2018-2028 STORMWATER AND FLOOD PROTECTION ASSET MANAGEMENT PLAN

He Rautaki Whakahaere Rawa mō Te Wai Āwhā me te Taupā Waipuke

GENERAL VOLUME

HE PUKAPUKA MATUA

Mountain to Sea

Te Kaunihera-ā-Rohe o Ngāmotu

NEW PLYMOUTH DISTRICT COUNCIL

newplymouthnz.com

DOCUMENT CONTROL

Document Name	2018-2028 Stormwater and Flood Protection Asset Management Plan General Volume
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GLOSSARY

ADWF	Average Dry Weather Flow (sewage)
AM	Asset Management
AEP	Annual Exceedance Probability
AMP	Asset Management Plan
AMS	Asset Management System
ARI	Average Reoccurrence Interval (rainfall)
AS/NZS	Australian/New Zealand Standards
Capex	Capital Expenditure
CCTV	Closed Circuit Television
CDEM Act	Civil Defence Emergency Management Act
City Care Ltd	Water and Wastewater reticulation maintenance contractor
Communitrak	Annual Communitrak survey performed by National Research Bureau
COP	Code of Practice
CSR	Comprehensive Safety Review
CV	Corporate Vision
DWS	Drinking Water Standards (or the latest edition thereof)
EColi	Bacterium Escherichia coli that produces a toxin and can cause severe illness
FAC	Free Available Chlorine
GCRC	Gross Current Replacement Cost
GIS	Graphical Information System
GL	General Ledger
HUE	Household Unit Equivalent
I&E	Instrumentation and Electrical
Infra/Enterprise	NPDC customer support services information system
IRP	Incident Response Plan
IWWF	Instantaneous Wet Weather Flow (sewage)
Kl	Kilo-litres
KPI	Key Performance Indicator
LAPP	Local Authority Public Protection
LGA	Local Government Act
LIM	Land Information Memoranda
LoS	Levels of Service
LTCCP	Long-Term Council Community Plan
MAV	Maximum Allowable Value
MCC	Main Control Cabinet
MfE	Ministry for Environment
Ml	Mega–litres (1 ML = 1,000,000 litres)
MIS	Management Information System (water and wastewater)
MoD	Money of the Day
MoH	Ministry of Health
NAMS	National Asset Management Strategy
NB	Nominal Bore
NPDC	New Plymouth District Council
NPV	Net Present Value
NRB	National Research Bureau
NTU	Turbidity units
NZWWA	New Zealand Water and Wastes Association
ODM	Optimised Decision Making
ODRC	Optimised Depreciated Replacement Cost
Opex	Operational Expenditure
PIM	Project Information Memorandum
PRV	Pressure Reducing Valve
PWC	Price Waterhouse Coopers
PWWF	Peak Wet Weather Flow (sewage)
RCA	Road Controlling Authority
RFP	Request for Proposal
RFWP	Regional Fresh Water Plan
RMA	Resource Management Act
SCADA	Supervisory Control and Data Acquisition system
SDC	Stratford District Council
STDC	South Taranaki District Council
SOLD	Society of Large Dams
Tech1	Technology One
TNZ	Transit New Zealand
TRC	Taranaki Regional Council
UAC	Uniform Annual Charge
UFW	Unaccounted-For-Water (also known as Non-Revenue Water)
UV	Ultra Violet disinfection treatment
VFR	Visiting friends and relations
WOMB	Waitara Outfall Management Board

1. EXECUTIVE SUMMARY

This general Stormwater and Flood Protection Asset Management Plan outlines how we will contribute to the community outcomes and priorities identified in the 2018-2028 Long Term Plan (LTP).

Amongst other things, our stormwater and flood protection activities include operating, maintaining and developing the stormwater system, including flood protection structures. Our key service objectives for these activities are to:

- Provide a safe, healthy and efficient service at a relatively low cost.
- Minimise the impact of high density human populations on the environment.
- Ensure that infrastructure has the capacity to meet current and future demand within defined levels of service.
- Comply with TRC's Regional Fresh Water Plan.
- Ensure that public health and the environment is protected, and that we provide a high level of reliability in emergency situations.

Managing and maintaining the stormwater network and flood protection assets is resource intensive. As at 30 June 2016, the certified Optimised Depreciated Replacement Cost (ODRC) or fair value of the Council's stormwater and flood protection assets was $167m, excluding land and buildings. The Gross Current Replacement Cost (GCRC) of these assets was assessed at $253m excluding land and buildings.

To sustain current levels of service, stormwater and flood protection assets will require Opex of $16.9m. A further $18.6m of Capex is planned for the next 10 years to provide for asset renewals, to meet forecast growth in demand and to deliver some improvements to levels of service.

Specific details about each of the asset categories in the stormwater network can be found in the Stormwater and Flood Protection AMP volumes.

Note: All financial forecasts are shown in inflation adjusted dollar values.

1.1 Purpose of the Plan

This plan contains the information required for effective decision making about stormwater and flood protection services in the New Plymouth District. It underpins the Long Term Plan and the Annual Plan before those documents go to the community for consultation.

The purpose of this plan is to:

- Demonstrate that our asset management strategies support the core social, economic, environmental and cultural outcomes, identified through community consultation.
- Outline how we will meet legal and regulatory obligations relating to stormwater
- Manage stormwater and flood protection demands in a sustainable and cost effective way, both now and in the long term.
- Provide well substantiated financial forecasts and projections.
- Ensure we identify and utilise improvement opportunities.

The plan is **not** an authorisation to commit budgets to the programmes it describes. Such authorisation is made through our LTP and AP processes.

1. EXECUTIVE SUMMARY

1.2 Asset Description

We collect, manage and dispose of stormwater run-off from around 6,600 hectares of urban area in the district, covering New Plymouth, Bell Block, Waitara, Inglewood, Urenui, Onaero, Lepperton, Egmont Village, Öäkura and Okato. We also monitor and maintain three flood protection dams and two diversion tunnels. An overview of these assets is provided in Table 1. More details about each of the asset categories can be found in the stormwater and flood protection AMP volumes.

Table 1 Asset summary

Asset Category	Description	Quantity	AMP Volume
Pump Station		1 No	Volume 1
Reticulation Network	Manholes	4,911 No	Volume 2
	Reticulation	284 Km	
	Stormwater Services	12 Km	
Inlets/Outlets	Inlets Outlets	9,117 No	Volume 3
	Mangati - Wet land	2 No	
	Peringa Park -Wetland	1 No	
Flood Protection	Dams	3 No	Volume 4
	Bunds	8 No	
	Diversion Tunnels	3 No	
	Huatoki Plaza - Weir	1 No	

1.3 Levels of Service

Our overall Stormwater and Flood Protection service objective is as follows:

'We will deliver flood protection and stormwater services that protect and promote public health, meet legislative standards, while endeavouring to meet community expectations, in a safe, efficient and affordable manner, today and for the future.'

This links to our community outcomes in the following ways:

Stormwater

- Protecting people and property from the effects of stormwater run-off and localised flooding after a significant rainfall event contributes to Putting people first - *Aroha ki te Tangata,*
- Effective stormwater management also protects our natural resources, contributing to Caring for our place - *Manaaki whenua, manaaki tangata, haere whakamua*.
- Our planning for challenges such as increased rainfall and climate change helps minimise potential risk to property and industry, contributing to Supporting a prosperous community - *Awhi mai, Awhi atu, tātou katoa.* Providing new stormwater systems to accommodate growth also supports development in the district.

Flood Protection

- Reducing flood contributes to Putting people first - *Aroha ki te tangata.* Protecting people and property from the effects of flooding from rivers and streams in severe storm events enables residents to continue with their daily lives after a significant rainfall event.
- Our flood protection and control works also protect our natural environment and outdoor lifestyle opportunities, supporting Caring for our place - *Manaaki whenua, manaaki tangata, haere whakamua*
- Reducing flood risk protects businesses and industry, contributing to Supporting a prosperous community - *Awhi mai, awhi atu, tātou katoa* . This includes reducing the impact of flooding on the central business district through the Huatoki dam scheme

To support this objective and community outcomes we have established levels of service that identify key measures and targets for our stormwater and flood protection service. These are summarised below. Further details can be found in Section 3.

Stormwater

- We provide a stormwater management system that protects people and property.
- We comply with all resource consents for discharges from our stormwater system.
- We respond to service requests in a timely manner.
- Customers are satisfied with the performance of our stormwater system.

Flood Protection

- We effectively maintain our flood protection and control works.

1.4 Future Demand

We anticipate that by 2045, the district's population will increase by 19%, to approximately 88,000 people. This expected population growth will create additional demand on existing stormwater network infrastructure. Climate change is also likely to place more demand on the existing network.

During the 2018-28 LTP period, we plan to produce a Stormwater Master Plan to ensure that population growth and climate change projections are catered for in a coordinated way.

Network modelling will underpin and inform the key components of the Stormwater Master Plan. Network models are essential tools for optimising capital works programmes, particularly for service level and growth. They are considered assets in their own right and require renewal on a regular basis. Many of our existing network modelling tools require updating. Some catchments in the network still require modelling to be developed and introduced.

To encourage development and facilitate growth in urban areas, we will need to extend some stormwater assets. Policies and standards relating to development require that stormwater systems be designed and installed to achieve hydraulic neutrality using features including detention ponds, stone galleries, soak holes etc.
Details of general initiatives and their associated expenditure forecasts are included in Section 4.

1.5 Lifecycle Management Plan

The lifecycle of an asset consists of:

- Creation (plan, design, procure, construct);
- Operation and maintenance;
- Renewal or rehabilitation; and
- Disposal.

General descriptions of the asset management practices, processes and system we use throughout the life cycle of our assets are included in Section 4 of our Asset Management Strategy.

Particular details of how we manage the lifecycle of each asset category can be found in the asset category volumes 1-4, including how we optimise costs over a lifecycle. For example, it may be more cost efficient for us to choose a more expensive valve that costs less to maintain over the course of its life, than to choose a cheaper valve that will require a lot of maintenance.

1.6 Risk Management Plan

Our Corporate Risk Management Framework is used to identify, record, manage and mitigate key risks to the wastewater network. During project development and system performance analysis, we also investigate and assess opportunities to enhance asset resilience where appropriate.

All reticulation assets have been assigned criticality ratings which are used to prioritise maintenance and renewal planning. We are also working to complete a full criticality assessment for the wastewater plant and equipment assets.

Further details about risk management are included in Section 6 and in the asset category volumes 1-4.

1.7 Financial Summary

Table 2 summarises the total expenditure forecasts for stormwater and flood protection assets, as detailed in the individual category volumes.

Table 2 Expenditure forecast summary

Stormwater and Flood Protection Expenditure Forecast ($000)											
Activity	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	LTP Total
Personnel Costs	75	77	81	83	85	171	175	179	273	279	1,478
General Operating Expenditure	92	94	97	99	102	105	108	111	114	117	1,038
Direct Cost of Activities	530	547	627	536	545	593	608	705	719	740	6,150
Shared Services (Overhead)	355	363	682	767	948	1,050	1,072	1,027	987	954	8,205
Opex Total	1,052	1,081	1,487	1,485	1,680	1,919	1,963	2,022	2,093	2,090	16,871
Renewals	239	246	360	257	262	266	274	281	288	295	2,768
Service Level	50	567	1,104	2,629	2,252	2,304	978	60	60	62	10,066
Growth	50	52	5,102	75	77	78	81	83	84	87	5,769
Capex Total	339	865	6,566	2,961	2,591	2,648	1,333	424	432	444	18,603
Total	1,391	1,947	8,052	4,446	4,271	4,567	3,296	2,444	2,525	2,535	35,473

Note: Personnel costs are included in Shared Services (Overhead) to represent the proportion of the water and wastes team allocated to stormwater and flood protection activities.

1.8 Improvement and Monitoring Plan

Details about our general asset management maturity improvement programme can be found in our Asset Management Strategy. General identified improvements can be found in Section 8 of this volume. Specific identified improvements are included in the asset category volumes 1-4.

2. INTRODUCTION

2.1 Background

We own and operate stormwater and flood protection assets and services as part of our duty to ensure that public health and wellbeing is protected efficiently. Our service mitigate against the potential negative effects of stormwater and flooding on our communities and the environment by:

- Having robust stormwater management and planning processes.
- Having robust maintenance, operation and renewal practices.
- Ensuring work carried out within pipe network rehabilitation/renewal programmes meets industry standards.
- Ensuring prompt response and repair in accordance with defined standards.
- Modelling of catchments to identify drains and pipes that below capacity, risking constraints on future development or flooding.
- Developing and updating stormwater catchment management plans

Our stormwater services are also designed to be highly reliable in emergency situations.

Purpose of Plan

This plan has been developed in accordance with the planning requirements of the LGA 2002. It covers the forecast activities and expenditure for a thirty year planning period, with an emphasis on the 10 year period from 1 July 2018 to 30 June 2028.
The purpose of this plan is to:

- Demonstrate that our asset management strategies support the core social, economic, environmental and cultural outcomes, identified through community consultation.
- Demonstrate responsible stewardship of the stormwater assets including optimising life cycle activities to achieve savings.
- Provide the basis for compliance with the Local Government Act by tracking changes in service potential and determining optimal long-term financial strategies for stormwater assets.
- Demonstrate sustainable and cost-effective provision for population growth.
- Demonstrate sound and well substantiated financial forecasts and projections.
- Provide a basis for customer consultation over price/quality trade-offs relating to service level options.
- Manage the environmental, social and financial risks associated with stormwater assets.
- Assess the demand and key performance indicators for stormwater assets.
- Ensure our stormwater services are sustainable for the long term.
- Ensure we identify and utilise improvement opportunities.

Relationships with Other Planning Documents

The relationships between AMPs and other Council-wide planning documents are detailed in our Asset Management Strategy. Other documents specific to Stormwater and Flood protection planning are:

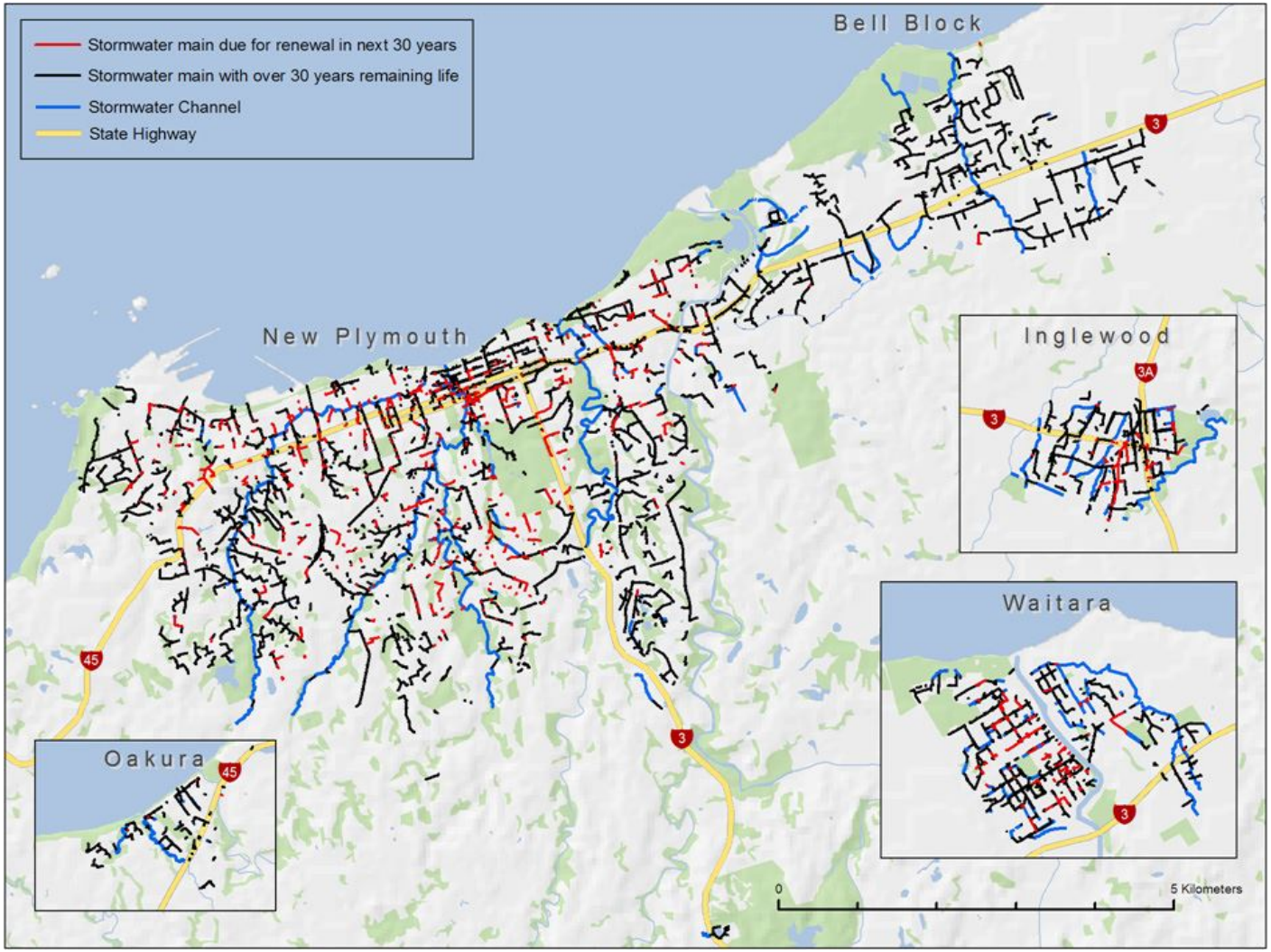
Stormwater Services Management System and Contracts: The service levels, strategies, information requirements described in this plan are incorporated in the contract specifications, Key Performance Indicators (KPIs) and reporting requirements.

NPDC Bylaw: The Water, Wastewater and Stormwater services bylaw (2008, Part 9) addresses the issues associated with the terms and conditions for the supply of stormwater assets and the protection of our customers and the residents of New Plymouth District.

2.2 Assets Included in the Plan

The map in Figure 1 shows the location of the stormwater reticulation network assets in the district.

Figure 1 Asset location map



2. INTRODUCTION

Asset Valuation

The value of our stormwater and flood protection assets is summarised in Table 3.

Table 3 Asset valuation

Asset Category	Gross Current Replacement Cost ($)	Annual Depreciation ($)	Optimised Depreciated Replacement Cost ($)
Pumping Stations	1,226,594	15,452	423,600
Reticulation	217,495,022	2,245,495	145,017,390
Inlets/Outlets	16,036,650	276,999	7,438,423
Flood Protection	18,607,707	119,112	13,902,698
Total	253,365,973	2,657,058	166,782,111

Assets are valued at optimised depreciated replacement cost (ODRC). To calculate the ODRC we first establish the gross current replacement cost (GCRC) of an asset by applying unit rates to quantifiable asset attributes (length, width, depth, etc). We then deduct an estimate of the asset's accumulated depreciation from its GCRC. Accumulated depreciation is calculated on a straight line basis using estimates of useful lives and remaining useful lives.

2.3 Organisational Structure

A range of our staff are involved in preparing and delivering the AMP and providing support services for asset management. How these responsibilities are allocated, managed and delivered are shown in the hierarchical diagram in Table 4.

Table 4 Organisational structure

	Elected Members (Council) Approval of key resolutions, policy, LTP, AP and AMPs to ensure Council's responsibilities to the community are being met in an effective and efficient way.		
Tier 1	***Chief Executive*** Overall management of the organisation's activities to ensure Council objectives are met.		
Tier 2	***Chief Operating Officer*** Manages delivery the services and plans defined in the asset management plans.	***Group Strategy Manager*** Manages production of our LTP, 30-year Blueprint and District Plan.	***Chief Financial Officer*** Manages our information technology services, legal services, records management, property assets, payroll, accounts, rates, procurement and risk management.
Tier 3	***Infrastructure Manager*** Manages day-to-day operations, maintenance, renewal and augmentation of the water supply system in accordance with the LTP, AP and AMP. Overall management of resources to achieve plans including balance of internal and contract resources. Providing advice and guidance on tactical infrastructure asset management to the COO and CE.	***Infrastructure Planning Lead*** Preparation of strategic asset management plans, asset management objectives, levels of service and the Infrastructure Strategy.	***Information Services Manager*** Support and solutions development for asset management software and systems. ***Business Services Manager*** Preparation and monitoring of financial budgets and targets related to asset management planning.
Tier 4	***Asset Operations Planning Lead*** Preparation of the tactical aspects of the AMPs, maintaining the asset inventory and asset records, developing annual work programmes, conducting asset condition assessments and asset valuations. ***Manager Three Waters*** Delivery of day-to-day operations, maintenance and minor renewals of stormwater and flood protection assets. Management of internal and contract resources. ***Manager Infrastructure Projects*** Delivery of major projects and technical investigations for the renewal and augmentation of stormwater and flood protection assets.		

2.4 Document Structure

A high level description of how the plan links to our vision, mission, goals and objectives can be found in our overarching LTP, with more specific detailS in the Infrastructure Strategy and Council Services sections.

Asset management planning content is split between our Asset Management Strategy, a General Asset Management Plan for each asset class, and a volume for each specific asset category within that class. This Stormwater and Flood Protection AMP includes a General volume and four specific asset category volumes:

- Volume 1 – Pump Station
- Volume 2 – Reticulation
- Volume 3 – Inlets/outlets
- Volume 4 – Flood Protection

The framework and key elements of the overall asset management plan are shown in Table 5.

Table 5 Asset management document structure

No.	Document Name	Key Document Contents
1	Long Term Plan (LTP)	Infrastructure Strategy • Strategic Framework • Guiding Themes • High Level Information for Each Asset Class Council Services • High Level Information • Levels of Service • Financial Plan
2	Asset Management Strategy	General Asset Management Principles and Overview
3	Asset Class General Volumes	General Information and Glossary about each asset class • Executive Summary • Introduction • Levels of Service • Future Demand • Risk Management Plan • Financial Summary • Plan Improvement and Monitoring
4	Asset Category Lifecycle Management Volumes	Asset Life Cycle Management for each asset category within each asset class • Description • Condition • Remaining Lives • Valuation • Operations & Maintenance • Renewals • Acquisition and Augmentation • Disposals • Annual Work Plan • Risk Management • Financial Summary • Improvement Plan

2.5 Asset Information and Data

Information and data about our stormwater and flood protection assets is stored and managed in various systems, including the following:

- Enterprise Asset Management (EAM) system (Technology 1) for document management, financial management, customer information & requests, asset inventory, asset history, work order management and maintenance scheduling;
- ARCGIS for spatial records with general GIS viewer MILES;
- Drawing Management System in SharePoint on intranet and drawing files stored on server;
- Water Outlook for gathering and managing SCADA and process data; and
- Infoworks for pipe network modelling.

3. LEVELS OF SERVICE

As described in Section 1.3 the levels of service are driven by overall objectives, customer expectations, and legislative and technical requirements. The Capex and Opex investment programmes included in this plan are based on effective asset management practice that delivers on these objectives, expectations and requirements.

3.1 Customer Levels of Service

The customer levels of service included in the LTP together with target levels and a snapshot of past performance are shown in Tables 6 and 7.

Stormwater

Table 6 Stormwater levels of service

What you can expect	How we measure performance	Actual 2016/17	2018/19	2019/20	2020/12	By 2027/28
We provide a stormwater management system that protects people and property.	The number of flooding events in the district per financial year.	0	0	0	0	0
	The number of habitable floors affected in each flooding event (per 1,000 properties connected to the Council's stormwater system).	0	1 or less	1 or less	1 or less	1 or less
We comply with all resource consents for discharges from our stormwater system.	The number of abatement notices, infringement notices, enforcement orders and convictions received.	0	0	0	0	0
We respond to service requests in a timely manner.	The median response time to a flooding event (from the time that the Council receives notification to the time service personnel reach the site).	0.34 hours	one hour	one hour	one hour	one hour
Customers are satisfied with the performance of our stormwater system.	The number of complaints received about the performance of the Council's stormwater system (per 1,000 properties connected).	3.13	7 or less	7 or less	7 or less	8 or less

3. LEVELS OF SERVICE

Flood Protection

Table 7 Floodwater levels of service

What you can expect	How we measure performance	Actual 2016/17	2018/19	2019/20	2020/12	By 2027/28
We effectively maintain the Council's flood protection and control works.	Major flood protection and control works are maintained, repaired and renewed in accordance with the Asset Management Plan and annual works programme.	Achieved	Achieved	Achieved	Achieved	Achieved

3.2 Legislative Requirements

In addition to the Levels of Service there are a number of technical and operational parameters required by legislation including:

- Local Government Act 2002 and 2010 Amendments
- Resource Management Act 1991 including Amendments from the Legislation Act 2012
- Local Government (Rating) Act 2002
- Civil Defence Emergency Management Act 2002
- Health and Safety at Work Act 2015
- Building Act 2004
- Public Works Act 1981
- Climate Change Response Act 2002
- Guidelines for Earthworks (2006)
- NZ Standards – Technical Specifications for water renewals and construction
- Land Development and Subdivision Infrastructure

3.3 Technical Levels of Service

Table 8 shows the design stormwater protection levels required for different functions. General standards are as defined in NZS4404: 2010 – Land Development and Subdivision Standard. NPDC's specific requirements are defined in New Plymouth District Council and South Taranaki District Council's adopted standard for Land Development and Subdivision Infrastructure. This is based on NZS 4404:2010 with local amendments.

Table 8 Stormwater protection levels

Function	AEP (%)	Return Period (years)
Parks, Reserves, Sports Grounds Land	20	5
Residential Land	20	5
Commercial/Industrial/Public Land	10	10
Residential/Commercial/Industrial/Public Floors	1	100
Road Culverts (urban)	10	10
Road Culverts (rural)	2	50
Bridges	1	100

The Regional Council's preference to design all assets to 100 year return periods is currently being considered by NPDC.

3.4 Levels of Service Projects

The individual AMP volumes include details of the level of service projects totalling $10.1m over the 10 year period of the AMP. Table 9 below summarises the levels of service Capex for the next ten years.

Table 9 Level of service expenditure forecast

Stormwater & Flood Protection Level of Service Forecast ($000)											
Activity	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	LTP Total
Stormwater Pump Station	-	-	-	-	-	-	-	-	-	-	-
Reticulation	-	515	1,052	2,575	2,197	2,248	920	-	-	-	9,507
Inlets-Outlets	50	52	52	54	55	56	58	60	60	62	559
Flood Protection	-	-	-	-	-	-	-	-	-	-	-
General	-	-	-	-	-	-	-	-	-	-	-
Total Levels of Service	50	567	1,104	2,629	2,252	2,304	978	60	60	62	10,066

4. FUTURE DEMAND

By 2045, the district's population is expected to grow by 19%, to approximately 88,000 people. The development resulting from population growth will lead to an increase in paved areas and a decrease in permeable areas in the district, creating additional demand on the existing stormwater network infrastructure. Climate change is also likely to place more demand on the existing network.

We recently developed a strategic Water Master Plan to manage the expected growth of the district in relation to water supply. During the 2018-28 LTP period, we plan to develop a Stormwater Master Plan to ensure we cater for forecast population growth and climate change in a coordinated way. **This is system wide asset management issue and is included as Action 1 in Section 8 – Improvement and Monitoring Plan.**

The Stormwater Master Plan will provide a number of benefits, including:

- Clearly defined technical standards for stormwater system performance;
- Clarity for our development community about our expectations for low impact design;
- Strategic approach to growth and development so that up-stream development is planned for; and
- More consistent and reliable delivery of our defined levels of service.

To develop an effective and informed Master plan we need a better underst anding of how the network is performing. This requires improvements to our data collection and analysis of catchment areas. We also need to examine areas prone to flood and establish programmes of works. All of this requires effective stormwater hydraulic modelling systems, which are essential tools for optimising capital works programmes, particularly those related to service level and growth.

Modelling tools are assets in their own right and require renewal on a regular basis. Many of our current stormwater hydraulic models are out of date. Some catchments require models to be rebuilt and/or validated, while other catchments require introduction of models for the first time. We also require a system to ensure models remain up to date in the future. **This is recorded as Action 2 in Section 8 – Improvement and Monitoring Plan.**

The modelling requirements of each catchment are as follows:

- Waitara (update progress)
- New Plymouth (needs updating)
- Bell Block (needs updating)
- Inglewood (needs to be created)
- Urenui (needs to be created)
- Onaero (needs to be created)
- Okato (needs to be created)

We have included an allowance from 2021/22 through to 2027/28 to update our stormwater models.

Based on the costs of producing the Water Master Plan, we have also allocated $1,473k to produce the Stormwater Master Plan in 2020/21.

As the district's urban areas are extended, opportunities for subdivisions and development are created. In some instances there are no stormwater services in new growth areas and developers are expected to extend the stormwater systems from their proposed subdivisions themselves, which can discourage them from proceeding. To encourage development and facilitate growth, we have made an annual allocation to extend stormwater services in urban areas.

The Capex forecast for general growth related activities is shown in Table 10.

Table 10 General growth expenditure forecast

Storm Water & Flood Protection General Growth ($000)											
Activity	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	LTP Total
ST2004 - Provision of Stormwater Services For Subdivisions In Unserved Areas	50	52	53	54	55	56	58	59	60	62	559
ST2003 - Stormwater Master Plan	-	-	1,473	-	-	-	-	-	-	-	1,473
ST2005 - Stormwater Model Updates	-	-	-	21	22	22	23	24	24	25	161
Total	50	52	1,526	75	77	78	81	83	84	87	2,193

In addition to the above, the individual AMP volumes include details of growth projects totalling $3.6m over the 10 year period of the AMP. Table 11 below summarises the total growth Capex for the next ten years.

Table 11 Growth expenditure forecast summary

Stormwater & Flood Protection Growth Forecast ($000)											
Activity	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	LTP Total
Stormwater Pump Station	-	-	-	-	-	-	-	-	-	-	-
Reticulation	-	-	3,576	-	-	-	-	-	-	-	3,576
Inlets-Outlets	-	-	-	-	-	-	-	-	-	-	-
Flood Protection	-	-	-	-	-	-	-	-	-	-	-
General	50	52	1,526	75	77	78	81	83	84	87	2,193
Total Growth	50	52	5,102	75	77	78	81	83	84	87	5,769

5. LIFECYCLE MANAGEMENT PLAN

The lifecycle of an asset has four stages:

- Creation (plan, design, procure, construct);
- Operation and maintenance;
- Renewal or rehabilitation; and
- Disposal.

A general overview of how these stages are managed is included in our Asset Management Strategy. Detailed lifecycle management is covered in each asset category volumes 1-4.

5.1 Operations and Maintenance

Our general asset operations and maintenance approach is included in Section 4.2 of our Asset Management Strategy. Specific operations and maintenance activities are included in each of the asset category volumes 1-4. Identified improvement areas applying to all asset categories are outlined in the general volume. Improvement areas related to a particular asset category are included in the corresponding asset category volume.

We do not currently have a Maintenance Management Plan that details how we identify, record, measure, analyse and optimise/improve maintenance activity and performance. This has resulted in high levels of reactive maintenance and the associated higher levels of risk and cost. **This is an asset management improvement issue and is recorded as Action 3 in Section 8 – Improvement and Monitoring Plan.**

There are large discrepancies between the asset inventory of our plant and equipment (P &E) assets and the physical assets that exist on site. This has resulted in undervaluation of P&E assets and in unrecorded assets having no defined scheduled maintenance.**This is an asset management improvement issue and is recorded as Action 4 in Section 8 – Improvement and Monitoring Plan.**

Many of our mechanical plant and equipment assets do not have any scheduled maintenance activities assigned to them. This has resulted in high levels of reactive maintenance and the associated higher levels of risk and cost. It has also resulted in poor reliability. **This is an asset management improvement issue and is recorded as Action 5 in Section 8 – Improvement and Monitoring Plan.**

We record and schedule most maintenance tasks using T1. However, Instrumentation and Electrical maintenance is not scheduled in T1, which makes it difficult to monitor and measure performance. **This is an asset data integrity issue and is recorded as Action 6 in Section 8 – Improvement and Monitoring Plan.**

A significant number of our P&E assets are not tagged with P&ID reference numbers. This is not consistent with good engineering practice and makes it difficult to identify equipment on-site. **This is an asset management improvement issue and is recorded as Action 7 in Section 8 – Improvement and Monitoring Plan.**

Many of our Piping and Instrumentation Drawings (P&IDs) and layout drawings for plant and equipment are inaccurate, incomplete or out of date. This causes delays and additional cost when planning projects and potential safety issues when operating equipment. **This is an asset management improvement issue and is recorded as Action 8 in Section 8 – Improvement and Monitoring Plan.**

We also require an updated assessment of the critical spares required for the stormwater pump station and flood protection assets.**This is an asset integrity issue and is recorded is recorded as Action 9 in Section 8 – Improvement and Monitoring Plan.**

5. LIFECYCLE MANAGEMENT PLAN

The overall Opex forecasts for Stormwater and Flood Protection over the next ten years are shown in the Tables 12 and 13.

Table 12 Stormwater drainage opex forecast

Stormwater Drainage Opex Forecast ($000)											
Activity	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	LTP Total
Personnel Costs	75	77	81	83	85	129	132	134	183	187	1,165
General Operating Expenditure	92	94	96	99	102	104	107	110	114	117	1,035
Direct Cost of Activities	461	470	586	491	502	514	525	597	612	627	5,385
Shared Services (Overhead)	327	335	654	738	918	1,020	1,042	997	956	924	7,911
Total	955	977	1,417	1,412	1,607	1,767	1,806	1,838	1,864	1,854	15,497

Table 13 Flood protection opex forecast

Flood Protection Opex Forecast ($000)											
Activity	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	LTP Total
Personnel Costs	-	-	-	-	-	42	43	44	90	93	313
General Operating Expenditure	0	0	0	0	0	0	0	0	0	0	2
Direct Cost of Activities	69	77	41	45	43	79	83	108	108	113	765
Shared Services (Overhead)	28	28	28	29	30	30	30	30	30	31	294
Total	97	105	69	73	73	152	157	182	228	237	1,373

Personnel costs include salaries and wages and other personnel expenses including training and recruitment. General operating expenditure includes occupancy and utility costs, property maintenance and legal and professional fees. Direct costs of activities include contractor's costs, materials and services. Shared Services (Overhead) includes internal charges for support services e.g. Executive Leadership Team, HR, labour costing expenses and internal goods and services charges.

Note: Personnel costs are included in Shared Services (Overhead) to represent the proportion of the water and wastes team allocated to stormwater and flood protection activities.

5.2 Renewals

Our general approach to asset renewals can be found in Section 4.3 of our Asset Management Strategy. Specific renewal activities and programmes are included in each of the asset category volumes 1-4. We are also required to renew our existing stormwater management consents with TRC, at an estimated cost of $110k in 2020/21. The overall Capex forecast for Stormwater and Flood Protection renewals is $2.8m over the next ten years is summarised in Table 14.

Table 14 Renewals expenditure forecast summary

Stormwater & Flood Renewals Forecast ($000)											
Activity	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	LTP Total
Stormwater Pump Station	10	10	11	11	11	11	12	12	12	12	112
Reticulation	201	207	210	215	220	224	230	236	242	248	2,233
Inlets-Outlets	-	-	-	-	-	-	-	-	-	-	-
Flood Protection	28	29	29	31	31	31	32	33	34	35	313
General	-	-	110	-	-	-	-	-	-	-	110
Total Renewals	239	246	360	257	262	266	274	281	288	295	2,768

6. RISK MANAGEMENT PLAN

6.1 Critical assets

We assess the criticality of stormwater reticulation mains using the process and scoring system detailed in ECM#988741 - Water, Wastewater and Stormwater Mains Criticality and Renewals Prioritisation Process. These scores are converted into criticality ratings and recorded in the T1 asset inventory to assist with asset maintenance and renewal planning.

We recently commenced a programme to assess and record criticality ratings for plant and equipment assets in the T1 asset inventory. This process is only partially complete and is recorded as an improvement action in the corresponding asset category volumes.

6.2 Risk Assessment

Our risk assessments are conducted, recorded, managed, escalated and monitored in accordance with ECM#1479536 – Corporate Risk Management Framework – Policy & Process. A summary of how the policy and process operate and a list of the current key risks relevant to our assets is included in Section 7 of the Asset Management Strategy. The list includes risks that are applicable across all asset categories and those particular to Stormwater and Flood Protection.

6.3 Infrastructure Resilience Approach

During the development of the Water Master Plan we investigated opportunities to assess and enhance asset resilience and allocated investment forecasts where appropriate. An example of this is the Eastern Feeder Trunk Mains Stage 2 project, which includes plans to install a parallel trunk main to provide additional capacity, rather than replace the existing trunk main with larger sized pipe. This parallel pipe will provide the additional capacity required and will also enhance resilience by allowing for uninterrupted supply in the case of an emergency event or scheduled maintenance.

We will explore similar opportunities when we produce the Stormwater Master Plan and when planning stormwater and flood protection asset upgrades and replacements.

7. FINANCIAL SUMMARY

7.1 Financial Statements and Projections

The 10-year summary expenditure forecast for stormwater and flood protection assets is show in Table 15. Forecasts for each of the asset categories are included in the individual volumes.

Table 15 Expenditure forecast summary

Stormwater and Flood Protection Expenditure Forecast ($000)											
Activity	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	LTP Total
Personnel Costs	75	77	81	83	85	171	175	179	273	279	1,478
General Operating Expenditure	92	94	97	99	102	105	108	111	114	117	1,038
Direct Cost of Activities	530	547	627	536	545	593	608	705	719	740	6,150
Shared Services (Overhead)	355	363	682	767	948	1,050	1,072	1,027	987	954	8,205
Opex Total	1,052	1,081	1,487	1,485	1,680	1,919	1,963	2,022	2,093	2,090	16,871
Renewals	239	246	360	257	262	266	274	281	288	295	2,768
Service Level	50	567	1,104	2,629	2,252	2,304	978	60	60	62	10,066
Growth	50	52	5,102	75	77	78	81	83	84	87	5,769
Capex Total	339	865	6,566	2,961	2,591	2,648	1,333	424	432	444	18,603
Total	1,391	1,947	8,052	4,446	4,271	4,567	3,296	2,444	2,525	2,535	35,473

Note: Personnel costs are included in Shared Services (Overhead) to represent the proportion of the water and wastes team allocated to stormwater and flood protection activities.

7.2 Funding Strategy

Stormwater and flood protection services are funded through general rates. Capital improvements are loan-funded while the renewal and replacement of assets come from renewal reserves. The replacement value of the stormwater and flood protection assets is $254m (including land and buildings).

7.3 Valuation Forecasts

The last 3-yearly statutory valuation of fixed assets was conducted in 2016. Details can be found in the Infrastructure Fixed Asset Final 2016 Certified Valuation Report (ECM#7164171). This includes the valuation methodology and a summary of the gross current replacement cost (GCRC), Optimised Depreciated Replacement Cost (ODRC or fair value) and annual depreciation for all asset categories.

The unit rates for stormwater reticulation mains were critically reviewed during the 2016 valuation. This resulted in a GCRC increase of approximately $86m, which compared favourably with equivalent sized district councils around New Zealand. No future significant variation in valuation forecasts is anticipated.

8. IMPROVEMENT AND MONITORING PLAN

Our general Asset Management Maturity Improvement Plan is included in the Asset Management Strategy.

General improvements to Stormwater and Flood Protection assets are shown in Table 16. Specific areas of improvement identified for different asset categories can be found in the individual volumes.

Table 16 Improvements summary

No	Improvement Area	Owner	Start Date	End Date
1	Produce stormwater master plan	Infrastructure Planning Lead	2018	2020
2	Produce Modelling Management Plan and up to date validated stormwater models.	Asset Operations Planning Lead	Jul-19	Jun-20
3	Produce and implement Maintenance Management Plan	Manager Three Waters	Jul-18	Jun-20
4	Survey all plant and equipment and match inventory to on-site status	Asset Operations Planning Lead	Mar-18	Jun-20
5	Produce full set of scheduled maintenance and check sheets for mechanical plant and equipment and record/implement schedule in T1.	Manager Three Waters	Jul-18	Jun-20
6	I&E scheduled maintenance tasks to be recorded and managed in T1.	Manager Three Waters	Jul-18	Jun-20
7	Check and install tagging to all plant and equipment	Manager Three Waters	Jul-18	Jun-20
8	Following survey in item 2 update P&IDs and layout drawings	Asset Operations Planning Lead	Mar-18	Jun-20
9	Conduct update of critical spares analysis and procure any required items.	Manager Three Waters	2018	2019

2018-2028 STORMWATER AND FLOOD PROTECTION ASSET MANAGEMENT PLAN

He Rautaki Whakahaere Rawa mō Te Wai Āwhā me te Taupā Waipuke

GENERAL VOLUME
HE PUKAPUKA MATUA