peak summer season water conservation measures – levels 1 to 3 enforced through the Water Supply Bylaw has been a regular strategy. Currently the Water Supply Bylaw has provision for setting three levels of water restrictions to manage water demand by reducing outdoor irrigation to conserve stored water and limit peak draw off. Typically, these have only been imposed during extended dry periods.

We have now adopted a summer water use campaign whereby customers are encouraged to voluntarily use water in line with level 2 rules between December and April. It is recommended that the success of this campaign is assessed in terms of managing water use and achieving water conservation objectives.

5.9 Impact of Demand and Drivers

Demand drivers and proposed improvements described above and proposed in the 2024/34 LTP are summarised in the table below.

Table 11:Summary of Demand Drivers and Proposed Improvements for 2024-34 LTP

Demand Driver	Proposed Improvements
Growth	Infrastructure upgrades and extensions to meet residential and industrial growth projections
Resilience and reliability	Trunkmain upgrades particularly in the Palmerston North CBD to improve resilience and service reliability Seismic strengthening of water supply bore facilities Improved water supply to Massey University water and a new bore to the south of the Manawatu River.
Climate change	Recommendation that Council includes specific actions for three waters activities in the next update of its climate change action plan.
Sustainability	Implementation of the Turitea Reserve Management Plan Fish mobility improvements in partnership with Rangitāne o Manawatū Implementation of the Water Conservation Management Plan Ongoing operational improvements to promote efficiency
Legislative changes	Participation in Three Waters Reform activities Upgrades and improvements to meet new drinking water standards and regulations Alignment of processes and initiatives with national and regional environmental legislation Compliance with proposed changes to Dam Safety Regulations

Demand Driver	Proposed Improvements
Technology advances	Implementation of DMAs and smart metering of our largest customers to better manage water pressure and demand patterns

5.10 Improvement Actions

- Council includes specific actions for three waters activities in the next update of its climate change action plan.
- The summer water use campaign is regularly assessed in terms of managing water use and achieving water conservation objectives.

6 Our Assets, Condition and Performance

6.1 Asset Summary

We own some $380 million worth of assets in order to provide our Water Supply services. As mentioned in Section 3.1, Scope of our Services, our services are arranged under three sub-activities:

- Water collection;
- Water treatment; and
- Water distribution.

Figure 10 below shows that 76% of our water supply assets, by value, are associated with the distribution of water, and the majority of that, some $200M, are watermains. The key water supply developments include:

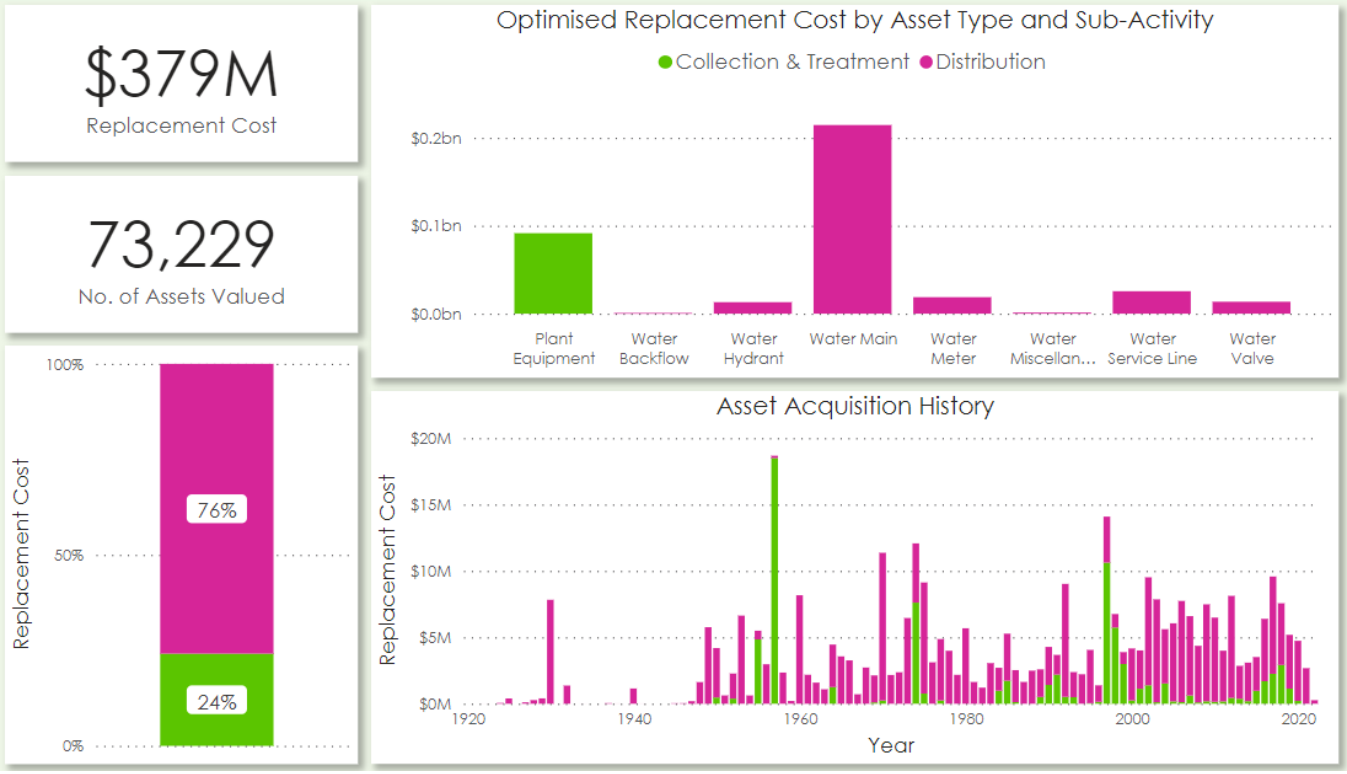


Figure 10: Optimised Replacement Cost (2022)

The table below contains further details and number of assets under each sub-activity.

Table 12: Asset Groups by Water Supply Sub-Activity (June 2023)

Asset Group	Details	Key Metrics
Collection and Treatment		
Headworks	Turitea Reserve Turitea Upper Dam Turitea Lower Dams Turitea Upper Dam Mini Hydroelectric Station	3500 ha 1,682 ML 180 ML 200 kW
Groundwater Bores	Palmerston North Bores Ashhurst Bore	9 no. 1 no.

Asset Group	Details	Key Metrics
	Bunnythorpe Bore	1 no.
	Longburn Bore	1 no.
Treatment	Turitea Water Treatment Plant	22,000 m^3/day
	Ashhurst Polishing Facility	1 site
	Groundwater treatment	8 sites
Reservoirs	Ngahere Park	6000, 9000 m^3
	Aokautere	2500 m^3
	Ashhurst	1000, 1900 m^3
	Bunnythorpe	217 m^3
	Longburn	188 (total) m^3
Distribution		
Reticulation	Watermains	586 km
	Valves	5167 no.
	Hydrants	3296 no.
	Service Lines	200 km
	Swabbing Points	431 no.
	Zone Sampling Boxes	12 no.
	Fluoride Free Tap	1 no.
Booster Stations	Roberts Line	1 no.
	Turitea	1 no.
	Silicon Way	1 no.
	Kingsdale Park	1 no.
	Aokautere (back up only)	1 no.
	Fitzherbert Pressure Management Station	1 no.
	Ngahere Park	1 no.
	Longburn	1 no.
	Bunnythorpe	1 no.
Connections	Service Tobies and Manifolds	27,701 no.
	Water Meters	2,116 no.
	Back Flow Preventers	454 no.

6.2 Palmerston North Water Supply Assets

In Palmerston North, the four water supply zones are supplied water from various sources as below. Approximately 60% of Palmerston North's water comes from the Turitea stream, a tributary of the Manawatū River on the Tararua range. The balance of water comes from nine groundwater bores. Groundwater is from a secure aquifer and of good quality. Fluoride is added to the surface and groundwater supplies as a dental health measure.

Figure 11: Palmerston North Water Supply Zones, Plants and Sources

6.2.1 Turitea Reserve and Management Plan

It is worth noting that not only do we manage water collection (or headworks) assets at Turitea but also the Turitea Reserve itself. Our current Turitea Reserve Management Plan has been operative since 2006 and covers some 3,500 hectares of reserve in and around the Turitea water supply catchment (2,400 hectares) including Hardings Park on the Tararua Ranges.

The protected reserve area has a rich history significant to Rangitāne and today "represents 90% of the ecology of Palmerston North City"[3]. The Turitea Stream provides a koha that enables sustainable use as the main source of safe drinking water for the City. Bounding the Turitea catchment are landmark peaks of significance to Rangitāne o Manawatū including Tirohanga, Mairehau (Bryant Hill), Ramiha and Mārima. The latter was transferred from the Department of Conservation to Rangitāne under the Rangitāne o Manawatū Claims Settlement Act 2016. The figure below shows the key features of the Turitea Water Supply Catchment.

The following assets are included within the Turitea Reserve:

- South Range Road – 13.3 km of unsealed road.
- Dam and Boatshed access roads – 5.4 km of unsealed road.

We have been engaging with Mercury Energy has started construction of a wind farm within the Turitea catchment regarding the potential effects on the drinking water catchment.

[3] Turitea Wind Farm Proposal, Final Report and Decision of the Board of Inquiry (September 2011)

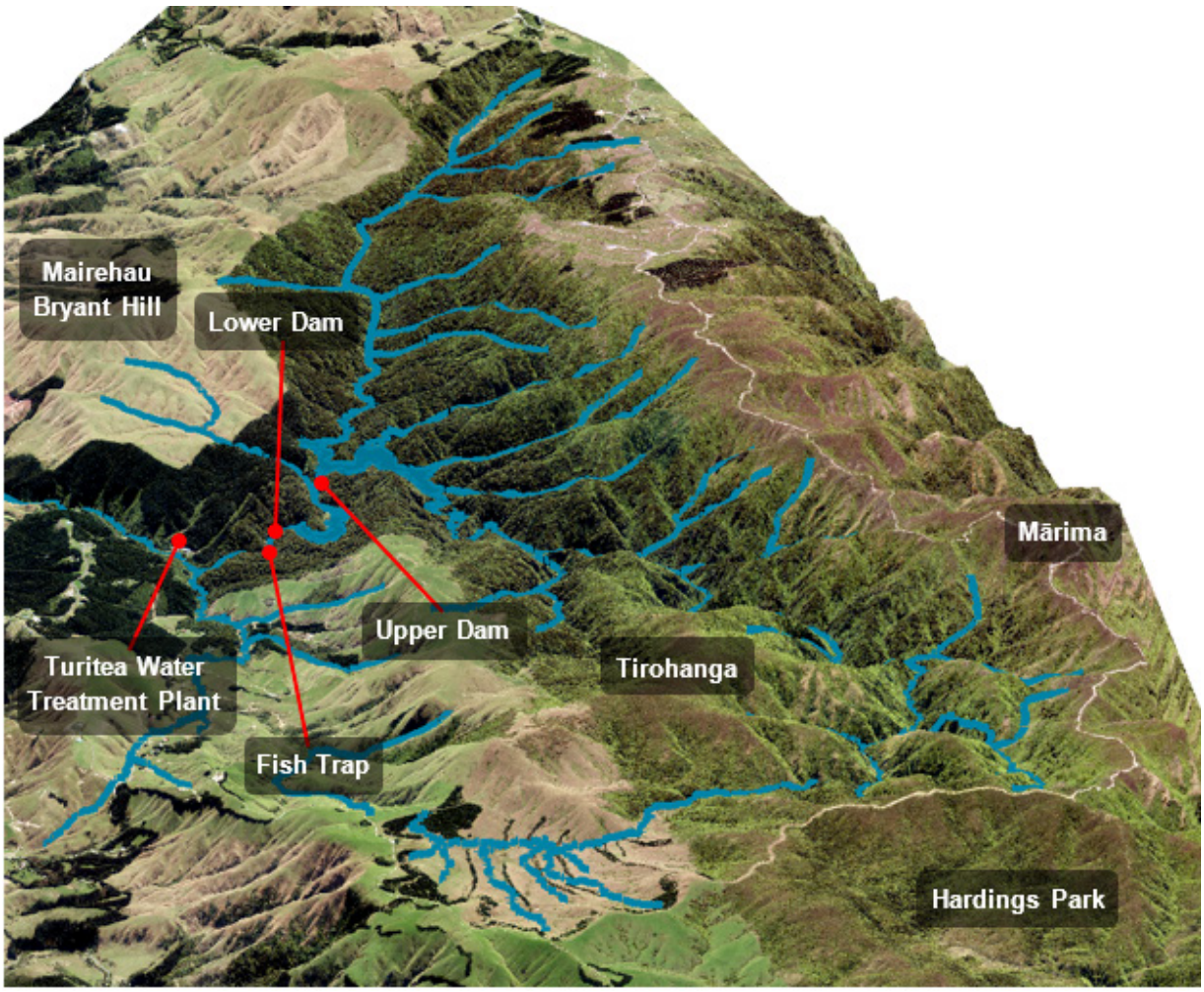


Figure 12: Key Features of the Turitea Water Supply Catchment

6.2.2 Turitea Dams and Hydroelectric Power Station

The Upper Turitea Dam was completed in 1957 and is a concrete arch with gravity concrete abutments.

The latest upgrade to the Lower Turitea Dam consists of a concrete faced rock fill dam that was completed in 1995. A key feature of the upgrade was the construction of a syphon in the Lower Dam in order to maintain a minimum stream flow.

Annual Dam Safety Reviews (ADSR) and five-yearly Critical Dam Safety Reviews (CDSR) are undertaken for both dams. Most actions from the 2013 CDSR have been actioned and the latest review in 2017 suggested both the Upper and Lower Turitea Dams are in a satisfactory condition and performing as expected. This includes modelling of what would happen to each dam under a significant earthquake and the probably maximum flood. Both dams are expected to remain intact.

A small, 200 kW, hydroelectric power station was installed on the Upper Turitea Dam and commissioned in 2001. When operating at full capacity, it can generate enough power to meet the requirements of the Turitea Water Treatment Plant. Surplus electricity is sold to the national grid. During extended dry periods water is only released from the Upper Dam to maintain the water level in the Lower Dam above the outlet syphon. Since 2017 all generators have had a major service.

The water quality in the dams is very good in general with slightly elevated iron and manganese concentrations which are still well under the Guideline Values set out in the Drinking-Water Standards for New Zealand 2005 (Revised 2008). The iron and manganese compounds precipitate and accumulate in the reticulation and following any disturbance can result in localised discoloured water issues for consumers. An aeration system was commissioned late 2017 in order to mitigate this issue by keeping the upper Turitea reservoir mixed during summer. Mixing prevents the formation of thermal stratification with a warm layer on top and a deep anoxic layer where iron and manganese precipitate out. Prior to the installation of the aerators these minerals would be released in Autumn into the water body when the warm layer cooled and inverted the deep anoxic layer.

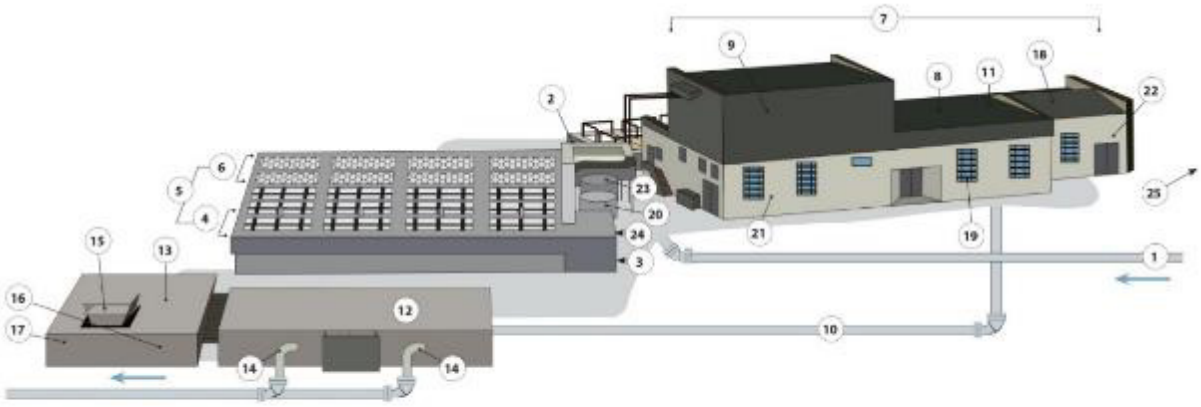
6.2.3 Turitea Water Treatment Plant

Water from the lower Turitea Dam gravitates via duplicate pipes (1907 cast iron and 1952 concrete lined steel) to the Turitea Treatment Plant. The pipes join just before the plant at a boosting station that can be turned on to increase the flow rate but **exceeds the consented rate of take** from the Turitea Stream. The booster has been retained in service for resilience in the event of bore stations being disrupted by a disaster and is run once a year with Horizons' permission.

The Turitea Water Treatment Plant, shown schematically below, is a conventional surface water treatment system. It was upgraded substantially in 1999 to ensure that the water quality met the Drinking-Water Standards New Zealand and to increase production capacity from 26,000 to 35,000 ML/day.

As shown in the Turitea Water Treatment Plant process diagram, the current plant comprises the following treatment steps:

- Coagulation, flocculation and settling;
- Advanced filtration with dual media; and
- Fluoridation, pH correction and chlorination.



1. Incoming water Potassium permanganate and Soda Bicarbonate addition, control valve and flow meter
2. PACL addition, first stage flocculation
3. Instrument room
4. Second stage floccuation
5. Clarifiers
6. Tube settlers
7. Dual media filters (at rear of building)
8. Control & Laboratory
9. Dry chemical store (Lime, Soda Bicarbonate, Potassium Permanganate, Polyelectolyte)
10. Out flow meter
11. Upwash pumps and air scour blowers
12. Clear water tanks
13. Wastewater surge tank
14. Finished water outlets
15. Lamella seperator
16. Wastewater motor control centre
17. Sludge and service water pumping room
18. Main motor control centre
19. Plant supervisors office
20. Chlorine dosing room
21. Main chemical storage (PACL (liquid), Fluoride (HFA)) and dosing area
22. Generator room
23. PACL storage area
24. Chlorine storage
25. Emergency assembly area

Figure 13: Turitea Water Treatment Plant Schematic

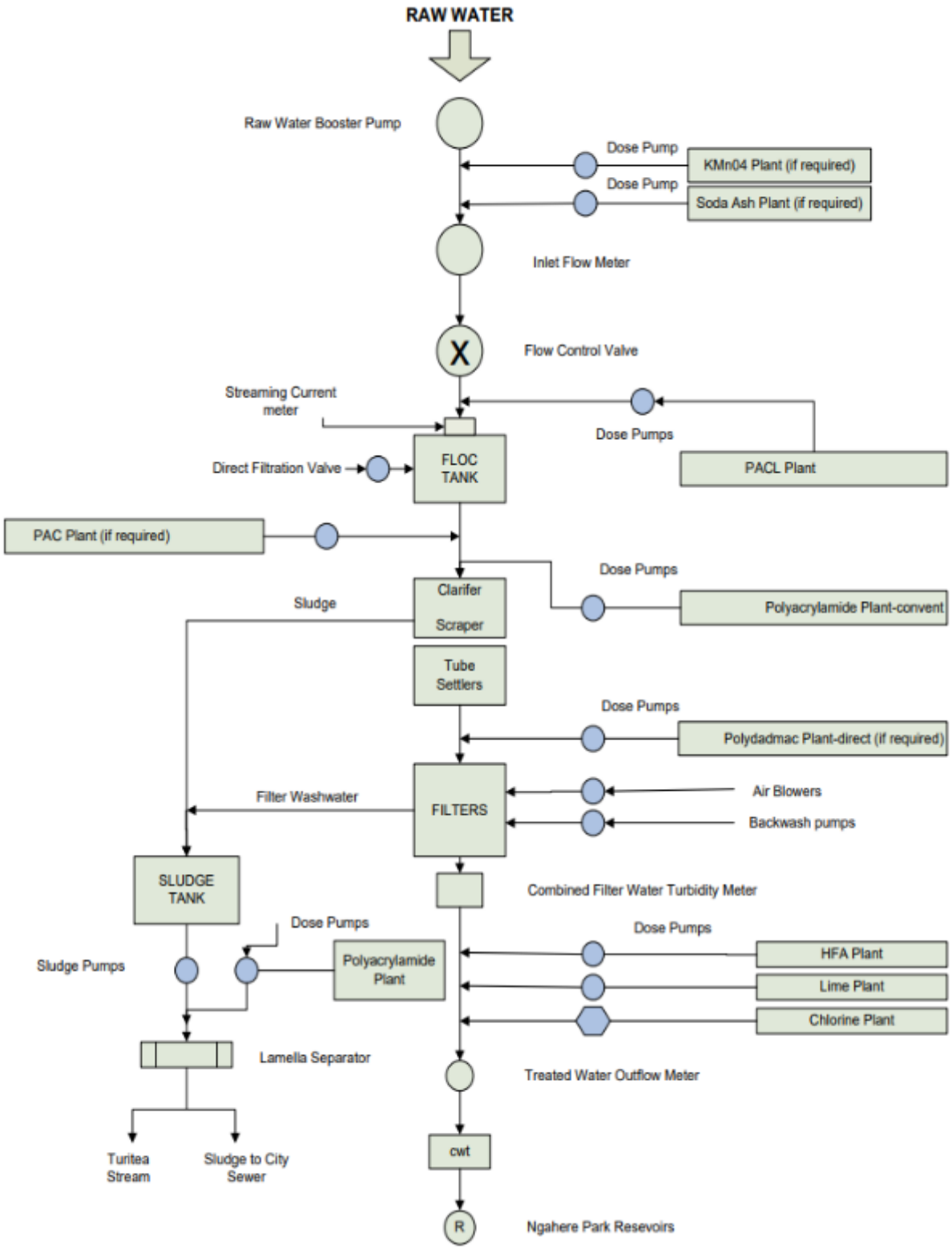


Figure 14: Turitea Water Treatment Plant Process Diagram

In 2006, both dams experienced an algal bloom that affected the taste of the water and caused some odour issues. The presence of significant cyanobacteria may lead to residual levels of toxin occurring in the reticulation system. Several investigations were undertaken to identify the cause of the algal bloom, but no firm conclusions could be drawn. A new Powdered Activated Carbon (PAC) Dosing Plant was installed in 2007 to treat the taste and odour and remove any possible residual toxins. A Cyanobacteria Management Framework has been developed and agreed by the Drinking Water Assessor. The management measures and the PAC dosing plant have been working effectively.

The waste sludge from the clarifier tank and filter backwater is thickened and pumped to the city sewer system. Some process water is discharged back to the Turitea Stream.

Other assets associated with the Turitea Water Treatment Plant include:

- Turitea Water Treatment Plant access road – 1.4 km of sealed rural road. Including approximately 24 retaining structures, full-length dish channel, sumps and culverts.
- The bridge over the Turitea Stream immediately below the treatment plant.

6.2.4 Palmerston North Groundwater Bore Stations

The purpose of the groundwater bore stations are to:

Meet demand including the consented future peak day demand;

Provide operational flexibility, such as providing redundancy to allow for scheduled maintenance of critical assets, or increasing production during summer in order to conserve water at the Turitea dams; and

Provide resilience in the advent of a disaster.

The Water Supply Development Plan is updated regularly and provides the strategy for investing in groundwater bores in order to meet these outcomes. Bores are located at four locations around Palmerston North. Papaioea and Roberts Line have 2 operational bores at the sites with the older bores being used as standbys. The remaining bores are located at Takaro Park and Keith Street. Three new bores have recently been constructed:

Keith Street Bore 2 to increase production and security of supply to the Kelvin Grove zone (commissioned);

Papaioea Bore 3, including UV treatment, to increase production due to a decrease at Papaioea Bore 1 (yet to be commissioned); and

Railway Road Bore, to provide for industrial growth (North East Industrial Zone and Extension Area) and security of supply to the Kelvin Grove zone (yet to be commissioned)

Details of the capacity of the bores, construction and operation details, and age can be found in Appendix B of the Water Safety Plan.

In terms of disinfection, chlorine (or hypochlorite at Roberts Line) is added to oxidise hydrogen sulphide and ammonia naturally present and provide a protective residual in the reticulation (chloramines). Fluoride is added for dental health purposes. A fluoride-free tap is provided at Papaioea Park to the public.

No storage is provided at the bore sites so water is pumped directly into the reticulation which is controlled by pressure in the system.

6.2.5 Reservoirs

Four treated water storage reservoirs are located at:

- Turitea WTP (1,000m^3)
- Aokautere (2,500 m^3)
- Ngahere Park (9,000m^3 and 6,000m^3)

The Aokautere reservoir is the newest. Constructed in 2017 it is designed to withstand a major seismic event with no loss of water storage capacity or quality. The other reservoirs are of reinforced concrete with roofs but none of the reservoirs has earthquake shut down facilities.

6.2.6 Reticulation

There is approximately 539km of main in the network (including rural pipes), which consists mainly of asbestos cement (AC), PVC and MDPE pipe with small amounts of cast iron (CI) pipe. Other assets in the reticulation include valves, hydrants, pressure reducing/sustaining valves and booster stations.

We own and operate five reticulation pump stations:

- Roberts Line Booster Station;
- Turitea Road Pumping Station;
- Aokautere Booster Station;
- Silicon Way Booster Station; and
- Kingsdale Park Booster Station.

The Turitea Road Pumping Station delivers water to the new Aokautere Reservoir. The Aokautere Booster Station has now been relegated to a backup facility since the Aokautere supply upgrade was commissioned. The Fitzherbert Avenue Pressure Management Station incorporates a booster to enable water to be pumped from the City back up to the Ngahere Park reservoirs in the event of a failure of supply from the Turitea Water Treatment Plant.

6.3 Ashhurst Water Supply Assets

6.3.1 Groundwater Bore

The Ashhurst water supply is drawn from an artesian aquifer using a submersible pump south of Ashhurst on private farmland accessed from Hacketts Road.

The bore water quality is of consistently high quality. Chlorine is dosed at a relatively high level to provide a disinfectant residual to prevent the growth of the bacteria in the network. Fluoride is added for dental health purposes. A fluoride day tank has been installed to address the risk of excessive fluoride dosing occurring in line with the risk mitigation recommended in the Code of Practice for Fluoridation of Drinking Water Supplies in New Zealand (Water New Zealand – 2014).

6.3.2 Rising Main and Reservoirs

There are no storage facilities on site at the bore so water is pumped directly to the two reservoirs located on Colyton Road using two boosting pumps on a standby/duty arrangement through a 5km long rising main. The rising main installed in 1992 has had to be replaced in 2020 due to numerous bursts. Reasons for loss of supply also include power cuts.

Historical issues have included severe concrete corrosion of the previous concrete reservoir, which was replaced in 2015. During the new reservoir construction additional valves were installed to enable independent operation of the reservoirs. The new reservoir was designed to be functioning post-earthquake and has the auto shutdown valve triggered by the big ground movement to retain water.

6.3.3 Ashhurst Polishing Station

The Ashhurst Polishing Facility was commissioned in 2004 to remove excessive particulate manganese and iron resulting from chlorination of the bore water. Located on Oxford Street, just prior to the town reticulation, the station contains four (5-micron) polypropylene cartridges.

6.3.4 Ashhurst Reticulation

The Ashhurst water supply is operated as a single pressure zone. There are approximately 26 km of mains consisting of over 50%asbestos cement (AC) pipes which were laid in the early 1970s. To date, the AC pipes have had a very low failure rate compared to pipes of similar age in Palmerston North, probably because of the deeper groundwater levels not impacting on the pipe bedding and the more stable pressure regime during the day.

6.4 Bunnythorpe Water Supply Assets

6.4.1 Groundwater Bore

The Bunnythorpe water supply is drawn from an artesian aquifer in Bunnythorpe on Raymond Street. The bore, constructed in 1996, is consented to withdraw up to 600m^3/day and is 202m deep with 150mm casing.

Chlorine is dosed from two 70kg gas cylinders and is controlled to a set point chlorine concentration. Once chlorine has been added the water passes through a 45m^3 contact tank, fitted with a baffle to prevent short circuiting.

6.4.2 Reservoirs

Following the contact tank, the water is stored in a single 154m^3 reservoir, located at the Raymond St site. The concrete reservoir was constructed in 1952 and is approximately half buried and half above ground. Water is withdrawn from the reservoirs by three pumps: two in duty/assist configuration and the third provides firefighting flows.

6.4.3 Reticulation

The Bunnythorpe water reticulation network is composed of approximately 5.4km of 100-150mm asbestos cement pipes, possibly with some sections of low-density polyethylene. Properties are supplied through 32mm PVC connections. The population is supplied through approximately 180 connections.

6.5 Longburn Water Supply Assets

6.5.1 Groundwater Bore and Tanks

The Longburn bore in Iti Street was commissioned in 1985 and is artesian. Chlorine is injected before the water flows into six onsite storage tanks (23 m^3 each). Breakpoint chlorination to remove ammonia is achieved in the storage tanks with water then pumped into the reticulation supplying the township. There is a connection for a mobile generator but no on-site generator.

A dedicated firefighting system was commissioned in 2017. This includes two new 25 m^3 tanks to provide enough firefighting storage, two pumps on a duty/standby arrangement, and a dedicated firefighting main.

6.5.2 Reticulation

Longburn township's water supply comprises a single pressure zone. Most of the pipes, laid in 1985, are plastic and are 50 mm or smaller. These pipes are not designed to provide firefighting flows.

6.6 Asset Condition and Performance

6.6.1 Draft Condition and Performance Policy

In July 2023, a draft staff policy was prepared to guide and develop condition and performance practice. Refer to **Appendix B** for the draft policy. This policy outlines current processes, acknowledges Council's desire to advance asset management practice and seeks to incorporate the new asset criticality framework into condition and performance programmes. The policy also includes detailed improvement actions to implement the policy.

6.6.2 Condition

Water supply condition assessment is done by adhoc inspection. When roading projects are undertaken, the AC pipes underneath will be replaced. Renewals are typically based on age, material type and historical failures. To better focus our renewals programme investment, we propose to develop preventative maintenance and condition assessment programmes.

Condition ratings shown below are predominantly assumed based on age and expected life as there are very few formal asset condition assessments carried out (note that the water treatment plant and bore stations have regular visual inspections by staff/contractors). Condition ratings are: 1- very good; 2 – good; 3 – moderate; 4 – poor; 5 – very poor.

Based on their age, there is a significant amount of plant equipment, hydrants and water meters which are nearing the end of their lives.

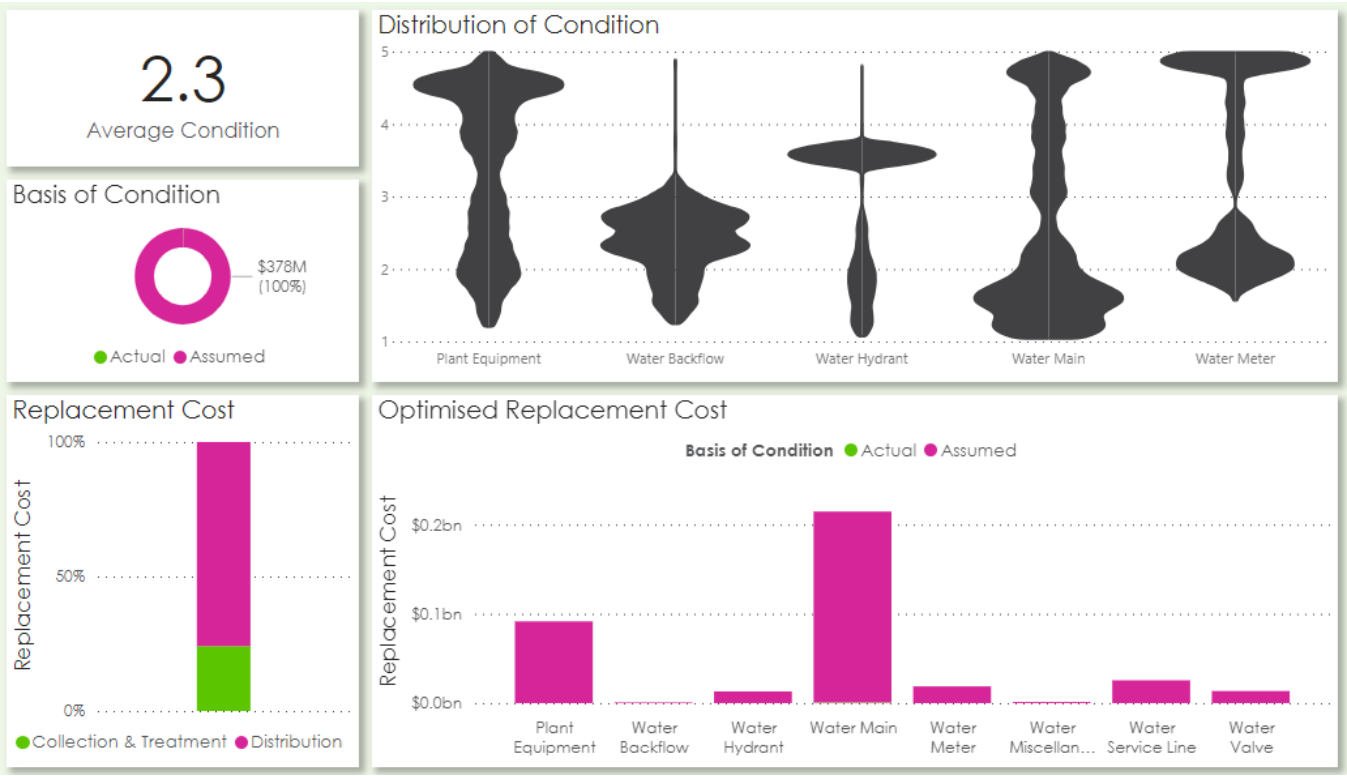


Figure 15: Asset Condition

Network Condition

The figures below show how our assessment of water network asset condition compares with the national average from the Water NZ National Performance Review. This suggests that we may be overestimating the amount of network in above average condition based upon theoretical asset design lives. Further work is required to confirm the actual condition of our piped network.

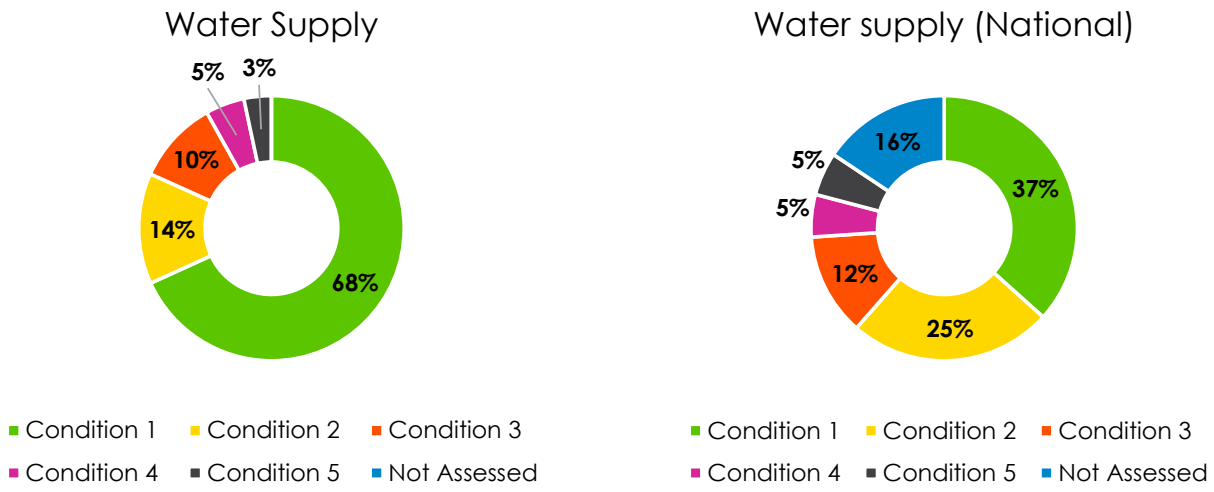


Figure 16: Palmerston North Water Supply Reticulation Condition (PNCC Network: Left, National Average: Right) (NPR 2022 Data)

Treatment Plant Asset Condition

The majority of maintenance for our plant assets is carried out reactively. The biggest risk of this approach is at our pump stations and treatment plants, where the most critical assets are located. For this reason, an Electrical and Mechanical contract has commenced in 2023. The scope of this contract includes establishing routine inspections, condition assessments and preventative maintenance.

An improvement item is to include more condition assessment information about treatment plant assets in this AMP.

6.6.3 Performance

A summary of our current resource consents is provided in **Appendix C.**

Surface Water Yield

As part of the 2015 update of the Water Supply Development Plan, a reassessment of the Upper Turitea Dam sustainable water yield during a 1 in 50-year drought event was completed incorporating the latest climate change assumptions. The assessment revised the sustainable yield downward to 14,940 m^3/day and this was included in the latest modelling of water supply source requirements. The yield is based on maintaining a minimum release flow of 25 L/s in the Turitea Stream from the lower dam which equates to 41 L/s as monitored near the Ngahere Park Climate Station. Currently the water yield from the dam is adequate to meet peak summer demand periods. The potential impact of climate change on the dam's sustainable yield is discussed in Section 5.3.

Reservoir Capacity

All reservoirs are of adequate storage capacity for peak demand and firefighting purposes.

Groundwater Yield

The groundwater bores have a mixed history of performance in terms of yield/production rates. Many bores are performing at their design yield and show no indication of decline. However, some bores have declined for various reasons and attempts at restoring their yield have not been successful. The table below contains a summary of the bore yield performance.

Table 13: Bore Yield Performance

Bore Name	Designed & Current Capacity	Performance	Status
Keith Street 1	380 m3/hr 180 m3/hr (current)	Poor (4)	Redevelopment in 2002 and 2005 but has since declined. Declining yield, specific capacity has dropped, sand ingress over 200 m3/hour (sand filter installed).
Keith Street 2	400 m3/hr 100 m3/hr (current)	Poor (4)	Further study to determine why the yield is less than expected. Standby only.
Papaioea Park 1	250 m3/hr 15 m3/hr (current)	Very Poor (5)	Redevelopment failed. Now standby bore.
Papaioea Park 2	380 m3/hr 140 m3/hr (current)	Poor (4)	Redeveloped to 275 m3/hr but has since declined.
Papaioea Park 3	360 m3/hr	Excellent (1)	To be commissioned
Railway Road	260 m3/hr	Excellent (1)	To be commissioned
Roberts Line 1	250 m3/hr 103 m3/hr (current)	Poor (4)	Reconfigured to run with Roberts Line 2. Likely to be supplemented by Railway Road bore in future.

Bore Name	Designed & Current Capacity	Performance	Status
Roberts Line 2	500 m3/hr 330 m3/hr (current)	Moderate (3)	Submersible pump recently lowered to improve performance as yield had declined.
Takaro	450 m3/hr 400 m3/hr (current)	Good (2)	Stable, excessive sand production over 400 m3/hr.
Ashhurst	165 m^3/hr (current)	Excellent (1)	
Bunnythorpe	25 m^3/hr (current)	Excellent (1)	
Longburn	10 m^3/hr	Excellent (1)	Annual demand total is approaching consent limit.

Water Quality

Previous work had identified that the aged cast iron pipes were suffering extensive corrosion or tuberculation, which results in reduced internal diameters and accumulation of sediments which then contributed to "discoloured water" issues in the City.

Iron and manganese deposits on the interior walls of unlined cast iron pipes can lead to discolouration of the water if dislodged. Swabbing programmes have been implemented to remove these deposits although this is impeded in tuberculated pipes as the swabs are destroyed by the tubercles. Tuberculation also results in reduced capacity and pressures. The by-products of the tuberculation contribute to discolouration of the water.

Cast iron pipelines have been progressively replaced and now only constitute 14 km (less than 2%) of the total pipeline network with a consequential significant reduction in discoloured water complaints in the main city supply as shown below.

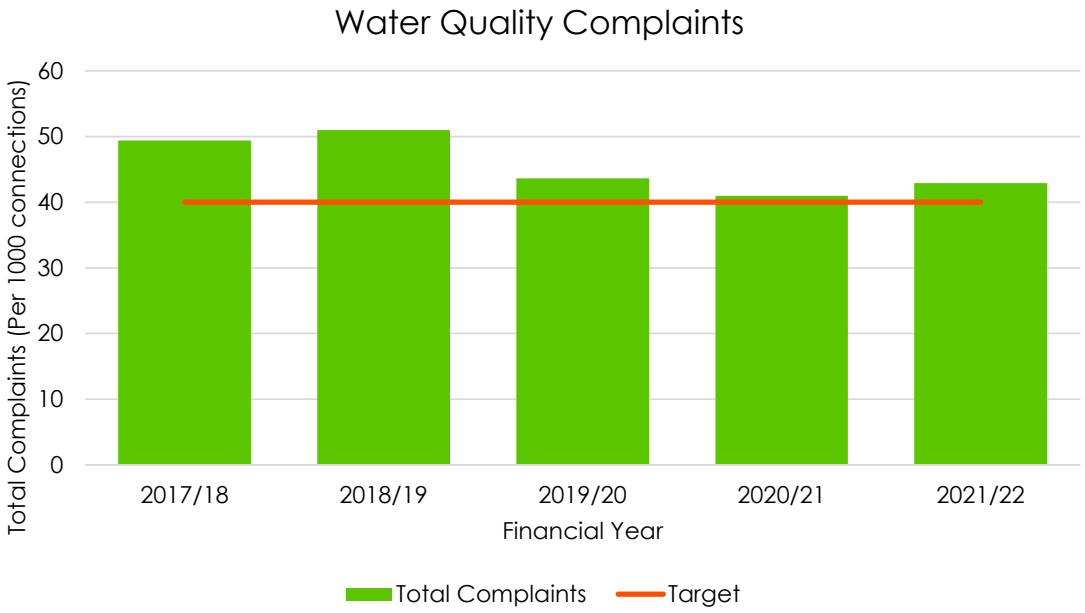


Figure 17: Annual Number of Water Quality Complaints

Network Capacity (Governed by Fire Fighting Flows)

Most of the current distribution network in urban areas has the capacity to delivery 25 L/s firefighting flow (FW2) to residential areas and 50 L/s (FW3) for commercial and industrial areas. In recent years a programme of works has been carried out to upgrade water mains to provide adequate firefighting where modelling has identified inadequacies.

Service Failure (Water Main Breaks)

The figure below shows the trend in annual water main breaks (excluding those caused by third party damage) has increased in the last decade.

Figure 18: Annual Water Main Breaks (Last 11 Years)

The figure below shows clearly that asbestos cement (AC) pipes feature predominantly in the number of water main bursts.

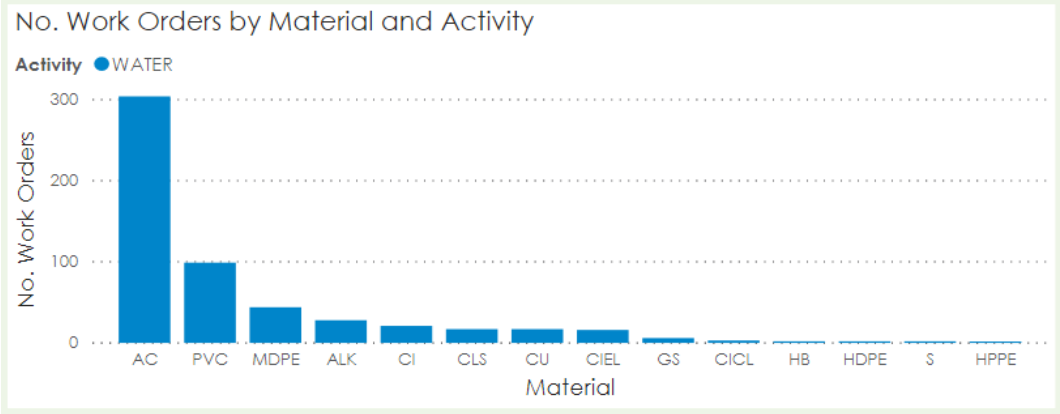


Figure 19: Number of Watermain Breaks by Pipe Material (Last 11 Years)

Pressure

Customer complaints about low pressure that have required an investigation are minimal as shown below.

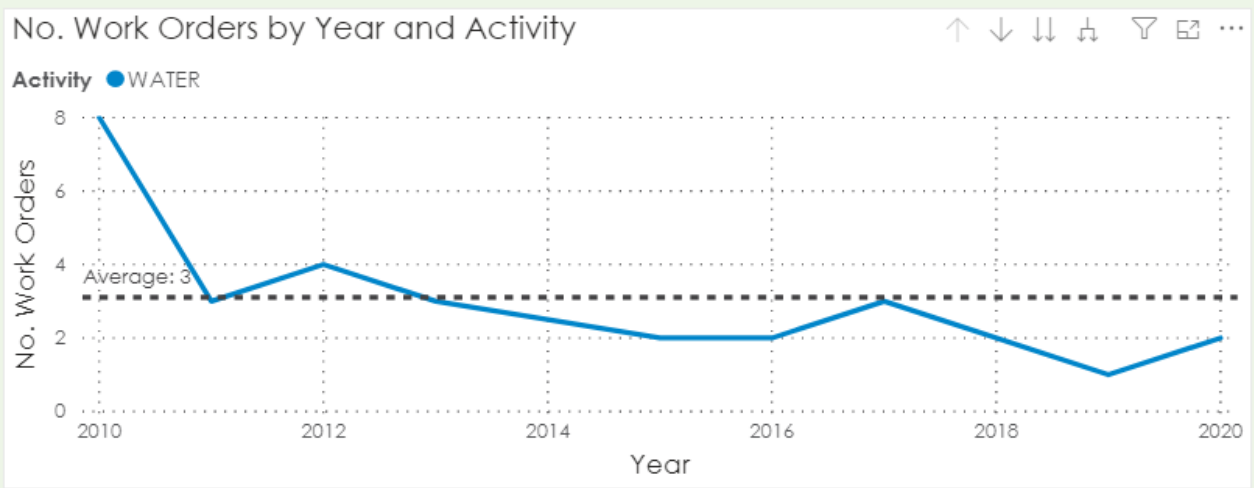


Figure 20: Number of Low Pressure Complaints (Last 11 Years)

Seismic Performance

For the Palmerston North main urban area, having two independent sources of water (surface water and groundwater) and bore fields distributed around the city provides an inherently high level of resilience by avoiding 'common mode failure'.

Under the NZ Society of Large Dams Dam Safety Guidelines (NZSOLD, 2015), both dams are required to withstand the Safety Evaluation Earthquake (SEE) and Probable Maximum Flood (PMF). Dam structural performance has been modelled. In June 2019, Stantec produced a report for Palmerston North City Council on the Potential Impact Classifications (PICs) for the Upper and Lower Dams. This concluded that, partly because they are critical for the water supply of Palmerston North, the PIC for each dam is High. The report made recommendations for further work to better understand the risk to downstream properties. Council will engage with property owners and occupiers in any affected areas to communicate the level of risk, as well as what Council is doing to manage these risks, and reassurance about the extensive monitoring programme in place to ensure that any issues are identified.

In recent years, the newer, circular reservoir at Ngahere Park has been strengthened to IL4 (Importance Level 4). This level is for structures that must remain standing even after a major earthquake, the reason being that we need it to supply water for Palmerston North. The older, rectangular reservoir at Ngahere Park was assessed, but it was deemed impractical to strengthen it. For this reason, allowance has been made in our 10 Year Plan to provide a third reservoir at Ngahere Park, ultimately allowing the rectangular reservoir to be decommissioned.

Work is underway to address the risk of the Ngahere Park reservoirs emptying after a large seismic event. Instruments and control equipment will be installed to detect a large earthquake or a major sudden increase in outflow from the reservoirs, then act to quickly shut off valves to retain water. The new Aokautere reservoir is understandably 100% of the New Build Standard.

The table below provides a summary of the assessed resilience of the water assets to a MM9 earthquake, with a return period of 625 years. Where the current level of resilience is less than the desired level of resilience further work is to be undertaken over the next 10 years to determine options for future management and development of the asset. This will include reviewing the desired level of resilience.

Table 14: Seismic Resilience

Asset	Criticality	Current Level of Resilience	Desired Level of Resilience
Turitea Dams	High	High. Dam intact and serviceable	Very High (Status Quo)
Turitea Treatment Plant	High	Moderate with vulnerability of some treatment structures and access road	Very High
Turitea trunk mains	High	Moderate	Very High
Trunk mains on riverbed	High	Low	Very High
Ngahere Park reservoir (cicular)	High	Moderate	Very High
Ngahere Park reservoir (rectangular)	High	Low	Very High
Aokautere water storage	Medium	Low – based on existing reservoir	High
Palmerston North watermains	Low to Medium	Varies	Moderate to High
Ashhurst water bore	Low	Low. Single supply bore	High
Ashhurst Reservoirs	Low	High	High
Ashhurst trunk main	Low	Moderate	High
Bunnythorpe	Low	Low	Moderate
Longburn	Low	Low	Moderate

6.7 Actions to Address Condition and Performance Issues

6.7.1 Asset Deterioration

We have ongoing renewals programmes for our treatment plants, bores, pump stations and network (pipes, water tobies, meters, hydrants and valves). The highest proportion of investment is required for replacing watermains which are at the end of their useful lives.

6.7.2 Understanding Condition and Performance

As mentioned above, more investment is required to better understand the condition and performance of our assets and optimise capital decision making. The following initiatives are proposed:

- **District Metering Areas (DMAs)** – investigation and installation of DMAs and utilising specialist software for pressure management to reduce leakage.
- **Smart metering** – installing smart meters for our larger commercial customers to understand water consumption patterns and manage demand
- **Network Modelling** – further develop our network models to better understand operational performance as well as for development planning
- **Network Condition Assessments** – develop and implement a condition assessment programme for network assets to better inform our renewals programme

6.7.3 Drinking Water Standards Compliance

Some upgrades are required to meet the treatment and monitoring requirement of the Drinking Water Standards and Rules. We submitted updated water safety plans in late 2022 to Taumata Arowai. Some of our bore supplies do not meet the chlorine residual requirements and we are in the process of applying for an exemption until work can be carried out.

We have an ongoing asset renewal programme to maintain the integrity of our bores, pump stations and other facilities. There are planned process upgrades at the Turitea WTP to improve compliance and for our Ashhurst and Bunnythorpe water supplies to remove iron and manganese.

Ongoing updates are also required to our Water Safety Plans over the next 10 years, in liaison with Taumata Arowai.

6.7.4 Meeting Compliance Requirements

Other future planned activities to meet compliance requirements are:

- **Turitea Dams – Dam Safety Assurance Programme** – review of the potential impact classification (PIC) every 5 years as legally required
- **Turitea Catchment Management** – activities associated with the responsible management of the Turitea water catchment and as required by our water take consent
- **Consent renewals** – upcoming consent renewals for the Turitea hydroelectricity scheme and for trunkmain flushing in our networks

6.7.5 Meeting Levels of Service

The following activities are planned to achieve/maintain our levels of service beyond regular ongoing programmes:

- **Turitea Dams - Aeration Upgrade** – investigation and mitigation of iron and manganese flocculation in the Turitea Stream. Aerators in the upper dam will be reviewed and may require new aerators in the lower dam.
- **Water Main Upgrades – Firefighting/Intensification** – we will continue to upgrade our existing watermains in response to infill development and/or to meet firefighting requirements
- **Three Waters Public Education** – Water – investing in public education helps us maintain the water service by reducing the impacts of peak water demand.

6.8 Improvement Actions

- Apply an asset criticality methodology to identify which assets should be prioritised for condition, risk and performance assessment and where applicable renewal works
- To better focus our renewals programme investment, we propose to develop preventative maintenance and condition assessment programmes.
- An improvement item is to include more condition and risk assessment information about treatment plant assets in this AMP.
- Implement the draft condition and performance policy (including improvement actions)

7 Risk

This section outlines how we identify and manage risks associated with our assets and services. It also describes how we incorporate criticality and resilience into the planning and management of our assets and services.

The SAMP describes our risk policy and risk management framework and the council-wide approach to managing risk across our different asset portfolios.

7.1 Activity Risks

7.1.1 Risk Management Processes

The table below outlines how we identify, evaluate and treat risks associated with the water supply activity.

Table 15: Summary of risk identification, treatment, risk register

How we identify risk	How we evaluate and treatment of risk	Risk Register
• Periodic risk review workshop with the Risk Advisor • Day to day operations and maintenance • Routine inspections • Condition assessments • Renewal work or upgrade work • Our risk is identified through our business processes.	Risk mitigation actions are mainly through: • Asset response - integration within day to day operations & maintenance work and planning • Through direct work programme targeting the risk (renewal programmes, operations and maintenance programmes, compliance programmes) • Non – asset responses work process changes • Root Cause Analysis to understand repetition reduction	• The 3 Waters Risk register is reviewed periodically and as needed by the Waters Division to ensure that it is up to date and that actions are being implemented and planned for. • The risk treatment plan is completed by the risk owner. Our Risk Management Advisor liaises with the Waters Manager to ensure that all raw risk has a mitigation measures and plans to turn into a residual risk. • Identified risks, consequences and mitigation actions to reduce the impacts of the identified risk are captured in the Property Risk Register.

7.1.2 Key Activity Risks and Risk Register

Risk management at the Activity level was reviewed in 2022 and aligned with the latest Risk Management Framework (June 2021). Refer to **Appendix D** for a copy of the latest risk register. The controls we have put in place are assessed as mostly effective. This has resulted that our overall residual risks for our assets are now at a medium to low level only.

Key activity risks and proposed mitigation measures are provided below:

- **Dams** – there are significant risks around the operation and maintenance and integrity of the Turitea water supply dams. Existing mitigation measures are in place to manage these high risk assets. Further investment is proposed to comply with upcoming changes in dam safety regulations and also to improve aeration in the dam.
- **Bores** – the main risks around the water supply bores are maintaining operation, water quality and preventing contamination. Further investment is proposed to upgrade relevant bores to comply with drinking water standards and rules and to maintain their integrity.
- **Distribution (reticulation)** – risks to the distribution network centre around maintaining operation and service to our customers. We mitigate these risks by carrying out renewals of aged assets and improving resilience by reconfiguring pipelines and upgrading reservoirs. These aspects are all covered in our proposed capital works programme.

7.1.3 Improvements to Risk Management

Our risk management improvements will be focused on ensuring our mitigation or controls are working effectively, ensuring our overall residual risk is within our risk tolerance. The following improvements were identified as part of our most recent asset management maturity assessment (Asset Management Maturity Assessment Report, Infrastructure Associates, July 2022).

Corporate Risk Improvements

The 2022 maturity assessment found that Council had improved its risk management practice since the last review in 2019. Although there was a corporate (divisional) risk register and associated processes in place, it observed that further work was required to embed these in activity level business processes. It is also recommended that Council complete asset crticiality identification and embed prioritisation of critical assets in its business processes. Elected members were more aware of the risk narrative but that Council needed to accommodate for its legacy in underinvestment in renewals.

Key corporate risk improvements were:

- Embed standard operating policies, processes, and procedures for documenting and escalating new risks to provide a consolidated and consistent view across all activities.
- Develop and implement a risk management information system to manage the capture, assessment, and management of operational (Divisional) and corporate enterprise risks

Three Waters Risk Improvements

The 2022 maturity assessment acknowldged that the 3 Waters activity had completed a risk assessment with the Risk Management Advisor. It was noted that since 2019, we had improved resilience of power supply to the treatment plants, there is a strategic programme to deal with seismic risk and that the annual dam safety review was completed.

The assessment recommended that the Infrastructure Unit need to fully develop and embed the risk capture and escalation process across the unit.

7.2 Risk Insurance

Reference should be made to the Strategic Asset Management Plan.

7.3 Critical Assets and Services

Critical assets are defined as those that have a high consequence when they fail and cease to function. Criticality is one of the categories we consider alongside, risk, performance, condition and levels of service. We are still starting out with incorporating criticality into our renewals and maintenance work programmes.

7.3.1 Essential Services

In 2009 (see OASIS 1731539) the Water Activity was identified as an essential service. Water testing and maintenance of critical assets were identified as essential activities. This was confirmed during our response to Covid-19.

7.3.2 Asset Criticality

The PNCC Asset Criticality Framework is made up of Parts A to G. Part A is provides the overall Council Framework (Part A: PNCC Asset Criticality Framework and Guidelines, Palmerston North City Council, July 2022) with other parts for specific activities. The SAMP describes the overall principles and processes for applying the criticality framework. The four key criteria are based on financial, environment, health and safety and service delivery.

The water supply activity is covered by Part C: Waters Supply Pipes – Asset Criticality Framework and Guidelines, July 2022. Criticality ratings have been applied for all three waters network assets and a sample set of above ground assets.

Water Supply Pipes Criticality

The water supply pipe parameters influencing the extent of impact on the Council consequence criteria were identified as:

- Pipe diameter (acts as a proxy for extent of service failure, i.e. numbers of customers likely to be impacted in a pipe failure). The larger the diameter, the higher the criticality.
- Supplies critical customers who depends on water supply to function (customers include those that have high economic value and provide an important community service, including health and safety).
- Location (repair costs are likely to be higher in these areas and may cause disruption to the road/building/railway that it is in the vicinity of).

The water supply pipes criticality model is shown below. About 20% of watermain assets have a high or very high criticality rating.

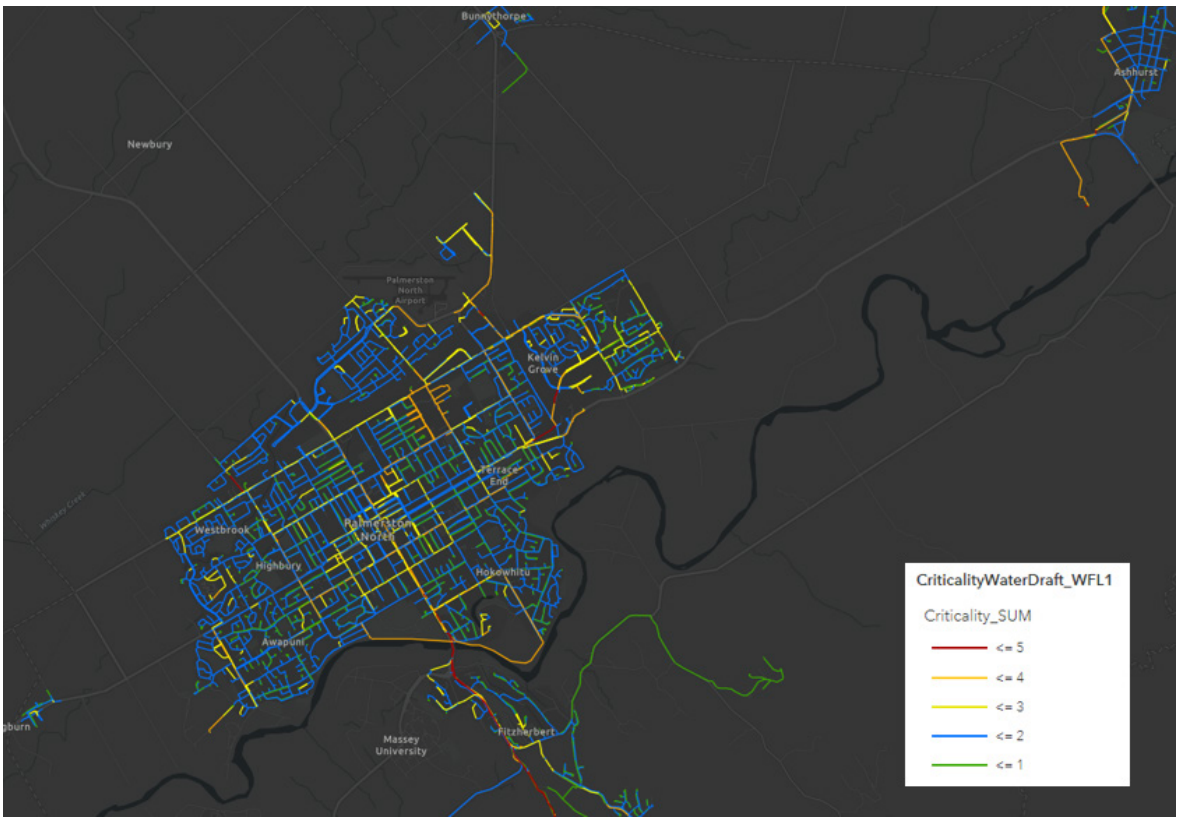


Figure 21: Water Supply Pipes Criticality Model (Source: Part A: PNCC Asset Criticality Framework and Guidelines, Palmerston North City Council, July 2022)

Criticality of Collection and Treatment Assets

The criticality of collection and treatment assets are yet to be integrated into the criticality framework. The collection and treatment assets' criticality were derived from the population served. The population-based criticality grading criteria are shown below.

Table 16: Criticality Grading Criteria

Population Affected	Criticality
Above 8,000 persons	High
Between 6,000 and 8,000 persons	Medium
Between 4,000 and 6,000 persons	Low
Up to 4,000 persons	Non-Critical

The table below contains a summary of the criticality grading of non-pipe assets. Additional work is required to determine the more critical assets at each complex.

Table 17: Criticality Grading for Water Assets

Component	Criticality
Palmerston North	
South Range Road, 13.9 km of unsealed road (access to Turitea catchment)	Medium
Treatment plant access road, 1.4 km of sealed road, 10 retaining walls, sumps and culverts	High
Dams and boatshed access road – 5.4 km of unsealed rural road	High
Upper and Lower Turitea Dams	High
Palmerston North (Continued)	
Turitea Water Treatment Plant	High
Bore Stations at Roberts Line, Papaioea Park, Takaro Park, Keith Street, Railway Road	Low to Medium
Reservoirs at Ngahere Park	High
Aokautere Reservoir and Turitea Booster Station	Low
Villages	
Ashhurst, Bunnythorpe & Longburn bores and reservoirs	High

7.3.3 Critical Customers

In 2019, the criteria for critical customers was reviewed (Jacobs, Three Waters Importance Level Policy, December 2019). Assets serving critical customers form one component of the assessment factors for criticality ratings within the three waters networks. Critical customers are determined based on the consequence of service failure and are to be identified by customer type and demand.

In terms of maintaining water supply service, critical customers have been allocated ratings in the table below. Those rated A are considered the most critical and those rated E are the least critical. As of 2022, critical customers were identified on the map below.

Table 18: Critical Customers (Source: Part A: PNCC Asset Criticality Framework and Guidelines, Palmerston North City Council, July 2022)

Customer Type	Critical Customer Rating	Criticality Score	Notes
Hospital - regional	A	4	Understood that there is limited onsite potable water storage.
Critical Lifelines Sites - limited backup arrangements	A	4	e.g. WWTP
Hospital - other	B	3	
Emergency operations centre	B	3	ECC Building designed to IL5, can operate without mains water.
Main Civil Defence welfare centre	B	3	
Critical Lifelines Sites - backup arrangements	B	3	
Emergency services headquarters	B	3	
Rest homes	B	3	
Very Large water users > 100m^3/day	B	3	
Large water users 50-100m^3/day	C	2	
Other Civil Defence welfare centres	C	2	
Primary / secondary schools >250 people	C	2	
Colleges / adult education >500 people	C	2	
Business zone (District Plan)	D	1	Large water users will be categorised higher
Industrial zone (District Plan)	D	1	Large water users will be categorised higher
Dialysis patients	A / E	1	A if using for response prioritisation, but don't use for renewal planning (locations move).

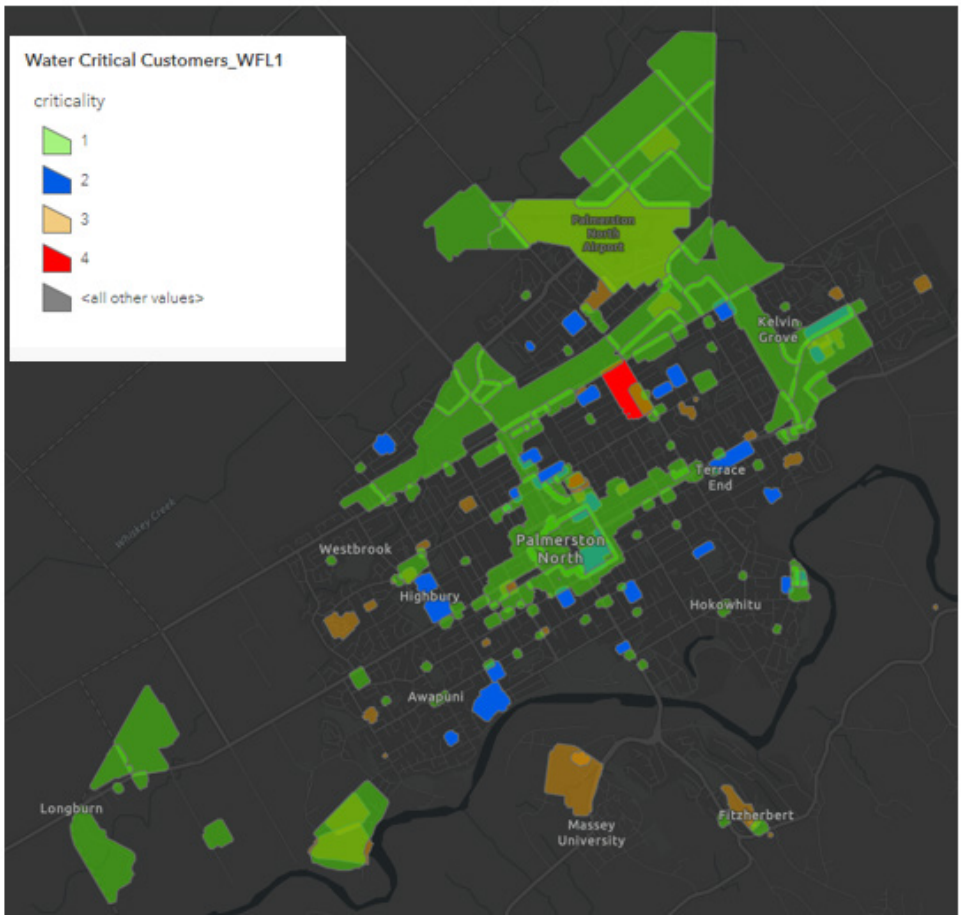


Figure 22: Water supply critical customers (Source: Part A: PNCC Asset Criticality Framework and Guidelines, Palmerston North City Council, July 2022)

7.3.4 Critical Suppliers

Critical suppliers are those providing services required for the Water Activity and includes:

- Radio communication
- Fuel
- Power
- Building access
- Information Management

7.3.5 Criticality Improvements

Further work is required to:

- Assign criticality ratings for all above ground assets
- Apply asset criticality in water and stormwater condition assessment and renewal programmes
- Further embed asset criticality in other investment decision making processes

7.4 Resilience

Resilience is the ability of infrastructure assets and networks to anticipate, absorb, adapt to and/or rapidly recover from a potentially disruptive event. This section highlights the need to make our assets and services more resilient to the impacts of seismic, flooding, and volcanic events and climate change. More information about resilience can be found in our SAMP.

7.4.1 Civil Defence and Emergency Management

The National Disaster Resilience Strategy outlines the vision and long-term goals for civil defence emergency management in New Zealand. We participate in the Manawatū-Whanganui Civil Defence Emergency Management (MWCDEM) Group. Our commitment and activities are further described in the SAMP.

As a lifeline utility we have obligations under the Civil Defence and Emergency Management Act 2002. It is important that we participate in the Manawatū-Whanganui Lifelines Advisory Group with other lifeline organisations. An improvement action is to update this AMP with current commitments to regional CDEM and Lifeline groups.

In New Zealand, in order to prepare for disasters, we classify risks into five categories:

- Natural hazard risks
- Biological hazard risks
- Technological risks
- Security risks
- Economic risks

Our asset planning considers the resilience of the built environment only.

Table 19: Effect and Mitigation Summary of Risk Catergories

Description of Risk	Potential Effect on Assets/Service	Mitigation Measures
Natural Hazards		
Seismic	Pipe network: • 44% pipes classified as brittle (more vulnerable to seismic events) • 56% pipe network classified as ductile (less vulnerable to seismic events) Seismic strength of buildings and plants	Renewal with ductile pipe materials Prioritise pipe replacement for critical services or those in seismically vulnerable areas Ongoing seismic assessment and strengthening programme for buildings and plants Seismic valves installed at Ngahere and Aokautere reservoirs. Planned installation at Ashhurst reservoirs in next 3 years. Back up operational resilience e.g. two points of supply
Storms (Flooding, Lightning and other Severe Weather)	Overtopping of dams Treatment plant capacity reduced due to high turbidity Compromised security of boreheads Disruption of access to water treatment plants	Probability analysis carried out Ability to treat high turbidity water Borehead upgrades planned

Description of Risk	Potential Effect on Assets/Service	Mitigation Measures
	Loss of power	
Volcanic	Ashfall affecting surface water takes	Backup plan in place to utilise groundwater sources
Biological Hazards	Availability of staff to carry out operations, preventative maintenance and inspections of critical assets (such as pump stations and grills) during a pandemic.	Procedures in place to protect our staff and maintain workforce availability during a pandemic
Technology Risks	Reliance on technology to deliver services	Telecommunications and control systems recently upgraded
Security Risks	Security and cyber-attacks affecting services	Recent review of building access security Dedicated security advisor role Cyber security protocols in place
Economic Risks	Supply chain issues delaying upgrades and impacting operations	Early procurement Spares inventory

7.5 Water Safety Plans

Water Safety Plans highlight the safety and quality of the drinking water we provide and how we are managing it. Water Safety Plans for Ashhurst, Bunnythorpe and Palmerston North water supplies have been prepared and submitted to Taumata Arowai. These are no longer approved by the regulator and the onus is on us as a drinking water supplier to ensure our Water Safety Plans are fit for purpose and compliant.

Improvements are planned in the LTP to increase compliance with the Drinking Water Standards and Rules. Some water safety plans are being updated to apply for chlorine residual exemptions in some areas.

7.5.1 Palmerston North Water Supply Water Safety Plan

In 2022 the Water Safety Plan was revised for the Palmerston North water supply. The table below contains a summary of the key risk events that had a residual risk of High and the proposed corrective action.

Table 20: Key Corrective Actions from the Palmerston North Water Safety Plan

Risk Event with High Residual Risk	Proposed Corrective Action
Entry of or dissolution of chemicals or micro-organisms from construction.	Pipe condition assessment, pipe type analysis and renewal programme. Enhanced monitoring of all construction activities. Stringent application of Disinfection Code of Practice. Review work practices at all construction and reactive maintenance/repair work sites. Increased focus on drinking water safety and contamination avoidance in all open trenches during repair activity.
Introduction of contaminating material into the distribution system.	Enhanced monitoring of work sites and contractor procedures. Continuous review of approved contractor activities. Increased monitoring of development works, repairs and connection installations. Increase and improve Back Flow Preventor programmes and establish new regime for all testing to be undertaken by us.
No, inadequate, faulty, or incorrectly installed backflow prevention device.	Greater monitoring and enforcement using enhanced bylaw provisions. Taking a tougher stance on unauthorised use of hydrants. Consideration of additional tanker filling points to minimise the need for unauthorised hydrant use. Review NZ Fire Service operational procedures in terms of tanker filling and the need for backflow prevention on standpipes/hoses that are also used to draw water from non-potable sources.

7.6 Business Continuity Planning

The 3 Waters Business Continuity Plan (BCP) was updated in 2023. The Plan details strategies including co-ordination of people and resources to ensure that we can reduce the impact of any disruption on our critical services. Our priorities in any disruption are to:

- Ensure the health, safety and wellbeing of staff, contractors and the community
- Reduce the impact (and costs) of any event
- Resume core functions effectively and efficiently

The BCP outlines the maximum tolerable downtime, key inputs and contingency plans for the following critical services/functions:

- Water treatment plant, bores, reservoirs and network assets
- Wastewater treatment plants, ponds and network assets
- Stormwater flood protection

The BCP is reviewed by the Group Manager – 3 Waters and delegates at least every six months, and immediately following any significant organisational change.

7.7 Improvement Actions

- Fully develop and embed the risk capture and escalation process across the Infrastructure unit (which covers this activity).
- Assign criticality ratings for all above ground assets
- Formally incorporate collection and treatment assets into the criticality framework.
- Apply asset criticality in condition assessment and renewal programmes
- Further embed asset criticality in other investment decision making processes
- Update this AMP with current commitments to regional CDEM and Lifeline groups.
- Update this AMP with most recent water safety plan risks

8 Lifecycle Management

This section outlines how we plan for, manage, and operate the assets at the agreed level of service while minimising lifecycle costs.

8.1 Lifecycle Overview

8.1.1 Asset Lifecycle

The Water Supply activity is planned for, managed and operated in three distinct functional areas: collection, treatment, and distribution. This section considers the following aspects of the asset lifecycle for each functional area.

Table 21: Lifecycle Elements

Lifecycle Elements	Description
Customer and Strategic Issues	Links levels of service, strategic direction, activity challenges, and risks through to specific assets. Translates these into short term goals, long term goals, and life cycle impacts sought from investment.
Operations and Maintenance	How we operate and maintain our assets is important for asset performance. Operational activities ensure the successful continuation of the service, while maintenance activities serve to extend the life of the asset, delaying the need for asset renewal.
Renewals Plan	The renewal plan aims to identify the optimum level of renewal investment to minimise whole of life costs while delivering an appropriate level of service to the customers.
Asset Improvement and New Assets	To deliver the outcomes sought for the Water Activity, asset improvement and capital new investment may also be required. Asset improvement will typically be required where there is a gap between a level of service and what is currently being delivered.
Asset Disposal	When an asset is no longer required, it is appropriate that decommissioning and disposal be considered. Ideally, this would have been considered in the planning for the asset. In July 2023, a draft staff policy was prepared with guidance for the disposal of assets.

8.1.2 What the Water Supply Currently Costs

Activity costs for the last ten years are shown below for operational, renewal and new capital expenses. Annual operational expenses are increasing mainly in the collection treatment areas and are now over $10m. The cost of renewing assets is increasing as our treatment and pipe assets are aging. We have invested in new water sources and pipes to provide for both growth and to increase resilience.

Figure 23: Activity Expenditure for the Last 10 Years

8.2 Water Collection

8.2.1 Service Overview

Collection assets allow abstraction, storage, and water transportation from the various sources to treatment facilities in enough quantity to meet demand projections. This is done in a manner that secures water from contamination, is reliable and complies with resource consent conditions.

8.2.2 Customer and Strategic Issues

The table below summarises the links between service levels and the lifecycle management of the collection assets.

Table 22: Water Supply Collection Lifecycle Intent and Impacts

Life Cycle Intent Statement	Indicator	Short Term Goal	Long Term Goal	Life Cycle Impacts
Continuous service is maintained by investing in critical collection assets.	Average condition grading of critical collection assets.	Reactive maintenance – meet urgent response and resolution targets.	Renewal strategy is informed by criticality. Proactive maintenance.	Critical collection assets are renewed before they are at risk of failure.
Reliable service is maintained by investing in reliable condition information.	% of inspected assets with remaining life of <10 years.	All critical collection assets with <10 years remaining life have reliable condition scores by Year 2.	Renewal strategy is informed by reliable condition data.	Optimal balance between renewal and maintenance costs.
Safe drinking water is provided by treating the water to an adequate quality.	Bore compliance with NZ drinking water standards.	Compliance is met as set out in the NZ drinking water standards.		Assets are maintained to deliver safe drinking water.

8.2.3 Operations and Maintenance

The following activities are included within operation and maintenance of the water collection assets:

- Operation of Bore stations
- Chemical dosing
- Water sampling
- Proactive maintenance
- Servicing of bore stations
- Mechanical and electrical testing
- Scheduled inspections
- Turitea catchment management
- Reactive maintenance
- Equipment failure

Operations and Maintenance Practices

Operations and maintenance practices for the water collection system are mainly documented in the Palmerston North Water Bores Operations and Ashhurst Water Treatment Operations and Maintenance Service Level Agreement (SLA). This was the service provision agreement between the Water Operations Division and the previous iteration of our Infrastructure Unit developed to provide the documented water collection levels of service.

Even though it is no longer required due to a structure change, it is still the best record of the schedule of operation and maintenance tasks and frequencies. The maintenance schedule is pushed out to the water operations division through the IPS system. Reactive maintenance tasks are also detailed in the SLA.

Operators inspect all bore headworks. Any potential public health risks identified are followed up and addressed. Bore security status verification assessments are undertaken every five years. The existing Global Bore Consent is an amalgamation of the individual bore consents that combines the five bore sites and will be due for renewal in the year 2036.

Water Operations Standard Operating Procedures (SOPs) provide greater detail about individual operational and maintenance tasks and procedures. These cover most administrative tasks and critical or irregular field work, but not all tasks are covered by an SOP. Water Operations staff develop new SOPs when they identify a need.

Tasks without an SOP are guided by experienced staff and judgement, and the technical requirements for these tasks are passed on as institutional knowledge. Site observations and issues are discussed weekly by the Water Operations leadership, with options for alternative operations and maintenance methods. This process needs to be reviewed, in conjunction with the whole SOP development process, to determine a way of documenting all procedures to reduce reliance on institutional knowledge.

Turitea Reserve Management

The Turitea Reserve is managed according to the Elected Member adopted Turitea Reserve Management Plan. The operations and maintenance are documented in the Turitea Reserve Management Service Level Agreement (SLA). There are pest and weed control programmes in place to protect the water supply quality and preserve the storage, as well as conserving the ecosystem and natural landscape.

The unsealed road in the reserve is covered by the Turitea Reserve Management SLA and is maintained through a regular inspection and maintenance programme. Periodic capital investment in new retaining structures is typically required and will continue to address significant slip events. However, the sealed length of waterworks road from Turitea road to the dams, including the car park are excluded from the Turitea Reserve Management SLA.

Turitea Dams and Power Plant

The mini hydro power plant, the upper and lower dams are part of the Turitea Water Treatment Plant Operations and Maintenance Service Level Agreement (SLA). This includes inspection and reporting on the condition of the upper and Turitea dam structures on a monthly basis. Apart from the internal inspections, regular dam safety reviews as part of a Dam Safety Assurance (to comply with new legislation) are also required. The consents for the hydro power plant expire in 2030 and will need to be reviewed before then.

Reservoirs

The reservoirs are configured so that real-time knowledge of water levels and valve positions (where available) can be obtained through the telemetry system. The reservoir water levels are controlled to ensure an appropriate amount of emergency storage. An alarm message is sent to the operators when reservoir water levels reach pre-set high or low levels. All hatches at the Ngahere Park reservoirs have been alarmed via the telemetry system to alert possible contamination or unauthorised entry.

All the reservoirs are cleaned and inspected every two years. Structural inspections are also carried out when the reservoirs are emptied. Monthly exterior visual inspections are carried out, including the roof using the drone facility.

Improvement Opportunities

The following improvement opportunities have been identified for operation and maintenance planning:

- Turn the existing SLA into the collection and Turitea reserve operation and maintenance practice documents
- Undertake a gap analysis of SOPs and plan for documentation of all procedures
- Develop feedback and improvement processes for operation and maintenance practices and procedures
- Undertake formal reviews and/or optimisation studies of maintenance and operations activities based on data and risk

Operations and Maintenance Investment

Operations and maintenance programmes that will address the water collection assets' issues are shown in the table below in 8.6.1. Some of the programmes are also linked to the issues identified in the previous sections in terms of risk management, levels of service and demand drivers.

8.2.4 Renewal Plan

The decision making around whether to renew collection assets or continue to carry out maintenance or repairs has historically been based on staff judgement and experience. The Turitea dam structural assets are assessed by external consultants.

Renewal budgets for bore station buildings has been set aside in the 10 Year Plan in discussion with the Property division, who will manage this work. Outstanding maintenance issues have also been identified, and a separate maintenance budget set aside, to ensure that minor issues are dealt with before complete replacements are required where possible.

Further information on this and the building assets can be found in the Property AMP.

Renewal Investment

Renewal programmes that will address the water collection assets' issues are shown below in 8.6.2.

8.2.5 Asset Improvement and New Assets

The drivers which lead to capital new planning for water supply collection assets have been outlined in earlier sections of this AMP.

Capital-new planning for the collection assets is derived from the Water Supply Development Plan is based on our hydraulic model with demands over set planning horizons. The key output of the Plan is a Capital Works Register, which is used to inform and populate the proposed programmes for the AMP. The Plan details the water network and outlines studies undertaken in the development of the 30-year programme of works.

We evaluate programming and prioritisation of capital projects by considering a range of criteria including risk and benefits, affordability, ranking with other expenditure, existing asset performance with respect to levels of service and lifecycle costs and efficiency.

Capital Investment

Capital new programmes for water collection assets are shown below in 8.6.3.

8.2.6 Asset Disposal

Asset disposal is not primarily included as part of renewals consideration as most water collection assets are not physically removed and disposed of to allow for the replacement component. In cases where a bore station is renewed, the new bore station is installed close to the existing bore station, and the existing bore station eventually remains, even though it is redundant. The existing bore may be used as a backup in case of an emergency in future. If a bore is decommissioned it is typically sealed using bentonite in accordance with the New Zealand Environmental Standard for Drilling of Soil and Rock (NZS 4411) to prevent surface water ingress.

Wherever possible, above ground assets are sold for scrap value with revenue used to further enhance the water supply system. Effort is made to reuse assets in this manner that are no longer required.

In general, the old asset is disposed of in the information system when the replacement asset is entered.

8.3 Treatment

8.3.1 Service Overview

Treatment assets allow water treatment that complies with the Water Services Act 2021, including drinking water standards and rules. This section outlines the operation and maintenance planning that is specific to the treatment functional area only.

8.3.2 Customer and Strategic Issues

The table below summarises the links between service levels and the lifecycle management of the treatment assets.

Table 23: Water Treatment Lifecycle Intent and Impacts

Life Cycle Intent Statement	Indicator	Short Term Goal	Long Term Goal	Life Cycle Impacts
Continuous service is maintained by investing in plant equipment.	Average condition grading of critical plant equipment.	Critical plant and equipment meta data is up to date and included in the asset management data base.	Renewal strategy is informed by criticality.	Critical plant equipment is renewed before they are at risk of failure.
Reliable service is maintained by investing in reliable condition information.	% of inspected assets with remaining life of <10 years.	All critical pipelines with <10 years remaining life have reliable condition scores by Year 2.	Renewal strategy is informed by reliable condition data.	Optimal balance between renewal and maintenance costs.
Safe drinking water is provided by treating the water to an adequate quality.	Compliance with NZ drinking water standards.	Compliance is met as set out in the NZ drinking water standards.	Ongoing compliance with all aspects of the NZ Drinking Water Standards as defined by the new national regulator.	Assets are maintained to deliver safe drinking water.
Customer expectations are met by supplying safe drinking water of good aesthetic quality.	Water quality complaints.	Analyse trends on water quality complaints.		Optimal balance between renewal and maintenance costs.
Water supply service is affordable and cost effective.	The treatment cost.	Operational efficiencies are managed on a continuous basis.	Treatment cost per unit is monitored and managed.	

8.3.3 Operations and Maintenance

The following activities are included within operation and maintenance of the water treatment plant:

- Operation of the Turitea water Treatment plant
- Sampling and testing of raw and treated water
- Calibration and certification of instruments.
- Reactive maintenance
- Pump, motor and electrical repairs
- Minor asset repairs and replacements
- Emergency work
- Call-out service to carry out unscheduled maintenance
- Proactive maintenance
- Backwashing and cleaning treatment plant components
- Maintenance of critical above ground assets
- Routine servicing of mechanical and electrical equipment
- Refurbishment of mechanical and electrical equipment
- Grounds maintenance
- Maintenance, servicing and testing of standby power generators
- Routine condition assessment
- Monitoring condition of access roads.

Operations and Maintenance Practices

Treatment operations and maintenance SLAs, although no longer required, are still a good record of the schedule of operation and maintenance frequencies. The operations and maintenance practices for water treatment are detailed in the SLAs given below:

- Turitea Water Treatment Plant Operations and Maintenance (OASIS 2946398)
- Palmerston North, Bunnythorpe and Longburn Water Bores Operations (OASIS 2946392)
- Ashhurst Water Treatment Operations and Maintenance (OASIS 2946396)

Scheduled inspections are managed using Lutra ID, these inspections include sanitary surveys on head works, reservoir inspections and dam inspections. The operational inspections at the treatment plants are also managed on the Infrastructure Data forms from Lutra.

Reactive maintenance works are referred to in the SLA, but very little detail is specified. These are typically initiated by operators after alarm responses or as a result of regular inspections. The reactive maintenance works are supposed to be recorded in IPS, but this process is currently quite variable. Historically some of this was also recorded as text notes in the treatment plant SCADA.

The SLA was last renewed and updated in 2017. As with other SLAs there is no process to review and amend the overall schedule. Again, it would be more appropriate to move to a collectively owned way of documenting the operational and maintenance practices, with an agreed process for feedback and improvement to the tasks and frequencies including analysis of maintenance data to improve the practices.

Currently the budgets allocated to water treatment and disposal operation and maintenance are not enough to carry out all the tasks to provide the agreed levels of service. Additional funding to address this gap will be required.

Providing greater detail about individual operational and maintenance tasks and procedures in the SLA are the treatment plant processes manuals and the site-specific Treatment Plant Health & Safety Manual. These must be continually updated as new equipment, compliance requirements, or processes are introduced. In addition, the processes are yet to be integrated into Promapp. These are challenges because of a lack of administration support within the team.

Adequate condition data is critical to the effective management of the water treatment plant. Further development of the scheduled maintenance regime is planned to ensure that the condition information required is captured.

Decision-making around whether to carry out maintenance or repairs for an asset or when an asset is instead renewed, is based on staff judgement and experience. Staff will typically consider the risks associated with the asset, overall disruption to the service, and the cost.

Improvement Opportunities

The following improvement project opportunities have been identified for operation and maintenance planning:

- Turn the existing SLAs and wall planner into treatment and disposal operation and maintenance practice documents
- Integrate treatment plant processes into Promapp
- Improve recording of treatment and disposal operational and maintenance data in IPS
- Undertake formal reviews and/or optimisation studies of maintenance and operations activities based on data and risk
- Allocate additional funding to water treatment and disposal operation and maintenance
- Develop the scheduled maintenance to ensure that the condition information required is captured

8.3.4 Renewal Plan

Capital renewal for Water Treatment plant assets is similar to the situation for collection and distribution assets. Assets are replaced once they have reached their end of useful life. For plant assets, a like for like approach is used to replace the asset unless support from suppliers is discontinued.

The selection for renewal of specific treatment plant mechanical and electrical equipment has historically been finalised at the start of every budget year. This has been replaced by a more robust six-year renewals programme. Considered in this process are informal assessments of repair history, criticality and current condition.

Renewal planning for water treatment buildings will be managed in the same way as other buildings. Further information on this and building assets can be found in the Property AMP.

8.3.5 Asset Improvement and New Assets

The drivers which lead to capital new planning for water treatment assets have been outlined in earlier sections of this AMP.

The capital new planning for treatment is covered in depth in the Water Supply Development Plan (WSDP). The WSDP is updated or reviewed every five to six years and therefore provides input into approximately two AMP cycles. The water supply hydraulic model is used to model the demands over four planning horizons. The WSDP does not cover anticipated changes due to a change in water supply regulations.

8.3.6 Asset Disposal

Asset disposal is primarily included as part of renewals consideration as most water treatment components are physically removed and disposed of to allow for the replacement component. In some cases where a component is replaced the replacement component is installed alongside the existing component, and the existing component (wholly or partly) eventually remains, even though it is redundant. This may be to save costs or because the existing component is too difficult to completely remove.

Wherever possible, above ground assets are sold for scrap value with revenue used to further enhance the water system. Effort is made to reuse assets in this manner that are no longer required. In general, the old asset is disposed of in the information system when the replacement asset is entered.

8.4 Distribution

8.4.1 Service Overview

Distribution assets allow the supply of water that is of high quality, reliable, and available and meets domestic, commercial, and industrial customers' needs.

8.4.2 Customer and Strategic Issues

The table below summarises the links between service levels and the management of the lifecycle of the network assets.

Table 24: Water Supply Network Lifecycle Intent and Impacts

Life Cycle Intent Statement	Indicator	Short Term Goal	Long Term Goal	Life Cycle Impacts
Continuous service is maintained by investing in critical pipes.	Complaints regarding faults and bursts. Average condition grading of critical pipelines.	Callout trends are analysed to enable renewals trade-offs.	Renewal strategy is informed by criticality.	Optimal balance between renewal and maintenance costs. Critical pipes are renewed before they fail.
Reliable service is maintained by investing in reliable condition information.	% of inspected assets with remaining life of <10 years.	All critical pipeline with <10 years remaining life have reliable condition scores by Year 2.	Renewal strategy is informed by reliable condition data	Optimal balance between renewal and maintenance costs.
Adequate flows and pressure for firefighting will be maintained by ensuring an adequate capacity network.	Firefighting flows: FW2 for residential, FW3 for commercial/industrial.	Rectify deficiencies identified from modelling or fire hydrant flow testing.	Renewal strategy is informed by criticality.	Critical hydrants are renewed before they are at risk of failure. Mains are upgraded or constructed to provide capacity.
Water supply service is affordable and cost effective.	The operating cost of the stormwater services per property.		All network O&M procedures are documented.	O&M effort is targeted and optimised.
Sustainable water supply is maintained by optimising usage and leakage.	Water balance and minimum night flows.	Public education and pressure reduction.	Continue with public education and renewal of pipes informed by leak detection.	Prolonged asset life where pressures are reduced.

8.4.3 Operations and Maintenance

The following activities are included within operation and maintenance of the water reticulation assets:

- Attending to customer service requests
- Inspection of assets
- Reactive maintenance (includes):
  Repairs to leaks on point assets such as valves and tobies
  Repairs to burst pipes
- Emergency work
- Proactive maintenance
- Swabbing of Turitea trunk and Ashhurst rising mains
- Flow and pressure testing of fire hydrants
- Scheduled operation, maintenance and exercising of valves.

Operations and Maintenance Practices

Although SLAs no longer required, they are still a good record of the schedule of operation and maintenance frequencies. The operations and maintenance practices for distribution are detailed in the SLAs given below:

- Citywide Water Supply Reticulation Operations & Maintenance
- Citywide Water Toby Renewal
- Citywide Minor Water Reticulation Renewals

Scheduled maintenance is pushed out to the Water Operations team through IPS Field Inspector. Reactive maintenance works are typically initiated through KBase as customer requests. The response and resolution times are all recorded in KBase and the reactive maintenance works are recorded in IPS.

Everyday field tasks undertaken in the day to day operations and maintenance of the network are guided by experienced staff and judgement. Typically, technical requirements for these tasks are passed on as institutional knowledge. On the other hand, generally, most administrative tasks and critical or irregular field work (e.g. a burst water main repair) are covered by Standard Operating Procedures (SOPs).

The decision making around whether to carry out maintenance or repairs for an asset or when an asset is instead renewed is based on staff judgement and experience. Staff will typically consider the risks associated with the asset, overall disruption to the service, and the cost.

Currently no formal reviews or optimisation studies are undertaken on the operational and maintenance tasks that are completed on the network. A regular review or annual optimisation study of the field work would help identify where best to focus operation and maintenance budgets for the most effective distribution network outcome. This is an area that has been identified as an opportunity for improvement.

Improvement Opportunities

The following improvement project opportunities have been identified for reticulation operation and maintenance planning:

- Turn the existing SLA into reticulation operation and maintenance practice documents
- Undertake gap analysis of SOPs and plan for documentation of all procedures
- Develop feedback and improvement processes for operation and maintenance practices and procedures
- Undertake formal reviews and/or optimisation studies of maintenance and operations activities based on data and risk
- Allocate additional funding to water network operation and maintenance

- Optimise amount of pipe sampling and condition inspections in order to assess the overall condition of the network and rate of deterioration of assets

8.4.4 Renewal Plan

The decision on whether to renew the reticulation asset or continue with maintenance repairs is generally based on staff judgement and experience. Reticulation renewals could also be generated through the decision model in IPS. The decision model was developed historically and uses the maintenance and condition to generate the renewals.

A renewals decision making criteria is being developed for pipeline assets and will continue to be refined. These renewals criteria consider condition, criticality, failure history and the asset location. Many water meters are at the end of their useful life and are likely to be under-recording flows. As these flows are used for water billing purposes there is likely to be lost revenue, and over-reporting of water losses.

The strategy for the renewal of the Service Toby Valves and Manifolds is to renew those currently without a manifold within four years. This is driven by the latest Water Safety Plan for Palmerston North which has an emphasis on backflow prevention. Ultimately, in order to protect public health, every connection on all our water supplies will have some level of backflow protection. The lowest level, which is applicable to residential dwellings, is a manifold which contains a non-testable double check valve arrangement. An assumption was made around what year new toby valves had begun to be installed, and then any older than this have been scheduled as part of this renewal programme. The renewal programme is based on renewing these assets a quarter of the city each year over the four-year programme.

8.4.5 Asset Improvement and New Assets

The drivers which lead to capital new planning for water reticulation assets have been outlined in earlier sections of this AMP.

The water supply hydraulic model is used as a planning tool for both potential upgrades of existing infrastructure and additional new infrastructure. The model is used to assess the relevant factors and needs to provide the basis of the infrastructure required.

The key output of the Water Supply Development Plan is a Capital Works Register, which is used to inform and populate the proposed programmes for the AMP. The WSDP document details the water network and outlines studies undertaken in the development of the 30-year programme of works.

Drivers for the new and improvement work in the water supply network is to increase resilience, provide redundancy, and meet the required fire flows.

New assets are acquired in a variety of ways, as follows:

- Assets within a new subdivision, including booster stations, are vested to us.
- We construct new network assets where the development has been confirmed which will support residential growth areas or where water supply services are needed.
- The risk, costs, and benefits of accepting vested assets will be reviewed, and a decision regarding approval for the acquisition will be made on a case by case basis by our staff. When satisfactorily completed in accordance with our standards and any approvals given, we will accept such assets into public ownership.
- Water efficiency improvements can help defer the requirement for new assets or alternatively assessing options to reduce peak demand can enable more effective utilisation of existing assets.

8.4.6 Asset Disposal

Asset disposal is primarily included as part of renewals consideration as many water pipes are replaced on the same alignment. Therefore, the old asset is both physically disposed of and disposed of in the information system when the replacement asset is entered.

Buried asbestos water mains that are no longer required are generally left in position and the replacement is laid on an alternative alignment. An effort is made to reuse these redundant assets, most commonly as ducts for rider mains feeding from the replacement mains.

In general, the old asset is disposed of in the information system when the replacement asset is entered. This process is currently relatively informal and does not necessarily consider where a redundant component remains.

8.5 Lifecycle Management Alternatives

As stated in the SAMP lifecycle, decision making is an area of improvement for us. This includes consideration of lifecycle alternatives for water supply. Thus, for all types of water supply assets, lifecycle management alternatives have not been well considered. This will be addressed in the proposed lifecycle decision making improvements for us, including risk-based analysis of alternatives and embedding of the business case development process.

8.6 Lifecycle Proposed Expenditure Summary

8.6.1 Proposed Operations and Maintenance Expenditure

Existing operations and maintenance budgets were reviewed against historic expenditure and levels of service requirements. This was used to forecast future budget needs for existing assets, and to estimate the budget required for new assets programmed to be created.

Proposed operations and maintenance expenditure over the next 10 years is shown below. Overall operations and maintenance expenditure is proposed to increase with most costs in water treatment. The higher value for collection in 2032/33 is due to the proposed renewal of the hydro power consent.

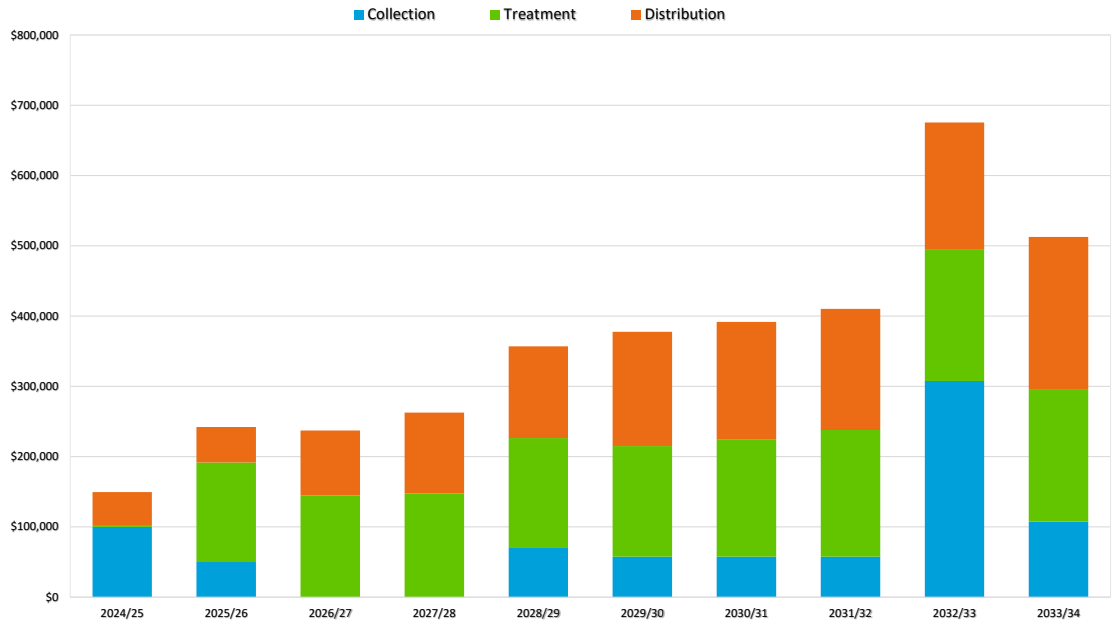


Figure 24: Proposed O&M 10 year Expenditure Plan

The figures below show the breakdown of the proposed operations and maintenance budgets for the next ten and 30 years. Different expenditure categories are:

- **Maintain Service Level or MSL**: budget for the operation and maintenance of the existing assets;
- **Operational Programmes**: budgets for discrete operational programmes, for example the collection of base asset condition data, resource consent renewal, or business case preparation; and
- **Capital New (Consequential Opex)**: budget allowance for operation and maintenance due to the creation of new assets each year

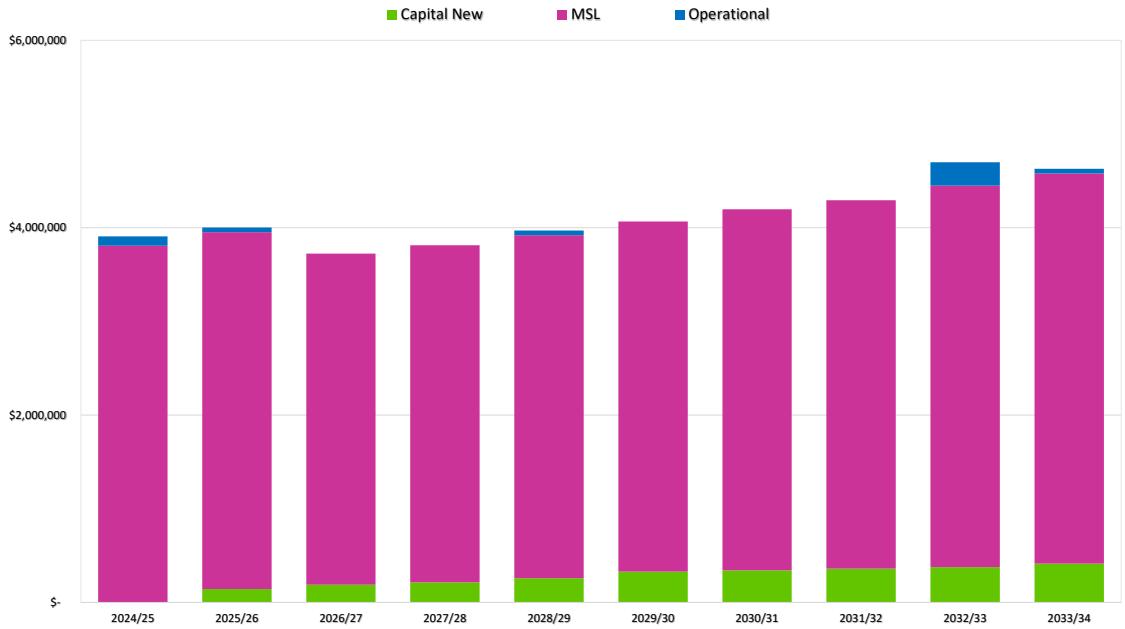


Figure 25: Water Supply Proposed Operational and Maintenance Budget Breakdown

The figure below shows the breakdown of the Maintain Service Level costs proposed over the next ten years(excluding revenue and inflation). The highest proportion is for maintenance expenditure with increased expenditure in years 1 and 2 for additional materials. Overall costs are expected to increase over the next decade.

The budget for consultants includes specialist investigations and design work. Maintenance costs are associated with consumables, plant and physical works. Administration costs include overheads, insurance, software, rates (Regional Council) amongst other items.

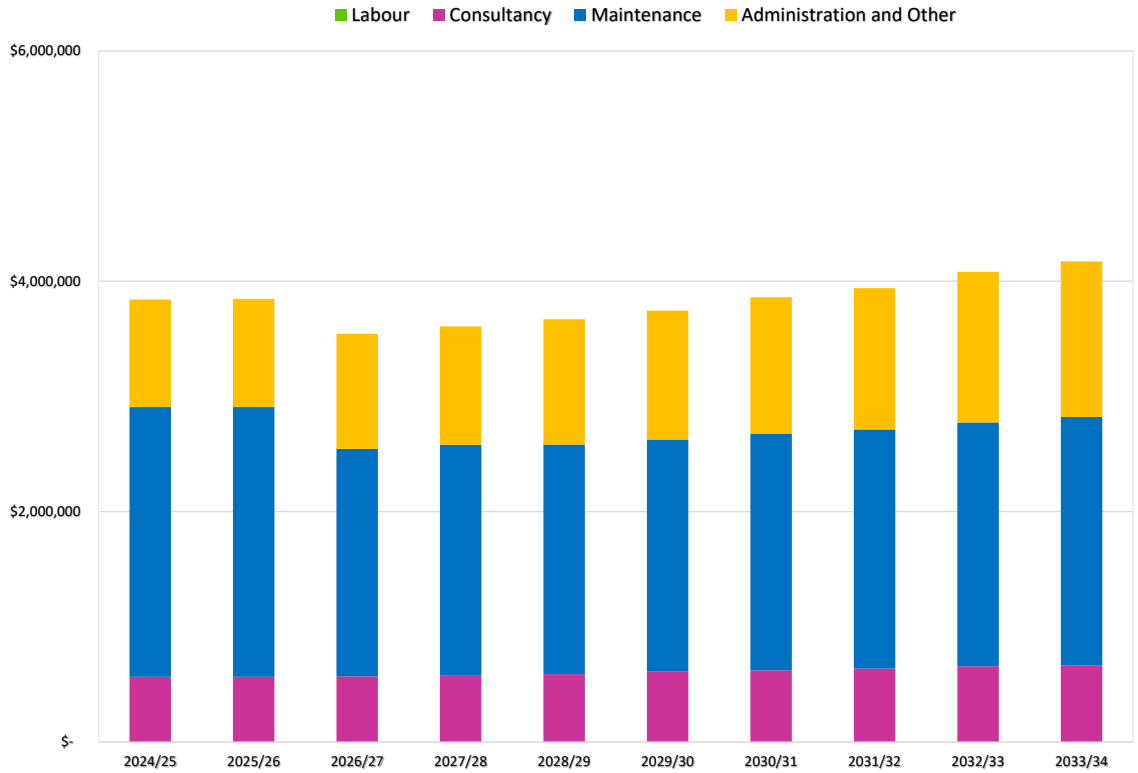


Figure 26: Water Proposed MSL Budget Breakdown

Table 25: Proposed O&M Water 10 year Expenditure Plan

Prog. Type	Prog. No. & Name	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	10 Year Total
MSL	Maintain Service Level	$ 5,906,337	$ 5,835,558	$ 5,479,806	$ 5,464,974	$ 5,462,039	$ 5,465,496	$ 5,529,806	$ 5,556,376	$ 5,645,167	$ 5,696,621	**$ 56,042,183**
Capital New	Consequential Opex	$ 1,400	$ 143,879	$ 189,024	$ 214,338	$ 258,775	$ 329,378	$ 343,611	$ 361,985	$ 377,285	$ 414,448	**$ 2,634,123**
O&M	1870 - Turitea Dams - Consent Renewal - Hydroelectricity	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 250,000	$ -	**$ 250,000**
O&M	1905 - Turitea Dams - Turitea Forest Harvest	$ 50,000	$ 50,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 100,000**
O&M	2504 - Turitea Catchment Reserve Management Plan	$ 50,000	$ -	$ -	$ -	$ 50,000	$ -	$ -	$ -	$ -	$ 50,000	**$ 150,000**
Capital	Total Expenditure	**$ 6,007,737**	**$ 6,029,437**	**$ 5,668,830**	**$ 5,679,312**	**$ 5,770,814**	**$ 5,794,874**	**$ 5,873,417**	**$ 5,918,361**	**$ 6,272,452**	**$ 6,161,069**	**$ 59,176,306**

8.6.2 Proposed Renewal Expenditure

The renewal programme budgets are developed primarily by the value and expected useful life of the assets as contained in the asset register (IPS). This is used to generate a projected cumulative replacement value for an asset group over the next 100 years. The existing cumulative renewals budget is compared with the projected replacement value to see if there is a shortfall or not in the required renewals budget. From this, the required renewals budget is adjusted to match over time the projected replacement value.

Refer to **Appendix E** for theoretical asset renewal profiles.

The exception to this method of budget development is the Service Toby Valves and Manifolds where the strategy is to renew those currently without a manifold over the next decade.

Proposed renewals over the next 10 years are shown below. The majority of proposed expenditure is for replacement of distribution assets. Increased expenditure in the first four years is to renew the Turitea WTP raw water main and networks in Longburn and Bunnythorpe.

Increased investment in renewal of water supply bore infrastructure is planned for the first three years to meet drinking water rules and improve borehead security.

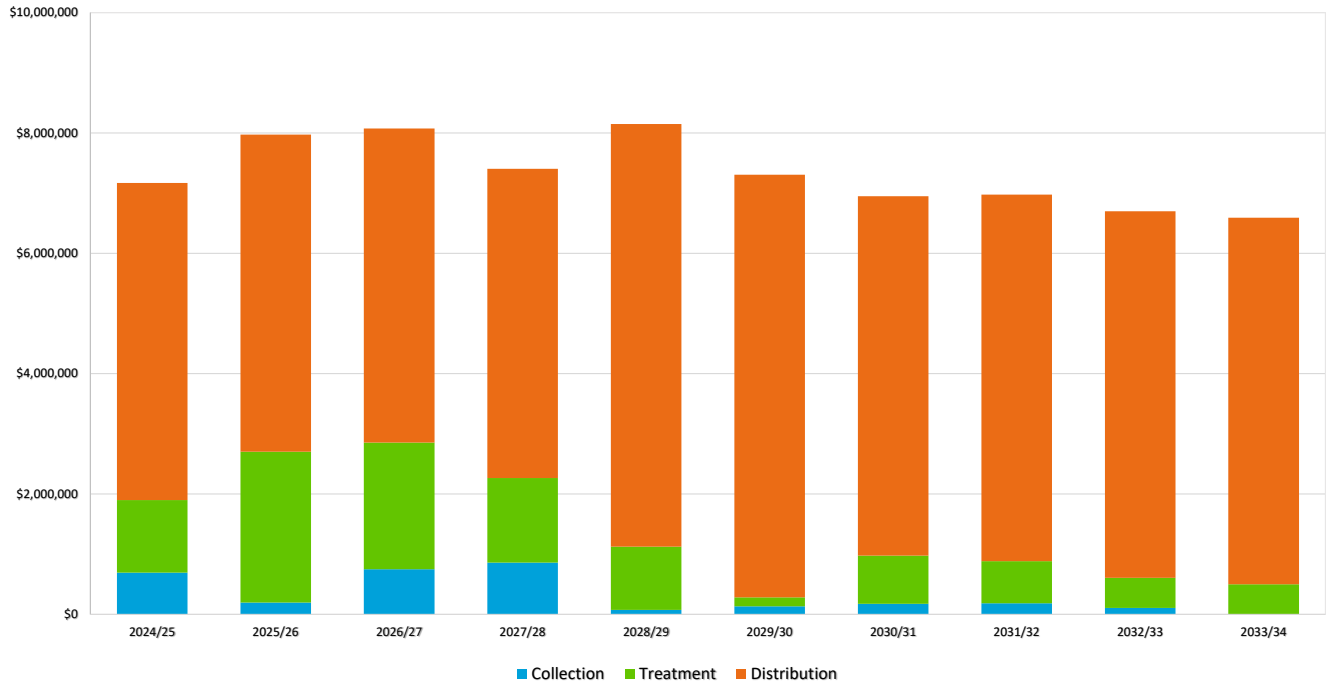


Figure 27: Proposed Renewal 10 year Expenditure Plan

Table 26: Proposed Renewal 10 year Expenditure Plan

Prog. Type	Prog. No. & Name	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	10 year Total
Renewal	199 - City-wide - Water Supply Bore and Network Facility Renewals	$595,125	$198,720	$600,000	$112,000	$76,500	$134,200	$176,750	$184,500	$107,800	$0	**$2,185,595**
Renewal	207 - Turitea WTP - Equipment and Facility Renewals	$400,000	$400,000	$500,000	$1,000,000	$1,000,000	$100,000	$500,000	$400,000	$200,000	$200,000	**$4,700,000**
Renewal	214 - City-wide - Water Toby and Manifold Renewals	$517,500	$517,500	$517,500	$517,500	$530,450	$530,450	$530,450	$530,450	$530,450	$530,450	**$5,252,700**
Renewal	218 - City-wide - Water Main Renewals	$4,000,000	$4,000,000	$4,000,000	$4,000,000	$4,000,000	$4,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	**$36,000,000**
Renewal	1061 - City-wide - Water Supply Reservoir Renewals	$50,000	$150,000	$100,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	**$440,000**
Renewal	1700 - City-wide - Water Meter Renewals	$350,000	$300,000	$300,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	**$1,650,000**
Renewal	1701 - City-wide - Water Supply Valve & Hydrant Renewals	$350,000	$300,000	$300,000	$300,000	$150,000	$150,000	$100,000	$100,000	$100,000	$100,000	**$1,950,000**
Renewal	2042 - Turitea WTP - Raw Water Main Renewal	$200,000	$1,150,000	$1,150,000	$0	$0	$0	$0	$0	$0	$0	**$2,500,000**
Renewal	2276 - Turitea Dams - Access Road Renewals	$0	$0	$150,000	$750,000	$0	$0	$0	$0	$0	$0	**$900,000**
Renewal	2278 - Longburn - Water Bore and Treatment Renewal	$100,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$100,000**
Renewal	2279 - Longburn - Water Asset Renewals	$354,612	$354,612	$354,612	$354,612	$0	$0	$0	$0	$0	$0	**$1,418,448**
Renewal	2280 - Bunnythorpe - Water Asset Renewals	$0	$500,000	$0	$0	$0	$0	$250,000	$250,000	$250,000	$250,000	**$1,500,000**
Renewal	2288 - Turitea WTP - Automation and PLC Renewals	$150,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$150,000**
Renewal	2310 - Citywide - Water Critical Spare Replacements	$100,000	$100,000	$100,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	**$650,000**
Renewal	2344 - Turitea WTP - Falling Main Rehabilitation	$0	$0	$0	$200,000	$2,220,000	$2,220,000	$2,220,000	$2,340,000	$2,340,000	$2,340,000	**$13,880,000**
Renewal	Total Annual Expenditure	**$7,167,237**	**$7,970,832**	**$8,072,112**	**$7,404,112**	**$8,146,950**	**$7,304,650**	**$6,947,200**	**$6,974,950**	**$6,698,250**	**$6,590,450**	**$73,276,743**

8.6.3 Proposed Capital Expenditure

The proposed budgets for capital new programmes are based on the information available for each programme. This could be a design, a feasibility study with various costed options, or simply a programme concept.

Proposed capital expenditure over the next 10 years is shown below. The highest proportion of investment is in distribution which is driven by growth and resilience improvements. Increased collection investment is required between now and 2030 to support growth and to upgrade the Turitea dams and reservoirs. Ongoing investment in treatment is also required to support growth and meet drinking water standards and rules.

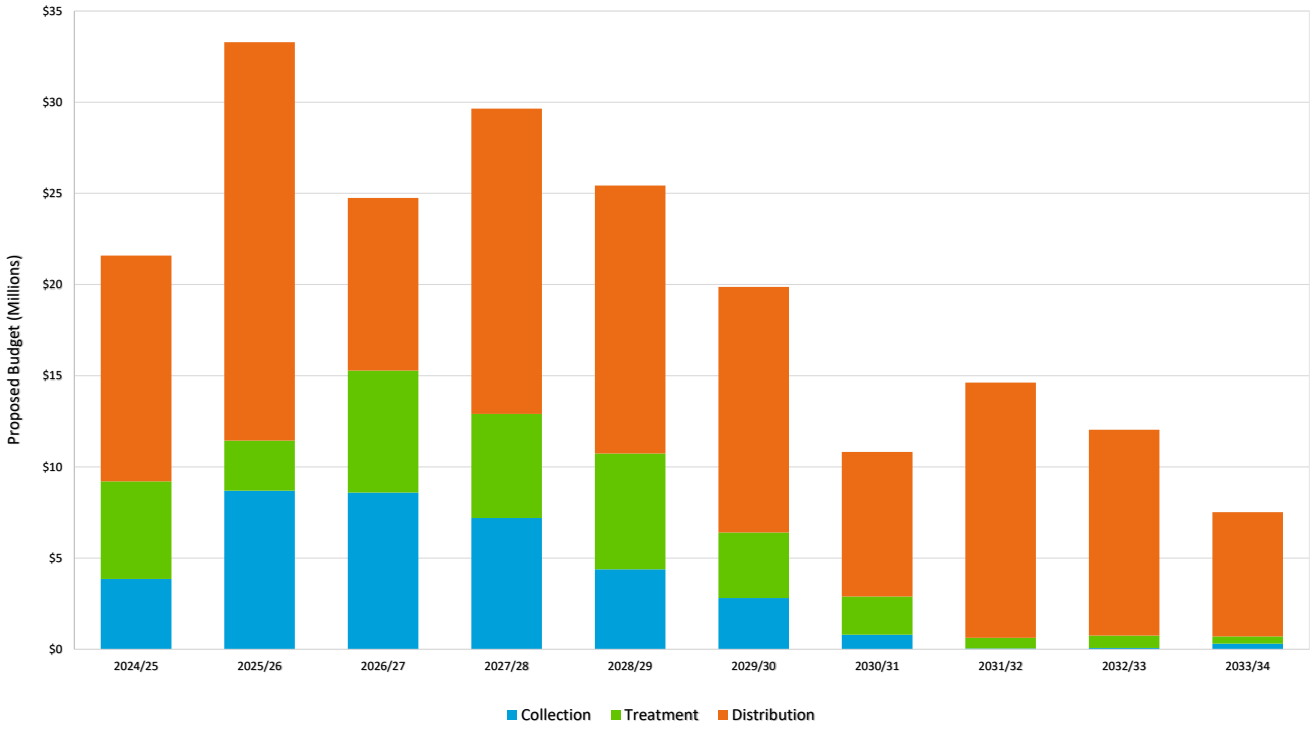


Figure 28: Proposed New Capital 10 year Expenditure Plan

Table 27: Proposed New Capital 10 year Expenditure Plan

Prog. Type	Prog. No. & Name	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	10 Year Total
Capital	88 - Turitea WTP - Falling Main from WTP to Reservoir	$ 150,000	$ 879,750	$ 1,242,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 2,271,750**
Capital	132 - City-wide - Water Supply Resilience - Trunk Mains	$ 600,000	$ 1,113,900	$ 1,075,727	$ 1,008,893	$ 180,000	$ 472,090	$ 473,150	$ 400,000	$ 1,035,000	$ 1,035,000	**$ 7,393,760**
Capital	135 - Urban Growth - Bunnythorpe Extension - Water Supply	$ 75,000	$ 450,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 525,000**
Capital	246 - Urban Growth - Development Contributions - Water Supply	$ 260,000	$ 300,000	$ 300,000	$ 350,000	$ 350,000	$ 350,000	$ 350,000	$ 400,000	$ 400,000	$ 400,000	**$ 3,460,000**
Capital	651 - City-wide - Water Supply Resilience - Seismic Strengthening	$ 300,000	$ 300,000	$ 750,000	$ 500,000	$ -	$ 260,000	$ 750,000	$ -	$ -	$ 260,000	**$ 3,120,000**
Capital	986 - Turitea Dams - Aeration Upgrade	$ 150,000	$ 500,000	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 950,000**
Capital	1004 - Urban Growth - Whakarongo - Water Supply	$ 200,000	$ 700,000	$ 1,290,000	$ 2,450,000	$ 2,960,000	$ 1,600,000	$ -	$ -	$ -	$ -	**$ 9,200,000**
Capital	1005 - Urban Growth - NEIZ - Water Supply	$ -	$ -	$ -	$ 300,000	$ 700,000	$ 2,200,000	$ 2,700,000	$ 2,600,000	$ -	$ -	**$ 8,500,000**
Capital	1054 - Ashhurst - Water Quality Improvements	$ 4,000,000	$ 500,000	$ 500,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 5,000,000**
Capital	1170 - Urban Growth - Kakatangiata - Water Supply	$ 550,000	$ 500,000	$ -	$ -	$ 2,500,000	$ 3,000,000	$ 2,500,000	$ 1,000,000	$ 2,200,000	$ 3,000,000	**$ 15,250,000**
Capital	1384 - City-wide - Water Supply Resilience - Additional Reservoirs	$ 3,000,000	$ 15,000,000	$ 3,000,000	$ 8,924,000	$ 4,471,000	$ 4,587,000	$ 500,000	$ 7,950,000	$ 5,692,000	$ 200,000	**$ 53,324,000**
Capital	1387 - Urban Growth - New North-East Water Supply Bore	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
Capital	1388 - Palmerston North - District Metering Areas for Water Supply	$ -	$ 82,800	$ 51,750	$ 155,250	$ -	$ -	$ -	$ -	$ 82,800	$ 51,750	**$ 424,350**
Capital	1389 - City-wide - Water Supply Resilience - Security of Supply	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 500,000	**$ 770,000**
Capital	1607 - City-wide - Health & Safety - Water Treatment Chemical Handling	$ -	$ 150,000	$ 300,000	$ 300,000	$ -	$ -	$ -	$ -	$ 30,000	$ -	**$ 780,000**
Capital	1696 - City-wide - Drinking Water Standards Upgrades	$ -	$ 250,000	$ 1,500,000	$ 1,500,000	$ -	$ -	$ -	$ -	$ -	$ -	**$ 3,250,000**
Capital	1697 - Turitea WTP - Water Supply Resilience - Upgrades	$ 900,000	$ 210,800	$ 1,454,111	$ 1,500,000	$ 2,000,000	$ 400,000	$ 400,000	$ 400,000	$ 75,000	$ 300,000	**$ 7,639,911**
Capital	1841 - Urban Growth - Ashhurst - Water Supply	$ 180,000	$ 250,000	$ 300,000	$ -	$ -	$ -	$ 250,000	$ 500,000	$ 726,000	$ 500,000	**$ 2,706,000**
Capital	1873 - City-wide - Water Main Upgrades - Firefighting	$ -	$ -	$ -	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	**$ 700,000**
Capital	1874 - Turitea Dams - Health & Safety Improvements	$ 500,000	$ 300,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	**$ 1,200,000**
Capital	1880 - Urban Growth - Aokautere - Water Supply	$ -	$ -	$ -	$ 207,000	$ 1,552,500	$ -	$ -	$ 80,000	$ 500,000	$ -	**$ 2,339,500**
Capital	1883 - 3 Waters - Small Plant and Equipment	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	**$ 1,000,000**
Capital	2048 - City-wide - Water Toby and Manifold enhancements	$ 6,363,313	$ 2,289,938	$ 2,289,938	$ 2,289,938	$ 2,277,000	$ -	$ -	$ -	$ -	$ -	**$ 15,510,127**
Capital	2060 - City-wide - Commercial Water Meters	$ 124,909	$ 124,909	$ 124,909	$ 124,909	$ 124,909	$ 124,909	$ 20,000	$ 20,000	$ 20,000	$ 20,000	**$ 829,454**
Capital	2228 - City-wide - Water Main Improvement	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	**$ 10,000,000**
Capital	2270 - Turitea WTP - Sludge Handling and Disposal Improvements	$ -	$ 100,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ -	$ -	$ -	$ -	$ -	**$ 3,100,000**
Capital	2283 - Turitea WTP - New Retaining Walls on Access Road	$ 150,000	$ 560,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 710,000**
Capital	2285 - Turitea WTP - Filter Backwash System Risk Mitigation	$ -	$ -	$ -	$ 200,000	$ 1,000,000	$ 1,000,000	$ -	$ -	$ -	$ -	**$ 2,200,000**
Capital	2286 - Turitea Dams - Installation of Dewatering Systems (both dams)	$ -	$ -	$ -	$ 200,000	$ 1,000,000	$ 1,000,000	$ -	$ -	$ -	$ -	**$ 2,200,000**
Capital	2297 - Urban Growth - Napier Road Bore (City East)	$ -	$ 2,500,000	$ 3,000,000	$ 2,500,000	$ 1,000,000	$ -	$ -	$ -	$ -	$ -	**$ 9,000,000**

Prog. Type	Prog. No. & Name	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	10 Year Total
Capital	2298 - Bunnythorpe - Water Quality Improvements	$ -	$ -	$ -	$ -	$ 200,000	$ 2,100,000	$ 1,600,000	$ -	$ -	$ -	**$ 3,900,000**
Capital	2299 - Urban Growth - New Northern Water Supply Bore (Milson Line)	$ 2,500,000	$ 3,000,000	$ 2,500,000	$ 1,000,000	$ -	$ -	$ -	$ -	$ -	$ -	**$ 9,000,000**
Capital	2300 - Urban Growth - New South Eastern Water Supply Bore (Ngahere Park)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
Capital	2301 - Urban Growth - New Longburn Water Supply Bore	$ 258,500	$ 1,393,500	$ 1,394,000	$ 1,952,500	$ 1,135,000	$ -	$ -	$ -	$ -	$ -	**$ 6,133,500**
Capital	2302 - Citywide - Reservoir Storage and Chemical Facilities Upgrades	$ -	$ -	$ 200,000	$ 500,000	$ 500,000	$ -	$ -	$ -	$ -	$ -	**$ 1,200,000**
Capital	2303 - Citywide - Bore Facility Improvements	$ 200,000	$ 700,000	$ 700,000	$ 700,000	$ -	$ -	$ -	$ -	$ -	$ -	**$ 2,300,000**
Capital	2311 - WTP - Secondary Access Road	$ -	$ -	$ 300,000	$ 700,000	$ 1,200,000	$ 1,500,000	$ -	$ -	$ -	$ -	**$ 3,700,000**
Capital	Total Expenditure	**$ 21,591,722**	**$ 33,285,597**	**$ 24,752,435**	**$ 29,642,490**	**$ 25,430,409**	**$ 19,873,999**	**$ 10,823,150**	**$ 14,630,000**	**$ 12,040,800**	**$ 7,516,750**	**$199,587,352**

8.7 Improvement Actions

Items identified that would improve lifecycle management are:

- Turn the existing SLAs and various dispersed planning documents into operation and maintenance practice documents for the water collection, treatment, and reticulation.
- Undertake a gap analysis of SOPs and plan for documentation of all procedures.
- Process map all operational and maintenance practices and procedures.
- Develop feedback and improvement processes for operation and maintenance practices and procedures.
- Improve recording of treatment and disposal operational and maintenance data in IPS.
- Undertake formal reviews and/or optimisation studies of maintenance and operations activities based on data and risk.
- Optimise amount of pipe sampling and condition inspections in order to assess the overall condition of the network and rate of deterioration of assets.
- Review the breakdown of plant and equipment in IPS to ensure it is appropriate for valuation, maintenance and renewal.
- Extend our pipe renewal programming out to six years to reduce the risk of conflicts with other services that also need to be renewed.
- Review, revise and process map the processes for disposal of water supply plant and equipment.
- Integrate treatment plant processes into Promapp.
- Develop the scheduled maintenance to ensure that the condition information required is captured

9 Financial Summary

This section outlines the long-term financial requirements for the operations, maintenance, capital renewal and capital new to meet the agreed levels of service for the water supply activity. These requirements have been identified and assessed individually throughout this plan and are summarised in this section. This section also includes discussion on the strategies used to develop the financial budgets, as well as the assumptions and risks inherent in the budget forecasts.

A theoretical renewals profile (based upon asset valuation information is provided in **Appendix E.**

Key assumptions made in preparing proposed financial requirements are provided in **Appendix F**

9.1 Asset Valuation

Our assets were last valued in 2022 (Revaluation of PNCC 3 Waters Assets 2022, AECOM, August 2022). The valuation covered all three waters assets and excluded capital works in progress and capitalised cost items associated with asset repairs, maintenance or labour. Land values were provided by Council and included in the valuation report for completeness.

The tables below shows a breakdown of asset value between reticulation and non-reticulation assets and movements since the last valuation in 2020.

Table 28: Water Supply Revaluation 2022 (Source: Revaluation of PNCC 3 Waters Assets 2022, AECOM, August 2022)

Asset Group	Optimised Replacement Cost 30-Jun-22	Optimised Depreciated Replacement Cost 30-Jun-22	Annual Depreciation 2022
Reticulation	$276,323,075	$156,361,228	$3,189,956
Non-reticulation	$120,470,656	$92,108,360	$1,129,409
Total	**$396,793,731**	**$248,469,589**	**$4,319,365**

Table 29: Comparison between Revaluation 2020 and 2022 (Source: Revaluation of PNCC 3 Waters Assets 2022, AECOM, August 2022)

Asset Group	Optimised Replacement Cost change since 2020	Optimised Depreciated Replacement Cost change since 2020	Annual Depreciation change since 2020
Reticulation	+$67,572,715	+$38,009,025	+$710,444
Non-reticulation	+$39,109,431	+$32,315,145	+$244,566
Total	**+$106,682,145**	**+$70,324,170**	**+$955,010**
% increase 2022 vs 2020	**36.77%**	**39.48%**	**28.39%**

The asset values have increased significantly since the last valuation in 2020. The report found that general movements were due to:

1. Inflation in construction costs.
2. Additional assets that have been added since the 2020 valuation (partially offset by assets which have been removed).
3. The application of an additional 2 year's depreciation.
4. Changes from 2020 to 2022 in the base asset data. This reflects PNCC's commitment to ongoing improvement in the quality of its asset data.

Specific comments for water supply were:

- Since the 2020 valuation there has been an increase in the Optimised Replacement Cost, Optimised Depreciated Replacement Cost and Annual Depreciation for the Reticulation assets. The major contributors to this have been inflation in construction costs as reflected in changes in the capital goods price indices and better alignment with construction costs on other comparable areas in the North Island.
- ORC has increased by 37% since the 2020 valuation. This is due to the increase in construction costs reflected in the capital goods price index (CGPI) as well as updated land valuations that have contributed to substantial increases.

9.1.1 Valuation Improvements

The 2022 valuation report recommended the following improvements to future Three Waters asset valuations.

- **Unit rates** – unit rates from contracts carried out during the year are captured in a suitable database and that the supply of rates in a suitable format and incorporating an appropriate apportionment of contract costs such as P&G, Insurances etc. is a contract condition for 3 waters construction contracts.
- **Asset remaining lives validation** - a sample of actual asset condition data is used to confirm the assumption that asset condition and remaining life is proportional to age
- **Verification of Unit Rates** - unit rates from this valuation are compared with actual construction costs in the local market and identifying future movements in rates (either upwards or downwards) that may be appropriate
- **Site Visit** - undertake a site visit to validate a sample of asset data
- **Standardisation of Valuation Approaches** - discussions with Audit NZ and/or the National Transition Unit of the Department of Internal Affairs regarding the standardisation of the valuation approach, assumptions and interpretation prior to the formation of the proposed Water Entities.

9.2 Financial Forecasts

Thirty-year capital and operational forecasts proposed in the draft Long Term Plan 2024/34 and Infrastructure Strategy are shown below. Years 11 to 30 are shown in five-year groups.

9.2.1 Overall Capital and Operational Forecast

The largest proportion of proposed investment is to maintain/achieve levels of service over the next 30 years. This is followed by growth and renewals. Focused investment is required for upgrade of water collection and treatment assets to maintain service and to meet drinking water standards and rules.

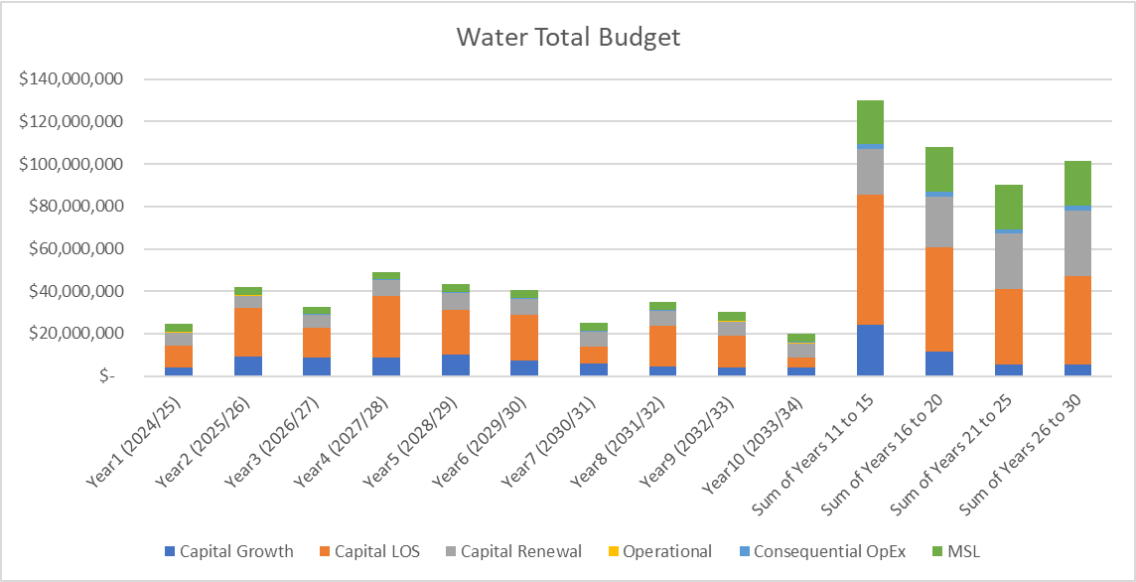


Figure 29: Overall Capital and Operational Forecast

9.2.2 Renewal Forecast

The forecast annual renewals expenditure is similar to annual depreciation values and is steady for the next decade.

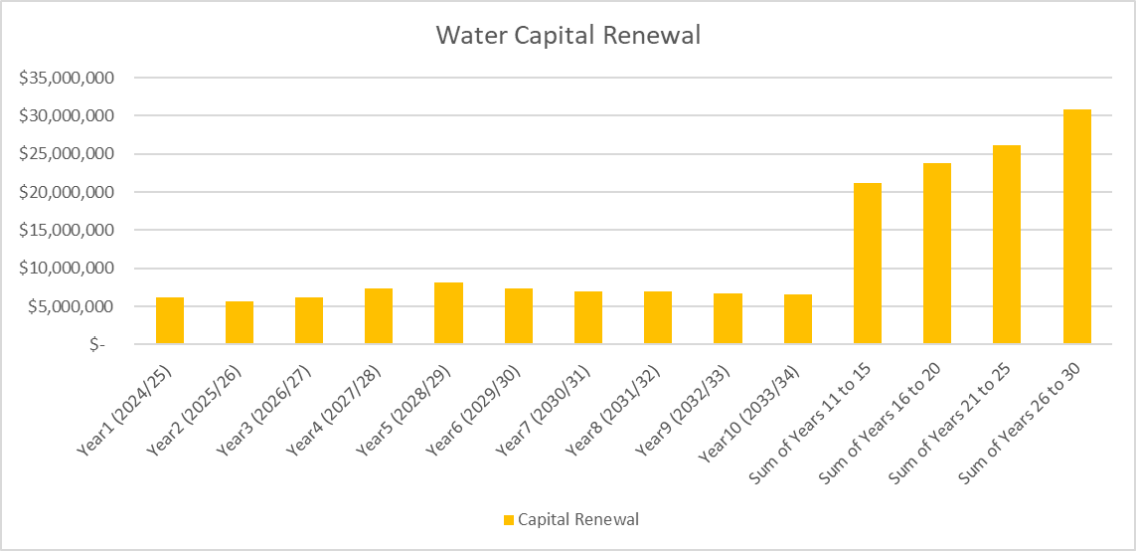


Figure 30: Renewals Forecast

9.2.3 Operations and Maintenance Forecast

The highest proportion of operational expenditure is to operate and maintain existing assets. Consequential operational expenditure (from the creation of new assets) increases steadily over the next decade due to the high proportion of projected growth.

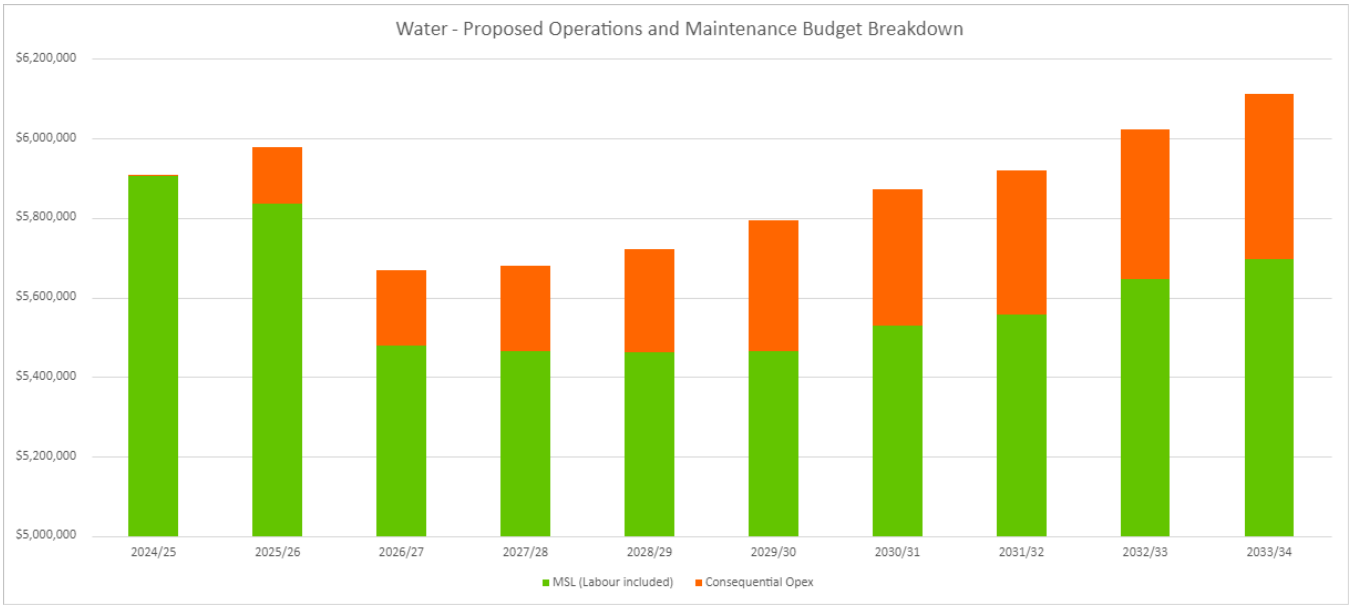


Figure 31: Operations and Maintenance Forecast

9.2.4 Capital Forecast

Capital investment is mainly for levels of service and then to meet project growth demands. Actual service growth is dependent on timing of developments.

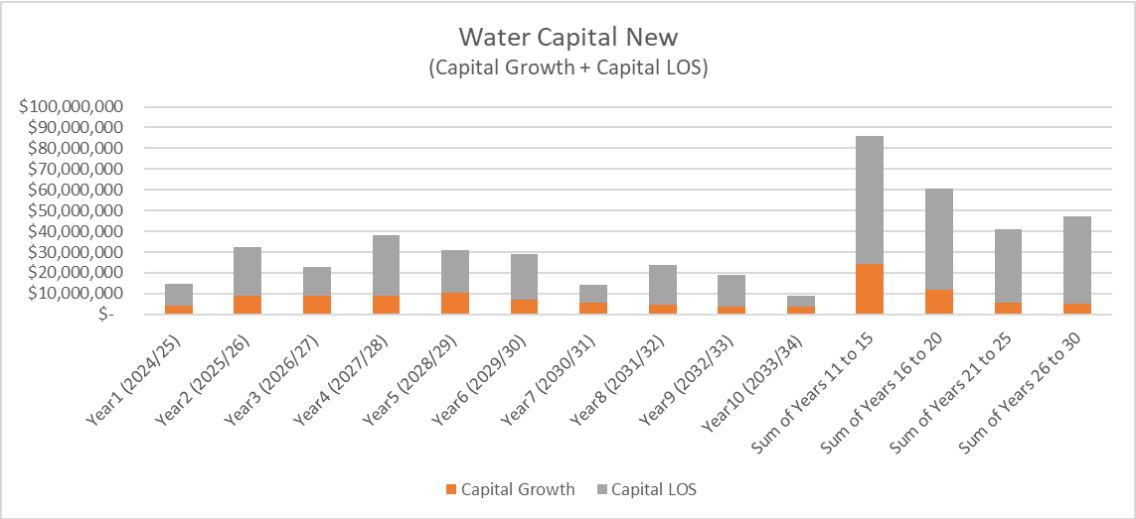


Figure 32: Capital LOS and Growth Forecast

9.3 How We Will Pay for It

The different types of expenditure are funded in different ways. These are as follows:

- **Operations & Maintenance** are funded by targeted rates and water meter charges. Historic water production is used to derive a total cost per volume of water produced. Metered properties are then charged using this volumetric rate and the balance is apportioned to the non-metered properties based on their number of connections in accordance with our rating policy. Currently, metered properties typically account for approximately 20% of total demand. However, for the purposes of financial projections in the AMP the annual volume of metered water is assumed to remain the same.
- **Capital renewal** is funded from rates revenue based on a three-year rolling average and, if necessary, from borrowing.
- **Capital new works** that provide for an increased level of service are funded from borrowing. The Council seeks to obtain funding for the infrastructure that is required for growth through the application of its Development Contribution policy. Programmes that are attributable to growth are shown in this AMP. Development contributions for water supply are city-wide for Palmerston North urban and there are separate development contributions for Ashhurst and Longburn.

9.4 Financial Forecast Uncertainty

9.4.1 Potential Effects of Uncertainty

Expenditure forecasts are based on the best available information. The longer-term budgets will be refined both in scope and costing as these programmes get closer to implementation. Periodic revision and adjustment to the schedule of works every three years enables the adverse effect of uncertainty in the financial forecasts to be mitigated.

Should the required level of funding not be available, then there is a potential risk of deferred maintenance and renewal or development. This may not be noticeable immediately but would ultimately result in agreed levels of service not being met.

The ideal cost accuracy for any programme (operational, renewal and new) is based on when the programme first appears in the 10 Year Plan or Infrastructure Strategy. These ideal accuracies are:

Years 1 to 3 (2024/25 -2027/28): The scope and pricing of work should be reliable, based on good market information for unit rates, etc.

Years 4 to 6 (2027/28 - 2029/30): Estimates should be reliable, with detailed design work not yet carried out.

Years 7 to 10 (2010/11 - 2033/34): Estimates generally based on a high-level idea of what the programme will involve.

Years 11 to 30 (2034/35 onwards): Rough order costing based on the estimated quantum of work; forecasts could change significantly with further investigation.

9.4.2 Operational and Maintenance Forecast Reliability

Forecasts of operational and maintenance expenditure are reasonably reliable based on a known quantum and scope of work. However, as the operational and maintenance procedures are collected and documented, there will be more certainty and reliability in forecasting the operations and maintenance budgets.

Obtaining condition data will also have an impact on O&M budgets as some specific assets may require immediate maintenance in response to condition inspections. The impact of this will not be known until condition inspections begin.

9.4.3 Capital Renewal Forecast Reliability and Deliverability

The renewals expenditure forecast is mostly based on the asset information out of IPS. Renewal budgets for different asset types were created using the asset install date, estimated useful life, and the replacement cost from the most recent asset revaluation. There is uncertainty when using the estimated useful life of any asset for forecasting renewals budgets.

The reliability of the renewals forecast will improve once asset condition and performance data is obtained. However, the budgets are expected to be of the right quantum over 30 years, with condition data changing the date of renewal of specific assets as opposed to the overall budgets.

Another factor that may affect the certainty of the long-term renewals forecast is the rate of increase in the value of the assets. If the overall valuation increases at the same rate as inflation, then the forecast renewals budget, with an inflation adjustment, will be adequate. If the asset value increases at a greater rate than inflation, as has occurred in the last three years, then the forecast renewals budgets will need to be revised.

9.4.4 Capital New Forecasts Reliability and Deliverability

The budget forecast for each capital new programme is based on the assumptions and information available for that programme, and thus the reliability varies between programmes. The data associated with each programme indicates the reliability of the budget for that programme.

The timing of the growth programmes assumes that the demand for these programmes will occur in a predicted year. However, when this demand will trigger the need for the growth programmes to occur is uncertain. While the budget for each growth programme has a stated level of reliability, the timing of the programme has a relatively low level of reliability. The development scenario for residential growth is based on meeting the needs of a growing population and includes the additional margins required by the National Policy Statement for Urban Development Capacity.

9.5 Improvement Actions

There are no improvements actions for this section.

10 How We Manage the Activity

10.1 Asset Management Leadership and Teams

Asset ownership ultimately sits with the Elected Members and Executive Leadership Team on behalf of the community, while Asset Management as a forward focus is primarily led by Strategy and Planning. The Three Waters Division (Infrastructure Unit) is primarily accountable for the management of the Water Activity (service delivery).

The Three Waters Division is also supported by functions that sit within other Units of Council as summarised below. In time, Asset Management leadership will include a, yet to be established, cross-functional Steering Group.

Table 30: Asset Management Functions and Teams

Function		Unit | Division | Team
Leadership		Elected Members Executive Leadership Team
Finance	Support Service	Finance Infrastructure | Asset Planning | Asset Planning Team
IT		People and Performance | Digital Solutions
HR		People and Performance | People Operations People and Performance | Employee Experience
Asset Management Plans	Forward Focus	Strategic Planning | City Planning Infrastructure | Asset Planning | Asset Management Team
Risk Management		Finance | Risk and Resilience
Performance Management		Strategic Planning | Community Planning People and Performance | Organisation Performance
Continual Improvement		Infrastructure | Asset Planning | Asset Planning
Construction	Present Day	Infrastructure | Three Waters Infrastructure | Project Management Office
Operations		Infrastructure | Three Waters
Maintenance		Infrastructure | Three Waters
Customer Interface		Customer | Customer Contact
Technical Specialists	All	Various Internal and External Design Panel
GIS	Data	People and Performance | Digital Solutions | GIS
Asset Management System		Infrastructure | Asset Planning
Records		People and Performance | Digital Solutions | Records Information

An organisation chart is provided for reference in Figure 33 below.

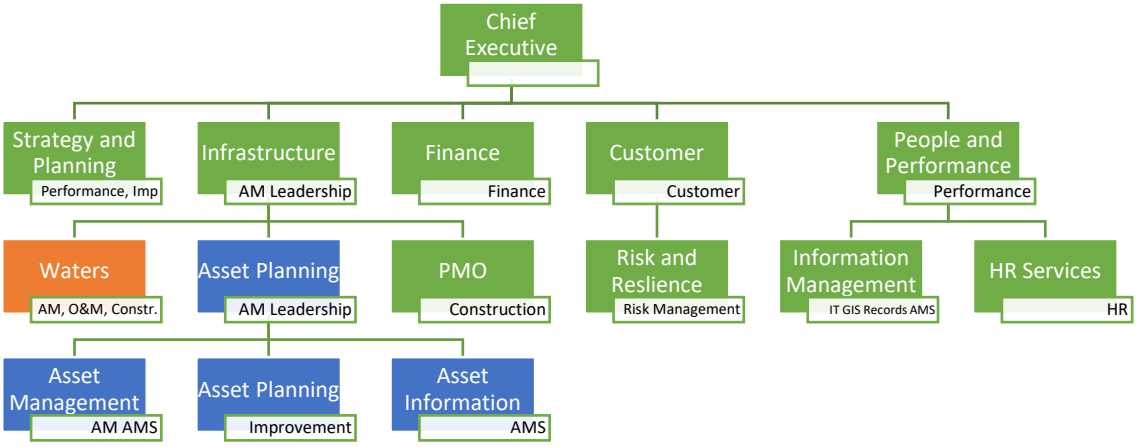


Figure 33: Organisation Chart with Asset Management Functions

10.2 Service Delivery Model

10.2.1 Overview of Service Delivery Model

While many Councils have outsourced their Water service delivery, we have retained significant capability in-house, as summarised below. Essentially, either more complex activities (such as the design and construction of treatment plants), or less frequent (such as the design and construction of trunk mains), are delivered through the procurement of external contractors.

External contractors are procured in line with our Management Team Policy for procurement and are managed predominantly by in-house Project Managers. Note that external consultants are also engaged to carry out specialist investigations or provide technical advice on planning, consenting and policy matters, or temporarily fill vacancies as part of the asset management function.

Table 31: Service Delivery Model

Service Delivery Function	Internal Service Delivery Team	Internal Capabilities	External Service Delivery
Design	Three Waters > Activities Team	Network renewals	Design Panel established May 2022 for most projects
Construct	Three Waters > Networks Operations Three Waters > Networks Capital	Minor projects (Fitting, mechanical and electrical) Pipe renewals and channel upgrades	Some operational projects delivered externally Plant, equipment and large capital upgrades
Operate	Three Waters > Networks Operations, Treatment	All Minor CCTV capability	Backflow device testing and laboratory services CCTV inspection

Service Delivery Function	Internal Service Delivery Team	Internal Capabilities	External Service Delivery
Maintenance	Three Waters > Networks Operations, Treatment	All reticulation Minor treatment repairs (fitters)	Mechanical and electrical repairs

10.2.2 Section 17A Review of Service Delivery Model

The service delivery model has not been reviewed in recent years for this activity as future delivery will be determined by the national Three Waters Reform.

10.3 Asset Management Planning

The development of this AMP was led by the Asset Management Team and sponsored by the Three Waters Division. Teams responsible for the asset management functions that support the Water Activity were engaged with as key stakeholders in order to produce the 2023 revision of the Water AMP.

10.4 Management Systems

10.4.1 Asset Management System

The Maturity Assessment also found organisational issues with the Management System:

- **Scope:** This is now defined in the SAMP.
- **Asset portfolio:** This is now defined in the SAMP.
- **Asset Management Functions:** Refer to Table 30 above.
- **Processes:** Few processes have been documented.
- **Asset Management Maturity Levels:** These were set during the 2022 Asset Management Maturity Assessment.

10.4.2 Business Process Mapping

For the Water Activity there are few processes mapped and heavy reliance on key people. Standard Operating Procedures however are well established where there are risks to quality or health and safety. This is expected to improve once the Asset Management Policy is adopted.

The Turitea water treatment plant has a comprehensive suite of ISO 9001 accredited processes while the individual bores have operation and maintenance manuals. Both the water treatment plant processes and the bore manuals need to be continually maintained as new equipment, compliance requirements or processes are introduced. There is a resourcing challenge in keeping the processes and manuals up to date.

Currently, most SOPs are compiled in Microsoft Word document format and Water Operations has yet to implement Promapp software to manage SOPs. A lack of administrative support within the team has been identified as an impediment to this.

10.5 Information Systems and Tools

The table below contains a summary of the Asset Information System used by this Activity and commentary on recent improvements or issues. Further commentary on software specific to the Activity and data is provided below.

Table 32: Asset Information Systems

Component Type	Components	Improvements and Issues
Procedures and Standards	• Staff have begun documenting procedures in Promapp. • Standard Operating Procedures are saved in OASIS (document management system).	• Standard Operating Procedures are established but require continual review for relevance and accuracy • Maintenance management – needs improvement
People	• The 2022 Asset Maturity Assessment noted: • *The organisational restructure brought together asset management information and planning teams and created a project management office. In addition, transport was split into a separate group from the three waters There has been a significant turnover of staff, with many fairly new to their roles. There are also roles that have yet to be filled in some teams. It is expected that with a continued focus on asset management, staff training and experience that the gap in maturity will close over the next three years.*	• Asset information integration with financial and customer service systems is limited. • The customer services system has been linked with asset information via GIS – a special layer has been created, at the request of operations staff, to enhance visibility of issues. • The Asset Investigations and Planning team have been meeting monthly with Depot Three Waters operations staff to understand and respond to their data/data analysis needs, and to provide visibility to existing data and data systems.

Component Type	Components	Improvements and Issues
Data	• Asset hierarchy in place. • Asset naming convention in place. • Asset register is complete enough for valuation purposes. • Data confidence has been assessed. • Field asset data is collected by Operations team using the Field Inspector add-on to IPS • The Criticality Framework and Condition and Performance policies have both been completed over the past 3 years	• The Asset Information Team have conducted a number of training sessions, including site visits, to train Operations staff to use the Field Inspector add-on to IPS. Use of Field Inspector enables capture of Asset Data in the field, including maintenance data. • Consider training Treatment Plant staff in using field inspector for plant assets (as relevant) • Data is being collected but not necessarily being fully utilised in improvements. No formal asset data programme to address information gaps. • Asset data confidence and reliability requires validation • Criticality scores have not yet been applied at a component level in IPS – this is an improvement item across Infrastructure and all AI systems • Existing time series data is not easily accessible (SCADA and Telemetry data) – partly due to security concerns – however there is a programme proposed to make this data accessible and able to be interrogated safely

Component Type	Components	Improvements and Issues
Software	• IPS Hansen (waters), RAMM (transportation), SPM (buildings) - asset as-built attributes, condition, maintenance, criticality, valuation details • Salesforce Quality Supply and Demand (QSD) reporting and analytics • Infrastructure Data – migrating from RCMonitoring for water quality/consent compliance and other time series data (eg rainfall, dam water levels, stream flows). • Authority Altitude (financial, corporate valuation) • KBase (Customer Requests) • RCMonitoring App (consent management) • ArcGIS (geographical information system) • Hydraulic modelling - Hydraulic modelling – Mike Plus for water supply and wastewater models. Tuflow model for stormwater model (2D) and Waternet advisor (DHI) for strategic modelling • Project Management – plans to replace Project Status with new software • MagiQ – financial and programme tracking and reporting tool	• Corporate project to improve data integration by creating data lake across datasets • Limited reporting and analytics. • Need more development of models and planning tools for renewals and capital upgrades.

10.6 Quality of Data Supporting the Plan

10.6.1 Asset Data Requirements

The quality of our asset data is the foundation to staff making evidence-based decisions when managing this activity. The business processes for the capture and recording of data are not well defined. This includes, when to collect data, what data is collected, how the data is collected and who should collect the data.

While we have enough information to complete asset valuation (basis attributes, replacement cost and asset age/life) we have limited criticality information completed for the piped network to support prioritisation of programmes.

10.6.2 Asset Hierarchy

An Asset Hierarchy for the activity has been established (refer OASIS 2931127 and 2927045). The purpose of the asset hierarchy is to organise all the assets in a top-down structure to allow staff and contractors to understand the relationship between assets, thus making it more efficient to manage them.

10.6.3 Data Management and Confidence Levels

Table 33 contains the data confidence levels for different asset attributes, which have been assessed using the confidence categories in Table 34. As data requirements are specified and data collection prioritised, it is expected that data confidence levels will increase.

Table 33: Summary of Asset Data Confidence Levels

Asset	As-Built Attributes	Condition	Repairs and Maintenance	Utilisation	Demand and Forecasts	Criticality	Risk	Resilience	Service Performance	Valuation	Financial Performance
The Dam	4	4	3	5	5	5	5	5	4	4	3
Bores & Pump Stations	3	2	2	3	3	3	3	3	3	3	3
Treatment Plant	3	2	2	2	4	3	3	3	3	3	3
Reservoirs	4	4	3	5	4	3	4	3	3	4	3
Mains	5	3	4	3	3	4	3	4	3	4	3
Valves	3	1	3	1	0	1	1	0	2	3	3
Hydrants	3	2	3	2	2	0	0	0	2	3	3
Swab Launchers	4	2	1	0	0	0	0	0	0	4	0
Service Lines	3	2	3	3	0	3	3	0	3	3	3
Tobies	3	2	3	3	0	3	3	0	3	3	2
Meters	4	3	3	3	3	0	0	0	3	4	2
Backflow Preventers	3	3	4	3	0	2	0	0	4	4	0

Table 34: Asset Data Confidence Level Grading System

Confidence Grade	Description	Processes	Asset Data
5	Highly reliable/ Audited	Strictly formal process for collecting and analysing data. Process is documented and always followed by all staff. Process is recognised by industry as best method of assessment.	Very high level of data confidence. Data is believed to be 95 to 100% complete and ±5% accurate. Regular data audits verify high level of accuracy in data received.
4	Reliable/ Verified	Strong process to collect data. May not be fully documented but usually undertaken by most staff.	Good level of data confidence. Data is believed to be 80 to 95% complete and ±10 to 15% accurate. Some minor data extrapolation or assumptions has been applied. Occasional data audits verify reasonable level of confidence.

Confidence Grade	Description	Processes	Asset Data
3	Less Reliable	Process to collect data established. May not be fully documented but usually undertaken by most staff.	Average level of data confidence. Data is believed to be 50 to 80% complete and ±15 to 20% accurate. Some data extrapolation has been applied based on supported assumptions. Occasional data audits verify reasonable level of confidence.
2	Uncertain	Semiformal process usually followed. Poor documentation. Process to collect data followed about half the time.	Not sure of data confidence, or data confidence is good for some data, but most of dataset is based on extrapolation of incomplete data set with unsupported assumptions.
1	Very uncertain	Ad hoc procedures to collect data. Minimal or no process documentation. Process followed occasionally.	Very low data confidence. Data based on very large unsupported assumptions, cursory inspection and analysis. Data may have been developed by extrapolation from small, unverified data sets.
0	No data	No process exists to collect data.	No data available.

10.7 Improvement Actions

- Update this AMP with latest asset data confidence table
- Consider training Treatment Plant staff in using field inspector for plant assets (as relevant)
- Maintenance management process needs improvement
- Improve asset information integration with financial and customer service systems
- Develop processes for asset and performance data to be better utilised in improvements.
- Consider formal asset data programme to address information gaps.
- Asset data confidence and reliability requires validation
- Criticality scores have not yet been applied at a component level in IPS – this is an improvement item across Infrastructure and all AI systems
- Improve accessibility of existing time series data (SCADA and telemetry data)
- Corporate project to improve data integration by creating data lake across datasets
- Improve data and performance reporting and analytics.
- Further development of models and planning tools for renewals and capital upgrades.

11 Plan Monitoring and Improvements

This section describes activity specific asset management improvements made in the last three years and our proposed focus improvement areas for the next three years. It also summarises our recent asset management maturity assessment results and improvements identified in this AMP.

11.1 Achievements

Over the past three years several identified asset management improvement items have been completed by the Water Activity team.

Two key improvements which have had a significant impact on activity have been the:

- reconfiguration of IPS, the Asset Information system, to have a clearer structure which is aligned with industry best practice.
- the roll out of Field Inspector, a mobile extension of IPS, to allow water network maintenance staff to add asset information to IPS from the field.

Further improvements have been the establishment of backflow prevention maintenance programme and update of the Water Safety Plan, which has its own improvement plan.

Note that staff turnover and vacant roles in the team have limited their capacity to implement improvements.

Pan-Infrastructure work has also been carried out to develop Asset Condition and Performance policies for all activity groups.

Further work has been completed to develop a Criticality Framework for all activity groups and asset classes, however the framework has yet to be applied to all assets.

11.2 Next steps

To align with pan-Infrastructure Asset Management improvement items, the Water Activity team have identified four Improvement Items to focus on over the next three years (refer to table below). Many of these programmes and associated improvement activities have already been identified in the Infrastructure Asset Management Improvement Plan.

Table 35: Activity Improvement Plan Focus Areas

	Proposed Improvement Action	Status	Comment	Who is responsible
1.	Better data collection processes/procedures	In Progress	Drinking water compliance live monitoring and reporting as per DWQAR requirements. Works at bore treatment plants.	Service Manager - Water
2.	Structured co-ordination between roading and water asset replacements and upgrades.	In Progress	Works initiated in GIS to co-ordinate between the deparments for short to medium terms planning.	Service Managers – 3 Waters
3.	Cost to Serve	Not started	Development of “zero base” budgets. Determine inputs required to deliver promised Levels of Service. This will be an Infrastructure wide programme of work and will enable various growth	

	Proposed Improvement Action	Status	Comment	Who is responsible
			scenarios for Water supply to be costed.	
4.	Promapp of processes	Not started	Documentation of AM and operating and maintenance processes. This will occur in parallel with Item 3 and will help to inform Item 3.	

11.3 Maturity Assessment

External reviews of Council's asset management practice were undertaken in July 2019 and May 2022. Both reviews were carried out by Infrastructure Associates Ltd using the New Zealand Treasury framework. The broader discussion of the results of these are outlined in the SAMP. One of the outputs of the reviews was a list of activity specific improvement items. Many of the more generic improvement items have and are continuing to be addressed by the Asset Planning Division, alongside the development of the Asset Management Policy and Strategic Asset Management Plan.

The chart below shows the asset management improvement progress being made by the Water activity.

Figure 34: Asset Maturity Assessment Results (2019 and 2022, Infrastructure Associates)

The maturity assessment improvement items are listed in the table below. For each item there is comment on the status and progress that has been made, as well as where it is addressed, either in the SAMP or this AMP.

Table 36: 2022 Maturity Assessment Actions

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
Strategic Direction	Consider developing activity related asset management policies.	Medium	Not started	
Levels of Service Framework	Review three waters levels of service performance measures and develop options for the next LTP round.	High		
Demand Forecasting and Management	Review the impact of demand resulting from infill development on existing infrastructure	High Yr2	In progress	
Asset Condition and Performance	Develop process to capture asset condition data during routine inspections and repair work.	Medium	In progress Field Inspector being rolled out to Operators	
Managing Risk and Resilience	Need to fully develop and embed risk capture and escalation process across the Infrastructure Unit.	Medium	In progress Risk Framework in place	This AMP refer to Section 7
Operational Planning	Develop process to centrally develop and track proactive maintenance schedules.	High Yr1	In progress Maintenance contract covers bore stations and booster pump stations	This AMP refer to Section 8
Asset Data and Information	Complete the review of the critical assets and classify the criticality of the three waters assets within the asset database.	High Yr2	In progress Criticality framework complete, but not all assets have been classified yet	This AMP refer to Section 7
Asset Management Information Systems (AMIS)	Reconfigure IPS system to improve functionality, especially around the capture of condition data.	High Yr1	In progress IPS hierarchy has been reset	This AMP refer to Section 8
AM Process Management	Complete mapping of processes in ProMapp	Medium	In progress	

11.4 Improvement Plan

Section 7.2 of the SAMP describes how the Asset Management Improvement Plan (AMIP) has been developed and is being implemented. This plan captures, contains and tracks progress of all identified improvement items for each Activity Area, including Resource Recovery, as well as for Council and Infrastructure wide improvements.

11.5 Improvements identified in this AMP

The table below summarises activity and AMP improvements identified in this AMP. These are yet to be prioritised and allocated to staff for action.

Table 37: AMP Improvements

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
Climate change plan	• Council includes specific actions for three waters activities in the next update of its climate change action plan			
Water conservation	• The summer water use campaign is regularly assessed in terms of managing water use and achieving water conservation objectives.			
Managing risk and resilience	• Fully develop and embed the risk capture and escalation process across the Infrastructure unit (which covers this activity). • Assign criticality ratings for all above ground assets • Formally incorporate collection and treatment assets into the criticality framework • Apply asset criticality in condition assessment and renewal programmes • Further embed asset criticality in other investment decision making processes			
Asset condition and performance	• Implement the draft condition and performance policy (including improvement actions) • To better focus our renewals programme investment, we propose to develop preventative maintenance and condition assessment programmes • Optimise amount of pipe sampling and condition inspections in order to assess the overall condition of the network and rate of deterioration of assets			

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
	• Develop the scheduled maintenance to ensure that the condition information required is captured			
Improvements to this AMP	• Include more condition assessment information about treatment plant assets in this AMP. • Update this AMP with current commitments to regional CDEM and Lifeline groups • Update this AMP with most recent water safety plan risks • Update this AMP with latest asset data confidence table			AMP
Operational planning/ Promapp of processes	• Turn the existing SLAs and various dispersed planning documents into operation and maintenance practice documents for the water collection, treatment, and reticulation • Undertake a gap analysis of SOPs and plan for documentation of all procedures • Process map all operational and maintenance practices and procedures. • Develop feedback and improvement processes for operation and maintenance practices and procedures. • Undertake formal reviews and/or optimisation studies of maintenance and operations activities based on data and risk • Review, revise and process map the processes for disposal of water supply plant and equipment • Integrate treatment plant processes into Promapp • Maintenance management process needs improvement • Develop processes for asset and performance data to be better utilised in improvements			

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
Asset Information Systems	• Review the breakdown of plant and equipment in IPS to ensure it is appropriate for valuation, maintenance and renewal • Improve recording of treatment and disposal operational and maintenance data in IPS • Consider training Treatment Plant staff in using IPS Field Inspector for plant assets (as relevant)			
Capital Works Planning	• Extend our pipe renewal programming out to six years to reduce the risk of conflicts with other services that also need to be renewed			
Asset Data and Information	• Improve asset information integration with financial and customer service systems • Consider formal asset data programme to address information gaps • Asset data confidence and reliability requires validation • Improve accessibility of existing time series data (SCADA and telemetry data) • Corporate project to improve data integration by creating data lake across datasets • Improve data and performance reporting and analytics • Further development of models and planning tools for renewals and capital upgrades			

12 Appendices

A. Glossary

The following terms and acronyms (in brackets) are used in this Asset Management Plan.

Term or Acronym	Description
Annual Budget	The Annual Budget provides a statement of the direction of Council and ensures consistency and co-ordination in both making policies and decisions concerning the use of Council resources. It is a reference document for monitoring and measuring performance for the community as well as the Council itself.
Asset	A physical component of a facility which has value, enables services to be provided and has an economic life of greater than 12 months.
Asset Management (AM)	The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost-effective manner.
Asset Management System (AMS)	A system (usually computerised) for collecting analysing and reporting data on the utilisation, performance, lifecycle management and funding of existing assets.
Asset Management Plan (AMP)	A plan developed for the management of one or more infrastructure assets that combines multi-disciplinary management techniques (including technical and financial) over the lifecycle of the asset in the most cost-effective manner to provide a specified level of service. A significant component of the plan is a long term cashflow projection for the activities.
Asset Management Strategy	A strategy for asset management covering, the development and implementation of plans and programmes for asset creation, operation, maintenance, renewal, disposal and performance monitoring to ensure that the desired levels of service and other operational objectives are achieved at optimum cost.
Asset Management Team	The team appointed by an organisation to review and monitor the corporate asset management improvement programme and ensure the development of integrated asset management systems and plans consistent with organisational goals and objectives.
Asset Register	A record of asset information considered worthy of separate identification including inventory, historical, financial, condition, construction, technical and financial information about each.
Business Plan	A plan produced by an organisation (or business units within it) which translate the objectives contained in an Annual Budget into detailed work plans for a particular, or range of, business activities. Activities may include marketing, development, operations, management, personnel, technology and financial planning.
Capital Expenditure (CAPEX)	Expenditure used to create new assets or to increase the capacity of existing assets beyond their original design capacity or service potential. CAPEX increases the value of an asset.
Cash Flow	The stream of costs and/or benefits over time resulting from a project investment or ownership of an asset.
Components	Specific parts of an asset having independent physical or functional identity and having specific attributes such as different life expectancy, maintenance regimes, risk or criticality.
Condition Monitoring	Continuous or periodic inspection, assessment, measurement and interpretation of resulting data, to indicate the condition of a specific component to determine the need for some preventive or remedial action.

Term or Acronym	Description
Critical Assets	Assets for which the financial, business or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action than non-critical assets.
Current Replacement Cost	The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset.
Deferred Maintenance	The shortfall in rehabilitation work required to maintain the service potential of an asset.
Demand Management	The active intervention in the market to influence demand for services and assets with forecast consequences, usually to avoid or defer CAPEX expenditure. Demand management is based on the notion that as needs are satisfied expectations rise automatically and almost every action taken to satisfy demand will stimulate further demand.
Depreciated Replacement Cost (DRC)	The replacement cost of an existing asset after deducting an allowance for wear or consumption to reflect the remaining economic life of the existing asset.
Depreciation	The wearing out, consumption or other loss of value of an asset whether arising from use, passing of time or obsolescence through technological and market changes. It is accounted for by the allocation of the historical cost (or revalued amount) of the asset less its residual value over its useful life.
Disposal	Activities necessary to dispose of decommissioned assets.
Economic Life	The period from the acquisition of the asset to the time when the asset, while physically able to provide a service, ceases to be the lowest cost alternative to satisfy a particular level of service. The economic life is at the maximum when equal to the physical life however obsolescence will often ensure that the economic life is less than the physical life.
Facility	A complex comprising many assets (e.g. a hospital, water treatment plant, recreation complex, etc.) which represents a single management unit for financial, operational, maintenance or other purposes.
Geographic Information System (GIS)	Software which provides a means of spatially viewing, searching, manipulating, and analysing an electronic database.
Infrastructure Assets	Stationary systems forming a network and serving whole communities, where the system is intended to be maintained indefinitely at a particular level of service potential by the continuing replacement and refurbishment of its components. The network may include normally recognised ‘ordinary’ assets as components.
Level Of Service	The defined service quality for an activity (i.e. roading) or service area (i.e. street-lighting) against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost.
Life	A measure of the anticipated life of an asset or component; such as time, number of cycles, distance intervals etc.
Life Cycle	Life cycle has two meanings: The cycle of activities that an asset (or facility) goes through while it retains an identify as a particular asset i.e. from planning and design to decommissioning or disposal. The period between a selected date and the last year over which the criteria (e.g. costs) relating to a decision or alternative under study will be assessed.

Term or Acronym	Description
Life Cycle Cost	The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs.
Maintenance	All actions necessary for retaining an asset as near as practicable to its original condition but excluding rehabilitation or renewal.
Maintenance Plan	Collated information, policies and procedures for the optimum maintenance of an asset, or group of assets.
Maintenance Standards	The standards set for the maintenance service, usually contained in preventive maintenance schedules, operation and maintenance manuals, codes of practice, estimating criteria, statutory regulations and mandatory requirements, in accordance with maintenance quality objectives.
Net Present Value (NPV)	The value of an asset to the organisation, derived from the continued use and subsequent disposal in present monetary values. It is the net amount of discounted total cash inflows arising from the continued use and subsequent disposal of the asset after deducting the value of the discounted total cash outflows.
Objective	An objective is a general statement of intention relating to a specific output or activity. They are longer term aims and are not necessarily outcomes that managers can control.
Operation	The active process of utilising an asset which will consume resources such as manpower, energy, chemicals and materials. Operation costs are part of an asset's life cycle costs.
Optimised Renewal Decision Making (ORDM)	An optimisation process for considering and prioritising all options to rectify performance failures of assets. The process encompasses NPV analysis and risk assessment.
Performance Indicator (PI)	A qualitative or quantitative measure of a service or activity used to compare actual performance against a standard or other target. Performance indicators commonly relate to statutory limits, safety, responsiveness, cost, comfort, asset performance, reliability, efficiency, environmental protection and customer satisfaction.
Performance Monitoring	Continuous or periodic quantitative and qualitative assessments of the actual performance compared with specific objectives, targets or standards.
Pipeline Asset Management System	The computerised utilities asset management software system (Hansen IMS) supplied by MITS-Hansen under a bulk supply agreement with ALGENZ for use by New Zealand local authority asset managers.
Planned Maintenance	Planned maintenance activities fall into 3 categories: Periodic - necessary to ensure the reliability or sustain the design life of an asset. Predictive - condition monitoring activities used to predict failure. Preventive - maintenance that can be initiated without routine or continuous checking (e.g. using information contained in maintenance manuals or manufacturers' recommendations) and is not condition-based.
Rehabilitation	Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally, involves repairing the asset using available techniques and standards to deliver its original level of service (i.e. heavy patching of roads, slip-lining of sewer mains, etc.) without resorting to significant upgrading or replacement.
Renewal	Works to upgrade, refurbish, rehabilitate or replace existing facilities with facilities of equivalent capacity or performance capability.

Term or Acronym	Description
Repair	Action to restore an item to its previous condition after failure or damage.
Replacement	The complete replacement of an asset that has reached the end of its life, to provide a similar, or agreed alternative, level of service.
Remaining Economic Life	The time remaining until an asset ceases to provide service level or economic usefulness.
Risk Cost	The assessed annual cost or benefit relating to the consequence of an event. Risk cost equals the costs relating to the event multiplied by the probability of the event occurring.
Risk Management	The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.
Routine Maintenance	Day to day operational activities to keep the asset operating (replacement of light bulbs, cleaning of drains, repairing leaks, etc.) and which form part of the annual operating budget, including preventative maintenance.
Service Potential	The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset.
Strategic Plan	Strategic planning involves making decisions about the long-term goals and strategies of an organisation. Strategic plans have a strong external focus, cover major portions of the organisation and identify major targets, actions and resource allocations relating to the long-term survival, value and growth of the organisation.
Unplanned Maintenance	Corrective work required in the short term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.
Upgrading	The replacement of an asset or addition/ replacement of an asset component which materially improves the original service potential of the asset.
Valuation	Estimated asset value which may depend on the purpose for which the valuation is required, i.e. replacement value for determining maintenance levels or market value for life cycle costing.

B. Water – DRAFT Condition and Performance Policy (July 2023)

1. Introduction

The following policy statement outlines Council's approach to assessing the physical condition and monitoring the performance of the water assets. The aim of this statement is to document and standardise (as much as practicably possible) the approach to condition assessment and performance monitoring. The statement captures Council's intentions, including aligning condition and assessment processes with the recently completed asset criticality identification. Council has decided the most appropriate level of guidance required for condition assessment and performance monitoring is a practice-based policy statement rather a stand-alone policy. The policy statement is intended to be included in the Water Asset Management Plan and fulfils one of the recommended improvements in the 2022 Asset Management Maturity Assessment.

The policy statement aligns with the following best practice recommendations and principles:

A) Monitoring performance includes both customer and technical/operational monitoring techniques.

B) Recognition that condition assessment is a prerequisite to renewal decisions and maintenance planning

C) The outcomes, key roles and responsibilities for the Condition Assessment Programme are documented and referred to for guidance and direction

D) The approach to condition assessment is primarily based on asset criticality, and the useful remaining life of the asset.

E) Condition assessment standards, procedures, training, methods, and policies will be documented.

Council recognises that condition assessment and performance monitoring is an essential element of asset management practice.

Condition assessment involves inspecting, assessing, measuring asset components, and then interpreting the resulting data to determine the physical condition of the component.

Performance monitoring involves the continuous or periodic quantitative or qualitative assessment of the asset compared with specific objectives, targets, and standards.

2. Why do we do it?

The Council relies on well performing water assets to deliver a wide range of services to community. To ensure assets are fit for purpose Council regularly assesses the condition and performance of Water assets. Understanding the condition of assets and how well they are performing enables Council to make informed decisions about the need and timing of preventative or remedial action. The overall aim is to maintain the service potential of the assets for the lowest lifecycle cost and avoid loss of service to the community. By collecting and monitoring asset information, Council can get a better understanding of asset performance and forecast remaining asset life, and plan for asset management interventions and expenditure. Information can be used to:

- Create effective and proactive maintenance plans
- Monitor the actual level of service achieved against desired levels
- Forecast remaining asset life and plan for renewals
- Demonstrate achievement towards council's objectives
- Demonstrate effective stewardship of assets to stakeholders and customers
- Identify asset management improvement opportunities and
- Measure the effectiveness and performance of service delivery providers.

3. How do we do it? What's our approach?

Council's approach to Condition Assessment and Performance Monitoring takes account of the following considerations.

3.1 Council's aspiration – Advancing Asset Management Practice

As per Council's Asset Management Policy, the organisation is aiming to advance the current level of asset management practice. Improvements are required to reach the appropriate level of asset management practice which has been set at the 'high intermediate' level (or a score of 80) for Council overall. Currently the condition assessment and performance monitoring element for Council overall has an 'intermediate' score of 60 against an 'advanced' target of 85[4]. Similarly, the water activity has an 'core' score of 60 against an'advanced' maturity target of 85. Medium priority improvements required to increase the current rating include developing processes to capture asset condition data during routine inspections and repair work.

3.2 Best Practice Guidelines

Council uses best practice guidelines from the International Infrastructure Management Manual to determine its approach to condition assessment and performance monitoring. In practice this involves using a detailed performance assessment and monitoring methodology that includes:

- Using criticality assessment to identify what assets are most important to monitor and maintain
- Condition assessment undertaken at the component level
- The use of grading systems and expert independent assessment (where necessary)
- Performance monitoring using range of customer and technical performance measures
- Recording data into Asset Management Information Systems.

3.3 Incorporating Criticality

In 2022 Council developed its first consistent criticality framework across all asset areas. The Council and is currently in the process of incorporating this information into its asset management practice. One of the significant improvement actions Council will undertake in 2023 is to align criticality information with condition assessment and performance monitoring practices[5]. See Improvements section 8.

The Asset Criticality Framework[6] is used to assess the consequence of an asset not operating, known as asset failure. Four criteria are used to assess the consequence of asset failure (financial, environmental health, safety and wellbeing, and service delivery). Critical customers are also taken into account in the calculation. E.g. Te Pae Hauora o Ruahine O Tararua - MidCentral Hospital is a Critical Customer Rating A which equates to criticality score of 4. The higher the consequence[7] of failure the more critical an asset is deemed to be. The approach taken to condition assessment and performance monitoring will be aligned to the criticality of the asset, alongside other considerations. Generally, the higher the criticality rating the more frequent the assessment and monitoring.

[4] As noted in the Asset Management Maturity Assessment, July 2022

[5] As noted in the Asset Management Maturity Assessment 2022.

[6] Palmerston North City Council Criticality Framework Part A, Draft March 2022

[7] Consequence of failure is not necessarily the most expensive in dollar terms, it may be the cost or consequence of failure to the provision of a service or the cost or consequence of failure to the wellbeing of the community.

Table 1. Criticality and Approach to Condition Assessment and Performance Monitoring

Criticality Rating[8]	Consequences of asset failure	Examples	Approach to Condition Assessment and Performance Monitoring
5 Severe	Financial loss > $1 million and/or Asset Value >$10 million. Extensive widespread irreversible damage to land and/or ecosystems. Permanent severe disability or loss of life, or multiple serious injuries, widespread sickness in the community. Severe loss of operational capability and disruption to service levels. Suburb, multi suburb or critical facility/service impact to essential service delivery.	Pipes with a diameter of > = 500mm	A separate plan is developed for individual assets. This plan will include the condition assessment requirements as well as detail for how the results will be used to manage the asset.
4-5 Major	Financial loss $500k-$1million and/or asset value $5-10million. Widespread long term (but reversible) environmental damage or localized long term irreversible damage. Serious injury and/or sickness requiring specialist medical treatment or hospitalisation. Long Term disability or 3+ month incapacitation. Major loss of operation capability and disruption to service levels. Suburb, multi suburb or critical facility/service impact to essential service delivery.	Pipes with a diameter of 300-499mm and/ or critical customer A	A combination of separate plans for individual assets and sample assets from each critical area.
3-4 Serious	Financial loss $200k-$500k and/or asset value $1-5million. Measurable damage to the environment requiring significant corrective action resulting in localized medium term reversible damage to land/or water ecosystems.	Pipes with a diameter of 200-299mm and/ or critical customer B	A predetermined sample of assets from each critical area will be collected and assessed. Assessments are subject to subject matter expert judgement

[8] Based on Maximum Criticality Score, Palmerston North Criticality Framework Part C, Water Pipes v1.0 March 2022

Criticality Rating[8]	Consequences of asset failure	Examples	Approach to Condition Assessment and Performance Monitoring
	Injury and/or sickness requiring medical treatment up to 3 months incapacitation. Serious loss of operational capability and disruption to service levels. Isolated or suburb wide impact to essential service delivery/facility.		
2-3 Moderate	Financial loss $50k-$200k and/or asset value $200k 1 million. Contained and reversible (minimal) environmental impact resulting in localized or minor reversible damage to land and/or water ecosystems. Minor injury requiring first aid. Loss of operational capability in some areas and/or some disruption to service levels. Localised impact/outage to essential service delivery.	Pipes with a diameter of 100-199mm and/ or critical customer C	A combination of assessment samples from each critical areas and representative samples from predetermined cohorts and assessed to extrapolate condition grades.
1-2 Minor	Financial loss <$50k and/or asset value <$200k. Small localized and reversible environmental impact resulting in slight short-term damage to land and/or water ecosystems. Minor injury or near miss, first aid not required. No loss of operational capability and/or minimal disruption to service levels.	Pipes with a diameter of <100 mm and/ or critical customer D, E	Representative samples will be collected from predetermined cohorts and assessed to extrapolate condition grades

3.4 Operational Knowledge

As with all areas of asset management practice, condition assessment and performance monitoring are not undertaken in isolation. Operational knowledge, the life stage of the asset, actual performance results, asset failure, customer complaints and other considerations may result in assets being assessed more or less frequently than recommended by the criticality assessment framework.

4. What is measured and when?

The main asset types for the water activity include the water network pipes, plant and equipment (e.g. bore stations). Council currently uses a combination of customer and technical monitoring techniques to assess condition and performance. The water asset condition is largely theoretical and based on the age of assets. While regular inspections occur there are very few formal asset condition assessments carried out other than for the water treatment station and the bore stations. The Turitea dam structural assets are assessed by external consultants. There is little actual conditional and performance data currently being recorded in the asset information systems and improvements include improvement of data maintenance and collection of data as part of routine inspections.

Table 2 below outlines what asset types are measured and when.

*Please note that the assets that are currently measured and the frequency may change upon implementation of Improvements in Section 8.

Table 2. Under Development

Network pipes	
Condition Assessment	**Frequency**
Inspections	10 years
Performance Monitoring	**Frequency**
Residents' Satisfaction Survey	Annually
Monitoring of customer complaints and requests	Ongoing

Plant (Turitea Dam)	
Condition Assessment	**Frequency**
Inspections	Various
Performance Monitoring	**Frequency**
Residents' Satisfaction Survey	Annually
Monitoring of customer complaints and requests	Ongoing

Equipment (Bore Stations)	
Condition Assessment	**Frequency**
Inspections	Various
Performance Monitoring	**Frequency**
Residents' Satisfaction Survey	Annually
Monitoring of customer complaints and requests	Ongoing

5. How is it measured?

Council uses a range of processes and systems to determine and analyse condition and performance data as shown in Table 3. Once collected data is entered into systems. The systems are used to link the asset registers with the asset inspections, and store captured data so that it can be managed. Systems provide tools for completing data analysis, calculation of overall grades and ranking against targets.

Table 3 Condition Assessment Processes (Under Development)

Network pipes				
Component	Method	System	Range of grading scores 1 = very good to 5= poor	Target E.g. X % of the network is at grade 1
Pipes	Inspection	IPS	1 to 5 IIMM Condition Index	TBC
Plant				
	Method	System	Range of grading scores	Target
Treatment Plant	Scheduled inspection	IPS	1 to 5 IIMM Condition Index	TBC
Dams	Scheduled inspection	Annual Dam Safety Review	TBC	TBC
Equipment				
	Method	System	Range of grading scores	Target
Bore Stations	Scheduled inspection	IPS	1 to 5 IIMM Condition Index	TBC

6. What can data tell us about the future of water assets?

Data assists Council to understand:

- The current point in time condition of its water assets, and
- How the condition and performance of the Water assets are going to change in the future i.e. where the assets are in their life cycle.

This allows Council to determine when it is best to carry out planned maintenance, refurbish or replace either components or the complete asset.

To do this Council uses the following methods to calculate what the deterioration of its water assets will be over a period of time.

- Forecasting models in RAMM, IPS and SPM
- Inspections
- Expert judgement.

7. How do we use data for reporting?

Council reports on Water asset service and performance in a number of ways:

- Internal operational and technical sections such as asset managers and operational staff
- Executive leadership team
- Elected members, and
- External stakeholders and customers

The level and approach to reporting is determined by the specific audience targeted and that audience's information requirements. The amount of data and performance information shared is determined by how the audience will use the data i.e. operational and technical staff will require detailed and disaggregated data as opposed to elected members and stakeholders who will require aggregated data such as performance against levels of service.

8. Improvements

The following improvements will assist Council to further advance its Condition and Performance practices.

Table 4

Action	Who	When
Undertake a detailed condition assessment of the existing water treatment plant and equipment.	Asset Activity Manager	TBC
Complete a review of the current condition and performance data held for the Water Activity to identify its use in decision making and programme initiatives.	Asset Activity Manager and Asset Data Team	TBC
Developing processes to capture asset condition data during routine inspections and repair work.	Operators and Field Inspection Staff	Ongoing

Action	Who	When
Complete criticality rating work for the remaining Water assets (where appropriate)	Asset Planning Team	2023
Align criticality information with condition assessment and performance monitoring practices.	Asset Activity Manager and Asset Planners	2023
Create individual plans for Water assets with criticality rating 5. Plan should outline the condition and assessment requirements as well as detail for how the results will be used to manage the assets.	Asset Activity Managers	TBC
Create a combination of separate plans for individual assets and sample assets from each critical area for Water assets with criticality rating 4.	Asset Activity Managers	TBC
Create a predetermined sample of assets from each critical area and conduct assessments for water assets with a criticality rating 3-4. Assessments should be subject to subject matter expert judgement.	Asset Activity Managers	TBC
Undertake a combination of assessment samples from each critical area and representative samples from predetermined cohorts and assess to extrapolate condition grades for water assets with a criticality rating 2.	Asset Activity Managers	TBC
Select representative samples to be collected from predetermined cohorts and asses to extrapolate condition grades on Water assets with a criticality rating 1.	Asset Activity Manager	TC
Review Customer Satisfaction Survey questions to provide more meaningful information	Asset Planning Team and Community Development Team	Before next survey date TBC

C. Resource Consents

Summary of Resource Consents

Consent No.	Term [Yr]	Expiry Date	Type	Consent Subtype	Location	Description
ATH-2011010156.04	18	12-Jun-36	Discharge Permit	Discharge to Water	Turitea Water Treatment Plant	To discharge treated process wastewater from the Turitea Water Plant up to 1,675 cubic metres per day.
105191	13	1-Jul-23	Water Permit	Groundwater Take	Ashhurst Water Supply Bores (Hacketts Rd)	To abstract water from an underground bore. The combined abstraction from 105191 & 105192 shall not exceed 5,300m3/day and the maximum annual abstraction rate shall not exceed 706,000 m3/year.
105192	13	1-Jul-23	Water Permit	Groundwater Take	Ashhurst Water Supply Bores (Hacketts Rd)	To abstract water from an underground bore. The combined abstraction from 105191 & 105192 shall not exceed 5,300m3/day and the maximum annual abstraction rate shall not exceed 706,000 m3/year.
105146/3	25	12-Jun-36	Water Permit	Surface Take	Turitea Water Treatment Plant	To abstract water from the Turitea Stream via water storage reservoirs (the Turitea Dams). The volume abstracted shall not exceed 37,000 m3/day at a maximum rate of 0.428 m3/s (428 L/s).
4650	35	13-Dec-29	Water Permit	Dam	Turitea Lower & Upper Dams	To dam the Turitea Stream to a total height of RL 145.9 m.
4651	35	13-Dec-29	Land Use Consent	River Control Works	Turitea Lower & Upper Dams	To alter the existing dam & reconstruct a spillway weir & stilling basin in & adjacent to the Turitea.
4652	35	13-Dec-29	Water Permit	Divert	Turitea Lower & Upper Dams	To divert water from & within the Turitea Stream.
4676	35	13-Dec-29	Discharge Permit	Discharge to Water	Turitea Lower & Upper Dams	To temporarily discharge water & suspended sediment into the Turitea Stream.

Consent No.	Term [Yr]	Expiry Date	Type	Consent Subtype	Location	Description
100207	35	7-Aug-33	Land Use Consent	Construct	Turitea Stream	To excavate to place a water main and to place concrete and gravel fill in the bed of the Turitea Stream.
101488	30	12-Dec-30	Land Use Consent	Construct	Turitea Hydro Scheme	To place structures in the bed of Turitea Stream and to use and maintain those works for electricity generation - construction period expired on 12.12.05.
101489	30	12-Dec-30	Water Permit	Divert	Turitea Hydro Scheme	To take divert and use water in the Turitea Stream and to use and maintain those works for electricity generation.
101490	30	12-Dec-30	Discharge Permit	Discharge to Water	Turitea Hydro Scheme	To take divert and use water in the Turitea Stream and to use and maintain those works for electricity generation - construction period expired on 12.12.05.
ATH-2018201933.02	18	1-Jul-36	Water Permit	Groundwater Take	Global consent for: Takaro, Papaioea Park, Roberts Line, Keith Street and Railway Road Water Supply Bores	Abstraction of Ground water from Bores for Palmerton North City Municipal Supply Purposes.
101734	35	12-Jun-36	Water Permit	Dam	Turitea Lower & Upper Dams	To use and maintain the upper dam and associated damming of surface water in the Turitea Stream.
105150	35	22-Feb-45	Land Use Consent	Inland Toe of Stopbank	Manawatū River & Tributaries	To install a water trunk main within 8 metres of the inland toe of the Manawatū River stopbank adjacent to the Manawatū River, between Fitzherbert Street and Albert Street.
105644	32	1-Jul-43	Water Permit	Groundwater Take	Bunnythorpe Water Supply Bore	To take 600 cubic metres per day of water from well number 326103 for the purpose of the Bunnythorpe water supply at Raymond Street, Bunnythorpe.

Consent No.	Term [Yr]	Expiry Date	Type	Consent Subtype	Location	Description
106233	21	1-Jul-33	Water Permit	Groundwater Take	Longburn Water Supply Bore - Iti Street	To take 250 cubic metres per day of water from well number 335351 for the purpose of Longburn water supply at Iti Street, Longburn.
106577	20	1-Jul-33	Discharge Permit	Discharge to Water	Trunk Water Main	To discharge up to 4,500 cubic metres of discoloured treated water and suspended sediments to the Manawatū River per cleaning event from trunk water mains through the existing stormwater network.
101507	35	28-Nov-35	Land Use Consent	Construct	Turitea Stream	To excavate to place a water main and to place concrete and gravel fill in the bed of the Turitea stream and to use that water main.

D. Water – Risk Register (March 2022)

Risk Management Framework: Risk Register Working Paper		Division/Unit:	Three Waters, Infrastructure
Process Name	Source Water (Dam) WOP01	Process Owner	Group Manager - Three Waters
Sub Process		• Collection and storage of raw water • Monitoring dam levels • Quality assessments of water • Aeration operations of the upper dam	
Potential Failure	1. Inadequate water resource 2. Water quality problems including algae blooms, sediment, protozoal, other microbiological invasions 3. Catchment degradation, including construction activity 4. Catchment insecurity 5. Nefarious actions		
Risk Category	Service Delivery	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Severe
Raw Risk Rating	Extreme		
Risk Category	Environmental	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Likely	Raw Risk Consequence	Major
Raw Risk Rating	Very High		
Raw Risk Rating Overall	Extreme		
Causes	1. Drought conditions 2. Poor water demand management 3. Hydro-electric water management failure/overuse 4. Excessive or wasteful water use 5. Excessive nutrient loading 6. Poor or inadequate boundary management 7. Breaches of contractor management requirements (Windfarm) 8. Security breach		

Controls & Owners (Include control description, % population checked, Material items checked, source of any check, how is check performed)	Control Type	Control Effectiveness	Control Reliance
	Choose an item.	Effective	Choose an item.
	1. Demand management, with appreciation of requirements on daily basis Effective 2. Long term weather forecasts Partially Effective 3. Water save mode application/operation (control of hydroelectric plant) Effective 4. Application of water restrictions through bylaws Partially Effective 5. Raise water saving awareness Partially Effective 6. Boundary control activity through fencing and excessive land ownership/control Partially Effective 7. Aeration operations preventing algae blooms forming Effective 8. Weekly temperature, dissolved oxygen and quality testing of dam water Effective 9. Security catchment status preventing public access Partially Effective		

	10. Long term strategy to increase draw from boresEffective 11. Switch to bore water Partially Effective NB: For those controls that are partially effective, the reliance rating is generally "Medium"					
Residual Risk Likelihood	Unlikely		Residual Risk Consequence	Moderate		
Residual Risk Rating	Service Delivery	Medium	Within Risk Tolerance	Yes - No Further Action		
Residual Risk Likelihood	Unlikely		Residual Risk Consequence	Serious		
Residual Risk Rating	Environmental	Medium	Within Risk Tolerance	Yes - No Further Action		
Residual Risk Rating Overall	Medium					
Control Sample Testing *(To be undertaken in later phase)*	CST Description		Control	Frequency	Sample Size	
Process Control Design Improvement / Risk Treatment Options	1. Improvements to catchment security (accidental or intentional access) 2. Increased land boundary exclusion zone or land use					
Target Risk Rating	Service Delivery	Medium	Likelihood	Unlikely	Consequence	Moderate
Target Risk Rating	Environmental	Medium	Likelihood	Unlikely	Consequence	Serious
Target Risk Rating Overall	Medium					

Risk Management Framework: Risk Register Working Paper		Division/Unit:	Three Waters, Infrastructure
Process Name	Source Water – Bores WOP02	Process Owner	Group Manager - Three Waters
Sub Process		• Ensure bore head works meets required standards • Collection of raw water • Monitoring bore casing pressure (to assess well condition) • Quality assessments of water	
Potential Failure	1. Over extract resulting in early deterioration of bore capacity 2. Contamination event from surface 3. Non-compliance with Sanitary Survey 4. Bore water quality deteriorates 5. Submersible pump failure		
Risk Category	Service Delivery	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Severe
Raw Risk Rating	Extreme		
Risk Category	Health & Safety	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Unlikely	Raw Risk Consequence	Severe
Raw Risk Rating	High		
Raw Risk Rating Overall	Extreme		
Causes	1. Inadequate extraction quantity monitoring		

	2. Poor demand management 3. Inadequate sanitary survey conducted or overlooked 4. Inadequate maintenance and inspections of bore headworks 5. Contamination ingress in aquafer 6. Valve failure (resulting in backflow issues)					
Controls & Owners (Include control description, % population checked, Material items checked, source of any check, how is check performed)	Control Type		Control Effectiveness		Control Reliance	
	Choose an item.		Effective		Choose an item.	
	1. Pressure monitoring as part of demand/supply management Effective 2. Monthly sanitary survey inspections by water technicians Effective 3. Five yearly sanitary audits by third party engineers Effective 4. Routine inspections and maintenance of headworks Effective 5. Water quality testing to meet NZ drinking water standards (frequency of testing and MAV) (bio and chemical determines) Effective 6. Routine inspections and maintenance of above ground assets Effective					
Residual Risk Likelihood	Rare		Residual Risk Consequence		Minor	
Residual Risk Rating	Service Delivery	Low	Within Risk Tolerance		Yes - No Further Action	
Residual Risk Likelihood	Rare		Residual Risk Consequence		Serious	
Residual Risk Rating	Health & Safety	Low	Within Risk Tolerance		Yes - No Further Action	
Residual Risk Rating Overall	Low					
Control Sample Testing *(To be undertaken in later phase)*	CST Description		Control		Frequency	Sample Size
Process Control Design Improvement / Risk Treatment Options	1. Review new rules for Taumata Arowai regulator in July 2022					
Target Risk Rating	Service Delivery	Low	Likelihood	Rare	Consequence	Minor
Target Risk Rating	Health & Safety	Low	Likelihood	Rare	Consequence	Serious
Target Risk Rating Overall	Low					

Risk Management Framework: Risk Register Working Paper		Division/Unit:	Three Waters, Infrastructure
Process Name	Water Treatment WOP03	Process Owner	Group Manager - Three Waters
Sub Process		• Coagulation /flocculation • Separation / Clarification • Filtration • Disinfection • Addition of chemical balances for distribution	
Potential Failure	1. Chemical dose pump failure 2. Chemical storage failure 3. Chemical delivery failure 4. Chemical addition process failure		

	5. Demand/capacity imbalance in separation process and filtration process 6. Mechanical sludge removal failure 7. Bottleneck at sludge processing plant 8. Overload rapid gravity sand beds during filtration (can be caused by failure of upstream processes) 9. Mechanical backwash failure (pumps and air compressors) 10. Mechanical or electrical failure on filters 11. Compliance monitoring equipment failure 12. CL gas injection failure 13. Overall electricity failure 14. Failure of programmable logic controller and SCADA monitoring equipment (including water compliance testing)		
Risk Category	Service Delivery	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Severe
Raw Risk Rating	Extreme		
Risk Category	Health & Safety	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Severe
Raw Risk Rating	Extreme		
Risk Category	Reputational	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Severe
Raw Risk Rating	Extreme		
Raw Risk Rating Overall	Extreme		
Causes	1. Mechanical breakage/failure. 2. Poor asset management of plant, processes and other essential plant assets 3. Inadequate inventory management 4. Supply chain failure 5. Out of spec chemicals 6. Poor maintenance of plant & equipment 7. Operational calculation errors 8. Upstream process failure and cause effect on downstream filter operations 9. Scheduled calibration not performed as per IPS 10. Sludge pump or pipeline failure 11. Black out and brown outs from electricity provider		
Controls & Owners (Include control description, % population checked, Material items checked, source of any check, how is check performed)	Control Type	Control Effectiveness	Control Reliance
	Choose an item.	Effective	Choose an item.
	1. Scheduled asset maintenance Effective 2. Minimum chemical stores required beyond just in time Effective 3. Weekly stocktakes on chemicals inventory Effective 4. Redundancy on critical mechanical equipment Effective 5. Scheduled calibration on compliance monitoring equipment Effective 6. Onsite laboratory testing Effective		

	7. Standby generator Effective 8. Slam shut values Effective 9. Qualified water treatment personnel Effective 10. System generated checks of intervention (manual calculations) Effective 11. All compliance data monitored offsite and reported daily by third party data monitoring company Effective 12. Assay certification on all chemicals Partially Effective 13. Third party calibration on all handheld and fixed compliance monitoring equipment Effective 14. Alternate disposal route available for sludge Effective 15. Critical spares stored on site Effective 16. Switch to bore water Effective

Residual Risk Likelihood	Rare		Residual Risk Consequence	Serious
Residual Risk Rating	Service Delivery	Low	Within Risk Tolerance	Yes - No Further Action
Residual Risk Likelihood	Rare		Residual Risk Consequence	Serious
Residual Risk Rating	Health & Safety	Choose an item.	Within Risk Tolerance	Yes - No Further Action
Residual Risk Likelihood	Rare		Residual Risk Consequence	Moderate
Residual Risk Rating	Reputational	Low	Within Risk Tolerance	Yes - No Further Action
Residual Risk Rating Overall	Low			

Control Sample Testing *(To be undertaken in later phase)*	CST Description	Control	Frequency	Sample Size
Process Control Design Improvement / Risk Treatment Options	1.			

Target Risk Rating	Service Delivery	Low	Likelihood	Rare	Consequence	Serious
Target Risk Rating	Health & Safety	Low	Likelihood	Rare	Consequence	Serious
Target Risk Rating	Reputational	Low	Likelihood	Rare	Consequence	Moderate
Target Risk Rating Overall	Low					

Risk Management Framework: Risk Register Working Paper		Division/Unit:	Three Waters, Infrastructure
Process Name	Water Reticulation WOP04	Process Owner	Group Manager - Three Waters
Sub Process		• Management and operation of trunk mains • Management and operation of pipe network • Management and operation of pressure stations • Maintenance of valves and other assets • Backflow protection • Quality control and compliance of water within network	
Potential Failure	1. Trunk Mains Failure 2. Pipe burst 3. Accidental damage		

	4. Pressure station failure 5. Contamination event (from pipe failure or repair process) 6. Valve failure 7. Backflow device failure 8. Failure to manage sampling and testing activities		
Risk Category	Service Delivery	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Severe
Raw Risk Rating	Extreme		
Risk Category	Health & Safety	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Severe
Raw Risk Rating	Extreme		
Risk Category	Reputational	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Severe
Raw Risk Rating	Extreme		
Raw Risk Rating Overall	Extreme		
Causes	1. Poorly maintained network 2. Aging infrastructure 3. Poor pipe material selection 4. Third party ingress 5. Damage to pipe allowing contamination 6. Poor renewal planning and management 7. Incorrect repair techniques used 8. Poor quality construction techniques 9. Seismic activity, including earth subsidence 10. Over pressure in network 11. Poor sampling techniques, resulting potential false positive result. 12. Poor, or lack of testing and maintenance of back flow devices		
Controls & Owners (Include control description, % population checked, Material items checked, source of any check, how is check performed)	Control Type	Control Effectiveness	Control Reliance
	Choose an item.	Effective	Choose an item.
	1. Renewals programme Effective 2. Asset management plan Effective 3. Annual testing of back value devices Effective 4. GIS mapping of pipe locations Partially Effective 5. Trained and qualified operators Effective 6. IANZS accredited laboratory Effective 7. Modern pipe material for all renewals Effective 8. Regular maintenance of network and equipment Effective 9. Standard operating procedures for repairs Effective 10. Degree of rerouting available, including reticulation from bores Effective		

	11. Redundancy of supply Effective 12. Post breach, post repair disinfection technic to reduce contamination risk. Effective 13. Pipe renewal quality meets ability to meet degrees of seismic activity Effective

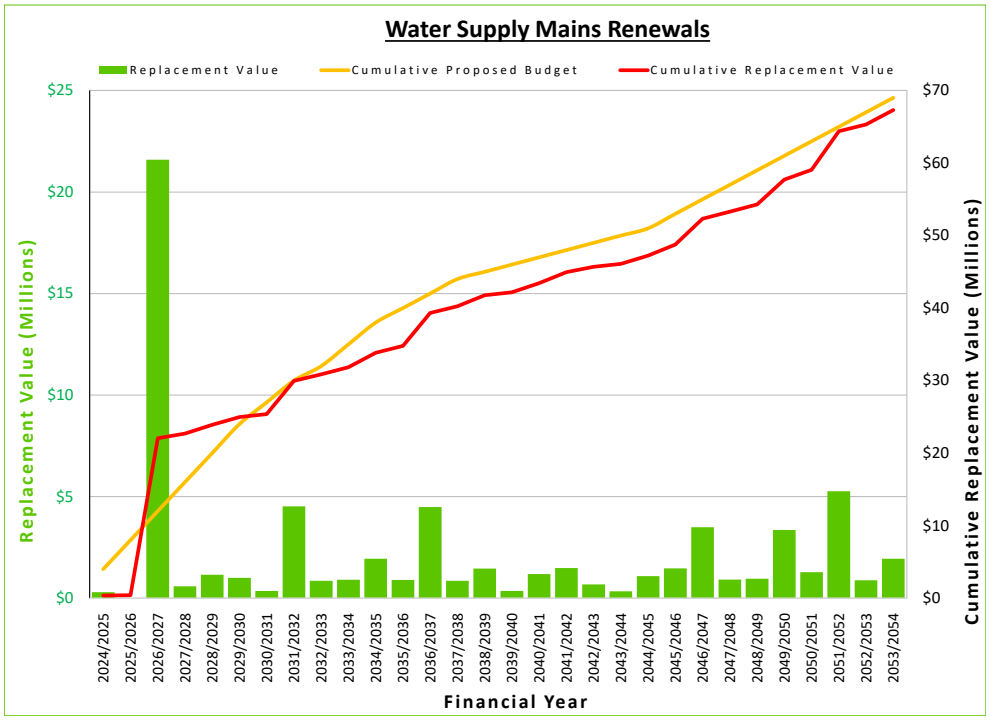
Residual Risk Likelihood	Rare		Residual Risk Consequence	Moderate
Residual Risk Rating	Service Delivery	Low	Within Risk Tolerance	Yes - No Further Action
Residual Risk Likelihood	Rare		Residual Risk Consequence	Serious
Residual Risk Rating	Health & Safety	Low	Within Risk Tolerance	Yes - No Further Action
Residual Risk Likelihood	Rare		Residual Risk Consequence	Serious
Residual Risk Rating	Reputational	Low	Within Risk Tolerance	Yes - No Further Action
Residual Risk Rating Overall	Low			

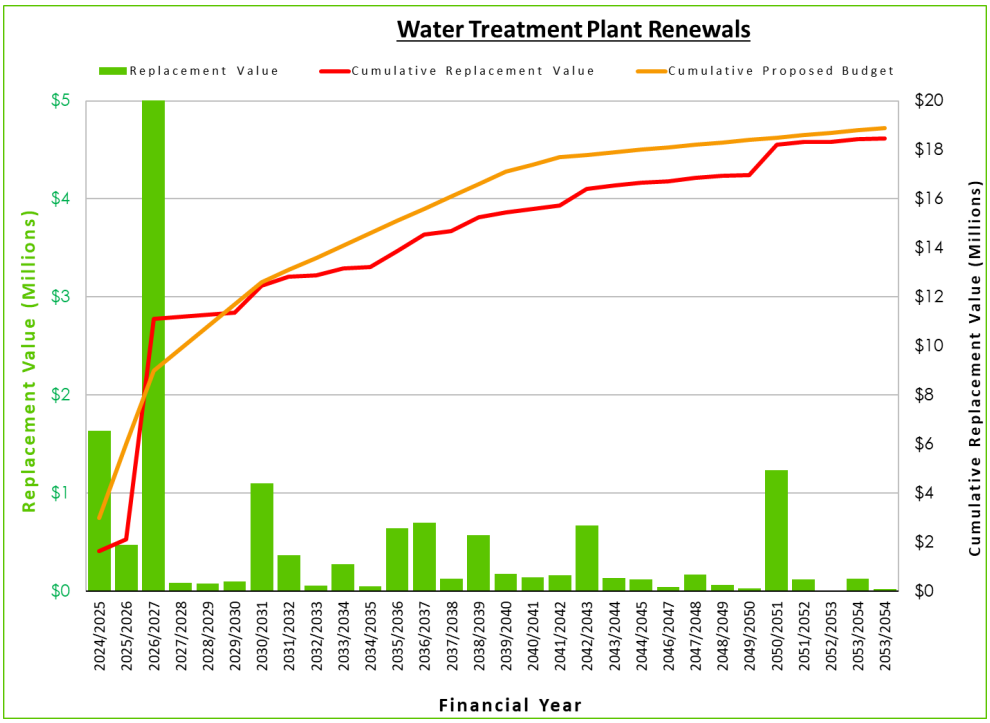
Control Sample Testing *(To be undertaken in later phase)*	CST Description	Control	Frequency	Sample Size
Process Control Design Improvement / Risk Treatment Options	1. Join “Dial Before you Dig”			

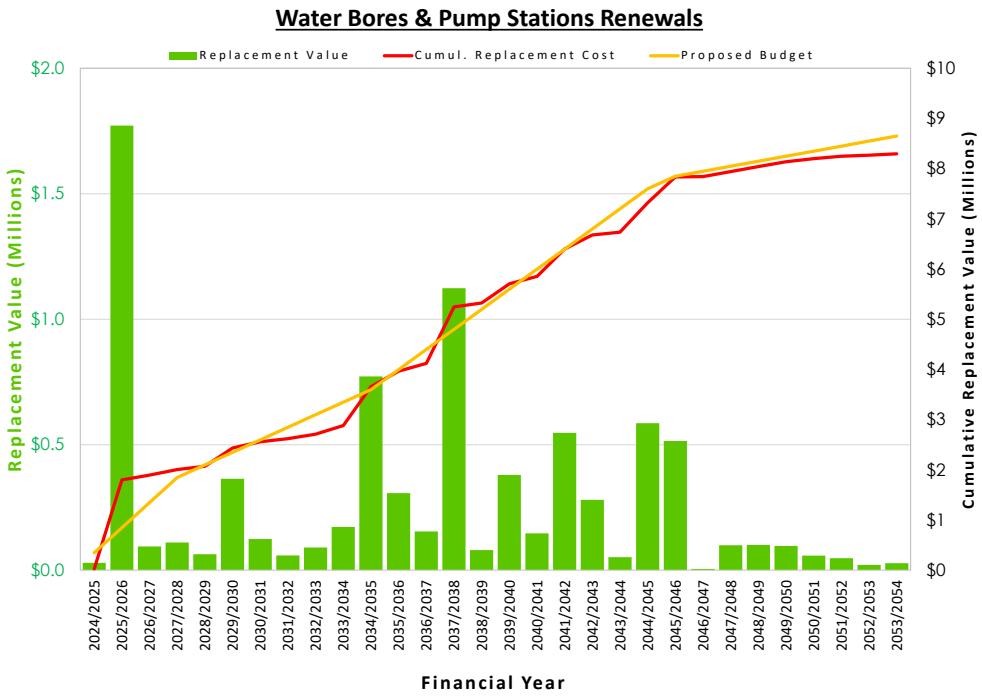
Target Risk Rating	Service Delivery	Low	Likelihood	Rare	Consequence	Moderate
Target Risk Rating	Health & Safety	Low	Likelihood	Rare	Consequence	Serious
Target Risk Rating	Reputational	Low	Likelihood	Rare	Consequence	Serious
Target Risk Rating Overall	Low					

E. Theoretical Renewals Profile

Based upon information stored in IPS and valuation information, the theoretical renewal profile for water supply assets is shown below. In reality, renewals profiles consider more asset condition and performance information but this provides an indication of the likely level of expenditure required.






Water Bores & Pump Stations Renewals
Replacement Value
Cumul. Replacement Cost
Proposed Budget
$2.0
$1.5
$1.0
$0.5
$0.0
Replacement Value (Millions)
$10
$9
$8
$7
$6
$5
$4
$3
$2
$1
$0
Cumulative Replacement Value (Millions)
2024/2025
2025/2026
2026/2027
2027/2028
2028/2029
2029/2030
2030/2031
2031/2032
2032/2033
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2049/2050
2050/2051
2051/2052
2052/2053
2053/2054
Financial Year

F. Key Assumptions

The following assumptions have been adopted for this AMP.

Inflation

Financial projections are based on July 2022 estimated costs. No inflation factors have been applied.

BERL inflation factors will be applied to the programmes and budgets in the 10 Year Plan. Budgets for successive years of the Annual Budget are based on the corresponding year of the 10 Year Plan.

Depreciation

Average asset lives at a project level for new works have been used to calculate depreciation.

New works are a small percentage of total depreciation. Differences from actual due to averaging of lives are relatively minor.

Vested Assets

On average the same level of assets are gifted to the Council as a result of subdivision as has occurred over the last 5 years.

Note that the rate of change of development will be taken account of in future revisions of the AMP and subsequent O&M and depreciation taken into account.

Service Potential

Service potential of the asset is maintained by the renewal and maintenance programme.

There is low risk that the service potential of the asset will not be maintained by implementation of the renewal programme since this is based on reliable asset and condition information from the asset management system.

Asset lives

Asset lives are accurately stated.

The risk that lives are inaccurate is low. Lives are based on generally accepted industry values modified by local knowledge. The asset database gives a good knowledge of asset condition and an extensive field assessment has recently been undertaken.

Natural Disasters

That there are no major natural disasters during the planning period requiring additional funds.

There is medium risk of a natural disaster occurring during this period requiring additional funds to repair or reinstate assets. Some further provision for increasing the resilience of the assets has been built into this plan but there is still further work to be undertaken to determine the desired level of resilience and the further asset improvements to achieve this.

Council Policy

No significant change to Council policy that impacts on assets and services.

Any significant change will require a full review of the AMP and implications identified at the time.

Interest Rate

Interest on term debt is calculated using an interest rate of 5% for the first three years of the LTP and 5.2% thereafter. To allow for anticipated timing of capital expenditure, interest is provided for on only 50% of forecast new loan amounts in the year of the capital expenditure, but on the full amount in each year thereafter.

G. Water Addendum 2024

Several changes have been made to the AMP budget through the 10 Year Plan - Long Term Plan (LTP) process due to internal and external constraints. Draft AMP documents were finalised on 30 September 2023 and were based on a best for asset approach.

Elected members reviewed the plans in November and December 2023 during the preparation of the 2024 – 2034 Long Term Plan and the Consultation Document. During these discussions elected members were concerned about the affordability of what was proposed. In some cases, further information was available that provided more accurate view of budget requirements.

To address concerns programmes were deferred, reduced in scope, or removed from the LTP. In some cases new programme had to be inserted as a result.

The addendum captures the changes and comments on the effects on Levels of Service and Risk that will result from the change in funding in the Adopted LTP and Consultation Document.

Each programme has two scenarios:

Proposed AMP Budget – The proposed budgets were set prior to 31 August 2023. This AMP's operational and maintenance, renewals and capital new costs are informed the 31 August 2023 budget scenario.

Adopted LTP Budget – The adopted budget reflects the budgets in the 10 Year 2024-34 Long Term Plan. They reflect the outcomes of internal and external consultation as part of the 10 Year Plan process.

Challenges in budget creation:

In 2023, we faced some challenges with finalising the asset management plan scenario for our budgets. This included upgrading our financial system which led to challenges with allocating the labour component to our operations and maintenance (MSL) budgets and growth timing for some programmes changed.

3 Waters Reform

Our Asset Management plans were prepared on the basis that the 3 waters activity would be transferred to a new entity in 2026. We were requested by the entity to develop budgets for the full 30 years for the Infrastructure Strategy and AMP's so that they would have a forward view of funding requirements.

In late October 2023 a General Election was held resulting in a change of Government. The new collation had campaigned on the repeal of the 3 waters legislation within the first 100 day of being in office. The Water Services Acts Repeal Act 2024 was passed on 16 February 2024 resulting in the 3 waters activities remaining under control of PNCC.

The new Government intends to introduce new legislation in the latter half of 2024 that will enable Territorial Local Authorities to form separate conglomerate entities to manage provision of 3 Waters services.

Types of changes to budgets:

Changes in any of our work programmes fall into one or more of the following categories:

- Budget decrease – Where there has been a significant decrease in budgets over the next 10 years.
- Budget increase - Where there has been a significant increase in budgets over the next 10 years.
- Not adopted – Where a programme has not been adopted for this LTP - 10 Year Plan.
- Introduced – Where a new programme has been introduced as result of consultation or when an existing programme has been recategorised, for example from a capital new growth programme to a capital new level of service programme.
- Programme timing change - Where there has been a programme timing change within a 10 year period.

Programmes that did not have any changes have been omitted from this addendum view.

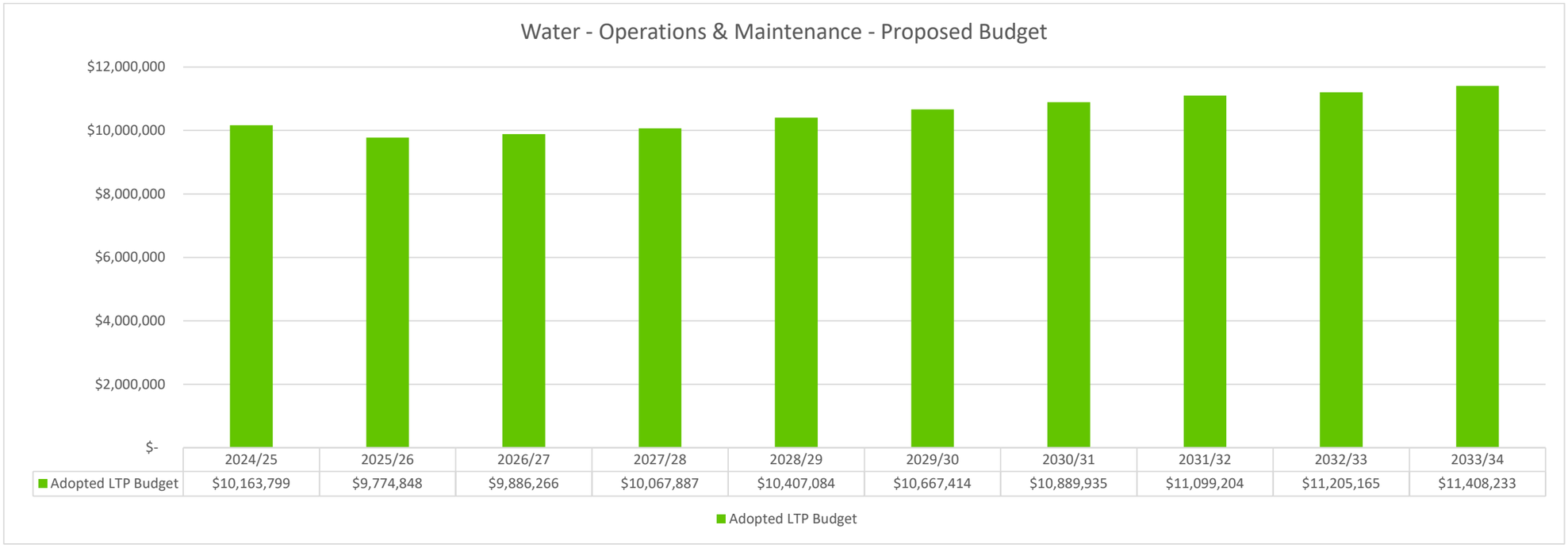
Operations and Maintenance

Operations and maintenance budgets contained in the Water Asset Management Plan were based on best available data at 30 August 2023, when the draft plan was finalised. At that time internal overheads and were under development and were not included in estimates. Subsequently these budgets have been refined to ensure that they reflect a true and fair view of estimated expenditure.

There has been no material change to budgets except those relating to allocation of labour.

Consequential Operational budgets are operational costs associated with the operation of new assets built from Capital New LOS, and Growth. Change to the timing of Consequential Operational Budgets therefore will move financial years. Change to Consequential Operational Budgets will follow any changes to Capital New budgets.

The largest proportion of operational expenditure is spent operating and maintaining our existing assets. Consequential operational expenditure (from the creation of new assets) increases steadily over the next decade due to the projected high volume of growth. Overall operations and maintenance expenditure is proposed to increase with most costs in water treatment.



Water	Year 1 2024 / 25	Year2 2025 /26	Year 3 2026 /27	Year 4 2027 / 28	Year 5 2028 /29	Year 6 2029 / 30	Year 7 2030 / 31	Year 8 2031 / 32	Year 9 2032 / 33	Year 10 2033 / 34
Admin and other	$6,064,337	$5,720,816	$5,825,778	$6,065,630	$6,366,533	$6,675,332	$6,937,975	$7,185,443	$7,284,162	$7,300,074
Consultancy	$349,000	$289,237	$283,129	$287,589	$335,310	$288,242	$288,069	$288,280	$287,425	$431,279
Maintenance	$1,464,649	$1,432,449	$1,454,467	$1,467,886	$1,518,762	$1,568,403	$1,599,064	$1,619,093	$1,646,462	$1,677,783
Remuneration	$2,285,813	$2,316,192	$2,290,076	$2,208,853	$2,109,104	$2,007,732	$1,922,281	$1,844,467	$1,812,391	$1,808,213
Consequential OpEx	$0	$16,154	$32,815	$37,929	$77,376	$127,705	$142,546	$161,920	$174,725	$190,884
Water Total	$10,163,799	$9,774,848	$9,886,266	$10,067,887	$10,407,084	$10,667,414	$10,889,935	$11,099,204	$11,205,165	$11,408,233

Operational Programmes

Operational programmes provide funding for specific operational activities that fall outside of the definition of operation and maintenance of the asset. They relate to programmes which are completed within a defined period of time and have a specific purpose, as distinct from general operations and maintenance. These programmes often support other capital programmes and may be capitalised in the future, if they are required to enable the capital works to take place. Examples include, but are not limited to;

- Feasibility studies and optioning for future capital works
- Resource Consent applications
- Capacity Modelling
- Reserve Management Plans

The tables below contain a summary of the programme changes for operational programmes within a 10 year period as a result of the LTP consultation process, implications for the changes and effects on levels of service as a result of a change.

Programme Timing Change

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels of Service (LOS)
1870 - Turitea Dams - Consent Renewal - Hydroelectricity	AMP View	$0	$0	$0	$0	$0	$0	$0	$0	$250,000	$0	$250,000	Budget phased to better align with scope and the timing of the expiry of the existing consent.	No apparent risks.	Levels of service will be maintained.
1870 - Turitea Dams - Consent Renewal - Hydroelectricity	LTP View	$0	$0	$0	$0	$0	$0	$0	$0	$0	$100,000	$100,000			

Budget Decrease

There have been no budget decreases

Budget Increase

There have been no budget increases

Introduced

There have no new programmes

Not adopted

All operational programmes were adopted

Renewals

Overall, water supply renewals budgets have decreased in the LTP from the proposed AMP budgets for the first six years. The seventh year represents an increase, and years 8-10 are approximately the same in the two views. Overall, there is a decrease of $8.6M in budgets over the ten years. It is a true decrease as these budgets have not been moved beyond the LTP into years 11-30.

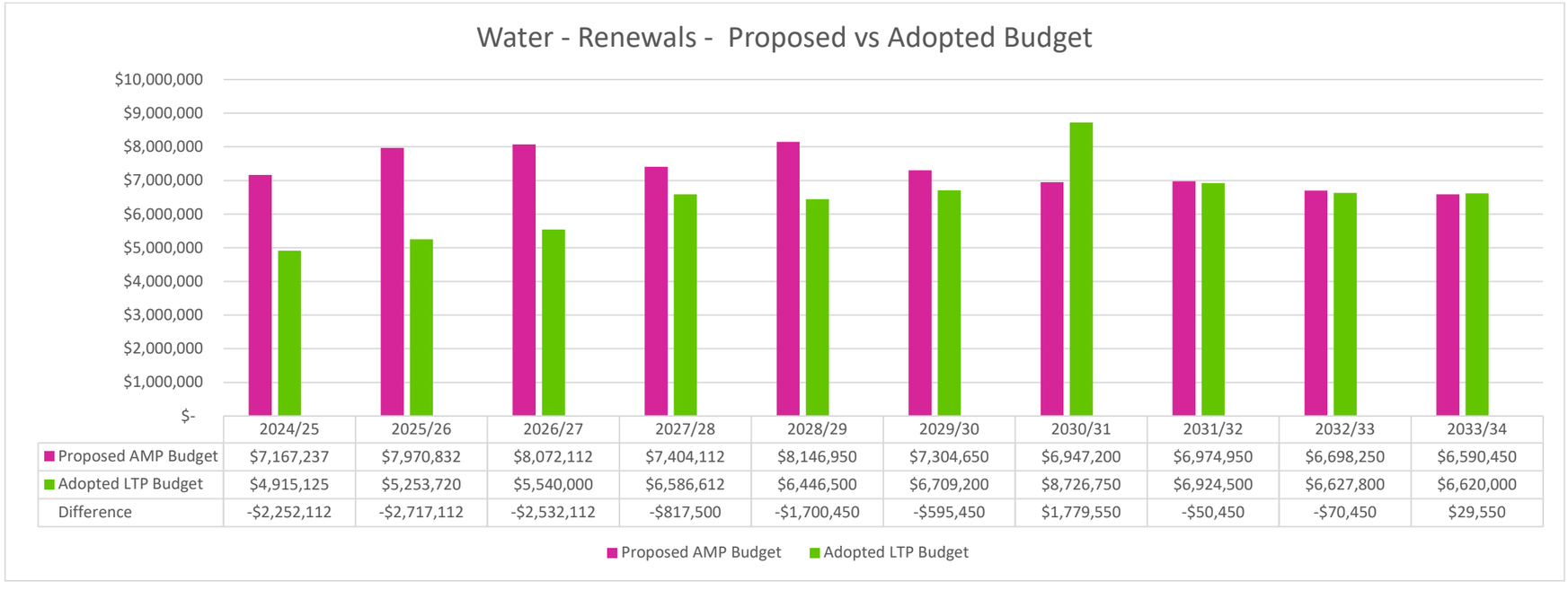
As mentioned above, part of the preparation of the draft LTP a resolution was passed to prepare draft budgets that stepped renewals from a Council wide prescribed budget value in Year 1 to a prescribed budget value in Year 10[9]. These draft budgets were prepared and subsequently accepted.

An analysis on the impacts of the resolution was also requested, which can be found here: Agenda of Council - Wednesday, 13 December 2023 (infocouncil.biz). The attachment entitled 'Impact and Risks of moderating the Capital Renewals Programme' details the impacts of the changes to the budgets, including risk implications and potential impact on levels of service. The primary impacts are:

- The overall condition of all our assets will continue to decrease resulting in increasing risk of asset failure and unplanned service disruptions
- Addressing the backlog of renewals will be deferred, so that the cost of those renewals will become an issue for future generations

The deferral of addressing the backlog means that the date at which the cumulative total of renewal budgets equals the value of the backlog is further in the future and thus the value of the backlog is increasing.

In general, the decrease in water supply renewals budgets is in response to this resolution. The decrease would have been greater if it had not been for increases in some programmes due to reviewing of scope and full recognition of the budget required to complete that scope.



	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Proposed AMP Budget	$7,167,237	$7,970,832	$8,072,112	$7,404,112	$8,146,950	$7,304,650	$6,947,200	$6,974,950	$6,698,250	$6,590,450
Adopted LTP Budget	$4,915,125	$5,253,720	$5,540,000	$6,586,612	$6,446,500	$6,709,200	$8,726,750	$6,924,500	$6,627,800	$6,620,000
Difference	-$2,252,112	-$2,717,112	-$2,532,112	-$817,500	-$1,700,450	-$595,450	$1,779,550	-$50,450	-$70,450	$29,550

The tables below contain a summary of the renewal programme changes within a 10 year period as a result of the LTP consultation process, implications for the changes and effects on levels of service as a result of a change.

[9] Minutes of Extraordinary Council Meeting 29 November 2023, Clause 193-23, Attachment 1a: That a version of the draft LTP Capital Renewal programme starting at $32M in Year 1 and stepping up to no more than $40M per annum by Year 5 and no more than $55M per annum by Year 10 be prepared for consideration alongside Opex programmes for Council meeting of 13 December 2023.https://palmerstonnorth.infocouncil.biz//Open/2023/11/COU_20231129_MIN_11232_EXTRA.PDF

Budget Decrease

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect on Levels of Service (LOS)
199 - City-wide - Water Supply Bore and Network Facility Renewals	AMP View	$595,125	$198,720	$600,000	$112,000	$76,500	$134,200	$176,750	$184,500	$107,800	$0	$2,185,595	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Increased risk of asset failure and unplanned service disruptions. Consequential reputational and financial risks.	Failure of assets will result in loss of the service they provide.
199 - City-wide - Water Supply Bore and Network Facility Renewals	LTP View	$245,125	$198,720	$400,000	$112,000	$76,500	$134,200	$376,750	$184,500	$107,800	$0	$1,835,595			
207 - Turitea WTP - Equipment and Facility Renewals	AMP View	$400,000	$400,000	$500,000	$1,000,000	$1,000,000	$100,000	$500,000	$400,000	$200,000	$200,000	$4,700,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Increased risk of asset failure and unplanned service disruptions. Consequential reputational and financial risks.	Failure of assets will result in loss of the service they provide.
207 - Turitea WTP - Equipment and Facility Renewals	LTP View	$200,000	$200,000	$200,000	$550,000	$550,000	$555,000	$550,000	$400,000	$200,000	$200,000	$3,605,000			
214 - City-wide - Water Toby and Manifold Renewals	AMP View	$517,500	$517,500	$517,500	$517,500	$530,450	$530,450	$530,450	$530,450	$530,450	$530,450	$5,252,700	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Marginally increased risk of being unable to maintain current staffing level with a reduced budget. Other marginally increased risks are not meeting our obligations for Drinking Water Quality Assurance Rules and unacceptable risk of backflow contaminating the water supply.	Levels of service will be maintained.
214 - City-wide - Water Toby and Manifold Renewals	LTP View	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$4,000,000			
218 - City-wide - Water Main Renewals	AMP View	$4,000,000	$4,000,000	$4,000,000	$4,000,000	$4,000,000	$4,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$36,000,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Increased risk of asset failure and unplanned service disruptions. Consequential reputational and financial risks.	Failure of assets will result in loss of the service they provide.
218 - City-wide - Water Main Renewals	LTP View	$3,000,000	$3,000,000	$3,000,000	$3,100,000	$3,100,000	$3,100,000	$3,500,000	$3,200,000	$3,200,000	$3,300,000	$31,500,000			
1700 - City-wide - Water Meter Renewals	AMP View	$350,000	$300,000	$300,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$1,650,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Increased risk of asset failure and unplanned service disruptions. Consequential reputational and financial risks. Some meter renewals may be delayed, possibly affecting revenue gathering efficiency.	Failure of assets will result in loss of the service they provide.
1700 - City-wide - Water Meter Renewals	LTP View	$250,000	$275,000	$300,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$1,525,000			
1701 - City-wide - Water Supply Valve & Hydrant Renewals	AMP View	$350,000	$300,000	$300,000	$300,000	$150,000	$150,000	$100,000	$100,000	$100,000	$100,000	$1,950,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Increased risk of asset failure and unplanned service disruptions. Valves failure may impact on the ability complete repairs and hydrants failures on the ability to fight fires. Consequential reputational and financial risks.	Failure of assets will result in loss of the service they provide.
1701 - City-wide - Water Supply Valve & Hydrant Renewals	LTP View	$250,000	$250,000	$250,000	$250,000	$150,000	$150,000	$100,000	$100,000	$100,000	$100,000	$1,700,000			
2280 - Bunnythorpe - Water Asset Renewals	AMP View	$0	$500,000	$0	$0	$0	$0	$250,000	$250,000	$250,000	$250,000	$1,500,000	Budget marginally reduced in accordance with resolution as part of LTP programme prioritisation.	No apparent risks	Levels of service will be maintained.
2280 - Bunnythorpe - Water Asset Renewals	LTP View	$0	$200,000	$200,000	$0	$0	$0	$250,000	$250,000	$250,000	$250,000	$1,400,000			
2310 - Citywide - Water Critical Spare Replacements	AMP View	$100,000	$100,000	$100,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$650,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Increased risk of asset failure and unplanned service disruptions. Risk of supply delays could compound the length of service disruptions. Consequential reputational and financial risks.	Failure of assets will result in loss of the service they provide.
2310 - Citywide - Water Critical Spare Replacements	LTP View	$70,000	$80,000	$90,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$590,000			

Programme Timing Change & Budget Decrease

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect on Levels of Service (LOS)
2344 - Turitea WTP - Falling Main Rehabilitation	AMP View	$0	$0	$0	$200,000	$2,220,000	$2,220,000	$2,220,000	$2,340,000	$2,340,000	$2,340,000	$13,880,000	Budget reduced and phased to align with the staging of programmes 88 and 2042.	Failure of the Turitea Falling main may result in total water shutdown for 60% of the city water supply for an extended period of time. Consequential reputational and financial risks.	Failure of assets will result in loss of the service they provide.
2344 - Turitea WTP - Falling Main Rehabilitation	LTP View	$0	$0	$0	$0	$0	$250,000	$1,000,000	$2,220,000	$2,200,000	$2,200,000	$7,870,000			

Budget Increase

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect on Levels of Service (LOS)
1061 - City-wide - Water Supply Reservoir Renewals	AMP View	$50,000	$150,000	$100,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$440,000	Marginal increase, not considered material.	Risks of asset failure and unplanned service disruptions will be mitigated.	Levels of service will be maintained.
1061 - City-wide - Water Supply Reservoir Renewals	LTP View	$50,000	$150,000	$100,000	$20,000	$20,000	$20,000	$150,000	$20,000	$20,000	$20,000	$570,000			
2279 - Longburn - Water Asset Renewals	AMP View	$354,612	$354,612	$354,612	$354,612	$0	$0	$0	$0	$0	$0	$1,418,448	Marginal increase, not considered material.	No apparent risks	Levels of service will be maintained.
2279 - Longburn - Water Asset Renewals	LTP View	$300,000	$300,000	$300,000	$354,612	$0	$0	$200,000	$0	$0	$0	$1,454,612			

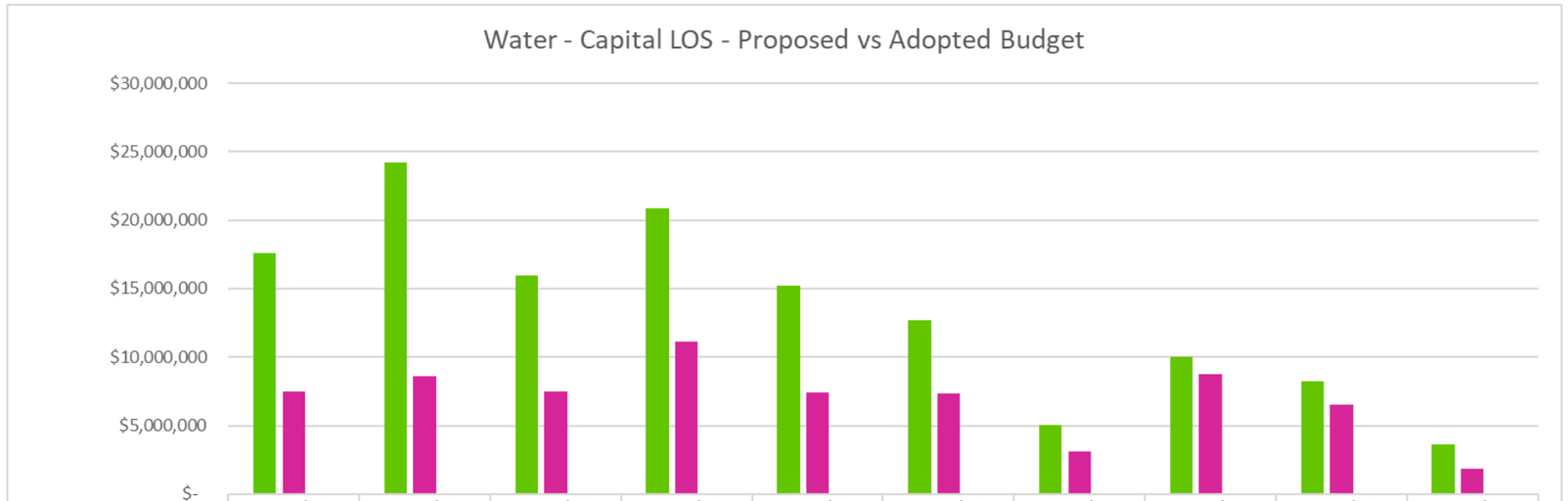
Programme Timing Change and Budget Increase

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect on Levels of Service (LOS)
88 - Turitea WTP - Falling Main from WTP to Reservoir	AMP View	$150,000	$879,750	$1,242,000	$0	$0	$0	$0	$0	$0	$0	$2,271,750	Budget increased as scope has been reviewed and full costs recognised. Budget has also been phased to align with programme 2042 and 2344.	Risks of asset failure and unplanned service disruptions will be mitigated.	Levels of service will be maintained.
88 - Turitea WTP - Falling Main from WTP to Reservoir	LTP View	$0	$150,000	$0	$1,650,000	$1,650,000	$1,650,000	$1,650,000	$0	$0	$0	$6,750,000			
2276 - Turitea Dams - Access Road Renewals	AMP View	$0	$0	$150,000	$750,000	$0	$0	$0	$0	$0	$0	$900,000	of slip further along the road). Also, budget has been phased to ensure deliverability and so levels of service can be maintained while work is carried out.	Risks of asset failure and unplanned service disruptions will be mitigated.	Levels of service will be maintained.
2276 - Turitea Dams - Access Road Renewals	LTP View	$0	$0	$250,000	$0	$350,000	$300,000	$300,000	$0	$0	$0	$1,200,000			
2288 - Turitea WTP - Automation and PLC Renewals	AMP View	$150,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$150,000	Budget increased to include automation upgrade requirements as the current system is no longer supported, and phased due to fiscal constraints.	Risk of failure of the current system before budget is available. Consequential reputational and financial risks.	Levels of service will be maintained.
2288 - Turitea WTP - Automation and PLC Renewals	LTP View	$50,000	$50,000	$50,000	$0	$0	$0	$100,000	$0	$0	$0	$250,000			

Capital New - Levels of Service

Water supply budgets relating to levels of service have substantially decreased in the LTP from the proposed AMP budgets across the whole 10 years. Initial reductions were made prior to prioritisation for affordability and to ensure that Council operated within its debt limits. Subsequent to this, during the preparation of the draft LTP, a resolution was passed to reduce water and wastewater budgets by $20M over the 10 year period, with a view to deferring those budgets to years 11-15.[10].

The decrease would have been greater if it had not been for increased budget for the enforceable undertaking submitted to Taumata Arowai to ensure that our bore sites comply with the new bacteriological standards in the Drinking Water Quality Assurance Rules.



	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Proposed AMP View	$17,568,222	$24,192,097	$15,968,435	$20,882,990	$15,232,909	$12,723,999	$5,023,150	$10,050,000	$8,214,800	$3,616,750
Adopted LTP View	$7,525,000	$8,588,900	$7,488,900	$11,162,809	$7,395,909	$7,311,909	$3,120,000	$8,770,000	$6,512,000	$1,820,000
Difference	-$10,043,222	-$15,603,197	-$8,479,535	-$9,720,181	-$7,837,000	-$5,412,090	-$1,903,150	-$1,280,000	-$1,702,800	-$1,796,750

The tables below contain a summary of the capital levels of service programme changes within a 10 year period as a result of the LTP consultation process, implications for the changes and effects on levels of service as a result of a change.

[10] Minutes of Extraordinary Council Meeting 29 November 2023, Clause 193-23, Attachment 1a: That the Wastewater and Water Capital New programmes in Appendix 3 be reduced by $20M across Years 1-10 in the drafting of the 2024/34 Long-Term Plan, with a view to delivery in Years 11-15 of the Asset Management Plan. https://palmerstonnorth.infocouncil.biz//Open/2023/11/COU_20231129_MIN_11232_EXTRA.PDF

Budget Decrease

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels of Service (LOS)
132 - City-wide - Water Supply Resilience - Trunk Mains	AMP View	$600,000	$1,113,900	$1,075,727	$1,008,893	$180,000	$472,090	$473,150	$400,000	$1,035,000	$1,035,000	$7,393,760	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Resilience of water supply system will not be able to be sufficiently increased to address known risks. This means that will be an ongoing risk of loss of service in an emergency event.	Levels of service in an emergency event may not be met. Levels of service in terms of providing a resilient water supply will not be met.
132 - City-wide - Water Supply Resilience - Trunk Mains	LTP View	$600,000	$1,213,900	$1,213,900	$113,900	$1,000,000	$1,000,000	$0	$0	$0	$0	$5,141,700			
651 - City-wide - Water Supply Resilience - Seismic Strengthening	AMP View	$300,000	$300,000	$750,000	$500,000	$0	$260,000	$750,000	$0	$0	$260,000	$3,120,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Risk that bore site structures will not be strengthened sufficiently to remain functional after a seismic event. This means that will be an ongoing risk of loss of service in an emergency event.	Levels of service in an emergency event may not be met. Levels of service in terms of providing a resilient water supply will not be met.
651 - City-wide - Water Supply Resilience - Seismic Strengthening	LTP View	$0	$0	$200,000	$300,000	$300,000	$300,000	$300,000	$0	$0	$0	$1,400,000			
986 - Turitea Dams - Aeration Upgrade	AMP View	$150,000	$500,000	$300,000	$0	$0	$0	$0	$0	$0	$0	$950,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation. Scope of the programme has been reviewed and is based on more cost-efficient solution.	No apparent risks	Levels of service will be maintained.
986 - Turitea Dams - Aeration Upgrade	LTP View	$200,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$200,000			
1054 - Ashhurst - Water Quality Improvements	AMP View	$4,000,000	$500,000	$500,000	$0	$0	$0	$0	$0	$0	$0	$5,000,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation. Scope of the programme has been reviewed and is based on more cost-efficient solution.	No apparent risks	Levels of service will be maintained.
1054 - Ashhurst - Water Quality Improvements	LTP View	$2,500,000	$1,500,000	$500,000	$0	$0	$0	$0	$0	$0	$0	$4,500,000			
1384 - City-wide - Water Supply Resilience - City Supply Reservoir	AMP View	$3,000,000	$15,000,000	$3,000,000	$8,924,000	$4,471,000	$4,587,000	$500,000	$7,950,000	$5,692,000	$200,000	$53,324,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Resilience of reservoirs will not be able to be sufficiently increased to address known risks. This means that will be an ongoing risk of loss of service in an emergency event.	Levels of service in an emergency event may not be met. Levels of service in terms of providing a resilient water supply will not be met.
1384 - City-wide - Water Supply Resilience - City Supply Reservoir	LTP View	$500,000	$500,000	$1,000,000	$0	$0	$0	$0	$0	$0	$0	$2,000,000			
1388 - City-wide - Water Supply Resilience - City Supply Reservoir	AMP View	$0	$82,800	$51,750	$155,250	$0	$0	$0	$0	$82,800	$51,750	$424,350	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Risk to provision of safe drinking water due to not being able to identify water loss effectively and efficiently	Levels of service will be maintained.
1388 - City-wide - Water Supply Resilience - City Supply Reservoir	LTP View	$75,000	$75,000	$75,000	$0	$0	$0	$0	$0	$0	$0	$225,000			
1389 - City-wide - Water Supply Resilience - Security of Supply	AMP View	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000	$500,000	$770,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Risk to provision of safe drinking water due to inability to adequately increase security at water treatment sites.	Levels of service regarding supply of safe drinking water may not be met in the event of a security breach.
1389 - City-wide - Water Supply Resilience - Security of Supply	LTP View	$30,000	$30,000	$30,000	$0	$0	$0	$0	$0	$0	$0	$90,000			
1607 - City-wide - Health & Safety - Water Treatment Chemical Handling	AMP View	$0	$150,000	$300,000	$300,000	$0	$0	$0	$0	$30,000	$0	$780,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Risk that reduced budget solution potentially may not resolve all Health and Safety risks, putting Councillors officers at risk.	Levels of service regarding supply of safe drinking water may not be met.
1607 - City-wide - Health & Safety - Water Treatment Chemical Handling	LTP View	$0	$150,000	$200,000	$200,000	$0	$0	$0	$0	$0	$0	$550,000			
1697 - Turitea WTP - Water Supply Resilience - Upgrades	AMP View	$900,000	$210,800	$1,454,111	$1,500,000	$2,000,000	$400,000	$400,000	$400,000	$75,000	$300,000	$7,639,911	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Risk that Water Treatment Plant structures will not be strengthened sufficiently to remain functional after a seismic event. This means that will be an ongoing risk of loss of service in an emergency event.	Levels of service in an emergency event may not be met. Levels of service in terms of providing a resilient water supply will not be met.
1697 - Turitea WTP - Water Supply Resilience - Upgrades	LTP View	$200,000	$250,000	$150,000	$0	$0	$0	$0	$0	$0	$0	$600,000			

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels of Service (LOS)
1873 - City-wide - Water Main Upgrades - Firefighting	AMP View	$0	$0	$0	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$700,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Risk that requirements for firefighting water supply will not be met in some areas of the city.	Levels of service in an emergency event may not be met. Levels of service in terms of providing a resilient water supply will not be met.
1873 - City-wide - Water Main Upgrades - Firefighting	LTP View	$100,000	$100,000	$100,000	$100,000	$0	$0	$0	$0	$0	$0	$400,000			
1874 - Turitea Dams - Health & Safety Improvements	AMP View	$500,000	$300,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$1,200,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Risk that reduced budget solution potentially may not resolve all Health and Safety risks, putting Councillors officers at risk.	Levels of service regarding supply of safe drinking water may not be met.
1874 - Turitea Dams - Health & Safety Improvements	LTP View	$150,000	$150,000	$150,000	$100,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$850,000			
1883 - 3 Waters - Small Plant and Equipment	AMP View	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$1,000,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Risk to services if minor equipment is required but cannot be replaced. If it is essential it may need to be paid for from other budgets, which would result in the risk of overspend of those other budgets.	Levels of service across all Three Waters may not be met.
1883 - 3 Waters - Small Plant and Equipment	LTP View	$100,000	$100,000	$100,000	$0	$0	$0	$0	$0	$0	$0	$300,000			
2060 - City-wide - Commercial Water Meters	AMP View	$124,909	$124,909	$124,909	$124,909	$124,909	$124,909	$20,000	$20,000	$20,000	$20,000	$829,454	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Risk to ability to collect revenue because commercial site does not have a meter. Also risk to water supply due to lack of backflow protection (which is installed with the meter).	Levels of service regarding supply of safe drinking water may not be met. It will affect potential revenue which could have a negative effect on operational budgets.
2060 - City-wide - Commercial Water Meters	LTP View	$70,000	$70,000	$70,000	$124,909	$124,909	$124,909	$20,000	$20,000	$20,000	$20,000	$664,727			
2283 - Turitea WTP - New Retaining Walls on Access Road	AMP View	$150,000	$560,000	$0	$0	$0	$0	$0	$0	$0	$0	$710,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Resilience of access road will not be able to be increased sufficiently to address the risk of damage or failure of the road and the resulting impact to the raw water main under the road.	Levels of service in terms of providing a resilient water supply will not be met.
2283 - Turitea WTP - New Retaining Walls on Access Road	LTP View	$0	$100,000	$0	$100,000	$0	$0	$0	$0	$0	$0	$200,000			
2286 - Turitea Dams - Installation of Dewatering Systems (both dams)	AMP View	$150,000	$560,000	$0	$0	$0	$0	$0	$0	$0	$0	$710,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation. Scope of the programme has been reviewed and is based on more cost-efficient solution.	No apparent risks	Levels of service will be maintained.
2286 - Turitea Dams - Installation of Dewatering Systems (both dams)	LTP View	$0	$100,000	$0	$100,000	$0	$0	$0	$0	$0	$0	$200,000			
2303 - Citywide - Bore Facility Improvements	AMP View	$200,000	$700,000	$700,000	$700,000	$0	$0	$0	$0	$0	$0	$2,300,000	Budget deferred in accordance with resolution as part of LTP programme prioritisation.	Risk of not being able to carry out sufficient improvements to comply with the Drinking Water Quality Assurance Rules.	Levels of service regarding supply of safe drinking water may not be met.
2303 - Citywide - Bore Facility Improvements	LTP View	$900,000	$300,000	$200,000	$200,000	$200,000	$0	$0	$0	$0	$0	$1,800,000			

Budget Increase

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels of Service (LOS)
1696 - City-wide - Drinking Water Standards Upgrades	AMP View	$0	$250,000	$1,500,000	$1,500,000	$0	$0	$0	$0	$0	$0	$3,250,000	Our bore sites need to comply with the new bacteriological standards in the Drinking Water Quality Assurance Rules. Changes to this programme reflect the upgrades to achieve this detailed in the enforceable undertaking submitted to Taumata Arowai.	Will reduce risk of non-compliance with Drinking Water Quality Assurance Rules.	Will meet existing levels of service as we are currently non-compliant with Drinking Water Quality Assurance Rules.
1696 - City-wide - Drinking Water Standards Upgrades	LTP View	$100,000	$600,000	$600,000	$7,924,000	$3,471,000	$3,587,000	$500,000	$6,950,000	$4,692,000	$0	$28,424,000			

Programme Timing Change

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels of Service (LOS)
2311 - WTP - Secondary Access Road	AMP View	$0	$0	$300,000	$700,000	$1,200,000	$1,500,000	$0	$0	$0	$0	$3,700,000	Budget deferred in accordance with resolution as part of LTP programme prioritisation.	Risk to drinking water supply because of not being able to access and operate WTP if current road is inaccessible.	Levels of service in terms of providing a resilient water supply will not be met.
2311 - WTP - Secondary Access Road	LTP View	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0			

Programme Timing Change and Budget Decrease

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels of Service (LOS)
2048 - City-wide - Water Toby and Manifold enhancements	AMP View	$6,363,313	$2,289,938	$2,289,938	$2,289,938	$2,277,000	$0	$0	$0	$0	$0	$15,510,127	Budget reduced in accordance with resolution as part of LTP programme prioritisation. Budget has also been phased to allow for installation of new tobies at a reasonable rate.	Increased risk of not meeting our obligations for Drinking Water Quality Assurance Rules and unacceptable risk of backflow contaminating the water supply.	Levels of safety regarding supply of safe drinking water may not be met.
2048 - City-wide - Water Toby and Manifold enhancements	LTP View	$750,000	$750,000	$750,000	$750,000	$750,000	$750,000	$750,000	$750,000	$750,000	$750,000	$7,500,000			
2298 - Bunnythorpe - Water Quality Improvements	AMP View	$0	$0	$0	$0	$200,000	$2,100,000	$1,600,000	$0	$0	$0	$3,900,000	Budget has been balanced and phased with other budgets for Bunnythorpe.	Risk of not resolving current known water quality issues in Bunnythorpe. Delays resilience to the Bunnythorpe community.	Levels of safety regarding supply of safe drinking water will be met, but aesthetic levels of service may not be met.
2298 - Bunnythorpe - Water Quality Improvements	LTP View	$50,000	$550,000	$0	$0	$200,000	500,000	500,000	$0	$0	$0	$1,800,000			

Programme Timing Change and Budget Increase

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels of Service (LOS)
2302 - Citywide - Reservoir Storage and Chemical Facilities Upgrades	AMP View	$0	$0	$200,000	$500,000	$500,000	$0	$0	$0	$0	$0	$1,200,000	Budget reduced and deferred in accordance with resolution as part of LTP programme prioritisation.	Without central chemical storage there is the risk of having insufficient chemicals for water treatment at bore sites in the event of that market and/or supply fluctuations.	May affect compliance if there is no ability to store chemicals and there is a period where they cannot be supplied.
2302 - Citywide - Reservoir Storage and Chemical Facilities Upgrades	LTP View	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0			

Not Adopted

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels of Service (LOS)
2270 - Turitea WTP - Sludge Handling and Disposal Improvements	AMP View	$0	$100,000	$1,000,000	$1,000,000	$1,000,000	$0	$0	$0	$0	$0	$3,100,000	Budget removed as risk can be managed operationally	Risk to operational budgets if currently sludge disposal mechanism fails (current known issue) and alternative measures need to be put in place while it is repaired. Resulting reputational risk.	The effects can be managed with no effect on current LoS.
2285 - Turitea WTP - Filter Backwash System Risk Mitigation	AMP View	$0	$0	$0	$200,000	$1,000,000	$1,000,000	$0	$0	$0	$0	$2,200,000	Budget removed as risk can be managed operationally	If all filters need backwashing at once the treatment plant cannot treat water and there is potential risk to drinking water supply.	The effects can be managed with no effect on current LoS.
2311 - WTP - Secondary Access Road	AMP View	$0	$0	$300,000	$700,000	$1,200,000	$1,500,000	$0	$0	$0	$0	$3,700,000	Budget removed in accordance with resolution as part of LTP programme prioritisation.	Risk to drinking water supply because of not being able to access and operate WTP if current road is inaccessible.	Levels of service in terms of providing a resilient water supply will not be met.

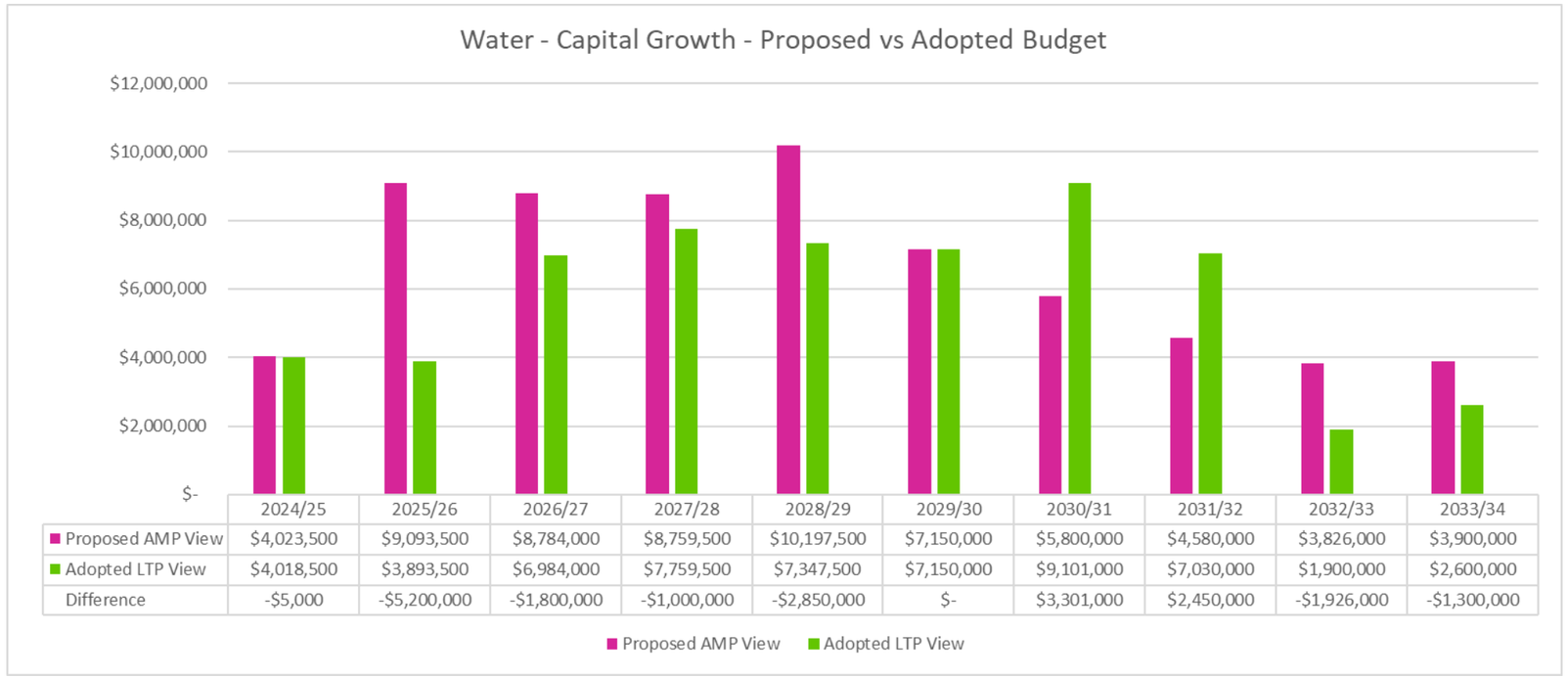
Introduced

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels of Service (LOS)
2042 - Turitea WTP - Raw Water Main Renewal	AMP View	$200,000	$1,150,000	$1,150,000	$0	$0	$0	$0	$0	$0	$0	$2,500,000	Programme moved from Renewal to Capital New.	Will improve resilience for the Water Treatment Plant	Ensures levels of service in terms of providing a resilient water supply will be met.
2042 - Turitea WTP - Raw Water Main Duplicate	LTP View	$200,000	$1,150,000	$1,150,000	$0	$0	$0	$0	$0	$0	$0	$2,500,000			

Capital New – Growth

The timing of Water supply growth programmes has generally been adjusted in accordance with revised growth timing assumptions. As stated in the Strategic Asset Management Plan these assumptions are made Council wide based on population projections, economic projections, government policy on requirements for dwellings and projections of greenfield development areas.

These assumptions have some inherent risks – which are detailed in the Significant Forecasting Assumptions for the Long-Term Plan. Those most relevant to programmes is that growth is at significantly different rates than assumed. The impact on programmes is that budget is not available to service the growth at the time it occurs. This will in turn affect the ability to provide standard levels of service to the growth that has occurred.



	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Proposed AMP View	$4,023,500	$9,093,500	$8,784,000	$8,759,500	$10,197,500	$7,150,000	$5,800,000	$4,580,000	$3,826,000	$3,900,000
Adopted LTP View	$4,018,500	$3,893,500	$6,984,000	$7,759,500	$7,347,500	$7,150,000	$9,101,000	$7,030,000	$1,900,000	$2,600,000
Difference	-$5,000	-$5,200,000	-$1,800,000	-$1,000,000	-$2,850,000	$-	$3,301,000	$2,450,000	-$1,926,000	-$1,300,000

The tables below contain a summary of the capital growth programme changes within a 10 year period as a result of the LTP consultation process, implications for the changes and effects on levels of service as a result of a change.

Programme Timing Change & Budget Decrease

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels of Service (LOS)
2299 - Urban Growth - New Northern Water Supply Bore (Milson Line)	AMP View	$2,500,000	$3,000,000	$2,500,000	$1,000,000	$0	$0	$0	$0	$0	$0	$9,000,000	Budget reduced and timing changed to enable bundled procurement for well drilling of bores, which will result in efficiency gains and better construction deliverability.	See general risks for growth programmes above.	See general implications on levels of service for growth programmes above.
2299 - Urban Growth - New Northern Water Supply Bore (Milson Line)	LTP View	$1,000,000	$1,500,000	$2,500,000	$2,500,000	$200,000	$0	$0	$0	$0	$0	$7,700,000			

Programme Timing Change

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels of Service (LOS)
135 - Urban Growth - Bunnythorpe Extension - Water Supply	AMP View	$75,000	$450,000	$0	$0	$0	$0	$0	$0	$0	$0	$525,000	See general reasons for growth programme timing changes above.	See general risks for growth programmes above.	See general implications on levels of service for growth programmes above.
135 - Urban Growth - Bunnythorpe Extension - Water Supply	LTP View	$0	$0	$0	$0	$0	$0	$75,000	$450,000	$0	$0	$525,000			
1170 - Urban Growth - Kakatangiata - Water Supply	AMP View	$550,000	$500,000	$0	$0	$2,500,000	$3,000,000	$2,500,000	$1,000,000	$2,200,000	$3,000,000	$15,250,000	See general reasons for growth programme timing changes above. Decreased as new programme created for Kikiwhenua (see programme 2512).	See general risks for growth programmes above.	See general implications on levels of service for growth programmes above.
1170 - Urban Growth - Kakatangiata - Water Supply	LTP View	$0	$0	$0	$0	$0	$0	$2,750,000	$2,500,000	$1,000,000	$2,200,000	$8,450,000			
1387 - Urban Growth - New North-East Water Supply Bore	AMP View	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	See general reasons for growth programme timing changes above. Programme will start in year 11.	See general risks for growth programmes above.	See general implications on levels of service for growth programmes above.
1841 - Urban Growth - Ashhurst - Water Supply	AMP View	$180,000	$250,000	$300,000	$0	$0	$0	$250,000	$500,000	$726,000	$500,000	$2,706,000	See general reasons for growth programme timing changes above.	See general risks for growth programmes above.	See general implications on levels of service for growth programmes above.
1841 - Urban Growth - Ashhurst - Water Supply	LTP View	$0	$0	$0	$0	$250,000	$500,000	$726,000	$500,000	$0	$0	$1,976,000			

Introduced

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels of Service (LOS)
2512 - Urban Growth - Kikiwhenua - Water Supply	LTP View	$1,300,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,050,000	Separated from programme 1170.	See general risks for growth programmes above.	See general implications on levels of service for growth programmes above.

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