Asset Management Plan

Stormwater

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

Stormwater

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.

The purpose of the stormwater system is to protect public health and assets by mitigating the level of flooding during significant rainfall events. Sediment and other contaminants are also to be managed to reduce the impacts on our streams and rivers.

With the effects of climate change projected to become more apparent over the next 30 years, our stormwater network has never been so important.

Long-term forecasts of more intense rainfall means our network will need to be adapted to better cope with these increased risks.

Taumata Arowai 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 oversight of wastewater and stormwater networks.

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. These reforms are designed to improve 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, while upholding iwi/Māori rights and interests relating to water services.

As a member of the Manawatū River Leaders' Accord, we recognise we have a role in improving the mauri and health of the Manawatū River. Our strategic focus is to raise the profile and quality of city urban streams, acknowledging their value and cultural significance as tributaries of the Manawatū River.

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 plan to manage and invest in our stormwater 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 stormwater assets to:

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

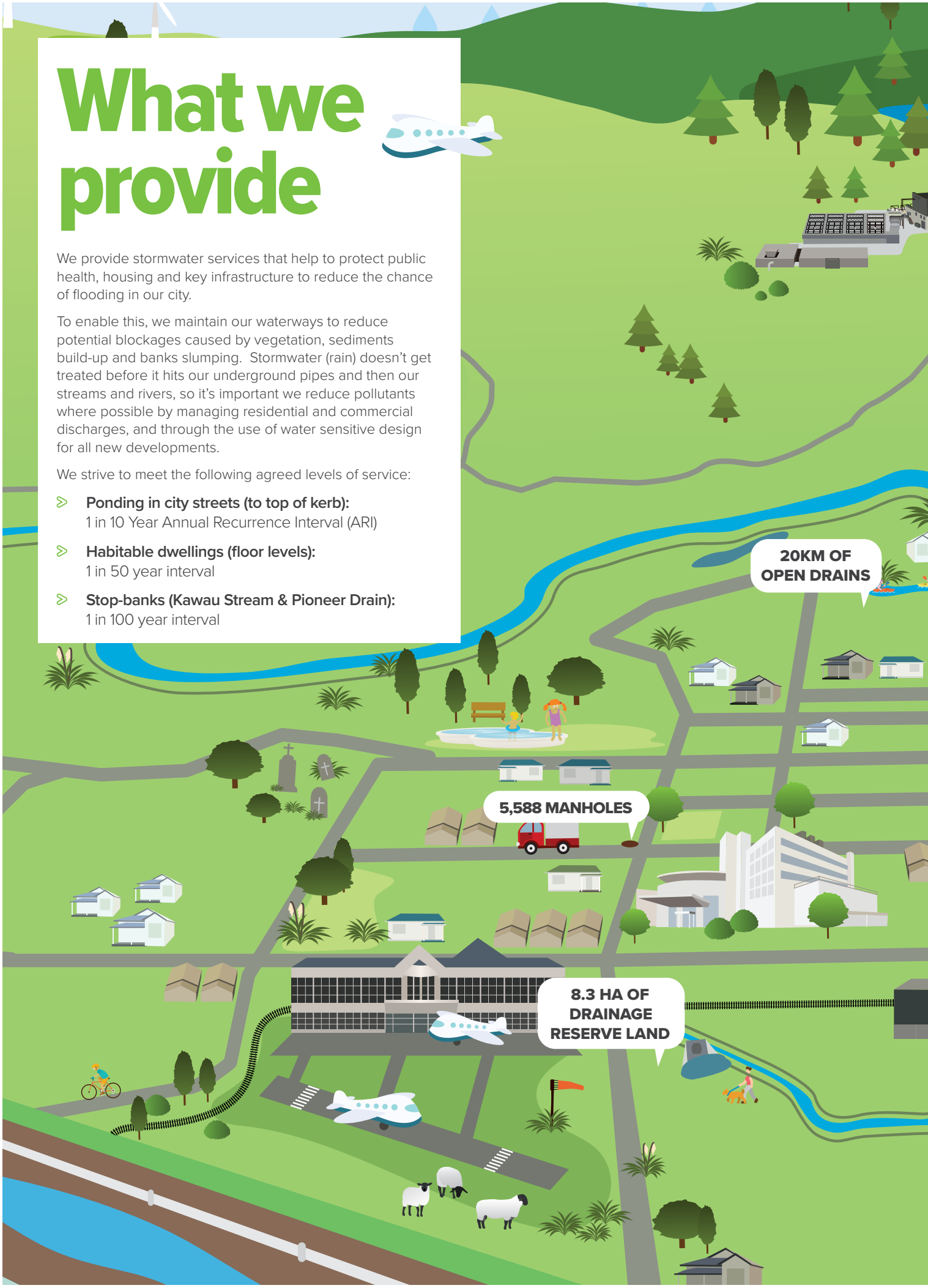
What we provide

We provide stormwater services that help to protect public health, housing and key infrastructure to reduce the chance of flooding in our city.

To enable this, we maintain our waterways to reduce potential blockages caused by vegetation, sediments build-up and banks slumping. Stormwater (rain) doesn't get treated before it hits our underground pipes and then our streams and rivers, so it's important we reduce pollutants where possible by managing residential and commercial discharges, and through the use of water sensitive design for all new developments.

We strive to meet the following agreed levels of service:

- **Ponding in city streets (to top of kerb):** 1 in 10 Year Annual Recurrence Interval (ARI)
- **Habitable dwellings (floor levels):** 1 in 50 year interval
- **Stop-banks (Kawau Stream & Pioneer Drain):** 1 in 100 year interval




305KM OF PIPED DRAINS
14KM OF STOPBANKS
18 PUMP STATIONS

Everyone is a customer

Residential

Visitors

Industrial

Rural

Education sector

Fire and Emergency New Zealand

Healthcare

Council

Developers

Commercial

Our focus is to raise the profile and quality of city urban streams, as tributaries of the Manawatū River, acknowledging their cultural significance to residents, including Rangitāne. Stormwater quality can be an issue in some parts of the city due to contaminants. We are working with Horizons Regional Council as we have some overlapping responsibilities.

People expect their properties to be safe from flooding. We aim to reduce the potential for habitable floors to be flooded in a 50-year incidence. To achieve this, we set minimum floor levels on new houses where deemed to be necessary. Some property flooding has been recorded in recent years and we are in the process of upgrading the network to help mitigate these issues.

Complaints and the overall satisfaction of residents about stormwater and urban waterways have increased since maintenance budgets and associated activities were reduced in recent years.

We have some challenges + risks

Our city is growing

In most areas where the City is growing there are existing sensitive receiving environments such as urban streams and remnant oxbows. Many of these have been significantly modified over time or they are degrading. As further development occurs (urbanisation) there is an opportunity to improve water quality and ecology by applying water sensitive design which helps reduce the risk of flooding. A significant increase in sub-division activities, especially where properties are being subdivided to create more homes is continuing. Existing levels of service must be maintained or improved, through low impact and water sensitive design, to manage the amount of land being coverted into concrete or other hard surfaces that don't absorb rain.

Water quality is poor in our urban streams

Cultural health monitoring of the urban streams is carried out in conjunction with Rangitāne o Manawatū under the joint programme Hei Manga Oranga. Water quality monitoring indicates that urban streams have unsatisfactory levels of contamination.

There are on-going issues with managing excess vegetation in our open drains and streams, as well as sedimentation, which often results in capacity issues for these streams. More appropriate plant species are needed to improve capacity, water quality and amenity.

Climate change will have an impact

Climate change will see more heavy rainfall events throughout the year, but more than we're used to over summer. The impacts of climate change on the stormwater network are expected to be an overall increase in rainfall and greater frequency of more intense rainfall events. The 2022/23 summer with Cyclone Gabrielle has demonstrated these type of events and impacts for our community. Changes in weather patterns could increase both nuisance surface water ponding and flood events.

Understanding Flood Risk

We now have better modelling and GIS tools to manage overland flow paths (where rain flows over land) and understand flooding impacts in different scenarios. However, there are some historic low-lying areas that need to be addressed. In addition, some urban streams are only accessible through private property, preventing us from providing effective management.

Council owns and manages 14km of stop-banks and other flood protection assets. These help to control flows in two streams (the Kawau and Mangaone) protecting the community, buildings and other key infrastructure assets. Modelling and on-going discussions are held with the Regional Council to share information, including district wide advice for flooding. There is keen interest to collaborate by both parties to ensure the right advice is given to the ratepayers regarding minimum floor levels and flooding extent, especially for future planning purposes.

Freshwater regulation

Central government has signalled its desire to improve freshwater quality. Ultimately this will be reflected in higher quality standards for discharges to rivers and streams. The urban streams and waterways of Palmerston North have been heavily urbanised and many are degraded due to overgrowth of exotic vegetation, with some litter and other contaminants entering, including through the stormwater network.

Asset condition knowledge is limited

While the risk profile of our stormwater pipes is acceptable as they tend to have a long asset life, we have limited knowledge of the condition of the majority of the piped network. Condition assessments have been undertaken on the critical pump stations, with work programmed to rectify issues.

What's our plan?

Partnership with Rangitāne and the community

Applying water sensitive design to any upgrades or projects will be a key change in the medium to long term. This approach will help to improve outcomes for water quality, hydraulic capacity and amenity.

Our approach is to fund a clean-up and vegetation removal-programme for all the urban streams with a five-year period. As sections are cleared, they will be planted with appropriate species in conjunction with Rangitāne and with support from community groups and businesses.

Respond to growth

We will continue to work proactively with property owners and developers to mitigate the quality and quantity effects of the stormwater runoff from new land development, and to provide growth infrastructure connections into our systems. Ensuring that there continues to be a portion of land that can absorb rain (known as hydraulic neutrality) will be one key response to managing growth but some capacity upgrades of existing infrastructure will also be required.

We are expecting increased operational costs to maintain stormwater treatment devices that will be vested to Council by developers.

As the city grows, we will need to continue to also maintain and update our stormwater model to reflect the changes.

Design for climate change

We will continue to consider climate change when we are designing and constructing new infrastructure. Where infill (the subdividing of property) is occurring, the impacts of heavier, more frequent rainfall can be mitigated by developers adopting rainwater tanks for storage and minimising the area of surfaces that can absorb water.

Improve resilience and reduce risk

We have several key ongoing programmes focussed on improving resilience.

- **Stormwater Pump Stations Improvement** – significant upgrades or addition to mechanical/electrical equipment in stormwater pump stations and associated outlet works to ensure levels of service are improved; including providing backup for some pump stations that are only equipped with one pump (i.e. no standby).
- **Flood Mitigation** – targeting larger/big scale mitigation projects required to alleviate and minimise flooding on catchment wide basis. These projects include diverting or upgrading the network and storing stormwater to reduce discharge rates to the pre-development level
- **Land purchase** – acquire drainage reserves for waterways that are currently flowing through private Lots and do not have designated drainage reserves.

Use condition data to prioritise replacements

New condition assessment data will help to confirm our service failure risk profile and inform a prioritised programme of pipe defects to be rectified. This will help us maintain our level of service by planning and optimising future pipe replacements.

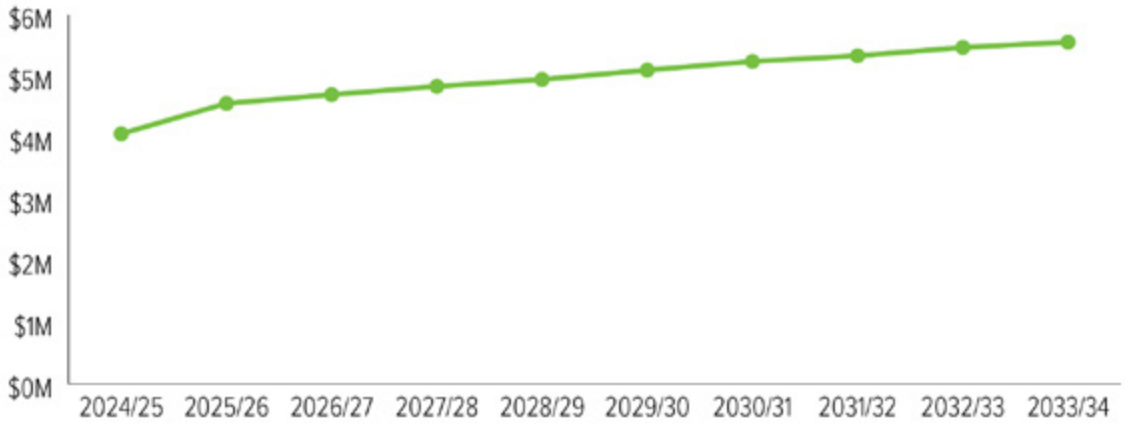
Continue to monitor waterway health

Our partnership with Rangitāne on Hei Manga Ora has provided us with invaluable information on the cultural health of our waterways. This information combined with the roll out of an improved water quality monitoring programme will inform future discharge consent applications.

How much will it cost?

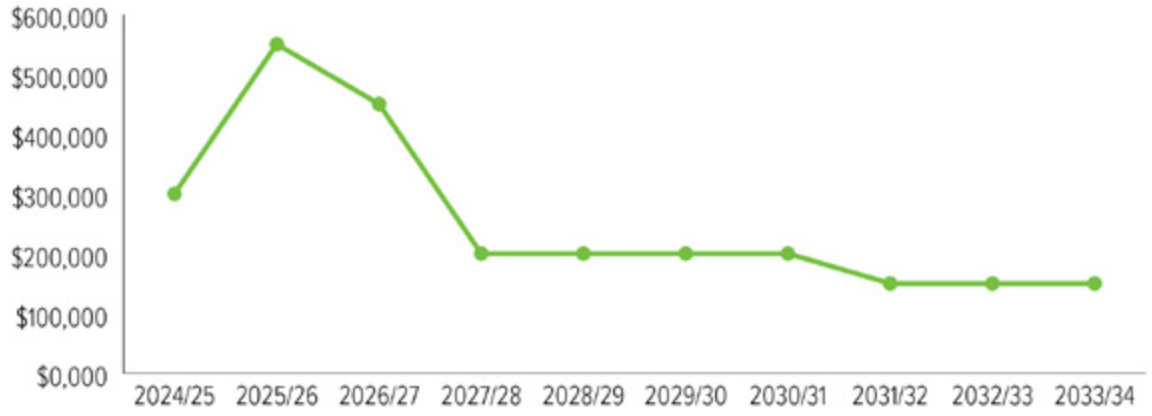
Operations and Maintenance

The largest proportion of operational expenditure is spent operating and maintaining our existing assets. Overall operations and maintenance expenditure is proposed to trend slightly upwards with most costs in maintaining service levels. There is a gradual rise in the consequential Opex from 2024/25 onwards due to increasing maintenance associated with new assets in growth areas.



Consequential operational expenditure (from the creation of new assets) increases steadily over the next decade due to the high volume of projected growth.

Renewals



The proposed renewal budget is similar to annual depreciation values. We propose to have fairly low renewals over the next 10 years. Over time as assets get older, our renewal costs should gradually increase.

However, that's not the case in our plan. As we need to do more work to develop the condition-based renewals programme, especially for 2027/28 onwards. Our renewals budget is lower as we anticipate to complete upgrades to increase levels of service across the stormwater network.

Capital new

Capital investment is mainly required to meet Council levels of service and growth demands. Actual service growth is dependent on timing of developments. The increase from 2028/29 to 2031/32 for stormwater pipes and treatment is to provide for growth in new residential and industrial developments e.g., Kakatangiata and Aokautere, as well as general network improvement works.

There are two major capital programmes intended to increase capacity and resilience of the existing network, totalling $27M over the next 10 years, and two major growth programmes totalling $30M over the next 10 years.

Status: Final

This document was prepared by:

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

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1.2	2023 Draft Update	August 2023
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1 Introduction

1.1 He Mihi

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.

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 Stormwater Activity.

At Palmerston North City Council we provide stormwater services to:

- protect buildings and communities from flooding

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 stormwater; and
- Rangitāne o Manawatū have opportunities for early involvement in all stormwater projects and initiatives.

1.3 Activity Successes, Challenges, and Opportunities

Our successes in the last three years, key challenges and opportunities to improve our services are outlined below.

1.3.1 Key Successes

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

- **Maintenance** – we have cleared more waterways, planted and maintained streams, worked on significant slumping banks, and installed mechanically stabilised living walls at Milson Line and McGregor catchments.
- **Risk and resilience** – we have improved our service resilience by purchasing two new sets of emergency flood pumps and generators. We have improved citywide flood model especially for catchments with high flood risk and the results will feed into optioneering on the large scale flood mitigation projects.
- **Upgrade** – we have renewed and refurbished Birmingham, Ellesmere, Sutton Pl, Vautier Park, Paisley and Guy Ave pump stations. We have undertaken network upgrade at Hospital, Kent Crescent, Jamiesons Drive, Botanical Road, Churchill Avenue, Jensen Court, Setters Line, Church/ Victoria Avenue. We have completed detailed design for the Whakarongo attenuation pond and wetland system, and they are at tendering stage.
- **Stormwater management** – we have developed a comprehensive stormwater management guide to provide clear conditions and rules for new development areas
- **Stormwater monitoring** – we are continuing the Hei Manga Oranga (Towards Healthy Waterways) waterways monitoring programme. We have completed cultural monitoring at 12 locations and urban waterway monitoring at eight locations.

[1] Rangitānenuiarawa is the Rangitāne expression of Kaitiakitanga, 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

The table below 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
Highly modified streams	Since the Highways and Watercourses Diversion Act in 1858 to the Water and Soil Conservation Act in 1967 the Crown introduced 11 Acts nationally and locally that have impacted water ways. All urban streams are highly modified, as they are either piped and/or diverted and/or stripped of vegetation	Reduced ability to provide naturalise "drainage" and restore stream ecology, mahinga kai, amenity and access.
Infill and hard surfaces	As existing residential sections are subdivided (infill) and industrial sites are paved the amount of hard, impervious surfaces increases. When it rains this results in an increased direct runoff, i.e. higher peak flows that take up more pipe capacity. Less water soaks into the groundwater and therefore there is reduced baseflow entering urban streams from the groundwater.	A gradual reduction in the level of service over time for existing parts of the network. Secondary, overland flow paths are being utilised more than is desirable. Reduced water quality due to reduced minimum flows, including tuna die-off in droughts.
Customer expectations	It is impractical and unaffordable to provide a primary stormwater system with the capacity to accommodate runoff from all rainfall events.	Instead, a primary network designed to provide for frequent rainfall events is combined with a secondary system comprising overland flow along roads or over designated overland flow paths is provided.
Land use	Overlapping and unclear demarcation of responsibilities with Horizons Regional Council for managing land use makes it difficult to manage the impacts of runoff.	A collaborative approach with Horizons Regional Council is required to consent stormwater discharges.
Water quality is poor in our urban streams	Previous water quality monitoring indicates that the urban streams are contaminated by sewage from urban environment and our wastewater network. Inspections in 2019 identified significant areas of poorly managed vegetation in our open drains and streams and other issues causing hydraulic capacity problems. More appropriate species are needed to improve capacity, water quality and amenity.	Cultural health monitoring of the urban streams carried out by Rangitāne o Manawatū under our joint programme Hei Manga Ora.
Low-lying properties	Areas of Palmerston North have stop banks to protect them. When the Mangaone and Kawau streams are high stormwater cannot drain from the city into them.	An increased consequence of failure. Pump stations are required to lift rainwater out of the city into the streams.
Growth	Some future growth areas are onto land with a known flood hazard.	Requires significant investment in planning, design and infrastructure to protect properties.

Challenge	Challenge Description	Impact on Service
Climate change	Current research suggests that the main impacts of climate change on the stormwater activity will be a significant increase in rainfall in winter, and a higher frequency of extreme rainfall events.	This could increase both nuisance surface water ponding and flood events.
Asset condition knowledge is limited	While the risk profile of our stormwater pipes is acceptable as they tend to last a very long time, we have limited knowledge of the actual condition of these assets.	Failure of the Stormwater network could see a loss of service to the community. With the impact of climate change, more pressure on our Stormwater system. However, historically only a small amount allocated for stormwater network condition assessment.

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.

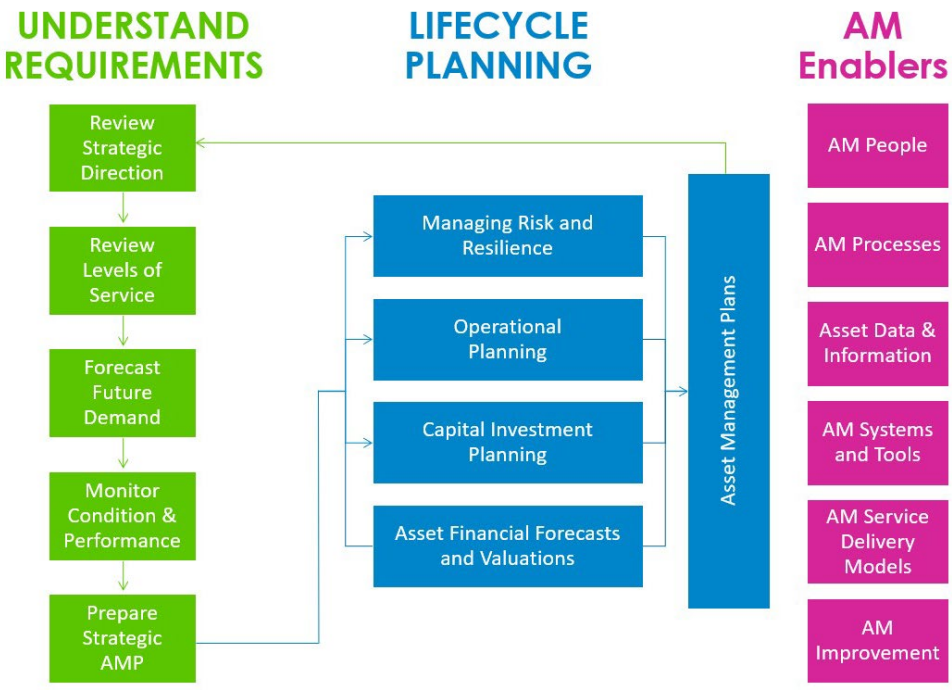


Figure 1: Asset Management Framework

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 Stormwater 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 Stormwater AMP provides detail on how our strategic asset management planning is applied to the Stormwater 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 Stormwater AMP and other Council AMPs. These other plans are available on our website.

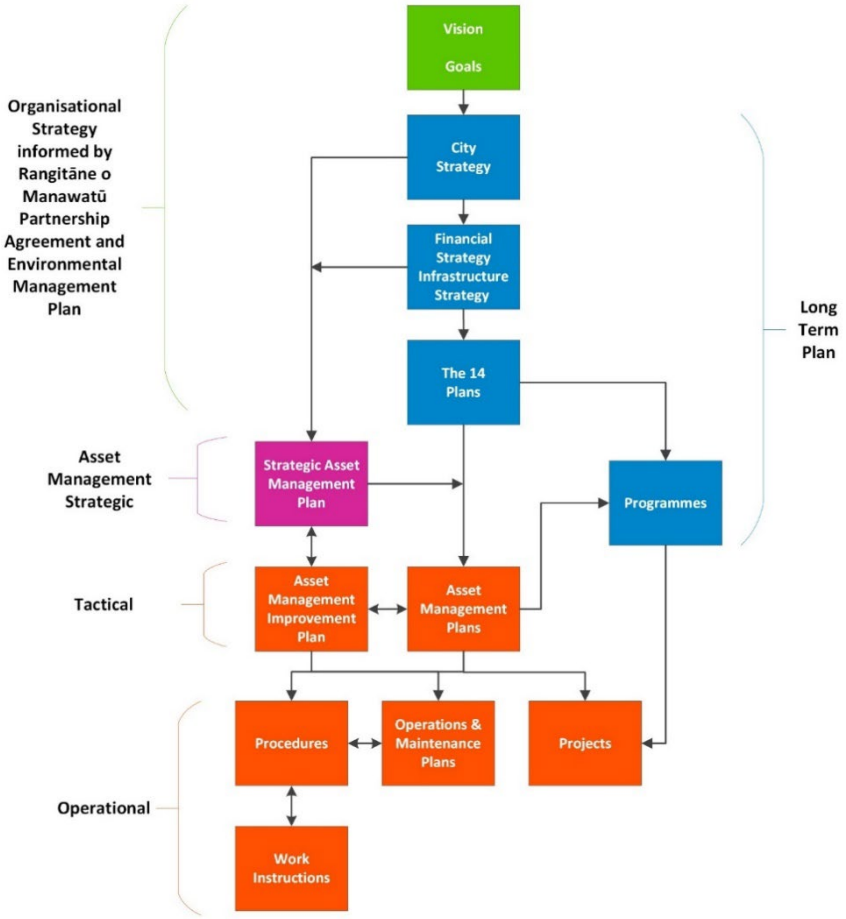


Figure 2 AMP and Key Documents in our Management Framework

1.6.1 Relationship to the Stormwater Management Plan

A significant increase in sub-division activities, particularly infill development has continued within the city. Council has worked proactively with property owners and developers to support their infrastructure provision which mitigates the quality and quantity effects of the additional stormwater runoff from new land development, and to provide growth infrastructure connections into our systems. This has become more critical with the impact of climate change on rainfall intensities and expected changes to National Freshwater Policies setting higher water quality standards for discharges. A Stormwater management framework aims to: 1) protect and restore Te Mana o te Wai; 2) ensure the safety and wellbeing of people; 3) protect property and infrastructure in the event of flooding. Stormwater Management Plans are now a standard requirement for all sub-division and major building consent applications. There is also an increased understanding of the requirements for developers' design of measures to treat stormwater discharge and control stormwater peak flows.

To guide the measures to be employed, Council is developing a Stormwater Management Framework, following discussions and stakeholder engagement workshops. It was expected that the framework will provide applicants for subdivision and/or building consents with an overview of the challenges in each stormwater catchment in the City which must be addressed as part of their development. This work has been put on hold due to water reform.

1.6.2 Relationship to Other Asset Management Plans

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

- Parks and Reserves AMP: Some Stormwater ponds, wetlands, open drains and/or stream run through parks ad reserves. We need to coordinate the management of these assets.
- Wastewater AMP: Overflow of Stormwater flow into wastewater network causing cross contamination and inflow and infiltration issues.
- Transport AMP: Transport assets such as bridges and roads carry critical Stormwater assets, e.g., culverts.

1.7 Key Partners and Stakeholders

The table belowTable 2 contains a summary of stakeholders that we regularly engage with on stormwater 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 who live or businesses that are located within the Palmerston North City Council boundaries.
Tangata Whenua	Tangata whenua, are 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.
Horizons Regional Council	The Manawatū-Whanganui Regional Council trading as Horizons manages land, air, and the quality of water in our lakes and rivers. Horizons is also responsible for biodiversity, regional parks, flood protection, emergency management and regional transport.
Contractors	The Stormwater 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 Stormwater activity.
Consultants	Likewise, specialist advice or additional capacity is brought in when appropriate.
Suppliers	There is a large supply chain behind the Stormwater activity, providing everything from testing equipment to large diameter pipelines.
Developers	Urban development requires sufficient Stormwater management to protect people, property, infrastructure and the receiving environment.
Forest & Bird	Maintaining and enhancing the environment in Turitea Reserve has substantial positive benefits for drains, streams, and birdlife. Likewise, failure to keep ecological balance (e.g., 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 Stormwater 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.

In particular, City's approach to Stormwater management reflects the partnership with Rangitāne o Manawatū and Rangitānenuiarawa. Many of the following Iwi aspirations are also shared by us:

- Water sensitive design;
- Mitigation of flooding as a result of climate change;
- Restoration of urban waterways;
- Wetlands should be enhanced, protected, and created wherever possible;
- Hei Manga Oranga cultural monitoring of waterways;
- A high proportion of Māori communities live in downstream locations susceptible to flooding. Improvements are needed to stormwater infrastructure to protect these communities.

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 Te Mana o te Wai following 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:
    a) Protecting and restoring the mauri of the Manawatū Awa and coastal 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, molluscs, 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.
    b) 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.
    c) 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:
    a) firstly, the health and well-being of waterbodies and freshwater ecosystems, and the ability of mana whenua to uphold these
    b) 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)
    c) 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

The table belowTable 3 contains a summary of national legislation and policies that govern the Stormwater Activity.

Table 3: Legislation that Governs the Stormwater Activity

Statutory Requirement	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.

Statutory Requirement	Description	Implications
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 • 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.
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 Stormwater Activity is identified as a core service to be considered by a local authority.
Land Drainage Act 1908	The Land Drainage Act 1908 empowers councils to order the removal of obstruction from watercourse or drain.	Protects our watercourse and drains from any obstruction and mitigates potential risks for further environmental and social consequences.
Three Waters Reform Legislation	This includes the following legislation: Water Services Entities Act 2022 Established water services entities, including legal form, ownership structure, objectives, functions, operating principles and service area Water Services Legislation Bill Establishes 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. Water Services Economic Efficiency and Consumer Protection Bill Establishes an economic regulation and consumer protection regime as part of water services reform.	Responsibility for the delivery of the Stormwater activity will transfer to a new entity.

Statutory Requirement	Description	Implications
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 Stormwater activity. We need to comply with resource consent for discharge to watercourses. 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.
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 land use and discharge consents and related activities must comply with One Plan.
Stormwater Bylaw and Administration Manual	Stormwater Bylaw 2022 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 Stormwater Bylaw protects our stormwater network from damage or contamination. This includes piped infrastructure as well as natural waterways.
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

Statutory Requirement	Description	Implications
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 Stormwater assets will need to comply with these regulations

2.6 Improvement Actions

There are no improvement actions for this section.

3 Description of the Stormwater Activity

3.1 Scope of Our Services

The purpose of the stormwater system is to protect the environment and public health by controlling the level of pollutants and sediment in stormwater runoff that goes into streams and rivers and to protect buildings from internal flooding by water that ponds during heavy rain.

Through the Stormwater Activity we provide the following:

- Reliable collection and disposal systems, with the capacity to cope with frequent rain events.
- A degree of Flood Protection during rain events and/or high water levels in natural water bodies.
- Treatment of stormwater before disposal in some locations (relatively new area)

Broadly, these services are arranged under the sub-activity “stormwater collection and disposal”.

We provide these services in the urban areas of Palmerston North, Ashurst, Bunnythorpe and Longburn. Properties outside these areas are catered for by on-site soakage, roadside drains (managed under the Transport Activity), privately owned drains and streams, and Manawatū River (managed by Horizons).

Where a piped stormwater network is available, the point of service or discharge for stormwater drainage is the property boundary. All drains, pipework and plumbing upstream of the point of service, including watercourses within private property, are the responsibility of the property owner. This includes private pipelines discharging directly to watercourses.

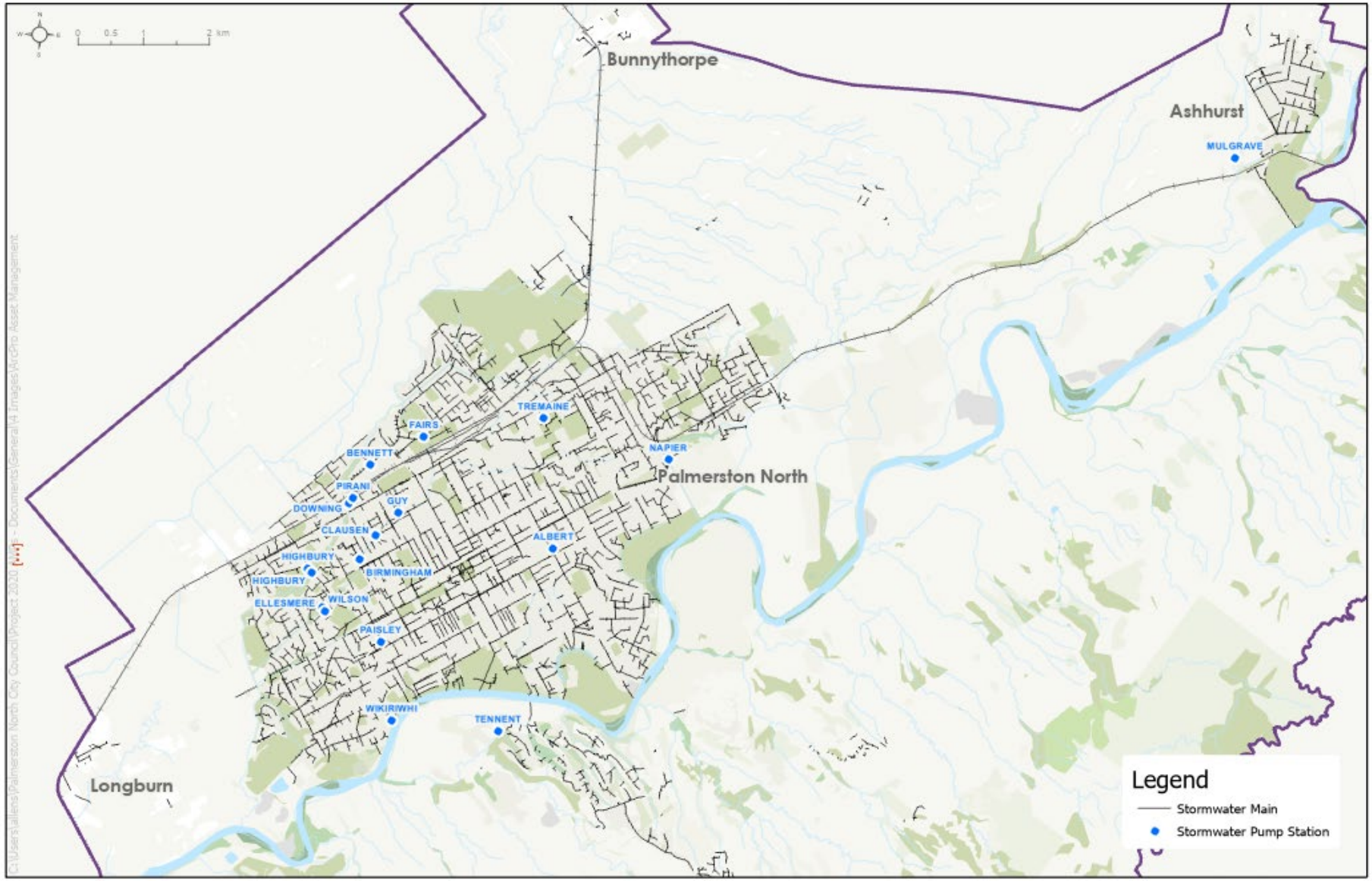


Figure 3: Our Stormwater Network

3.1.1 Stormwater Quality and Stormwater Discharge Compliance

Central government has signalled its desire to achieve significant improvements in freshwater quality. This will be reflected in higher quality standards for discharges to freshwater. The urban streams and waterways of Palmerston North are heavily degraded due to overgrowth of exotic vegetation, litter and significant levels of contaminants entering via the stormwater system. Council will need to work proactively with the community to achieve improved stormwater quality. This can be achieved through a combination of investment in treatment systems, at the source where possible, and remediation of the existing urban waterways. Council will also consider regulatory action under the Stormwater Bylaw 2022 to address illegal discharges.

To support improved freshwater quality, Council has started work on a comprehensive city-wide freshwater monitoring programme called Hai Manga Oranga in close collaboration with Rangitāne. Rangitāne has completed their first round of monitoring at 12 monitoring points covering sensitive environments and along the Kawau Stream. The framework on joint monitoring reporting system to report the scientific and the cultural parameters have been completed. The next step is to start the scientific monitoring and establish an interactive reporting platform. The 2nd year of the monitoring programme is in progress.

To protect public health and the environment, Council is required to comply with the resource consents for discharge from its stormwater system. Based on Non-financial performance measures published by Department of Internal Affairs, Councils' performance is measured by the number of: (a) abatement notices; and (b) infringement notices; and (c) enforcement orders; (d) successful prosecutions, received by Council in relation to those resource consents. Refer to **Appendix C** for a list of resource consents.

3.1.2 Stormwater Catchment Management Plan

There is no catchment management plan developed for Council yet. However, specific projects were designed and delivered to reduce stormwater issues in catchments with high frequency flooding. Council has continued its focus on identifying and addressing local stormwater efficiency and nuisance flooding issues and completed significant investments in new and upgraded infrastructure in the following areas:

- Kent Crescent and Wincanton Place
- Churchill Avenue
- Hospital Line

3.1.3 Flood Protection and Control Work

Council owns and manages 14km stop banks and other flood protection assets to provide control over the flows from two streams (Kawau and Mangaone) to protect the community, buildings and infrastructure. A flood model for areas north of the airport and Bunnythorpe has been completed. Modelling work was extended to include Aokautere and is at a final draft stage. On-going discussions are held with the Regional Council on sharing of flood maps and district advice for flooding. There is keen interest to collaborate by both parties to ensure the right advice is given to the ratepayers regarding minimum floor levels and flooding extent for planning purposes.

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 stormwater services provided by others and assets not owned by Council. For example, stormwater assets located and owned on private land.

3.3 Rationale and Variation with Water and Sanitary Services Assessments

Council provides stormwater services to protect buildings from inundation and from flooding in major events.

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

3.4 Significant Negative Effects

The table belowTable 4 contains a summary of the significant negative effects for the Activity and mitigation measures.

Table 4: Mitigation of Significant Negative Effects of the Stormwater Activity

Significant Negative Effect	Description of Effect	Mitigation Measures
Flooding of Property	Failure of the system resulting in flooding of habitable residential and commercial buildings.	Capital works to address capacity constraints, effective building control to set minimum building floor levels, site-specific detention and attenuation of stormwater in new growth and infill sub-divisions. Protection of secondary flow paths.
Poor water quality	Pollution and contamination of the stormwater from runoff and cross-connections with the wastewater network, resulting in contaminants entering the stormwater network and discharging to streams and the Manawatū River.	Identifying and targeting sites that are at high risk of discharging significant contaminants. Runoff from industrial areas with the potential for stormwater contamination is managed through the building consenting and trade waste regulatory processes. The clean-up for any pollution incidents is managed by emergency response plans (with Horizons Regional Council). Behaviour change initiatives within the community focus on reducing illegal dumping, littering and discharging of hazardous substances into the stormwater system.

3.5 Improvement Actions

- Develop stormwater catchment management plan in liaison with Horizons re One Plan requirements

4 Levels of Service

A key objective of this AMP is to ensure that assets support the 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 Stormwater 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 stormwater.

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 5 Performance Against Existing Levels of Service

Levels of Service Statements	Customer Performance Measures	Target	Performance 2020/21, 2021/22, 2022/23
We provide stormwater services to protect buildings from inundation from flooding in major events.	The number of flooding events per year that result in stormwater from Council's stormwater system entering a habitable floor in an urban area.	Less than 5 events	☺ ☺ ☺
	The number of habitable floors per 1,000 properties within urban stormwater service areas affected by a flood event.	Less than 2	☺ ☺ ☺
	Median time to attend a flooding event	Less than 2 hours	☺ ☹ ☺
	The number of complaints received about the performance of the Council's urban stormwater system per 1,000 properties connected.	Less than 15	☹ ☺ ☺

Levels of Service Statements	Customer Performance Measures	Target	Performance 2020/21, 2021/22, 2022/23
We provide stormwater services to protect buildings from inundation from flooding in major events.	Compliance with resource consent conditions for discharge from our stormwater system measured by the number of: • Abatement notices; • Infringement notices; • Enforcement orders; • Convictions.	100% compliance	
We manage our stormwater assets in a financially sustainable way.*	A 30-year Asset Management is in place and major AMP projects approved in the 10 Year Plan are achieved	Renewals as a group	
	Major services and projects are provided within budget.	Services provided 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

Our Stormwater Activity provides a service for a wide range of users and stakeholders. Anyone who lives, works or plays in the city will benefit from our service. The table below provides the user and stakeholder groups of each of the elements of the stormwater activity 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.

Table 6: Stormwater Users, Partners and Stakeholders

Sub-Activity	Service Description	Customers	Partners	Other Stakeholders
Collection	Removal of rainwater from ponding in public spaces to enable their continued use during, or shortly following, regular rain events.	• Property Owners • Businesses • Residents • Visitors • Road users	• Rangitāne o Manawatū • He Waka Kotahi	• Nga Iwi o te Awa Manawatū • Horizons Regional Council • Developers • Manawatū District Council
Flood Protection	Protection of property from the negative effects of flooding in regular rain events.	• Owners of habitable property	• Rangitāne o Manawatū	• Nga Iwi o te Awa Manawatū • Developers

			• Horizons Regional Council • Lifelines Group	• Property Owners • Businesses • Road Users
Treatment	Minimise the negative environmental impact of rainwater runoff with regards to natural receiving environments.	• Urban properties	• Rangitāne o Manawatū	• Nga Iwi o te Awa Manawatū • Horizons Regional Council • Developers

What's important to our Customers?

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

- Stormwater is collected and disposed of, minimising flooding of buildings and public space.

The reticulation network, specifically the collection and/or discharge points of that network, has traditionally been the primary interface with users, usually in the form of downpipes, catchpits and pipe outfalls. Interaction also occurs at some detention facilities because of dual usage as parks, playgrounds and sports fields.

As treatment facilities become more commonplace, and urban design ideas take hold, community interaction with these facilities will also increase but not necessarily with a perception that these facilities are stormwater-related (for example, rain gardens may just be perceived as gardens rather than collection devices, wetlands as a natural amenity rather than a treatment device, etc.).

What is important to our Stakeholders?

Stakeholders will often agree with users on many aspects of level of service. For example, a developer wants to ensure flood protection for a new subdivision. There will however be key differences and tension between some stakeholder groups in some areas. That same developer will want to meet its regulatory requirements while keeping development costs down.

Rangitāne o Manawatū as a Partner play an integral part in all aspects of environmental impacts. They take a keen interest in Council's progress towards minimising the impact of stormwater discharge on the environment.

Wider groups not directly affecting the district, such as surrounding communities (including other Iwi groups), rural businesses, etc. are also affected by our actions. This is especially so for those downstream of our district. While they could be negatively affected by our actions, they have no direct way of influencing our decisions. These groups are relying on government and regional regulatory controls to ensure we are meeting our requirements for our stormwater discharge.

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:

- Council cannot provide a system that contains all flows. Whether this is in the piped system with no nuisance flooding, or the piped and overland system with no flood damage to property, at some point storm events will exceed the designed capacity of the system, and have an impact on the community;
- While all new buildings have a floor level set by Council, not all old buildings were built to a minimum floor level and so some older buildings may flood more frequently than is considered acceptable. Council considers it impractical and unaffordable to stop this from happening, and considers that the issue will gradually be addressed as the stormwater network is improved and buildings are redeveloped to new standards;
- The maintenance of stormwater catchpits and associated level of service is managed by the Transport activity;
- Although treatment of stormwater to high quality is desirable, Council considers that financial constraints mean a targeted approach to treatment is more appropriate.
- While many of our actions serve to minimise negative environmental impacts, we cannot mitigate all downstream effects of our stormwater discharge or influence the discharge of others outside of our scheme.

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 Stormwater-related infrastructure were:

A summary of customer satisfaction on Stormwater service is presented as follows:

- About two-thirds of Palmerston North residents (62%) are satisfied with Stormwater services.
- Overall satisfaction in 2023 has decreased slightly from previous years
- Residents of Awapuni are the most likely to be dissatisfied with the Stormwater service.

The figure belowFigure 5 shows a summary of the latest Residents' Survey results and the summary of the last five years in Table 7.

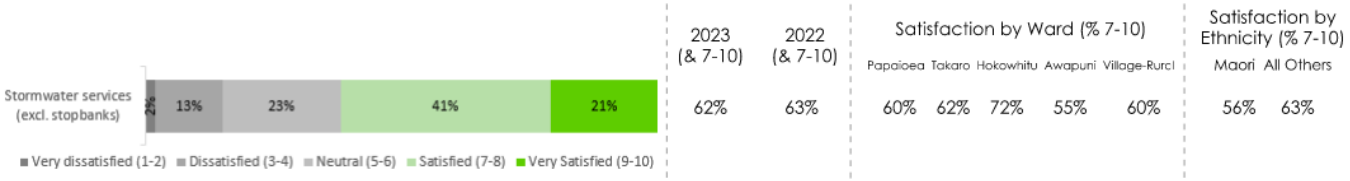


Figure 5: Customer Satisfaction Survey Results for Stormwater

Table 7: 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%
Stormwater services (excl. stopbanks)	-3%	62%	63%	72%	71%	66%

He Aha Ra Nga Whāinga 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 Whāinga 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 8: He Aha Ra Nga Whāinga 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. • 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 Stormwater system is adequate to protect buildings from inundation from flooding in major events. In 2021/22, there was one recorded flood event which affected 6 flooded habitable floors or 0.17 per 1000 properties within urban Stormwater service areas.

In 2021/22, the median response time to attend the flooding event was 3 hours which is more than the target of 2 hours set by Council.

A total of 205 complaints or 6.1 complaints per 1000 properties connected were received in 2021/22. This is a reduction from 2020/21 when our Stormwater service received 560 complaints in total, equating to 16.7 per 1,000 connections. The highest proportion of complaints relate to pipe/ underground services damage, followed by waterway or open drain problems, property flooding or drainage problems, stormwater events, and roadside ponding.

Our Stormwater service has fully complied with resource consents for discharge for the last three years. There have been no convictions, abatement, infringement or enforcement orders received by Council since 2019.

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 the provision of our services within budget. This is mainly due to:

- The city's stormwater infrastructure continues to age. Use of CCTV, physical inspection, and condition assessments will enable Council to develop a robust assessment of renewal requirements. It is likely increasing investment in the stormwater network will be required to maintain levels of service.
- While there was one recorded flood event during 2021/22, significant areas of the City remain at risk of flooding, considering the potential impacts of climate change. Work needs to continue using modelling and improved understanding of the network and property risks to identify high-risk areas in the City. This will help us to identify effective and affordable flood mitigation options and maintain the current level of service.

4.4 Improvement Actions

- Continue development and application of flood modelling

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.

Stormwater's current approach is to regularly maintain and update the stormwater model to understand the effect of the projected growth and development scenarios. Programme has been developed to fund operation and maintenance of vested Stormwater assets.

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.

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.

To provide stormwater service to growing residential areas, there will be a need to expand the network and enhance the capacity of the network. It is assumed rural-residential subdivision will occur in locations which do not require us to fund substantial upgrades to the Stormwater network in order to facilitate the subdivision.

To protect buildings and community from inundation from flooding events in the subdivision, Council is currently adopting the approach of identifying local areas and undertaking on-site mitigation. The citywide flooding protection programme will benefit the city density projects.

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 have developed a Stormwater Management Plan for this new subdivision that includes green corridor, swale, ponds, wetland. Council will purchase the land and the funding is expected from development contributions. This project is currently in the planning and concept stage.

Ashhurst

Growth in Ashhurst is planned for the medium term (next 4-10 years). This proposed development is located along the current stopbank owned by Horizons Regional Council; therefore, we are likely to not support this development due to viability.

Aokautere

This is a proposed plan change to allow for up to 1,000 new homes in Aokautere in the medium term. It is anticipated that all stormwater discharge will go to the gully which will increase the risk of erosion at the gully. Therefore, our Stormwater network will need to detain the discharge flows and surface run-off. We will introduce controlled post-development conditions to mitigate peak flows and downstream effects.

Rezoning Roxburgh Crescent

Roxburgh Crescent is an industrial pocket of Hokowhitu, situated between the Manawatu River and neighbouring homes. This rezoning project will enable up to 123 new homes to be built. We plan to upgrade the stormwater outfall through the stop bank along the River.

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 home eventually planned. As this development progresses, extensions to the Palmerston North Stormwater network will be needed to service new homes. In addition, new Stormwater drains and ponds will be developed to service the community along the Napier Road.

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. We will continue to monitor the type of industry going into the NEIZ. We will determine how our Stormwater network can best service this area.

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 the Stormwater capacity meet agreed levels of service.

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.

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 redundancy 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 ongoing programmes focussed on improving resilience.

- **Stormwater Pump Stations Improvement** – significant upgrade or addition to mechanical/electrical equipment in the stormwater pump stations and the associated outlet works to ensure level of service are improved; provide redundancy for some of the pump stations that are only equipped with one pump and without any standby.
- **Flood Mitigation** – works to look into the larger/big scale mitigation projects required to alleviate and minimise flooding city-wide. They projects include diverting or re-aligning the network (pipes bigger than DN2050) and creating dams to store stormwater to reduce stormwater discharge rates to the pre-development level
- **Land purchase** – acquire drainage reserves for waterways that are currently flowing through private Lots and do not have designated drainage reserves.

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. The capacity of stormwater systems may be exceeded more frequently due to heavy rainfall events, causing damage to public and private properties. Combined with the ageing stormwater infrastructure, we might see increased numbers of the unexpected asset failures in Palmerston North as they are exposed to beyond-design events with climate change.

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 stormwater collection, 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 Stormwater pump stations, will mean less reliance on the national energy grid.

Key sustainability issues arising impacting on the stormwater activity are as follows:

- Increased hardstand areas reduce opportunities for soakage, increase total runoff and reduce potential for groundwater recharge.
- The transmission of pollutants from the source to the receiving environment via stormwater discharges. The quality of the stormwater discharges, particularly first flush of runoff from the built environment, will need addressing if an improvement to the biodiversity of streams and gullies and better riparian ecology is to be fostered.
- Continuing community pressure to reduce the incidence of flood damage and reduce extended ponding following rain events may necessitate strategic capacity upgrades to the stormwater network.
- An increased community focus on transforming stormwater reserves, corridors and waterways in terms of condition and appearance. This is due to increased environmental awareness and interaction with these spaces, including providing cycling and walking connectivity, amenity and recreational spaces.

It is important to note that regulatory and community expectations in this area are expected to increase, pushing Council to look for new ways of delivering services.

Sustainability considerations are incorporated into the AMP through the following mechanisms:

- Implementing consent conditions for all new developments to include stormwater treatment as a requirement
- Engineering Design Standards which require whole of lifecycle cost assessment and set out acceptable solutions for stormwater attenuation and detention devices and treatment systems.
- Stormwater Drainage Bylaw 2022 which provides for at-source improvement of stormwater discharges.
- A programme of city-wide stream cultural and scientific monitoring to track the quality of the receiving environments to ensure the measures are working.

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.

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 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 Stormwater 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 2.3). It is expected that Horizons Regional Council (Horizons) will amend the Regional Plan (The One Plan) in response to the NPSFM. Based on Horizons response to previous 2017 NPSFM is anticipated that this will at least include:

- A move towards Global Discharge Consenting for urban areas.
- The requirement will be introduced to have Catchment Management Plans for all existing urban areas within Palmerston North City boundary. These Catchment Management Plans will set out performance targets and actions to achieve stormwater quality improvements.

Horizons continues to seek to limit the extent of stormwater peak flow increase in order to limit flood flows in the Manawatū River. This will drive the requirement to limit peak flows to pre-development levels (i.e. attenuation) in all major new developments.

We will continue to work proactively with Horizons to identify the best means of achieving improvements in stormwater quality outcomes, that is both practical and cost effective. As a part of this we intend to implement the treatment requirement for all new developments to include stormwater treatment in their consent conditions and publish a framework to guide developers.

We 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.

We are also committed to implementing the monitoring of receiving environments to track how well treatment devices are operating, which will aid us in refining treatment options if some are found to have issues.

5.5.3 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 Stormwater network to plan for network improvements and upgrades.

To help us better understand network performance, we propose the following improvements:

- **Data Collection** – undertake city-wide data collection and water quality monitoring
- **Stormwater Treatment Devices** – maintenance of city-wide Stormwater treatment devices

5.7 Demand Trends

Medium density urban intensification has been occurring in Palmerston North, which results in a significant increase in stormwater demand in the development and surrounding areas. It is difficult to gain a good understanding of demand projections due to the lack of a robust and consistent data source. However, we have identified key trends as follows:

- **Addressing flooding issues** – Due to climate change, there is expected to be more frequent and severe weather events. urban intensification also increases the likelihood of extensive flood events. Considering community's expectations on protection of buildings from flooding events, it is anticipated that we will launch more flood mitigation initiatives.
- **Water quality treatment and waterbody restoration** – To deliver on Te Mana o te Wai, stormwater quality treatment and restoration of our waterbodies is going to become increasingly important.

5.7.1 Flood Affected Habitable Floors

The number of habitable floors per 1,000 properties within urban stormwater service areas affected by a flood event can indicate the demand trend for Stormwater infrastructure. The figure below shows the Water New Zealand National Performance Review results for the last four years for affected habitable floors and flood events. In 2021/22, one recorded flood event occurred in Palmerston North, as a result, six flooded habitable floors or 0.17 per 1000 properties within urban stormwater service areas were damaged.

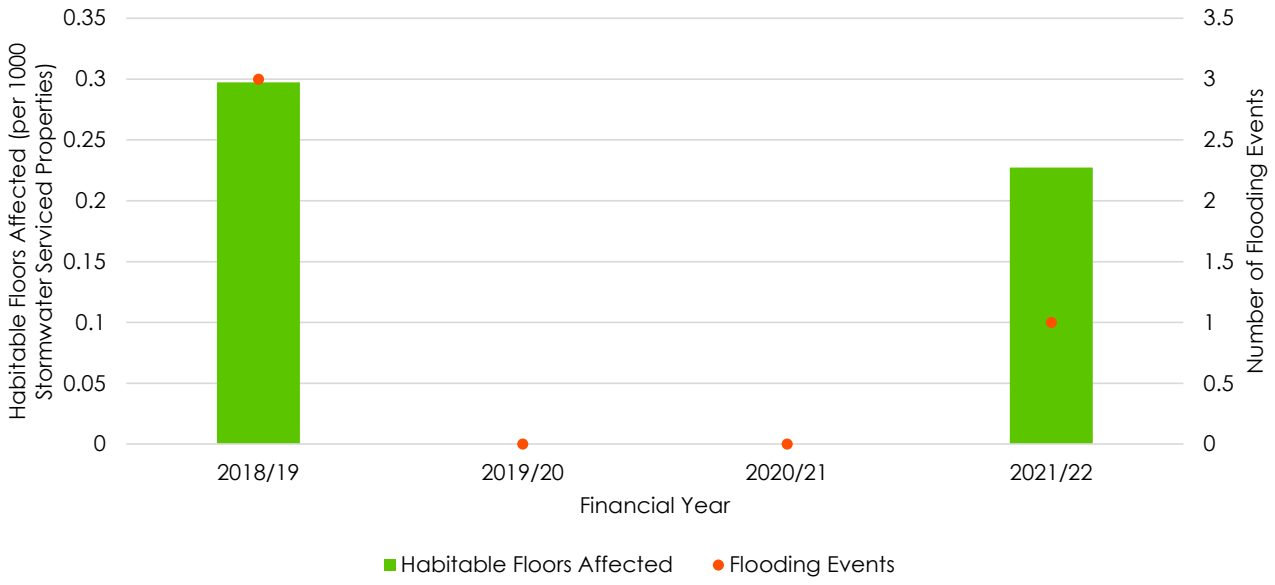


Figure 6: Historical Yearly Affected Habitable Floors against Number of Flood Events

5.8 Demand Management

5.8.1 Sensitivity to Demand Changes

The city wide 2-D stormwater modelling work is well advanced and has identified the current pattern of stormwater drainage and identified areas at risk of significant loss due to flooding. This modelling work will be further developed to assess the impacts of significant changes in land use, especially that of infill development and increasing percentages of impervious surfaces, on the flood damage risk. Based on this work, a range of potential mitigation measures have been identified and these will be assessed to determine their technical feasibility and efficacy at mitigating the flood risk. The works are largely focussed on the development in the existing urban area.

With respect to future growth areas, stormwater discharge typically will be released to Horizon's controlled water courses or rural drainage networks. Council has mandated specific stormwater volume and quality mitigation measures to ensure developments have as little impact as possible on the receiving environment.

5.8.2 Stormwater Management Framework

The extent to which Council can implement sustainable urban drainage requirements will determine the extent of growth impacts on the demand for stormwater services. Consent conditions are being applied to new developments requiring attenuation (limiting peak flows to pre-development levels) and treatment facilities funded by the developers either directly or through development contributions.

As mentioned in section 1.6.1, we are in the process of preparing a stormwater framework to guide developers on implementation of these measures. The Framework details at a high level what is generally required in terms of stormwater attenuation and treatment across each catchment within the greater area of Palmerston North City. Over time additional policy and planning instruments will be utilised to look to apply the principles of the Framework. It will include its reference in the District Plan. This work has been put on hold as it may be superseded during the water reform.

5.8.3 Building Floor Level Control

A key factor in effectively mitigating flood damage is to accurately identify flood risk areas and then restrict and control building activity by way of setting minimum floor levels for new dwellings or buildings. This is particularly important within infill development where older style timber piled housing is often replaced with concrete slab foundation dwellings. Without the setting of specific minimum floor levels supported by flood modelling work, new buildings could be constructed with a lower floor level than the original building resulting in an increased risk of flood damage.

The predicted 50yr ARI flood levels in the model are used to set floor levels through the building consent process. These are then enforced via the Building Act.

5.8.4 Education & Environmental Enhancement

Education programmes could create greater public awareness on our environment. A series of education and public engagement activities includes:

- Promotion of the impact of human activities and contaminants on the stormwater receiving environment
- Undertaking watercourse enhancement activities to raise cognisance of biodiversity and improve community ownership and engagement with the urban stormwater network
- Community engagement, such as stream cleaning, vegetation clearing and planting the banks

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 9: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	Significant upgrade or equipment improvement in the stormwater pump stations and the associated outlet works Conducting larger/big scale flood mitigation projects to alleviate and minimise flooding Acquiring drainage reserves for waterways that are currently flowing through private Lots and do not have designated drainage reserves
Climate change	Recommendation that Council includes specific actions for three waters activities in the next update of its climate change action plan.
Sustainability	Inclusion of stormwater treatment as consent requirements for all new developments Enhancement of Engineering Design Standards for design of stormwater facilities Enforcement of the Stormwater Bylaw 2022 to improve stormwater discharges Conducting the programme of city-wide stream cultural and scientific monitoring to track the quality of the receiving environments
Legislative changes	Participation in Three Waters Reform activities Alignment of processes and initiatives with national and regional environmental legislation Compliance with proposed changes to Dam Safety Regulations
Technology advances	Implementation of city-wide data collection and water quality monitoring Maintenance of city-wide Stormwater Treatment Devices

5.10 Improvement Actions

- Council includes specific actions for three waters activities in the next update of its climate change action plan.
- Data Collection – undertake city-wide data collection and water quality monitoring
- Stormwater Treatment Devices – maintenance of city-wide Stormwater treatment devices

6 Our Assets, Condition and Performance

6.1 Asset Summary

We own some $322 Million worth of assets to provide our stormwater services in the urban areas (note that rural roadside drainage is managed as part of the Transport Activity). The figure belowFigure 7 presents our stormwater assets, of which most assets, by value (over $200M), are stormwater mains. While the assets are managed under a single sub-activity, “Collection and Disposal”, these assets provide three core functions:

- Drainage (piped network and modified streams);
- Flood protection (flood gates and Kawau Stream stop banks); and
- Treatment (gross pollution traps, nets, rain gardens and constructed wetlands).

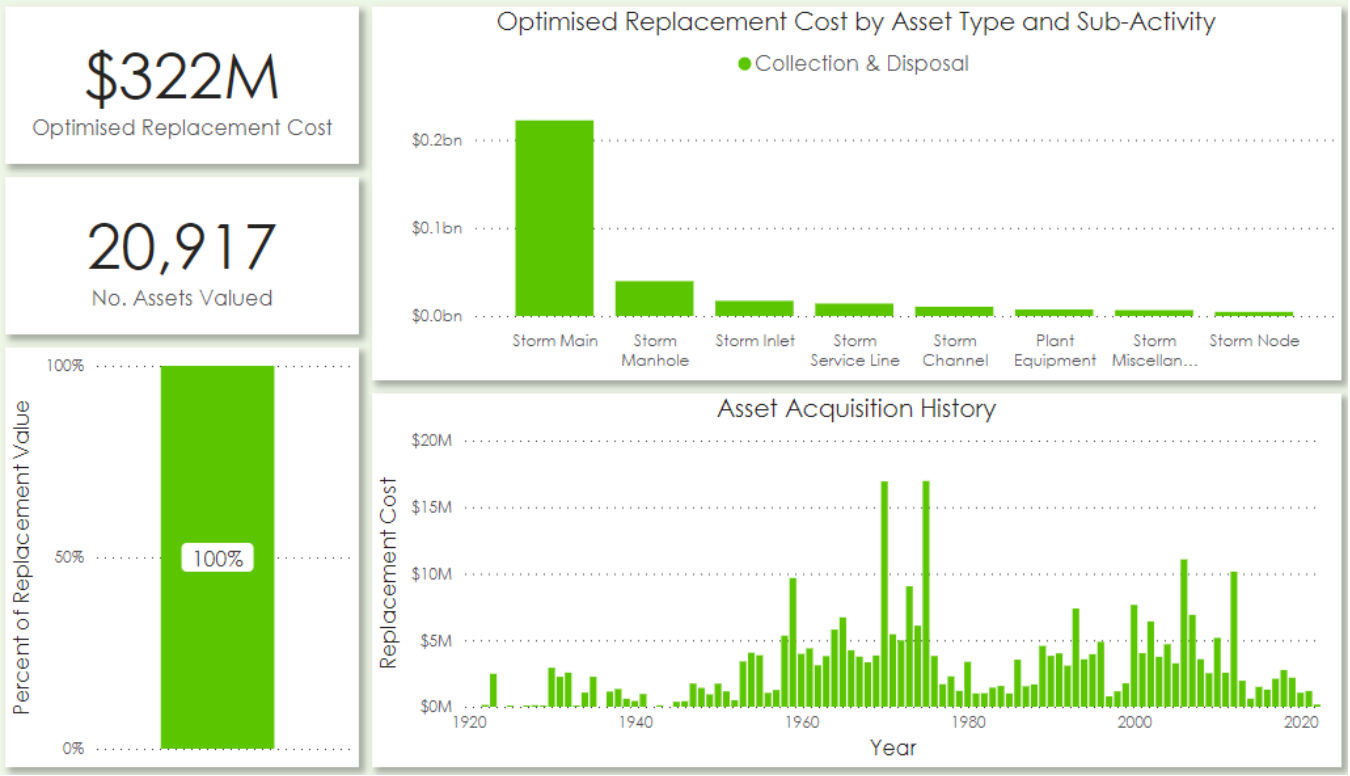


Figure 7: Optimised Replacement Cost (2022)

The table belowTable 10 contains some additional key statistics for each asset type. While constructed channels, stop banks, basins and other improvement works are valued, natural water courses and streams are not included in the stormwater asset valuation.

Table 10: Key Stormwater Asset Statistics (June 2023)

Asset Group	Details	Quantity
Collection	Pipes – Circular	296,161 m
	Pipes – Rectangular	8,365 m
	Manholes	5,588 no.
	Mains Connections	25,912 m
	Sumps Connections	55,344 m
	Kerb Connections	66,876 m
	Inlet and Outlet Structures	585 no.
	Channels, natural and artificial	54,264 m
	Protection Works	15 no.
Flood Control and Protection	Floodgates	138 no.
	Storage Basins	8 no.
	Stop Banks	14,106 m
	Pump Stations	18 no.
Pre-Treatment and Treatment	Drainage Reserve Land	83,288 m2
	Constructed wetlands	
	Rain gardens	
	Gross pollution traps (including outlet nets)	
	Sump traps	6,051 no.
	Grass swales	

The table below gives a brief description of the different stormwater asset types.

Table 11: Definition of Asset Types

Asset Type	Purpose
Pipelines and Culverts	These convey stormwater away from developed areas. Pipelines are normally circular pipework while culverts here refer to stormwater conduits that are of non-circular shapes such as rectangular, corrugated or multi-cell units. Rectangular pipes are associated mainly with the piping of the Kawau Stream
Manholes	These chambers provide access to pipelines at intervals of generally not greater than 100m. Manholes are located at confluences, changes in pipeline gradient or alignment.
Mains Connections	These pipes convey stormwater from properties directly to Council's stormwater mains.
Sump Connections	Sometimes referred to as sump leads. These pipes connect the street sumps to the stormwater mains.
Kerb Connections	Convey stormwater run-off from private property to the street kerb face.
Floodgates	Flood gate structures control the direction of the stormwater when the flow is high.

Asset Type	Purpose
Inlet/Outlet Structures	Located at inlet and outlets when necessary, to retain the surrounding earth.
Detention Basins	Provide storage to reduce peak flows of stormwater downstream.
Channels-Artificial	In addition to natural watercourses and streams, these man-made or modified channels convey stormwater away from developed areas when the construction of a pipeline is uneconomic or not appropriate.
Stop-banks	These are earth embankments or concrete floodwalls along stream banks provided to prevent the overtopping of stream banks and discharge of flows onto surrounding properties.
Protection works	These protect the banks and beds of channels from erosion and include gabion baskets, channel lining etc.
Pump stations	Civil and mechanical structures which enable the pumping of stormwater from low areas in the system.
Treatment Devices	Assets that achieve treatment of stormwater via various means, including pre-treatment where they capture gross pollutants.
Flume	An inclined Open channel to discharge stormwater through steep embankments

6.2 Collection (Drainage) Assets

The collection network is made up of primary and secondary systems. The primary system is to drain stormwater resulting from frequent rain events. The secondary system, typically roadways and overland flow paths, exists to minimise the effects of flooding when the flows are more than the capacity of the primary system.

Historically the indicative design standard adopted by Council for the primary stormwater system has been to handle runoff from a storm with a 20% AEP (Annual Exceedance Probability, or the chance of being exceeded in any given year). For more significant and less frequent rainfall events the expectation is that the secondary stormwater system will provide the additional capacity required to avoid flooding of habitable dwellings and commercial premises for up to a 1% AEP event. In practice, significant parts of the city have been provided historically with primary networks having a much lower design capacity, such that secondary flow networks operate more frequently than is currently desirable.

Stormwater collected by the existing pipe system is often discharged into streams and channels which may be located within our reserves or private properties.

The ultimate receiving watercourses are the Manawatū River, Mangaone Stream, Kawau Stream downstream of Botanical Road, and the Ashhurst Stream.

6.2.1 Pipelines, Culverts and Manholes

The figure belowFigure 8 depicts the length of stormwater mains and culverts categorised by age. More than two thirds (77%) of stormwater pipelines have been constructed since 1960. Concrete stormwater pipes are expected to last well more than 100 years; thus, most pipelines are in the first half of their lifecycle. Most of the pipelines are made of concrete, but new pipes are typically constructed of plastic if they are smaller in diameter. Overall, most of the network comprises pipes smaller than 600mm in diameter. Note that the kerb and channel, and sump assets are managed separately under the Transport AMP.

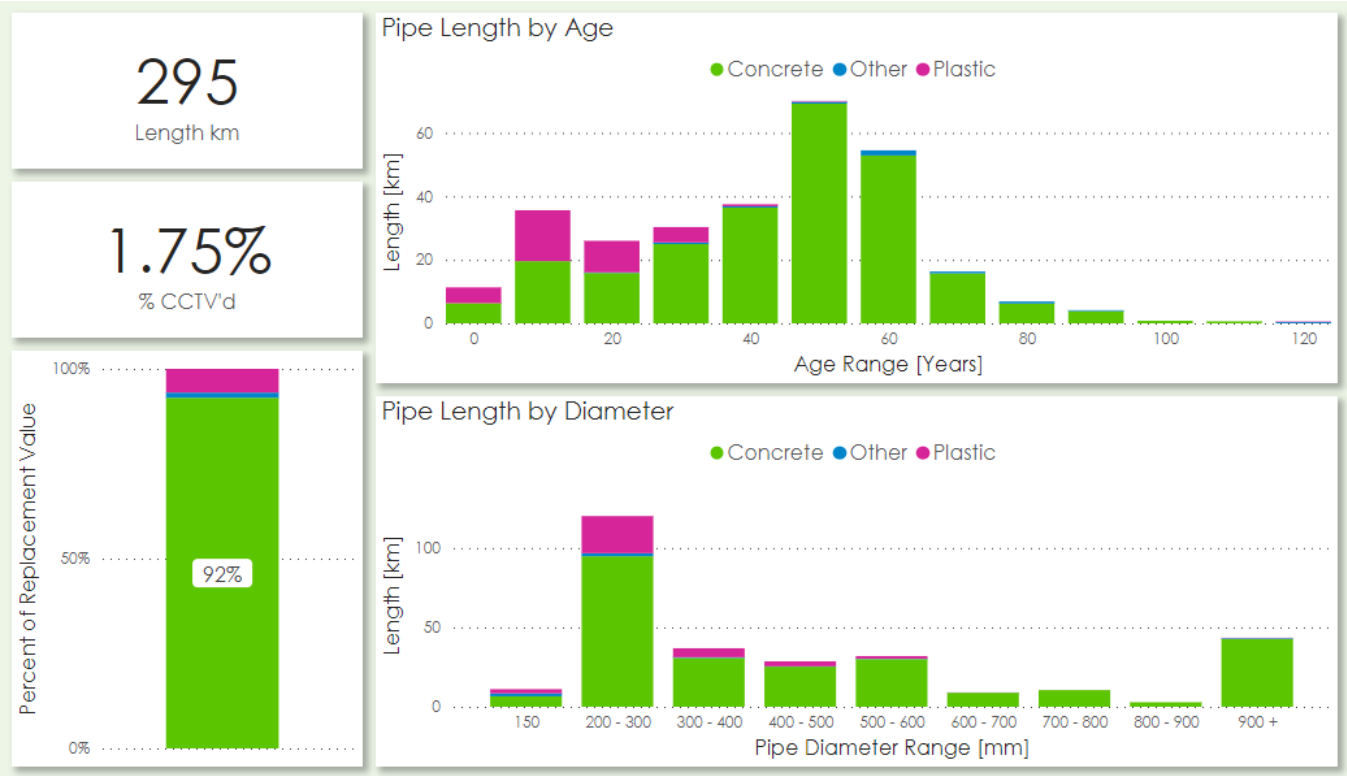


Figure 8: Stormwater Pipe

6.2.2 Channels and Protection Works

Structures associated with streams and channels protect the integrity of the watercourse and allow it to interact with other infrastructure. This includes floodwalls, fences, concrete and timber retaining walls, as well as erosion protection works such as gabion baskets and channel lining.

6.3 Flood Protection Assets

Flood protection measures are largely regulatory, with planning and building controls placed on all buildings, such as minimum floor levels, as well as additional controls or possibly bans in particularly high-risk areas.

6.3.1 Pump Stations

Due to the flat topography of Palmerston North, some areas cannot drain to the natural streams or rivers by gravity alone, especially when receiving levels are high and gravity stormwater outlets are submerged. Pump stations are required in these areas to dispose of stormwater during high flows and increase the capacity of the system. Locations of these pump stations are shown in Figure 9. Many of the pump stations in the city currently are running on either one pump or equipped with pumps at the end of their life span. This is the second year of Council's programme to renew and refurbish the major stormwater pump stations in the city. Last year saw significant work completed on Sutton Pl, Paisley St and Vautier Park pump stations. Although there was significant delay in implementation of the work this year due to limited contractor availability, work is at 80% completion at Guy Ave and Wilson Cres pump stations. Sutton and Paisley pump stations now have new duty and standby pumps with the appropriate level of service. These pump stations also had significant upgrade of electrical cabinets as part of works standardising the operation and settings across the city's other pump stations.

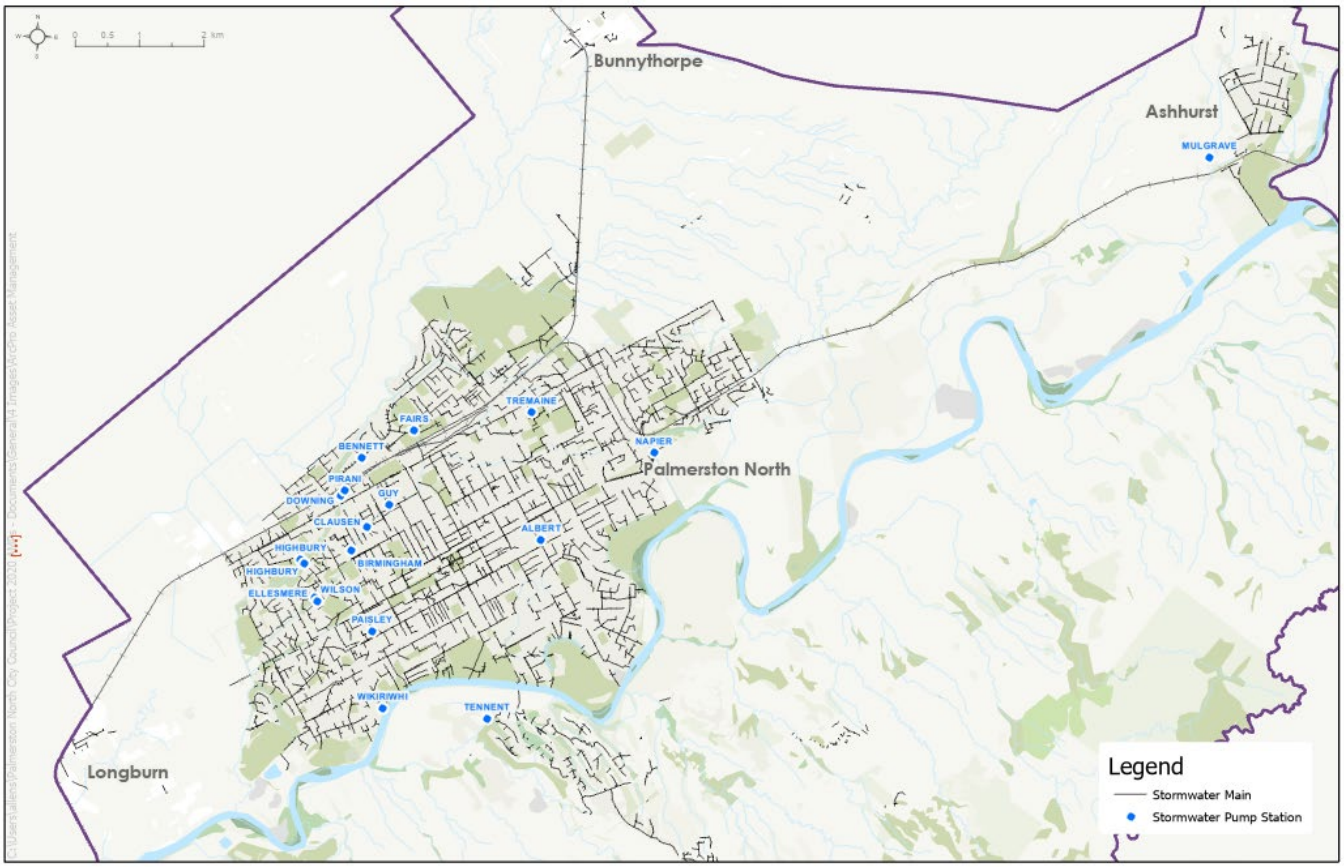


Figure 9: Location of Stormwater Mains and Pump Stations

6.3.2 Stop Banks

With regards to physical infrastructure, stop banks are provided and maintained on two streams (Kawau and Mangaone) running through the city, which also double as receiving environments. Pumps are placed in strategic locations to lift stormwater over these stop banks when the streams are running high.

6.3.3 Detention Basins

There are also a small number of storage basins and ponding areas that form part of the stormwater collection system. In managing stormwater drainage, informal storage basins and formal surface attenuation devices reduce peak flows by detaining stormwater until drainage networks and receiving watercourses can cope with the flows.

6.3.4 Floodgates

Floodgates and other mechanical installations support flood protection assets by controlling the direction of the stormwater when the flow is high. Floodgates include not only penstocks and sluice gates but also flap gates (non-return valve or backflow preventers).

6.4 Treatment Assets

Stormwater treatment methods are diverse and can be:

- placed at the point of collection, such as gross pollutant and sump traps to provide screening and pre-treatment;
- Along road shoulders such as rain gardens or similar bio-retention devices
- built into the conveyance system, such as with grassed swales; or
- situated just before discharge to a receiving system (piped system, open drain, or watercourse) such as with constructed wetlands.

Currently, we own relatively few of these assets, but the number is expected to increase as water-sensitive design is applied to improve water quality.

6.4.1 Constructed Wetlands

Wetlands are engineered treatment system consisting of large shallow pools of water body and planted with suitable species of vegetation to provide the required water quality outcomes. This approach is often adopted for new sub-divisions discharging to sensitive receiving environment, where Horizons Regional Council is likely to place stringent water quality requirements.

6.4.2 Rain Gardens and Grass Swales

Rain gardens and swales are generally the more preferred bioretention facilities to treat stormwater runoff from the road and other hard surfaces for all the new sub-divisions. They are typically located on road shoulders and use engineered media to treat polluted stormwater. These facilities are planted with shrubs and grass which promotes filtration through different layers to achieve the required water quality outcomes.

6.4.3 Sump Traps, Gross Litter Traps and Outlet Nets

These devices are generally used as screening and to capture larger contaminants and solids from entering the network. This prevents the network from being blocked up and provides pre-treatment. Generally installed in sumps, at outlet structures, stream crossings and end sections of the network. Some of the larger commercial and industrial areas have been fitted with these devices to capture plastics and intercept other particles such as oil, grease and grit.

6.5 Asset Condition and Performance

6.5.1 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.

6.5.2 Condition

Condition ratings shown in Figure 10 are largely assumed based on age and expected life. Condition ratings are: 1- very good; 2 – good; 3 – moderate; 4 – poor; 5 – very poor.

For our Stormwater Activity, we only carry out CCTV condition assessment for Stormwater pipes. A $50,000 budget is designated for CCTV condition assessment annually. A programme has been developed for undertaking CCTV inspection on pipes with a diameter of 900mm or larger. It is noted that our Stormwater network is not very old.

Figure 10: Stormwater Asset Condition

Network Condition

The figures below show how our assessment of Stormwater network asset condition which is mainly based upon theoretical asset design lives compares with the national average from the Water NZ National Performance Review. Further work is required to confirm the actual condition of our piped network.

Council has an on-going investment in CCTV inspection of critical and aged parts of the pipe network, which runs a camera through the pipe network to pick up faults through visual inspection. This year 3km of the critical network was inspected, mostly covered sections of Kawau Stream. This data will be used to plan priorities for renewal works for the next few years. The CCTV inspections, as well as condition assessments of pump stations, also identified areas of the network in urgent need of renewal. A city-wide inspection of the open drain and streams network identified a significant backlog in maintenance work. Additional funding was approved by Council to begin to address this issue over the next ten years. A programme of work has been developed to address some of the most critical sections of the network, for example, clearing waterways and channels, planting stream, working on some significant slumping banks.

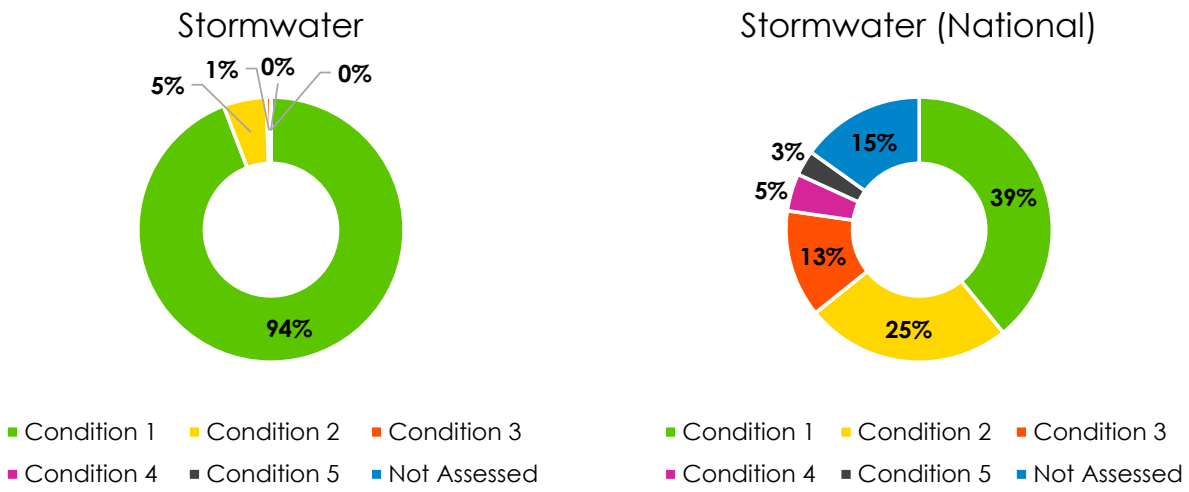


Figure 11: Palmerston North Stormwater Pipe Network Condition (PNCC Network: Left, National Average: Right) (NPR 2022 Data)

Pump Station Condition

All condition statuses of plant equipment in pump stations is assumed and indicates that nearly half of the assets are approaching the end of their useful life. As pump stations provide flood protection it is a high priority to assess their actual condition.

6.5.3 Performance

Performance of stormwater assets is largely indicated through customer complaints, especially properties that repeatedly experience flooding issues. Areas of concern that have been addressed by increasing the capacity of the network recently include Botanical Road, Long Melford and Jensen Street. New GIS and modelling tools have been developed to understand the cause of issues as they are reported by customers.

There were no reported cases of habitable property flooding during this year. Incidents of localised ponding, road and property flooding were reported; however, these were at levels similar to the previous year. Some immediate mitigation work was undertaken to clear the local network of blockages and investigation work is underway to identify cost-effective improvements to reduce the risk of future flooding events in these areas.

There are consent issues on most of discharges to the Manawatu river and to the Mangaone stream. Council has no records of stormwater interceptors or treatment devices recorded for existing industrial premises and high risk catchments such as Tremaine Ave and Rangitikei St. Efforts are initiated to monitor water quality in some catchments (refer to section 8.8).

6.5.4 Asset Deterioration

We have ongoing renewals programme for our Stormwater network (pipes, sumps, manholes and outlet structures) and pump stations. For Stormwater network, it includes ongoing replacement, upgrading and rehabilitation of elements of the network; while for pump stations, we undertake renewal of mechanical/electrical equipment in the Stormwater pump stations and the associated outlet works.

6.5.5 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:

- **Network Condition Assessment** - develop and implement a condition assessment programme for network assets to better inform our renewals programme
- **Network Modelling and Consenting** - further develop our network models to better understand operational performance, facilitate resource consent process, and improve development planning
- **Data Collection** - undertake city-wide data collection and water quality monitoring

6.5.6 Meeting Levels of Services

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

- **Network Improvement Works** - upgrade and/or extend Stormwater systems. Assets includes pipes, sumps, manholes, streams, channels, and earth structures
- **Network Maintenance** - undertake ongoing maintenance programme for reticulation, open channels, drains, streams, and earth structures.
- **Stormwater Treatment Devices** - maintenance of city-wide Stormwater treatment devices
- **Pump Station Operation and Maintenance** - maintenance of city-wide Stormwater pump stations

6.6 Improvement Actions

- Include more condition assessment information about pump stations assets in this AMP
- Apply an asset criticality methodology to identify which assets should be prioritised for condition assessment and where applicable renewal works
- To better focus our renewals programme investment, we propose to develop preventative maintenance and condition assessment programmes.
- 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 Stormwater activity.

Table 12: 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 risks are 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 programs, 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 each raw risk has 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 Waters 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 were 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:

- **Stormwater 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 upgrading pipelines and cleaning grate and gullies. These aspects are all covered in our proposed capital works programme.
- **Compliance** – the main risks around the stormwater compliance are Ingress of unacceptable substances into stormwater and flooding events/incident resulting in unwanted discharge. Further testing, inspection, and regular sample analysis are proposed to identify issues. Public education, financial penalties and infringement notices are also effective approaches for this risk.

7.1.3 Improvements to Risk Management

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

Council Wide 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 criticality 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 enterprise risks.

Three Waters Risk Improvements

The 2022 maturity assessment acknowledged 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, the Stormwater Activity was identified as an essential service, in particular, flood protection (refer to OASIS: 1731539). The maintenance of critical assets, specifically pump stations, was identified as an essential service. 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 Stormwater activity is covered by Part E: Stormwater 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.

Stormwater Pipes Criticality

For Stormwater, the 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 by flooding in properties or roads). (It is recognised that this is a 'loose' connection but is the best option in the absence of data from catchment modelling identifying specific overland flow paths or ponding arising from pipe failure). The larger the diameter, the higher the criticality.
- Assets in stopbanks are critical, based on the assumption that consequences of pipe failure in a stopbank are higher than other locations.
- Location (repair costs are likely to be higher in these areas and may cause disruption to the road/building/railway that the pipe is in the vicinity of).

The Stormwater pipes criticality model is shown below.

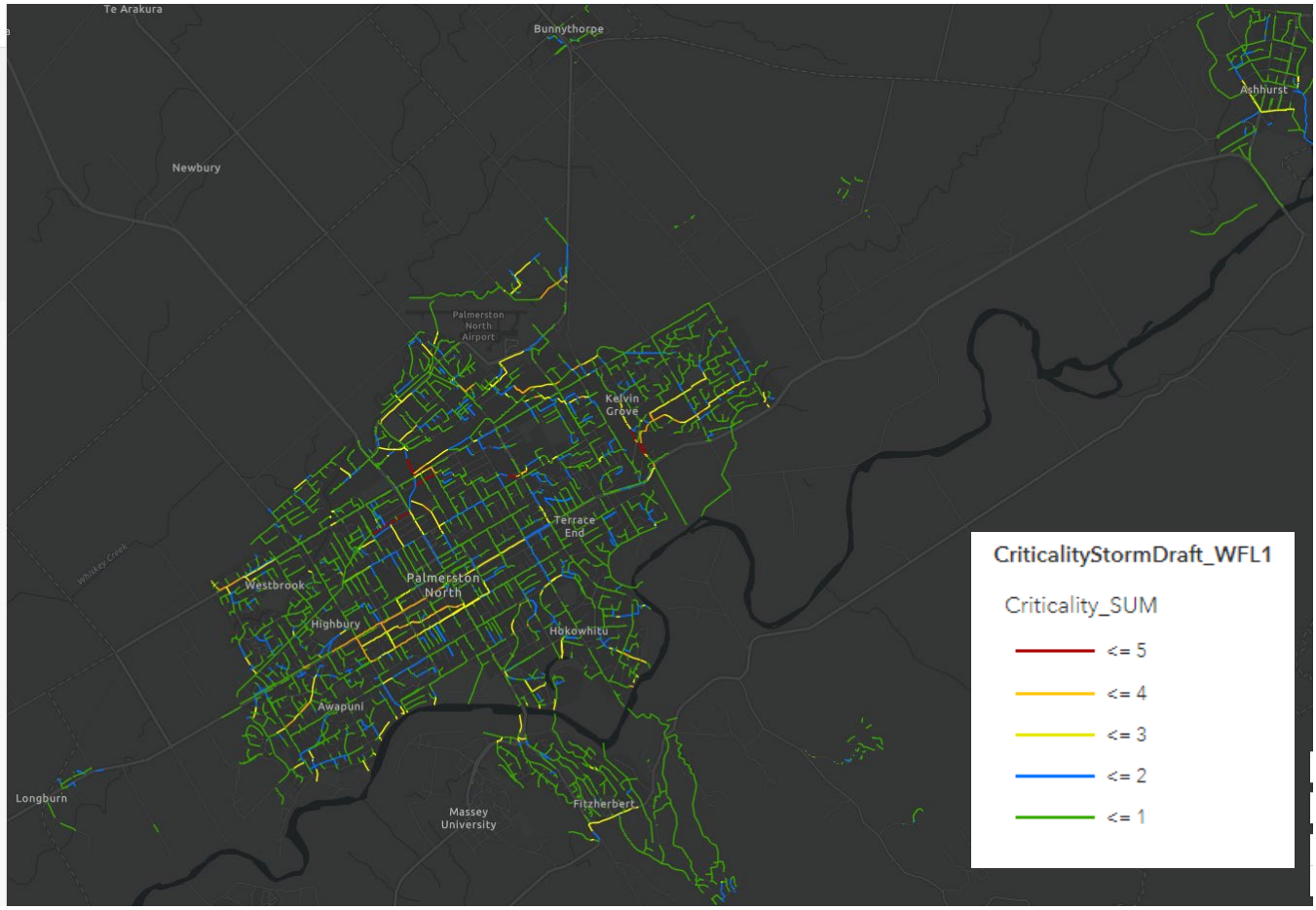


Figure 12: Stormwater Pipes Criticality Model (Source: Part E: Stormwater Pipes - Asset Criticality Framework and Guidelines, Palmerston North City Council, July 2022)

Criticality of Pump Stations and Stop Banks

Table 13: Critical Assets of Stormwater Pump Stations and Stop banks

Critical Asset	Criteria	Dependent Users & Services	Assessed Overall Criticality
Pump Stations: • Fairs Road • Ellesmere Crescent • Guy Avenue • Birmingham Avenue • Clausen Street	The number of people and properties adversely affected. Flow rate >750 L/s. Consequential cost of failure	Residents. Emergency services.	High
Pump Stations: • Bennett Street • Paisley Street	The number of people and properties adversely affected. Flow rate >750 L/s. Consequential cost of failure Critical user,	Residents. Significant business activities.	Medium
All flood gates Kawau stream upstream of botanical Road	Number of people and properties affected	Residents.	Medium

7.3.3 Critical Customers

Critical customers have not been assessed on the basis that a disruption to a pipe or channel downstream of a critical customer will not usually require that site to stop operating - any overflow would be mitigated at the failure location.

7.3.4 Critical Suppliers

Critical suppliers are those providing services required for the Stormwater 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 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.

Description of Risk	Potential Effect on Assets/Service	Mitigation Measures
Natural Hazards		
• Seismic	Pipe network: • 87% pipes classified as brittle (reinforced concrete, more vulnerable to seismic events) • 13% pipe network classified as ductile (less vulnerable to seismic events) Loss of power	Renewal with ductile pipe materials Prioritise pipe replacement for critical services or those in seismically vulnerable areas Back up operational resilience e.g. two points of supply A trailer-mounted generator is maintained by Water Operations (Infrastructure) which can be used for any of the stormwater pump stations
• Storms (Flooding, Lightning and other Severe Weather)	Breach of stopbank Unable to drain the excessive flood water Damaged pump controls and electrical circuitry caused by a lightning strike	The Horizons One Plan requires new structures, activities or critical infrastructure located in a floodway to be designed to be protected from a 0.5% AEP (1 in 200 years) flood event. Horizons has upgraded the river stopbank assets to protect the urban areas for river flood events up to a 0.2% AEP (1 in 500-year ARI) flood event. Flood gates are installed on outlets Extensive secondary flow path network and informal local detention areas
Volcanic	Ashfall building up in the City's stormwater drains and channels	Reactive network maintenance including pipe flushing, channel

Description of Risk	Potential Effect on Assets/Service	Mitigation Measures
	Ash carried through to pump stations, damaging pumps through corrosion and/or choking of the pump impellors	excavation, desilting of attenuation ponds, and pump station cleaning
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

7.4.2 Desired Resilience Levels Versus Current Levels

Table 14 provides a summary of the assessed resilience of the critical stormwater assets to an MM9 earthquake, with a return period of 1,000 years. Where the current level of resilience is less than the desired level of resilience, further work is to be undertaken to determine options for increasing the resilience of the asset and managing service delivery following a seismic event. This will include a review of the desired level of resilience. The average resilience of the stormwater network as a whole is medium, noting that the network is mostly a gravity system that follows natural gradients and flow paths.

Table 14: Resilience to Seismic Hazard

Critical Assets	Criticality	Current Level of Resilience	Desired Level of Resilience
Piped drains and manholes	Medium-High	Low	Medium - High
Culverts	Medium	Medium	Medium - High
Pump stations	Medium-High	Low - Medium	High
Stop banks (PNCC owned)	Medium	Medium	Medium - High
Floodgates	Medium	Low - Medium	Medium

7.5 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.

7.6 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

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 assets that support the stormwater activity can be divided into three functional areas – collection, flood protection and treatment. However, for the management of lifecycle (operation, maintenance, renewal, improvement, disposal) the assets are divided into different groups. This is because the functional areas contain a mix of assets, with different lifecycle requirements. The table below contains a summary of asset lifecycle grouping for each asset type and functional area.

Table 15 Asset Lifecycle Grouping

Functional Area	Asset list	Lifecycle Group
Collection	Pipelines, including pipe connections	Pipe Network
	Manholes	Pipe Network
	Inlets / Outlet Structures (associated with reticulation network)	Pipe Network
	Culverts	Channel Structures
	Inlets / Outlet Structures (associated with culverts)	Channel Structures
	Protection works	Channel Structures
	Channels, natural and artificial	Streams, Channels and Earth Structures
Flood Protection	Floodgates	Channel Structures
	Stop Banks	Streams, Channels and Earth Structures
	Detention Basins	Streams, Channels and Earth Structures
	Pump Stations	Pump Stations
Treatment	Constructed wetlands Rain gardens Gross litter traps (including outlet nets) Sump traps Grass swales	Treatment Devices

This section considers the following aspects of the asset lifecycle for each functional area.

Table 16 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 lifecycle 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 Stormwater 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 Stormwater 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 and treatment areas and are now over $5M. The cost of renewing assets is increasing as our pipe assets are aging. We have invested in new pipes and emergency flood pumps and generators to provide for both growth and increase the resilience of the stormwater.

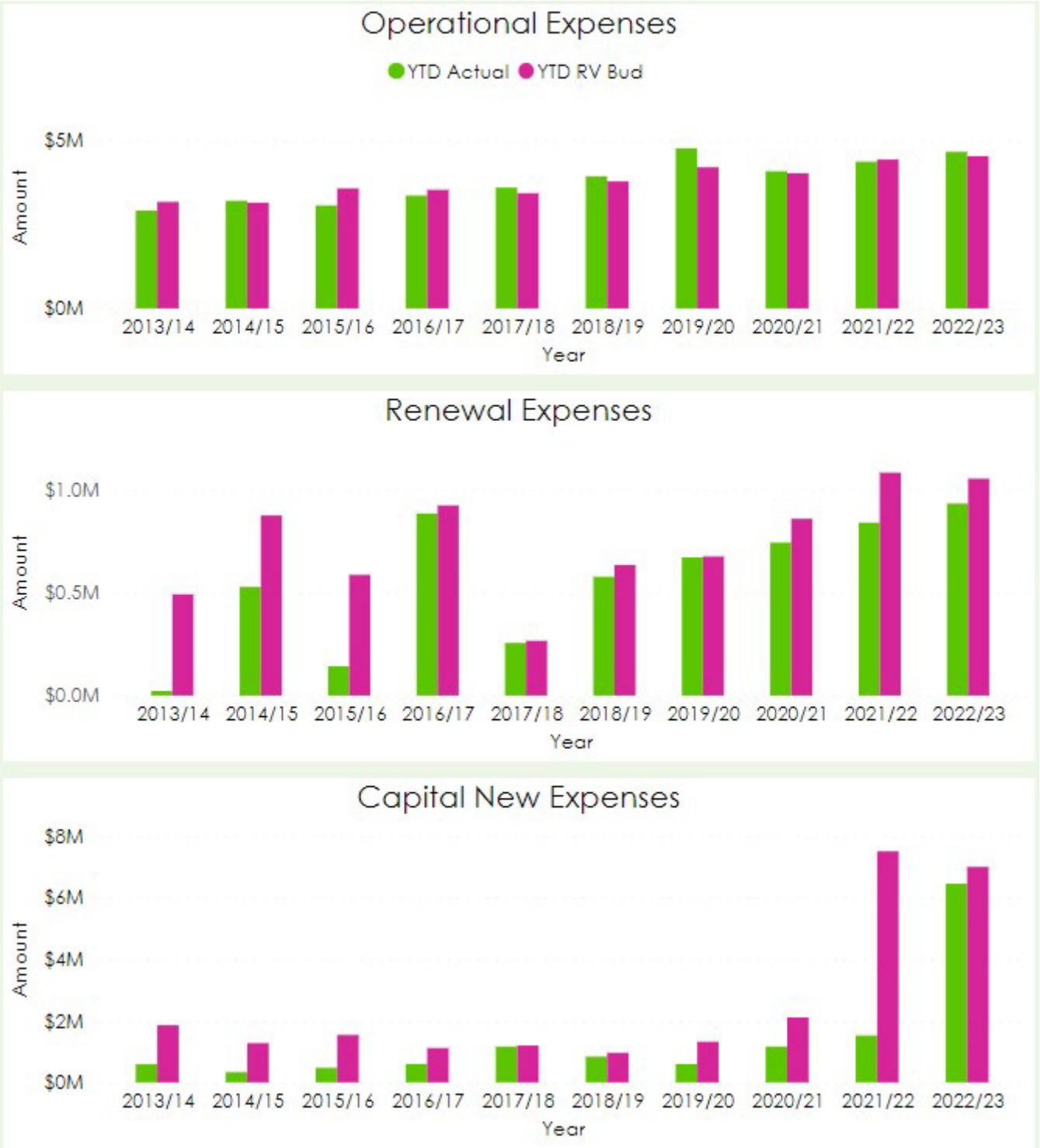


Figure 13: Activity Expenses for the Last 10 Years

8.2 Stormwater Pipe Network

8.2.1 Service Overview

The lifecycle management of the following assets is covered in this subsection:

- Pipelines as part of the stormwater reticulation network
- Manholes
- Mains Connections
- Sump Connections
- Kerb Connections
- Inlet/Outlet Structures associated with the reticulation network

The assets at the start and/or end of the pipes, such as inlet or outlet structures are used to enable the safe and reliable collection and reticulation of stormwater from overland drainage to an approved and appropriate outlet.

8.2.2 Customer and Strategic Issues

The table belowTable 17 summarises the links between service levels and the lifecycle management of the pipe network assets.

Table 17: Stormwater Pipe Network Lifecycle Intent and Impacts

Lifecycle Intent Statement	Indicator	Short Term Goal	Long Term Goal	Lifecycle Impacts
Drainage is provided by ensuring an adequate quality network.	Average condition grading of the network.	All critical pipelines with <10 years remaining life have reliable condition scores by Year 2.	Renewal strategy is informed by reliable condition data and criticality.	Optimal balance between renewal and maintenance costs. Critical pipes are renewed before they are at risk of failure.
Prolonged flooding is minimised.	Complaints regarding ponding.	O&M trends are analysed within next three years to enable renewals prioritisation.	Renewals are based on a robust, well documented strategy.	Optimal balance between renewal and maintenance costs.
Stormwater services are affordable and efficient	The operating cost of stormwater services per property.		All network O&M procedures are documented.	O&M effort is targeted and optimised.

8.2.3 Operations and Maintenance

Operational and maintenance practices for the stormwater pipe network were historically documented in the Citywide Stormwater Reticulation Maintenance Service Level Agreement (SLA). This was the service provision agreement between the Water Operations Division and the previous iteration of the Council Infrastructure Unit developed to provide the documented stormwater collection levels of service.

Changes to the approach to stormwater pipe network operations and maintenance meant that the programmes detailed in the SLA were reduced in practice. This resulted in the SLA essentially becoming redundant.

The current actions that are carried out as part of the pipe network operation and maintenance (detailed below) are not documented in a structured way, including in IPS. This maintenance regime is predominantly determined by staff experience.

There is no shared understanding between activity management and operations staff about what the programme should comprise. Even though it is no longer adhered to, the SLA is still a good basis for the documentation of such a programme.

Operations – General

Operationally the piped stormwater network is generally a passive system which provides a controlled drainage route for stormwater. No routine day to day operational intervention is undertaken by staff on the pipe network.

Operations – Post flooding event inspections

Following a flooding event, a general inspection will be carried out on the pipe network in the vicinity of the flood. The objective is to identify any damage to the network caused by the flood, and any possible failures in the network which may have contributed to the flood event.

Maintenance

To ensure the stormwater pipe network is operating at full capacity when rain events occur, a series of maintenance activities are conducted on a routine basis as summarised in the table belowTable 18.

Table 18: Stormwater Network Inspection Frequency

Asset	Inspection Frequency
Inlets and outlets	Prior to a predicted significant rain event (at least annually), clearing if required
Pipelines	Siltation clearing as required, selected annually for CCTV (as well as reactive)
Manholes	Checks conducted alongside pipelines

Reactive maintenance tasks are typically initiated through a KBase customer request, with the response and resolution times recorded in KBase. The reactive maintenance works are recorded in IPS.

Currently the budgets allocated to stormwater network operations 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.

Water Operations Standard Operating Procedures (SOPs) provide greater details 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.

Critical to effective management of the stormwater network is completion of regular condition inspections by CCTV and other inspections. There are currently insufficient inspections being carried out to assess the overall condition of the network and rate of deterioration of assets over time. Ideally all the critical network components should be inspected once every 10 years.

Improvement opportunity:

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

- Collate all the existing information on stormwater network operation and maintenance into agreed 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 stormwater network operation and maintenance
- Increase amount of condition inspections sufficient to assess the overall condition of the network and rate of deterioration of assets

Programmes that address operation and maintenance issues in relation to stormwater pipes and associated assets are shown in 8.8.1 below. Many of them also link to the issues raised in the previous sections in terms of risk management, levels of service, and demands and drivers.

8.2.4 Renewal Plan

The decision making around whether to renew stormwater pipe network assets or continue to carry out maintenance or repairs has historically been based on criticality and impacts of failure on levels of service. This process relies on understanding of asset condition, as well as staff judgement and experience. Candidates for renewals are typically generated from a decision process embedded in IPS. Ideally, this decision tree considers repair history and condition.

In general, stormwater assets last significantly longer than equivalent water and wastewater assets. This is predominantly due to the nature of the fluid beying conveyed – as stormwater is relatively inert and low pressure. Hence the failure mode of stormwater assets tends to be over a longer period, and asset criticality is typically lower. For these reasons, renewals profiles for stormwater assets should not be directly compared with either water supply or wastewater.

To improve decision making, criteria for prioritising specific stormwater pipe network assets for renewal is being developed and will continue to be refined. These criteria include flooding issues, other works in the area, condition, remaining theoretical useful life, location (e.g. under stop banks), large size, and criticality.

Stormwater renewals are generally done on a ‘like for like’ basis, unless the pipe to be renewed does not comply with the current Engineering Design Standards. If that is the case, then the pipe is considered for upgrade as well as renewal. If an upgrade is required, it can be funded from the renewals budget for the like for like replacement and from a capital new budget for the upgrade portion.

There is an opportunity to improve the cross-service interaction and efficiency gained in renewing assets at the same time. This is particularly important for footpath and pavement renewals. Currently renewals are input into GIS one year ahead across each service area to help identify projects for renewing at the same time. There is a desire to expand this out to 30 years so that better programming of renewals can be undertaken across different services.

Renewal Investment

Renewal programmes for stormwater pipes and associated assets are shown in 8.8.2 below.

8.2.5 Asset Improvement and New Assets

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

The Stormwater Management Framework will precipitate overall management plans for individual catchments. These will take into account not only the model output but will also consider the drivers listed above, catchment investigations and the requirements of the framework itself. The management framework will be used to provide the basis of the infrastructure required in the catchment, whether it be green field or brown field. This will in turn give potential developers an idea as to what the requirements are for new areas.

New pipe network assets to meet the needs of growth are acquired in a variety of ways, as follows:

- Assets within a new subdivision which are vested to us;
- We construct new network assets where the development has been confirmed, which will support residential growth areas or where stormwater services are needed.

The risk, costs and benefits of accepting vested assets will be reviewed and a decision regarding approval for acceptance will be made on a case-by-case basis by staff. When satisfactorily completed in accordance with our standards and any approvals given, we will accept such assets into public ownership.

Capital-new planning for Stormwater pipe network is derived from stormwater modelling and advice from the corporate planning team. It is an opportunity to better plan out capital-new projects to coincide where possible with renewals and/or new projects across services. This will increase efficiency of the projects (particularly for horizontal infrastructure) and reduce any potential rework and disruption of the network.

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 Stormwater pipe network are shown below in 8.8.3.

8.2.6 Asset Disposal

Asset disposal is often included as part of renewals consideration as most stormwater pipes and associated assets 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.

When a pipe asset is renewed on an alternative alignment or new location, the original assets is left in situ. Buried assets should be decommissioned by being filled to prevent voids forming around the pipe. Pipes may be replaced on an alternative alignment for several reasons including better accessibility.

There are no specific programmes associated with disposal of stormwater pipes and associated assets.

8.3 Stormwater Streams, Channels and Earth Structures

8.3.1 Service Overview

The lifecycle management of the following assets is covered in this subsection:

- Streams (natural water courses, with or without some modification)
- Artificially constructed earth channels
- Stop banks (earth)
- Detention basins

The open watercourses form part of the overall stormwater network and provide an appropriate outlet for the piped system. Man-made or modified channels are also used to convey stormwater where the construction of a piped stormwater drain is not economical or appropriate.

Detention basins and stop banks both provide important flood protection functions, by diverting high flows and detaining stormwater to release it in a more controlled fashion.

8.3.2 Customer and Strategic Issues

The table belowTable 19 summarises the links between service levels and the lifecycle management of the streams, channels and earth structures assets.

Table 19: Streams, Channels and Earth Structures Life Cycle Intent and Impacts

Life Cycle Intent Statement	Indicator	Short Term Goal	Long Term Goal	Life Cycle Impacts
Drainage is provided by ensuring an adequate quality network.	Average condition grading of the network.	O&M trends are analysed within next three years.	O&M programmes are based on a robust, well documented strategy.	Optimal maintenance costs.

8.3.3 Operations and Maintenance

As with the piped network, operation and maintenance practices for the stormwater streams, channels and earth structures were historically documented in the Citywide Stormwater Reticulation Maintenance Service Level Agreement (SLA). Again, changes to the approach to operations and maintenance meant that the programmes detailed in the SLA were reduced in practice, resulting in the SLA essentially becoming redundant.

The current actions that are carried out (detailed below) are generally not documented in a structured way. This maintenance regime is predominantly determined by staff experience. The only partial exception to this is the annual channel inspections, which are recorded in IPS.

There is no shared understanding between activity management and operations staff about what the programme should comprise. Even though it is no longer adhered, the SLA is still a good basis for the documentation of such a programme.

Operations – General

Operationally the stormwater system is a passive system which provides a controlled drainage route for stormwater. No routine day to day operational intervention by staff is undertaken on the network of streams and open channels. Nor is any day to day activity carried out on stopbank or detention basins.

Operations – Post flooding event inspections

Following a flooding event a general inspection will be carried out on these assets in the vicinity of the flood. The objective is to identify any damage caused by the flood, and any possible failures that may have contributed to the flood event.

Maintenance

To ensure these assets are operating at their full capacity and/or offering optimal protection when heavy rain events occur, a series of maintenance activities are conducted on a routine basis as shown in the table belowTable 20.

However, not all of this has not been completed historically and there is a backlog of this maintenance that is being rectified. There is an ongoing programme for this work. Given the increasing public engagement with open water courses, the clearing of the backlog needs to continue. Complete clean ups for entire water courses over the long term may be required to mitigate the risks of flooding.

Some stormwater asset groups, such as dentition basins have no scheduled maintenance programme so far. In addition to the lack of shared understanding of the programme, how the assets are recorded in IPS compounds this issue.

Table 20: Stormwater Stream and Channel Inspection Frequency

Asset	Inspection frequency
Channels	Annual inspections, followed by mechanical cleaning and/or spraying
Streams	Annual condition inspection
Stop banks	Annual condition inspection
Detention basins	No specific programme, but ideally quarterly, including all inlets and outlets are free from blockage, monitoring siltation in forebays and ponds, weed spraying and monitoring of flora/ fauna in receiving environment

Issues identified during maintenance inspections are sometimes scheduled to be rectified. This may take various forms, for example extra maintenance, construction of a structure or protection works or earthworks.

For the streams, channels and earth structures, reactive maintenance tasks are typically initiated through a KBase customer request, with the response and resolution times are all recorded in KBase. Reactive maintenance works are also recorded in IPS.

Improvement opportunities:

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

- Collate all the existing information on stormwater stream and channel operation and maintenance into agreed practice documents
- Undertake gap analysis of SOPs and plan for documentation of all procedures
- Improve recording the date of stream and channel in IPS
- Undertake formal reviews and/or optimisation studies of maintenance and operations activities based on data and risk
- Completely rectify the backlog of stream and channel maintenance
- Collect condition information as part of regular inspections to assess the overall condition and rate of deterioration of assets

Programmes that address operational and maintenance issues in relation to stormwater streams, channels and earth structures are shown in 8.8.1 below.

8.3.4 Renewal Plan

There is generally no renewal plan for streams, open channels and earth structures. Streams are natural watercourses and are maintained to ensure their integrity as opposed to being renewed. Likewise, open channels. Any work other than the routine maintenance would be a change in system type, (to pipe for example) which would be considered as asset improvement and/or a new asset.

Earth structures, such as stop banks, are managed in a very similar way. Once they are constructed, they are maintained as opposed to renewed.

8.3.5 Asset Improvement and New Assets

The requirement for new or improvements to open channels, stop banks or detention basins may be triggered in response to the stormwater capital development strategy. Particularly the guiding principle of mitigation of flood damage risks. Again, the 2D model would be used to assess options for the infrastructure need. Options would then be developed and the most appropriate one selected.

New stream assets will generally be only acquired as vested assets from a new development. The requirement for new or improvements to open channels, stop banks or detention basins can also be identified as part of planning processes. Normally this is as part of the requirements for zoning changes or resource consents. Changes within the urban areas will often require improvements to existing assets, whereas changes outside the urban boundary will trigger the requirement for new assets to be constructed.

Eventually, as with the piped network, new or improvements to open channels, stop banks or detention basins will be identified in our management plans for individual catchments. The management plan will be used to provide the basis of the infrastructure required in the catchment, whether it be green field or brown field. This will in turn give potential developers an idea as to what the requirements are for new areas.

The risk, costs and benefits of accepting vested assets will be reviewed and a decision regarding approval for acceptance will be made on a case-by-case basis by staff. When satisfactorily completed in accordance with our standards and any approvals given, we will accept such assets into public ownership.

Capital Investment

Capital new programmes for streams, channels and earth structures are shown below in 8.8.3.

8.3.6 Asset Disposal

Due to their function, stream and open channels are generally not disposed of but may be replaced with a pipe in certain circumstances. The circumstances would often involve mitigation of flooding or need for land and would be more common for open channels than for streams. Given the increasing public engagement with open water courses and the probable need for a resource consent such a change would be rare. Likewise, disposal of stop banks or detention basins would be rare. There are no specific programmes associated with disposal of streams, channels and earth structures.

8.4 Stormwater Channel Structures and Floodgates

8.4.1 Service Overview

The lifecycle management of the following assets is covered in this subsection:

- Culverts associated with stormwater channels
- Protection works
- Inlet/Outlet structures associated with culverts
- Floodgates including penstocks, sluice gates and flap gates (non-return valve or back flow preventors)

The structures associated with streams and channels protect the integrity of the watercourse and allow it to interact with other infrastructure. The floodgates support flood protection assets in by controlling the direction of the stormwater when the flow is high.

8.4.2 Customer and Strategic Issues

The table belowTable 21 summarises the links between service levels and lifecycle management of the channel structure and floodgate assets.

Table 21: Stormwater Channel Structures Lifecycle Intent and Impacts

Lifecycle Intent Statement	Indicator	Short term goal	Long term goal	Life Cycle impacts
Drainage is provided by ensuring an adequate quality network.	Average condition grading of the structures and floodgates	All critical structures and floodgates <10 years remaining life have reliable condition scores by Year 2.	Renewal strategy is informed by reliable condition data and criticality.	Optimal balance between renewal and maintenance costs. Critical structures and floodgates are renewed before they are at risk of failure.

8.4.3 Operations and Maintenance

In a similar manner to other lifecycle groups, operational and maintenance practices for the stormwater structures and floodgates were historically documented in the Citywide Stormwater Reticulation Maintenance Service Level Agreement (SLA). Again, changes to the approach to operations and maintenance meant that the programmes detailed in the SLA were reduced in practice, resulting in the SLA essentially becoming redundant.

The current actions that are carried out (detailed below) are generally not documented in a structured way. This maintenance regime is predominantly determined by staff experience. The only exceptions to this are the channel (which include the channel structures) and floodgate inspections, which are recorded in IPS.

There is no shared understanding between activity management and operations staff about what the programme should comprise. Even though it is no longer adhered, the SLA is still a good basis for the documentation of such a programme.

Operations – General

Operationally the stormwater system is a passive system which provides a controlled drainage route for stormwater. Floodgates and outfall structures are inspected under the level of service agreement. Under the open channel and drain maintenance programme, Council staff have undertaken preliminary assessment on site and are currently working through the critical stretches to maintain levels of service.

Operations – Post flooding event inspections

Following a flooding event a general inspection will be carried out on the open network in the vicinity of the flood. The objective is to identify any damage to the network caused by the flood, and any possible failures in the network which may have contributed to the flood event.

Maintenance

To ensure streams and open channel systems are operating at their full capacity when rain events occur, a series of maintenance activities are conducted on a routine basis as shown in the table belowTable 22.

Table 22: Stormwater Channel Structures Inspection Frequency

Asset	Inspection frequency
Culverts, inlets and outlets	Prior to a predicted significant rain event (at least annually), clearing if required
Protection works	Annual inspection with associated channel
Floodgates	Six-monthly inspections and routine maintenance Prior to a predicted significant rain event (at least annually) to check operation, clearing if required

Issues identified during these inspections are scheduled to be repaired or renewed.

As with the other lifecycle groups reactive maintenance tasks are typically initiated through a KBase customer request, with the response and resolution times are all recorded in KBase. The reactive maintenance works are recorded in IPS.

Improvement opportunities:

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

- Collate all the existing information on stormwater channel structures and floodgates operation and maintenance into agreed practice documents
- Undertake gap analysis of SOPs and plan for documentation of all procedures
- Completely rectify the backlog of channel and floodgates maintenance

Programmes that address operational and maintenance issues in relation to stormwater channel structures and floodgates are shown 8.8.1 below. Many of them also link to the issues raised in the previous sections in terms of risk management, levels of service, and demands and drivers.

8.4.4 Renewal Plan

The decision making around whether to renew channel structures and floodgates or continue to carry out maintenance or repairs has historically been based on staff judgement and experience.

There is no specific documented renewal strategy for channel structures and floodgates. In practice they are generally only renewed upon failure. For floodgates particularly the focus is on maintaining to a standard to avoid any failure, and therefore defer their renewal for as long as possible.

Technologies for protection of watercourses are developing over time, with many newer solutions designed to meet the current trends for more natural looking solutions. Thus, if a channel structure is renewed with a modern equivalent then the renewal may be different from what it is replacing.

Floodgates may also be renewed at the same time as the pipe that they serve. However, this is likely to be rare compared to replacement due to failure. This is because mechanical devices, even when maintained well, will normally have a much shorter life span than pipe materials.

Renewal Investment

Renewal programmes for stormwater channel structures and floodgates are shown in 8.8.2 below.

8.4.5 Asset Improvement and New Assets

The requirements for new and improvements to channel structures and floodgates are identified in several different ways. The means relates to the function of the structure.

Culverts, and their associated inlet/outlet structures would be acquired if a track or road was constructed that crossed an open channel or stream of some kind. However, acquiring these as stormwater assets would be a rare occurrence as most culverts constructed for such a purpose would be included as part of the asset base for the party owning the track or road (e.g., transport, parks and reserves).

Protection works are normally constructed in response to an issue in an open channel or a stream, often in response to maintenance inspections. This might be scouring or a bank collapse. Often the selected option to remedy this will be a structure of some kind such as a retaining wall or channel lining.

The requirement for new or improvements to floodgates may be triggered in response to the stormwater capital development strategy. Particularly the guiding principle of mitigation of flood damage risks. Again, the 2D model would be used to assess options for the infrastructure need. Options would then be developed and the most appropriate one selected.

The requirement for new or improvements to channel structures or floodgates can also be identified as part of planning processes. Normally this is as part of the requirements for zoning changes or resource consents. Changes within the urban areas will often require improvements to existing assets, whereas changes outside the urban boundary will trigger the requirement for new assets to be constructed.

Eventually, as with other asset types, new or improvements to channel structures and floodgates will be identified in our management plans for individual catchments. The management plan will be used to provide the basis of the infrastructure required in the catchment, whether it be green field or brown field. This will in turn give potential developers an idea as to what the requirements are for new areas.

The risk, costs and benefits of accepting vested assets will be reviewed and a decision regarding approval for acquisition will be made on a case-by-case basis by staff. When satisfactorily completed in accordance with our standards and any approvals given, we will accept such assets into public ownership.

Capital Investment

Capital new programmes for channel structures and floodgates are shown below in 8.8.3.

8.4.6 Asset Disposal

Asset disposal is often included as part of renewals consideration as most stormwater channel structures and floodgates are replaced in the same location. Therefore, the old asset is both physically disposed of, and disposed of in the information system when the replacement asset is entered.

In some rare situations, assets may cease to be required. For channel structures this might be because the replacement is constructed in an alternative location or planting takes hold over time. The existing component may be removed. In other situations, it might remain even though it is redundant, and it then ceases to function over time due to natural processes.

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

There are no specific programmes associated with disposal of stormwater channel structures and floodgates.

8.5 Stormwater Pump Stations

8.5.1 Service Overview

Pump station assets support flood protection assets in preventing habitable floor level property flooding and alleviating street ponding in their local catchment areas.

8.5.2 Customer and Strategic Issues

The table belowTable 23 summarises the links between service levels and lifecycle management of the pump stations.

Table 23: Stormwater Pump Station Lifecycle Intent and Impacts

Lifecycle Intent Statement	Indicator	Short term goal	Long term goal	Life Cycle impacts
Drainage is provided by ensuring an adequate quality network.	Average condition grading of pump stations.	All pump stations have reliable condition scores.	Renewal strategy is informed by reliable condition data and criticality.	Optimal balance between renewal and maintenance costs with reduced risk of critical failures
Flood protection is provided by ensuring network has capacity.	Number of pump stations that meet Council pump station standards.		Upgrades are based on a robust, well documented strategy.	
Prolonged flooding is minimised.	Complaints regarding ponding.	O&M trends are analysed to enable renewals trade-offs.	Renewals are based on a robust, well documented strategy.	Optimal balance between renewal and maintenance costs.

8.5.3 Operations and Maintenance

Operational and maintenance practices for the stormwater pump stations were historically documented in the Citywide Stormwater Pump Stations Operations & Maintenance Service Level Agreement (SLA). Yet again, changes to the approach to operations and maintenance meant that the programmes detailed in the SLA were reduced in practice, resulting in the SLA essentially becoming redundant.

The current actions that are carried out as part of pump station operation and maintenance (detailed below) are not documented in a structured way, including in IPS. This maintenance regime is predominantly determined by staff experience.

There is no shared understanding between activity management and operations staff about what the programme should comprise. Neither is there a process for adding additional pump stations to the list to be operated and maintained. Even though it is no longer adhered, the SLA is still a good basis for the documentation of such a programme.

Operations – General

No routine day to day operational intervention by staff is undertaken.

Operations – Post flooding event inspections

Following a flooding event a general inspection will be carried out on any pump stations in the vicinity of the flood. The objective is to identify any damage caused by the flood, and any possible failures which may have contributed to the flood event.

Maintenance

To ensure the stormwater pump stations are operating at their full capacity when rain events occur, a series of maintenance activities are conducted on a routine basis as shown in the table belowTable 24.

Table 24: Pump Station Inspection Frequency

Asset	Inspection Frequency
Pump stations	Annual pump run-checks and general pump station condition inspection, including electrical checks

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.

Currently the budgets allocated to stormwater pump station 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 Water Operations Standard Operating Procedures (SOPs). 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.

Although these assets are subject to inspection, the inspection purpose is predominately to identify issues to rectify as opposed to recording condition over time. It is critical to effective management of the stormwater pump stations to assess the overall condition and rate of deterioration of assets. Condition data therefore needs to be collected as part of these inspections.

Improvement opportunities

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

- Collate all the existing information on pump station operation and maintenance into agreed practice documents
- Undertake gap analysis of SOPs and plan for documentation of all procedures
- Improve recording of pump station operational and maintenance data in IPS
- Develop feedback and improvement processes for operation and maintenance practices and procedures, including introducing new pump stations into the processes
- Undertake formal reviews and/or optimisation studies of maintenance and operations activities based on data and risk
- Allocate additional funding to stormwater pump station operation and maintenance
- Collect condition information as part of regular inspections to assess the overall condition and rate of deterioration of assets

Programmes that address operational and maintenance issues in relation to stormwater streams, channels and earth structures are shown in 8.8.1 below. Many of them also link to the issues raised in the previous sections in terms of risk management, levels of service, and demands and drivers.

8.5.4 Renewal Plan

The decision making around whether to renew pump station assets or continue to carry out maintenance or repairs is generally based on staff judgement and experience.

The selection for renewal of specific pump station mechanical and electrical equipment has historically been finalised at the start of every budget year. This is being replaced by a more robust 6-year renewals programme. In this process, repair history, criticality and current condition are considered and assessed (informally).

Wherever possible, upgrades to assets to address growth or change in demand patterns should occur simultaneously with the planned renewal of those assets.

The breakdown and arrangement of pump station assets in IPS was informally reviewed as part of the planning process. This cast some doubts about the overall usefulness of the current breakdown. From this, an overall review needs to be carried out to see if these concerns are valid.

Renewal planning for pump station buildings is to be determined, but they will be managed in the same way as other buildings. Further information on this and the building assets can be found in the Property AMP.

Renewal Investment

Renewal programmes for stormwater pump stations are shown in the section below.

8.5.5 Asset Improvement and New Assets

The requirement for new or improvements to pump stations may be triggered in response to the stormwater capital development strategy outlined. Particularly the guiding principle of mitigation of flood damage risks. Options would be assessed for the infrastructure need, and the most appropriate one selected.

Eventually, as with other asset types, new or improvements to stormwater pump stations will be identified in our management plans for individual catchments. The management plan will be used to provide the basis of the infrastructure required in the catchment, whether it be green field or brown field. This will in turn give potential developers an idea as to what the requirements are for new areas.

New pump station assets to meet the needs of growth are acquired in a variety of ways, as follows:

- Assets within a new subdivision which are vested to us;
- We construct new network assets where the development has been confirmed, which will support residential growth areas or where stormwater services are needed.

The risk, costs and benefits of accepting vested assets will be reviewed and a decision regarding approval for acquisition will be made on a case-by-case basis by staff. When satisfactorily completed in accordance with our standards and any approvals given, we will accept such assets into public ownership.

Capital Investment

Capital new programmes for pump stations are shown below in 8.8.3.

8.5.6 Asset Disposal

Asset disposal is primarily included as part of renewals consideration as most stormwater pump station components are physically removed and disposed of to allow for the replacement component. In some cases, the replacement component is installed alongside the existing component (completely or partially), and 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 stormwater 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. This process is currently informal and does not necessarily consider where a redundant component remains. There are no specific programmes associated with stormwater pump station asset disposal.

8.6 Stormwater Treatment Devices

8.6.1 Service Overview

The lifecycle management of stormwater treatment devices is covered in this subsection. These assets enable the treatment of stormwater to the required standard and consent requirements. There are a wide variety of treatment assets in service. These include:

- Constructed wetlands
- Rain gardens
- Gross pollution traps (including outlet nets)
- Sump traps
- Grass swales

8.6.2 Customer and Strategic Issues

The table belowTable 25 summarises the links between service levels and lifecycle management of stormwater treatment devices.

Table 25: Stormwater Treatment Devices Lifecycle Intent and Impacts

Lifecycle Intent Statement	Indicator	Short term goal	Long term goal	Life Cycle impacts
Negative environmental impacts of rainwater runoff are minimised by sufficient quality stormwater treatment infrastructure	Average condition grading of treatment components.	All treatment components have reliable condition scores by Year 2.	Renewal strategy is informed by reliable condition data.	Optimal balance between renewal and maintenance costs with reduced risk of critical failures
The quality of natural waterways is not degraded due to ability to treat stormwater to discharge requirements.	Compliance with resource and discharge consents.	O&M trends are analysed within next three years to enable renewals trade-offs.	Renewals are based on a robust, well documented strategy.	Optimal balance between renewal and maintenance costs.
Stormwater services are affordable and efficient	The operating cost of the stormwater services per property.		All network O&M procedures are documented.	O&M effort is targeted and optimised.

8.6.3 Operations and Maintenance

Some operational and maintenance practices for stormwater treatment devices were historically documented in the Citywide Stormwater Reticulation Maintenance Service Level Agreement (SLA). However, this documentation was limited, and additional different treatment devices have been installed. This has resulted in anything the SLA about treatment devices essentially becoming redundant.

The variety of current stormwater treatment devices in service brings challenges for operation and maintenance practices. As stated in section 5.6, the number and variety are expected to increase as water-sensitive design is applied to improve water quality.

The current actions that are carried out (detailed below) are generally not documented in a structured way. This maintenance regime is predominantly determined by staff experience. Only a small number of inspections are recorded in IPS.

Maintenance requirements need to be recorded at time of vestment to us. The process for this needs to be improved to create a shared understanding between activity management and operations staff about what the programme should comprise.

Operations – General

Operationally the stormwater treatment devices are passive systems which provide a controlled inlet or outlet point for stormwater needing to be treated. No routine day to day operational intervention is undertaken so far.

Operations – Post flooding event inspections

Following a flooding event a general inspection will be carried out on the treatment devices in the vicinity of the flood. The objective is to identify any damage caused by the flood, and any possible failures which may have contributed to the flood event.

Maintenance

To ensure stormwater treatment devices are operating optimally when rain events occur, a series of maintenance activities are conducted on a routine basis as summarised in the table belowTable 26.

Table 26: Stormwater Treatment Devices Inspection Frequency

Asset	Inspection Frequency
Gross litter traps	Quarterly inspection and general cleaning
Outlet net	Monthly inspection and general cleaning
Swales	No specific programme, but ideally quarterly, including all inlets and outlets are free from blockage, monitoring siltation in forebays and ponds, weed spraying and monitoring of flora/ fauna in receiving environment
Wetlands	No specific programme, but ideally quarterly, including all inlets and outlets are free from blockage, monitoring siltation in forebays, weed spraying and monitoring of flora/fauna in receiving environment. Plant replacement may be required periodically.
Rain gardens	No specific programme, but ideally quarterly checks of outlets to network. Media replacement is expected to be required every 20-25 years.

As with the other lifecycle groups, reactive maintenance tasks are typically initiated through a KBase customer request, with the response and resolution times are all recorded in KBase. Although this is the anticipated programme. The reactive maintenance works are recorded in IPS.

As many of these devices are new, they do not have any Water Operations Standard Operating Procedures (SOPs). Individual operational and maintenance tasks and procedures are instead 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.

Although some of these assets are subject to inspection, the inspection purpose is predominately to identify issues to rectify as opposed to recording condition over time. This is critical for effective management of the stormwater channel structures to assess the overall condition and rate of deterioration of assets. Condition data therefore needs to be collected as part of these inspections.

Improvement Opportunities:

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

- Collate all the existing information on stormwater treatment devices into agreed 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
- Collect condition information as part of regular inspections to assess the overall condition and rate of deterioration of assets

Programmes that address operational and maintenance issues in relation to stormwater treatment devices are shown in 8.8.2 below. Many of them also link to the issues raised in the previous sections in terms of risk management, levels of service, and demands and drivers.

8.6.4 Renewal Plan

The decision making around whether to renew treatment devices or continue to carry out maintenance or repairs is likely to be based on staff judgement and experience. However, because many of these devices are so new to staff these decisions are limited.

There is no specific documented renewal strategy for treatment devices. These would very dependent on the type of device. These will continue to be developed as more devices are installed, and Council develops an understanding of which devices are preferred.

Renewal Investment

Renewal programmes for stormwater treatment devices are shown in 8.8.2 below.

8.6.5 Asset Improvement and New Assets

The requirement for new or improvements to stormwater treatment devices may be triggered in response to the stormwater capital development strategy, particularly the guiding principle of improvement of stormwater discharge quality. This is coupled with requirements from Horizons. This means a gradual implementation of new treatment devices in existing areas of the city.

The requirement for new or improvements to treatment devices can also be identified as part of planning processes. Normally this is as part of the requirements for zoning changes or resource consents. Changes within the urban areas will often require improvements to existing assets, whereas changes outside the urban boundary will trigger the requirement for new assets to be constructed.

Eventually, as with other asset types, new or improvements to stormwater treatment devices will be identified in our management plans for individual catchments. The management plan will be used to provide the basis of the infrastructure required in the catchment, whether it is green field or brown field. This will in turn give potential developers an idea as to what the requirements are for new areas.

The risk, costs and benefits of accepting vested assets will be reviewed and a decision regarding approval for acquisition will be made on a case-by-case basis by staff. When satisfactorily completed in accordance with our standards and any approvals given, we will accept such assets into public ownership.

Capital Investment

Capital new programmes for Stormwater treatment devices are shown below in in 8.8.3 below.

8.6.6 Asset Disposal

There is no specific documented disposal strategy for treatment devices. These need to be developed. Like renewals strategies these would very dependent on the type of device.

There are no specific programmes associated with disposal of stormwater treatment devices.

8.7 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 Stormwater. Thus, for all types of Stormwater assets, lifecycle management alternatives have not been well considered. This will be addressed in the proposed lifecycle decision making improvements for us, which include risk-based analysis of alternatives and embedding of the business case development process.

8.8 Lifecycle Proposed Expenditure Summary

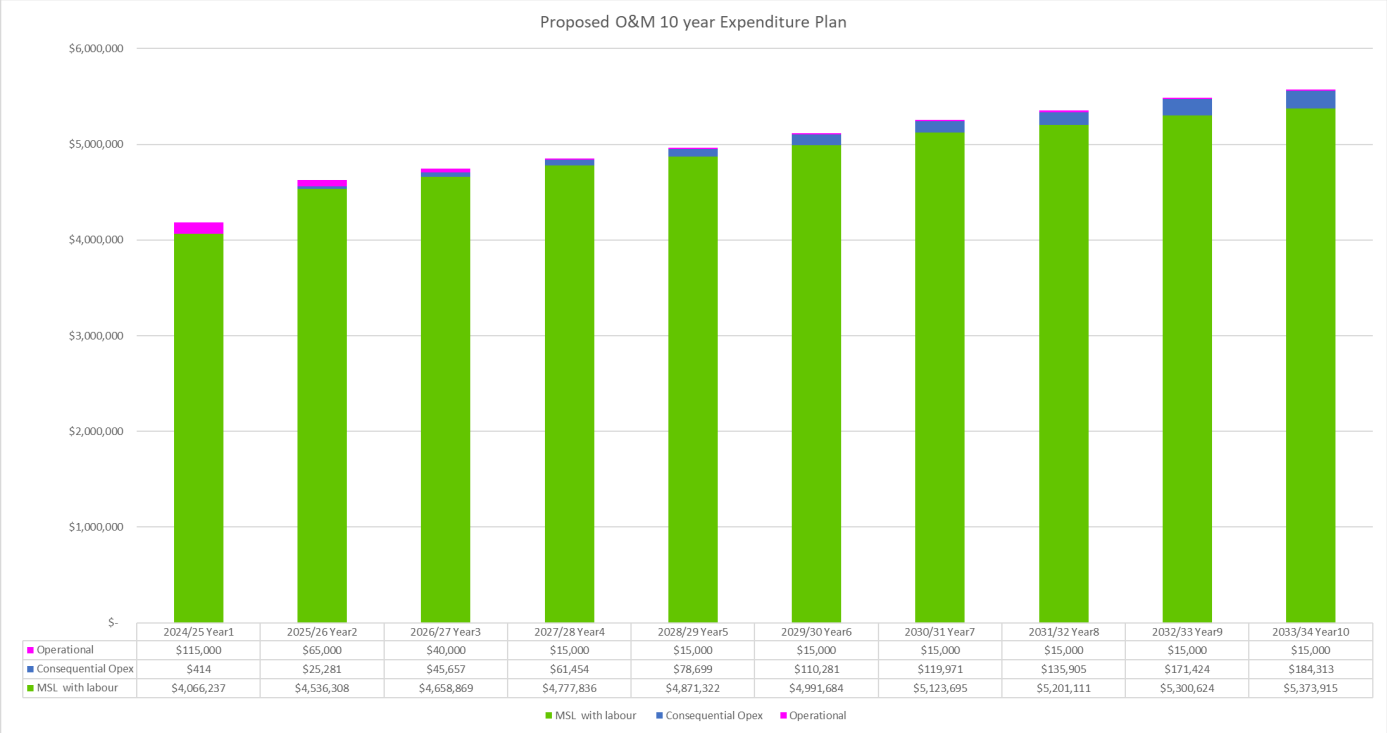
8.8.1 Proposed Operations and Maintenance Expenditure

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 ten years is shown below. Overall operations and maintenance expenditure is proposed to be slightly increasing with most costs in maintaining service levels. There is a gradual rise in the consequential Opex from 2024/25 onwards due to more maintenance associated with new assets in growth areas.

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



	2024/25 Year1	2025/26 Year2	2026/27 Year3	2027/28 Year4	2028/29 Year5	2029/30 Year6	2030/31 Year7	2031/32 Year8	2032/33 Year9	2033/34 Year10
Operational	$115,000	$65,000	$40,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000
Consequential Opex	$414	$25,281	$45,657	$61,454	$78,699	$110,281	$119,971	$135,905	$171,424	$184,313
MSL with labour	$4,066,237	$4,536,308	$4,658,869	$4,777,836	$4,871,322	$4,991,684	$5,123,695	$5,201,111	$5,300,624	$5,373,915

Figure 14: Proposed O&M 10 year Expenditure Plan

The figure below shows further detail on the breakdown of the MSL budgets (excluding revenue, labour and inflation). Contractors cost accounts for more than $1M each year (except for 2024/25), or about two thirds of the budget. Good proportions of budget are for professional works (typically for specialist investigations and design work) and for insurance brokerage. Costs are associated with materials, utilities and vehicle expenses contribute to another tenth of the budget. Other expenses cover software, rates (Regional Council) amongst other items.

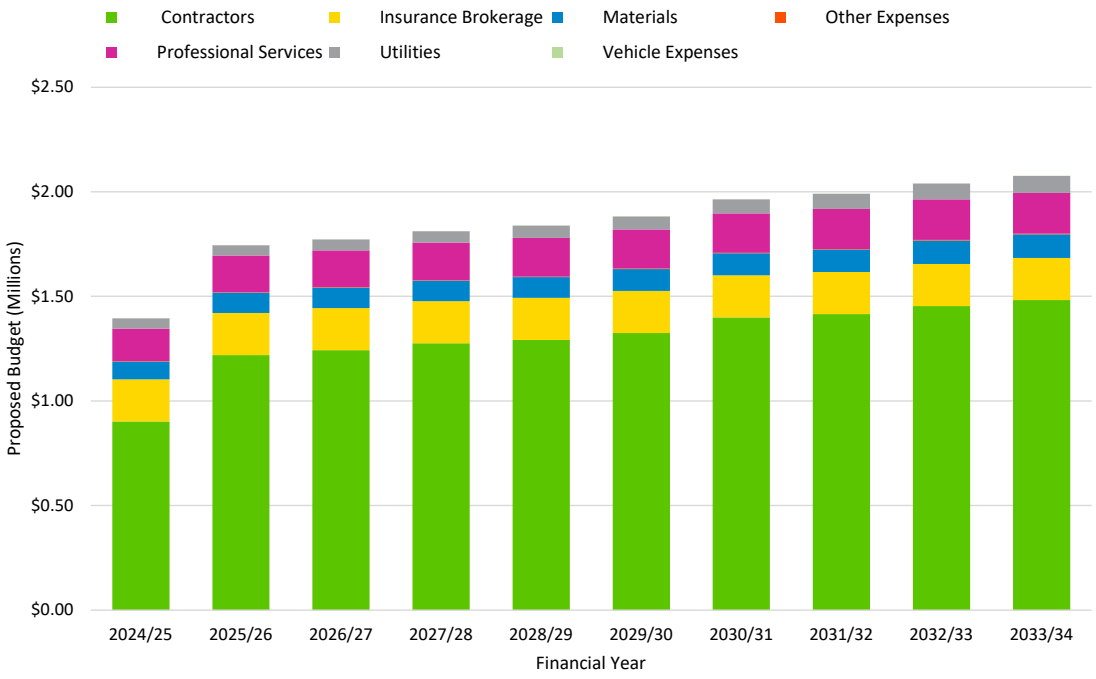


Figure 15: MSL Budgets Breakdown

Table 27: Proposed O&M 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
Consequential OpEx	51 - Urban Growth - Development Contributions - Stormwater	$ 414	$ 914	$ 1,414	$ 2,014	$ 2,614	$ 3,214	$ 3,814	$ 4,514	$ 5,214	$ 5,914	$ 30,040
Consequential OpEx	197 - Urban Growth - NEIZ - Stormwater	$ -	$ -	$ -	$ -	$ -	$ 12,753	$ 12,753	$ 13,391	$ 14,328	$ 15,618	$ 68,843
Consequential OpEx	1001 - Urban Growth - Whakarongo - Stormwater	$ -	$ 12,689	$ 13,577	$ 14,256	$ 15,111	$ 16,018	$ 16,979	$ 17,997	$ 18,897	$ 19,843	$ 145,367
Consequential OpEx	1060 - City-wide - Stormwater Network Improvement Works	$ -	$ 2,615	$ 5,230	$ 7,824	$ 10,107	$ 12,391	$ 14,675	$ 16,958	$ 18,828	$ 20,697	$ 109,325
Consequential OpEx	1065 - Urban Growth - Kakatangiata - Stormwater	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 27,000	$ 28,350	$ 55,350
Consequential OpEx	1372 - City-wide Stormwater Pump Stations Improvement	$ -	$ 8,777	$ 12,494	$ 14,237	$ 16,398	$ 17,745	$ 18,442	$ 18,442	$ 19,139	$ 21,294	$ 146,968
Consequential OpEx	1704 - Urban Growth - Aokautere - Stormwater	$ -	$ -	$ -	$ -	$ -	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 25,000
Consequential OpEx	1707 - City-wide - Land purchase associated with streams and channels	$ -	$ -	$ -	$ 3,984	$ 4,303	$ 4,647	$ 5,019	$ 5,420	$ 5,854	$ 6,322	$ 35,549
Consequential OpEx	1708 - City-wide - Stormwater Flood Mitigation	$ -	$ 286	$ 1,374	$ 3,325	$ 5,337	$ 5,737	$ 5,879	$ 14,489	$ 14,697	$ 16,397	$ 67,521
Consequential OpEx	2034 - Urban Growth - Ashhurst - Stormwater	$ -	$ -	$ -	$ -	$ -	$ 6,581	$ 7,108	$ 7,676	$ 8,597	$ 9,113	$ 39,075
Consequential OpEx	2035 - Urban Growth - Napier Rd Extention - Stormwater	$ -	$ -	$ 2,509	$ 2,710	$ 2,845	$ 3,016	$ 3,257	$ 3,648	$ 3,976	$ 4,334	$ 26,295
Consequential OpEx	2237 - Citywide - Installation of Local Stormwater Treatment Devices	$ -	$ -	$ -	$ 618	$ 662	$ 708	$ 758	$ 811	$ 867	$ 928	$ 5,352
Consequential OpEx	2239 - Bunnythorpe - Stormwater Asset Improvement	$ -	$ -	$ -	$ -	$ 2,186	$ 2,339	$ 2,503	$ 2,678	$ 2,865	$ 3,066	$ 15,637
Consequential OpEx	2240 - Longburn - Stormwater Asset Improvements	$ -	$ -	$ -	$ -	$ 2,186	$ 2,339	$ 2,503	$ 2,678	$ 2,865	$ 3,066	$ 15,637
Consequential OpEx	2241 - Citywide - Data Collection Devices for Stormwater Monitoring and Planning	$ -	$ -	$ -	$ 3,000	$ 3,000	$ 3,000	$ 3,100	$ 3,100	$ 3,100	$ 3,200	$ 21,500
Consequential OpEx	2312 - Industrial Growth - Longburn Stormwater	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,489	$ 2,688	$ 2,903	$ 3,135	$ 11,215
Consequential OpEx	2313 - Citywide - Installation of new Stormwater Assets	$ -	$ -	$ 5,794	$ 6,058	$ 6,342	$ 6,649	$ 6,981	$ 7,340	$ 7,727	$ 8,145	$ 55,036
Consequential OpEx	2324 - Urban Growth - Stormwater Roxborough Crescent Infill	$ -	$ -	$ 3,265	$ 3,428	$ 3,633	$ 3,851	$ 4,160	$ 4,160	$ 4,160	$ 4,160	$ 30,817
Consequential OpEx	2325 - Ashhurst - Stormwater Asset Improvement	$ -	$ -	$ -	$ -	$ 3,975	$ 4,293	$ 4,551	$ 4,915	$ 5,407	$ 5,731	$ 28,872
Operational	2316 - Third Party Stormwater Flood Problem Resolution	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 150,000
Operational	2502 - Stormwater Network Resilence Study	$ 100,000	$ 50,000	$ 25,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 175,000
MSL	Contractors	$ 901,982	$ 1,219,200	$ 1,243,000	$ 1,276,000	$ 1,292,000	$ 1,325,000	$ 1,399,500	$ 1,415,500	$ 1,453,500	$ 1,482,150	$ 13,007,832
MSL	Insurance Brokerage	$ 201,300	$ 201,300	$ 201,300	$ 201,300	$ 201,300	$ 201,300	$ 201,300	$ 201,300	$ 201,300	$ 201,300	$ 2,013,000
MSL	Materials	$ 85,632	$ 97,132	$ 97,500	$ 97,600	$ 99,149	$ 104,450	$ 104,850	$ 106,850	$ 111,850	$ 112,850	$ 1,017,863
MSL	Other Expenses	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,500	$ 2,500	$ 2,500	$ 3,000	$ 3,000	$ 23,500
MSL	Professional Services	$ 155,300	$ 175,300	$ 176,500	$ 180,100	$ 185,000	$ 187,000	$ 189,000	$ 192,000	$ 194,000	$ 195,000	$ 1,829,200
MSL	Utilities	$ 49,000	$ 49,000	$ 52,000	$ 55,000	$ 59,000	$ 62,000	$ 67,000	$ 72,000	$ 76,000	$ 81,000	$ 622,000
MSL	Vehicle Expenses	$ 400	$ 400	$ 550	$ 800	$ 850	$ 1,150	$ 1,200	$ 1,200	$ 1,300	$ 1,350	$ 9,200
MSL	Labour	$ 2,670,623	$ 2,791,976	$ 2,886,019	$ 2,965,036	$ 3,032,023	$ 3,108,284	$ 3,158,345	$ 3,209,761	$ 3,259,674	$ 3,297,265	$ 30,379,006
	Total	**$4,181,651**	**$4,626,589**	**$4,744,526**	**$4,854,290**	**$4,965,021**	**$5,116,965**	**$5,258,666**	**$5,352,016**	**$5,487,048**	**$5,573,228**	$ 50,160,000

8.8.2 Proposed Renewal Expenditure

The renewal programme budgets are developed primarily based on 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. It is noted that some non-critical pipes are allowed to run to failure, as they do not serve large catchments, are not critical or do not have a significant impact on levels of service should they fail.

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

Proposed renewals over the next 10 years are shown below. The proposed expenditure is for renewals of Stormwater network and pump stations. Technically the proposed profile should gradually increase over time as assets age. This indicates that further work is required to develop the condition-based renewals programme, especially for 2027/28 onwards.

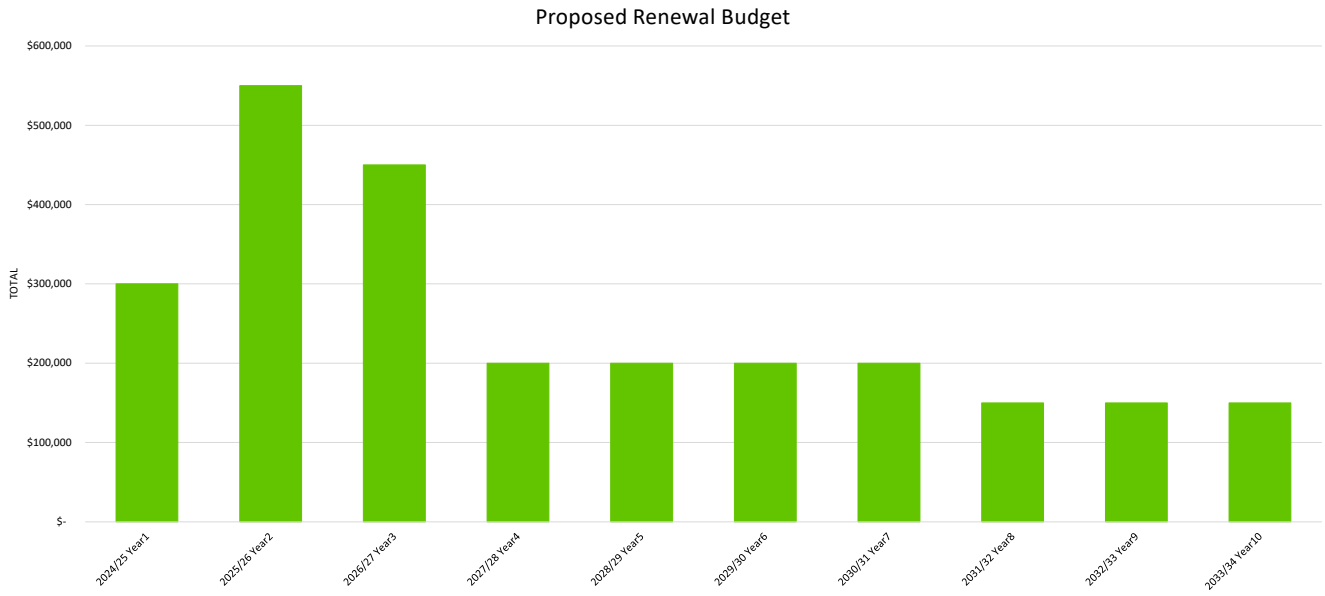


Figure 16: Proposed Renewal 10-year Expenditure Plan

Table 28: 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	20 - City-wide - Stormwater Pump Station Renewals	$200,000	$200,000	$100,000	$100,000	$100,000	$100,000	$100,000	$50,000	$50,000	$50,000	**$1,050,000**
Renewal	1062 - City-wide - Stormwater Network Renewal Works	$100,000	$350,000	$350,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	**$1,500,000**
Renewal	Total Annual Expenditure	**$300,000**	**$550,000**	**$450,000**	**$200,000**	**$200,000**	**$200,000**	**$200,000**	**$150,000**	**$150,000**	**$150,000**	**$2,550,000**

8.8.3 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 ten years is shown below. The increase from 2028/29 to 2031/32 for Stormwater pipes and treatment aim to provide Stormwater service for the new residential and industrial development e.g., Kakatangiata and Aokautere, as well as general network improvement works.

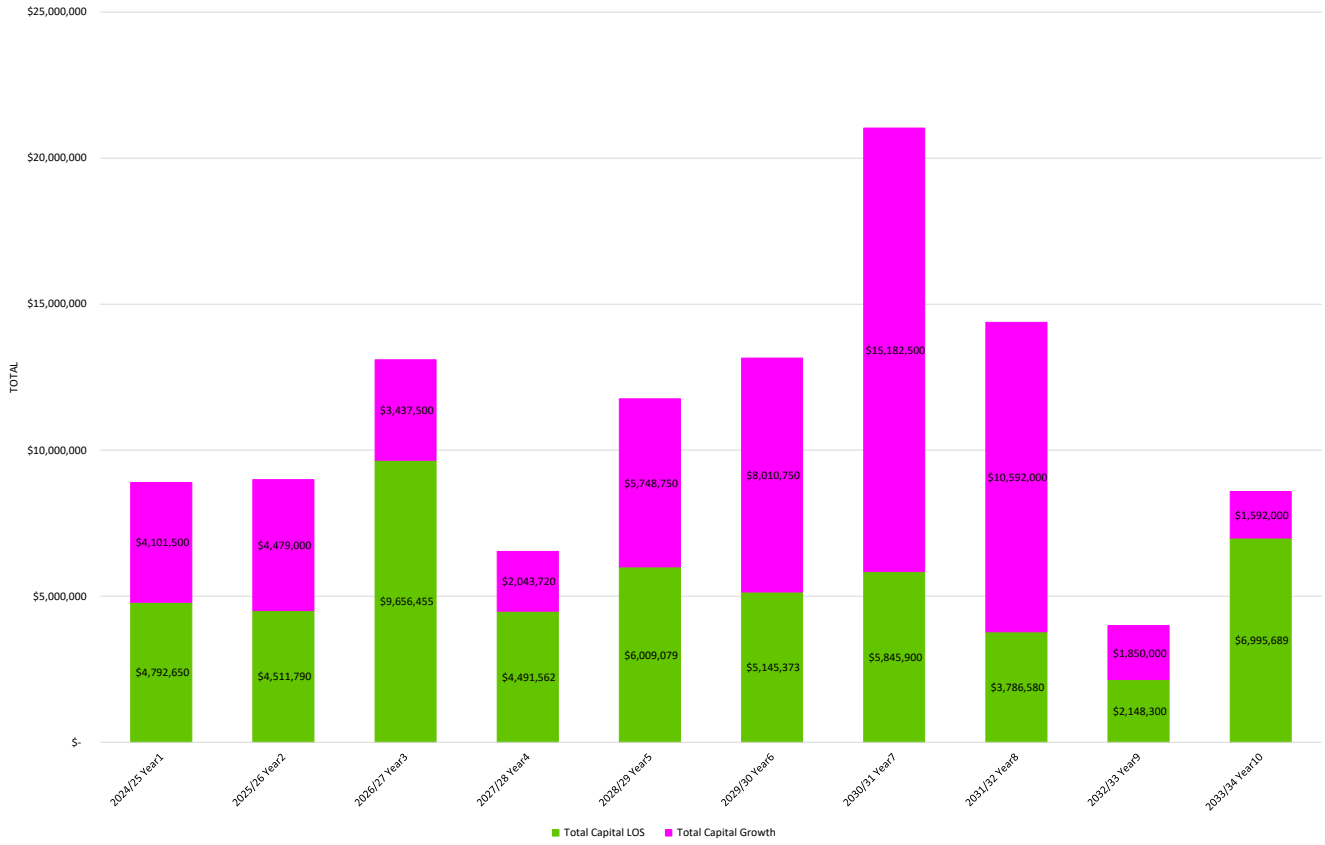


Figure 17: Proposed New Capital 10-year Expenditure Plan

Status: Final

Table 29: 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	51 - Urban Growth - Development Contributions - Stormwater	$250,000	$300,000	$300,000	$300,000	$300,000	$350,000	$350,000	$350,000	$350,000	$350,000	**$3,200,000**
Capital	197 - Urban Growth - NEIZ - Stormwater	$0	$0	$0	$151,720	$948,250	$948,250	$0	$0	$0	$0	**$2,048,220**
Capital	1001 - Urban Growth - Whakarongo - Stormwater	$2,500,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$2,500,000**
Capital	1065 - Urban Growth - Kakatangiata - Stormwater	$0	$0	$0	$0	$300,000	$500,000	$9,000,000	$10,242,000	$1,500,000	$1,242,000	**$22,784,000**
Capital	1704 - Urban Growth - Aokautere - Stormwater	$1,051,500	$2,979,000	$3,037,500	$742,000	$2,000,500	$4,212,500	$4,332,500	$0	$0	$0	**$18,355,500**
Capital	2034 - Urban Growth - Ashhurst - Stormwater	$0	$0	$0	$250,000	$1,550,000	$2,000,000	$1,500,000	$0	$0	$0	**$5,300,000**
Capital	2035 - Urban Growth - Napier Rd Extention - Stormwater	$150,000	$400,000	$0	$0	$0	$0	$0	$0	$0	$0	**$550,000**
Capital	2312 - Industrial Growth - Longburn Stormwater	$0	$0	$100,000	$600,000	$650,000	$0	$0	$0	$0	$0	**$1,350,000**
Capital	2324 - Urban Growth - Stormwater Roxborough Crescent Infill	$150,000	$800,000	$0	$0	$0	$0	$0	$0	$0	$0	**$950,000**
Capital	1060 - City-wide - Stormwater Network Improvement Works	$2,257,400	$2,457,400	$2,528,913	$2,041,800	$2,947,270	$2,946,270	$1,241,800	$1,034,800	$1,034,800	$831,300	**$19,321,753**
Capital	1372 - City-wide Stormwater Pump Stations Improvement	$486,450	$551,900	$258,750	$320,850	$200,000	$103,500	$0	$0	$103,500	$320,000	**$2,344,950**
Capital	1706 - City-wide - Stormwater Network Resilience	$0	$0	$0	$300,000	$0	$0	$300,000	$0	$0	$0	**$600,000**
Capital	1707 - City-wide - Land purchase associated with streams and channels	$0	$0	$0	$250,000	$0	$0	$250,000	$0	$0	$250,000	**$750,000**
Capital	1708 - City-wide - Stormwater Flood Mitigation	$1,548,800	$417,600	$4,757,667	$478,912	$1,361,809	$945,603	$3,104,100	$1,001,780	$60,000	$4,594,389	**$18,270,660**
Capital	2235 - Citywide - Restoring Flood Capacity of Stormwater Channels	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	**$1,500,000**
Capital	2237 - Citywide - Installation of Local Stormwater Treatment Devices	$50,000	$250,000	$50,000	$250,000	$50,000	$250,000	$50,000	$250,000	$50,000	$250,000	**$1,500,000**
Capital	2238 - Citywide - New Pipes to Redirect Stormwater Flows Away from Sewer Systems	$0	$0	$150,000	$0	$0	$150,000	$0	$0	$150,000	$0	**$450,000**
Capital	2239 - Bunnythorpe - Stormwater Asset Improvement	$200,000	$0	$200,000	$0	$200,000	$0	$200,000	$0	$200,000	$0	**$1,000,000**
Capital	2240 - Longburn - Stormwater Asset Improvements	$0	$200,000	$0	$200,000	$0	$200,000	$0	$200,000	$0	$200,000	**$1,000,000**
Capital	2241 - Citywide - Data Collection Devices for Stormwater Monitoring and Planning	$0	$0	$100,000	$0	$100,000	$0	$0	$100,000	$0	$0	**$300,000**
Capital	2313 - Citywide - Installation of new Stormwater Assets	$100,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	**$3,700,000**
Capital	2325 - Ashhurst - Stormwater Asset Improvement	$0	$84,890	$1,061,125	$100,000	$600,000	$0	$150,000	$650,000	$0	$0	**$2,646,015**
Capital	Total Annual Expenditure	**$8,894,150**	**$8,990,790**	**$13,093,955**	**$6,535,282**	**$11,757,829**	**$13,156,123**	**$21,028,400**	**$14,378,580**	**$3,998,300**	**$8,587,689**	**$110,421,098**

8.9 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 stormwater network, flood protection structures, pump stations, and treatment.
- Undertake 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.
- Review the recording of all asset types in IPS, including breakdown of the pump stations and equipment.
- Improve recording of stormwater network, structures pump stations, and treatment operational and maintenance data in IPS.
- Undertake formal reviews and/or optimisation studies of maintenance and operations activities based on data and risk.
- Increase the amount of condition inspections to a level that is enough to assess the overall condition of and rate of deterioration of the network, pump stations, and treatment and disposal assets (including incorporating into scheduled maintenance routines).
- Review, revise and process map the renewal strategy and section criteria for all asset types.
- Prepare management plans for all stormwater catchments.
- Expand out GIS mapping of forward works to avoid clashes to 30 years.
- Review, revise and process map the process for disposal all asset types.

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 Stormwater 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 30: Stormwater 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	$315,194,014	$226,341,433	$2,036,403
Non-reticulation	$7,628,348	$4,443,289	$121,405
Total	**$322,822,362**	**$230,784,721**	**$2,157,808**

Table 31: 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	+$26,135,099	+$15,071,077	+$236,239
Non-reticulation	+$887,583	+$392,312	+$10,340
Total	**+$27,022,682**	**+$15,463,388**	**+$246,580**
% increase 2022 vs 2020	**9.14%**	**7.18%**	**12.90%**

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 Stormwater were:

- The Stormwater assets have increased in Optimised Replacement Cost, Optimised Depreciated Replacement Cost, and Annual Depreciation by 9%, 7% and 1%, respectively. The majority of these increases were due to the addition of assets and inflation in construction costs as reflected in the changes to the capital goods price indices.

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

30 years capital and operational forecasts proposed in the draft Long Term Plan 2024/34 and Infrastructure Strategy are shown below. Years 11 and 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 maintain service level. Focused investment is required for the upgrade of Stormwater assets to maintain service levels.

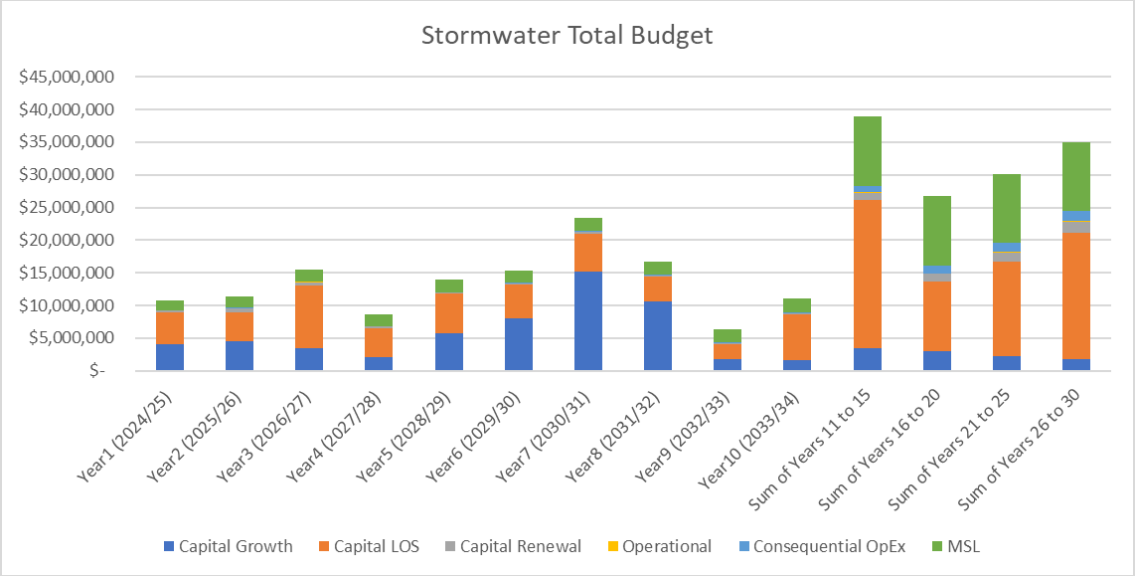


Figure 18: Overall Capital and Operational Forecast

9.2.2 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.

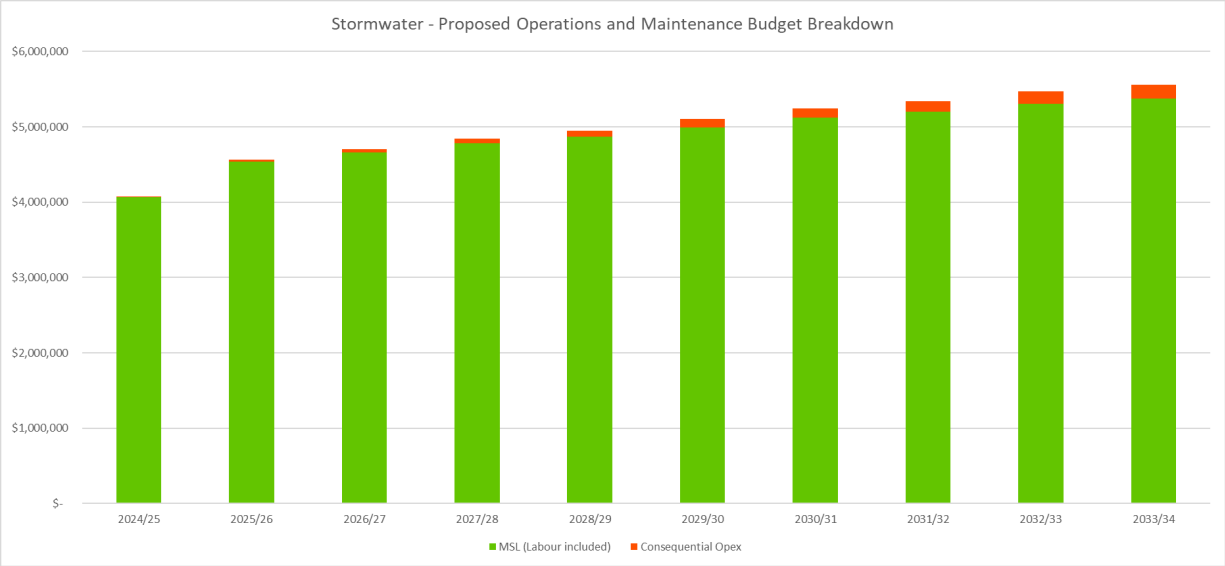


Figure 19: Operations and Maintenance Forecast

9.2.3 Renewal Forecast

The forecast annual renewals expenditure is similar to annual depreciation values and is fairly low over the next decade.

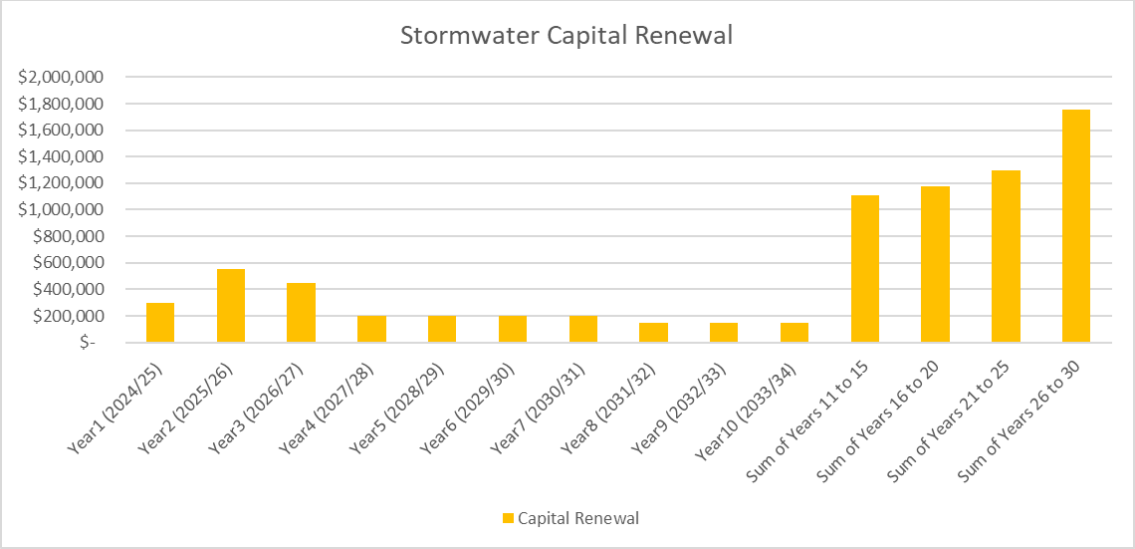


Figure 20: Renewals Forecast

9.2.4 Capital Forecast

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

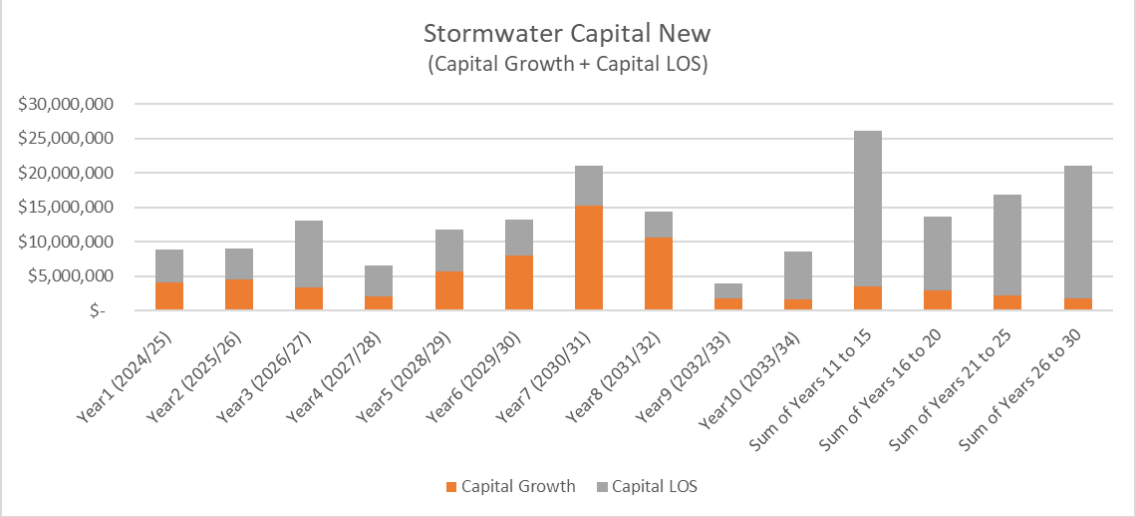


Figure 21: Capital LOS and Growth Forecast

9.3 How We Will Pay For It

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

- **Operation and Maintenance** is funded from the general rate.
- **Capital renewal** is funded from rates revenue to cover programmed renewal costs and if necessary, from borrowing.
- **Capital development works** that are for an increased level of service are funded from borrowing. Works that are required as a result of growth are funded, where possible, from user charges such as development contributions. Through the application of its Development Contribution policy we seek to obtain contributions to fund the infrastructure that is required due to City growth. Programmes that are attributable to growth are shown in this AMP. Development contributions for stormwater are area specific.
- **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 stormwater 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 quanta 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 operations and maintenance budgets as some specific assets may require immediate maintenance in response to the condition inspections. The impact of this will not be known until the condition inspections are begun.

9.4.3 Capital Renewal Forecast Reliability and Deliverability

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

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 the 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 unit rates. If unit rates increase at the same rate as inflation, then the forecast renewals budget with an inflation adjustment will be adequate. If unit rates increase at a rate greater than inflation, as has occurred in the last three years, then the forecast renewals budgets will be insufficient and will need to be increased.

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 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 in Table 32below. In time, Asset Management leadership will include a, yet to be established, cross-functional Steering Group.

Table 32: 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

Status: Final

An organisation chart is provided for reference below.

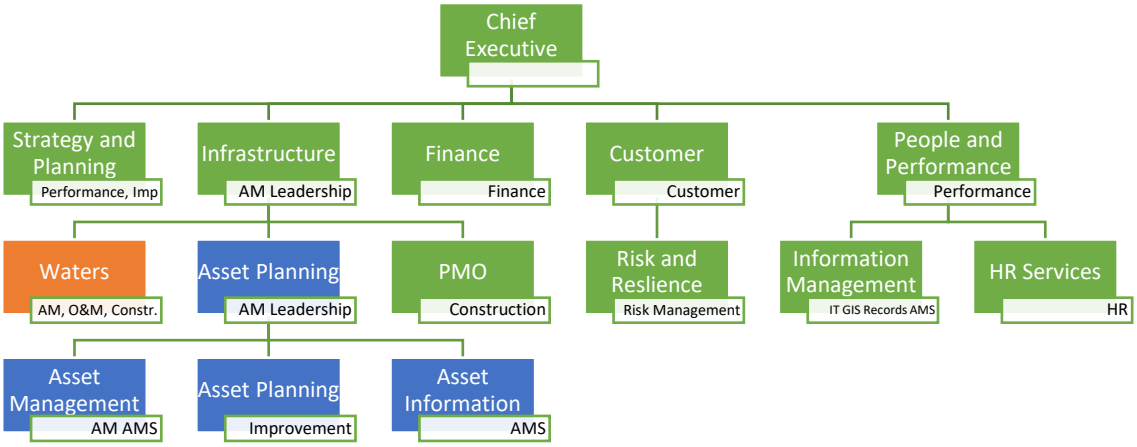


Figure 22: Organisation Chart with Asset Management Functions

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 in Table 33below. 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 33: 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
Operate	Three Waters > Networks Operations, Treatment	All Minor CCTV capability	Backflow device testing and laboratory services CCTV inspection
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 Stormwater Activity (see Table 32 above) were engaged with as key stakeholders in order to produce the 2023 revision of the Stormwater 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 32Table 32 above.
- **Processes:** Few processes have been documented.
- **Asset Management Maturity Levels:** These were set during the 2019 Asset Management Maturity Assessment.

10.4.2 Business Process Mapping

For the Stormwater 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.

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 34: 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).	• Procedures for asset information collection need to be developed and staff trained. • Standard Operating Procedures are well established where there are risks to quality or health and safety, but require continual review for relevance and accuracy
People	• The 2022 Asset Maturity Assessment noted: The organisational restructure brought together asset management information and	• Asset information integration with financial and customer service systems is limited.

Component Type	Components	Improvements and Issues
	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.	• 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.
Data	• Asset hierarchy in place. • Asset naming convention in place. • The 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
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	• 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.

Component Type	Components	Improvements and Issues
	• Infrastructure Data – migrating from RCMonitoring for water quality/consent compliance and other time series data (e.g. 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	

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 piped network) to support prioritisation of programmes.

10.6.2 Asset Hierarchy

An Asset Hierarchy for the activity has been established (refer to 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

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

Table 35: 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
Open Channels	2	3	3	3	3	3	2	0	3	3	**3**
Manholes	3	3	3	4	3	3	3	3	2	4	**0**
Pipes	5	2	2	4	3	4	3	3	3	3	**0**
Outlets	3	3	3	3	3	3	0	0	0	3	**0**
Floodgates	3	3	3	3	3	3	0	0	0	3	**0**
Pump Stations	4	1	2	0	0	0	0	0	0	4	**0**
Stop Banks	3	0	0	0	0	0	0	0	0	4	**0**
Detention Basins	2	1	2	0	0	0	0	0	0	4	**0**
Protection Works	2	0	0	0	0	0	0	0	0	3	**0**
Gross Litter Traps	4	0	1	0	0	0	0	0	0	4	**0**
Rain Gardens	0	0	0	0	0	0	0	0	0	0	**0**
Constructed Wetlands	4	0	0	0	0	0	0	0	0	4	**0**

Table 36: Asset Data Confidence Level Grading System

Confidence Grade	Description	Processes	Asset Data
5	Highly reliable/ Audited	A strictly formal process for collecting and analysing data. The process is documented and always followed by all staff. The process is recognised by industry as the 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 a 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 a reasonable level of confidence.

Confidence Grade	Description	Processes	Asset Data
3	Less Reliable	The process to collect data established. May not be fully documented but usually undertaken by most staff.	The 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 a reasonable level of confidence.
2	Uncertain	A semi-formal process usually followed. Poor documentation. The 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 the 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 is available.

10.7 Improvement Actions

- 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 Stormwater Activity team.

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

- Further development of the citywide flood model, especially for catchments with high flood risk, with enhanced capability to feed into optioneering for large scale flood mitigation projects.
- Award of a maintenance contract for mechanical and electrical stormwater assets. This will result in improved knowledge about asset condition, asset maintenance, creation of a critical spares inventory, and the introduction of a preventative maintenance schedule. Asset reliability is expected to improve, and reactive maintenance costs are expected to reduce over time as this contract progresses.

Further improvements have been the development of a comprehensive stormwater management guide to provide clear conditions and rules for new development areas and the continuation of the Hei Manga Oranga (Towards Healthy Waterways) waterways monitoring programme.

Note that staff turnover and vacant roles in the Stormwater Activity 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 37: Activity Improvement Plan Focus Areas

	Proposed Improvement Action	Status	Comment	Who is responsible
1.	Better data collection processes/procedures	In Progress	Undertake city-wide data collection and water quality monitoring	Service Manager - Stormwater
2.	Stormwater Treatment Devices – maintenance of city-wide Stormwater treatment devices	In Progress	Budget and preventative maintenance programme for stormwater treatment devices.	Service Manager - Stormwater
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 scenarios 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

Recent 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 Stormwater activity.

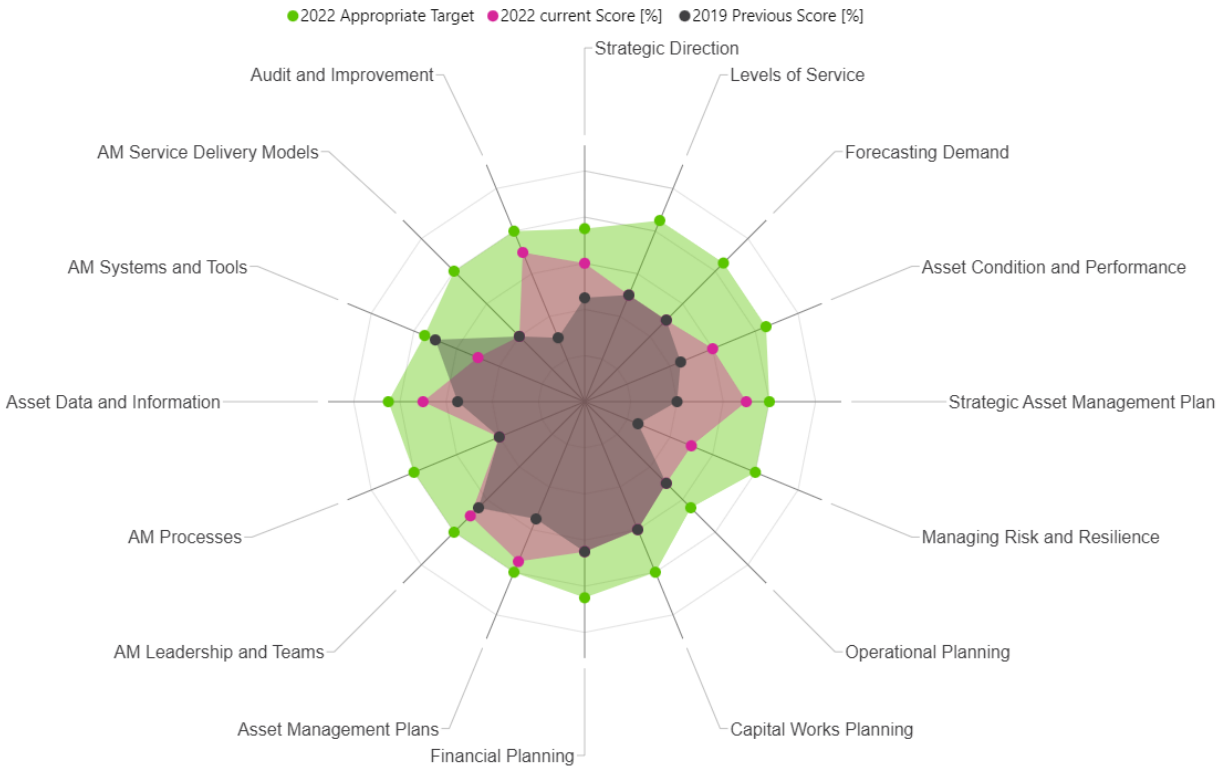


Figure 23: Asset Maturity Assessment Results (2019 and 2022, Infrastructure Associates)

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 38: 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	AMP
Operational Planning	Develop process to centrally develop and track proactive maintenance schedules.	High Yr1	In progress Maintenance contract	AMP

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
			covers bore stations and booster pump stations	
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	AMP
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	AMP
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 39: AMP Improvements

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
Catchment management plan	• Develop stormwater catchment management plan in liaison with Horizons re One Plan requirements			
Climate change plan	• Council includes specific actions for three waters activities in the next update of its climate change action plan			
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			

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
	• 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 • Develop the scheduled maintenance to ensure that the condition information required is captured			
Improvements to this AMP	• Include more condition assessment information about non-pipe assets in this AMP. • Update this AMP with current commitments to regional CDEM and Lifeline groups			AMP
Operational planning/ Promapp of processes	• Turn the existing SLAs and various dispersed planning documents into operation and maintenance practice documents for stormwater • 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			

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
	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 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			
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			

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
	• 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 AMP.

Term or Acronym	Description
Activity	An activity is the work undertaken on an asset or group of assets to achieve a desired outcome.
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.

Term or Acronym	Description
Condition Monitoring	Continuous or periodic inspection, assessment, measurement and interpretation of resulting data, to indicate the condition of a specific component so as to determine the need for some preventive or remedial action.
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 data-base.
Infrastructure Assets	Stationary systems forming a network and serving whole communities, where the system as a whole 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 a particular 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:

Term or Acronym	Description
	• The cycle of activities that an asset (or facility) goes through while it retains an identity 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.
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 are 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, per 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 assets 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

Term or Acronym	Description
	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.
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 on 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 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 materially improves the original service potential of the asset.
Valuation	Estimated asset value 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. Stormwater - DRAFT Condition and Performance Policy (July 2023)

Introduction

The following policy statement outlines Council's approach to assessing the physical condition and monitoring the performance of its stormwater 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 Stormwater 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.

Why do we do it?

The Council relies on well performing stormwater 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 its stormwater 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.

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

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

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. The target level 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 'core' score of 60 against an 'advanced' target of 85[3]. These results are similar for the Stormwater activity with a current 'intermediate' score of 60 against an 'advanced' maturity target of 85. Medium level priority improvements required to increase the current rating include developing a process to capture asset condition data during routine inspections and repair work.

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.

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[4]. See Improvements Section 8.

The Asset Criticality Framework[5] 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). The higher the consequence[6] of failure the more critical an asset is deemed to be. The approach taken to condition assessment and performance monitoring is aligned to the criticality of the asset, alongside other considerations. Generally, the higher the criticality rating the more frequent the assessment and monitoring. Currently only the criticality rating has been completed for the stormwater network pipes.

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

Criticality Rating[7]	Consequences of asset failure	Examples (diameter of pipes)	Approach to Condition Assessment and Performance Monitoring
5 Severe	Financial loss > $1 million and/or Asset Value >$10 million.	> 3,000 mm	A separate plan is developed for individual assets. This plan will include the condition assessment requirements as well as detail for

[3] As noted in the Asset Management Maturity Assessment, July 2022
[4] As noted in the Asset Management Maturity Assessment 2022.
[5] Palmerston North City Council Criticality Framework Part A, Draft March 2022
[6] 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.
[7] Based on Maximum Criticality Score, Palmerston North Criticality Framework Part E, Stormwater Pipes, draft March 2022 PLEASE NOTE IF THESE RESULTS ARE IN DISPUTE THIS WILL REQUIRE REVIEW AND UPDATE

	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.		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.	1501-3,000 mm	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. 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.	901-1,500 mm	A predetermined sample of assets from each critical area will be collected and assessed. Assessments are subject to subject matter expert judgement
2-3 Moderate	Financial loss $50k-$200k and/or asset value $200k 1 million.	601-900 mm	A combination of assessment samples from each critical areas and representative samples from predetermined cohorts and

	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.		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.	<600 mm	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 e.g. application of local knowledge and actual performance results may sometimes result in assets being assessed more or less frequently than recommended by the criticality assessment framework. A key example of this is where asset management officers consider the diameter of stormwater pipes and make further criticality calculations for stormwater pipes that pass through stop banks, under or over a railway, under a building or road corridor or when scores do not meet a 'logic' test.

What is measured and when?

The main asset types for the stormwater activity include: network pipes, plant, equipment, channels, streams, stop banks and detention basins. Currently the asset condition is theoretical and generally based on the age of assets. Little actual conditional data is recorded in the asset information systems. Stormwater pipes are generally the only assets that are assessed and recorded and the only component that has had criticality ratings completed.

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.

Pipes	
Condition Assessment	**Frequency**
Inspection	10 years

Performance Monitoring	**Frequency**
Residents' Satisfaction Survey	Annually
Monitoring of customer complaints and requests	Ongoing

Plant	
Condition Assessment	**Frequency**
Inspection	Various depending on age
Performance Monitoring	**Frequency**
Residents' Satisfaction Survey	Annually
Monitoring of customer complaints and requests	Ongoing

Equipment	
Condition Assessment	**Frequency**
Inspection	Various depending on age
Performance Monitoring	**Frequency**
Residents' Satisfaction Survey	Annually
Monitoring of customer complaints and requests	Ongoing

Channels	
Condition Assessment	**Frequency**
Inspection	Annually
Performance Monitoring	**Frequency**
Residents' Satisfaction Survey	Annually
Monitoring of customer complaints and requests	Ongoing

Streams	
Condition Assessment	**Frequency**
Inspection	Annually
Performance Monitoring	**Frequency**
Residents' Satisfaction Survey	Annually

Stop banks	
Condition Assessment	**Frequency**
Inspection	Annually
Performance Monitoring	**Frequency**

Residents' Satisfaction Survey	Annually

Detention basins	
Condition Assessment	**Frequency**
Inspection	Quarterly
Performance Monitoring	**Frequency**
Residents' Satisfaction Survey	Annually

How is it measured?

Council currently uses a combination of customer and technical monitoring techniques to assess condition and performance[8]. Once collected, data is entered into systems as outlined in Table 3. 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. For the stormwater activity CCTV is used to inspect approximately 4 km of network pipe per annum. Approximately 20km of a 290km network has been completed. Many of the other stormwater key assets are inspected but not inspected sufficiently to allow overall assessment of condition of the network [9]. Developing a regular inspection programme and recording data to enable condition assessment has been noted as improvements (see Section 8).

Table 3 Assessment of Condition (To be finalised as Policy is further Developed

Stormwater Assets				
Component	**Method**	**System**	**Range of grading scores** **For example** **1 = very good** **5= poor**	**Target**
Network pipes				
	Scheduled Inspection	IPS	XX	e.g. 70% are grade 1 = very good
Larger diameter pipes	CCTV	IPS?	XX	
Plant				
	Method	**System**	**Range of grading scores**	**Target**
EXAMPLES	Inspections	N/A	N/A	N/A
Equipment				
	Method	**System**	**Range of grading scores**	**Target**
EXAMPLES	Inspections	N/A	N/A	N/A

[8] The use of combined monitoring techniques is in line with best practice guidance and Council's aspiration regarding advanced asset management practices as outlined in the Asset Management Policy.

[9] While assets are subject to inspection the purpose is predominantly to identify issues as opposed to recording condition over time (AMP, 2020).

Channels				
	Method	**System**	**Range of grading scores**	**Target**
EXAMPLES	Not assessed	N/A	N/A	N/A
Streams				
	Method	**System**	**Range of grading scores**	**Target**
	Inspections?	SPM Database ?	XXX??	XXX???
Stop Banks				
	Method	**System**	**Range of grading scores**	**Target**
	Inspections	XX	XX	XX
Detention Basins				
	Method	**System**	**Range of grading scores**	**Target**
	Not inspected currently	XX	XX	XX

What can data tell us about the future of stormwater assets?

Data assists Council to understand:

- The current point in time condition of its resource recovery assets, and
- How the condition and performance of the resource recovery 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 resource recovery assets will be over a period of time.

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

How do we use data for reporting?

Council reports on Stormwater 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.

Improvements

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

Action	Who	When
Undertake a detailed condition assessment of all stormwater assets.	Asset Activity Manager	2023
Ensure that condition data is collected during all inspections and a regular monitoring programme is developed.	Asset Activity Managers and Asset Planning team	2023
Complete criticality rating work for the remaining stormwater assets (where appropriate)	Asset Planning Team	2023
Developing processes to capture asset condition data during routine inspections and repair work.	Operators and Field Inspection Staff	Ongoing
Complete a review of the current condition and performance data held for the Resource Recovery Activity to identify its use in decision making and programme initiatives.	Asset Activity Manager and Asset Data Team	TBC
Create a combination of separate plans for individual assets and sample assets from each critical area for Stormwater assets with criticality rating 4.	Asset Activity Managers	TBC
Create a predetermined sample of assets from each critical area and conduct assessments for Stormwater assets with a criticality rating 3-4. Assessments should be subject to subject matter expert judgement.	Asset Activity Manager	TBC
Undertake a combination of assessment samples from each critical area and representative samples from predetermined cohorts and assess to extrapolate condition grades for Stormwater assets with a criticality rating 2.	Asset Activity Manager	TBC

Select representative samples to be collected from predetermined cohorts and asses to extrapolate condition grades on Stormwater 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

Table C1: Summary of Resource Consents

Consent No.	Term [Yr]	Expiry Date	Type	Consent Subtype	Location	Description
APP-2015200167.00	35	1-Jul-2050	Water Permit	Dam & Divert	Norton Park	To undertake earthworks in Norton Park to construct a series of shallow ponds to create a wetland area, diversion of the Little Kawau Stream through the wetland area and installation of structures in the bed of the river subject to the attached condition schedule.
101464	35	22-Nov-2035	Land Use Consent	Land Disturbance	Cashmere Drive Subdivision	To excavate and disturb the surface of land and to place fill a culvert and structures for erosion protection.
6321	35	13-Dec-2030	Water Permit	Divert	Roberts Line	To divert water into a piped stormwater system on properties located on Roberts line.
APP-2016200765.00	5	1-Jul-2022	Land Use Consent	Construct	James Line	Installation/lengthening of a culvert.
APP-2016200765.00	5	1-Jul-2022	Land Use Consent	Land Disturbance	James Line	Land disturbance and vegetation clearance associated with the widening and upgrading of James Line within 5 m of a rare and threatened habitat.
APP-2016200765.00	5	1-Jul-2022	Discharge Permit	Discharge to Water	James Line	Discharge stormwater to a rare and threatened habitat.

D. Stormwater – Risk Register (March 2022)

Risk Management Framework: Risk Register Working Paper WOP01		Division/Unit:	Three Waters, Infrastructure
Process Name	Stormwater Reticulation WOP07	Process Owner	Group Manager - Three Waters
Sub Process		• Maintenance of stormwater reticulation network • Clearance of grates and gullies • Collection of stormwater and effective, efficient, legal and environmentally responsible discharge into waterways	
Potential Failure	1. Inability to manage localised heavy weather event 2. Localised or widespread flooding 3. Damage to property, both Council owned and private 4. Contamination event or significant pollutants picked up in stormwater 5. Sediment build up in reticulation network and streams and rivers 6. Erode stream channels 7. Stormwater ingress into effluent reticulation network, or vis versa		
Risk Category	Service Delivery	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Serious
Raw Risk Rating	Very High		
Risk Category	Reputational	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Likely	Raw Risk Consequence	Serious
Raw Risk Rating	Very High		
Risk Category	Environmental	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Likely	Raw Risk Consequence	Serious
Raw Risk Rating	Very High		
Raw Risk Rating Overall	Very High		
Causes	1. Poorly maintained network, including pumps 2. Aging infrastructure 3. Trees roots 4. Third party ingress 5. Poor renewal planning and management 6. Incorrect repair technics used 7. Poor quality construction technics 8. Seismic activity, including earth subsidence 9. Poor pipe material selection 10. Material ingress at grate point 11. Increasingly more severe and frequent extreme weather events (Climate change) 12. Urban creep and increased amount of impermeable surfaces 13. Inadequate climate change mitigation and adaption 14. Illicit stormwater network connections		

	15. Leaks and spills at industrial sites		
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. Regular grate and gullies clearing Effective 2. Weather forecasts and go teams to ensure clearance of grates/gullies at known trouble spots Effective 3. Insurance for water damage or third-party claims Effective 4. Routine pipe inspection by camera Partially Effective 5. GIS maps Partially Effective 6. Routine maintenance including flushing/cleaning, particularly known trouble spots Effective 7. Redundancy of pump capacity Effective 8. Pump station maintenance, including valves Effective 9. New residential building stormwater buffer tanks Effective 10. Land use restrictions in known flooding risk locations Effective 11. Erosion controls in exposed areas to protect land at source Effective 12. Maintenance of potential sediment source locations Effective 13. Catchment Management Plan and Stormwater Drainage Bylaw Effective		

Residual Risk Likelihood	Possible		Residual Risk Consequence	Moderate
Residual Risk Rating	Service Delivery	Medium	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 Likelihood	Unlikely		Residual Risk Consequence	Moderate
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. Dial before you dig			

Target Risk Rating	Service Delivery	Medium	Likelihood	Possible	Consequence	Moderate
Target Risk Rating	Reputational	Low	Likelihood	Rare	Consequence	Moderate
Target Risk Rating	Environmental	Medium	Likelihood	Unlikely	Consequence	Moderate
Target Risk Rating Overall	Medium					

Risk Management Framework: Risk Register Working Paper		Division/Unit:	Three Waters, Infrastructure
Process Name WOP08	Wastewater and Stormwater Compliance	Process Owner	Group Manager - Three Waters
Sub Process		• Inspection and compliance enforcement of liquid waste in accordance with bylaws • Stormwater monitoring	
Potential Failure	1. Creation of unmanageable quantities of wastewater 2. Creation of excessive amounts of untreatable wastewater		

	3. Reduced wastewater treatment processes 4. Inability to identify sources of unlawful waste discharge 5. Creation of PNCC failure under Horizons discharge consents 6. Inability to identify unacceptable trade waste types and amounts through testing 7. Ingress of unacceptable substances into stormwater 8. Increased maintenance requirements due to excessive wear and tear on infrastructure 9. Incident resulting in unwanted discharge

Risk Category	Legal/Compliance	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Unlikely	Raw Risk Consequence	Moderate
Raw Risk Rating	Medium		
Risk Category	Environmental	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Unlikely	Raw Risk Consequence	Major
Raw Risk Rating	High		
Risk Category	Financial	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Likely	Raw Risk Consequence	Moderate
Raw Risk Rating	High		
Raw Risk Rating Overall	High		

Causes	1. Extreme localised weather event 2. Illegal actions of polluting parties/businesses 3. Inadequate commercial cleaning procedures and equipment 4. Inadequate compliance testing and inspection 5. Inadequate register of business subject to trade waste compliance oversight

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. Sound policy in place Effective
2. Public education Effective
3. Dye testing in identifying issues Effective
4. Periodic inspections of commercial premises Effective
5. Financial penalties and infringement notices Effective
6. Maintenance of records on prior inspections Effective
7. Whilst blower procedures Effective
8. Trade waste testing and storm water testing Effective
9. Register of conditional consent holders (CCH) Effective
10. Monthly /weekly sample analysis of CCH Effective

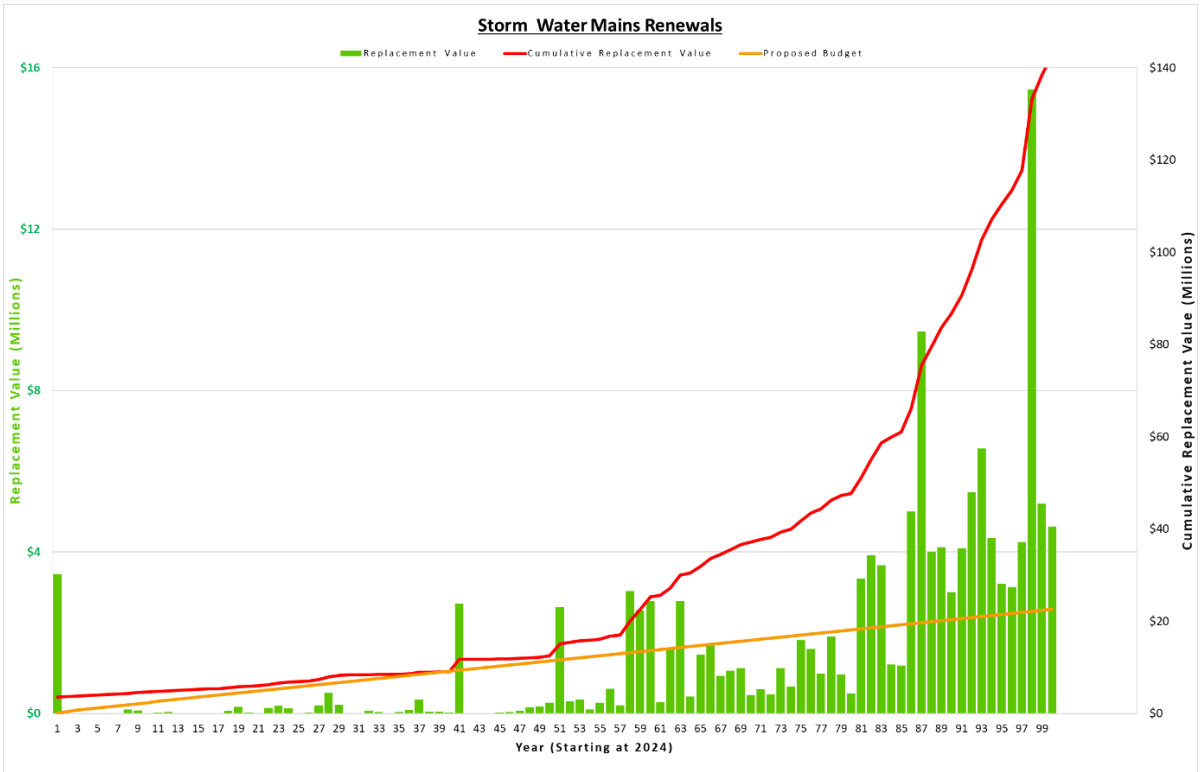
Residual Risk Likelihood	Rare		Residual Risk Consequence	Moderate
Residual Risk Rating	Legal/Compliance	Low	Within Risk Tolerance	Yes - No Further Action
Residual Risk Likelihood	Rare		Residual Risk Consequence	Serious
Residual Risk Rating	Environmental	Low	Within Risk Tolerance	Yes - No Further Action
Residual Risk Likelihood	Rare		Residual Risk Consequence	Minor

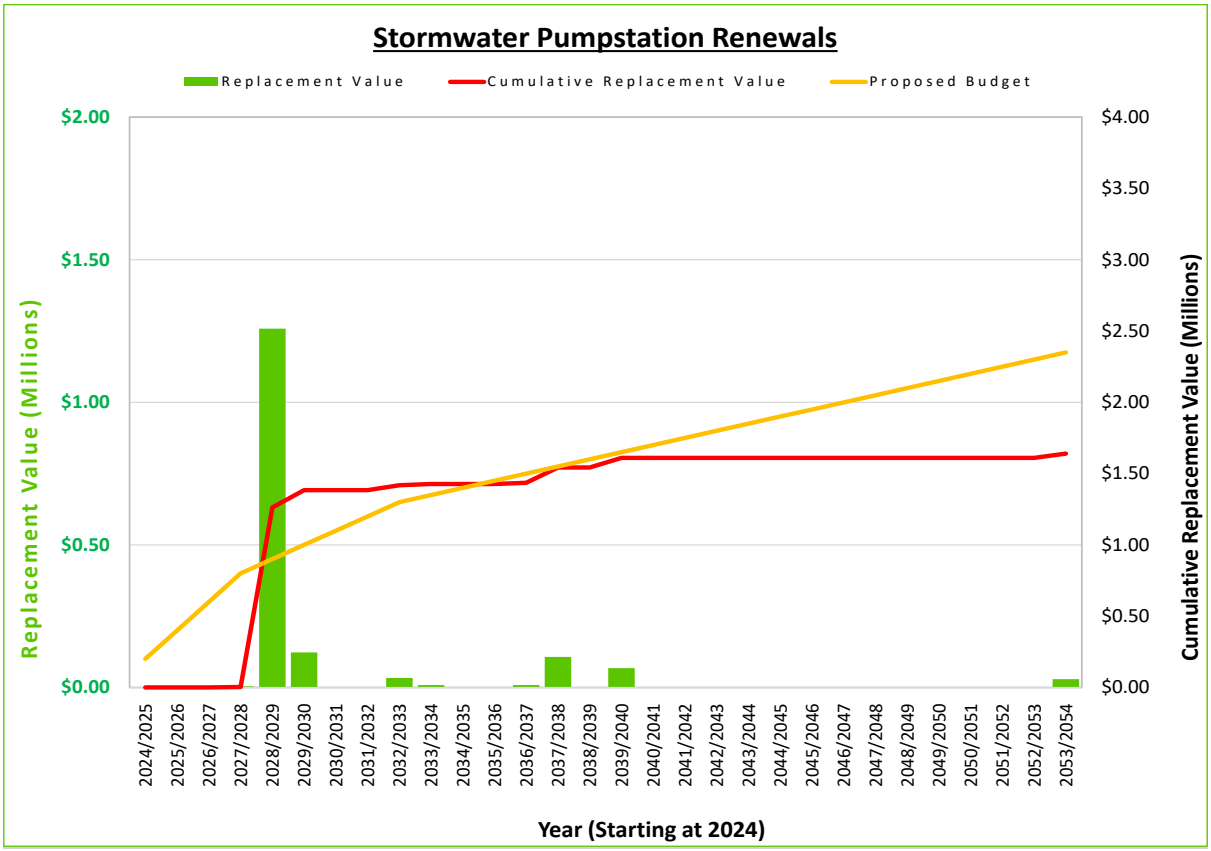
Status: Final

Residual Risk Rating	Financial	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	Legal/Compliance	Low	Likelihood	Rare	Consequence	Moderate
Target Risk Rating	Environmental	Low	Likelihood	Rare	Consequence	Serious
Target Risk Rating	Financial	Low	Likelihood	Rare	Consequence	Minor
Target Risk Rating Overall	Low					

E. Theoretical Renewals Profile

Based upon information stored in IPS and valuation information, the theoretical renewal profile for stormwater pipe 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.





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. Stormwater Addendum 2024

Several changes have been made to the AMP budget through the 10 Year Plan - Long Term Plan 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.

Status: Final

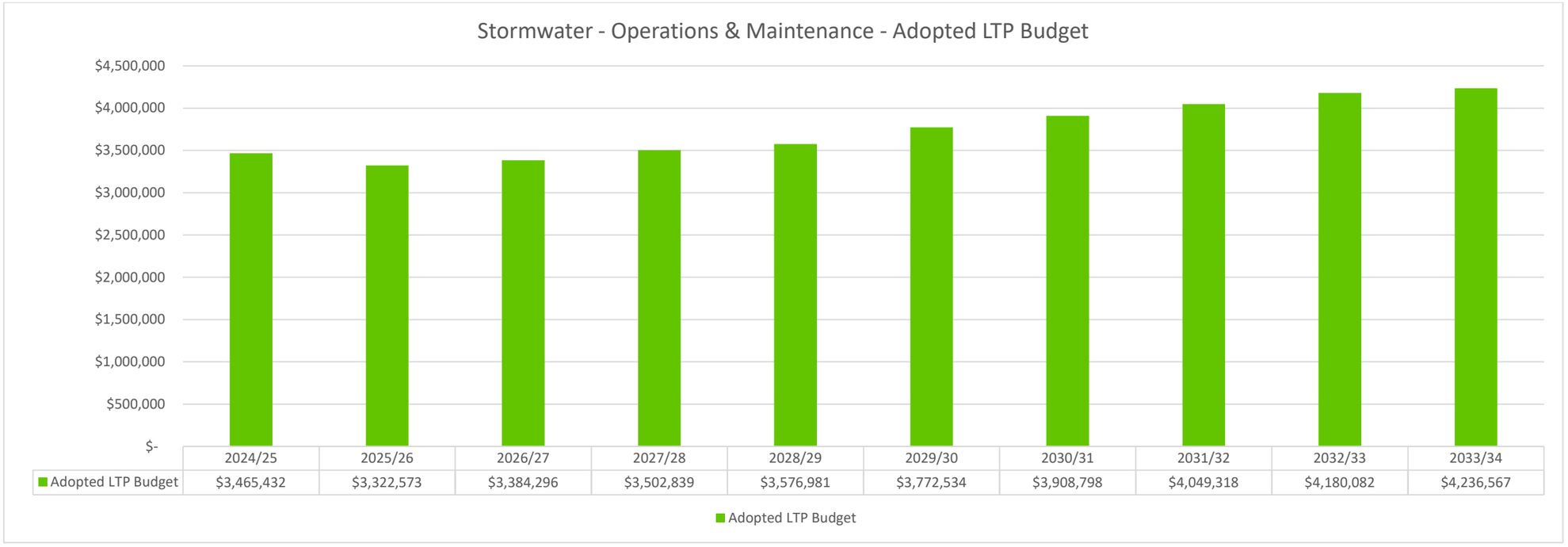
Operations and Maintenance

Operations and maintenance budgets contained in the Stormwater 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.

Most of our operational expenditure is directed towards operating and maintaining our existing assets. Overall operations and maintenance expenditure is proposed to trend slightly upwards, as our new asset base increases and our existing assets age.



Stormwater	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	-$302,036	-$247,211	-$208,837	-$173,146	-$141,963	-$117,691	-$96,974	-$74,082	-$64,187	-$53,783
Consultancy	$443,000	$337,604	$281,681	$260,664	$178,254	$179,671	$181,181	$183,581	$184,944	$185,445
Maintenance	$826,700	$823,277	$853,888	$889,631	$918,104	$967,758	$998,136	$1,025,872	$1,083,154	$1,115,021
Remuneration	$2,497,768	$2,384,537	$2,411,907	$2,464,854	$2,546,735	$2,635,562	$2,709,746	$2,781,530	$2,808,479	$2,809,565
Consequential OpEx	$ 0	$ 24,367	$ 45,657	$ 60,836	$ 75,851	$ 107,234	$ 116,710	$ 132,416	$ 167,692	$ 180,319
Stormwater Total	**$3,465,432**	**$3,322,573**	**$3,384,296**	**$3,502,839**	**$3,576,981**	**$3,772,534**	**$3,908,798**	**$4,049,318**	**$4,180,082**	**$4,236,567**

Status: Final

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

There were two new Operational Programmes introduced in the Stormwater Activity through the development of the LTP

Programme Type: Operating Programmes															
Programme Name	Budget view	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels of Service (LOS)
		2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34				
2536 - Future Development Strategy - Stormwater Strategy	LTP View	$103,000	$44,000	$0	$0	$0	$0	$0	$0	$0	$0	$147,000	Programme introduced	Opportunity to enable better stormwater service provision	None
2532 - Future Development Strategy - Technical Support - Stormwater	LTP View	$90,000	$90,000	$90,000	$90,000	$0	$0	$0	$0	$0	$0	$360,000	Programme introduced	Opportunity to enable better stormwater service provision	None

Renewals

Overall stormwater renewal budgets have been increased across the LTP in order to get on top the backlog of outstanding renewal works, however these budgets are small compared to budgets for Water and Wastewater Renewals. Stormwater is seen as a high priority by Councillors, as our stormwater system is generally the limiting factor when considering growth across Palmerston North.

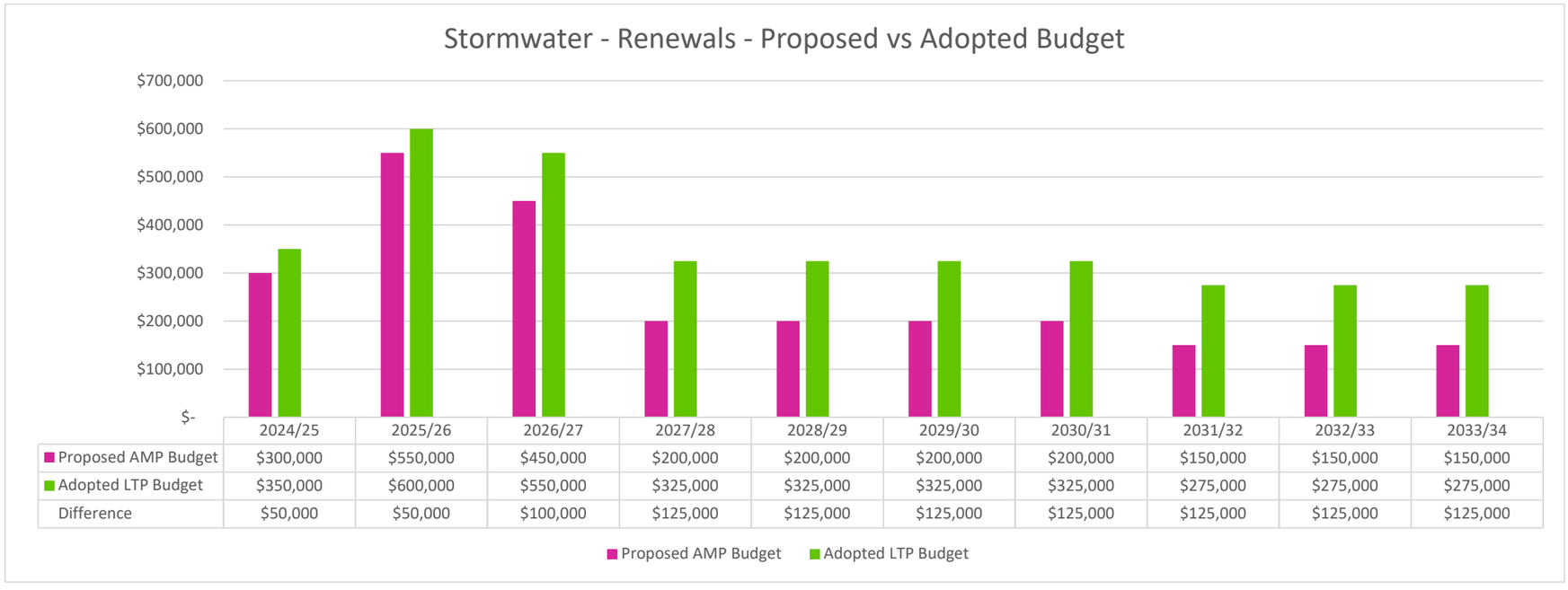
As mentioned above, part of the preparation of the draft LTP a resolution was passed to prepare draft budgets that stepped renewals from a Council wide prescribed budget value in Year 1 to a prescribed budget value in Year 10[10]. These draft budgets were prepared and subsequently accepted.

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.

The graph below summarises the budget differences between the proposed and adopted renewals budgets for the next ten years.



	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Proposed AMP Budget	$300,000	$550,000	$450,000	$200,000	$200,000	$200,000	$200,000	$150,000	$150,000	$150,000
Adopted LTP Budget	$350,000	$600,000	$550,000	$325,000	$325,000	$325,000	$325,000	$275,000	$275,000	$275,000
Difference	$50,000	$50,000	$100,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000

The tables below contain a summary of the Renewals programme changes within the first 10 years, as a result of the LTP consultation process. The implications of each change are described as are their impacts on existing levels of service.

[10] 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 Increase

There was an increase of $1,075,000 in the Renewal budget due to increases in two budgets to account for increasing costs and long lead times, and to get on top of the Renewals backlog. One budget was transferred from the Capital New category, adding a further $1,500,000 to the overall increase in the Renewal budget.

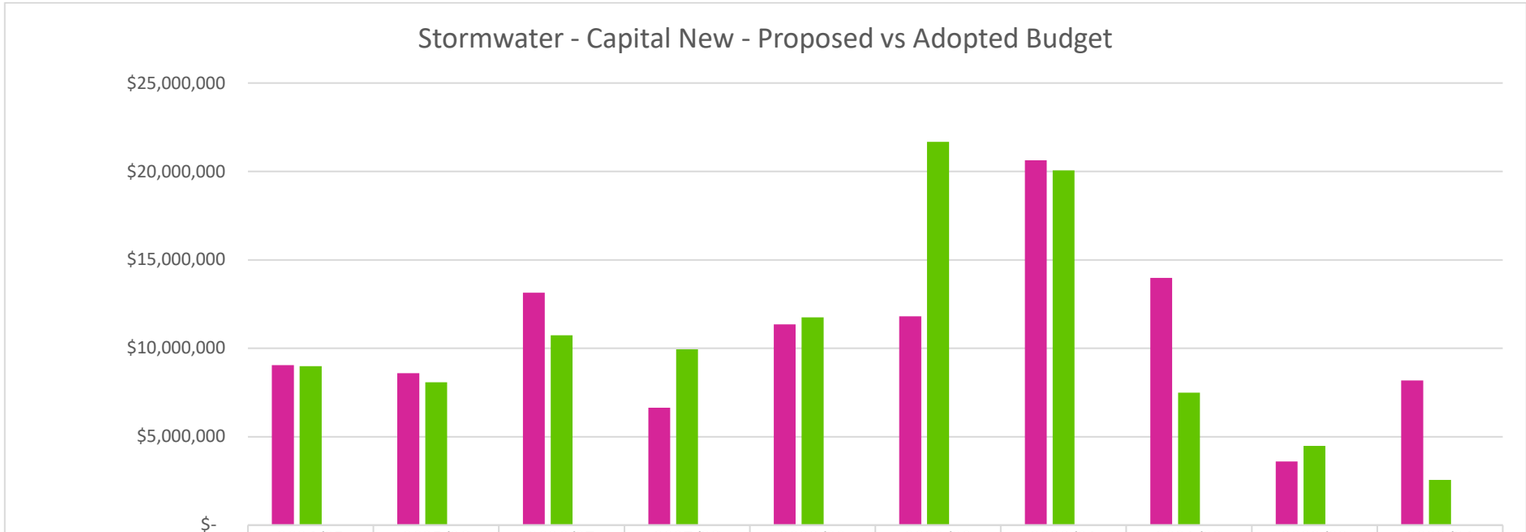
Programme Type: Renewals															
Programme Name	**Budget view**	**Year1**	**Year2**	**Year3**	**Year4**	**Year5**	**Year6**	**Year7**	**Year8**	**Year9**	**Year10**	**Total**	**Description of Change**	**Implication/Risk/Opportunity**	**Effect on Levels of Service (LOS)**
		2024/25	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**				
20 - City-wide - Stormwater Pump Station Renewals	AMP View	$200,000	$200,000	$100,000	$100,000	$100,000	$100,000	$100,000	$50,000	$50,000	$50,000	$1,050,000	Increases made to first 3 years of the planned programme, to take into account construction cost increases and long lead times for some mechanical plant.	Opportunity to replace aging equipment in a timely manner and ensure that LOS are maintained	Maintains level of service
20 - City-wide - Stormwater Pump Station Renewals	LTP View	$250,000	$250,000	$200,000	$100,000	$100,000	$100,000	$100,000	$50,000	$50,000	$50,000	$1,250,000			
22 - Restoring Flood Capacity of Stormwater Channels	AMP View	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	Capital New Programme 2235 was removed and the budget re-assigned to Renewal Programme 22 with no change to the budget	No change to risk	No change to LOS
22 - Restoring Flood Capacity of Stormwater Channels	LTP View	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$1,500,000			
1062 - City-wide - Stormwater Network Renewal Works	AMP View	$100,000	$350,000	$350,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$1,500,000	Increases made to years 4 to 10 of the planned programme. The asset management plan has indicated that there is a renewals backlog, we have increased the budget to address this and avoid future sharp renewal increases.	Opportunity to replace aging networks in a timely manner and ensure that LOS are maintained	Maintains level of service
1062 - City-wide - Stormwater Network Renewal Works	LTP View	$100,000	$350,000	$350,000	$225,000	$225,000	$225,000	$225,000	$225,000	$225,000	$225,000	$2,375,000			

Status: Final

Capital New

Capital investment is required to meet promised Council levels of service both now and into the future. This is particularly important for our stormwater networks as increasing resilience will be required to manage the potential impact of climate change.

There are two major capital programmes intended to increase capacity and resilience of the existing network, totalling $33M over the next 10 years. Investment in resilience makes networks more reliable and in general can reduce lifecycle costs, particularly during recovery from damaging events.



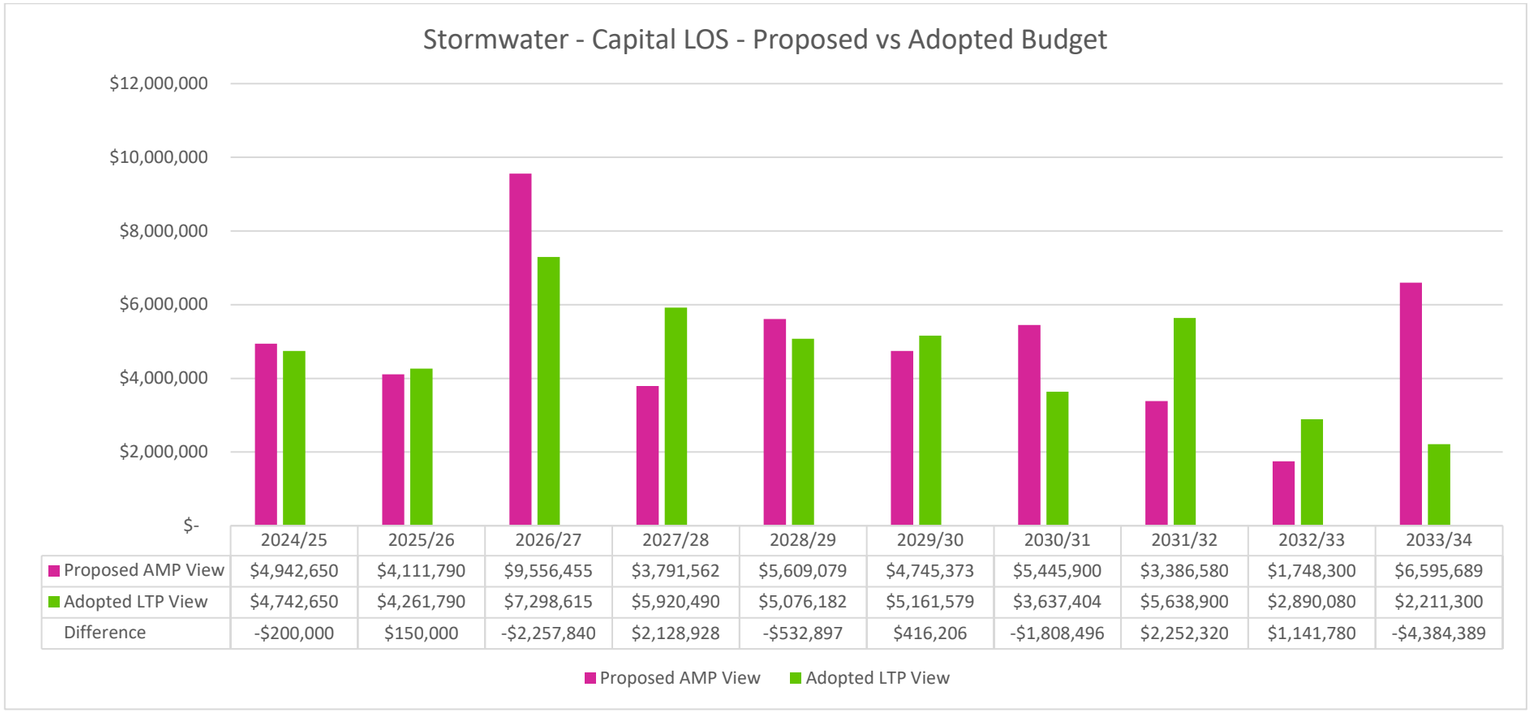
	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Proposed AMP Budget	$9,044,150	$8,590,790	$13,145,675	$6,631,782	$11,357,829	$11,807,873	$20,628,400	$13,978,580	$3,598,300	$8,187,689
Adopted LTP Budget	$8,986,650	$8,077,686	$10,736,115	$9,942,625	$11,748,227	$21,672,329	$20,061,904	$7,488,900	$4,482,080	$2,561,300
Difference	-$57,500	-$513,104	-$2,409,560	$3,310,843	$390,398	$9,864,456	-$566,496	-$6,489,680	$883,780	-$5,626,389

The tables below contain a summary of the Capital New programme changes within the first 10 years, as a result of the LTP prioritisation and consultation process. The implications of each change are described, as are their impacts on existing levels of service.

Status: Final

Capital New - Levels of Service

The graph below summarises the budget differences between the proposed and adopted capital new - level of service budgets for the next ten years.



	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Proposed AMP View	$4,942,650	$4,111,790	$9,556,455	$3,791,562	$5,609,079	$4,745,373	$5,445,900	$3,386,580	$1,748,300	$6,595,689
Adopted LTP View	$4,742,650	$4,261,790	$7,298,615	$5,920,490	$5,076,182	$5,161,579	$3,637,404	$5,638,900	$2,890,080	$2,211,300
Difference	-$200,000	$150,000	-$2,257,840	$2,128,928	-$532,897	$416,206	-$1,808,496	$2,252,320	$1,141,780	-$4,384,389

Budget Decrease

Only one stormwater programme had a budget decrease, of $4,595,000 as shown below. This was due to a change in timing, where works in the first three years were delayed and some expenditure then fell into the years beyond 2034. It should also be noted that Programme 2235 was re-assigned to the Renewals area, and renumbered as Programme 22, with no change to the budget for this programme, but contributing to a further $1,500,000 decrease in the Capital New budget.

Programme Type : Capital New - Levels of Service														
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)**
1708 - City-wide - Stormwater Flood Mitigation	AMP View	$1,548,800	$417,600	$4,757,667	$478,912	$1,361,809	$945,603	$3,104,100	$1,001,780	$60,000	$4,594,389	$18,270,660	Spread Y3 spend across Y3 and Y4 - due to fiscal constraints and pushed future spending out by 1 year	First major project (upgrade of Botanical) will be staged across 2 financial years	Will continue to have areas where we are unable to meet Levels of Service statements for a longer time
1708 - City-wide - Stormwater Flood Mitigation	LTP View	$1,548,800	$417,600	$2,599,827	$2,157,840	$478,912	$1,361,809	$945,604	$3,104,100	$1,001,780	$60,000	$13,676,272			
2235 - Citywide - Restoring Flood Capacity of Stormwater Channels	AMP View	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$1,500,000	Capital New Programme 2235 was removed, and the budget re-assigned to Renewal Programme 22	No change to risk	No change to LOS
2235 - Citywide - Restoring Flood Capacity of Stormwater Channels	LTP View	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0			

Programme Timing Change

Status: Final
Programme timing changes occurred in two projects as set out below. A decrease of $250,000 occurred as a result of delays to proposed works.

Programme Type: Capital New - Levels of Service															
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)
1706 - City-wide - Stormwater Network Resilience	AMP View	$0	$0	$300,000	$0	$0	$0	$300,000	$0	$0	$0	$600,000	Programme timing changed (defer commencement to Y4) to allow better alignment with Programme 1060 City-wide Stormwater Network Improvement Works and the newly introduced Programme 2313 - Citywide - Installation of new Stormwater Assets (Network installation)	Minimal risk	Maintain LOS through increases to other budgets and better alignment with this programme.
1706 - City-wide - Stormwater Network Resilience	LTP View	$0	$0	$0	$300,000	$0	$0	$300,000	$0	$0	$0	$600,000			
1707 - City-wide - Land purchase associated with streams and channels	AMP View	$250,000	$0	$0	$250,000	$0	$0	$250,000	$0	$0	$250,000	$1,000,000	Programme pushed out to commence in Y4 due to fiscal constraints	Minimal risk	No change to LOS
1707 - City-wide - Land purchase associated with streams and channels	LTP View	$0	$0	$0	$250,000	$0	$0	$250,000	$0	$0	$250,000	$750,000			

Introduced

There was $5,000,000 introduced into New Capital budgets. One programme was introduced, and two programmes were renumbered, as a function of late commissioning of the new financial and financial modelling systems, with no budget change.

Programme Type: Capital New - Levels of Service															
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)
2313 - Citywide - Installation of new Stormwater Assets (Network installation)	LTP View	$100,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$3,700,000	Intended to provide for installation of SW pipes in areas that currently only have overland flow	Might have to spread this budget to cover installation of treatment devices as well	Will enable improved service in areas where Level of Service is not currently met
2509 - Bunnythorpe - Stormwater Asset Improvement	LTP View	$200,000	$0	$200,000	$0	$200,000	$0	$200,000	$0	$200,000	$0	$1,000,000	Programme was 2239	Opportunity to provide a clear line of sight for Bunnythorpe community as to work in their specific area.	Will enable improved service in areas where Level of Service is not currently met
2529 - Citywide - Data Collection Devices for Stormwater Monitoring and Planning	LTP View	$0	$0	$100,000	$0	$100,000	$0	$0	$100,000	$0	$0	$300,000	Programme was 2241	Opportunity to understand the network better to alleviate any stormwater capacity issues.	Will enable planning to improve service in areas where Level of Service is not currently met

Not Adopted

There was a $1,950,000 reduction in budget when two programmes were not adopted. These programmes were both rolled into Programme 1060, effectively a 10% budget decrease, as the overall budget for Programme 1060 remained unchanged. However, merging of these programmes will allow officers greater flexibility in determining how to use this budget.

Programme Type: Capital New - Levels of Service															
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)
2237 - Citywide - Installation of Local Stormwater Treatment Devices	AMP View	$50,000	$250,000	$50,000	$250,000	$50,000	$250,000	$50,000	$250,000	$50,000	$250,000	$1,500,000	Merged into Programme 1060	No change to risk	No change to LOS
2238 - Citywide - New Pipes to Redirect Stormwater Flows Away from Sewer Systems	AMP View	$0	$0	$150,000	$0	$0	$150,000	$0	$0	$150,000	$0	$450,000	Merged into Programme 1060	No change to risk	No change to LOS

Status: Final

Capital New – Growth

Capital investment is also required to cater for expansion of the city and to meet growth demands. Actual service growth is dependent on timing of developments.

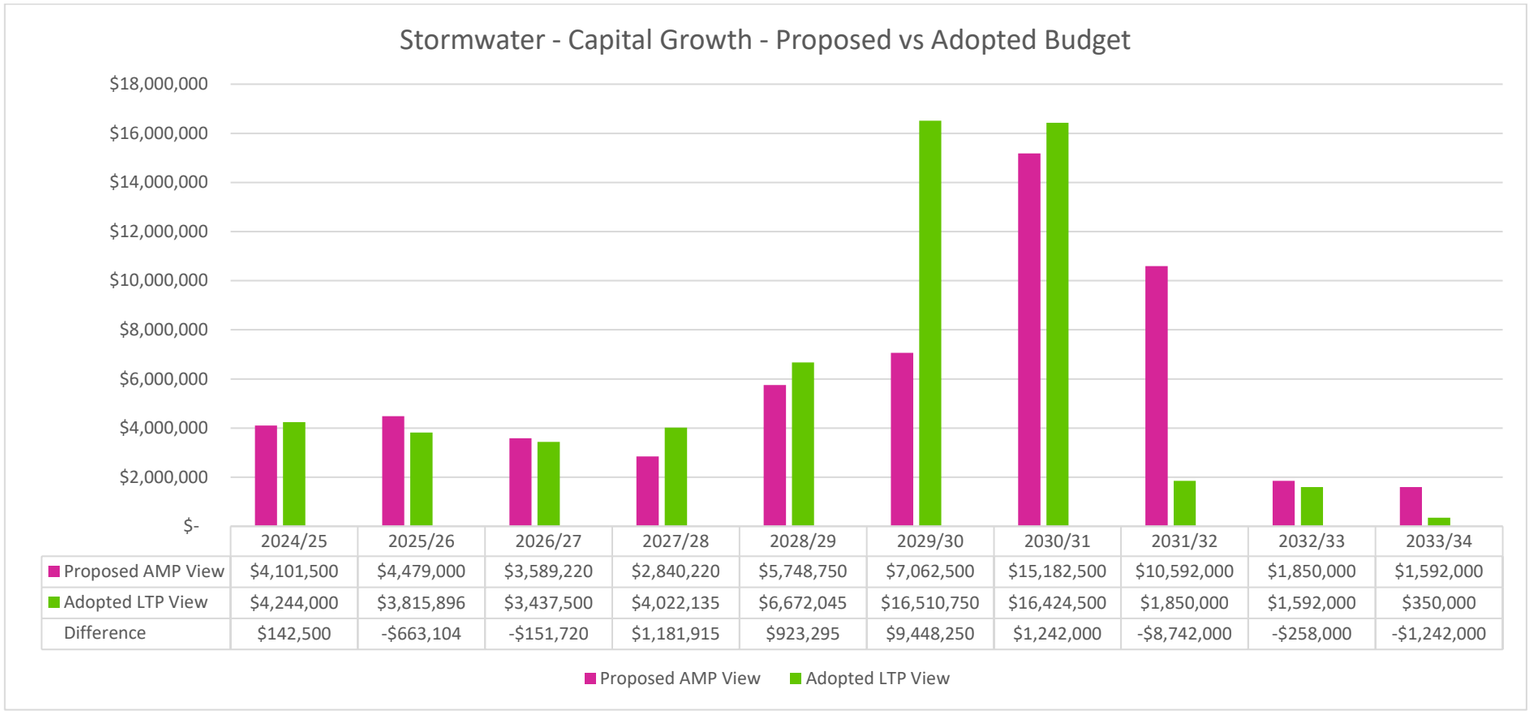
The timing of the growth programmes has been adjusted in accordance with revised growth timing assumptions. As stated in the Strategic Asset Management Plan these assumptions are made Council wide based on population projections, economic projections, government policy on requirements for dwellings and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

Several programmes were adjusted during the Council prioritisation process, as timing expectations for particular development areas were revised by the Strategy and Planning Team.

The increase from 2028/29 to 2031/32 for stormwater pipes and treatment is to provide for growth in new residential and industrial developments e.g., Kakatangiata and Aokautere

The graph below summarises the budget differences between the proposed and adopted capital new - growth budgets for the next ten years.



	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Proposed AMP View	$4,101,500	$4,479,000	$3,589,220	$2,840,220	$5,748,750	$7,062,500	$15,182,500	$10,592,000	$1,850,000	$1,592,000
Adopted LTP View	$4,244,000	$3,815,896	$3,437,500	$4,022,135	$6,672,045	$16,510,750	$16,424,500	$1,850,000	$1,592,000	$350,000
Difference	$142,500	-$663,104	-$151,720	$1,181,915	$923,295	$9,448,250	$1,242,000	-$8,742,000	-$258,000	-$1,242,000

Budget Increase

There was a $1,880,000 increase in the capital growth budgets.

Programme Type: Capital New - Growth														
Programme Name	**Budget view**	**Year1**	**Year2**	**Year3**	**Year4**	**Year5**	**Year6**	**Year7**	**Year8**	**Year9**	**Year10**	**Total**	**Description of Change**	**Implication/Risk/Opportunity**	**Effect on Levels on Service (LOS)**
		2024/25	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**				
2324 - Urban Growth - Stormwater Roxborough Crescent Infill	AMP View	$150,000	$800,000	$0	$0	$0	$0	$0	$0	$0	$0	$950,000	Increased to meet demand from new housing, as details of proposed development were not known when initial budget estimate was made	LTP budget has been aligned to development timeline for this area.	Meet LOS based on growth projections
2324 - Urban Growth - Stormwater Roxborough Crescent Infill	LTP View	$292,500	$136,896	$0	$1,678,415	$723,295	$0	$0	$0	$0	0	$2,831,106			

Programme Timing Change

Status: Final
Changes in the timing of two Programmes had no effect on the total Growth budget, but better aligned budget expenditure with growth projections.

Programme Type: Capital New - Growth															
Programme Name	**Budget view**	**Year1**	**Year2**	**Year3**	**Year4**	**Year5**	**Year6**	**Year7**	**Year8**	**Year9**	**Year10**	**Total**	**Description of Change**	**Implication/Risk/Opportunity**	**Effect on Levels on Service (LOS)**
		2024/25	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**				
197 - Urban Growth - NEIZ - Stormwater	AMP View	$0	$0	$151,720	$948,220	$948,250	$0	$0	$0	$0	$0	$2,048,190	Programme delayed by 1 year, to start in Y4	Alignment with growth projections	Meet LOS based on growth projections
197 - Urban Growth - NEIZ - Stormwater	LTP View	$0	$0	$0	$151,720	$948,250	$948,250	$0	$0	$0	$0	$2,048,220			
1065 - Urban Growth - Kakatangiata - Stormwater	AMP View	$0	$0	$0	$0	$300,000	$500,000	$9,000,000	$10,242,000	$1,500,000	$1,242,000	$22,784,000	Programme has been brought forward by 1 year, to start in Y4	LTP budget has been aligned to growth projections to commence year 4 not year 5	Meet LOS based on growth projections
1065 - Urban Growth - Kakatangiata - Stormwater	LTP View	$0	$0	$0	$300,000	$500,000	$9,000,000	$10,242,000	$1,500,000	$1,242,000	$0	$22,784,000			

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