2018-2028 STORMWATER AND FLOOD PROTECTION ASSET MANAGEMENT PLAN

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

INLETS, OUTLETS & WETLANDS

NGĀ NGOTE WAI / NGĀ PUTANGA WAI

VOLUME THREE | PUKAPUKA TUATORU

Mountain to Sea
Te Kaunihera-ā-Rohe o Ngāmotu
NEW PLYMOUTH DISTRICT COUNCIL
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DOCUMENT CONTROL

Document Name	2018-2028 Stormwater and Flood Protection Asset Management Plan Volume 3 - Inlets, Outlets & Wetlands
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1. INTRODUCTION

This volume includes details about the asset lifecycle management for the **Inlets, Outlets and Wetlands** asset category of the Stormwater and Flood Protection AMP. The framework and key elements of the overall asset management plan are outlined in Table 1.

Table 1 Asset management document summary

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

Purpose and Key Issues

The purpose of inlets is to collect stormwater into the stormwater network. The purpose of outlets is to discharge the stormwater into waterways, the sea and wetlands. Asset components include sumps, manholes and grilles.

Inlets and outlets link stormwater pipes to open channels and ponds. They are predominantly concrete structures and are installed as standard precast units. The majority of the sumps are installed in the transportation networks to collect stormwater from the kerb and channel.

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1. INTRODUCTION

In some locations inlet grilles prevent large objects from entering and blocking the system. They also act as a safety mechanism to prevent people or animals from entering into the stormwater system.

The wetlands at Mangati Ponds in Bell Block and Peringa Park in Fitzroy are used for containment and provide a 'refining' process for improving stormwater quality prior to discharge to the natural receiving environment.

The key issues faced by the inlets and outlets are:

- Capacity in respect ARI 100, 50 and 20 years.
- Suitability in respect of environmental conditions (on existing and future consents).
- Accessibility for monitoring, maintenance and renewal.
- Providing redundancy in the event of emergency or natural disaster.
- Inlets potentially limiting flow downstream of the network.

Levels of Service

Inlet and outlet assets support providing a reliable stormwater network. All the levels of service included in section 3 of the Stormwater General AMP apply to this volume.

Future Demand

The catchment plans for different areas in the district dictate the design capacity for the inlets and outlets. The catchment plans account for demand and climate change, which is reflected mainly in the number of sumps for inlets and the size of outlets.

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

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2.1 Asset Description

2.1.1 General

The stormwater network delivers stormwater to the open water surfaces. It has inlets at the entry points into the reticulation network and outlets at the end of the system. There are 9,117 inlets, outlets and nodes.

Inlets and outlets are generally constructed from concrete or rip-raps (outlets) to prevent scouring. As recorded in EAM, the inlets are mainly double sumps, sumps, well up sumps, wing walls and open pipes.

The number and types of inlets and outlets are shown in Tables 2 and 3.

Table 2 Inlet summary by type

Inlets	Number
Double Sump	503
Inlet Grill	47
Open Pipe End	295
Other	90
Side Entry Sump	23
Sump	5,661
Super Sump	1
Wellup Sump	838
Wingwall	60
Total	7,518

Table 3 Outlet summary by type

Outlets	Number
Bridge Abutment	4
Drainage Screen	6
End Point	361
Open Pipe End	335
Stormwater Outlet	547
Stormwater Soakhole	15
Y-T-Junct	174
Other	157
Total	1,599

We also have two constructed pond systems – the Mangati Ponds in Bell Block (completed 2003) and Peringa Park (commissioned 2009).

2.1.2 Mangati Ponds

Stormwater from industrial areas is captured and passed through a constructed wetland to trap litter, sediment, hydrocarbons (and chemical contaminants to the extent that it is feasible) before being discharged to the stream.

We hold Taranaki Regional Council (TRC) Discharge Permit Consent 4302-2 for a stormwater discharge to the Mangati Stream, although because TRC manages the individual discharge consents for industrial premises, our control over what enters the stormwater system is limited. TRC reports in the 1990s highlighted poor water quality in the Mangati Stream, Bell Block, and included reference to a significant number of reported industrial spills.

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2. LIFECYCLE MANAGEMENT PLAN

We proposed the construction of wetlands as part of a broader scope to develop an integrated water and land management system for the middle Mangati catchment in which:

- industrial land uses are physically and hydrologically isolated from the stream by a riparian reserve;
- a riparian reserve provides public access, a utilities corridor and machine access for stream maintenance; and
- flood detention structures and ponding areas are developed as required and integrated into the riparian reserve development.

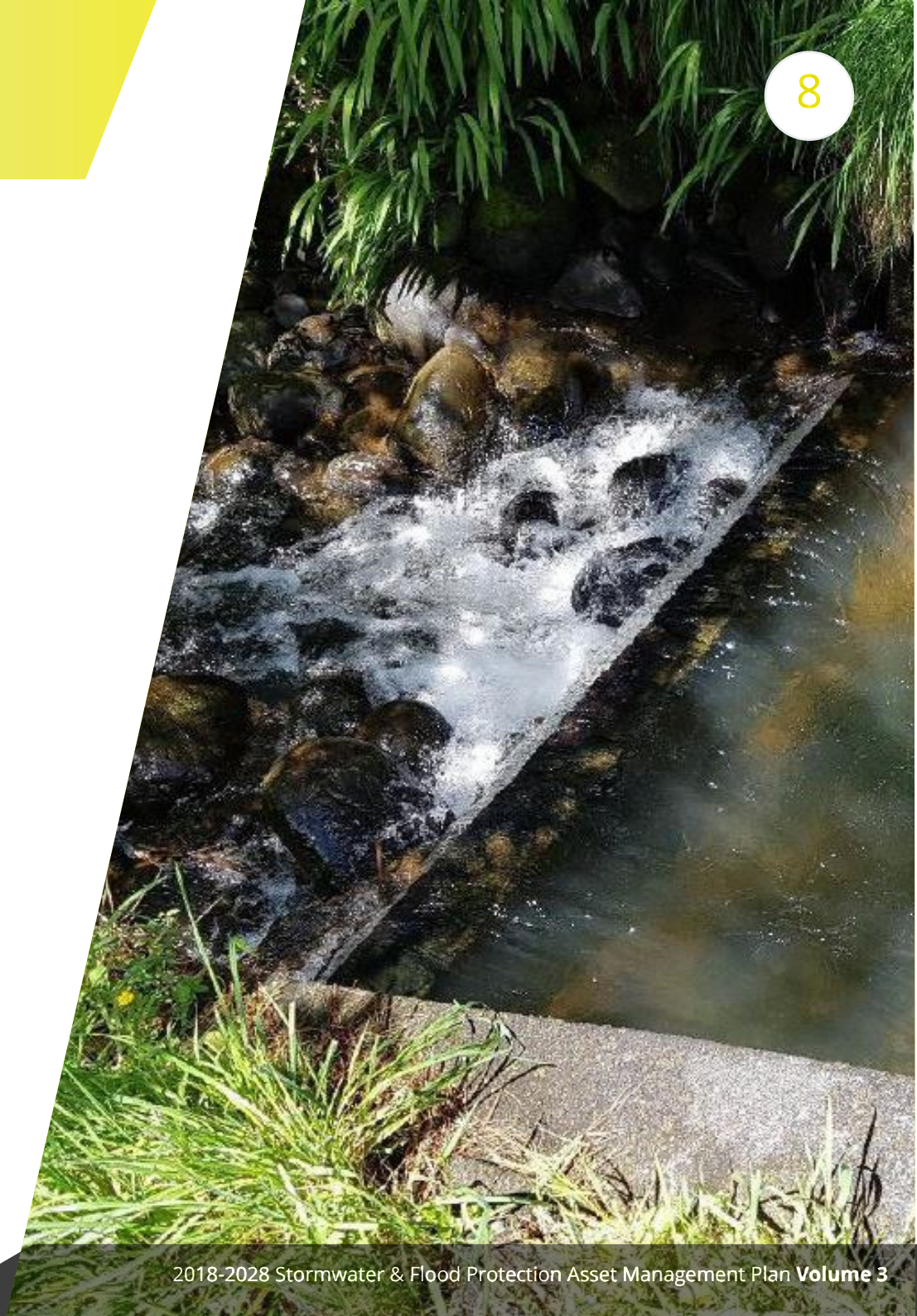
Wetland construction was completed in 2003 and further enhanced in 2006, with the installation of two oil traps in pond 4.

We do acknowledge that the wetlands largely provide a containment and 'polishing' process rather than any real treatment of discharges into the system. Therefore, TRC's on-site monitoring and management of those industrial premises from where the stormwater is drained remains critically important to enhancing the Mangati Stream. We maintain a close working relationship with TRC in monitoring individual discharge consents and identifying any non-compliance from industrial premises.

2.1.3 Peringa Park Wetlands

In 2008/09, a further wetland was constructed in Peringa Park, Fitzroy. This consists of a single pond with a floating plant mass to receive and 'polish' the stormwater from Fitzroy East before it discharges to Lake Rotomanu. This project and its associated planting have significantly enhanced the aesthetic and recreational amenity of this area, incorporating a pedestrian walkway. Water quality into Lake Rotomanu has also improved.

Importantly, the Peringa Park wetland ponds are the outlet to the $8M staged Fitzroy stormwater improvements constructed 2002-10. We intend to further extend the Peringa Park wetlands in the future.



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2.2 Asset Condition

Asset condition grades are given in accordance with Section 5 of the Asset Management Strategy.

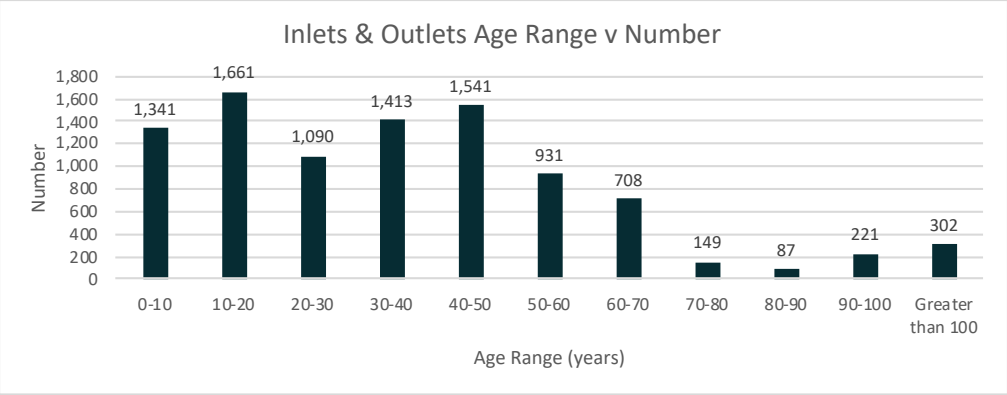
No formal asset conditions are recorded for inlets, outlets and wetlands in the asset inventory and all assets conditions are recorded as **6 - Unknown**. Therefore the data accuracy for asset condition is classed as grade **E – Unknown**. **This is a data integrity issue and is recorded as an action in Section 5 – Improvement and Monitoring Plan.**

2.3 Asset Remaining Lives

The expected lives of inlets and outlets range, depending on their construction materials and use. We assess the condition of inlets and outlets during preventative and reactive maintenance and have observed that the materials are generally performing well. Figure shows the number of inlets and outlets by age range.

The average age of the inlet and outlet assets was 35 years at 30 June 2016. The average age of the inlet and outlet assets at 30 June 2013 was 32 years.

Figure 1 Inlets and outlets age range v number



Based on sound knowledge, standards and guidelines, the data presented in this AMP on the remaining life of assets is classed as grade **B – Reliable.**

2.4 Asset Valuation

The value of inlets and outlets assets as at 30 June, 2016 is shown in the table below. There is no value for wetlands, which are included as land value.

Table 4 Asset valuation

Gross Current Replacement Cost (GCRC) ($)	Annual Depreciation ($)	Optimised Depreciated Replacement Cost ($)
16,036,650	276,999	7,438,423

Beca provided a detailed valuation of each asset component as part of the general plant and equipment valuation during the 2016 statutory valuation. Therefore, in conjunction with a well maintained and updated asset inventory, the data is classed as **B – Reliable**. Wetlands do not have a replacement values.

2.5 Operations and Maintenance Plan

2.5.1 Operations

During any storm event, one of the key features of the performance of the stormwater drainage system is the susceptibility of inlets to blockages. Inlets are attended to as required if they become blocked during storm events.

2.5.2 Maintenance Plan

The following routine inspection and maintenance tasks are conducted at inlets:

- Inspect stormwater inlets weekly or two monthly (depending on their tendency to block and level of risk associated with any blockage). Remove debris likely to cause an obstruction. Outlets in Waitara and Waiwhakaiho Rivers area need to be inspected every two months to avoid backflows from the river.
- Inspection of inlets that otherwise require weekly inspection immediately after a heavy rainfall warning is issued by Taranaki Regional Council. Remove debris likely to cause an obstruction.
- Remove debris blocking grates of sumps.
- Clean sumps.

We systematically install blue fish markers at all stormwater inlets and sumps to encourage the public not to dispose of any environmentally harmful pollutant to the stormwater system.

2.5.3 Critical Spares

An assessment of the critical spares required has not yet been conducted for inlets and outlets. Most items can be obtained locally or nationally at relatively short notice.

2.5.4 Opex Forecast

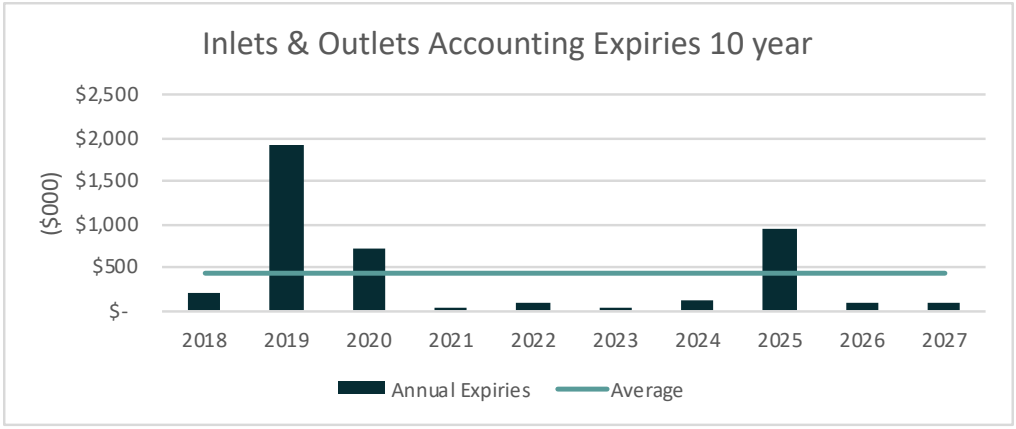
The general 10-year Opex forecast for stormwater assets is included in the Stormwater and Flood Protection General Volume and includes the Opex forecast for the maintenance and operation of inlet/outlet and wetland assets.

2.6 Renewal Plan

Our general approach to asset renewal is included in Section 4.3 of the Asset Management Strategy.

As the inlet and outlet assets continue to age, they will require renewal investment to maintain current reliability levels. Based on accounting expiries, the total expenditure required over the next ten years is $4.2m with an expenditure of $420k/year as shown in Figure 2.

Figure 2 Inlets and outlets accounting expiries 10Y



Inlets and outlets perform similarly to the reticulation network and they are generally in good material condition. However, to maintain levels of service their performance capacity requires upgrading in association with reticulation upgrades. No specific expenditure forecast has been made for inlets and outlets but any required renewals will be included as part of the reticulation renewals included in Stormwater and Flood Protection: Volume 2 – Reticulation. They will be based on condition, capacity and criticality as and when required.

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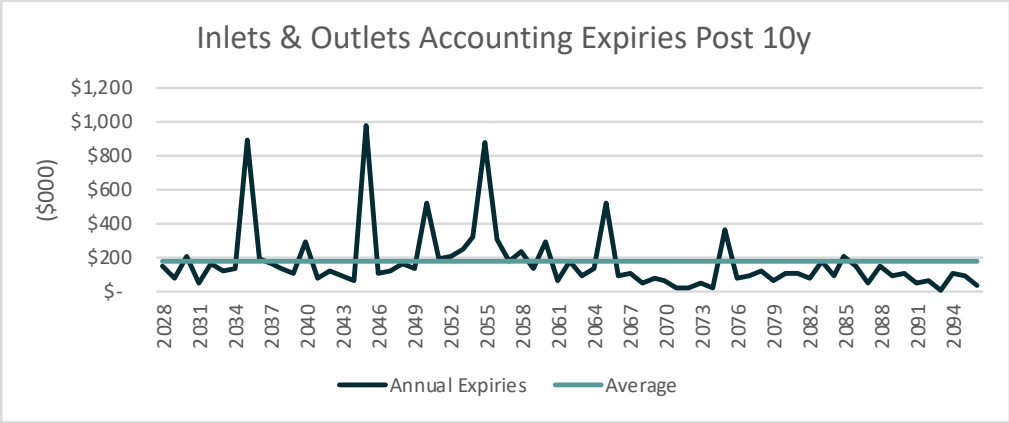
The accounting expiries for the years beyond 27/28 are shown in Figure 3. To renew the entire stock will require a total expenditure of $11.8m at an average of $150k/year through to 2096.

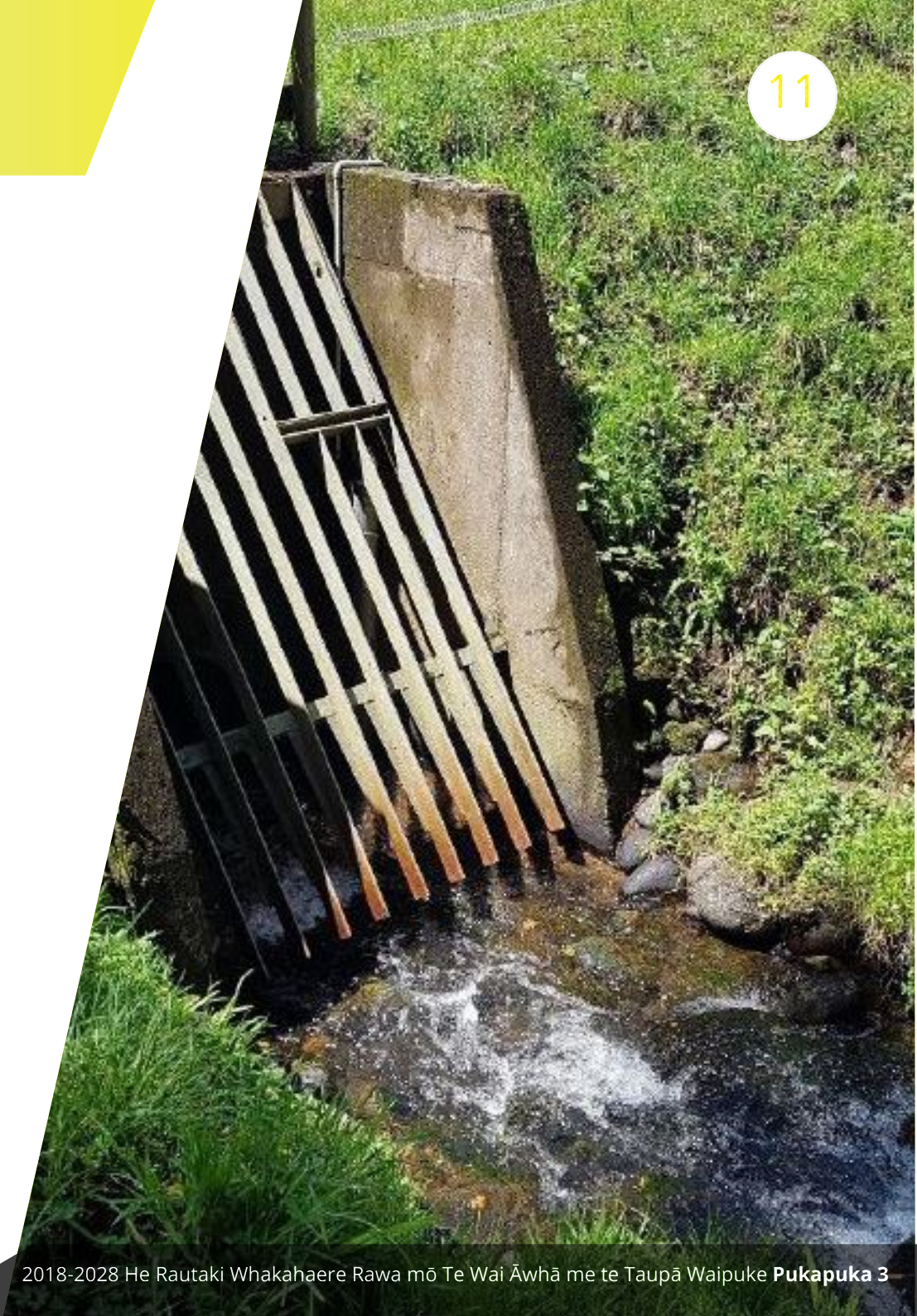
Figure 3 Inlets and outlets accounting expiries post 10Y



2.7 Acquisition and Augmentation Plan

Acquisition

When developers install new assets to serve new domestic and non-domestic developments, the assets are usually vested with us. Assets are built to the NZS4404: 2010 – Land Development and Subdivision Standard. Our specific requirements are defined in the New Plymouth District Council (NPDC) and South Taranaki District Council (STDC) adopted standard for Land Development and Subdivision Infrastructure, which is based on NZS 4404:2010 with local amendments. We assume full responsibility for any assets vested with us, and include them included in our operations, maintenance and future renewal plans.



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Level of Service

Policy 6.6.2 of the Regional Fresh Water Plan for Taranaki states that both new and existing structures in river and lake beds must not restrict fish passage. Where existing structures impede fish movement, construction of suitable fish passage facilities is required. Therefore, we have included an annual provision for modifying existing structures or building new facilities to enable fish passage through or past culverts. The level of service expenditure forecast is summarised in Table 5.

Augmentation (Growth)

General growth projects that contain inlet/outlet components are included in Section 4 of the Stormwater and Flood Protection General Volume.

Table 5 Level of service expenditure forecast

Stormwater Inlet/Outlet Level of Service 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
ST1050 - Installing fish passes at existing culverts (new Compliance	50	52	52	54	55	56	58	60	60	62	559
Total	50	52	52	54	55	56	58	60	60	62	559

General level of service projects that contain inlet/outlet components are included in Section 3 of the Stormwater and Flood Protection General Volume.

2.8 Disposal Plan

Disposal is the retirement or sale of assets when they become surplus or superseded by new or improved systems. Assets may become surplus to requirements for any of the following reasons:

- Under-utilisation
- Obsolescence
- Provision exceeds required level of service
- Replacement before end of predicted economic life
- Uneconomic to upgrade or operate
- Policy changes
- Service provided by other means (e.g. private sector involvement)
- Potential risk of ownership (financial, environmental, legal, social)

No asset disposals are planned over the 10 year AMP period.

2.9 Annual Work Plan

We will base our detailed work plans for Annual Plans on the asset renewal forecasts included in section 2.6 and the augmentation projects identified in section 2.7.

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3. RISK MANAGEMENT PLAN

3.1 Critical Assets

We have not yet conducted criticality ratings for inlet/outlet and wetland assets; therefore, there is currently no data recorded in EAM. **This is an asset data integrity issue and is recorded as an action in Section 5 – Improvement and Monitoring Plan.**

Following asset criticality assessment, we will develop a focused management plan to ensure the integrity and resilience of critical assets.**This is recorded as an action in Section 5 – Improvement and Monitoring Plan.**

3.2 Risk Assessments

Details of our Risk Management Framework are included in section 6.2 of the Stormwater and Flood Protection General AMP volume and section 7 of the Asset Management Strategy.

3.3 Infrastructure Resilience Approach

During the development of the Stormwater Master Plan, we will investigate and assess opportunities to enhance asset resilience and will include investment where appropriate.

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4. FINANCIAL SUMMARY

A summary of the Capex forecast included in this volume is shown in Table 6.

Table 6 Capex forecast summary

Stormwater Inlets/Outlets 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
Renewals	-	-	-	-	-	-	-	-	-	-	-
Service Level	50	52	52	54	55	56	58	60	60	62	559
Growth	-	-	-	-	-	-	-	-	-	-	-
Total	50	52	52	54	55	56	58	60	60	62	559

The Opex forecast for operations and maintenance is included in the overall opex forecast for Stormwater and Flood Protection and Control in the LTP. It is also included in the Stormwater and Flood Protection General Volume.

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5. IMPROVEMENT AND MONITORING PLAN

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

General improvements to Stormwater assets are included in the Stormwater and Flood Protection General Volume.

The specific areas of improvement identified for treatment plant assets are listed in the Table 7.

Table 7 Improvements summary

No	Improvement Area	Owner	Start Date	End Date
1	Assess asset condition and record results in EAM	Manager Three Waters	2018	2020
2	Produce focused management plan for those assets identified as critical	Manager Three Waters	2018	2019
3	Conduct criticality assessment and record results in EAM	Asset Operations Planning Lead	2018	2019

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