Mackenzie District Council

Stormwater

Activity Management Plan

2021 - 2031

Quality Record Sheet

Mackenzie District Council

Stormwater Activity Management Plan

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Revision History

Revision #	Date	Prepared by
1	2000	Amp produced by Waugh Consulting
2	2004	Revision of first AMP by MDC
3	2006	Revision of AMP by MDC
4	2013	Full update by MDC
5	2015	Revision by MDC to incorporate 30 Year Strategy and Ecans Land and Water Plan
6	2017	General review using Waugh Template to incorporate recommendations from the 2015 IIMM Manual – MDC and Waugh's
7	2018	MDC staff with assistance from Waugh IML
8	2021	MDC staff with assistance from Waugh IML
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TABLE OF CONTENTS

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Deleted: 36
Deleted: 36
Deleted: 38
Deleted: 40
Deleted: 40
Deleted: 43
Deleted: 43
Deleted: 43
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TABLE OF TABLES

TABLE OF FIGURES

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Deleted: 46
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Deleted: 79
Deleted: 108
Deleted: 109
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1.0 OVERVIEW

STORMWATER	The stormwater activity is a core Council activity that contributes towards the provision of good quality infrastructure and helps ensure public health and safeguards the environment. The stormwater system comprises pipes, retention/treatment systems and other assets that represent a significant council investment over many years.
FOCUS	**New Capital and Growth** – to improve stormwater collection, treatment and disposal across the district and comply with the environmental compliance framework -to provide capacity to meet future demand and support the expansion of development areas as identified by Council. **Renewals** – implement renewals strategy including condition and criticality assessments. Ensure appropriate budgets are available to replace aging and/or deteriorating assets. **3 Waters Regulatory Framework** – Continue to monitor and respond to the Government's new Water Regulatory Framework including but not limited to the following signals: • Nationally consistent monitoring and reporting requirements for wastewater and stormwater networks • minimising risks to public health and the environment, while meeting local community/iwi values. **COVID 19** - Central Government's programme and funding package to provide immediate post COVID 19 stimulus to maintain and improve three waters infrastructure
COMPLIANCE	**Resource Consents** - Council has a number of 3 Waters related resource consents and aims to achieve compliance with all resource consent conditions. Regular compliance monitoring and reporting is undertaken Stormwater (catchment) management plans are required under the Canterbury Land and Water Regional Plan to manage stormwater quantity and quality
SERVICE DELIVERY	**Service Delivery** - the stormwater activity is delivered via a combination of in-house resources and contracted services including a major contract; for the operation and maintenance activities of stormwater reticulation and facilities Operation and maintenance costs will increase to ensure compliance with resource consents.
PERFORMANCE	**Performance** - a comprehensive performance monitoring and reporting framework ensures that legislative requirements and other KPIs are regularly assessed and reported on.
RISK & RESILIENCE	**Understand** our communities, the hazards and risks and acknowledge that failure will occur. **Ensure** early detection and recovery through connecting communities, supporting community organisations and robust infrastructure assets The ability to deliver capital projects on time may be affected by the increased consultation processes under **Te Mana o te Wai** requirements.

2.0 EXECUTIVE SUMMARY

2.1 What are we doing

Council operates stormwater systems in three community areas in the Mackenzie District which provide a degree of protection against rainfalls of a moderate intensity. These stormwater systems are located at:

- Fairlie
- Lake Tekapo
- Twizel

Council supports this service by:

- Providing, operating and maintaining of the stormwater infrastructure
- Responding to call outs and service disruptions quickly and efficiently
- Planning for future development and needs.

The stormwater activity excludes roads, kerb and channels, catchpits and the infrastructure necessary to connect these items to the stormwater drains, as these form part of the Roading activity.

2.2 Why are we doing it?

Council has a legal obligation under the Health Act 1956 to improve, promote, and protect public health within the District. This includes identifying the need for stormwater services and either providing these directly or to oversee the service if it is provided by others. The Local Government Act 2002 requires ongoing stormwater services unless specific approval is sought to withdraw from this. Council-issued building consents require that plans comply with the Building Regulations for drainage, which specify standards for protection of buildings against flood inundation. Council owned stormwater assets in urban areas must also comply with the Building Regulations.

Council's stormwater activity contributes primarily to the following community outcomes

Community outcome	How it contributes
Resilient, successful communities	Manage flooding events in urban areas
	Timely response to service requests and system failures
A treasured environment	Providing a stormwater service that acknowledge and incorporates the natural environment in design, construction, operation and maintenance
Strong innovative economy	Council priority is maintaining quality and continuity of stormwater services

Council has not found any significant negative effect that the stormwater activity may have on the well being of the community.

2.3 Where are we headed?

Council's principal goal for stormwater over the next ten years is:

- To ensure adequate stormwater systems are in place to prevent surface flooding in our communities

There are a number of key issues facing Council over the next ten years and beyond:

- Environmental compliance – Historically Council operated the stormwater systems as permitted activities. Increased environmental standards as a result of the Canterbury Land and Water Regional Plan require Council to obtain resource consents for stormwater systems. Consent applications have been lodged. These consents apply to stormwater collection and discharge and requires:
    - approved Stormwater Management Plans

  - stormwater discharges to meet regional rules and water quality parameters
  - appropriate Erosion and Sediment Control measures
  - minimising adverse effects of stormwater discharges on the environment
- Central Government's 3 Waters Reform Programme and funding package to provide immediate post COVID 19 stimulus to local authorities to maintain and improve three waters infrastructure.
- Central Government's 3Waters Review is considering
  - New obligations on wastewater and stormwater network operators to implement a risk management plan
  - Nationally consistent monitoring and reporting requirements for wastewater and stormwater networks
  - Stronger Central oversight
  - Network operators to
    - adopt industry good practices and minimising risks to public health and the environment, while meeting local community/iwi values
    - implement a certified risk management plan that specifies how they will: –
      - Operate and maintain networks to meet current and future regulatory requirements; e.g. freshwater objectives and limits
      - Proactively manage risks to public health and environment
      - Support integrated planning of stormwater networks and land-use
- The paradigm shift in stormwater management moves from "to collect, convey, discharge" to a more integrated approach of "slow it down, spread it out, and soak it in". This approach includes quantity and quality considerations, multiple use facilities, riparian corridors, recreation, wetland preservation and groundwater recharge. This introduce a range of issues including changes in stormwater planning, design, operation and maintenance, construction, and financing.
- Climate Change –Greater intensity and frequency of events are expected and appropriate response is to be developed. The potential impacts and the appropriate mitigation measures are yet to be defined.
- Separated wastewater and stormwater systems (inflow/infiltration/exfiltration)
- Increased Community Expectation – the community has an increased expectation on Council's responsibility to provide adequate protection on properties through improved infrastructure.
- Ensure adequate in-house staff resource capacity and capability

The stormwater system represents a significant community investment. With age, asset condition and service potential reduces and an important aspect of asset management is determining the right time and right level of renewals investment in order to maintain the agreed levels of service over the long term. Council will continue implementing the appropriate intervention strategies i.e. a combination of maintenance, repair and renewal activities to maintain the service.

Generally, the stormwater network is in good condition and is maintained and renewed regularly, the service can be expected to last indefinitely, without any significantly abnormal costs having to be incurred.

2.4 How will we get there?

Council plans to maintain current levels of service for the life of this plan, unless legislation, consent conditions, or community expectations change. Over the next ten years Council plans to:

- Continue to collect, treat, and dispose of stormwater in a manner that protect public health, property, and the environment.
- Develop and implement Catchment Management Plans
- Plan for future development and needs
- Consult with the community on issues such as health and legislative compliance issues.

This vision is supported by a detailed stormwater asset management plan.

Significant projects and their funding sources are summarised in the following table:

Project	Year	Amount (uninflated)	Amount (Inflated)	Description
Reticulation – new	2021/23	$750,000	$764,000	Refurbishment, replacement of stormwater assets estimated to be $0.750m over the next 10 years. All stormwater system renewal work will be funded either by stimulus package funding or by the annual depreciation provision where funds are available
Stormwater Management Control (Flooding)[1]	2021/22	$25,000	$25,000	Comply with the requirements of the Canterbury Land and Water Regional Plan including but not limited to Stormwater Management Plans etc.
Sloane St Box Culvert Replacement[1]	2021/22	$34,670	$34,670	Sloane St Box Culvert Replacement
Total		**$809,670**	**$823,670**	

Stimulus Package Funding[1]

Key projects:

- Stormwater Management Plans
- Stormwater treatment installations
- renewals – refurbishment, replacement of stormwater assets estimated to be $0.764m over the next 10 years. All stormwater system renewal work will be funded either by stimulus package funding or by the annual depreciation provision where funds are available

To ensure on-going affordability of the stormwater service Council will continue to consider options in delivering the service.

2.5 How well are we doing and how well do we measure progress?

Council will continue to report on the non-financial performance measures, in accordance with 261B of the Local Government Act 2002, as this covers the key expectations in terms of the delivery of the service.

Council have reviewed and updated its systems and processes to ensure alignment and compliance with these rules.

The linkage between community outcomes, how the activity contributes, levels of service and performance measurement is shown in the following table.

Community outcome	How it contributes	Level of Service	Performance Measure
Resilient, successful communities	Manage flooding events in urban areas	System adequacy – the stormwater system is adequately sized and maintained	Number of flooding events
	Timely response to service requests and system failures	Response times – flooding from events from the stormwater system are promptly attended to	Response & resolution
A treasured environment	Providing a stormwater service that acknowledge and incorporates the natural environment in design, construction, operation and maintenance	Discharge compliance – they sw system is managed in accordance with consent conditions	Compliance with resource consent conditions Response & resolution
Strong innovative economy	Council priority is maintaining quality and continuity of stormwater services	Customer satisfaction – the sw system is managed to an appropriate quality of service	Response & resolution Number of complaints

2.6 What resources do we have and what resources do we need?

People –
The Essential Services Group has seven full time equivalent staff. The Essential Services Group provides management and engineering expertise to the Water, Wastewater, Stormwater, and Roading activities. The Unit utilises contractors to maintain, renew, and construct assets through various contractual agreements. The Unit augments its skill base through the engagement of specialist consultants as required to undertake specific projects and works.

It is likely that a shortage of technically skilled people to design, construct and manage stormwater assets will continue to have an impact on this activity in future years. This is a global issue which is also affecting other local authorities.

Physical Assets -
Council manages three reticulated stormwater systems consisting of collection, treatment and disposal systems. The collection systems consist of pipes, manholes and sumps.

- Length of stormwater mains 22km
- Number of retention/treatment areas 5
- Number of manholes 342
- Number of sumps 411.

The latest valuation, July 2019, estimates the replacement value of the Reticulation and Treatment Systems to be $9.8m.

2.7 Who pays for it?

This activity is funded by targeted rates from properties that have access to stormwater systems.

The New Zealand Government is undertaking a reform programme for “Three Waters” (drinking water, wastewater and stormwater) service delivery for communities **(Three Waters Reform Programme).** In conjunction with the Three Waters Reform Programme, the New Zealand Government is investing in water service delivery. The investment’s objectives are to:

- improve the safety and quality of drinking water services, and the environmental performance of drinking water and wastewater systems, by maintaining, increasing or accelerating investment in core water infrastructure renewals and maintenance; and
- support New Zealand’s economic recovery from the COVID-19 pandemic through job creation, by enabling investment to continue at a time when council revenues are uncertain and they face immediate cashflow challenges.

The Council has accepted crown stimulus grant funding for projects as part of the Three Waters Services Reform. The crown has committed approximately $500m nationwide in tranche 1, and the MDC allocation is $5.111m, of which $2.560m has already been received by MDC as an advance payment. These stimulus projects are in addition to current LTP projects already underway.

In year one a number of projects will be funded from this fund.

3.0 INTRODUCTION

This section sets out the purpose of this Asset Management Plan (AMP) and shows the plan framework.

3.1 Purpose

3.1.1 Purpose of this Asset Management Plan

The purpose of this AMP is to outline and summarise in a coordinated manner the Council's long-term asset management approach for the provision and intergenerational management of water throughout the District. This may also be considered the overall objective of Asset Management.

This AMP is intended to be read in conjunction with the Long Term Plan (LTP) and fulfils requirements of the Local Government Act 2002 (and amendments), - Schedule 10.

3.1.2 Purpose of Asset Management

The International Infrastructure Management Manual 2015 (IIMM) states the purpose and scope of AM as:

1. *The objective of asset management is to meet the required level of service, in the most cost effective manner, through the management of assets for present and future customers. As highlighted by ISO 55000, good AM is about achieving best value through the right balance between cost, risk and performance*
2. *Lifecycle asset management encompasses all practices associated with considering management strategies as part of the asset lifecycle. The objective is to look at lowest long-term cost (rather than short term savings) when making decisions*

Activity Management Planning is a management tool that provides the link between strategic planning and managerial areas of Council's business and community's desired outcomes.

3.2 Goals and Objectives of asset ownership

3.2.1 Purpose of Ownership

Council provides a safe, effective and sustainable stormwater system to:

- provide and maintain adequate piped stormwater systems that protect public health and property.
- ensure there is no detrimental impact on the environment from the disposal of stormwater in the urban communities

The Council's overriding goal is:

"***The outcome desired by the community is to have safe, effective and sustainable water, waste communication, energy and transport systems in place when required, through sound long term planning and funding***".

3.2.2 Review of Activities and Funding

The LTP identifies planned activities, defines the rationale for justifying these activities, and identifies the appropriate funding source.

3.2.3 Legal Authority for Council Action

The Local Government Act 2002 gives local authorities the full capacity, and full rights, powers and privileges, to carry on or undertake any activity or business, do any act, or enter into any transaction wholly or principally for the benefit of its district.

Along with these wide sweeping powers comes the requirement to identify all reasonably practicable options before making a decision, and to assess the benefits and costs of each option against the likely economic, environmental, social and cultural impacts.

Local authorities are also required to consult widely, effectively and appropriately with the community to determine the communities' wishes and to seek feedback on all potentially significant activities – not only when a particular course of action is proposed, but at the various stages of the decision-making process.

A significant aspect of this consultation process is the development of the LTP, which forms the long-term (not less than ten years) direction for all Council's activities.

Section 6.9.5 Council Strategies, Plans, Bylaws and Policies discuss the links with other planning documents and processes such as the Long Term Plan (LTP).

3.3 Links to MDC Vision, Mission, Goals and Objectives

MDC's outcomes and objectives for the stormwater network are stated in the LTP 2021 – 2031.

These outcomes and objectives have been translated into various targets for maintenance and renewals to be achieved in each financial year. The outcomes are reported in each Annual Report.

The principle goal is to provide an effective, efficient, accountable and sustainable range of services that meet the actual needs of the residents. The stormwater network provides drainage away from the road corridor and each residence to minimise the incidence of flooding.

The over-riding management strategy is that the Stormwater infrastructure as it presently exists will be maintained in the same state in perpetuity.

The Community Outcomes, Levels of Service and Performance Measures are discussed in Section 6.0 Levels of Service.

3.4 Asset Management Drivers

The business drivers, which define the need, priority and scope for improved AM practices within Council may be summarised as follows:

3.4.1 Customer Service

Customers require that agreed levels of service be delivered reliably, efficiently and economically. The use of AM techniques provides the following benefits in satisfying these demands:

- focuses on identifying and satisfying customer requirements
- provides a basis for customer consultation when determining levels of service preferences by identifying the range and cost of service level and service delivery options
- enhances customer confidence that funding is being allocated in an equitable and cost effective manner; that assets are being well managed and improves understanding of service level options and requirements

3.4.2 Financial Responsibility

The Local Government Act requires Local Authorities to:

- prepare and adopt, every three years, a long term (10 years plus) financial strategy for all infrastructural assets which takes into account asset creation, realisation, and loss of asset service potential
- determine their long term financial strategy, consider all relevant information and assess the cost/benefit of alternatives
- adopt a financial system consistent with generally accepted accounting practices
- manage assets prudently in the interests of the district and its inhabitants
- fund or otherwise provide for loss of service potential (deferred maintenance or depreciation) from July 1999

The implementation of the optimised work programmes and resulting long-term cash flow projections contained in AMP's will aid compliance with these requirements.
AMP's (supported by appropriate processes, systems and data) should provide clear justification for forward works programmes (and associated funding programmes) and provide the ability to even out peak funding demands and account for changes in asset service potential.

Changes to the Local Government Act 2002 during 2014 requires that a local authority must prepare and adopt, as part of its long term plan, an Infrastructure Strategy for a period of at least 30 consecutive financial years to guide decision-making for the next 30 years. This is detailed in Section 6.9.5 Council Strategies.

3.4.3 Environmental Responsibility

Asset Management (AM) Planning demonstrates how MDC is addressing sustainable management of its physical resources while enhancing the protection of the environment as required under the provisions of the Resource Management Act.

3.4.4 Safety

AM planning addresses MDC's safety obligations through:

- adoption of appropriate design standards for the creation of new assets
- development of risk management practices

3.4.5 Economic Efficiency

The techniques incorporated into this AMP support economic efficiency by:

- providing a basis for monitoring asset performance and utilisation
- enabling asset managers to anticipate, plan and prioritise asset maintenance and renewal expenditure
- identifying under-funding of asset maintenance and renewal
- quantifying risk, leading to minimisation of high impact (financial and service level) failures and environmental effects and resulting in savings where asset renovation is less than the cost of replacement
- extending the life of an asset by optimising maintenance programmes and demand management

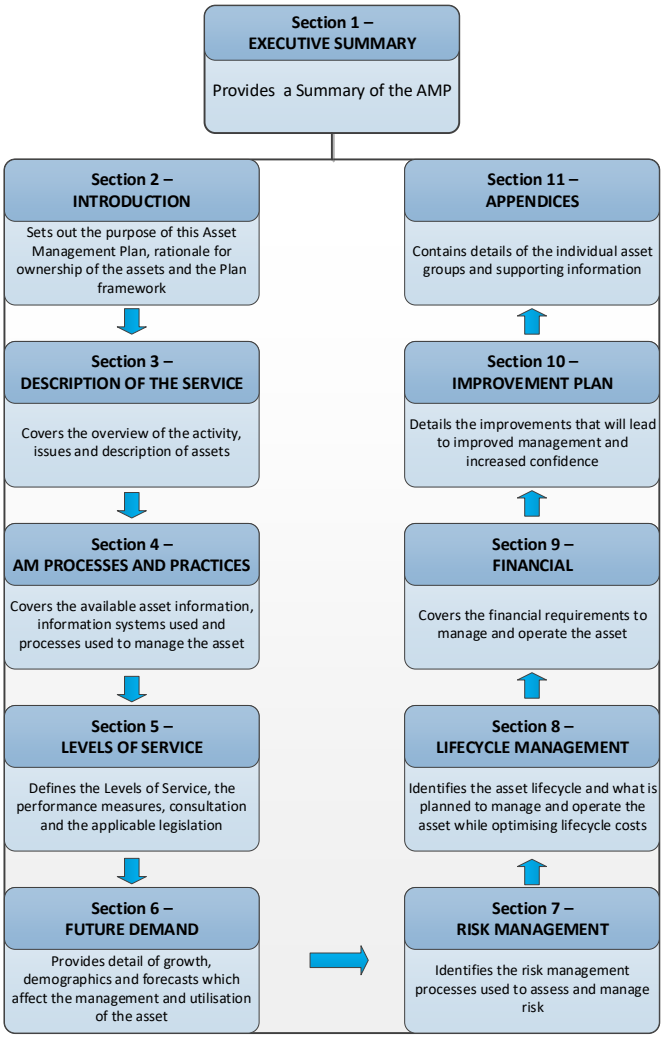
3.4.6 Achieve Strategic Goals

MDC has a strategic intent to "achieve sustainable development" and other goals relating to growth, building communities, protecting the environment, supporting the economy and providing quality customer service.

3.5 Plan Framework

The AMP structure is graphically represented below:

Figure 3-1: AMP Framework

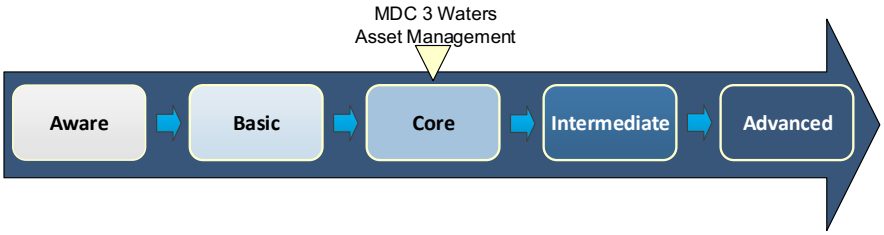


3.6 Appropriate Level of Asset Management

The International Infrastructure Management Manual (IIMM) provides a summary of the different levels of asset management maturity: Aware, Basic, Core, Intermediate and Advanced. The degree of complexity differs according to an organisation's corporate needs. The level of complexity of Asset Management is dependent on the following:

- The costs and benefits to the organisation
- Legislative and other mandated requirements
- The size, condition and complexity of the assets
- The risks associated with failures

- The skills and resources available to the organisation
- Customer expectations



A core Activity Management Plan will meet minimum legislative and organisational requirements for financial planning and reporting. It provides basic technical management outputs such as statements of current levels of service, forward replacement programmes and associated financial projections.

MDC considers the required sophistication of their plan in the short to medium term need not progress beyond a "Core" planning level, as:

- the cost at this time to move to an advanced plan would provide little significant benefit to Council or its' customers
- the size, complexity and use of the assets is consistent with a rural sparsely populated district
- the risks associated with failure are low

The current Activity Management Plan generally meets "**Core**" requirements. By implementing improvement planning Council can assess the asset management performance and identify gaps to drive the improvement actions.

4.0 DESCRIPTION OF SERVICE

This section of the Plan covers the overview of the activity and the description of assets covered under it.

4.1 Overview of the Activity

The Mackenzie District Council (hereafter council) is a local authority located in the middle of the New Zealand, South Island and covers 7,339 square kilometres.

Council is in many ways a typical example of the majority of its namesakes as a provider of "core" activities. Core activities are considered to be delivery of water (urban and rural), wastewater (sewerage), water races and stormwater services.

How and where water for human, agricultural, cultural and recreational uses is sustainably managed is of considerable importance. Council has consistently regarded the provision of the three Water services as vital to maintaining the community's health and well-being.

The stormwater assets are fundamental to Council's statutory responsibilities and strategies for conserving public health in pursuit of its mission to enhance the quality of life of residents in the District.

Council owns separate stormwater systems consisting of Fairlie, Lake Tekapo and Twizel.

4.2 Description of Assets

Overall there are 22 kilometres of reticulation, 342 manholes, 411 sumps and 5 retention/treatment areas. The reticulation varies from 100mm to 1,050mm in diameter.

Total operating costs are estimated to be $35,375 gradually increasing from 2021/22 over the ten years to $50,300 in 2030/2031. Replacement value of treatment plants, pump stations and reticulation is $9,801,000 as at the July 2019 asset valuation.

System	Population (UR)	Length of Pipe Reticulation (km)	Manholes	Sumps	Pump Stations	Retention/ Treatment area	Replacement Value
Fairlie	**693**	5.0	36	9	-	-	
Lake Tekapo	**369**	10.2	213	216	-	5	
Twizel	**1,137**	7	93	186	-	-	
Total	**2,199**	22.2	342	**411**	**-**	**5**	**$9,801,000**

4.3 Key Issues

There are a number of key issues facing Council over the next ten years and beyond:

- Environmental compliance – Historically Council operated the stormwater systems as permitted activities. Increased environmental standards as a result of the Canterbury Land and Water Regional Plan require Council to obtain resource consents for stormwater systems. Consent applications have been lodged. These consents apply to stormwater collection and discharge and requires:

  - approved Stormwater Management Plans
  - stormwater discharges to meet regional rules and water quality parameters
  - appropriate Erosion and Sediment Control measures
  - minimising adverse effects of stormwater discharges on the environment
- Central Government's 3 Waters Reform Programme and funding package to provide immediate post COVID 19 stimulus to local authorities to maintain and improve three waters infrastructure.
- Central Government's 3Waters Review is considering
  - New obligations on wastewater and stormwater network operators to implement a risk management plan
  - Nationally consistent monitoring and reporting requirements for wastewater and stormwater networks
  - Stronger Central oversight
  - Network operators to
    - adopt industry good practices and minimising risks to public health and the environment, while meeting local community/iwi values
    - implement a certified risk management plan that specifies how they will: –
      - Operate and maintain networks to meet current and future regulatory requirements; e.g. freshwater objectives and limits
      - Proactively manage risks to public health and environment
      - Support integrated planning of stormwater networks and land-use
- The paradigm shift in stormwater management moves from "to collect, convey, discharge" to a more integrated approach of "slow it down, spread it out, and soak it in". This approach includes quantity and quality considerations, multiple use facilities, riparian corridors, recreation, wetland preservation and groundwater recharge. This introduce a range of issues including changes in stormwater planning, design, operation and maintenance, construction, and financing.
- Ensure developers provide, implement appropriatly designed and effective treatment and disposal systems for their subdivision
- Climate Change –Greater intensity and frequency of events are expected and appropriate response is to be developed. The potential impacts and the appropriate mitigation measures are yet to be defined.
- Separated wastewater and stormwater systems (inflow/infiltration/exfiltration)
- Increased Community Expectation – the community has an increased expectation on Council's responsibility to provide adequate protection on properties through improved infrastructure.
- Ensure adequate in-house staff resource capacity and capability

The following table lists the key issues associated with each individual stormwater system.

Issues	Resolution
All Stormwater Systems	
Environmental compliance	Comply with the requirements of the Canterbury Land and Water Regional Plan including but not limited to Stormwater Management Plans etc.
Monitoring (first flush)	Develop and implement monitoring plan
Fairlie	
Old timber stormwater systems	Programmed for replacement 2022/23
Condition of steel pipe at the top end of Regent Street	Investigate issues, resolution options and implement
Lake Tekapo	
Increased environmental conditions and compliance parameters	Consideration of options and resolution. Application for resource consent lodged
Old discharge points and retention basins	
Twizel	
No specific issues	Ensure developers provide, implement appropriately designed and effective treatment and disposal systems for their subdivision

4.4 Stormwater Reticulation

The objective of a stormwater drainage system is to regulate stormwater surface runoff to the degree that agreed levels of service are maintained and any adverse effects on the environment are not more than minor. Remedial work or improvement works often needs to be incorporated within the stormwater drainage system to achieve the agreed levels of service. Potential adverse effects include flood damage, surface and channel erosion and sedimentation, water pollution, and damage to aquatic ecosystems.

The stormwater system consists mainly of a primary and secondary system where:

- Primary is the piped system catering for the frequent rainfall events
- Secondary is the open channels and controlled flow paths catering for the higher intensity events or where blockages occur in the primary system

Council's stormwater assets are owned and maintained under two asset groupings. These are:

- Roadway drainage assets
  - includes kerb and channel works, formed water tables, sumps and connecting leads, and under road culverts. All roadway drainage assets are owned and maintained as 'Roading' assets.
- Stormwater disposal assets
  - collect runoff from road way assets and adjacent land, and catchments generally upstream of a stormwater disposal asset, and convey it downstream to a natural water course or lake.

Individual properties that are connected to the stormwater service are responsible for their service laterals, up to and including the service lateral connection at the stormwater main.

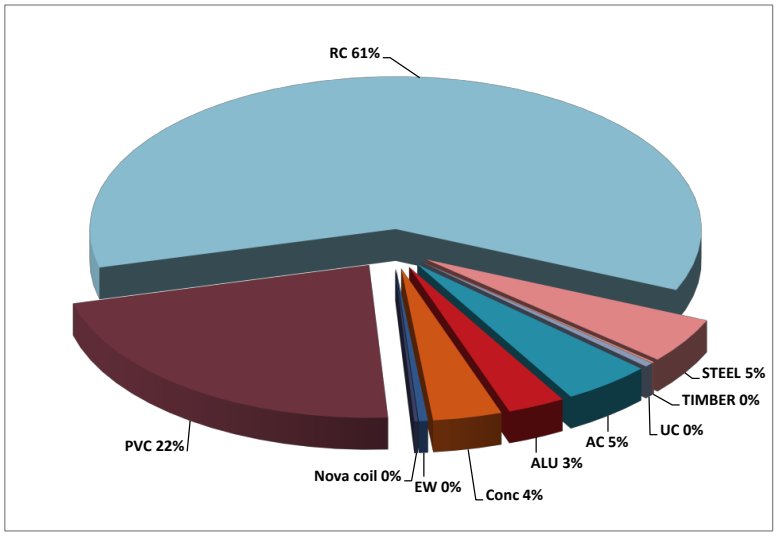
Main stormwater lines constructed to service more than one property are a Council asset.

The scope of this Plan includes only the 'Stormwater disposal' group of Council's stormwater assets.

All of the reticulation is via gravity with pipes ranging from 100mm to 1,350mm diameter.

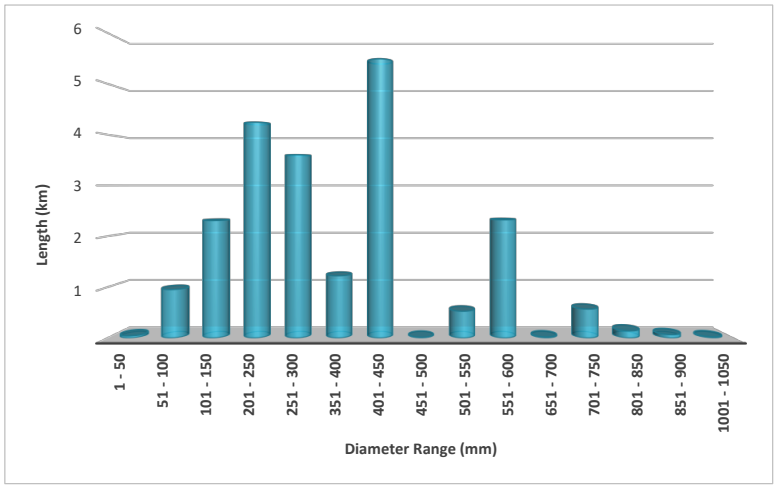
Council requires to discharge their stormwater to ground where ever possible to minimise the volume of stormwater the pipe network has to convey and treat before final disposal.

Figure 4-1: District wide stormwater main material distribution



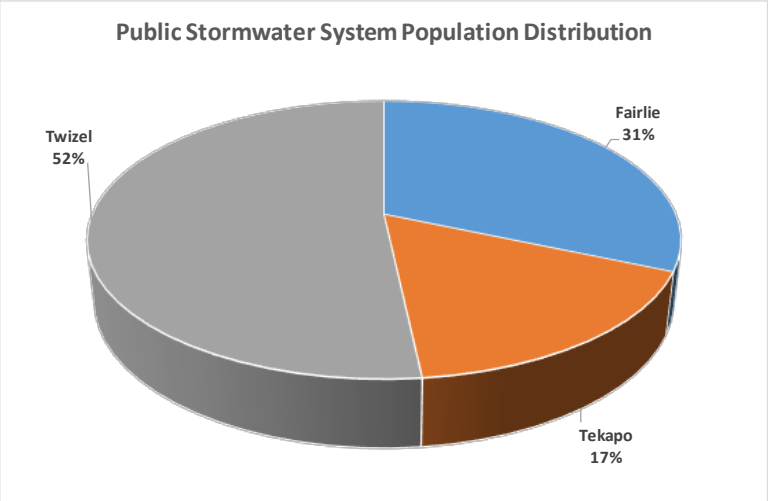
61% of the pipe reticulation consist of concrete.
The majority of the remaining 39% consist of PVC (22%); Steel (5%); and AC (5%).

Figure 4-2: District wide stormwater main size distribution



43% of the reticulation is > 400mm diameter.
15% of the reticulation is ≤150mm diameter.

Figure 4-3: District wide Public Stormwater System Population distribution



4.5 Manholes

A stormwater manhole is a stormwater access point with a removable cover which allows human and machine access to a (typically buried) stormwater pipes.

The manhole provides several functions, such as to:

- conduct inspections
- connect two stormwater mains when there is a change of grade or alignment or size
- provide a junction where two or more stormwater mains meet

Manholes are usually constructed from reinforced concrete, either precast or formed insitu. There are 244 manholes in the Council stormwater systems.

Stormwater inlets (sumps or mudtanks) that provide road drainage and the associated piped connections are classified as Roading assets and are managed under the Land Transport Activity.

4.6 Pump Stations

There are no pump stations within the MDC stormwater systems.

4.7 Stormwater Treatment/Retention Areas

Stormwater treatment/retention areas are constructed basins/wetlands designed to prevent flooding, downstream erosion and provide some form of treatment prior to the runoff flowing into natural waterways.

There are 5 retention areas in the Council stormwater systems, all located in the Lake Tekapo system.

4.7.1 Treatment/Discharge/Disposal

An important aspect of the stormwater system is to ensure that the district's natural water sources are manage responsibly. Resource consents are held for the various activities relating to the stormwater activity such as management and maintenance of the stormwater treatment and disposal system.

Discharge/disposal is generally to land. The resource consent conditions set out the inspection, monitoring and maintenance parameters required.

4.8 Buildings

There are no buildings associated with the stormwater activity.

4.9 Critical Assets

There has been no formal criticality assessment performed on the stormwater system assets. This is There has been no formal criticality assessment performed on the stormwater system assets. This is included as an Improvement Item (**IP 1**).
In the absence of a formal criticality assessment Council's approach in the stormwater activity is based on the following methodology:

Table 4-1 Critical asset assessment approach

Criticality Category	Condition Assessments	Renewal
Critical Assets The flow treatment of stormwater in Tekapo and its discharges into significant water bodies	Condition assessments performed during connections and pipe repairs. Detailed analysis obtained as deemed necessary	Renewal timing based on conservative base live and actual condition assessments of asset and estimated future deterioration.
Non-Critical Assets – distribution network of smaller culverts and drainage and property laterals	Sample inspections of material types and age bands during connections and pipe repairs. Greater proportion for assets nearing end of base life. Inspections of assets associated with major roading asset renewals to confirm condition.	Generally "run to failure" with renewals on a reactive basis.

Many of the critical stormwater assets are already covered through roading asset management. For example, culverts and kerbs are both considered a roading asset. One of the key critical assets is the stormwater treatment facility at Tekapo.

5.0 ASSET MANAGEMENT PROCESSES & PRACTICES

This Section covers the organisation structure, information systems used, data confidence and processes used to manage the asset.

5.1 Introduction

The MDC organisation structure and Group structure is shown below.

Figure 5-1: MDC Organisation Structure

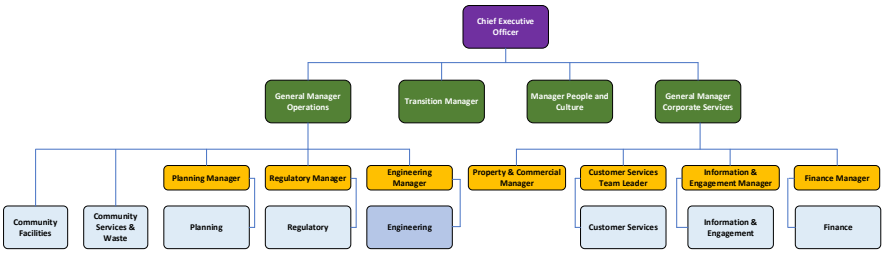
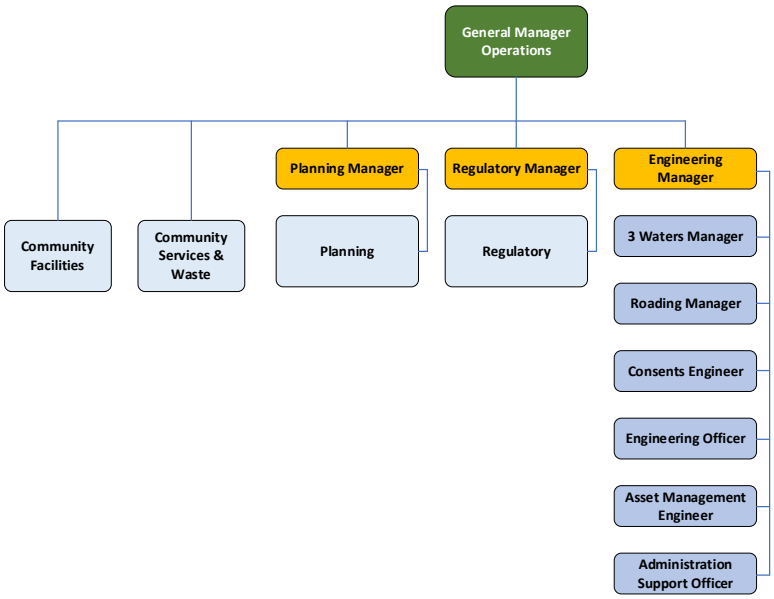


Figure 5-2: Essential Services Group Structure



MDC has an Engineering Manager, 3Waters Manager and an Asset Management Engineer responsible for the maintenance management of the Utilities network. Occasionally some elements of the work are tendered to consultancy services to manage (e.g. Pipeline replacements etc). The 3Waters Manager and the Maintenance Contractors regularly inspect and monitor the network. Any work identified is directly tasked to the incumbent maintenance contractor or, if it is beyond the scope of the maintenance contract, tendered using Competitive Pricing Procedure guidelines. This may or may not need the involvement of consultants depending on the nature or extent of the work.

MDC accounts for revenue and expenditure on an accrual basis. All work under the Works Programme is identified through a job cost ledger with a significant level of breakdown using analysis codes. The costs are summarised into the general ledger where operational/maintenance costs are identified separately to capital/renewal items.

The majority of the work (physical works and professional services) carried out as part of the total management of all Utilities Asset functions is actioned under either physical works or consultancy contracts.

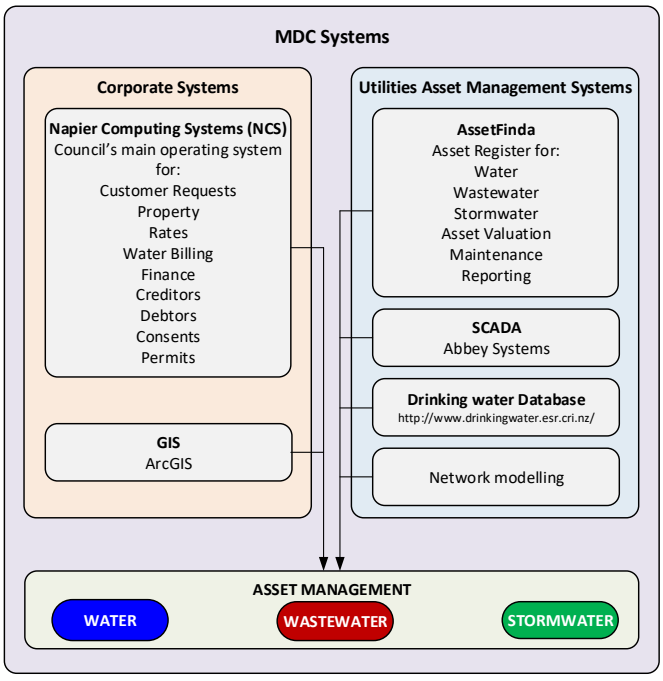
All contract works are claimed monthly against each of the contract item numbers by the physical works and professional services contractors. MDC and/or consultants confirm the payment value for all physical works and the MDC confirms the payment of any professional services. The accounts job number and account codes are included on the payment certificate. These certificates are forwarded to MDC for payment. The types of work that this system relates to are maintenance, renewals and capital expenditure.

There are a range of reports prepared in order to comply with the requirements of Council, and the Auditors. All external reports are prepared in compliance with Generally Accepted Accounting Principles (GAAP).

5.2 Systems

Information and Data Systems provide Council staff with the ability to obtain, store, analyse and report on the significant quantities of data that is associated with the 3 Waters. The information and data systems available to MDC staff are shown below and discussed within this section.

Figure 5-3: MDC Systems



Council uses Asset Finda which is a complete system for designing and managing solutions through the application of geographic knowledge. Data can be manipulated within AssetFinda, ArcGIS or exported to excel to assist in the decision making process for stormwater network issues.

5.2.1 AssetFinda

AssetFinda is an advanced Assets Management System designed to assist Councils in whole of life management of their assets. AssetFinda is designed to meet Council's long term and statutory asset management requirements.

It is has three main components:

Asset Register: An accurate asset register is critical to any asset management system. It controls a database that utilizes GIS, Web and iPad to view, edit, analyse and add data – faster, easier and more accurately than ever before.

Asset Maintenance: Maximizes the useful lifespan of assets by managing past, present and future maintenance requirements of your assets.

Asset Reporting: There is wide variety of reports, including Asset Revaluations, Monthly & Annual Depreciation Calculations, and Predictive Modelling.

AssetFinda utilizes a Web front end, GIS interfaces and iPad apps, thus creates a flexible and user friendly interface that even the newest of users can navigate quickly. The iPad App is designed to give real-time access to data in the field. View, analyse, edit & add data, capture images, run inspections, complete works requests from anywhere in the field with in either Online or Offline mode.

Council uses AssetFinda to manage the following:

- Water
- Stormwater
- Wastewater
- Parks (to be added)
- Buildings (to be added)

The Asset Register contained within AssetFinda/ArcGIS is contained within separate databases. Each database records the attribute of each asset to component level including age, condition, performance etc.

Depending on what type of asset is identified there are varying amounts of information recorded for that asset. There are gaps in the information for each asset, but we are continually gathering information on these to complete the Asset Register.

5.2.2 SCADA

At the time of writing this Plan there is no SCADA used within the stormwater system. However, if the need arise the SCADA system will be rolled out to the stormwater system to actively monitor and collect operational data.

5.3 Data Management

Key information comes into the Essential Services Group through work reports, as-builts, consumers and contractors. Other information comes into the Unit via emails, journals, Government publications and the media.

Decisions on activity management, renewals and acquisitions are made in consultation with staff, council and the public as appropriate. Staff meetings are held regularly to discuss current and future plans and decisions.

Asset data integrity audits is an ongoing process and data is checked on a continual basis. As service requests are completed and submitted to be captured within the asset register the data recorded on site is compared with the asset register data. This is an ongoing process of ensuring a high level of data integrity.

General maintenance work is continuous throughout the year and responds to the needs of the network. The data from the repairs carried out is reported to Council and recorded in MDCs systems on a regular basis.

New subdivisions in the District result in additions to the pipeline infrastructure. Processes are in place to ensure that this data is provided electronically so that it can easily recorded in the Asset Register and available for ongoing effective Asset management. Developers and consultants are required to supply accurate as-built information in appropriate form prior to a Section 224 Certificate being issued.

5.4 Data Confidence

Data confidence grades are held against each individual asset within the AssetFinda asset register. These grades indicate the type of data source and the confidence in the specific data source. Since the last independent data confidence review there has been a significant improvement in base asset information. An independent assessment was recently undertaken to reassess the data confidence grades of the AssetFinda register would be of value to determine the improvement opportunities prior to the next LTP. This An in-house assessment showed an improvement to the data confidence ratings from previous years but the table below reflects the data confidence status at the last independent review (2019). A summary of the confidence levels in the attributes of the assets are detailed in the following table.

Table 5-1 Data Confidence

Valuation element	Pipelines
Asset register or database	G
Attribute details	G
Asset category	G
Optimisation information	A
Useful life information	G
Unit rates	G
Where	
VH	Very High confidence
H	High confidence
G	Good confidence
A	Average confidence
P	Poor confidence

5.4.1 CCTV Inspections

The aim of asset management is to manage assets, such as stormwater systems, in a way that provides the required level of service in the most cost-effective manner through the creation, operation, maintenance, renewal and disposal of assets to provide for existing and future customers.

CCTV inspections can help organisations gain an understanding of the existing condition of their piped assets. This understanding can help organisations make decisions such as which pipelines are:

- Undersized and need to be upsized to meet future flows.
- In risk of collapse.
- In need of maintenance works such, as root cutting.

Council is then able to prioritise works and prepare a timetable and budget for any required rehabilitation works. Pipelines are regularly internally inspected by CCTV.

Reasons for CCTV inspections include, but not limited to:

- General condition surveys to determine the areas in pipe networks that require attention and to develop long-term programmes for replacement and maintenance of the network.
- Responsive maintenance, e.g. to identify and repair faults in pipes that have caused overflows or flooding.
- Determination of rehabilitation requirements, e.g. to determine which pipes need to be lined to prevent too much water entering into the system. This can result in the pipes not having enough capacity to cope with the flow, thus causing overflows.
- Quality checks on new works or after the rehabilitation of pipes.

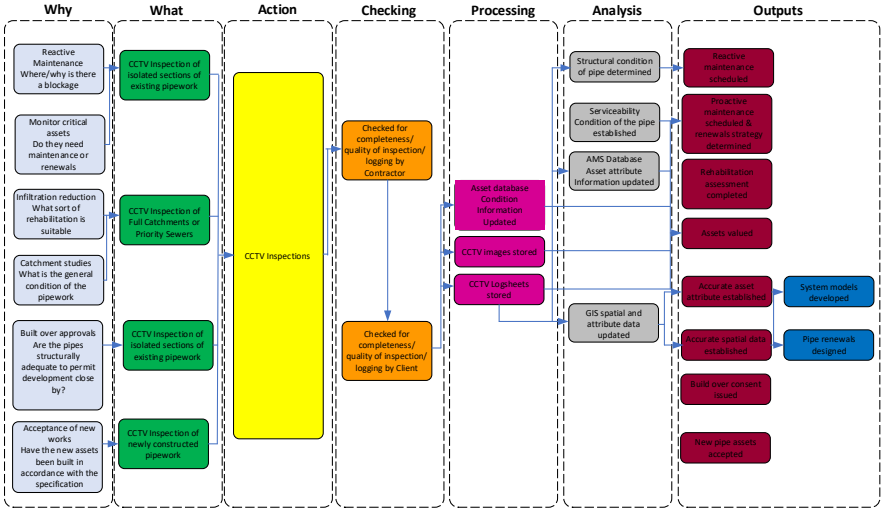
A CCTV inspection provides information for asset management, maintenance and rehabilitation purposes. CCTV inspections view the condition of assets, and provide information on attributes. Condition data can be used to:

- Determine the structural condition of pipes to enable rehabilitation works to be prioritised.
- Maintain a check on the structural condition and rate of deterioration of pipes to enable forward budgeting for maintenance and rehabilitation.
- Provide an overall inventory of the asset and a global picture of system problems.
- Check service conditions to enable regular maintenance planning.
- Provide miscellaneous information for additional uses, such as locating unused lateral connections for new housing developments.
- Provide a status of stormwater systems for industry benchmarking.

CCTV inspections also provide valuable information on the position and type/size of the pipes being inspected, such as:

- Connectivity, i.e. which manholes are connected by the pipe.
- The location of pipes and manholes can be determined by the length of the pipe surveyed and the position of the manholes noted when the CCTV camera was put into or retrieved from the pipe.
- The diameter of the pipe being inspected.
- The material of the pipe being inspected.

Figure 5-4: The CCTV Process



5.5 Information Technology

The responsibility for asset information security rests with the IT department administrators. The data is held in the 'cloud', remote data servers.

5.6 AMP Preparation

In preparation of the 2018- 28 LTP period Council engaged Waugh Infrastructure Management Ltd (WIML) to assist with the review and update of the 3 Waters AMPs. This resulted in significant changes to the 3Waters AMP documents. The 2020 updates, a collaborative effort by MDC staff and WIML staff, did not result in significant changes to document templates and content, but mainly focussed on aligning the content with:

- Government and industry direction
- general industry practice
- all 3 Waters asset based activities of Council are supported through the AMP
- 3 Waters AMPs are easy to read, and follow the same agreed format
- the underlying asset management planning processes occurring for each activity
- levels of service, and show linkages to other Council planning documents
- a robust reflection of the future intentions of Council with respect to 3 Waters activities
- the financials arising from the plans reliably forecast the lowest lifecycle cost to deliver agreed levels of service for a period of no less than 10 years.

5.7 Quality Assurance

5.7.1 Audits

To establish and ensure the ongoing improvement of the quality of this Plan a series of audits are planned and includes Financial, Systems, Technical and Performance Audits.

- **Financial audits** - the Local Government Act requires that independent annual financial audits be undertaken on the operations of Council; such audits may include all significant activities such

as asset management planning. The auditor's opinions will be included in the Annual Report. All recommendations are for improvement are adopted and implemented as appropriate and resources permit

- **System audits** - are continuous and ongoing and incorporated in operational practices. However, as part of the LTP process, systems are discussed and reviewed every 3 years. This audit identifies the current status of asset management processes, systems and data and produce targets for Asset Management practices to be achieved in following years.
- **Technical audits** – include peer reviews undertaken at regular intervals to assess and identify compliance with statutory accounting requirements.
    - The quality of the Plan in terms of completeness, objectivity, logic, technical content and presentation
    - Perceived strengths and weaknesses for Plan improvement
    - Recommended specific areas for Plan improvement
    - Technical Audits may be undertaken using external or internal reviewers
- **Performance audits** establish whether the stated objectives for the operation of the asset have been achieved. Measurement of the success of the operation of the asset will be assessed using the results of:
    - Customer satisfaction surveys
    - Key Service Criteria objectives compliance

5.7.2 Knowledge of assets

The process of capturing as-built records for the on-going enhancement of asset registers is included as a requirement of the maintenance contracts. The information is supplied to Council staff for them to upgrade the relevant registers. Projects undertaken outside the maintenance contracts have a requirement within their contract for the relevant information to be collected and forwarded to Council for them to upgrade the registers. Council needs to be diligent in obtaining as built data (e.g. new subdivisions) to ensure infrastructural asset data is up to date enabling informed decision making. The Contractors staff capture data on site and submit hard copy records to the 3 Waters Manager for updating the asset registers. Only two staff members have the ability to change asset data, the 3 Waters Manager and the GIS officer.

5.7.3 Accounting/Economics

Maintenance and renewal costs are recorded against broad activities in the general ledger. Valuations are currently based on straight line depreciation and assumed effective lives.

5.7.4 Risk Management

Although processes are in place for the monitoring of some critical assets (e.g. treatment areas), risk management is generally practised informally based on the knowledge of experienced staff.

5.7.5 Operations

Operational processes are documented in service delivery contracts and are subjected to regular review.

5.7.6 Maintenance

During 2020 Council tendered and awarded the operation and maintenance works with contract term of 5-years plus a 5-years right of renewal. Major new pipeline construction or replacement is tendered individually for larger budget items.

5.7.7 Optimised Lifecycle Strategy

Work optimisation for other assets is based on the judgement of experienced staff, internal inspection of pipelines and renewal projections are based on assumed economic lives.

5.7.8 Design & Project Management

Although there are no documented project management procedures for MDC and consultants, there is confidence that suitable procedures are used during the project evaluation and design phase. Council and consultants use appropriate project management manuals such as NZTA Project Management Manual and other appropriate guidelines. Sound contract management procedures are in place. The supervision of assets constructed within sub-divisional development and subsequently taken over by MDC is considered to be adequate.

5.7.9 Suitably Qualified and Trained Staff

An important measure of this Plan's quality is the ability, experience and qualifications of the individuals and companies involved in its preparation. The Mackenzie District Council employs staff appropriately qualified to carry out the asset management function.

On-going training is available for staff involved in infrastructure asset management and includes attendance of:

- IPWEA sponsored workshops on Asset Management
- NAMS seminars
- Annual WaterNZ conference
- Asset Management conferences
- Water Managers (NZ wide) quarterly meeting.

Council staff has a reasonable record of attendance at these seminars, conferences and workshops. Council engineering staff has the qualifications, skills and experience that are adequate and appropriate for carrying out the asset management function of the MDC, provided specialised external support is available as the need arises.

5.7.10 Skills

The Havelock North Water Inquiry observed that there should be a fundamental review of training in the water industry, with the recognition that the current content of existing qualifications needing to be updated but concluded that curricula and content of training courses were beyond the scope of the Inquiry and will need to be considered in detail by Government in due course.

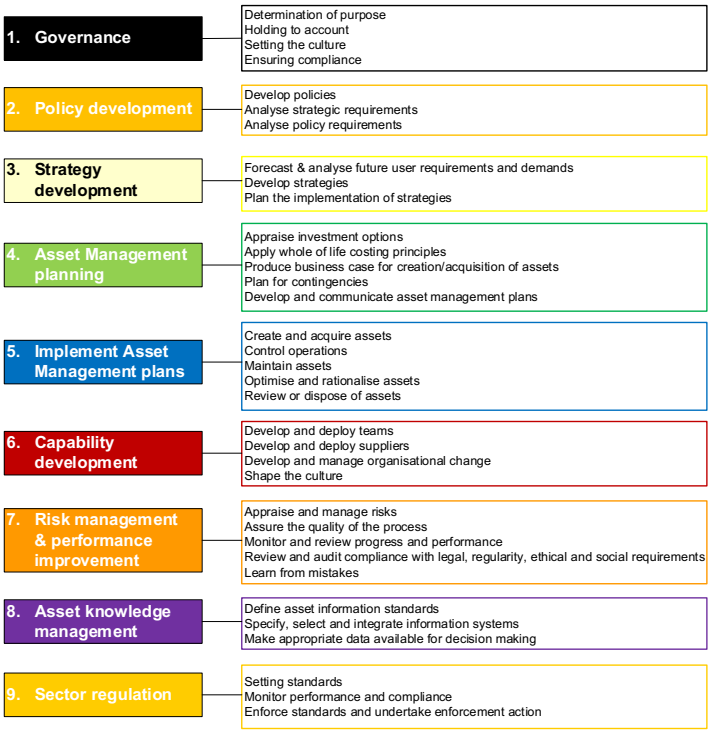
Training programs should encourage employees to communicate and think critically about the operational aspects of their work.

During 2020 Water New Zealand released its draft Competency Framework which describes what people should be able to do and what they need to know to competently undertake their work. The Competency Framework use treatment operator roles, the people who operate, monitor and maintain water and wastewater services, as a starting point. Network/Distribution operators are still to be developed which will include stormwater.

The Water Industry Professionals Association (WIPA) was jointly established by the Water Industry Operations Group and Water New Zealand to provide a system of recording the professional development of people working in the water and wastewater industry to ensure a high level of competency within the industry was maintained. At the time of writing this Plan registration is voluntary but may become compulsory under the new regulatory framework.

The Competency Framework identifies nine areas as shown below.

Figure 5-5: WaterNZ Competency Framework



(*Source: Water NZ – Competency Framework*)
Council will monitor the development in this area and envisage that any future competency requirements may be part of the future regulatory framework.

5.8 Sustainable Practices

5.8.1 Overview

Sustainability can be defined as meeting the needs of the current generation without compromising the ability of future generations to meet their own needs.

There are increasing signals from Central Government that the focus on more holistic approach to 3Waters management including improved management of water resources. Regional Councils are increasing water take/discharge consent conditions to encompass sustainable use of water. Increasing conditions will lead to a need for investment in additional infrastructure.

The Havelock North Water incident provided the catalyst for the Three Waters Review which resulted in the establishment of a Water Regulator and a Water Services Act. Regulatory coverage will extend to all water suppliers, except individual household self-suppliers. It will also include a multi-barrier approach to drinking water safety, including mandatory disinfection of water supplies, stronger obligations on water suppliers and local authorities to manage risks to sources of drinking water; and strengthened compliance, monitoring and enforcement of drinking water regulation. Furthermore, Central Government have also signalled through its 'Action for Healthy Waterways' discussion document improved stewardship of wastewater and stormwater services, with Risk Management Plans for wastewater and stormwater networks a likely outcome. This has renewed the focus on the very high

standard of care and diligence required to supply drinking water and collect, treat and discharge wastewater and stormwater. A significantly more holistic approach to 3 Waters management is dawning.

The LGA 2002 requires Local Authorities to take a sustainable development approach while conducting its business. In doing this Council is required to take into account the following:

- The social, economic, and cultural well-being of people and communities
- The need to maintain and enhance the quality of the environment
- The reasonable foreseeable needs of future generations

5.8.2 Sustainability and Lifecycle

Asset management is designed to improve decision-making about assets to enable the better management of existing and future assets. Effective asset management ensures that agreed levels of service are met and risks, including public health, financial and environmental are minimised, while costs are optimised. Evidence based decision-making is crucial to achieve asset management and sustainability goals. Having the correct asset information available is important to support the decision-making process. It is thus clear that lifecycle costs is part of and supports asset management and sustainability.

Asset management practices include action that recognise the need for environmental, economic, social and cultural sustainability, that is –

- The natural environment needs to be preserved for future generations and not degraded as a result of Council's asset management operations and development projects
- Financially, there is a limit to what ratepayers, developers, and therefore Council, can afford. Expenditure needs to remain within this limit and the costs need to fall equitably on the generations which derive the benefits
- Social relationships between individuals, interest groups and local government are valuable, and Council needs to facilitate and encourage this by providing infrastructure
- Our history, customs and creativity are valuable to us. Their preservation and enhancement over time is facilitated by providing venues where they can be practiced, preserved and displayed

Sustainability is considered in all tasks performed by Council. In managing, operating and maintaining stormwater systems. Council would like to do this to a level of excellence. However, this is not sustainable, and all stormwater systems are managed, operated and maintained to an optimum level appropriate for that specific stormwater system and task. Council endeavours to always act in the best interest of the community.

Council considers the following under sustainability:

- Efficient use of energy within facilities
- Water takes are consented
- Discharges are consented
- Efficient operation of facilities
- Reducing stormwater outflow volumes by requiring "to ground" disposal where ever possible.
- Improving effluent quality and/or improved disposal methods
- Collaboration with other Councils

Council also considers collaboration with other Council as sustainable practice. Sharing services/resources/systems/information is key to providing a sustainable service to the community, while maintain a district's own identity. Council collaborated with neighbouring district councils in response to the Government 3 Waters Review.

5.8.3 Significant Negative Effects

The negative effects that the stormwater system may have on the social, economic, environmental or cultural well-being of the community is tabled below. It indicates how the existing approach or proposed action to address these in the future.

Negative Effect	Impact on well-being				Comment
	Economic	Social	Environmental	Cultural	
Reticulation					
Discharge of contaminated stormwater to water	None	Minor	Minor	Minor	Very low quantities and not deemed to be significant. If contamination levels increase onsite treatment systems may be considered, but this will be a roading function as kerb inlets are roading assets. Treatment areas exist in certain areas
Pollutants originating from industry	Minor	Minor	Minor	Minor	Very low quantities and not deemed to be significant. Controls can be applied through District Plan process. If volumes increase onsite treatment systems may be considered. There are low numbers of light industry within the district.
Drains					
Use of chemical sprays	None	Minor	Minor	Minor	Compliance with consent conditions
Sediment and vegetation build up	None	None	Minor	Minor	Removal by mechanical/spraying. Plantings and screening where appropriate

There are no significant negative effects shown to occur for the stormwater activity.

5.9 Environmental Management

A very important aspect of the stormwater system's function is to ensure that the District's natural water sources are managed responsibly. Resource consents are held for various activities relating to the stormwater activity.

The Mackenzie district is under the authorisation of Environment Canterbury (ECan).

5.9.1 Schedule of Resource Consents

The following table lists the stormwater resource consents that are presently held for the taking of water and land use:

System	Consent #	Description	Expiry Date
Fairlie	CRC203556 – in process		
Lake Tekapo	CRC042748	Sealy Street Discharge - to discharge stormwater to water from the low lying area at the eastern end of Sealy Street by way of open drain along Murray Park and pipe along Sealy Street into Lake Tekapo	18 February 2040
	CRC146447 & CRC146445	Lochinver Discharge - to discharge contaminants onto land and into water from a residential subdivision	24 September 2039
	CRC141077	Domain Discharge - to discharge stormwater to water	23 December 2049
	CRC157319	SH 8, Simpson Lane & Lakeside Drive - to discharge stormwater to water	3 August 2050

System	Consent #	Description	Expiry Date
Twizel	CRC042742	To discharge stormwater to water from domestic gardens, driveways, footpaths, streets, SH8 and urban parkland via open swales and pipes to two discharge pipes into the Twizel River	18 February 2040
	CRC081120	To discharge stormwater to ground (Pukaki Airport)	7 December 2042

There are no resource consents which will expire during the term of this Plan.

Tekapo Landco Ltd. Development known as Station Bay along Lakeside Drive, have installed SW360 treatment systems to be maintained by Tekapo Landco Ltd for the first five years and then vested to the Mackenzie District Council. The five years will start on signing 224c likely to be in May 2021.

5.9.2 Consent Monitoring and Reporting

Consent reporting within MDC for Water, Wastewater and Stormwater is the responsibility of the 3 Waters Manager. The 3 Waters Manager collate all relevant information and aligned with resource consent conditions and report annually to Environment Canterbury.

The resource consent compliance for stormwater systems is considered to be good.

5.9.3 Canterbury Land and Water Regional Plan

The Canterbury Land and Water Regional Plan (LWRP) became operative in January 2014 and is a key driver for the stormwater activity, as its provisions impose increased environmental requirements for stormwater discharges.

Rule 5.93 sets out the regime for lodgement of catchment/network applications. Compliance with the LWRP is a major focus for the stormwater activity. Resource consent conditions include but are not limited to:

- Stormwater Management Plans
- Appropriate erosion and sediment control measures
- Detention basins
- Soil monitoring
- Water Quality monitoring
- Recording and reporting

Compliance with the conditions of resource consents add to already stretched resources.

5.10 Climate Change

Climate change is an important consideration in the Council's long-term planning. Guidance from the New Zealand government, based on the best available climate science is used to support the planning. The Ministry for the Environment information on https://www.mfe.govt.nz/climate-change/likely-impacts-of-climate-change/how-could-climate-change-affect-my-region/Canterbury provides a summary of projected climate changes over the period 2031-2050 and 2081-2100, compared with 1986-2005 and the key impacts this is likely to have.

Temperature - Compared to 1995, temperatures are likely to be 0.7˚C to 1.0˚C warmer by 2040 and 0.7˚C to 3.0˚C warmer by 2090.

By 2090, Canterbury is projected to have from 6 to 35 extra days per year where maximum temperatures exceed 25˚C and the number of frosts could decrease by around 13 to 38 per year.

Rainfall will vary locally within the region. The largest changes in rainfall are likely to be for particular seasons rather than annually.

By 2090, winter rainfall is projected to decrease by up to 12 per cent in Christchurch and up to 10 per cent in Hanmer, but increase by 6 to 28 per cent in Tekapo.

According to these latest projections, the frequency of extreme rainy days in the Canterbury region is not projected to significantly change as a result of climate change. Under the highest emissions scenario, there is likely to be a small increase in frequency by 2090.

Snowfall - The Canterbury region will likely experience significant decreases in seasonal snow. By 2090 the number of snow days is projected to decrease by up to 30 days per year. The duration of snow cover is also likely to decrease, particularly at lower elevations.

Less winter snowfall and an earlier spring melt may cause marked changes in the annual cycle of river flow in the regions. Places that currently receive snow are likely to see increasing rainfall as snowlines rise to higher elevations due to rising temperatures. So for rivers where the winter precipitation currently falls mainly as snow and is stored until the snowmelt season, there is the possibility of larger winter floods.

Wind - The frequency of extremely windy days in Canterbury by 2090 is likely to increase by between 2 and 10 per cent. Changes in wind direction may lead to an increase in the frequency of westerly winds over the South Island, particularly in winter and spring.

For Canterbury/Mackenzie this means:

Water shortages – Higher temperatures, less rainfall and greater evapotranspiration are likely to cause increasing pressure on water resources, particularly in North Canterbury. Droughts are likely to become more frequent and more extreme.

Fire risk – Strong winds, combined with high temperatures, low humidity and seasonal drought may result in an increased fire risk in some areas (such as Christchurch, Kaikoura, and Darfield). The length of the fire season is expected to increase.

Biosecurity – Climate change could increase the spread of pests and weeds.

Agriculture – Warmer temperatures, a longer growing season and fewer frosts could provide opportunities to grow new crops. Farmers might also benefit from faster growth of pasture and better crop growing conditions. However, these benefits may be limited by negative effects of climate change such as prolonged drought, increased flood risk, and greater frequency and intensity of storms. There is also likely to be increasing pressure on water resources.

The National Climate Change Risk Assessment (MfE August 2020) identifies 43 priority risks across five value domains (natural environment, human, economy, built environment and governance) and highlights 10 risks considered to be the most significant. This MfE report highlights, among others, the following two domains (particularly applicable to Council infrastructure) as extreme risks:

Domain	Risk	Consequence
Economy	Risks to governments from economic costs associated with lost productivity, disaster relief expenditure and unfunded contingent liabilities due to extreme events and ongoing, gradual changes.	Extreme
Built Environment	Risk to potable water supplies (availability and quality) due to changes in rainfall, temperature, drought, extreme weather events and ongoing sea-level rise.	Extreme
	Risks to buildings due to extreme weather events, drought, increased fire weather and ongoing sea-level rise.	

What this means for stormwater systems

Extreme rainfall events can overwhelm stormwater systems and can restrict maintenance access routes (e.g. manhole covers and pump stations) needed to restore service.

The Council will factor these key likely impacts into the planning for our infrastructure assets. It is expected that more information will be provided by Central Government to assist and guide local government in its decision making.

6.0 LEVELS OF SERVICE

6.1 Defining the Levels of Service

Asset management planning requires a clear understanding of customer needs and preferences and the minimum obligations that must be met. A key objective of this activity plan is to match the level of service provided by the asset with the expectations of the customers given legislative, financial, technical and safety constraints. Service standards, set to meet this objective, provide the basis for the life cycle management strategies and work programmes identified in Section 7.

The service standards defined in this section will be used:

- to ensure legal and legislative requirements are met
- to inform customers of the type and level of service offered
- as a focus for the asset management strategies developed to deliver the required level of service
- as a measure of the effectiveness of this Plan
- to identify costs and benefits of the services offered
- to enable customers to assess the suitability, affordability and equity of the services offered

The MDC levels of service for stormwater reflect current industry standards and are based on:

- Customer Research and Expectations: Information gained from the community on their expectations of quality and price of services
- Strategic and Corporate Goals: Provide guidelines for the scope of current and future services offered, the manner of service delivery and define specific levels of service which the MDC wishes to achieve
- Legislative Requirements: Environmental standards, regulations and acts that impact on the way assets are managed (i.e. resource consents, building regulations, health and safety legislation, Local Government Act)
- Demands on the Network: Service demands that are placed on the network.

6.2 Activity Goals and Objectives

The stormwater network must be operated to meet Council policy, objectives and various Environment Canterbury requirements. Council's goals and the community's expectations are stated in the LTP which provides the framework for the operation and development of the stormwater infrastructural assets.

6.2.1 Organisation Mission, Goals and Objectives

During 2020 Council developed a new vision statement, mission statement, supporting value statements and community outcomes. These are shown in the diagram below:

6.2.2 Stormwater Activity Goal and Principal Objectives

As outlined in Council's Long Term Plan (LTP), the stormwater asset contribution to achieving Council's governance goal and the community outcomes identified in Section 2 is through the Stormwater Activity Goal:

To ensure adequate stormwater systems are in place to prevent surface flooding in our communities

The specific Objectives of the Stormwater activity are as follows:

- To develop and activity management plan for stormwater disposal;
- To contract cost effective service delivery;
- To identify and prioritise key areas for network improvements and progressively correct these;
- To ensure all resource consents conditions are met; and
- To be proactive in ensuring adequate funds are provided to maintain and develop the District's stormwater network.

6.3 Current Levels of Service

Levels of Service:

- Define explicitly the standards required from the stormwater system
- Are an expansion of the corporate objective, as previously stated
- Will largely shape Council's detailed planning

In providing stormwater services to the community Council must balance the standard of service desired with the cost of providing the service. The Levels of Service are designed by Council to represent the best level of service possible for a cost that the community can afford and is willing to pay.

The levels of service that Council is aiming to achieve in future are shown in Table 6-1: Community Outcomes & Levels of Service linkage.

- It should be noted that the target Levels of Service are not intended as a formal customer contract. Rather Council's responsibility is initially to aim to achieve these levels and then to achieve them more cost effectively through a process of continual improvement

In 2010 the LGA 2002 was amended, requiring local authorities to use non financial performance measures when reporting to their communities. The aim is to encourage greater public participation in decision-making processes. The performance measures will do this through providing better information about the levels of service. The non financial performance measures came into force on 30 July 2014. Local authorities are now required to incorporate the performance measures in the development of their new 2015-2025 long-term plans. The performance measures was reported against for the first time in the 2015/2016 annual reports.

The Table 6-1: Community Outcomes & Levels of Service linkage provides the linkages between the Community outcomes, Levels of Service and Performance Measurement.

6.3.1 Changes to Levels of Service

In accordance with 261B of the Local Government Act 2002, Non Financial Performance Measures were adopted on 12 November 2013. These Performance Measures require Local Authorities to report on the performance of the key activities of water supply, wastewater, stormwater, flood protection and roads annually from 2015/16.

Council have developed their own Levels of Service and associated Performance Measures in the past, but in light of the Non-Financial Performance Measures Rules 2013 Council will only use the Levels of Service statements aligned with these new performance measures.

Council will only report on the mandatory measures as this covers the key expectations in terms of the delivery of the service.

6.3.2 Levels of Service

Table 6-1: Community Outcomes & Levels of Service linkage

Community outcome	How it contributes	Level of Service	Performance Measure
Resilient, successful communities	Manage flooding events in urban areas	System adequacy – the stormwater system is adequately sized and maintained	Number of flooding events
	Timely response to service requests and system failures	Response times – flooding from events from the stormwater system are promptly attended to	Response & resolution
A treasured environment	Providing a stormwater service that acknowledge and incorporates the natural environment in design, construction, operation and maintenance	Discharge compliance – they sw system is managed in accordance with consent conditions	Compliance with resource consent conditions Response & resolution
Strong and innovative economy	Council priority is maintaining quality and continuity of stormwater services	Customer satisfaction – the sw system is managed to an appropriate quality of service	Response & resolution Number of complaints

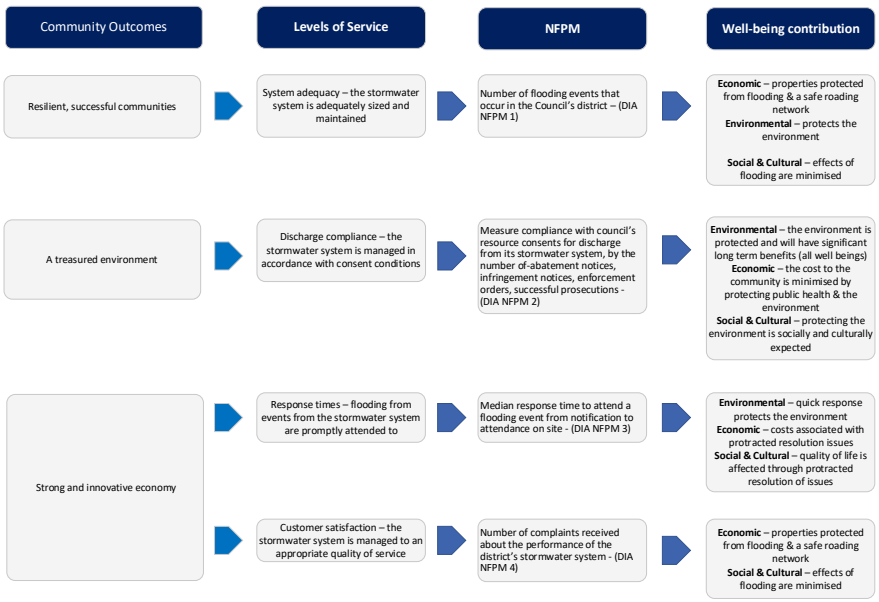
It should be noted that in the context of the requirements under the NFPM:

"**Flooding event**" means an overflow of stormwater from a territorial authority's stormwater system that entered a habitable floor.
"**Habitable floor**" means a floor of a building (including a basement) but does not include ancillary structures such as stand-alone garden sheds or garages.
"**Stormwater system**" means the pipes and infrastructure (excluding roads) that collect and manage rainfall runoff from the point of connection to the point of discharge.
However

- The definition of stormwater system which excludes streets, means that most (if not all) flooding in this district is not required to be reported as it is caused by runoff from the roads themselves and not the stormwater pipes.
- This Council, along with many others, does not know how many properties are connected to the stormwater system as they are not separately rated.
- The inclusion of basements (and attached garages) as a habitable floor is at variance with the NZ Building Code which does not regard these as habitable areas so Council is unable to prevent their being constructed above a floodable level.

Section 10 of the Local Government Act restores the four aspects of community well-being by requiring local authorities to promote the social, economic, environmental, and cultural well-being of communities in the present and for the future. The reinstatement of the four well-beings acknowledges that the Council has a broader role in looking after our communities, than simply providing core services.

The figure below demonstrates the stormwater activity contribution to the four well-beings.
This is a preliminary assessment and Council will further develop these contributions to the four well-beings in alignment with national guidance.



6.3.3 Secondary Levels of Service

These are technical measures included in the Infrastructural Services Contract

MDC Event	Service Standard
Flood event protection	
1 in 2 year event 1 in 5 year event 1 in 10 year event	Minimal ponding No flooding of above ground level floors of non-inhabited parts of buildings No flooding of above ground level floors of dwellings or business premises
Response	Provide a 24 hour, 365 day per year call out service Complete administration functions in a timely manner
Response times	Minor faults likely to cause problems in event of flooding – repair within two working days **Blockages Causing Minor Disruption:** • During working hours - The service to be reinstated by temporary or permanent repairs within six hours of call out • Outside working hours - The service to be reinstated by temporary or permanent repairs within 12 hours of call out **Localised Emergency Flooding:** • Take precautions to make site safe and minimise further damage. Response time one hour plus travelling time from depot.
Safety requirements	Worksafe requirements are met for all aspects of maintenance and construction

MDC is committed to maintaining and improving the network where current levels of service may not be being met. Analysis of the network condition over time provides an indication of asset behaviour and performance achievement. The following table outlines the measures that will be used to determine the network condition and performance.

Measure	Explanation	Method of Measurement	Target values	Response times
All drainage facilities function satisfactorily	Drainage facilities, such as: - Sumps - Open Drains - Inlet Structures - Outlet Structures	Visual inspection	Repairs to breakages or blockages affecting the system's operation Repairs to damaged pipes and manholes not critical to the system's operations Notified requests to check screens, and stormwater outlets in event of heavy rain warnings New service connection	1 hour 5 working days 2 hours 10 working days

6.4 Levels of Service Development

The current LOS being provided has been established through Council's LTP process. This would suggest there is approval with the current regime, although this could also be interpreted as an over provision of service in the context of Council's broader service profile.

Options to further examine this issue in the future could include:

a) Monitor and interpret customer feedback through customer feedback and complaints. This information can be analysed for any trends or common factors related to current service levels (e.g. number of complaints received)

b) Engage customers in a formal process. There are a number of mechanisms to achieve this from public meetings to surveys to focus groups. This may include the use of documented feedback processes. In all methods the clear description of different LOS options, fully costed, is a prerequisite to meaningful feedback

c) Engagement with key stakeholders. These include the Regional Council, and others. Again good input information to these engagements will produce valuable feedback.

6.4.1 Levels of Service Definition

The current LOS are documented as a combination of:

- LTP LOS documentation based on real or perceived customer feedback
- Contract processes which describe some elements of the quality of service provided, mainly travelling surfaces and intervention levels

This can be improved by:

a) Augmentation of existing information e.g. clearer relationships between alternative service levels for quality, pressure etc and their associated costs.
b) Utilisation of a LOS model defining quality, quantity, location, and timeframe. This would be based on the IIMM and define the stormwater service in terms of Accessibility, Health and Safety, Quality, Reliability and Responsiveness, Sustainability, Functionality.

These would form the basis for a consultative process as outlined above.

6.5 Performance Measures

Council has suite of performance measures agreed with the community and reported on annually by the Annual Reports. This performance is measured as per contractual requirements and changes in indicators such as increased flooding or maintenance. However Central Government introduced a suite of mandatory performance measures covering Transportation, Three Waters and Flood Control that came into force on 1 July 2014.

These mandatory performance measures have been adopted by Council for inclusion in the 2021-31 Long Term Plan and no other measures will be used.

Table 6-2: Levels of Service, Performance Measures and Targets

What you can expect from us	What we will measure	Latest result (2019/20)	Targets: 2021/22	2022/23	2023/24	By 2030/
Stormwater						
Maintain excellent network services	The number of flooding events in the Mackenzie district*	0	≤ 2	≤ 2	≤ 2	
	For each flooding event, the number of habitable floors affected (per 1,000 properties connected to the Council's stormwater system)*	0	≤ 2	≤ 2	≤ 2	
Stormwater services managed according to required environmental standards	Compliance with the Council's resource consents for discharge from its stormwater system, measured by the number of:*					
	a) abatement notices	Nil	Nil	Nil	Nil	
	b) infringement notices	Nil	Nil	Nil	Nil	
	c) enforcement orders	Nil	Nil	Nil	Nil	
	d) convictions	Nil	Nil	Nil	Nil	
Maintain excellent customer services	The median response time to attend a flooding event*	0	≤ 2h	≤ 2h	≤ 2h	
	The total number of complaints received about the performance of the stormwater system* *expressed per 1,000 connected properties*	1.4	≤ 5	≤ 5	≤ 5	
	The percentage of ratepayers satisfied with the stormwater service	80%	≥ 80%	≥ 80%	≥ 80%	≥

* Mandatory Performance Measure
Response time: from the time that the Council receives notification to the time that service personnel reach the site

6.6 Affordability and Willingness to Pay

Hand in hand with the current LOS vs. Desired LOS is the issue of cost. This needs to be addressed at two levels:

a) Cost for different Levels of Service options within the Stormwater Activity
b) Cost of the Stormwater activity within the total Council programme.

The first level can be addressed using the options outlined above where fully described and costed service level options are consulted with the community.

The second level needs to be addressed as an assessment of the relative contribution the Stormwater Activity makes towards the achievements of Community Outcomes at the current level vs. greater or lesser levels of service.

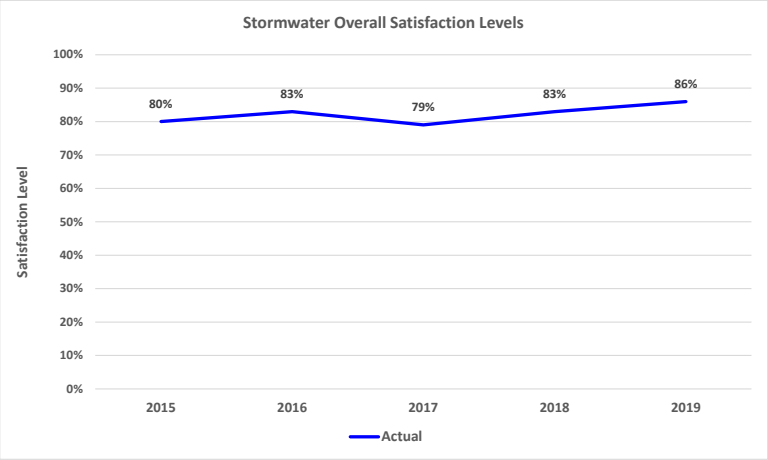
6.7 Reporting

Measurement and reporting of Customer Levels of Service shall be achieved through the customer satisfaction survey. With the use of everyday language in the Customer Levels of Service residents can fairly gauge their opinion on each issue.

The customer satisfaction survey is undertaken annually and this can be used as a benchmark for the next year, and the trend across the results of each year's survey provides a long term view of Council's performance.

The Ratepayers Opinion Survey 2019 provides useful commentary on issues that concern residents.

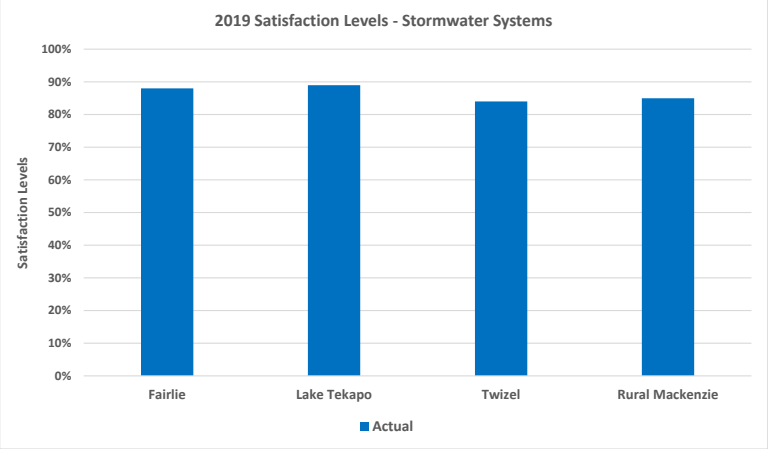
Figure 6-1: Stormwater Service - Satisfaction Rates



The survey identified that 86% of the respondents were satisfied with the overall stormwater activity. This is a 3% increase in satisfaction levels from the 2018 survey. Dissatisfaction responses included 'poor drainage/flooding issues; maintenance issues; Council inaction; lack of urban drainage and lack of rural drainage. It is important to note that the stormwater system is below and above ground. Within the Twizel stormwater system there are a number of siphon (bubble-up) sumps. These siphon type sumps transports stormwater from one area to another, but this results in some localised ponding creating the perception of a blocked stormwater system. In the winter time this can also lead to icy conditions.

As shown below the satisfaction levels are consistent across stormwater systems with an average across systems of 87%.

Figure 6-2: Stormwater Service - Satisfaction Rates



Measurement and reporting of Technical Service Standards is essential for the prudent management of the stormwater activity.

6.8 Consultation & Communication

6.8.1 Consultation

There are a number of instances where Council will undertake consultation at a District wide or comprehensive level. This generally occurs when there is a requirement to use the Special Consultative Procedure as prescribed in the LGA2002. This occurs in the following situations:

- Adopting or amending the Long Term Plan (LTP). The LTP is reviewed every three years with the Annual Plan giving effect to that Plan in the intervening years. The Council must consult on community outcomes at least every six years.
- Adopting the Annual Budget.
- Adopting, amending or reviewing a Bylaw
- Proposing a change in the way a significant activity is undertaken
- Significant decisions not already provided for in the LTP
- Termination of a service

The Council will decide that some decisions are significant and will therefore require a more rigorous assessment of options and a more robust consultative process. Those decisions are treated as amendments to the LTP and can be dealt with either separately or as part of the Annual Plan process.

6.8.2 Communication

In operating and maintaining the stormwater service Council consults and communicates with the community in various ways.

- Significant projects are notified in the printed media by means of a formal media release in the local papers
- For the duration of significant projects a weekly/fortnightly/monthly advertisement maybe placed in the local papers. This may include a short update on progress, an accompanying map showing the work area
- all consumers associated with the service interruption maybe notified through a letter drop

- critical and key customers maybe identified and notified 72 hours prior work affecting their service

This ensure customers stay informed of the project, its progress and how and when they will be affected.

6.8.3 Key Stakeholders

Mackenzie District Council has a history of actively communicating with the public via:

- Extensive public consultation
- Annual Plan Submissions
- Customer surveys
- Project teams for specific significant community projects
- Community Noticeboard (Council website)

This Plan recognises the following stakeholders:

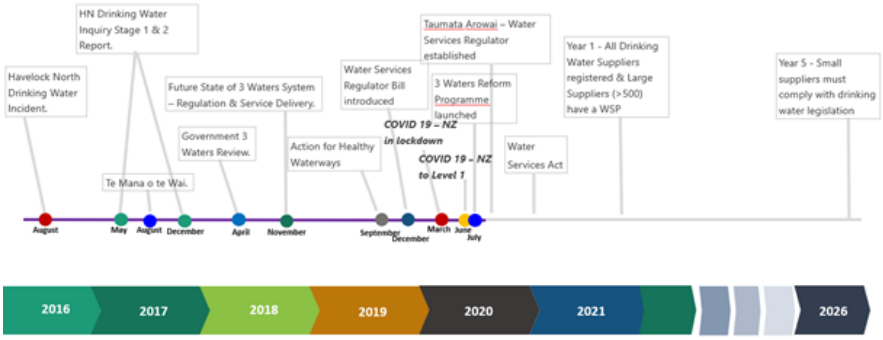
Key stakeholders
The Council as the ultimate owner of assets. Other key stakeholders of the stormwater network include:
Regional Council Owners and operators of inter-connecting or separate stormwater networks
Funding Partners
Funding is provided by several parties and in particular the following are significant contributors:
Ratepayers – Rates provide funding for maintenance and operation of the networks Developers – By constructing infrastructure and vesting it in the Council plus providing the required financial contributions

Customer Groups	Description	Customers
Associated service providers	These are other service providers who rely on the stormwater network	Contractors Commercial operators
Users	Those who directly benefit from the service	Ratepayers Residents and holiday home owners Commercial properties Industrial users
The Wider Community	Non-users that are affected if the service is not provided	Ratepayers and residents Tourists Local businesses

6.9 Legislative Requirements

In providing the 3 Waters Services the Mackenzie District Council keep a weather eye on the Central Government and Industry direction for the national infrastructure assets and public service provision. This is done through attending conferences and seminars, studying reports released by Central Government agencies and membership of industry organisations e.g. IPWEA, Water NZ, etc.

3 Waters - Government & Industry Direction



The August 2016 Havelock North Water incident and subsequent Inquiry has renewed the focus on the very high standard of care and diligence required to supply drinking water.

During 2017 the Minister for Local Government initiated the Government 3Waters Review to assess whether current local government practices and the system oversight are 'fit for purpose'. This review ran in parallel to the latter stages of the Havelock North Inquiry and raised a range of questions around the effectiveness, capability and sustainability of the current water service model.

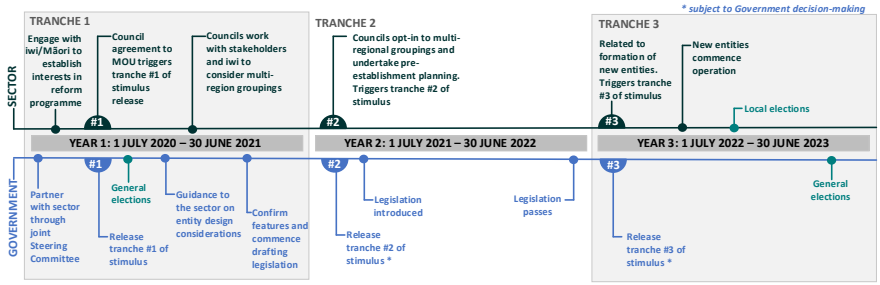
During 2017 the Government announced changes to the National Policy Statement for Freshwater Management – Te Mana o te Wai. Te Mana o te Wai is a concept for fresh water, which when given effect, the water body will sustain the full range of environmental, social, cultural and economic values held by iwi and the community. This requires councils to involve iwi/hapū in the management of freshwater, work with them to identify their values and interests, and reflect those values and interests in decision-making.

The MfE discussion document 'Action for Healthy Waterways' released September 2019 signals the direction for urban development, rural land and water management including Risk Management Plans for wastewater systems and stormwater systems.
Towards the end of 2019, the Government agreed to establish a new drinking water regulator as an independent Crown entity. Associated legislation is expected to be passed in 2020/21 and the establishment and roll out of the new Regulator will follow and is expected to take a number of years.
Following the global outbreak of the Corona Virus the Government announced New Zealand's four-level COVID-19 Alert System specifying public health and social measures to be taken against COVID-19. New Zealand went into Level 4 on Thursday 26 March 2020. Level 4 requirements included the general public to stay at home, educational facilities closed, only essential services & lifeline utilities remain open & operational, severe travel limitations, major reprioritisation of healthcare services, etc. NZ progressively reduced the alert levels from 27 April and returned to Level 1 on 10 June 2020.

The response to COVID 19 will have a significant impact on the economy and the ability to implement and progress the abovementioned Government initiatives. Several Councils already signalled no rates rises for the 2020/21 year.

July 2020 saw the Government announce the 3 Waters Reform Programme consisting of a $761m funding package over the next three years to provide immediate post COVID 19 stimulus to local authorities to maintain and improve three waters infrastructure. Initial funding will only be made available to councils that sign up to the Memorandum of Understanding. Mackenzie District Council signed up to the Memorandum of Understanding.

Below is an indicative timetable for the full reform programme. While this is subject to change as the reform progresses, this provides an overview of the longer-term reform pathway.



The following themes are signalled:

Theme	Source
Among a range of observations the OAG states "*I remain concerned that Council's might not be adequately reinvesting in their critical assets*". To do this well, councils need to improve their asset management information. In particular, they need: • good data about their critical assets in order to value, depreciate, and plan renewals; • good processes and sufficient resources to maintain and update their critical asset data; • effective working relationships between asset management, finance, and strategic planning staff, all of whom have an important role to play in supporting a council's asset management function; and • timely engagement with, and involvement by, elected members.	Insights into local government: 2019 OAG June 2020

Recommendations
To better manage their stormwater systems to protect people and their property from the risks of flooding, we recommend that councils:
1. understand the current and likely future flood risks in their district or city sufficiently to take a proactive approach to reduce the risk and effects of flooding;
2. provide elected members with the necessary information and options, including about local flood risks and their stormwater systems, to make well-informed and deliberate decisions about investment in their stormwater systems;
3. improve the information they make available to their communities so that people can understand:
  • the potential risk of flooding;
  • what the council is doing to manage that risk, including how it is managing the stormwater system and at what cost; and
  • what the remaining risk is to the community;
4. improve their understanding of their stormwater systems, which will entail ensuring the adequacy of their stormwater asset data, including condition data and information on the performance and capacity of the stormwater systems; and
5. identify and use opportunities to work together with relevant organisations to more effectively manage their stormwater systems.
	Managing stormwater systems to reduce the risk of flooding
	OAG Dec 2018

A more strategic and integrated approach to water management is needed • The Government is responding to the need for a more strategic and integrated approach to water management • A strategic and integrated approach would support targeting of investment decisions • A stronger focus on implementation is needed when setting strategy • Long-term thinking is needed when setting a strategic and integrated approach Understanding of water resources needs to improve • A national picture of the state of freshwater quality would support a more strategic and integrated approach • Information gaps can limit the ability to make well-informed decisions • Information needs to be understandable both to decision-makers and to those holding them to account • Good information depends on collecting quality data • There will always be some uncertainty	Reflecting on our work about water management OAG Feb 2020

Theme	Source
Water management challenges require adaptive ways of working • Balancing different views and values requires flexible frameworks • Collaboration needs to translate into action • More can be done to involve Māori in water management • Water management challenges require both central and local government response	
Recommendations • that councils prioritise collecting condition and performance information of critical assets and, in the meantime, take a precautionary approach for significant services where the condition information of critical assets is unknown; • that the Department of Internal Affairs and the local government sector review the required content for long-term plans to ensure that they remain fit for purpose, particularly: – the current suite of mandatory performance measures; – the disclosure requirements for financial and infrastructure strategies; – disclosures required under the Local Government (Financial Reporting and Prudence) Regulations 2014; and – how assumptions are disclosed in long-term plans; • that the Productivity Commission, in its review into the adequacy and efficiency of the existing funding and financing options for councils, consider the trends arising in the 2018-28 long-term plans, particularly the trends and concerns we have raised about increasing debt; and • that central government and local government continue to consider how increased leadership can be provided for climate change matters, particularly: – what data is needed and who collects this; – the quality of this data; and – how councils should consider this in future accountability documents, including the long-term plan.	Matters arising from our audits of the 2018-28 long-term plans OAG Feb 2019
LGNZ are working on four significant projects with the sector at present: Water 2050; Climate Change; Housing 2030 and the Localism Project. **Water 2050** - The Water 2050 project promotes discussion and contribute to policy development by central and local government, particularly in regards to the Government's Three Waters Review, across five key areas: • Allocation • Water Quality • Infrastructure • Cost and funding • Governance **Climate change** - leading and championing policy to deal with the impacts of climate change is a key policy priority for LGNZ. Climate change poses an unprecedented level of risk and adapting to and mitigating the impacts of climate change is a new priority focus for councils. **Housing** is a significant issue for our communities' social and economic futures. Unaffordable housing is having a negative impact on local economies, discretionary household expenditure and social well-being. This means addressing matters of supply, how social and community housing needs are met and the importance of healthy homes. Underpinning the issue is the need for appropriate funding and financing. LGNZ efforts are focussed in three general areas: • Supply; • Social and community housing; and • Healthy homes. **Localism** - Local government is calling for a shift in the way public decisions are made by advocating for greater self-government at the local and an active programme of devolution and decentralisation.	Local Government NZ
This project has two intended outputs. • The first is to research the current quantity and value of infrastructure (roads, 3Waters and buildings) exposed to sea level rise at four increments; 0.5, 1.0, 1.5 and 3.0 metres, and to quantify replacement value. • The second and more important output of this research is to provide responses to rising sea levels. This study intentionally avoids specific and local costs, and targets discussion at a regional and national level in order to highlight trends and general areas of high and low priority. It raises questions about how to improve procurement, appropriately share management of risk, and communicate with stakeholders about priorities.	Vulnerable: the quantum of local government infrastructure exposed to sea level rise Local Government NZ January 2019

Theme	Source
This document explores the workforce skills and capabilities for an effective, efficient, accountable and resilient three waters sector in New Zealand. It describes what people should be able to do and what they need to know to competently undertake their work. It is a work in progress and includes the following roles. • Drinking Water Treatment Operators • Wastewater Treatment Operators • Drinking Water Distribution Operators (to be developed) • Wastewater Network Operator (to be developed)	Water NZ Competency Framework Water NZ

6.9.1 National Strategies & Plans

National policy statements are issued by the government to provide direction to local government about matters of national significance which contribute to meeting the purpose of the Resource Management Act 1991.

Infrastructure Commission, Te Waihanga

The New Zealand Infrastructure Commission – Te Waihanga – was established in 2019 as an Autonomous Crown Entity to carry out two broad functions – strategy and planning and procurement and delivery support on infrastructure investment.

InfraCom - Te Waihanga will work with central and local government, the private sector, iwi and other stakeholders, to develop a 30-year infrastructure strategy to replace the National Infrastructure Plan.

The first plan will be reported to government by the end of 2021 and thereafter at least every 5 years . The strategy will cover the ability of existing infrastructure to meet community expectations; current and future infrastructure needs and priorities; as well as any barriers which could impede the delivery of infrastructure or services arising from it.

National Policy Statement for Freshwater

The National Policy Statement for Freshwater Management (NPSFM) 2020 came into force on 3 September 2020 and documents the objective to ensure that natural and physical resources are managed in a way that prioritises:

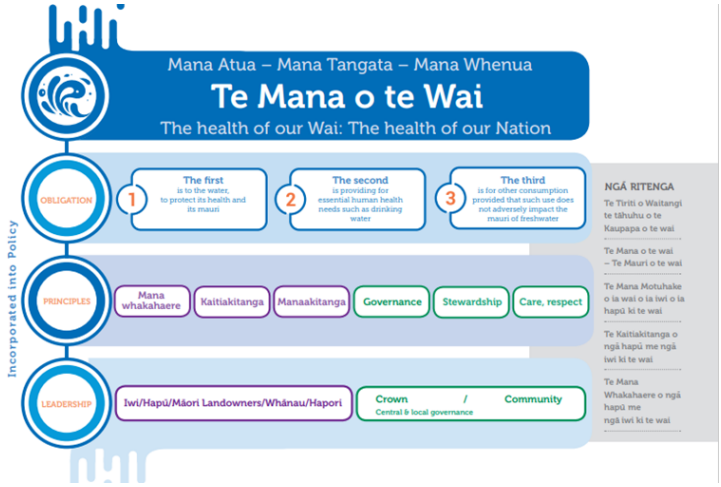
- first, the health and well-being of water bodies and freshwater ecosystems
- second, the health needs of people (such as drinking water)
- third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

The NPSFM includes a requirement to manage freshwater in a way that 'gives effect' to Te Mana o te Wai, including by actively involving tangata whenua in freshwater management, working with tangata whenua and communities to set out a 'long-term vision' in the regional policy statement, and through a new 'hierarchy of obligations' which prioritises the health and wellbeing of water bodies, then the essential needs of people (e.g. drinking water), followed by other uses.

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

'Action for Healthy Waterways' (Ministry for the Environment) signals the direction for urban development, rural land and water management including Risk Management Plans for wastewater systems and stormwater systems, likely regulatory requirements under a new 3 Waters regulatory framework.

This strengthens and upholds Te Mana o te Wai and signals the direction for urban development, rural land and water management including Risk Management Plans for wastewater systems and stormwater systems, likely regulatory requirements under a new 3 Waters regulatory framework.



(Source – *Te Mana o te Wai - Kāhui Wai Māori Report to Hon Minister David Parker - April 2019*)

These initiatives will flow through respective Regional Councils Policy Statements & Regional Plans.

National Policy Statement on Urban Development 2020

The National Policy Statement on Urban Development 2020 (NPSUD) sets out the objectives and policies for providing development capacity under the Resource Management Act 1991.

The NPSUD came into effect on 20 August 2020

The NPSUD directs local authorities to provide sufficient development capacity in their resource management plans for housing and business growth to meet demand.

Development capacity refers to the amount of development allowed by zoning and regulations in plans that is supported by infrastructure. This development can be "outwards" (on greenfield sites) and/or "upwards" (by intensifying existing urban environments).

Sufficient development capacity is necessary for urban land and development markets to function efficiently in order to meet community needs. In well-functioning markets, the supply of land, housing and business space matches demand at efficient (more affordable) prices.

The NPSUD contains objectives and policies that local authorities must give effect to in their resource management decisions. These objectives include the following:

- **Objective 1:** New Zealand has well-functioning urban environments that enable all people and communities to provide for their social, economic, and cultural wellbeing, and for their health and safety, now and into the future.
- **Objective 2:** Planning decisions improve housing affordability by supporting competitive land and development markets.
- **Objective 3:** Regional policy statements and district plans enable more people to live in, and more businesses and community services to be located in, areas of an urban environment in which one or more of the following apply:
    - the area is in or near a centre zone or other area with many employment opportunities
    - the area is well-serviced by existing or planned public transport

  - there is high demand for housing or for business land in the area, relative to other areas within the urban environment.
- **Objective 4:** New Zealand's urban environments, including their amenity values, develop and change over time in response to the diverse and changing needs of people, communities, and future generations.
- **Objective 5:** Planning decisions relating to urban environments, and FDSs, take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).
- **Objective 6:** Local authority decisions on urban development that affect urban environments are:
  - integrated with infrastructure planning and funding decisions; and
  - strategic over the medium term and long term; and
  - responsive, particularly in relation to proposals that would supply significant development capacity.
- **Objective 7:** Local authorities have robust and frequently updated information about their urban environments and use it to inform planning decisions.
- **Objective 8:** New Zealand's urban environments:
  - support reductions in greenhouse gas emissions; and
  - are resilient to the current and future effects of climate change

Productivity Commission

The New Zealand Productivity Commission (NZPC) is an independent Crown entity that provides advice to the Government on improving productivity in New Zealand. The NZPC conduct inquiries and productivity research to expand knowledge about productivity and identify areas for improvement.

In their Local Government Insights report (February 2020) the NZPC identified the following significant and challenging work facing local government.

- Councils will need to do better in advancing Māori interests,
- protecting the natural environment,
- tackling housing affordability
- lifting the performance of essential infrastructure such as three-waters services.
- adapting to climate change is a major new challenge facing councils

It is important for Council to stay abreast of any local government related inquiries conducted by the Productivity Commission as Central Government may use the NZPC's reports and findings as a catalyst to initiate proposed change.

6.9.2 Key Legislation

Council must comply with any relevant legislation enacted by Parliament. Significant legislation and regulations affecting the Water activities are provided in the table below.

Key Legislation
Biosecurity Act 1993
Building Act 2004
Civil Defence Emergency Management Act 2002
Climate Change Response Act 2002
Energy Efficiency and Conservation Act 2000
Environmental Protection Authority Act 2011
Epidemic Preparedness Act 2006
Hazardous Substances and New Organisms Act 1996
Health Act 1956

Key Legislation
Health and Safety at Work Act 2015
Heritage New Zealand Pouhere Taonga Act 2014
Infrastructure (Amendments Relating to Utilities Access) Act 2010
Land Drainage Act 1908
Local Government Act 2002
Local Government Act 1974
Local Government Rating Act 2002
Local Government Rating Act 1979
Local Government (Financial Reporting) Regulations 2011. Renamed to Local Government (Financial Reporting and Prudence) Regulations 2014
Marine and Coastal Area Act 2011
Ngai Tahu Claims Settlement Act 1998
Public Works Act 1981
Resource Management Act 1991
Telecommunications Act 1987
Utilities Access Act 2010
WorkSafe New Zealand Act 2013

The legislation that has or is expected to have the most effect is described below:

Building Act 2004
Provides a regulatory framework for building work, establishes a licensing regime and sets performance standards to ensure buildings have attributes that contribute to the health, safety, physical independence and well-being of people. All Council buildings have to meet the requirements of the Building Act.

Civil Defence Emergency Management Act 2002
Under the CDEM Act 2002 there is an expectation that Council's services will function at the best possible level and extent during and after an emergency, including no change from normal operation. Council has established planning and operational relationships with regional CDEM groups to deliver emergency management within Mackenzie district boundaries.

Health Act 1956
Places an obligation on Council to improve, promote and protect public health within the District. The provision of water services conserves public health and helps to protect land and waterways from contamination.

The Health Act requires Council to provide the Medical Officer of Health with reports on the level, rate and mitigation measures of diseases, and quality of water.

Health and Safety at Work Act 2015
The Health and Safety at Work Act 2015 (HSWA)was enacted on 4 April 2016 and is part of "Working Safer: a blueprint for health and safety at work" and reforms New Zealand's health and safety system following the recommendations of the Independent Taskforce on Workplace Health and Safety. Working Safer is aimed at reducing New Zealand's workplace injury and death toll by 25 per cent by 2020.

The HSWA:

- reinforces proportionality – what a business needs to do depends on its level of risk and what it can control
- shifts from hazard spotting to managing critical risks – actions that reduce workplace harm rather than trivial hazards
- introduces the "reasonably practicable" concept – focusing attention on what's reasonable for a business to do
- changes the focus from the physical workplace to the conduct of work – what the business actually does and so what it can control
- supports more effective worker engagement and participation – promoting flexibility to suit business size and need.

A guiding principle of the HSWA is that workers and other persons should be given the highest level of protection against harm to their health, safety, and welfare from work risks as is reasonably practicable. The HSWA shifts the focus from monitoring and recording health and safety incidents to proactively identifying and managing risks so everyone is safe and healthy.

The HSWA identifies four duty holders:

persons conducting a business or undertaking (PCBUs) – these may be individuals or organisations	have the primary responsibility for the health and safety of their workers and any other workers they influence or direct. They are also responsible for the health and safety of people at risk from the work of their business
officers	(company directors, partners, board members, chief executives) must do due diligence to make sure the business understands and is meeting its health and safety responsibilities
workers	must take reasonable care for their own health and safety and that their actions don't adversely affect the health and safety of others. They must also follow any reasonable health and safety instruction given to them by the business and cooperate with any reasonable business policy or procedure relating to health and safety in the workplace.
other persons at workplaces	who come into the workplace, such as visitors or customers, also have some health and safety duties to ensure that their actions don't adversely affect the health and safety of others

A range Regulations will be developed as part of this HSWA. The HSWA requires identifying the risks associated with hazards and associated mitigation to reduce those risks.

Heritage New Zealand Pouhere Taonga Act 2014
Describes an archaeological site as "Any place in New Zealand that:

- Was associated with human activity that occurred before 1900
- Is the site of the wreck of any vessel where that wreck occurred before 1900
- Is or may be able through investigation by archaeological methods to provide evidence relating to the history of New Zealand"

It is unlawful to modify, damage or destroy any archaeological site – recorded or not – without an authority from the New Zealand Historic Place Trust.

Local Government Act 2002
Defines the purpose of local authorities as enabling local decision-making by and on behalf of the community and allows local authorities the power of general competence. This Act specifically requires Councils to continue to provide water and wastewater services if they do so already.

In addition to the general requirements of the Local Government Act there are some specific clauses that apply to water services.

Section	Details	Applies to
S 10	Restores the four aspects of community well-being by requiring local authorities to promote the social, economic, environmental, and cultural well-being of communities in the present and for the future	Water and Waste Services
S 17A	Requires that Councils review the cost effectiveness of the way they deliver their services to ensure they meet the needs of communities	All services
S 101B	Requires a 30 Year Infrastructure Strategy	Core Services
S125	Places a requirement to assess water and other sanitary services from time to time	Water and Sanitary Services Assessment
S130	Imposes an obligation to maintain water services and places limitations on the transfer or selling of assets	Divestment of services
S136	Empowers Councils to enter into Contracts relating to provision of water services for periods not exceeding 35 years whilst maintaining control over the pricing of the service, retain legal responsibility for the service and being responsible for the development of policy related to the water services	Utilities Contract
S137	Empowers Councils to enter joint local government arrangements and joint arrangements with other entities for the provision of water services, with the same constraints as S136	Utilities and Professional Services provision and procurement
Pt 1 - 2 Pt 3 - 23	Council provides groups of activities for financial, performance and negative effects reporting purposes. The Water and Waste unit will provide Group summaries for water (urban & rural), sewerage and stormwater	Water and Waste Services

Local Government Act 1974
Part XXVI Sewerage and Stormwater, sections 440-469 (note some of these sections have been repealed) provide council with authority to construct, maintain and operate the sewerage and stormwater systems.

Local Government Rating Act 2002
Provides Council with flexible powers to set, assess, and collect rates to fund Council activities while ensuring that rates are set in accordance with decisions that are made in a transparent and consultative manner and providing for processes and information to enable ratepayers to identify and understand their liability for rates.

Resource Management Act 1991
Governs all water takes and discharges. Water takes and discharges to waterways and land occur through the extraction of water from waterways and land. Resource consents obtained for water takes and discharge activities require parameters such as volume and quality to be monitored as well as taking steps to mitigate any adverse effects that may occur through the activity.

There have been numerous amendments to the Resource Management Act (RMA) over the years with reform a key priority. During 2019 the Government appointed the Resource Management Review Panel to undertake a comprehensive review of the RMA. The Review Panel recommended:

- The RMA to be repealed and replaced with two new pieces of legislation
    - The Natural and Built Environments Act to strengthen the current system by not only seeking to protect the environment, but improve it.
    - The Strategic Planning Act to give statutory weight to strategic spatial plans and, critically, force reconciliation and alignment across central and local government to ensure implementation.

Utilities Access Act 2010
The Act establishes a framework for the National Code of Practice to govern how corridor managers and utility operators coordinate their activities within transport corridors.

The purpose of the Code is to:

- Maximise the benefit to the Public while ensuring that all Utility Operators are treated fairly;

- Ensures that disruptions to Roads, Motorways, and railways caused by Work by Utility Operators are kept to a minimum, while maintaining safety; and
- Provides a nationally consistent approach to managing access to Transport Corridors.

The Code is a mandatory requirement for all road and rail controlling authorities and utility network operators under the Utilities Access Act 2010, and came into effect on the 1st January 2012. The Code was reviewed during 2016.

6.9.3 Standards, Codes of Practice & Guidelines

National Environmental Standards
National environmental standards are regulations issued under the Resource Management Act 1991 (RMA). They prescribe technical standards, methods and other requirements for environmental matters. Region and local councils must enforce these standards (or they can enforce stricter standards where the standard provides for this). In this way, national environmental standards ensure consistent minimum standards are maintained throughout all New Zealand's regions and districts.

National Environmental Standards for Sources of Human Drinking Water (2008)
The National Environmental Standard for Sources of Human Drinking Water came into effect on 20 June 2008 and is intended to reduce the risk of contaminating drinking water sources such as rivers and groundwater. It does this by requiring regional councils to consider the effects of activities on drinking water sources in their decision making. Specifically the NES require Councils to:

- Decline discharge or water permits that are likely to result in community drinking water becoming unsafe for human consumption following existing treatment
- Be satisfied that permitted activities in regional plans will not result in community drinking water supplies being unsafe for human consumption following existing treatment
- Place conditions on relevant resource consents requiring notification of drinking water suppliers if significant unintended events occur (e.g. spills) that may adversely affect sources of human drinking water
- work with Regional Council to place conditions on applicable new consents for the protection of its public supply sources

AS/NZ Standards
Where possible, relevant AS/NZS standards are used as the basis for determining standards of design and construction. The Code for Subdivision and Development AS/NZS: 4404 is the principal document defining design requirements. New works within the urban areas are constructed in general accordance with NZS4404 Land Development and Subdivision Infrastructure which sets minimum standards for reticulation construction, including the provision of firefighting water.

Asset Management Standards
NAMS International Infrastructure Management Manual 2006
NAMS International Infrastructure Management Manual 2011
ISO 55000 International Standards for Asset Management 2014
PAS 55-1:2008 Asset Management (British Standards)
NAMS Developing Levels of Service and Performance Measures Guidelines 2007
NAMS Optimised Decision Making Guidelines 2004
NAMS Infrastructure Asset Valuation and Depreciation Guidelines 2006
NZWWA New Zealand Pipe Inspection Manual 2006
NZWWA The New Zealand Infrastructural Asset Grading Guidelines 1999

6.9.4 Regional Strategies & Plans

Under Section 30 of the Resource Management Act of 1991 Regional Councils are required to provide policies and methods to achieve integrated and sustainable management of the regions natural and physical resources. The Canterbury Land and Water Regional Plan provides a framework for the sustainable management of the regions water resources. These resources include groundwater, rivers, lakes and wetlands.

The **Canterbury Land and Water Regional Plan** (LWRP) identifies the resource management objectives for managing land and water resources in Canterbury to achieve the purpose of the Resource Management Act 1991. It identifies the policies and rules needed to achieve the objectives, and provides direction in terms of the processing of resource consent applications.

This LWRP is made up of 16 sections and a map volume:

- the first describes Canterbury's land and water resources, interrelated issues that need to be managed, the key partnerships, relationships and processes already underway, including the Canterbury Water Management Strategy (CWMS).
- The second section describes how the Plan works and contains the definitions used in the Plan.
- The subsequent three sections cover the region-wide objectives, policies, and rules.
- Sections 6 to 15 inclusive contain sub-region catchment specific policies and rules, and
- Section 16 contains the schedules.
- The maps referred to in the rules are in a separate map volume.

6.9.5 Council Strategies, Plans, Bylaws and Policies

Mackenzie District Council Long Term Plan
The Local Government Act 2002 requires local authorities in New Zealand to prepare a Long Term Plan that sets out Council's intentions over a ten-year period. The Act is very clear on how Councils should prepare their plans and what should be included in the final document. Consultation with the community is a very important part of this process. This is to ensure the people who effectively pay for the services delivered in the plan have the opportunity to feedback on what they want to see and how much they are prepared to pay. Land Transport/Water/Wastewater/Stormwater is considered to be a significant/core activity.

The Long Term Plan sets out the direction for Mackenzie District Council over the following ten years. The LTP is reviewed by Council every three years.

The Long Term Plan provides information on all Council activities, how these will be delivered, how much they will cost and how they will be paid for. The first year of the Long Term Plan is also the Annual Plan for the first year of the ten year LTP period and as a result there is no separate Annual Plan process for that year.

Annual Plan
In accordance with the Local Government Act 2002 local authorities in New Zealand must prepare and adopt and Annual Plan for each financial year. The Annual Plan must support the long-term plan in providing integrated decision-making and co-ordination of the resources of the local authority; and contribute to the accountability of the local authority to the community. The Annual Plan process provides an opportunity to adjust the direction of Council and the community for the twelve months following. It also provides an opportunity for Council to highlight the key issues it faces and update the community on achievements and plans for the following year.

Mackenzie District Plan
Section 73 of the Resource Management Act 1991 requires the Mackenzie District Council to have at all times a District Plan for its District.

The District Plan sets out in a systematic way the manner in which the Council intends to deal with its functions under the Act. In doing this, the District Plan specifies objectives, policies and methods, in

relation to resource management issues in the District, to achieve the integrated and sustainable management of the District's resources.

The District Plan must reflect and provide for the principle resource management issues pertaining to the District. The District Plan identifies and discusses the issues that have been identified by the Council and sets out the objectives and policies of the District Plan in regard to those issues. The District Plan also specifies the environmental results anticipated to be achieved by the implementation of the objectives and policies.

To achieve the objectives and policies of the Plan, rules are included which prohibit, regulate or allow activities.

The Council has adopted the principle of zoning. This technique recognises that different areas of the District will have different resources, character and levels of amenity and that the community will seek different environmental results for these areas. The zones provide opportunities for future development in keeping with the character and amenity sought for these different areas. Any particular activity must comply with the rules applicable to the zone in which it is situated, as well as general district rules covering a range of matters such as subdivision, heritage values and transportation.

30 Year Infrastructure Strategy
Changes to the Local Government Act 2002 during 2014 requires that a local authority must prepare and adopt, as part of its long term plan, an Infrastructure Strategy for a period of at least 30 consecutive financial years.

The task of building, operating and maintaining infrastructure assets in an affordable manner is becoming increasingly difficult in view of:

- Demographic changes
- Environmental impacts
- New technologies
- Continually changing legislative environment (Central & Regional Government)
- Infrastructure resilience
- Aging of infrastructure

Council considered these impacts and developed a strategy to guide decision-making for the next 30 years.

Delivery of Services Review
Section 17A of the Local Government Amendment Act 2014 requires that a local authority must review the cost-effectiveness of current arrangements for meeting the needs of communities within its district or region for good-quality local infrastructure, local public services, and performance of regulatory functions.

Section 17A has a number of triggers that apply to the application of the Section:

- Significant change in service levels
- Within two years of the completion of a relevant contract (before renewal of contract)
- At Councils discretion with a maximum time between reviews of six years
- The first review is required within three years (clause 1A of new Schedule 1AA)

Exceptions for review are:

- Circumstances where the services cannot be reasonably altered within the two years
- The local authority is satisfied that the potential benefits of undertaking the review do not justify the costs of undertaking the review

The review:

1. Must consider options for
    a. Governance
    b. Funding
    c. Delivery

2. Options for the responsibility for governance, funding and delivery is exercised by
    a. The local authority
    b. A Council controlled organisation of the local authority
    c. A Council controlled organisation where the local authority is one of several shareholders
    d. Another local authority
    e. Another person or agency

The Section 17A Review was completed and found no driver for change in the current arrangements for service delivery in the 3 Waters.

Asset Management Plans
Asset Management has been described as applied common sense. Therefore, documenting applied common sense results in an Asset Management Plan (AMP). In essence there is limited funding and competing priorities. The Asset Management Plan helps staff/Council decide where and how to spend the limited funds to achieve the desired results.

Changes to the Local Government Act 2002 further emphasised the need for asset management planning and the development of Asset Management Plans.

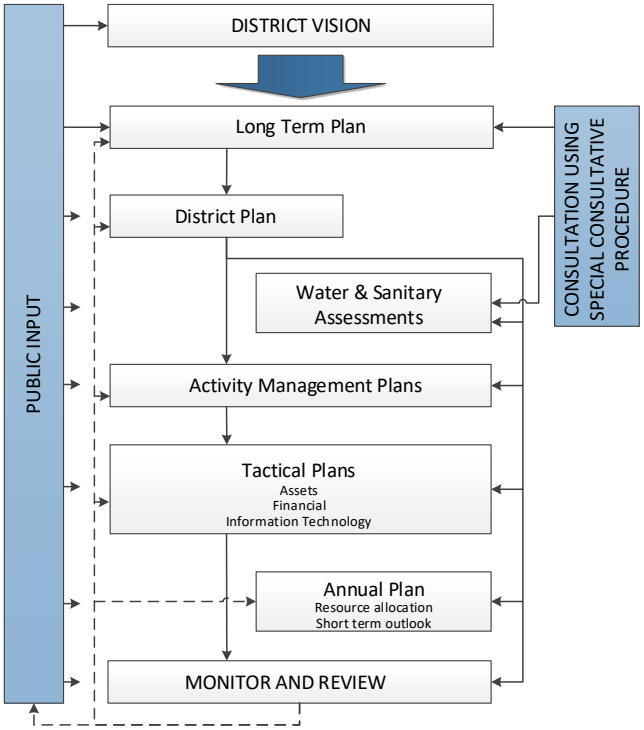
AMPs are a key component of Council's planning process. They are prepared within the context and framework of the LTP, District Plan, Annual Plan and Funding Policy. Figure 6-3: Corporate links to AMPs depicts the links and information flows with the Asset Management Plan, other corporate plans and public consultation.

As part of the Local Government Act 2002 requirements (Schedule 10) the LTP must, for the ten years of the Plan, identify for each group of assets the costs for any additional asset capacity required and the maintenance, renewal, and replacement costs for the assets.

This statement of cost for the 10-year period includes the accounting for asset depreciation in accordance with The New Zealand Equivalents to International Financial Reporting Standards, and the recording of all significant assumptions in preparing the financials.

This AMP will provide the basis for identifying service potential and any losses, and determining the long-term financial strategies for Council's water network assets. This AMP is part of a suite of AMPs and forms part of Council's LTP for the period 2021-2031.

Figure 6-3: Corporate links to AMPs



This AMP is intended to be read in conjunction with the Long Term Plan (LTP) and fulfils requirements of the Local Government Act 2002 (and amendments) – Schedule 10, which states:

1) The purpose of local government is—
   a. to enable democratic local decision-making and action by, and on behalf of, communities; and
   b. to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses.
2) In this Act, good-quality, in relation to local infrastructure, local public services, and performance of regulatory functions, means infrastructure, services, and performance that are—
   a. efficient; and
   b. effective; and
   c. appropriate to present and anticipated future circumstances.

In order to demonstrate that the delivery of services are efficient, effective and appropriate; Mackenzie District Council has developed a suite of Activity Management Plans (AMP) for its Core Infrastructural Services as part of this Long Term Plan process. These AMPs provide comprehensive account of the efficiency, effectiveness and appropriateness of Council's Core Infrastructural Assets, asset management practices and knowledge.

6.9.6 Bylaws

Bylaws are Council rules to regulate its own affairs and an enforcement tool and policies to guide decision making. Council requires a number of Bylaws and Policies to enable staff to perform their functions to the best of their ability across the full range of Councils responsibilities.

There is no bylaw that applies to the Stormwater service.

6.9.7 Policies

Significance and Engagement Policy 2014
During 2014 Council adopted the Mackenzie DC Significance and Engagement Policy:

- To enable Council and its communities to identify the degree of significance attached to proposals relating to issues, assets, and other matters
- To provide clarity about how and when communities can expect to be engaged in decisions made by Council
- To inform Council from the beginning of a decision-making process about the appropriate extent, form and type of engagement that may be required

This Policy identifies the following Strategic assets:

- The entire urban and rural roading network of the Mackenzie District.
- The urban water supplies of Burkes Pass, Fairlie, Lake Tekapo and Twizel.
- The piped rural water supplies of Albury, Allandale, and Downlands (Albury to Cave section).
- The stock water race systems at Ashwick/Opuha, Punaroa/Eversley and School Road.
- The wastewater reticulation and treatment systems at Burkes Pass, Fairlie, Lake Tekapo and Twizel.
- **The stormwater reticulation systems at Fairlie, Lake Tekapo and Twizel.**
- The Council cemeteries at Albury, Burkes Pass, Fairlie, Tekapo and Twizel.
- All Council's parks, recreation reserves, sports fields and facilities held under the Reserves Act 1977 or otherwise.
- Council's swimming pools at Fairlie and Twizel.
- Council's stock of tenanted pensioner housing.
- The Fairlie Medical Centre.
- The Twizel Events Centre and the community hall at Lake Tekapo.
- The Mackenzie Community Centre at Fairlie.
- Council's administration buildings in Fairlie and Twizel.
- Council's shareholding in Alpine Energy Limited.

The Significance and Engagement Policy provides a procedure to determine significance and a community engagement guide.

Earthquake Prone Buildings Policy
In accordance with Section 131 of the Building Act 2004 Council is required to adopt a policy on earthquake prone, dangerous and insanitary buildings. The Mackenzie District Council Policy on Earthquake Probe Byuildings was consulted on and adopted during 2006.

This Policy reflects Council's determination to reduce risk over time in a way that is acceptable in social and economic terms to the community. A flow chart in the Policy details the process for assessing Earthquake prone buildings.

There are no buildings associated with the Stormwater activity.

6.9.8 Procedures

Procedures include legislation, regulation, standards and guidelines. There are numerous standards and guidelines which Council refers to. These include Standard Operating Procedures and Operation and Maintenance/Management Manuals/Plans. The following details the Key Standards and Guidelines that are used in the management and operation of the Mackenzie District Council 3 Waters Systems.

Standards and Guides
Legislation as listed in Section 4.9.2 – Key Legislation

Standards and Guides
Drinking Water Standards for New Zealand
NZS/AS3725: 1989 – Loads on buried pipes
NZS 7643: 1979 – Code of Practice for the installation of unplasticised PVC pipe systems
The New Zealand Building Code
New Zealand Fire Service Fire Fighting Water Supplies Code of Practice – SNZ PAS 4509:2008
NZS 1477 7602, 7643 – PVC Pipes
NZS 4765:2007 m PVC pipes
NZS 4441: 2008 o PVC pipes
NZS 4442 – "Welded Steel Pipes and Fittings for Water, Sewerage and Medium Pressure Gas"
BS 5163 – Cast iron fittings (valves)
NZS 3910: 2003 – "Conditions of Contract for Building and Civil Engineering Construction"
Worksafe - Good Practice Guidelines Excavation Safety
Worksafe - Good Practice Guidelines Working at Height
Worksafe - Good Practice Guidelines Electrical Safety on Small Construction Sites
Worksafe - Good Practice Guidelines Conducting Asbestos Surveys
Worksafe - Good Practice Guidelines ACOP – Management and Removal of Asbestos
International Infrastructure Management manual – 2002
Creating Customer Value from Community Assets Manual – 2002
New Zealand Pipe Inspection Manual – 1999
New Zealand Infrastructural Asset Grading Guidelines" – 1999
New Zealand Infrastructure Asset Valuation and Depreciation Guidelines 2001

7.0 FUTURE DEMAND

This section provides details of growth forecasts, which affect the management and utilisation of all stormwater assets and details demand management strategies.

7.1 Overview

The future demand for services will change over time in response to a wide range of influences, including:

- Local population trends
- Accuracy of predicted future populations
- Local economic trends
- Changing technology
- Changing legislation requirements
- Land use changes
- Resource issues
- Climate change

7.2 Demand Drivers

The future demand for stormwater services in the Mackenzie District will be driven by:

- Growth in the District
  - Trends in population growth or decline give a good indication of future growth and in turn demand on the network
- Economic changes
  - Changes in land use, industry, economic climate and tourism can all affect the demand on the stormwater asset
  - E.g. developments such as motels/hotels and subdivisions where the properties are purchased as holiday homes do not increase the resident population but have a significant effect on the peak tourist population capacity
- Improvement to Levels of Service
  - Advances in available technology
  - A greater understanding of customers' perceptions and expectations
  - A higher level of public expectations
  - Changing legislative requirements
  - Government organisations setting higher standards

Increasing demand for a service may generate a requirement for the development of additional infrastructure. Expenditure programmes need to be planned to fund the capital works and associated on-going operational expenditure. Alternately, it may be possible to manage demand within the existing system capacity.

Where a reduced demand is forecast it may be appropriate to renew assets with a lesser capacity, operation expenses may decrease, or an asset may become surplus to requirements.

7.3 DEMAND FORECASTS

The Mackenzie District Growth Projections- 2020 (Rationale) report provides a projection of the population growth for the Mackenzie District over the next 30 years. The report provides growth projection outputs for usually resident population, employment, dwellings, rating units and visitors.

Typically, MDC used the growth projections prepared by Statistics New Zealand (StatsNZ). However, growth in the district has far exceeded even the most ambitious predictions, as this was driven by growth in the tourism industry, attracting both visitors and residents.

Due to the delayed release of the StatsNZ growth projections based on the 2018 Census and their typically conservative nature, MDC commissioned the latest growth projections to provide a single source of the truth for council and understand the future growth in their district.

Four growth scenarios have been modelled for each parameter representing different levels of ambition in terms of the district's growth over the next thirty years.

The report considered four growth scenarios i.e.

- Scenario 1 – Business as Usual (Pre COVID 19)
  - No impact from COVID 19 and no limit on dwellings that can be constructed
- Scenario 2 – High
  - minimal COVID 19 impact and currently zones land reaching capacity
- **Scenario 3 - Medium**
  - Expected COVID 19 impact, business as usual by 2025
- Scenario 4 - Low
  - Higher than expected COVID 19 impact

Scenario 3 is considered to be the most appropriate for MDC's long term planning as there will be short term effects due to COVID-19. *However, it is not yet known what, if any, long term effects there will be. Due to this uncertainty it is recommend that annual "check-ins" are completed with the most up-to-date data to monitor the impact of COVID-19 and the progress of recovery* {Rationale}.

7.3.1 Growth Trends

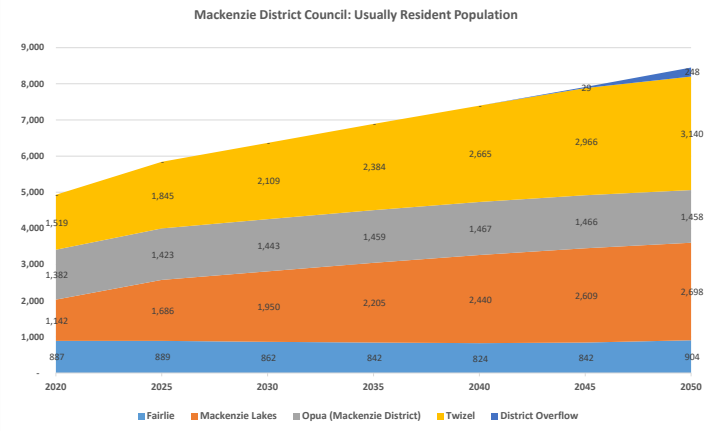
Population Projections

The key characteristics of Mackenzie's population are:

- A relatively recent an influx of younger people to the area for the employment opportunities provided by the tourism industry.
- People later in their working lives or early retirement are moving to the area for the lifestyle.
- Older people (over 70) tend to leave the area, likely in search of better healthcare.

MDC's population is predicted to continue to grow in all areas, at differing rates. Fairlie's population is predicted to decline through to 2045. This is due to the age profile of the district and low migration. However, after 2045 a slight increase in population is predicted this is due to Tekapo reaching capacity and 'spilling-over' into Fairlie.

Figure 7-1: MDC Usually Resident Population

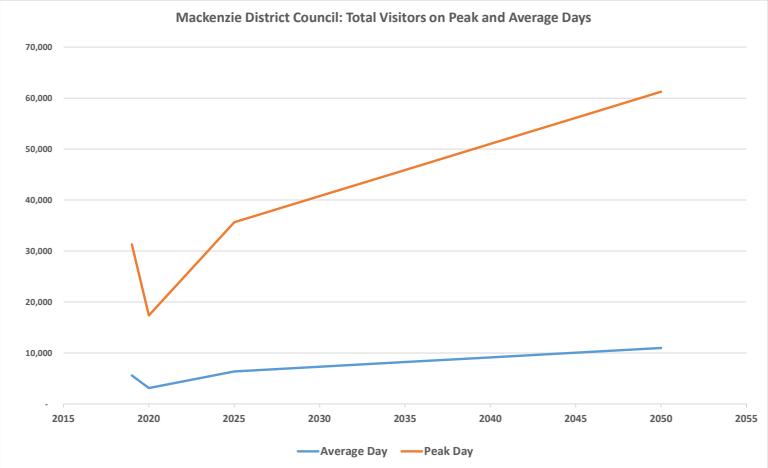


Consequently the following graph predicts a relatively static population growth over the period of this asset management plan. As a result there will not be any significant increase or decrease in demand for Council services based on change in population.

Tourism Projections
Due to COVID-19 and the closure of New Zealand's borders, the number of international tourists visiting Mackenzie has significantly reduced in the projections from 2020 to 2025.

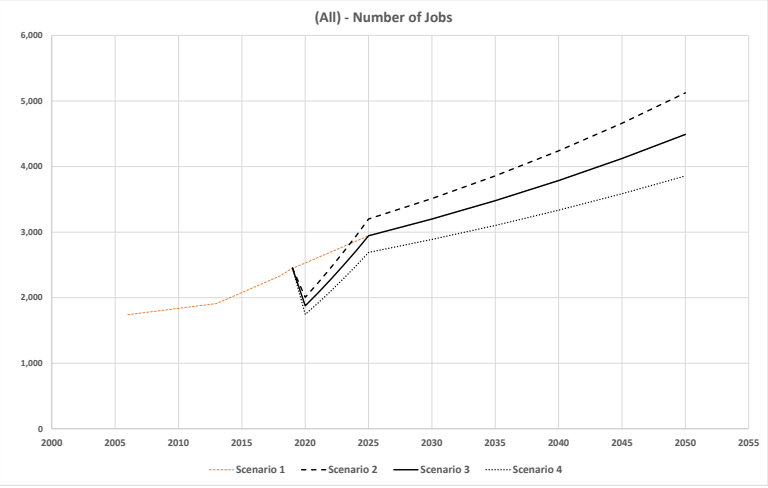
Based on current assumptions around the reopening of New Zealand's borders and the speed at which tourists are likely to return to New Zealand, the industry is expected to recover by around 2025.

Figure 7-2: MDC Total Visitors – Peak & Average Day



Employment Projections
Due to the importance of the local tourism industry and its dependence on international visitors it is expected that the Mackenzie district will experience a larger impact than other areas around the country in terms of COVID-19 related job losses {Rationale}. However, domestic tourism has performed better than expected and may lessen the forecasted impact.

Figure 7-3: Employment Projections



7.3.2 Response to Projected Growth

From the above it is evident that the effects of COVID-19 will have a significant impact on especially tourism and employment. This will slow down other areas such as population growth and dwellings etc. The projected deceleration in demand during the first part of this plan period provides Council an opportunity to reassess existing systems capacity and performance and focus on master planning for service provision.

However, Council is also mindful that COVID-19 also invigorated the domestic tourism market as data indicates that there were almost as many domestic visitors to the Mackenzie area at midday on the Saturday of Queens Birthday as there were on the Saturday of Waitangi weekend pre-COVID-19 lockdown.

The influx of domestic holiday-makers into the district, particularly the Mackenzie Basin, has little impact on the stormwater network. However, increase in visitors means an increase in vehicles, which relates to an increase in potential contaminants such as vehicle emissions, tyres, brake pads, fuels and lubricants. This impacts on stormwater discharge quality. As development occurs, the developers are required to develop their own stormwater system to cope with the expected increase in run-off or prove that the existing system can cope..

Changes in Land Use, Practices and Resource Use
Rural change can take several different dimensions, which might include:

- Land cover (e.g. grass, indigenous vegetation)
- Land use (e.g. development)

The change in land cover will not adversely affect run off in the district as the stormwater catchments in feeding the three towns are already intensively grazed.

Development is likely to have some impact on stormwater runoff with increased hard standing and roofs. Care will be required to ensure overland flow paths for run-off are not obstructed by development.

7.3.3 Improvements to Levels of Service

Changes in Customer Expectations
In recent years there has been an increasing awareness on the part of owners with respect to stormwater issues. It is anticipated that the following issues will become an increasing priority for Council in determining design and operational standards.

- Increased level of protection from rain fall events
- Improved response times

Changing Levels of Service Demands
The intended Levels of Service defined in Section 6 are considered to be representative of the service demands of the current and the future community. With rate of growth in the rating base reducing, the following factors may need to be considered:

- reduction in maintenance of some facilities that have little impact on the overall service delivery

Policy or Management Changes
Changes to stormwater policies may be driven from a number of directions. They could be internally driven (e.g. Development Impact Levy policies) or externally driven (e.g. changes driven by regional or national organisations like Environment Canterbury). Monitoring and being aware of possible implications of these changes enables the impacts of such changes to be anticipated and predicted. While there is no certainty, it is important to consider them when developing asset management risk forecasts and strategies.

Financial Contributions
Financial Contributions are another means of funding network infrastructure, reserves or community infrastructure. Mackenzie District Council has prepared a 'Financial Contribution Policy'. The contribution policy includes a methodology for calculating the cost of the impact a development will have

on existing community infrastructure including Stormwater. This ensures that the negative impact of development is in part funded by the developer rather than the ratepayer.

The policy uses the following formula to calculate the level of contribution:
(Asset Valuation – Debt Loading)/the number of connectable properties to the Scheme

For 2019/20, the financial contribution payable on each lot created at the time of subdivision is calculated at $1,789.52. This amount is GST exclusive.

The financial contribution figures are reviewed annually.

Canterbury Land and Water Plan (LWRP)

Clause 5.93
The discharge of stormwater from a community or network utility operator reticulated stormwater system onto or into land or into or onto land in circumstances where a contaminant may enter water, or into groundwater or a surface water body is a restricted discretionary activity provided the following conditions are met:

- *For a discharge that existed at 11 August 2012, an application for a discharge permit is lodged prior to 30 June 2018, or at a later date as agreed between the reticulated stormwater system operator and the CRC; and*
- *A stormwater management plan has been prepared to address the management of stormwater in the catchment and is lodged with the application; and*
- *The discharge will not cause a limit in Schedule 8 (Region Wide Water Quality Limits) to be exceeded.*

Also Clause 4.17 recommends

Where the discharge is from an existing local authority network, demonstration of a commitment to progressively improve the quality of the discharge to meet condition (c) as soon as practicable but no later than 2025.

Council have progressively applied for resource consents for stormwater discharges. Refer to Section 5.9.1 Schedule of Resource Consents.

7.4 Demand Impacts on Assets

Overall implications for the network of continual demand for improvement in levels of service tied to an effectively static population are:

- An increasing awareness of the effect of surface runoff and possible flooding effects
- An increasing focus environmental controls/requirements
- An increased level of expenditure to attain those desired controls/requirements
- A relatively static ratepayer base to fund Mackenzie District Council's contribution to the separate community based stormwater budget

7.5 Demand Management Plan

There are two recognised components to a demand management strategy:

7.5.1 Asset Based Demand Management

Asset Based demand management encompasses increased pipe size to cater for a higher design rain fall event. There is little opportunity to install retention dams above the network to slow the runoff.

Council requires a on stormwater off the hard stand areas and buildings to discharge to ground were ever possible, thus reducing the stormwater runoff to be conveyed, treated and finally discharged. There are minimal other asset based demand options that do not have a significant cost attached.

Upcoming issues during the next ten years
The Canterbury Land and Water Regional Plan (LWRP) became operative in January 2014 and is a key driver for the stormwater activity, as it impose increased environmental requirements for stormwater discharges.

Discharges to land or water require resource consent. Council has obtained resource consent for Lake Tekapo and Twizel and the global resource consent for stormwater discharge from the Fairlie stormwater system is being processed at the time of writing this Plan.

Fairlie -
The Regent Street stormwater line takes water from an open ditch off School Road and conveys it to the river. The pipeline is the old steel penstock pipe from an obsolete power generation plant. In one location it is poor condition but in the balance of the pipe it is okay. A number of camera access ports have been cut into this pipe to monitor its condition by CCTV. It is planned to internally inspect the Regent Street storm water pipe in to assess its condition. Depending on the results of that inspection it may be necessary to programme replacement sometime in the next 10 years. The Sloane Street timber main is being replaced as part of the 3 waters Stimulus package in 2021/23.

For compliance with Environment Canterbury's Land and Water Regional Plan, it is likely that there will be a need to install improvements on the other non-consented discharges in 2027 - 29. Estimated cost of $15,000 each at Denmark Street and Regent Street. This will necessitate an operational increase in maintenance and compliance monitoring costs.

The Stormwater Management Plan for Fairlie is under development at the time of writing this Plan.

Lake Tekapo Both the Lochinver subdivision and stages 1 to 3 of the west Tekapo subdivision known as The Cairns, have dedicated stormwater disposal systems using a dry pond, detention areas and wetlands that require specific maintenance requirements to operate as designed. Every five years, depending on the results of soil tests, any bare areas will be re-vegetated and contaminated soils replaced at a cost of $10,000 each time. The Lochinver system is expected to require revegetation in 2022/23

Lake Tekapo Enterprises Ltd (CRC094183 and CRC184387) and Bluewater Resort Ltd (CRC094181.1) hold the stormwater discharge consents for their catchment areas respectively. This resource consent will stay private until such time as assets are vested to Council. Although Council has no control over the consent compliance it is important for Council to ensure at such time the stormwater system performed to specification and complied with resource consent conditions. The catchment areas are shown in the figure below.

Figure 7-4: Lake Tekapo Enterprises Ltd and Bluewater Resort Ltd Catchment Areas

The Station Bay subdivision has a stormwater treatment system that is the responsibility of the developer for the first five years.

At the end of the initial term, the developer is required to provide confirmation from Environment Canterbury that the systems have performed in compliance with resource consent conditions. The facility and consent then has the potential to transfer to Council. The Resource Consent conditions for the development in relation to stormwater are as follows:

Prior to section 224(c) certification, a legal agreement between the consent holder and Council shall be executed to ensure the consent holder incurs the costs associated with maintenance of the Stormwater 360 System for a period of five years.

A maintenance schedule of the annual costs of the system shall be supplied to the Mackenzie District Council at the start of each financial year. The maintenance schedule shall also reference compliance with the Environment Canterbury Regional Council discharge consent.

Prior to section 244(c) certification, written confirmation from Stormwater 360 that the Council have a 20 year warranty on the stormwater system shall be provided to the Mackenzie District Council.

Prior to section 224(c) certification being sought, Lots 1 - 48 shall be provided with independent stormwater connections to the boundary of the net area of the allotment.

The consent holder shall ensure that all necessary consents are gained from Environment Canterbury Regional Council for the stormwater system to be installed. A draft of the consents shall be provided to Council prior to lodging with Environment Canterbury for comment.

The likely upgrade to meet the requirements of the Land and Water Plan would be the installation of a Humeceptor on the outfall. Humeceptor is a pollution prevention device that efficiently removes hydrocarbons and sediment from stormwater. This is programmed for 2022/23 at an estimated cost of $30,000.

The Stormwater Management Plan for Lake Tekapo is under development at the time of writing this Plan.

Twizel - to meet the requirements of the Land and Water Regional Plan by 2025, a Stormwater Management Plan is programmed for development. Improvements identified in that plan should be implemented in 2024. Installation of a Humeceptor is programmed for 2023/24.

The stormwater demand management plan involves implementing strategies to reduce effluent flows and promote more efficient network operations. These strategies involve altering or repairing the asset to achieve the target. The effluent flow reduction strategies used by MDC are outlined in the table below:

Strategy	Description
Inflow/Infiltration	Removal of stormwater ingress into the wastewater system through smoke testing, property inspections, CCTV and appropriate resolution
Response time	Prompt response and rectification of reported flooding
Replacement/Rehabilitation Programme	A Renewal Programme to ensure assets are not utilised beyond their useful life when the risk of unidentified failure is greatly increased in consideration of asset criticality
Codes of Practice	Ensure all maintenance is carried out to the relevant standards by enforcement of appropriate Engineering Codes of Practice
Technical Standards	Ensuring new assets are constructed to the correct standards and tested appropriately before being commissioned
Standard Materials	The use of standard (high quality) materials.
Quality Audits	To ensure all standards above are being met
Reduction	Encourage in ground disposal

The demand management plan also involves implementing non-asset strategies to manage the demand for a service. Non-asset solutions for current and future use by MDC are outlined in the table below:

Strategy	Description
Public Education	Encouraging and understanding the issues concerning the stormwater and wastewater system through public education and advertising campaigns
Property Inspections	Encouraging property owners to comply with Council's Bylaws and stormwater discharge requirements

7.5.2 A New Way of Handling Stormwater

The way we manage stormwater has, and continues to change. Traditionally, the stormwater system were built to collect and convey. The mind set was to get it out quickly and this approach is now changing to be more integrated and with a focus of slow it down, spread it out, and soak it in.

This new approach to stormwater management includes quantity and quality considerations, multiple use facilities, riparian corridors, recreation, wetland preservation and groundwater recharge.

This new approach has introduced a whole new array of issues that has resulted in basic changes in stormwater planning, design, operation and maintenance, construction, and financing. Now we have to find the resources to effectively satisfy the changes as well as the regulatory requirements.

As the move into the new stormwater approach occurs, it is also important to remember that the focus also needs to be on minimising costs and maximising the results achieved through the investments made.

Analysis of alternatives should include life cycle cost estimates and consideration for the four well beings (social, economic, cultural and environmental considerations).

7.6 Future Capital Programme

Stormwater assets are only required to perform during times of rainfall. Therefore, although the stormwater asset may technically reach the end of its expected life it may well be performing well. Deterioration levels for gravity stormwater assets are different to the deterioration levels for gravity sewer assets and pressurised water assets. Therefore renewal should be triggered by a failure or rapid decline in service performance.

During 2017 Council reviewed the remaining lives of all stormwater assets and extended these to 150 years as these assets are modern, in excellent condition and dry most of the time.

The following table details proposed capital requirements for the period 2021/22 to 2030/31. It can be seen that the new capital is primarily driven by environmental compliance.

Table 7-1: Stormwater Capital Projects (Inflated)

	2021-2031 LTP period									
Project	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**
Reticulation	$350,000	$414,000	x	x	x	x	x	x	x	x
Stormwater Management Control (Flooding)	$25,000	x	x	x	x	x	x	x	x	
Sloane St SW Box Culvert Replacement	$34,670	x	x	x		x	x	x	x	x
Total	**$409,670**	**$414,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

8.0 RISK MANAGEMENT

This Section identifies the risk management processes used to assess and manage risk. This involves the systematic application of management policies, procedures and practices to the tasks of identifying, analysing, evaluating, treating and monitoring those risks that could prevent a Council from achieving its strategic or operational objectives or plans, or from complying with its legal obligations.

8.1 Overview

A systematic and consistent approach to risk assessment improves Council's ability to manage its assets within resource limitations and to prioritise expenditure and actions that can avoid or mitigate the effects of an identified event. Risks can be grouped into financial, operational, or organisational categories. Their negative consequences can seriously impact public health and safety, incur financial loss or adversely affect public image. The risks identified might be relevant to many activities and be of concern at corporate level, or they might be localised, at an asset specific level.

This section describes the risk management processes used for the stormwater service. Assessment and management of risk within the Assets Group provides defensible tools for the communities and Council to develop prudent work programmes that support sustainable development.

The risk management processes described here are developed in the absence of a common adopted Council risk management framework.

8.2 Risk Events

The risk events that might impact on assets include but are not limited to:

Risk Event	Description	Examples
Natural events	Where there is no control over the timing or the extent of the event	Earthquake Floods Droughts Tsunami (lakes)
External Impacts	Organisations not providing services, such as material supply failures or transport failures	Power supply Telecommunications Fuel Vandalism Contamination
Physical failures	Where the condition or performance of the asset could lead to failure	Structural Capacity Mechanical components Electrical components
Operational	Where the management or operational activities might impact adversely on an asset	Training Maintenance Management Pollution during O&M

8.3 Current Approach

Various asset risk management tools and techniques, based on practical experience and the skilled application of its staff and service providers, have been used over a number of years at Council. This approach has generally been sufficient. As the value of the built asset increase, levels of service expectations rise, and threshold limits for cultural and environmental impacts tighten, the need for more formal risk management practices increases. Mitigation strategies need to be put in place and reviewed continuously to achieve improvement to levels of service. A new Risk Management Schedule will be developed as part of project/improvement item (**IP 4**). This Risk Schedule will include and consider the

various mitigation Plans including but not limited to Emergency Management Plan, Contingency Plan, Pandemic Plan, Operational Risk Plan, Business Continuity Plan, etc.

If the levels of service are achieved, in tandem with legislative compliance, prudent investment and good financial management, then minimisation of exposure to public and general liability and risks derived from operation of assets, should also occur.

Risks are considered to arise from many areas of the stormwater service management. They can be derived from the use of physical assets (e.g. a pump or a pipe failure) and management of the services provided (e.g. failure to formalise procedures and reporting of incidents).

8.3.1 Risks Assessed and Mitigated

There are numerous examples where risks have been identified, considered and appropriate mitigation performed. Examples include:

- Fairlie flood protection – to protect the town from a break out of Fairlie Creek. The costs in comparison with the risks were considered too high and the risk could be reduced by regular maintenance of Fairlie Creek. Environment Canterbury perform regular maintenance and have removed vegetation and build up of debris.
- Environmental risks – Council works with Environment Canterbury through the development of Stormwater Management Plans in consideration of treatment options for discharges within the district, eliminating or reducing the risk of environmental contamination.

This process is ongoing and it is important to note that risk management is not simply about the downside of events such as financial loss or legal proceedings. It also refers to the upside and opportunities that exist for the Council to do things more innovatively, sustainably, and effectively. However, Council engineers acknowledge that this needs to be formalised and documented through the Risk Schedule identified above (**IP 4**).

8.3.2 Integration of risk management approach

Council risk management is also integrated with other processes, often driven by legislative requirements. However, they are all integrated with the risk management approach that has been outlined above and can be used as sources for the definition of risk events.

Criticality - The criticality of an asset reflects the consequence of the asset failing (not the probability). High criticality assets are best defined as assets which have a high consequence of failure (not necessarily a high probability of failure).

Criticality of assets is identified as an improvement item (**IP 1**) and will allow the assets to be clearly identified and then the asset can be managed more proactively in order to mitigate the risk associated with their failure.

The criticality assessment will aid:

- Prioritising condition assessments
- Adjusting economic lives with respect to renewal profiles
- Prioritising/deferring renewals
- Prioritising expenditure
- Operation and maintenance planning
- Priorities for collecting asset information to the required level of confidence

8.3.3 Health and Safety

Council is responsible for providing a safe work environment for its staff and public. Council have aligned MDC Health and Safety practices with the Health and Safety at Work Act 2015. A Health and Safety committee meets regularly, and provides information to all council staff on their obligations in this matter. Council provides training in general and specific safety areas as required.

The Council's Utilities staff, by the nature of their work are exposed to risks outside the office environment that are associated with the utilities services (reticulation and facilities). Council provides training in general and specific safety areas as required, examples for the utilities services are:

- Confined space requirements for supervisors and engineering staff that are associated with reticulation
- Traffic control at work sites via the code of practice
- Facilities Health and safety register and associated sign in/out procedures

Council contractors are required to complete all works in accordance with safety guidelines as set out under regulation, MDC Health and Safety Manual and their own Health and Safety Plan.

8.3.4 Business Continuity Plan

No business, financial & operational continuity plan has been developed for the water activity within the Mackenzie District (**IP 4**).

8.3.5 Civil Defence & Lifelines

The Civil Defence Emergency Management (CDEM) Act 2002 requires Local Authorities to coordinate Plans, Programmes and Activities related to CDEM across the areas of Risk Reduction, Readiness, Response and Recovery. It also encourages cooperation and joint action within regional groups. Management systems for civil defence emergencies are detailed in the Council's CDEM plan.

Council is part of the Canterbury CDEM Group, which involves local authorities, emergency services and major utility operators and others working together to provide Civil Defence for the region..

The Canterbury CDEM Group Plan (June 2014 amended in 2018) is a strategic document for the region that provides direction on how comprehensive, risk-based emergency management will be implemented in the Canterbury region. In implementing this plan, the Canterbury CDEM Group will work towards its vision of "A Resilient Canterbury — Waitaha Tukaha".

The Canterbury CDEM Group Plan is structured around the 4 Rs — the model used for comprehensive risk management in New Zealand. In each chapter of the Plan, the mechanisms for achieving risk reduction, readiness, response and recovery are outlined. These are supported by key principles identified at the beginning of each chapter.

8.3.6 Emergency Management

Operational Risks are those associated with the day to day operation of the District. The most prevalent of these are snow events followed by flooding and serious wind events. Initial response to all these events is managed through the Utilities Services Maintenance Contract, and is covered in our specifications. These specifications covers response times, liaison, notifications, plant and personnel requirements.

Council has held discussions on the "Life Lines" philosophy with the various groups that provide services within the district and is reviewing its "Disaster Resilience Summary". Council has participated in an Engineering Lifelines project, Earthquake Hazard Assessment, and the summary of the assessment is discussed in the following section.

8.3.7 Earthquake Damage Assessment

The Earthquake Hazard Assessment, Report to Environment Canterbury, May 2008, (Ecan Report no. U/08/18) prepared by Geotech Consulting Ltd identifies the following faults in the Mackenzie basin:

- Ostler Fault Zone: This significant fault system crosses through the middle of the Mackenzie Basin
- Irishman Creek Fault: This complex and relatively poorly studied fault consists of series of short fault traces that are very close to Lake Tekapo and the Tekapo Canal.
- Fox Peak, Albury and Opawa Faults: These faults are located further to the east & southeast of Mackenzie Basin and along the hills and mountains adjacent to Fairlie and the Opihi Valley

The report further states that there are many other active faults within the district that represent a significant earthquake hazard but also some very large potential earthquake sources that are not very far away. The Alpine Fault in particular has a very high probability of generating a large earthquake and

is located only 15km from the north-western boundary of Mackenzie District. A large earthquake (Magnitude 8) on the Alpine Fault would result in serious simultaneous impacts over a wide area of the central South Island and is likely to have a major impact on lifelines and other infrastructure in parts of Waimate, Mackenzie and northern Waitaki districts. It is widely accepted by geologists that it is unlikely that the Alpine Fault can continue to accumulate stress at the current rate without an earthquake rupture in the next 100 years. It is therefore important to consider a large Alpine Fault earthquake in the design and management of all lifelines in the central South Island and this event forms the basis of one of the earthquake scenarios outlined in this report.

Ground shaking - The majority of Waimate, Mackenzie and northern Waitaki districts is underlain by harder basement rocks of the foothills and mountains that will not amplify earthquake shaking. Most of the remaining areas are on relatively dense older sediments such as alluvial gravels or glacial moraine. These materials will generally not cause much amplification and will behave as “average” foundation materials during earthquake shaking.

Tsunami - The lakes in the study area could all be subject to tsunami (waves created by the displacement of a large volume of water) and seiche (standing waves created by oscillation of lake water following a tsunami or by the earthquake ground shaking). The most likely cause of tsunami and any seiche large enough to be damaging, is a large landslide into a lake, or submarine landslide, particularly in the delta areas at the head of the lakes. The lakes most likely to be subject to these hazards are Ohau, Pukaki and Tekapo.

Liquefaction - overall there is only limited potential for liquefaction occurring in the study area.

The report includes a ‘damage assessment chart’ (tabled below) based on three shaking zones. The three shaking zones are - areas underlain with strong rock at shallow depth, intermediate ground conditions with a shallow to moderate depth of soil overlying soft rock, and areas underlain with deep soils The ‘damage assessment chart’ is intended to assist lifeline engineers in their appraisal of the vulnerability of various lifelines located in these three zones.

Zone	Shaking Intensity	Structures	Fixing designed for seismic loads	Equipment not fixed or fittings not designed for seismic loads
Structures				
1	MMVI	Slight damage to Type I buildings	Little or no damage	Movement probable, 10% failure
	MM VII	Minor damage except for poorly constructed weak material Type I buildings	Minor damage	Movement expected, 30% failure
	MM VIII	Well designed structures serviceable, but with at least minor damage. Many non seismically designed structures damaged and unserviceable. Some settlement damage possible	Considerable damage, 30-40% failure	80% failure
	MM IX	Damage and distortion to even modern, well designed structures, some may be unserviceable. Non seismically designed structures likely to be seriously damaged and poorly constructed weak material structures collapse. Settlement damage probable	Widespread damage, 50-60% failure	90-100% failure
2	MMVI	Slight damage to Type I buildings	Little or no damage	Movement probable, 10% failure
	MM VII	Minor damage except for poorly constructed weak material Type I buildings	Minor damage	Movement expected, 30% failure
	MM VIII	Well designed structures serviceable, but with at least minor damage. Many non seismically designed structures damaged and unserviceable.	Considerable damage, 25% failure	70% failure
	MM IX	Damage and distortion to even modern, well designed structures, some may be unserviceable. Non seismically designed structures likely to be seriously damaged and poorly constructed weak material structures collapse.	Widespread damage, 40% failure	90% failure
3	MMVI	As for Zone 2, with some small reduction in severity possible		
	MM VII			
	MM VIII			
	MM IX			

Zone	Shaking Intensity	Welded Steel, Polyethylene	Moderately ductile pipes Concrete with rubber joints Steel and cast iron with rubber joints	Non ductile pipe Ceramic with cement joints Brick
In ground pipework				
1	MMVI	Should be okay	Occasional mains damage and entry and junction failure	Minor mains damage 10% entries and junctions fail
	MM VII	Should be okay	Some mains damage, 25% of entries and junctions failure	Mains damage possible 40% entries and junctions fail
	MM VIII	Should be okay, minor damage and permanent distortion	Mains damage probable 60% entries and junctions failure	Mains damage widespread
	MM IX	Distortion to mains, damage possible at entry to structure and at junctions	Mains damage 80% entries and junctions failure	Major mains damage
2	MMVI	Should be okay	Occasional mains damage and entry and junction failure	Minor mains damage 5% entries and junctions fail
	MM VII	Should be okay	Little mains damage, 10% of entries and junctions failure	Mains damage possible 20% entries and junctions fail
	MM VIII	Should be okay, minor damage and permanent distortion	Mains damage likely 40% entries and junctions failure	Mains damage widespread
	MM IX	Distortion to mains, damage possible at entry to structure and at junctions	Mains damage probable 60% entries and junctions failure	Mains damage
3	MMVI	As for Zone 2, with some small reduction in severity possible		
	MM VII			
	MM VIII			
	MM IX			

It is important to remember that the Earthquake Hazard Assessment Report was develop din 2008, prior to the 2011 Canterbury earthquakes and 2016 Kaikoura earthquake. More information would be available now after these earthquakes which **may** influence the overall assessment.

8.3.8 Alpine Fault 8

Project AF8 is a cutting edge risk scenario-based earthquake response planning project, informed by thorough earthquake source, expression, and consequences science. The focus of the project is New Zealand's South Island Alpine Fault. Project AF8 commenced in July 2016, with funding from the Ministry of Civil Defence & Emergency Management's Resilience Fund, and is managed by Emergency Management Southland on behalf of all South Island CDEM Groups.

Project AF8 has been initiated to introduce outline planning for response actions, resources, and overall coordination within and between CDEM Groups across the South Island.

The South Island Alpine Fault Earthquake Response (SAFER) Framework provides a concept of coordination of response and priority setting across all six South Island Civil Defence Emergency Management (CDEM) Groups and their partner organisations in the first seven days of response. It is not intended to replace existing plans within agencies but to provide a coordinated picture of response across the South Island.

The SAFER framework includes:

- Scenarios
- Response assumptions
- Secondary and compounding risks such as:
  - Aftershocks
  - Ongoing structural failure
  - Cascading landscape effects
  - Tsunami
  - Severe weather
  - Communicable human diseases
  - Impacts on response operations
- Consolidated response framework

Council will keep a keen eye on the response actions and resources from the AF8 project and work with CDEM Groups.

8.3.9 Pandemic Response – COVID-19

The 2019–20 coronavirus pandemic is ongoing at the time of writing of this Plan. The timeline of events are as follows:

Date	Event	NZ Government Response	MDC Response
11/02/2020	World Health Organisation declares an official pandemic		
28/02/2020	NZ first reported case		
18/03/2020			
21/03/2020		Alert Levels (1-4) announced	
			EOC activated

Date	Event	NZ Government Response	MDC Response
24/03/2020		Move to Alert Level 3	
26/03/2020		Move to Alert Level 4	
1/04/2020			
25/04/2020			
27/04/2020		Move to Alert Level 3	
14/05/2020		Move to Alert Level 2	
15/05/2020			Economic & Community Recovery Action Plan
10/06/2020		Move to Alert Level 1	

The impacts will be wide ranging and likely include a significant and protracted recession. This presents an opportunity for Council to collaborate with Central Government to invest and progress infrastructure projects giving the economy the injection it will desperately need.

As an initial response Central Government decided to fast track eligible development and infrastructure through amendments to the Resource Management Act. This will aid in getting much-needed infrastructure programmes underway as soon as possible.

Further response includes the establishment of the Infrastructure Industry Reference Group (IIRG) to seek out infrastructure projects that are ready to start as soon as the construction industry returns to normal to reduce the economic impact of the COVID-19 pandemic. These 'shovel ready' projects include water, transport, clean energy and buildings. They would also have a public or regional benefit, create jobs and be able to get underway in short order.

Council did not apply for Government funding for shovel-ready projects, instead opting to bring forward shovel-ready projects as part of MDC COVID-19 recovery including $9.5m of water supply projects. Projects include the new Fairlie Water Treatment Plant and associated reservoir, replacing water pipes in Twizel and Fairlie and upgrading the Burkes Pass water supply treatment plant. In roading, prioritising key shovel ready minor and safety improvement projects, maximising available NZTA co-funding and low interest rates for Council's 49% share. The majority of these projects will be footpaths and shared-use paths to promote a fit and healthy community.

The COVID 19 pandemic created a very dynamic environment where circumstances can change on a daily basis. At the time of writing this Plan the assumption is that the Mackenzie district will be able to weather the storm as the districts' primary industries, agriculture and forestry, are less affected than for example tourism. Domestic tourism numbers appear to hold steady, but international tourism which made a significant contribution to the Mackenzie district economy is severely affected. The Department of Internal Affairs 'Local Government Sector COVID-19 Financial Implications Report 2 – Alert Level Scenarios, Assumptions and Updated Analysis' report projects "The agriculture sector is expected to perform relatively well in the short- and long-term".

Council will first attempt to reduce spending in ways that do not require reductions to service levels. Higher levels of reduction in spending would be more likely to require deferral of larger capital projects which may impact on Council's ability to comply with legislation and environmental standards in the 3Waters area.

Council could defer the replacement of assets for a period and potentially reduce the priority of capital expenditure so they can sustain service levels. The deferral of asset replacement may increase infrastructure resilience risks and increase long term costs.

The response to COVID 19 provided a snapshot of how quickly our environment can change and how quickly we can adapt. People working from home. The uptake of technology. Change in

transportation patterns. Online sales and deliveries. Outdoor activities. Socio economic impacts and response. Furthermore, the incidence of a pandemic has the potential flow-on effect of the Council failing some of its non-financial reporting measures.

8.4 Resilience

MDC customers have a high expectation of continuing functionality and service delivery. Recent high profile natural disasters have raised public awareness, but there is still a significant need to increase actual preparedness – both in general (e.g. household plans and emergency supplies) and for specific circumstances (e.g. tsunami preparedness in lake communities).

Resilience is based on a design philosophy which acknowledge that failure will occur. Resilience requires early detection and recovery, but not necessarily through re-establishing the failed system.

Resilience is not only applicable to natural hazards, but also needs consideration at an operational level where an asset failure is not necessarily a service failure.

Redundancy (duplication) does not provide Resilience.

Robust systems are designed to prevent failure. Resilience is about early detection and fast recovery. Resilience is defined as the intrinsic ability of a system to adjust its functioning prior to, during, or following changes and disturbances, so that it can sustain required operations under both expected and unexpected conditions.

Resilience is about the ability to plan and prepare for adverse events, the ability to absorb the impact and recover quickly, and the ability as a community to adapt to a new environment.

Council acknowledge that resilience is not only about physical assets. It is about the people. It includes but are not limited to:

- connecting people and communities (neighbour to neighbour; educate; access to household resilience items, etc.);
- supporting community organisations
- the built environment and asset systems which are robust

Adverse events/natural disasters/climate change and the related impacts cannot be avoided and as a result Council have to factor this into long term planning, civil defence planning and determining the infrastructure requirements moving forward to ensure the community's expectations are met with regard to safe and reliable services and general wellbeing.

In order to improve resilience Council approach will be to:

- Actively participate in CDEM planning and activities, at both regional and local levels
- Investigate options for alternative service provision and system redundancy
- Identify critical assets and ensure mitigation methods are developed
- Obtain insurance where this is deemed to be the most cost effective approach

8.5 Insurance

All above ground infrastructural assets are currently insured by Council. The below ground assets are not insured. Council keep a $3M cash reserve balance to part fund any repairs and relies on Central Government assistance for repairs as a result of any natural event.

Council is not a member of LAPP, but have considered becoming a financial member but due to the Christchurch earthquake there is a significant buy in cost. Council is also concerned that another event like the Christchurch earthquake in another main centre would fully deplete the fund to the point there would not be enough funds available to repair our assets if they were damaged at the same time.

8.6 Assumptions and Uncertainties

The LGA 2002 - Schedule 10, Part 1 (11) requires the Council to clearly define all the significant forecasting assumptions and risks that underlie the financial estimates, assumptions concerning the useful life of significant assets and an estimate of the potential effects of the uncertainty on the financial estimates provided.

Forecasting assumptions and uncertainties are essential in the operation of Council's assets to indicate the levels of risks associated with those assumptions. Where necessary, additional strategies can be implemented to reduce the risk.

Table 8-1: Significant Forecasting Assumptions

GROWTH ASSUMPTIONS

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
Population Growth It is assumed that growth in the district's population will generally be consistent with the medium projections developed for Mackenzie District Council in 2020. These indicate a growth rate of around three percent year on year, with population projections of 6,561 in 2030 and 9,050 in 2050.		✓		Population change occurs within the district at a higher or lower rate than predicted.	A significant, consistent decline in population may adversely affect Council's ability to set rates at a level affordable to the community. A significant, consistent increase in population could adversely affect Council's ability to meet some service levels.	Council will continue to monitor population measures within the district and respond to meet needs where possible.
Demographic Changes Most population growth within the District is expected to be at older ages (55+ years), with the proportion of over 65s living in the district projected to be slightly higher than the NZ average. Twizel and Fairlie have a higher proportion of older people (65+) than other areas in the district and this is not expected to change over the life of the plan.		✓		Demographic changes occur at a higher or lower rate than expected.	Changes to the projected demographics may place pressure on some Council services due to increasing demand, which may lead to a lower level of service in these areas or a requirement for additional investment.	Council will continue to monitor demographic changes within the district and respond to meet needs where possible.

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
Younger workers (20-30 years) will make up a considerable portion of the population employed in the tourism market.						
Household Changes It is anticipated that changes to household numbers and composition will generally reflect population projections and forecast changes to demographics (that is, an ageing population). This is not expected to create any significant impact on demand for infrastructure and services, given the relatively small increase in total population projected to occur.		✓		Household changes across the district occur at a higher or lower rate than expected.	A slower rate of household growth may mean that some service activities have overinvested in infrastructure (too much capacity too soon).	Council will continue to monitor household changes within the district. Where rapid growth occurs, this is likely to be within existing subdivisions where servicing provision has already been made or, where growth requires additional infrastructure, developers can be required to meet this demand through the payment of financial contributions.
Dwelling Numbers It is assumed that growth in dwelling numbers will primarily be driven by demand for short-stay visitor and holiday accommodation due to year-on-year increases in both domestic and international visitor numbers to the district. Growth in demand for private holiday accommodation is predicted to have an impact on the availability of residential housing. However, the large proportion of unoccupied dwellings in the district, particularly in Tekapo (60%) and Twizel (52%), is not anticipated to change or increase significantly.		✓		Dwelling changes across the district occur at a higher or lower rate than expected.	A higher or lower rate of dwelling growth may impact on provision of services, such as the issue of resource and building consents.	Council will continue to monitor dwelling growth in the district and adjust provision of supporting services as required.

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
Distribution of development across the district The pattern of growth will be consistent with the spatial planning used to inform the District Plan Review The pattern of growth will be guided by the next generation district plan which will be operative in 2022. Understanding of the growth pattern will be sufficient for infrastructure planning		✓		Development will be more focused in one area than another Growth will occur at a rate that differs from infrastructure planning and provision	Provision of infrastructure will not align with development	Guide development through the district plan, and track development levels
Tourism Numbers It is assumed that visitor numbers will return to pre-COVID-19 numbers around 2022/23, and from that point visitors to Mackenzie District will be at least equivalent to the growth level experienced pre-COVID-19. It is also assumed growth in domestic visitors to Mackenzie District will be significantly higher than pre-COVID-19 while international travel is limited.		✓		Change to tourism numbers and composition occurs at a rate significantly above or below the growth levels assumed.	Increases in projected visitor numbers may place pressure on supporting services and infrastructure. Conversely, a drop in tourism to the district may mean that service activities have overinvested.	Council will continue to monitor tourism numbers to the country and district and respond to meet needs where possible.
COVID-19 Borders will remain closed to tourists/casual travellers for a further twelve months, at which point limited tourism will resume. From 2021 to 2030 tourism activity will progressively return to 2020 levels		✓		Borders will remain closed for a significant period,	Economic activity and international migration will be limited, affecting population and business growth.	Council will continue to track trends and provide for the wellbeing of the community. Investment will be advanced to support employment and prepare infrastructure for the future.

ECONOMIC AND FINANCIAL ASSUMPTIONS

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
Economic activity, income levels and affordability It is assumed that there will sufficient economic activity and incomes within the district to support Council activities		✓		Service provision becomes unaffordable	If there is insufficient economic activity and incomes of district residents are businesses are strained, it would be difficult for Council to fund the range of activities it is responsible for	Economic activity is tracked and the funding impact strategy is reviewed in line with the economic circumstances
Inflation To develop a consistent approach for local government to account for inflation, the Society of Local Government Managers (SOLGM) contracted Business and Economic Research Limited (BERL) to construct forecasts for inflation. It is assumed that long term inflation will be consistent with BERL's Local Government Cost Index (LGCI) forecasts.		✓		Inflationary costs in some areas may increase at a rate different to that forecast. Local Government Cost Adjustor Forecasts Three scenarios	If inflation rates are higher than forecast in the financial model this will mean that either additional money will be required, or planned work is reduced to fit the fiscal envelope. If the work is not reduced this could mean using additional reserves, increasing debt or increasing rates.	In preparing the LTP, Council is required to use best estimates in determining the level of costs to be budgeted and to account for the effect of price changes or inflation expected over the ten year period. Council has endorsed the 'mid-scenario' rates produced by BERL (September 2020) as the assumption for accounting for inflation for the preparation of the LTP. Some types of costs (eg roading and transport costs) have been subject to fluctuations in recent years, so it is inherently difficult to predict trends with accuracy.

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
						However, these costs will be mitigated through the annual plan process where the annual adjustment can be made.
Interest Rates and Borrowing Borrowing costs are assumed to be as included in Financial Forecasts. Council assumptions on interest rates are based on the Official Cash Rate (OCR) plus an appropriate margin. For the life of the LTP the borrowing rate is assumed to range from 1.7% to 2.4%. That rate will be used for calculating interest rates and will be adjusted annually.		✓		Forecast interest rates are higher or lower than forecast.	The movement in interest rates has a wide ranging effect on the Council. The Council's cash investments have derived interest at the market rates and the Council's internal financing policy bases the interest paid to or charged to individual communities on the Official Cash Rate. The level of works and services rates levied is dependent in part on the interest rate used in Council's internal funding policy.	Any exposure to borrowing interest movement will be managed by a preference for a higher percentage of fixed term rates.
Waka Kotahi (NZTA) Financial Assistance The Long Term Plan assumes that the subsidy from New Zealand Transport Agency will be 51% across all activities for the life of the Long Term Plan, and that these subsidy rates will remain at		✓		Council's risk is the roading programme may reduce due to a number of factors. These include 1. a further change in subsidy rates and/or size of the programme in years	The roading programme could be reduced from what is shown, due to limitations on the amount of work NZTA is prepared to financially support. Expenditure may differ in any year from that forecast.	The Council will consider the impact of any change as part of the annual budget process and consider the funding implications of any cost changes.

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
this level until the Funding Assistance Rate is reviewed.				4-10. This plan assumes Council will maintain or expand its spend through additional unsubsidised work. 2. the NZTA subsidiseable programme may differ from what has been assumed, which may impact the Council's spend in future years..	If Council wanted to continue its roading programme, other funding sources such as rates would need to be utilised.	
Dividends received – Alpine Energy Ltd It has been forecast that the dividend based on Council's shareholding will be $123,000 per year. This value could change from year to year based on Alpine Energy decisions.		✓		The dividend could be less than that anticipated,	A lower dividend would reduce this funding source, meaning greater reliance on other revenue sources or reduction in expenditure.	While a level of funding is expected, the financial strategy will consider if this revenue stream is lost
Development and Financial Contributions Costs associated with growth will be partially funded through development and/or financial contributions	✓			Council does not recoup costs associated with meeting infrastructure costs associated with growth	The ability to fund infrastructure costs will fall on ratepayers alone.	Council will review its Development Contributions and Financial Contributions policy as part of the Long Term Plan/Infrastructure Strategy process.

Assumption	Level of Uncertainty *(High/Medium/Low)*			Risk	Impact of variation to assumption	Management of risk
	H	M	L			
Waste levy The waste levy will be progressively increased to $60/tonne, at the same time opportunity to receive funding for waste minimisation education and initiatives will increase			✓	That the cost and revenue associated with the change is inappropriate	That increased waste levy costs will discourage responsible disposal of waste, and illegal dumping will increase That funding of programmes will not be available for waste minimisation education and initiatives in Mackenzie district.	Sufficient explanation to the community about the costs and benefits
Sale or Transfer of Assets It is assumed throughout this plan that we will retain ownership of our significant assets and continue with the current Council Departments.			✓	That the objectives whether financial or non-financial of holding strategic assets are not achieved.	Should specified returns not be attainable, we would review our investment. Such a review may have a financial impact.	Any decision to sell or partially sell would be significant. A proposal with with options would be provided to the community for feedback as part of a special consultation process.
Sources of Funds for the Future Replacement of Assets It is assumed that funding for the replacement of existing assets will be obtained from the appropriate sources as detailed in Council's Revenue and Financing Policy.			✓	A particular funding source is not available.	Depreciation funds renewals funded mainly through rates and user charges. Should other sources of capital funding such as subsidies or development / financial contributions differ from levels forecast in a particular activity, Council is able to access borrowings through its central treasury function.	

Assumption	Level of Uncertainty *(High/Medium/Low)*			Risk	Impact of variation to assumption	Management of risk
	H	M	L			
Timing & Level of Capital Expenditure The Long Term Plan assumes that the timing and cost of capital projects and associated operating costs are as determined through the Council's activity management planning process.		✓		There is a risk that capital projects may not occur as planned, or actual costs may vary from the forecast therefore may have an impact on the costs. Transport projects seeking subsidy will need a Business Case approach to NZTA which may change originally anticipated outcomes.	If projects do not occur as planned, capital expenditure may differ from forecast. Delays may change the cost of individual projects and defer planned borrowing. This will impact on rates increases. Delayed renewals could lead to an increase in maintenance costs. Any significant delay will have a negative Impact on the delivery of future capital programme due to a limited number of resources Council has available to deploy in any one year.	The Council will consider the impact of any change as part of the annual budget process and consider the funding implications of any cost changes. High level of vigilance over capital delivery to Executive level, resulting in timely corrective actions if required Regular reporting to Council on the programme so Council has full visibility of programme, milestones, and tracking Programme is prioritized by vulnerability and criticality to ensure projects that would lead to loss of service or additional costs are top of the list Regular market assessments undertaken including critical supply chains to ensure programme is realistic and deliverable Council have the ability to value engineer the project if it exceeds estimates. In addition, the Council has contracted external project managers to oversee the

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
						programme and project management and delivery of key 3 Water projects.
Asset Revaluations Council has a policy of revaluing its buildings, land and infrastructural assets on a three yearly basis. The LTP assumes that the book values of the relevant assets as at the revaluation dates will be increased by inflation rates as per the inflation assumption.		✓		Inflationary costs in some areas may be different from that forecast. The condition of the assets may be different to that assumed and the value of the asset may differ accordingly.	There may be a higher or lower asset value and a lower or higher depreciation charge.	The Council will consider the impact of any change as part of the annual budget process and consider the funding implications of any cost changes.
Planning Horizons and Asset Lifecycles It is assumed that the planning horizon for growth (30-45 years) and asset lifecycles (30 years plus) are sufficient to inform the ten year forecasts included in the LTP.		✓		The planning horizon for growth and asset life services differ from that assumed.	There is insufficient planning to guide decision making and investment	LTP and IS are thoroughly developed relevant to District issues
Useful Lives of Assets The useful lives of assets have been assumed as set out in the following table, which matches the depreciation policy under the Statement of Accounting Policies:	✓			Assets last longer than the lives assumed, or assets deteriorate at a faster rate that the lives assumed.	Assets require replacement earlier or later in their life cycle.	Ongoing assessment of the quality of assets means this information is updated regularly and work programmes adjusted to minimise the chance of asset failure. In the event of assets wearing out earlier than anticipated, capital projects could be brought forward. This may affect borrowing and depreciation expenses. Negative

Assumption	Level of Uncertainty *(High/Medium/Low)*			Risk	Impact of variation to assumption	Management of risk
	H	M	L			
						impacts are likely to be at least partially offset by some assets lasting longer than estimated. Mitigation may also involve reprioritisation of the capital expenditure programme.

Assets	Depreciation method	Life (years)
Buildings	Straight line	13-80
Computer hardware	Straight line	3-10
Computer network cabling	Straight line	10
Furniture and fittings	Straight line	10
Heritage assets	Straight line	60-150
Land	Not depreciated	-
Motor vehicles	Straight line	5
Office equipment	Straight line	5-10
Light plant and machinery	Straight line	10-25
Plant and machinery	Straight line	10-25
Resource recovery parks	Straight line	10-33
Flood protection and control works	Not applicable	-
Landfills	Straight line	30-50
Village projects	Straight line	5-80

Assets	Depreciation method	Life (years)
Alps 2 Ocean cycleway	Straight line	50
Formation	Not depreciated	-
Surfacing	Straight line	0-17
Land under roads	Not depreciated	-
Roads and footpaths	Straight line	6-80
Formation	Not depreciated	-
Sub-base	Not depreciated	-
Base course	Straight line	75-100
Surfacing	Straight line	0-17
Kerb and channelling	Straight line	10-10
Street signs	Straight line	13
Street lighting	Straight line	20-40
Bridges	Straight line	80-100
Resource consents	Straight line	10-33

Assets	Depreciation method	Life (years)
Stormwater		
Lines	Straight line	60-150
Manholes	Straight line	150
Open drains	Not depreciated	-
Wastewater		
Mains	Straight line	60-80
Pumps	Straight line	15
Oxidation ponds	Not depreciated	-
Box culverts	Straight line	100
Manholes	Straight line	80

Assets	Depreciation method	Life (years)
Water supplies		
Piping mains	Straight line	60-80
Pumps	Straight line	25
Service lines	Straight line	80-100
Hydrants	Straight line	80
Valves and air valves	Straight line	80
Meters	Straight line	25
Reservoirs	Straight line	80

GOVERNMENT, LEGISLATION AND REGULATION ASSUMPTIONS

Assumption	Level of Uncertainty *(High/Medium/Low)*			Risk	Impact of variation to assumption	Management of risk
	H	M	L			
Legislative Change and Regulatory Reform As an organisation that is created and derives its powers from statute, changes to legislation have a direct impact on the way we conduct our business. The speed and scale of legislation review depends largely on the policy direction and priorities of the government of the day. Reform of the Resource Management Act 1991 will proceed in 2021-22. A new legislative framework will include the Natural and Built Environments Act, the Climate Change Adaptation Act, and the Strategic Planning Act. The Strategic Planning Act is intended to integrate functions under the RMA, Local Government Act 2002, Land Transport Management Act 2003 and the Climate Change Response Act 2002 so changes are also expected with those Acts. It also assumes the Council will remain an independent unit		✓		The impact of government legislation is more or less than expected. New legislation is enacted that alters the activities Council undertakes or provides.	Unrealised impacts of legislative changes may create greater impacts on Council operations, including operating budgets, workloads, time and resource availability. These pressures may lead to additional costs for ratepayers. Where legislative changes require Council to provide additional services or increased levels of services, this may impact fees and charges for cost-recovery activities.	Most changes to legislation are known in advance, giving councils the ability to prepare for implementation. Council will monitor existing and potential legislative changes as they move through parliamentary process. Where appropriate, Council will submit on legislation to encourage reduced or improved impacts on Council operations and limit costs to ratepayers. Historical trends have been for services transferred from central government to local government. The cost and impact on our activities as a result of future legislative changes cannot be quantified at this stage as it would be dependent on the specific services affected by the legislative change. Financial uncertainty in this area would generally impact the cost of introducing changes,

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
of local government during the next 10 years.						and the mechanisms required to fund any new services.
Legislation Reform – Water Services While it is assumed that that there will be change to the ownership and delivery of Three Waters in the next ten years, Council is not able to predict with absolute certainty what those changes will be. It is unlikely that details will be known earlier than mid-to-late 2021. This LTP has been developed on a business-as- usual basis for the delivery of Three Waters; but the change is very likely to occur over the mid-term (3-5 years). The replacement value of all Three Waters assets total $90.7 million (as of 30 June 2020). Planned capital projects will be valued at $52.6 m at the end of the LTP. The major capital projects are the $4.8m sewerage reticulation upgrade and $18.1m waste water treatment plant upgrade. In addition currently underway we have $7.4m water treatment projects underway (20/21 and 21/22).[1]	✓			Legislation changes under urgency in parliament that must be implemented and transitioned to over a period of time	Changes are required to be implemented more quickly than anticipated and the changes are mandatory rather than voluntary.	Council closely monitors any and all developments, and responds accordingly

[1] All values are inflated values

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
Resource Consents It is assumed that the conditions of resource consents held by Council will not be changed significantly and that the Council will be able to renew and obtain the necessary resource consents for its planned projects.			✓	Resource consents are changed through reviews, or applications for Council projects are not approved or have significant compliance or monitoring costs.	Projects will cost more if compliance requirements are significant, or may not proceed as planned if consents are not obtained.	The Council will consider the impact of any change as part of the annual budget process and consider the funding implications of any cost changes.

ENVIRONMENT ASSUMPTIONS

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
Climate Change Climate change is already impacting how our communities live and function and these impacts are expected to increase in magnitude and extent over time. Impacts include increases to mean temperature, with corresponding reductions in snow and frost days. We anticipate an increase in the frequency and severity of extreme weather events.		✓		There is a risk that climate change effects are not understood and appropriate action taken. There is a risk that Council actions will not be consistent with community opinion.	If climate change happens more quickly or in a different way to that projected; Council may need to carry out work on its infrastructure assets. Council's business units may not recognise climate change in the delivery of their services. Decisions made now without this consideration may have	Climate change assumptions are factored into Council strategies and plans including the District Plan Review and Infrastructure Strategy. Council activities will build appropriate mitigation responses into resilient infrastructure development including the improved water storage in Fairlie, water metering, the establishment of the emergency operations centre

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
					intergenerational effects on land use decisions, environmental policy and infrastructure decisions e.g. relying on undersized assets and resources in highly vulnerable areas.	reserve fund and Council's risk management work through the Canterbury Emergency Management Group. Council will continue to monitor climate change science and the response of central government and adapt its response where required.
Natural Hazards / Local Natural Disasters The district is at risk from natural hazards such as flooding, earthquake, and storms. These events can occur at any time, without warning. It assumed that there will be no major adverse events during the period covered by this Long Term Plan beyond Council, Regional and National capabilities. While events may occur at any time, Council's planning will focus on operational resilience and Emergency Management.		✓		A major adverse event occurs resulting in a significant impact on the district and Council's services.	A disaster has the potential to cause significant, unbudgeted impact on the Council and the community. In the event of a major disaster, Council has assumed additional central government support will be forthcoming. Council would need to borrow additional funds to make repairs and meet the costs of restoration	Council seeks to mitigate this risk through its Civil Defence, Risk Management and Insurance Policies. Council keeps appropriate levels of cash reserves ($3.0m) and sufficient head room in its borrowings to enable it to undertake any repairs on its underground assets. Central government has a role in disaster recovery after a natural disaster. Council will progressively build a reserve to fund the local share of Emergency Works applications to NZTA

Assumption	Level of Uncertainty *(High/Medium/Low)*			Risk	Impact of variation to assumption	Management of risk
	H	M	L			
Civil Defence and Emergency Management CDEM functions will continue to be provided across the district, via the Canterbury Regional Group		✓		CDEM structures and planning are not appropriate for application to Mackenzie	The response to an event would not be suitable	Ongoing involvement in CDEM planning and governance
Insurance Council will hold a reserve fund of at least $3 million to respond to emergencies and that this will be adequate for immediate requirements			✓	A major event will have significant financial implications that are beyond Council's ability to fund	It is assumed this will be adequate to meet the portion Council needs to fund – this is highly variable	A review is proposed on the insurance of assets and the suitability of a reserve fund as 'self-insurance'
Earthquake prone buildings There are no earthquake prone buildings affecting strategic transport routes						
There are no unknown earthquake risks associated with Council owned buildings.			✓	Actions required by Council have not been allowed for	Processes are required, that would put additional workload on staff	Actions assigned to staff
Council's building control responsibilities can be delivered through normal management and operational processes						

LEVELS OF SERVICE AND SERVICE DELIVERY ASSUMPTIONS

Assumption	Level of Uncertainty	Risk	Impact of variation to assumption	Management of risk

	(High/Medium/Low) H	M	L			
Level of Service It is assumed the level of service expectations of the community will remain similar to current level, or change progressively over time.		✓		That there is a rapid change in expectations	Service provision may not be able to be adapted quickly to meet changes	On going customer satisfaction assessment is undertaken and consultation over service levels occurs through the LTP and Annual Plan processes
Service Delivery Modes & Contracts It is assumed that there will be no significant changes to current modes of service delivery for each service area or variations in terms of contract prices (above inflation and inventory adjustments) for current operations and maintenance contracts. Council will continue to consider collaboration opportunities and assess changes to service delivery on a case by case basis.			✓	Maintenance contracts may be re-tendered during the plan period. If maintenance and service contracts are consolidated and/or re-tendered there is a possibility contract prices will be higher than anticipated.	This would require Council to either increase rates and/or operating revenue if efficiencies cannot be found or it may consider reducing levels of service.	

OTHER ASSUMPTIONS

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
New Technologies There will be no new technologies deployed within the period covered by the Long Term Plan that will significantly change the demand for or provision of services.			✓	Technologies may become available which significantly change the demand for or provision of services.	Inefficient of ineffective provision of services in the traditional manner when other alternatives maybe available.	Council will regularly monitor existing and proposed technologies as they relate to service provision.
Collaboration and Shared Services Opportunities for joint initiatives will continue to be explored (e.g. Waste Management Service Delivery, Aoraki Roading Collaboration, Water Services review). District and Community Board Autonomy will remain similar to the current level.		✓		Council is not sufficiently represented in decision making	Council is unable to provide services that are fit for purpose or efficiently	Council will engage in and commit to combined initiatives for the benefit of Mackenzie residents.
Te Rūnanga o Ngāi Tahu and ngā papatipu rūnanga Council has established and enduring relationships with Te Rūnanga o Ngāi Tahu (TRoNT) and the three papatipu rūnanga whose rōhe (area) include the Mackenzie District: Te Rūnanga o Arowhenua, Te Rūnanga o Waihao, and Te Rūnanga o Moeraki.			✓	Engagement and consultation is not effective and appropriate for the relationships	Decision making does not include Maori as required under legislation; or as is appropriate for the wider Mackenzie community	There is ongoing dialog with Te Rūnanga o Ngāi Tahu and ngā papatipu Rūnanga

9.0 LIFECYCLE MANAGEMENT

This section of the AMP outlines what work is planned to keep the assets operating at the current levels of service defined in Section 5 while optimising lifecycle costs. The overall objective of the Life Cycle Management Plan is:

To maintain performance measures to ensure that the current strategies do not consume the asset leading to an unexpected increase in maintenance/renewal expenditure in the future.

9.1 Overview

Lifecycle asset management focuses on management options and strategies from initial planning through to disposal, while considering all relevant economic and physical consequences. The effective application of asset management principles will ensure the reliable delivery of service and reduce the long-term cost of ownership and in this way reduce service costs. A well-structured lifecycle management plan will reduce the long term costs of ownership and in so doing reduce the service cost.

The Lifecycle Management Programme cover five key categories of work necessary to achieve the required outcomes. These key categories and goals are:

Table 9-1: Lifecycle Management Categories

Lifecycle Categories		Aim
Management Plan	Management functions required to support the other Programmes	To maintain the assets to ensure that the assets achieve their service potential
Operations and Maintenance Plan	To ensure efficient operation and serviceability of the assets so that they achieve their service potential over their useful lives. This includes the day-to-day work to keep the assets operating	
Renewal Plan	To provide for the progressive replacement of individual assets that have reached the end of their useful lives (restores the original capacity)	
Development Plan	To improve parts of the system currently performing below target service standards and to allow development to meet future demand requirements	To meet future demand and close any service gaps
Disposal Plan	To better plan for disposal of assets through rationalisation of asset stock or when assets become uneconomic to own and/or operate	To dispose of assets appropriately

9.2 Management

Management and monitoring strategies set out the activities required to support the maintenance, operations, cyclic renewal and asset development programmes. These activities include:

- Strategic planning
- Data management and evaluation
- Business processes
- Monitoring
- Financial management.

The following management activities are used to achieve the desired outcomes.

Table 9-2: Management Activities

Activity	Objective
Strategic Planning	This AMP supports the achievement of the relevant MDC Community Outcomes and Infrastructure Strategy
	To develop Levels of Service aligned with strategies and plans
	To develop the professional skills of the staff through adequate training and experiences
Data Management	To develop and optimise the asset register and develop functionality in line with business needs
	Appropriate data collection programmes (condition, performance, asset registers) closely aligned with business needs implemented in accordance with documented quality processes
	To ensure the asset data are subject to defined quality assurance processes
Business processes	To ensure the AMP is s strategic 'living' document through regular updating and 3 yearly reviews
	Risk Management is an essential part of Asset Management and will be managed by the implementation of risk mitigation measures to maintain risk exposure at acceptable levels including but not limited to maintaining emergency response planning, condition monitoring of critical assets, preventative maintenance, development and implementation of operations manuals and standards
	To document, review and implement quality processes
Monitoring	To ensure agreed service levels and appropriate for demand
Financial	To ensure expenditure programmes are in accordance with funding and budget preparation policies and procedures
	To ensure systems are managed in a financially sustainable manner over the long term

9.3 Operations and Maintenance

This covers planning for on-going day to day operation and maintenance to keep assets serviceable and prevent premature deterioration or failure. This plan includes:

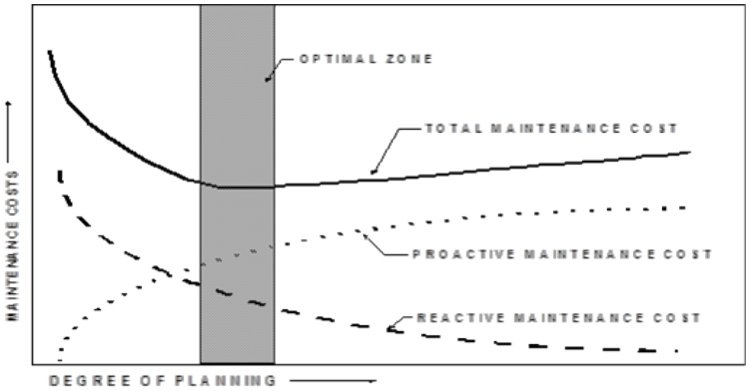
- Current trends and issues
- Maintenance decision making process
- Strategies required to meet levels of service
- How tasks are prioritised
- Summary of future costs
- Any deferred work and associated risks

Two categories of maintenance are carried out:

- Unplanned Maintenance: Reactive work carried out in response to reported problems or defects (e.g. repair broken water mains, respond to low chlorine alarms or pump failure alarms)
- Planned Maintenance: Proactive work carried out to a predetermined schedule (e.g. water main replacement, chlorine plant refurbishment, routine pump inspections and refurbishment etc).

A key element of asset management planning is determining the most cost effective blend of planned and unplanned maintenance as illustrated in Figure 9-1.

Figure 9-1: Balancing Proactive and Reactive Maintenance



9.3.1 Service Delivery

Council staff manages the Stormwater network with some assistance from consultants. The maintenance on the network is maintained through a competitively tendered multi-year contract. The current contracts let are included in Table 9-3.

The Utilities Services contracts (3 year + 1 yr + 1 yr) place considerable onus on the contractors to self-manage all utilities maintenance activities; this involves regular inspection of the various components of the networks, locating maintenance requirements and carrying them out.

Table 9-3: Current Contract

Contract # and Name	Term	Responsibilities	Contractor
1240 - Utilities Services Contract 2020-2025	5 years plus potential 5 year extension dependent on mutual agreement	**Water Supplies** The contract includes the complete operation and maintenance of the following water supplies • Fairlie • Lake Tekapo • Twizel • Burkes Pass • Allandale **Wastewater Systems** The contract includes the complete operation and maintenance of the following waste water systems • Fairlie • Lake Tekapo • Twizel • Burkes Pass • Mt Cook Lookout **Stormwater System** The contract includes the complete operation and maintenance of the following stormwater system • Fairlie • Lake Tekapo • Twizel	Whitestone Contracting Ltd

9.3.2 Management & Maintenance History

Historical data is used to make an assessment of past performance and to see if future trends can be applied. At a network level, these trends can indicate if the condition of the network is deteriorating or improving. The different forms of historical data and their location are outlined in Table 9-4.

Table 9-4: Historical data

Type	Location	Comment
CCTV inspection	Asset Register	Pipelines are internally inspected and rated for condition
Past Maintenance Costs	Contractor's database	Provides summary of maintenance costs and works completed.
Past History	MDC staff and records	Update Assetfinda

9.3.3 Maintenance and Operational Strategies

Stormwater maintenance work is included under the main utilities services maintenance contract and covers:

- minimum maintenance standards
- frequency of routine inspections
- response times to correct defects

Stormwater maintenance is achieved by employing the following asset strategies:

Table 9-5: Asset Strategies

Asset	Activities	Comment
Surface water channels	Chemical weed control	As required
Side drains	Cleaning	As required
Culverts	Inspection	3 Monthly, or as required and prior to a severe weather warning
	Cleaning	After severe weather events
Headwalls	Inspect & maintain	To maximise culvert efficiency, as required
Critical Mains	Inspection	As appropriate
Selected Mains	Condition Assessment by Pipe Sampling	Selected mains targeted by condition/age/material etc. are sampled during repairs
Manholes	Condition inspection	During maintenance or as required
Treatment Areas	Inspect & maintain	3 monthly or after heavy rain events
Unplanned Maintenance		
All	When a defect has been identified, remedial work is programmed before the risk and consequence of failure become unacceptable	
All	Priority is given to defects which are a safety hazard, likely to cause premature failure or severe economic deterioration	
All	Remain alert and prepared for emergency situations	
All	Respond to and repair failures by the most economic method available, making temporary repairs if major repairs or renewals are required	

Maintenance Strategy
Condition inspections: The maintenance contractors are required to report any defects observed during day to day maintenance activity.

Unplanned condition assessment of critical drainage assets are required after each heavy downpour to assess the number of culverts, drains and sumps affected by blockages.

The Contractors are required to maintain an effective communication system and level of preparedness to ensure emergency works are undertaken within the specified response timeframes.

Planned maintenance includes Preventive Maintenance, Servicing and Condition Monitoring. Planned Maintenance is usually carried out at a given frequency either at fixed intervals or 'on condition' to preserve the required levels of service at a minimum cost. On Condition means that once an asset has degraded to a certain condition (detected through condition monitoring) a decision as to the most appropriate maintenance must be made. This does not mean once an asset has failed.

Damaged and malfunctioning stormwater assets identified by public complaint or contractor reports are programmed for repair according to the following priority:

- Loss of Service
- Environmental impact
- Public safety
- Accelerated deterioration

Maintenance Standards
The maintenance standards to be achieved are set out in MDC specifications contained in the utility services maintenance contract.

All critical stormwater assets are required to be inspected and maintained regularly.

Maintenance Programme
The majority of the stormwater maintenance is reactive so budgets have been based on historical expenditure.

The following non asset strategies are employed:

Table 9-6: Non-Asset Strategies

Strategy	Description
Alternative Technologies	Alternative technologies are considered as appropriate
Approved Materials	Only approved materials shall be used in the wastewater system to ensure the quality and longevity of the asset
Health and Safety Audits	Audits undertaken randomly to ensure all work completed by Council and Contractor staff complies with the Health and Safety at Work Act and Traffic Management Regulations
Monitoring Planned vs Unplanned Maintenance	The mix of Planned vs Unplanned Maintenance will be analysed periodically to allow optimising of the activities
Flooding history	Flooding history with severity (property, basement, house) and rainfall indicator will be recorded against the relevant property for future analysis of stormwater network needs (**IP 4**)

9.3.4 Current Condition

Council rates the condition of the stormwater pipelines but does not rate the condition of open drains or treatment sites as these are above ground and readily visible. There is an ongoing inspection and maintenance regime under the routine maintenance contract.

9.3.5 Current Performance

Performance issues for drainage control assets relate to:

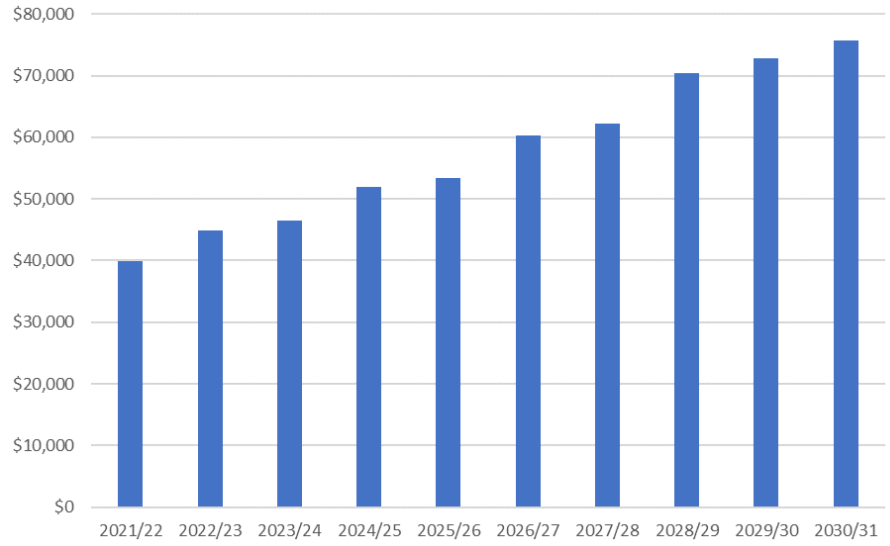
- coverage (i.e. are there open water tables or ponding areas that could be serviced by pipe drains or formed channels?)
- improving drainage where storm events cause flooding problems
- stormwater entrance capacity to culverts
- conformity with standards (kerb and channel in all urban streets)
- ensure soak holes associated with development and vested with Council perform as designed

Overall the performance of drainage assets is adequate. Even though few urban streets don't have any kerb and channel this does not create specific performance issues. The only issue is the sealed swales in Twizel that hold water and freeze during winter. Most existing drainage assets are performing well and have been adequately designed. Some swale drains are still being developed as part of pre-treatment prior to discharge.

9.3.6 Operation and Maintenance Costs

The average annual expenditure over the next 10 year period equates to $57,798 (inflated). The 2021/22 annual operation and maintenance costs is $39,875. The year by year operation and maintenance costs are shown in the figure below.

Figure 9-2: Operation and Maintenance costs (inflated)



9.3.7 Manuals and procedures

There are no facilities within the Stormwater Activity and therefore no need for operation and maintenance manuals. However, consideration should be given to the development of documented emergency, operations and maintenance procedures required for Council's stormwater network assets (**IP 5**).

9.4 Renewal/Replacement

This covers Major work which restores an existing asset to its original capacity or its required condition (e.g. pipeline replacement, pump replacement or reconditioning). This plan includes:

- End of life projections

- Renewal decision making process
- Renewals strategies and methods to meet required LOS
- How renewals are identified, prioritised and to what standard they are replaced
- Summary of future costs

The renewal programme is prioritised on the basis of overall condition.

Preventive Maintenance
Preventative maintenance includes non-routine work required to protect the serviceability of the network and minimise the threat of flooding.
Standards
The MDC standards for replacement infrastructure are based on NZS 4404:2010. The O&M Contract specify Approved Materials.

9.4.1 Renewal Strategy

There is currently no documented renewal strategy for the stormwater assets. The maintenance strategies employed provides a basis for such a strategy, and as the maintenance strategies are refined the renewal strategy will be formalised.

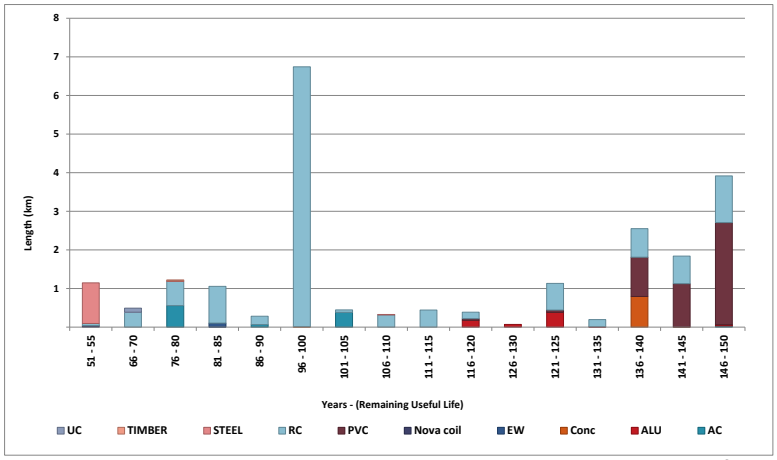
No formal criticality assessment has been documented, but Council engineers use practical experience and skilled application of staff and service providers in consideration of critical assets. This allows for different strategies to be applied depending on priority. For example, a "run to failure strategy" is applied to low priority assets as the consequence of failure is not major and the costs of ongoing condition monitoring may outweigh the costs of failure. A "risk and condition-based strategy" is applied where there is a significant implication due to failure, such as a major health and safety risk, significant reliability of supply consequence or significant expense to repair.

Currently the primary driver for replacement of an asset is the overall condition and remaining economic life of the asset with the condition of the asset informing the final decision for renewal.

9.4.2 Projected Renewals

Using the expected useful lives within the asset register provides the following graphical renewal projection of stormwater mains.

Figure 9-3: District Wide Projected Renewals



The graph above shows that there are no stormwater mains that will reach the end of its lives within the next 50 years.

Stormwater assets are only required to perform during times of rainfall and as a result the stormwater asset may technically reach the end of its expected life but it may well be performing well. Deterioration levels for gravity stormwater assets are different to the deterioration levels for gravity sewer assets and pressurised water assets. Therefore, renewal should be triggered by a failure or rapid decline in service performance.

During 2017 Council reviewed the remaining lives of all stormwater assets and extended these to 150 years as these assets are modern, in good to excellent condition and dry most of the time.

9.4.3 Deferred Renewals

There is no deferred work associated with the stormwater system.

9.4.4 Planned Renewals

The planned renewals for the next 10 years are listed in the table below. This summarises the renewals for each stormwater system. The specific details are discussed within each individual stormwater system in Appendix A – Individual System Description. All schemes include projects such as revaluation, etc.

Table 9-7: Planned Renewals (Inflated)

	2021-2031 LTP period									
	Financial Year									
Stormwater System	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**
Reticulation	$350,000	$414,000	x	x	x	x	x	x	x	x
Stormwater Management Control (Flooding)	$25,000	x	x	x	x	x	x	x		
Sloane St SW Box Culvert Replacement	$34,670	x	x		x	x	x	x	x	x
Total $409,670	**$409,670**	**$414,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

[1] Three Waters Reform Projects

9.5 Asset Development

Most new assets are created as part of subdivisions and subsequently taken over by the Council.

The criterion used for justifying new/replacement construction undertaken by Council includes evidence of regular maintenance issues e.g. blockage or flooding.

Development Standards
MDC uses the Land Subdivision Standard NZS4404: 2010

Development Programme
The cost of pipeline renewal and development works is included in the Council Renewal Programme.

9.6 Asset Disposal

In general Council has no specific plans for disposal of components of the Stormwater asset. Details for specific assets are included in the following table.

Asset	Comment
Pipes	Generally left in the ground or are removed in pieces as part of the excavation to lay the replacement pipe
Manholes	Depending on condition, re-used or taken out.
Pump stations	Generally removed and the hole filled in. Where possible components are reused, otherwise they are disposed to waste

All pipeline renewals have a corresponding disposal either through the pipes being removed and disposed of at the landfill, or being left in the ground if the water services are renewed using 'no-dig' techniques or the asset is replaced in a new location. A work order report records each disposal and the details put in the AssetFinda database. Similarly, replacement of components at treatment plans and pumping stations usually involves disposal of those items being renewed/upgraded.

Buried assets remain in the ground unless economic to remove or they pose a potential hazard.

In all cases asset disposal processes must comply with Council's legal obligations under the Local Government Act 2002, which covers:

- Public notification procedures required prior to sale
- Restrictions on the minimum value recovered
- Use of revenue received from asset disposal

Under the stormwater activity no assets for disposal are considered to be eligible to be for sale. When considering disposal options all relevant costs of disposal will be considered, including:

- Evaluation of options
- Consultation/advertising
- Obtaining resource consents
- Professional service, including engineering, planning and legal survey
- Demolition/making safe
- Site clearing, decontamination, and beautification

10.0 FINANCIAL

This Section documents the financial requirements to manage and operate the asset.

10.1 Funding Details

10.1.1 Financial Strategy

The Council is required to have a financial strategy as part of its Long Term Plan (LTP). The purpose of the Financial Strategy is to facilitate prudent financial management by providing a guide to consider proposals for funding and expenditure against, and to show the overall effects of funding and expenditure proposals on the Council's services, rates, debt and investments.

In the strategy, the Council is required to specify the factors expected to have a significant impact on Council for the period covered by the LTP.

Council outlined the factors considered to be significant. These include:

a) Affordability of key infrastructure, including implementation of the Drinking Water Standards.
b) Levels of internal debt currently held by Council and plans to repay that debt over a 25 year period.
c) Reduction in Central Government roading subsidy contribution.
d) Property Sales.

Affordability of Key Infrastructure
Upgrades to sewerage and stormwater systems are also required in the Long Term Plan (LTP) period. While no significant change to the operation of most of the Council's stormwater assets is proposed, the Council is required to develop 'stormwater management plans' under the Land and Water Regional Plan, and stormwater discharges will be required to be progressively upgraded to improve discharge quality.

Changes to environmental standards, climatic conditions and growth will also require upgrades to some of the district's sewerage systems. Replacement of deteriorating infrastructure is also required over the term of the LTP.

10.1.2 Rating

The district's urban stormwater schemes vary in age and condition and there are some renewal costs over the next decade. This, combined with an increase in costs to meet upcoming environmental planning and discharge quality requirements, leads to an additional financial burden of providing stormwater networks.

In previous years the urban stormwater activity was funded by each town separately through a targeted rate. This meant that each town faced rates rises when upgrades and replacements were required. The Council has now moved to a system of amalgamating the rates for the four urban water supplies across the townships in the district (harmonisation – refer to Section 10.1.3 below).

The general approach to funding of the annual costs of the 3 Waters schemes starts from the premise that those who benefit (either directly or indirectly) should pay. – termed targeted rating.

10.1.3 Harmonisation

During the 2015-25 LTP Council consulted with the community on harmonisation of infrastructure costs across the district. Council has done extensive forward planning and this showed that over the next 30 years each town in the district will need to upgrade and maintain much of its infrastructure. These projects come at significant cost. There were concerns that people who rely on a fixed income, such as a pension, might not be able to afford the spikes in rates that would happen in the future as these big projects were undertaken.

Council has decided to address this issue by spreading the costs of each utility across the towns so all users pay the same for each service. Every town will have the same level of service. This will spread the costs smoothly over time and insulate the towns from sudden costly rate increases when capital work is needed. It also ensures the sustainability of the district in the future.

10.1.4 Price Level Changes & Forecast Financial Statements

Accounting rules require that Council adjust its forecast financial information to take account of the impact of inflation. This should more fairly indicate rates movements, particularly in the first three years of the Plan. Council, through the Society of Local Government Managers has contracted Business and Economic Research Ltd (BERL) to construct forecast price level changes for key categories of expenditure as they affect local government. Council has considered this advice and considers it appropriate to apply it to our circumstances.

Council has endorsed the rates produced by BERL and has used these rates as the assumption for accounting for inflation for the preparation of the LTP.

FY	2023	2024	2025	2026	2027	2028	2029	2030	2031
% change (on prior year)	3.5	2.6	2.7	2.9	2.8	3.2	3.3	3.4	3.1

BERL Mid Scenario Cost Adjustors

10.1.5 Vested Assets

When a developer carries out a subdivision, they are required to vest various assets to Council. These assets include any new roads, water mains, sewer mains, stormwater systems, footpaths, street lighting and landscaped areas. The Council is then responsible for the maintenance and future replacement of those assets.

The Council record the cost of those vested assets at the current cost when received and the assets will be revalued in line with the Council's other infrastructural assets. These assets will also be subject to depreciation.

10.1.6 Funding Strategy

The first priority is to maintain and operate the existing network in its current condition then allow for renewal expenditure that revitalises a component of the network that has worn out. Capital projects are funded through the Council's Policy for Funding Capital Expenditure, which was adopted as part of the 2012-2022 Long Term Plan.

The policy is summarised as follows:

Capital Reserves

- A Capital Reserve has been established for each activity that the Council undertakes.
- All depreciation that has been funded from that activity will be lodged into the Capital Reserve on a quarterly basis when each instalment of rates is due.
- Funds from other reserves or financial contributions can also be deposited into the Capital Reserve.
- All capital expenditure will be paid from the Capital Reserve at the time of payment.
- Capital Reserves may go into overdraft at any stage with prior approval of Council.

Capital Expenditure

- All Capital Expenditure must be approved by Council through the budget process or by an explicit resolution.

Interest Component For Debt Incurred Prior to 30 June 2012:

- If the balance of the Capital Reserve is overdrawn, the community of interest for the relevant activity will be charged an interest rate set at 100 basis points greater than the Official Cash Rate determined by the Reserve Bank. Such interest will be charged as a cost to the activity operating expenses and be rated for.
- If the balance of the Capital Reserve is in funds, then the Council will pay the community of interest in the relevant activity an interest payment set at 25 basis points less than the Official

Deleted: Year ending
Deleted: June 22
Deleted: June 23
Deleted: June 24
Deleted: June 25
Deleted: June 26
Deleted: June 27
Deleted: June 28
Deleted: June 29
Deleted: June 30
Deleted: 3.00
Deleted: 5.9
Deleted: 8.6
Deleted: 11.3
Deleted: 14.1
Deleted: 16.9
Deleted: 19.9
Deleted: 23.1
Deleted: 26.4

Cash Rate determined by the Reserve Bank. Such interest will accrue to the activity's Capital Reserve.

Interest Component For Debt Incurred After 30 June 2012:

- For the component of the debt incurred after 30 June 2012 the interest rate will be set at a level equal to the Council's average bond portfolio rate applying at the previous 1 January. Such interest will be charged as a cost to the activity operating expenses and rated for.

In determining the projects to be undertaken the benefit/cost ratio is the governing criteria used with preference being given to projects which can be shown to be economically justified, attract subsidy and have the necessary Council funding available.

Three Waters Stimulus Package
The Council has accepted crown stimulus grant funding for projects as part of the Three Waters Services Reform. The crown has committed approximately $500m nationwide in tranche 1, and the MDC allocation is $5.111m, of which $2.560m has already been received by MDC as an advance payment. These stimulus projects are in addition to current LTP projects already underway.

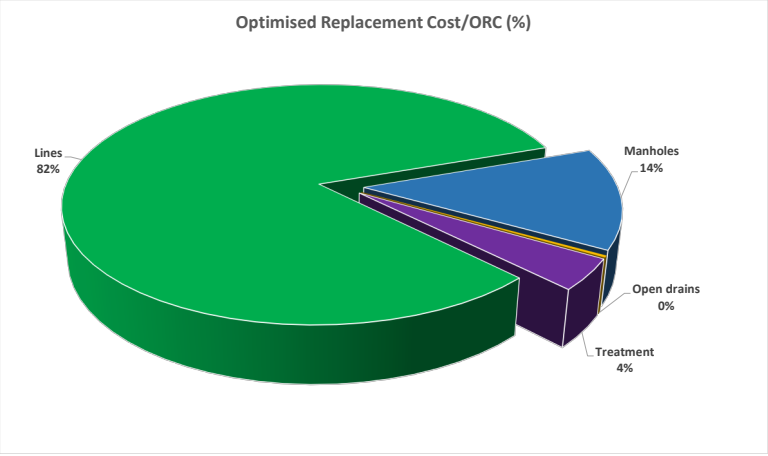
10.2 Asset Valuation

The last valuation of the Stormwater infrastructural network and associated assets was undertaken as at 1 July 2019 and is summarised in the following figure. The valuation is updated 3 yearly to take into account capital works and additions to the water supply network.

The valuation consists of an assessment of the replacement cost, depreciated replacement cost and the annual depreciation or decline in service potential of the network. The annual depreciation or decline in service potential is the amount the asset declines in value over a year as a result of the remaining life of the asset reducing. Provision is required to be made to fund this depreciation so as to make suitable allowance for the future replacement or renewal of the asset.

The total optimised replacement cost of the Stormwater assets was assessed to be $9,801,000 as at 1 July 2019. The total optimised depreciated replacement cost was assessed to be $7,402,324.

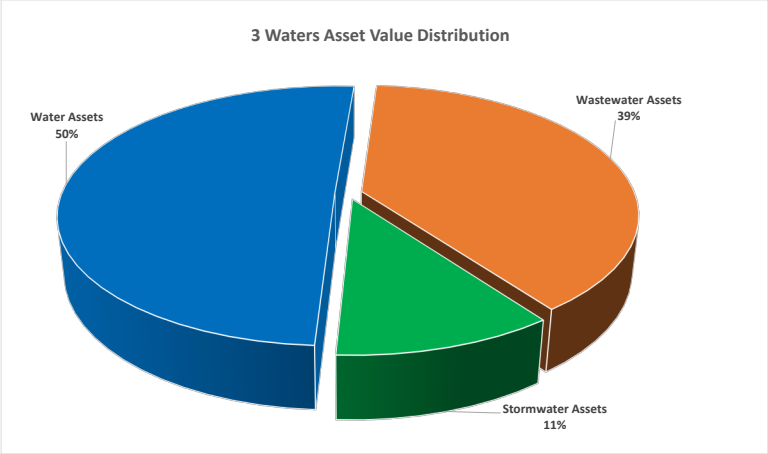
Figure 10-1: Asset Valuation



The table and figure below shows the asset value distribution of the water, wastewater and stormwater assets.

Water Replacement Costs	Wastewater Replacement Costs	Stormwater Replacement Costs
$44,843,496	$34,934,000	**$9,801,000**

Figure 10-2: 3 Waters Asset Value Distribution



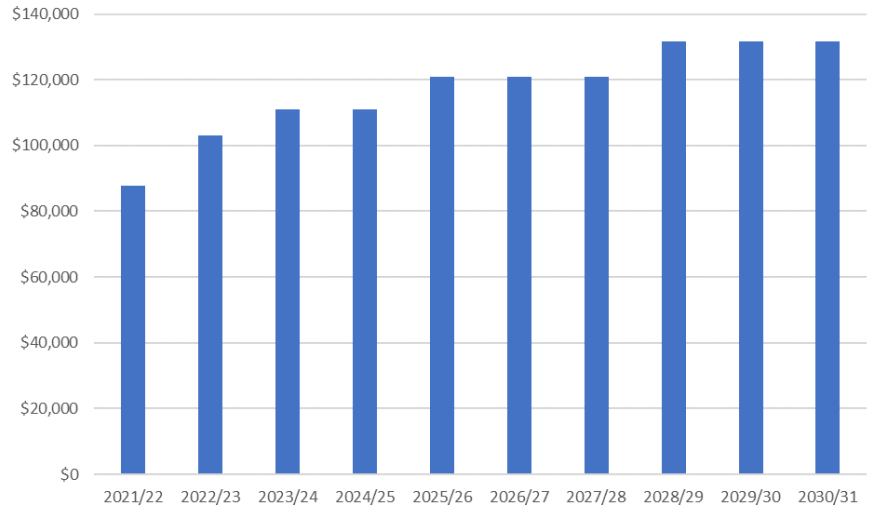
10.2.1 Depreciation

Depreciation is provided on a straight-line basis on all physical assets at rates which write off the cost of the asset to the estimated residual value at the end of its assumed effective life.

Expenditure on renewing or improving the capacity of the asset is capitalised annually as are assets which are vested in Council by developers. Capital work in progress is not depreciated. The total cost of this work is capitalised at the end of the financial year in which it is completed and depreciated from then onwards.

The annual depreciation has been determined to be $87,750 per annum (in 2021/22) and increases over the 10 year period as the council takes on additional vested assets and capital projects are complete as shown in the figure below.

Figure 10-3 Annual depreciation (inflated)



10.2.2 Valuation methodology

All assets have been valued using depreciated replacement cost (DRC). A DRC valuation requires:

- Determination of quantities of assets optimised to relate to those required for current service delivery and foreseeable demand
- Unit rates for replacement with modern engineering equivalent assets
- Effective lives that take account of local influences
- Depreciation that defines current value given a definable remaining life.

The NZ Infrastructure Asset Valuation and Depreciation Guidelines 2006 give direction as to the overall methodology applicable to a DRC valuation for water supply assets. This has been applied in this case to achieve a suitable valuation for MDC Improvements and Infrastructure Asset Valuation.

Borrowing costs were excluded from the valuation.

The primary data source for this revaluation was MDC's Asset Register.

10.2.3 Asset Lives and Assumptions

The base life of an asset is set during the valuation process in order to identify what is believed to be the average length of time that the asset will be capable of providing the required level of service. The setting of the base life is the factor in the valuation process that directly affects the annual depreciation requirement for the asset.

The expected base lives in the reticulation for water, sewer and stormwater are reviewed as part of each valuation to align the expected lives, and the method of setting these with the renewal decision making practice.

Asset group	Expected useful life (years)
Lines	150
Manholes	150

Open drains	Not depreciated

10.2.4 Resource Consents

It is difficult to determine the fair value of Resource Consents due to their specialised nature and having no active market to compare values against. For these reasons, Council holds resource consents at deemed cost and they are amortised over the life of the consent.

10.3 Financial Summary

The future overall financial requirements for the Stormwater activity are tabled and graphically illustrated below:

Table 10-1: Future Financial Requirements (Inflated)

	2021-2031 LTP period									
Project	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**
Reticulation	$350,000	$414,000	x	x	x	x	x	x	x	x
Stormwater Management Control (Flooding)	$25,000	x	x	x	x	x	x	x	x	
Sloane St SW Box Culvert Replacement	$34,670	x	x	x		x	x	x	x	x
Total	**$409,670**	**$414,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Table 10-2: Three Waters Capital Projects (Inflated)

	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Water	$11,395,421	$5,643,855	$1,011,991	$1,475,582	$957,237	$1,001,325	$1,015,497	$1,049,019	$1,084,675	$1,151,058
Wastewater	$2,419,075	$776,250	$807,044	$8,724,800	$9,538,700	$1,153,600	$1,190,500	$1,229,800	$0	$0
Stormwater	$409,670	$414,000	$0	$0	$0	$0	$0	$0	$0	$0
Grand Total	**$14,224,166**	**$6,834,105**	**$1,819,035**	**$10,200,382**	**$10,495,937**	**$2,154,925**	**$2,205,997**	**$2,278,819**	**$1,084,675**	**$1,151,058**

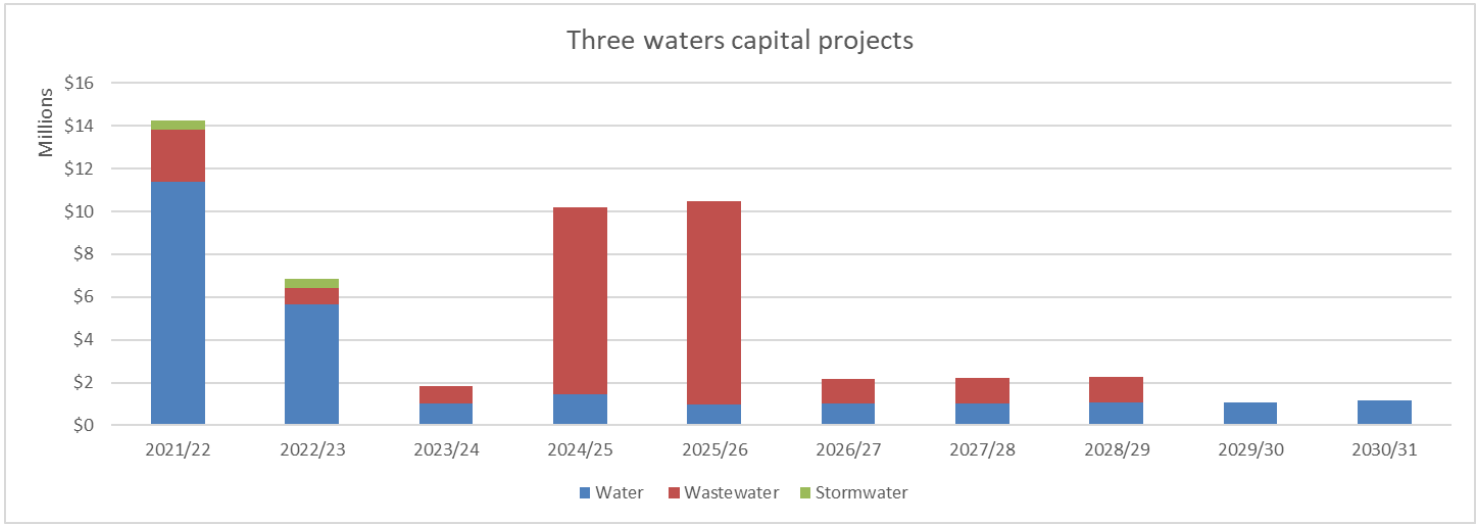

Three waters capital projects
Millions
$16
$14
$12
$10
$8
$6
$4
$2
$0
2021/22
2022/23
2023/24
2024/25
2025/26
2026/27
2027/28
2028/29
2029/30
2030/31
Water
Wastewater
Stormwater

Table 10-4: Funding Impact Statement

Stormwater	Annual Plan 2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/2030	2030/31
						(thousands)					
General Rates, uniform annual general charges, rates penalties	0	0	0	0	0	0	0	0	0	0	0
Targeted rates	118	132	199	162	168	213	186	188	244	210	212
Subsidies and grants for operating purposes	0	15	0	0	0	0	0	0	0	0	0
Fees & Charges	0	0	0	0	0	0	0	0	0	0	0
Internal charges and overheads recovered	0	0	0	0	0	0	0	0	0	0	0
Local authorities fuel tax, fines, infringement fees and other receipts	0	0	0	0	0	0	0	0	0	0	0
Total operating funding (A)	**118**	**147**	**199**	**162**	**168**	**213**	**186**	**188**	**244**	**210**	**212**
Payments to staff and suppliers	37	54	92	46	53	89	61	62	108	74	75
Finance costs	0	0	0	0	0	0	0	0	0	0	0
Internal charges and overheads applied	4	4	4	5	4	4	5	5	5	5	5
Other operating funding applications	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding (B)	**41**	**58**	**96**	**51**	**57**	**93**	**66**	**67**	**113**	**79**	**80**
Surplus (deficit) of operating funding (A-B)	**77**	**89**	**103**	**111**	**111**	**120**	**120**	**121**	**131**	**131**	**132**
Subsidies and grants for capital expenditure	0	60	0	0	0	0	0	0	0	0	0
Development and Financial Contributions	0	157	182	201	427	328	343	360	408	428	388
Increase (decrease) in debt	0	-1	-1	0	0	0	0	0	0	0	0
Gross proceeds from sale of assets	0	0	0	0	0	0	0	0	0	0	0
Lump Sum Contributions	128	0	0	0	0	0	0	0	0	0	0
Other dedicated capital funding	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding (C)	**128**	**216**	**181**	**201**	**427**	**328**	**343**	**360**	**408**	**428**	**388**
Applications of Capital Funding											

Stormwater

	Annual Plan 2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/2030	2030/31
						(thousands)					
Capital expenditure											
To meet additional demand	0	0	0	0	0	0	0	0	0	0	0
To improve the level of service	0	410	414	0	0	0	0	0	0	0	0
To replace existing assets	0	0	0	0	0	0	0	0	0	0	0
Increase (decrease) in reserves	205	-105	-130	312	538	448	463	481	539	559	520
Increase (decrease) of investments	0	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding (D)	**205**	**305**	**284**	**312**	**538**	**448**	**463**	**481**	**539**	**559**	**520**
Surplus (deficit) of capital funding (C-D)	**-77**	**-89**	**-103**	**-111**	**-111**	**-120**	**-120**	**-121**	**-131**	**-131**	**-132**
Funding Balance ((A-B) +(C-D))	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

11.0 IMPROVEMENT PLANNING

An important component of this Activity Management Plan is the recognition that it is a "live" document in need of monitoring, change and improvement over time. This Section details the improvements that will lead to improved management and increased confidence.

11.1 Improvement Plan Achievements

Many of the Improvement Plan Tasks identified have been achieved. The following table details improvements achieved to date.

Table 11-1: Improvement Plan Achievements

Project Description	Status	Date	Comment
Current age and remaining life of all assets needs to be reviewed and determined	Complete	June 2017	
Augment existing LoS information	Complete	June 2017	
Undertake customer surveys with defined performance targets.	Completed	2016	Ongoing
Develop a stormwater management plan for Twizel to ensure future subdivision allows for the peak flows and overland flow paths are not compromised	Completed	June 2017	
Develop a stormwater management plan for Mackenzie District to ensure compliance with ECan's Land and Water Regional Plan.		June 2017	Lodged 2019/208
Complete a Customer Survey, including local industry, to establish any changes in customer expectations as they relate to demand on the network.	Complete	2016	Ongoing
All assets need to be assessed for criticality	Transferred	June 2017	Part of the Current IP Programme
Risk management register needs to be developed. Assessed risks can then be linked to maintenance and renewals programmes.	Transferred	June 2017	Part of the Current IP Programme
Significant negative effects need to be identified and provide an input into the LTP. Also identify procedures for mitigating significant negative effects.	Completed	June 2017	Included in Section 5.8.
Emergency management (including lifelines) requires full review and inclusion. Require procedures in place for rapid response to emergency failures.	Completed	June 2017	Part of Maintenance Contract
Corporate insurance policy/requirements and updating of asset insurance costs needs to be considered and incorporated.	Complete	June 2017	
Review and update the Asset Register database. Ensure all inventory data is captured.	Complete	June 2017	Ongoing
Complete a full review of the network assets (using both the Asset Register and field inspections) and develop a detailed 10 year Forward Work Programme for all asset groups	Complete	June 2017	
Produce Annual Plan Forecasts, adjust 10 year plan and add Year 10 to total programme	Complete	June 2017	Ongoing
Review and update the Asset Register database. Ensure all inventory data is captured and up to date	Complete	June 2017	
The default construction date and the expected life of all assets need to be reviewed	Complete	June 2017	Ongoing
Sustainability - Include further summary of sustainability measures that are in place, including details of Council Sustainability policy, strategies and operations enabling greater sustainability etc.			

11.2 Improvement Plan Focus

The Mackenzie District Council Stormwater Services Asset Management Improvement Plan and Projects will be focused on the following key areas:

- To continue to provide affordable, reliable and efficient stormwater disposal systems
- protecting the natural environment
- Risk Management
- System knowledge update
- Investigating innovative ways to provide an efficient and cost effective stormwater system and ensure ongoing affordability of the stormwater service
- Asset Management

11.3 Current Improvement Plan

The following table documents the Improvement Items identified during the review and update of the AMP.

Table 11-2: Current Improvement Plan

IP #	Reference Section	Project Description	Timeline	Responsibility	Internal/External Resource
IP 1	Section 4.9	Develop a formal documented criticality assessment			
IP 2	Section 5.9.3	Comply with LWRP – develop Stormwater Management Plans			
IP 3	Section 8.3	Develop Risk Management Schedule including all associated documents			
IP 4	Section 9.3.3	Continue to record and analyse flooding history, areas of ponding etc.			
IP 5	Section 9.3.7	Develop & maintain Operation and Maintenance Manuals (ongoing)			
IP 6	Section 11.6A1.6	Include replacement costs for all pipes in asset register			

11.4 Project Identification and Assignment

Projects are identified through various processes including but not limited to:

- Legislative Compliance
- Levels of Service
- Growth
- Renewal
- Operation & Maintenance

Projects are then assigned to the individual staff to complete depending on their association or main project criteria e.g. Facilities/Reticulation/Asset Management, etc.

While projects in year 1 of the updated LTP are considered to be highly relevant, over the following two years some become less or totally inappropriate. This is generally due to:

- changes in legislation which remove the need for the work or change priorities
- better understanding of methods, costs and timing to deliver the project outcomes. This may be via other council business units, external agencies or through other projects.
- The community and council no longer supporting the work

11.5 Reporting on Projects

Currently all projects in the Long Term Plan 2021-31 and Annual Plan are reported quarterly. It is acknowledged that the management and completion of improvement items will contribute to the achievement of Community Outcomes, and regular reporting on activity items assist to ensure that achievement towards each outcome.

11.6 AM Preparation, Monitoring & Review

This AMP will continue to be developed over time to incorporate further advanced asset management techniques, make use of improved data collection and management systems, respond to legislative and policy changes, and address evolving issues. This Plan will be further tested and developed with ongoing focus on legislative compliance, planning for climate change, environmental management, and improving efficiency.

This AMP is to be reviewed on a 3-yearly basis, with the next full review taking place in 2023. Each review will be completed in line with whole of Council LTP delivery plans. During the three year period leading up to this review, the items in the Improvement Programme should be addressed within the timeframes provided. These improvements can then be incorporated into the next review of the AMP.

This AMP is the responsibility of the 3Waters Manager.

APPENDIX A INDIVIDUAL SYSTEMS DESCRIPTION

A1 Fairlie Stormwater System

A1.1 Overview

Description		Quantity
Population Served 2013 % of district served by community stormwater system		693 (900 during holidays) 31%
Type of Collection		Gravity
Properties	Able to connect	530
History	Original scheme installed in	1938
Demand	Mean annual rainfall	mm
Length of reticulation		5.0 km
Number of manholes		36
Number of sumps		6
Number of pump stations		-
Length of open drains		1.6 km
Retention/Treatment Areas		-
Treatment	Treatment	None
Discharge flows to		Land adjacent to Opihi River
Financial	Funding	Universal rate
	Annual maintenance cost (2015/16) % of District Wastewater O&M	$14,653 66%

A1.2 Key Issues for Service

Issues	Resolution
Condition of steel pipe at the top end of Regent Street	Investigate issues, resolution options and implement
Environmental compliance	Comply with the requirements of the Canterbury Land and Water Regional Plan including but not limited to Stormwater Management Plans etc. (**IP 2**)

A1.3 Overview & History

The Fairlie Stormwater System has developed over a number of years. The diversion of Fairlie Creek away from the town was the first major effort to divert flows away from Fairlie. The majority of open races have over the years been piped or partly diverted away from Fairlie. Also a number of the original drainage swales have been built over or partly filled in and this contributes to some of the surface flooding.

The information on location, condition, size etc is stored in Council's GIS. This is continually updated as new information is obtained. Council's contractor continually feeds updated information into the system as work is carried out on the infrastructure.

A1.4 Reticulation

A1.4.1 Condition

Condition relates to the structural integrity of the asset.

The condition information presented below has been prepared by MDC staff on a top down basis to assist with the establishment of asset remaining lives. This data is based on representative field sampling and observations by MDC staff of asset failures. The condition grading has been based on the age of the system and inspections of the pipes.

Each asset is graded for performance and condition from 1 to 5. In addition, a confidence grading is applied to each assessment from A to D. The grading of the asset has been based on the International Infrastructure Management Manual – 2011.

A number of pipes are shown as requiring maintenance to return to an accepted level of service; these are regularly monitored and maintained as required, including visual inspection and sampling. This gives Council the information to decide on replacement time frames. The condition 3 pipelines will be inspected by CCTV to gauge their remaining useful life. Depending on the outcome of that inspection, they may require replacement in the term of this plan.

Some reinforced concrete pipes not manufactured to standard specifications. The Council had its own moulds and staff made their own pipe. There is no evidence that there are any quality issues associated with this pipe.

A1.4.2 Performance

The performance of the asset relates to the capability of the asset to meet defined levels of service. The preliminary findings which are based on the Status Reports are:

- System adequate for the 1 in 5 year storm
- Surface ponding expected for a 1 in 10 year storm.

A1.4.3 Pump Stations

There are no pump stations within the Fairlie stormwater system.

A1.4.4 Treatment

Fairlie stormwater is not formally treated before discharging to land adjacent to the Opihi River, but is collected by and discharges via vegetated swales that provide a measure of primary treatment.

The likely upgrade to meet the requirements of the Land and Water Plan would be the installation of a Humeceptor, a pollution prevention device that efficiently removes hydrocarbons and sediment from stormwater. Installation of a Humeceptor is programmed for 2027/28.

A1.4.5 Discharge

Stormwater discharge outlets are either piped or open drains. There are three outlets adjacent to Denmark Street, two in the Camping Ground area and one adjacent to Talbot Road. Apart from these formal discharge points overland flow contributes to a high proportion of the discharge. All discharge ultimately reaches the Opihi River.

A1.5 Environmental Management

The following table list the resource consent associated with the Fairlie Stormwater System.

Consent #	Description	Expiry Date	Allowable discharge
CRC203556	In process		

Development of a Stormwater Management Plan is programmed for 2021/22.

A1.5.1 Fairlie

The stormwater system is adequate for the 1 in 5 year return period if the influences of flow from outside the town are ignored.

In most areas for the 1 in 10 year return period some surface ponding can be expected. These areas are:-

- Flooding from western catchments.
- Doon Street / Alloway Street area
- Denmark Street outlets
- Gall Street / State Highway 8 area
- Top end of Regent Street
- Gray Street / Argyle Street area
- Sloane Street

There is a proposal to install a new 400mm stormwater main along Alloway St from the medical centre Helicopter pad to Doon St. From Doon St to an existing manhole on Denmark St a 600mm stormwater main recently laid to a new discharge over land adjacent to the Opihi River.. This will take the bulk of the stormwater from Alloway, Doon and some from Mt Cook Rd thus reducing the pressure on the stormwater at the BP service station.

A large proportion of the system relies on roadside swales to convey stormwater flow. Local ponding can occur through the use of siphon type sumps at road intersections.

A1.5.2 General

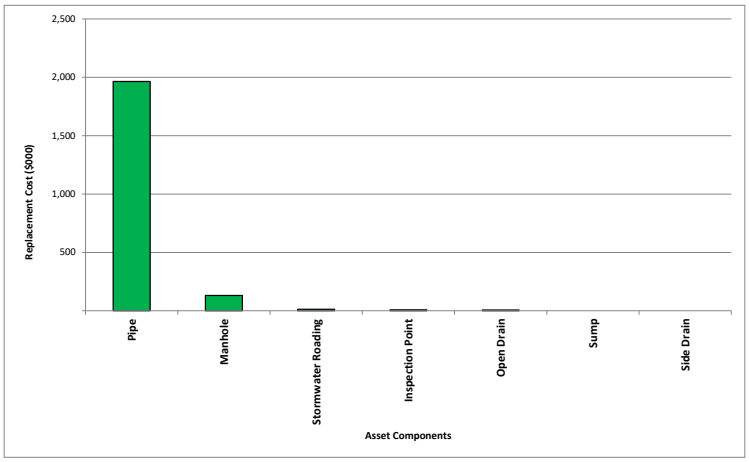
Over winter problems can occur with snow or hail blocking stormwater drains and sump inlets causing localised flooding and ice hazards. It is the responsibility of the road or village maintenance contractors to take all practical steps to rectify these situations when they occur.

Regular or spasmodic flooding can occur in the locations noted above and can be categorised thus:

- Risk to human life;
  - There is no risk to human life
- Inconvenience to the public (eg roads impassable);
  - Some sites would make traffic passage difficult but not impossible
- Buildings flood (occasionally);
  - Flooding from the western catchments can flood buildings in the Main Street
  - Whilst not directly related to stormwater systems in Fairlie, flooding from the Opihi in a 1 in 100+ year event can inundate buildings in the Eversley Reserve
- Land flooded but no risk to buildings.
  - Whilst not directly related to stormwater systems in Fairlie, flooding from the Opihi in a 1 in 100+ year event can inundate land in the Eversley Reserve

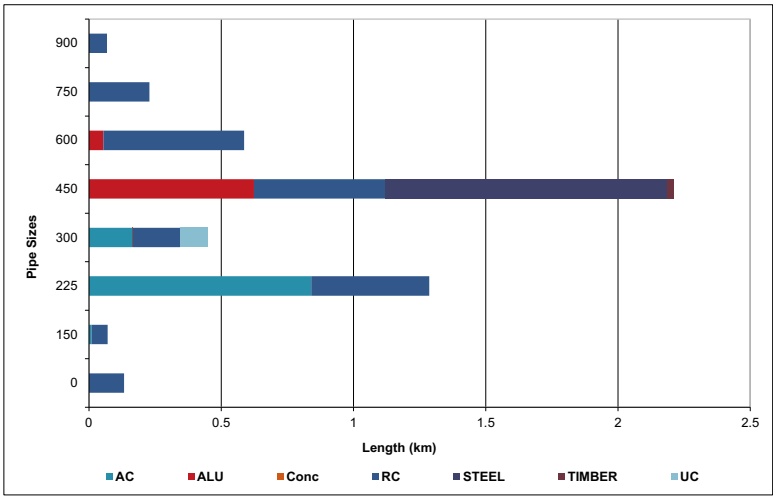
A1.6 Asset Details

Appendix Figure 1: Replacement Costs Reticulation



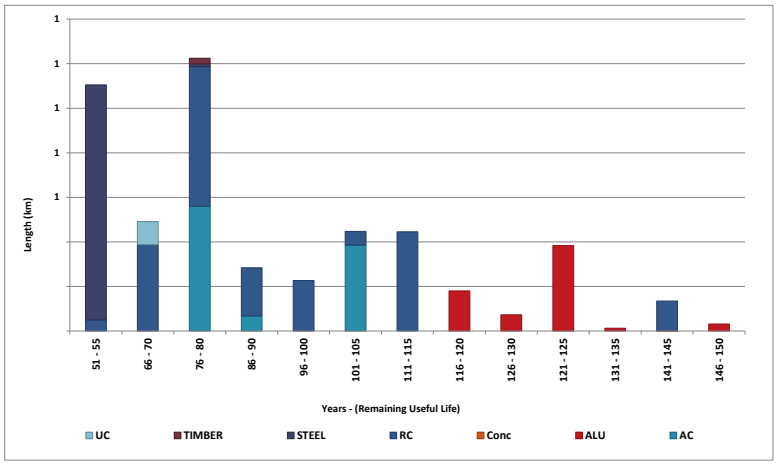
Manholes make up 79% of the total asset values. The replacement costs of a significant number of pipes are not recorded within the Asset Register (**IP 6**)

Appendix Figure 2: Stormwater Main Diameters



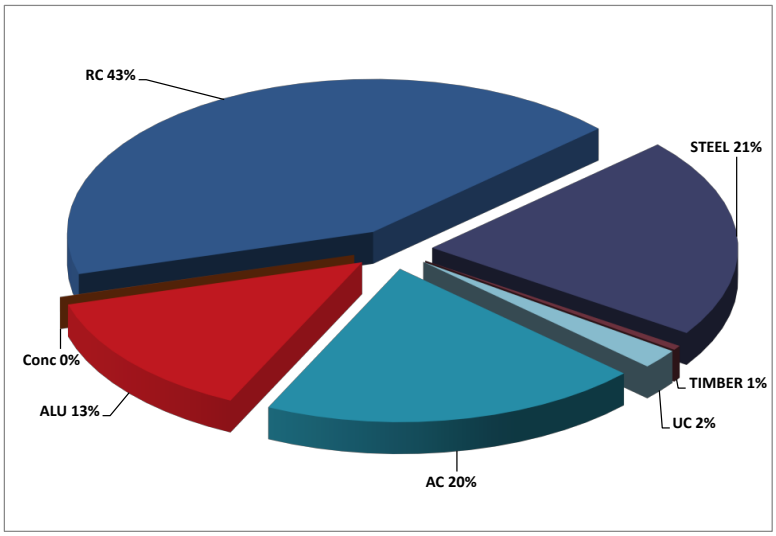
Ø450mm pipe make up 44% of the stormwater main length.
Ø225mm pipe make up 26% of the stormwater main length

Appendix Figure 3: Pipe Age Group Replacement Cost



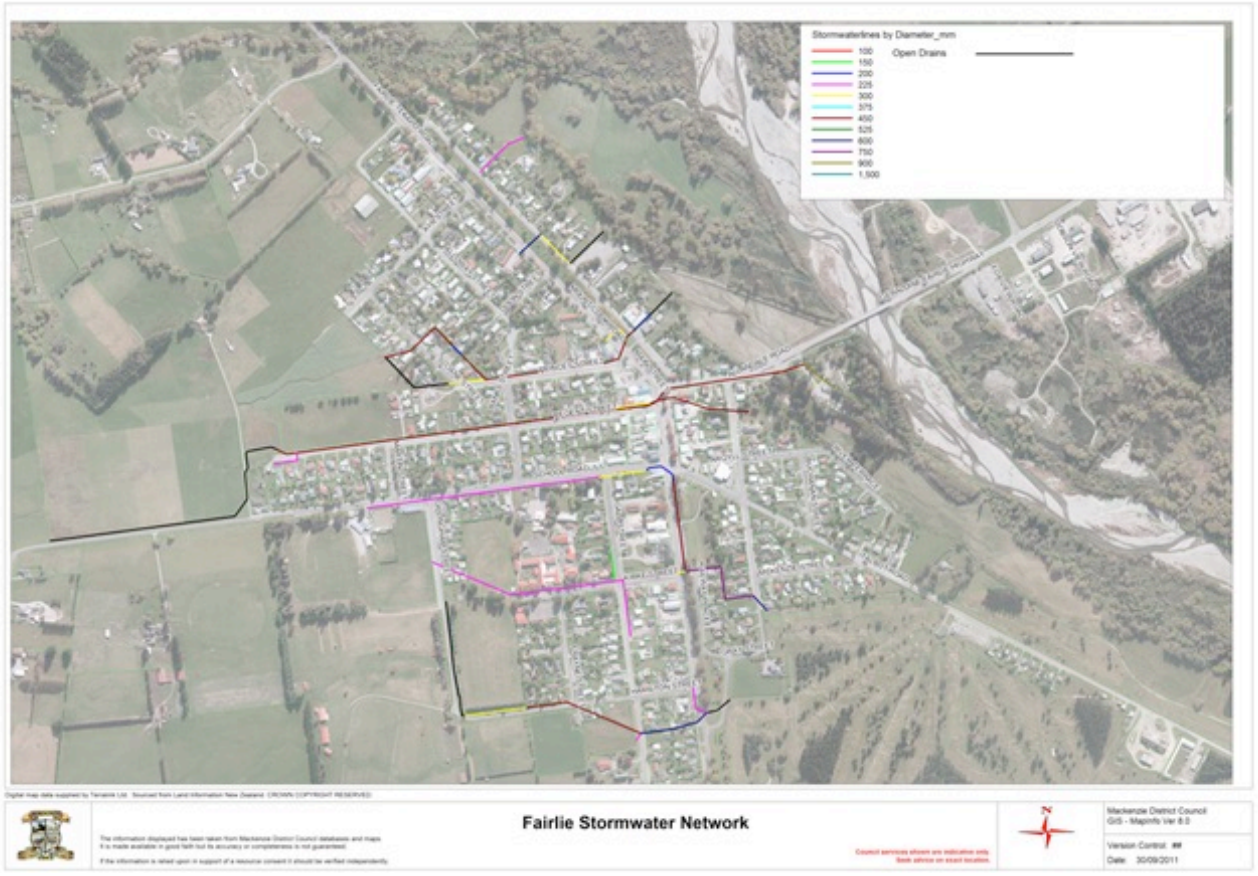
There is 1.1km of pipe (mainly Steel) that will reach the end of its expected useful life during the 51-55 year window.

Appendix Figure 4: Stormwater Main Material



The graph shows that 43% of the reticulation consist of Concrete, 21% of Steel and 20% of AC. The remainder is made up of Aluminium and Timber

A1.7 Fairlie Stormwater Map



A2 Lake Tekapo Stormwater System

A2.1 Overview

Description		Quantity
Population Served 20** % of district served by community stormwater system		369 (1,050 during holidays) 17%
Type of Collection		Gravity
Properties	Able to connect	687
History	Original scheme installed in	1950's
Demand	Mean annual rainfall	mm
Length of reticulation		10.2km
Number of manholes		213
Number of sumps		216
Number of pump stations		-
Length of open drains		0.7km
Retention/Treatment Areas		-
Treatment	Treatment	None
Discharge flows to		Consented treatment facilities next to Lake Tekapo & Tekapo River
Financial	Funding	Universal rate
	Annual maintenance cost (2015/16) % of District Wastewater O&M	$4,553 21%

A2.2 Key Issues for Service

Issues	Resolution
Increased environmental conditions and compliance parameters	Consideration of options and resolution
Old discharge points and retention basins	
Environmental compliance	Comply with the requirements of the Canterbury Land and Water Regional Plan including but not limited to Stormwater Management Plans etc. (**IP 2**)
Monitoring (first flush)	Develop and implement monitoring plan

A2.3 Overview & History

Lake Tekapo being located on rolling country is not confronted with the same problems as Fairlie for stormwater disposal. The majority of the stormwater system is less than 30 years old and has been well planned.

One concern is on hill sections where blocked sumps can cause local concentrations of flow on steep slopes.

In the new subdivisions stormwater disposal is well planned to modern engineering standards with a design life of 100 years.

The information on location, condition, size etc is stored in Council's GIS. This is continually updated as new information is obtained. Council receives reports from contractor and continually update the information as work on the infrastructure is completed.

A2.4 Reticulation

A2.4.1 Condition

Condition relates to the structural integrity of the asset.

The condition information presented below has been prepared by MDC staff on a top down basis to assist with the establishment of asset remaining lives. This data is based on representative field sampling and observations by MDC staff of asset failures. The condition grading has been based on the age of the system and inspections of the pipes.

Each asset is graded for performance and condition from 1 to 5. In addition, a confidence grading is applied to each assessment from A to D. The grading of the asset has been based on the International Infrastructure Management Manual – 2011.

A2.4.2 Performance

The performance of the asset relates to the capability of the asset to meet defined levels of service. The preliminary findings which are based on the Status Reports are:

- System adequate for 1 in 5 year storm
- Main outlets adequate for 1 in 20 year storm
- Blocked sumps could cause local concentration of flows on hill slopes

A system has been set up to record areas of ponding and poor performance during storms (**IP 5**).

A2.4.3 Pump Stations

There are no pump stations within the Lake Tekapo stormwater system.

A2.4.4 Treatment/Retention areas

Council has no specific stormwater treatment plants in Tekapo, however the Sealy Street discharge uses the existing grass swales to treat the stormwater prior to discharge to Lake Tekapo.

Both the Lochinver subdivision and stages 1 to 3 of the west Tekapo subdivision known as The Cairns, have dedicated stormwater disposal systems using a dry pond, detention areas and wetlands that require specific maintenance requirements to operate as designed.

The Cairns developed by Lake Tekapo Enterprises Ltd (CRC094183 and CRC184387) and Bluewater Resort Ltd (CRC094181.1) hold the stormwater discharge consents for their catchment areas respectively. This resource consent will stay private until such time as assets are vested to Council. Although Council has no control over the consent compliance it is important for Council to ensure at such time the stormwater system performed to specification and complied with resource consent conditions. The catchment areas are shown in the figure below.

Lake Tekapo Enterprises Ltd and Bluewater Resort Ltd Catchment Areas

These resource consents will stay in private management until such time as assets are vested to Council. Although Council has no control over the consent compliance it is important for Council to ensure at such time that the stormwater system performed to specification and complied with resource consent conditions.

Every five years, depending on the results of soil tests, any bare areas will be re-vegetated and contaminated soils replaced at a cost of $10,000 each time. The Lochinver system is expected to require revegetation in 2022/23.

There are also Council owned treatment facilities on Lakeside Drive and Domain Road.

To meet the requirements of the Land and Water Plan installation of Humeceptors, a pollution prevention device that efficiently removes hydrocarbons and sediment from stormwater, is programmed for 2022/23 in the small discharge points that don't have any other way to treat the discharge.

Station Bay The Station Bay subdivision has a Stormwater 360 treatment system that is the responsibility of the developer for the first five years. The reason for this was that Council were not certain that the upscaled design could provide the level of treatment and disposal required for that site with operating costs at an acceptable level.

At the end of the initial term, the developer is required to provide confirmation from Environment Canterbury that the systems have performed in compliance with resource consent conditions. The facility and consent then has the potential to transfer to Council subject to the requirements of the formal agreement between the parties.

A2.4.5 Discharge

Stormwater on the eastern side of Lake Tekapo Dam discharges into Lake Tekapo. The exception is a small area of Murray Place which is discharged into the Tekapo River. With the new Lochinver Subdivision, stormwater disposal is via a new consented disposal treatment area and discharge point direct to the lake.

Aorangi Crescent area on the western side of Lake Tekapo Dam discharges into the Tekapo River. The remainder of developed land on the western side discharges into the lake.

Lake Tekapo Enterprises Ltd on the Western side has a consented disposal treatment area that discharges into Lake Tekapo on Lakeside Drive.

Council obtained consent to discharge & treat stormwater from the Domain development and this work was completed during 2015/16.

A2.5 Environmental Management

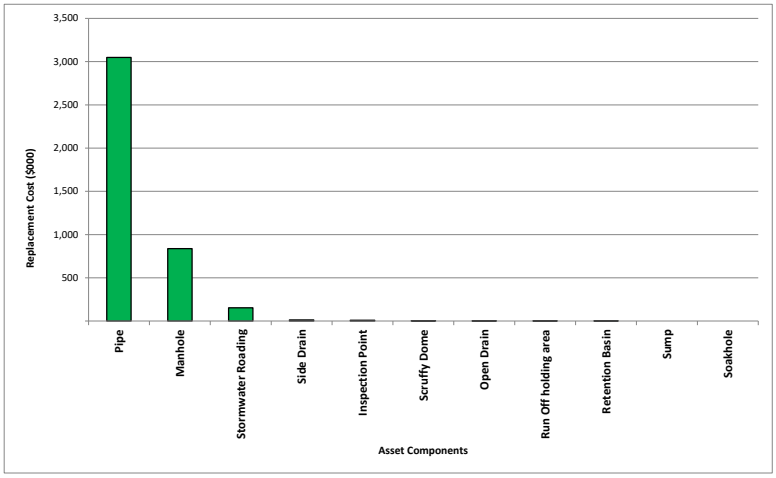
The following table list the resource consent associated with the Lake Tekapo Stormwater System.

Consent #	Description	Expiry Date
CRC042748	Sealy Street Discharge - to discharge stormwater to water from the low lying area at the eastern end of Sealy Street by way of open drain along Murray Park and pipe along Sealy Street into Lake Tekapo	18 February 2040
CRC146447	Lochinver Discharge - to discharge contaminants onto land and into water from a residential subdivision	24 September 2039
CRC141077	Domain Discharge - to discharge stormwater to water	23 December 2049
CRC157319	SH8, Simpson Lane & Lakeside Drive – to discharge stormwater to water	3 August 2050

Development of a Stormwater Management Plan is programmed for 2021/22.

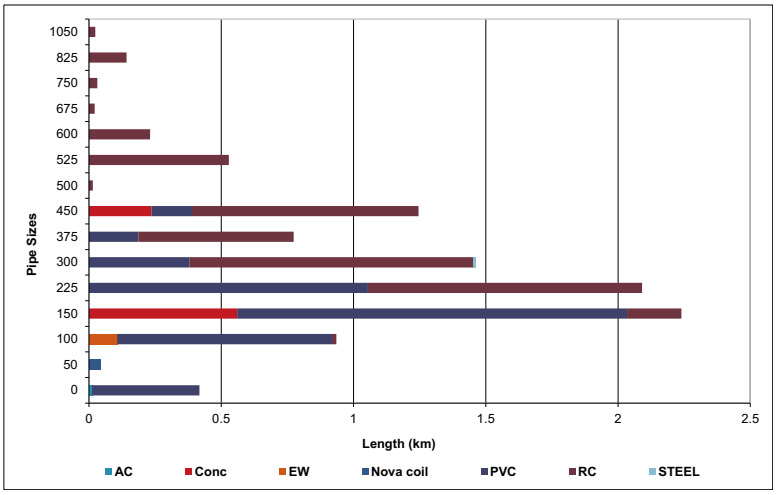
A2.6 Asset Details

Appendix Figure 5: Replacement Costs Reticulation



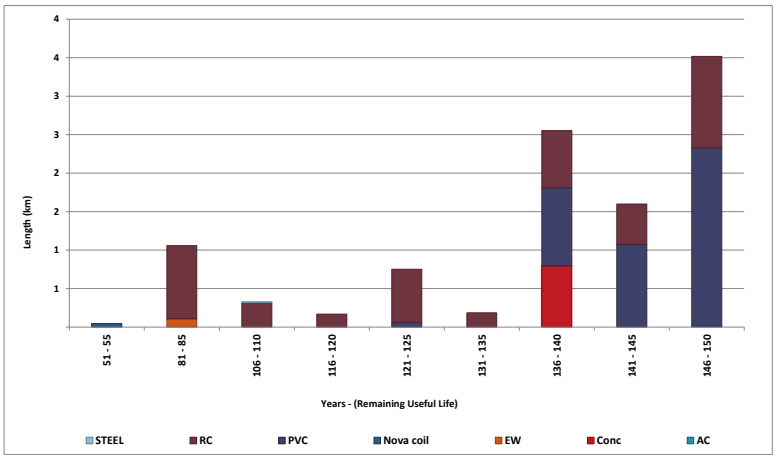
Stormwater pipes make up 75% of the total asset value and manholes make up 21% of the total asset value.

Appendix Figure 6: Stormwater Main Diameters



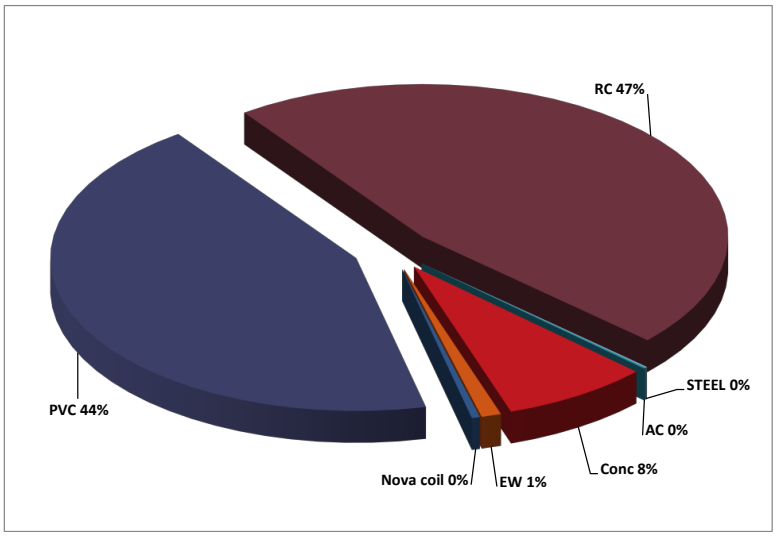
Ø150mm pipe make up 22% of the stormwater main length.
Ø225mm pipe make up 20% and Ø300mm pipe make up 14% of the stormwater main length.

Appendix Figure 7: Pipe Age Group Replacement Cost



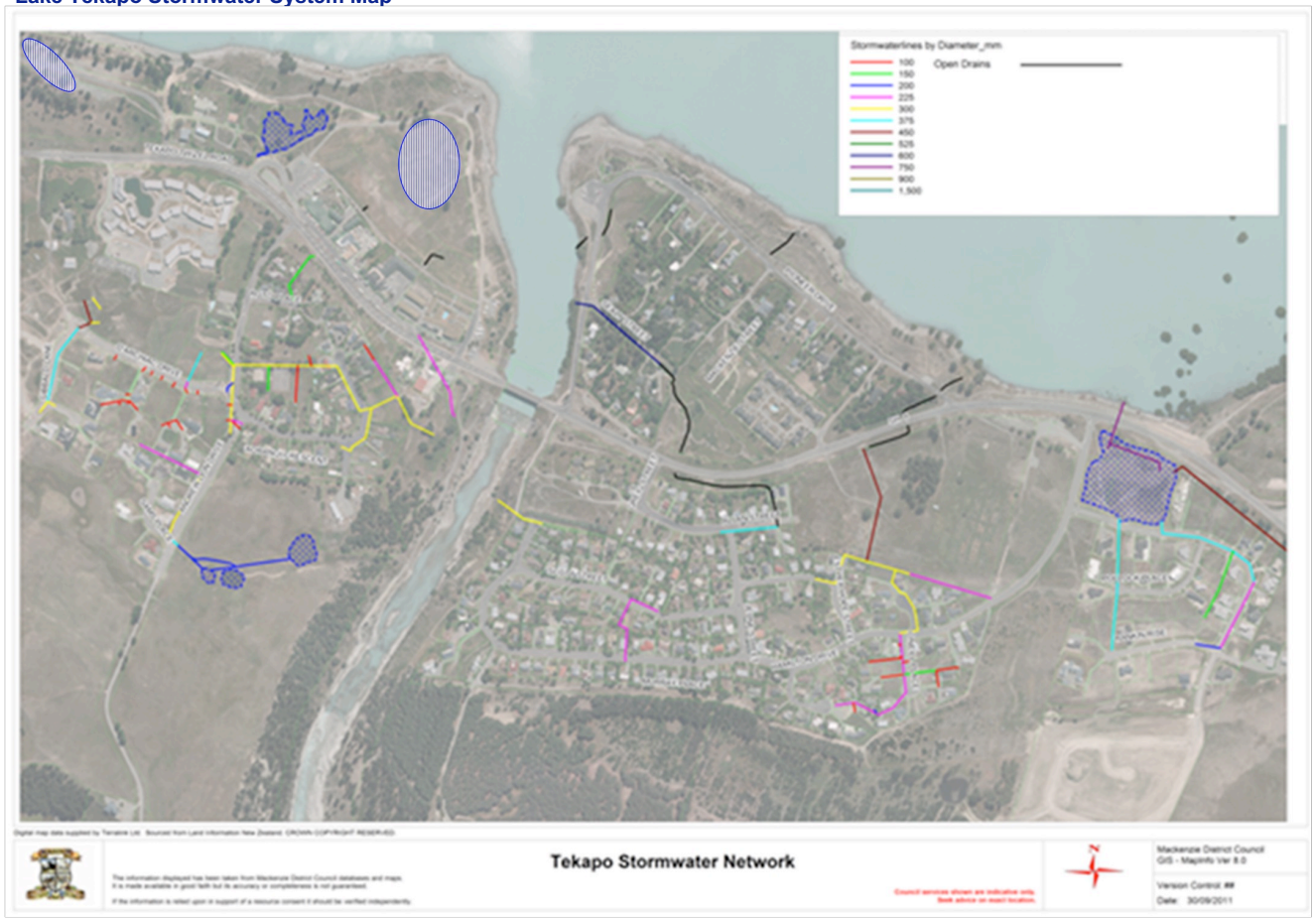
There is 44 metres of Novacoil that will reach the end of its expected useful life within the 51-50 year window. There is 1.1km of pipe (mainly Concrete) that will reach the end of its expected useful life during the 81-85 year window.

Appendix Figure 8: Stormwater Main Material



The graph shows that 55% of the reticulation consist of Concrete and 44% of PVC. The remainder is made up of EW, PE and Steel.

A2.7 Lake Tekapo Stormwater System Map



A3 Twizel Stormwater System

A3.1 Overview

Description		Quantity
Population Served 20** % of district served by community stormwater system		1,137 (3,500 during holidays) 52%
Type of Collection		Gravity
Properties	Able to connect	1,769
History	Original scheme installed in	1970's
Demand	Mean annual rainfall	mm
Length of reticulation		7 km
Number of manholes		93
Number of sumps		186
Number of pump stations		-
Length of open drains		3.8 km
Retention/Treatment Areas		1
Treatment	Treatment	None
Discharge flows to		Land adjacent to the Twizel River
Financial	Funding	Universal rate
	Annual maintenance cost (2015/16) % of District Wastewater O&M	$2,897 13%

A3.2 Key Issues for Service

Issues	Resolution
Environmental compliance	Comply with the requirements of the Canterbury Land and Water Regional Plan including but not limited to Stormwater Management Plans etc. (**IP 2**)
Monitoring (first flush)	Develop & implement monitoring plan

A3.3 Overview & History

Twizel is fortunate in having a stormwater system that was designed as a one off for the whole town. A shortcoming with the Twizel Stormwater System is the localised ponding that occurs at siphon type sumps. In the wintertime this sometimes causes ice.

The information on location, condition, size etc is stored in Council's GIS. This is continually updated as new information is obtained. Council's contractor continually feeds updated information into the system as work is carried out on the infrastructure.

A3.4 Reticulation

A3.4.1 Condition

Condition relates to the structural integrity of the asset.

The condition information presented below has been prepared by MDC staff on a top down basis to assist with the establishment of asset remaining lives. This data is based on representative field sampling and observations by MDC staff of asset failures. The condition grading has been based on the age of the system and casual inspections of the pipes.

Each asset is graded for performance and condition from 1 to 5. In addition, a confidence grading is applied to each assessment from A to D. The grading of the asset has been based on the International Infrastructure Management Manual – 2011.

A3.4.2 Performance

The performance of the asset relates to the capability of the asset to meet defined levels of service. The preliminary findings which are based on the Status Reports are:

- System adequate for a 1 in 20-year storm event.
- Siphon type sumps cause local ponding at intersections. These areas will be individually assessed to see if improvements can be made to minimise the ponded water.

A system has been set up to record areas of ponding and poor performance during storms.

A3.4.3 Pump Stations

There are no pump stations within the Twizel stormwater system.

A3.4.4 Treatment/Retention areas

All the Stormwater from Twizel either discharges directly to ground or receives primary treatment by being channelled via vegetated swales before discharging to the Twizel River.

To meet the requirements of the Land and Water Plan installation of a Humeceptor, a pollution prevention device that efficiently removes hydrocarbons and sediment from stormwater is programmed for 2023/24.

A3.4.5 Discharge

The whole of the town has two outlet points for stormwater discharge which are located near Glen Lyon Road. All stormwater from the Glen Lyon Road outlets discharge into the Twizel River.

New subdivisions discharge stormwater to ground via grassed swales and specific designed sumps.

A3.5 Environmental Management

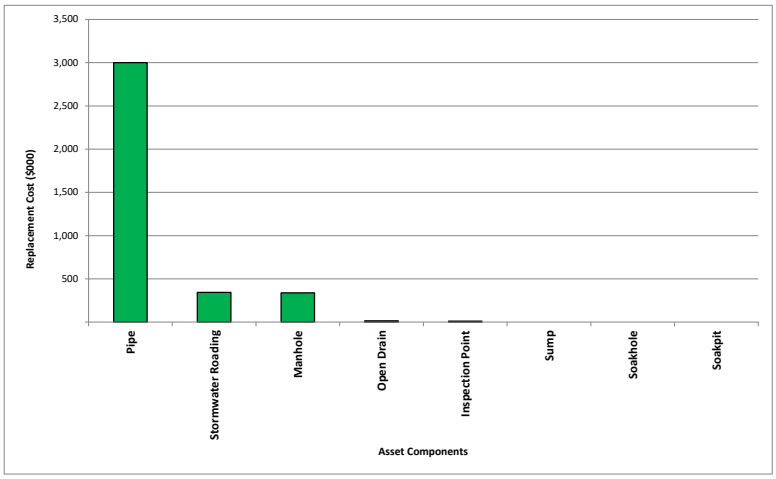
The following table list the resource consent associated with the Twizel Stormwater System.

Consent #	Description	Expiry Date
CRC042742	To discharge stormwater to water from domestic gardens, driveways, footpaths, streets, SH8 and urban parkland via open swales and pipes to two discharge pipes into the Twizel River	18 February 2040
CRC081120	To discharge stormwater to ground (Pukaki Airport)	7 December 2042

There will always be instances at some point in time when stormwater systems cannot cope with the rainfall run off due to its intensity or fast snow melt. In this respect the roading network has been designed, where possible, to act as a secondary flow path.

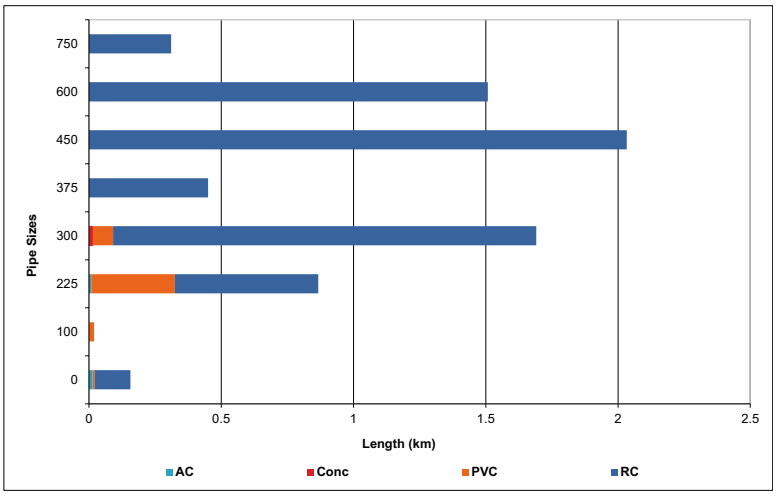
A3.6 Asset Details

Appendix Figure 9: Replacement Costs Reticulation



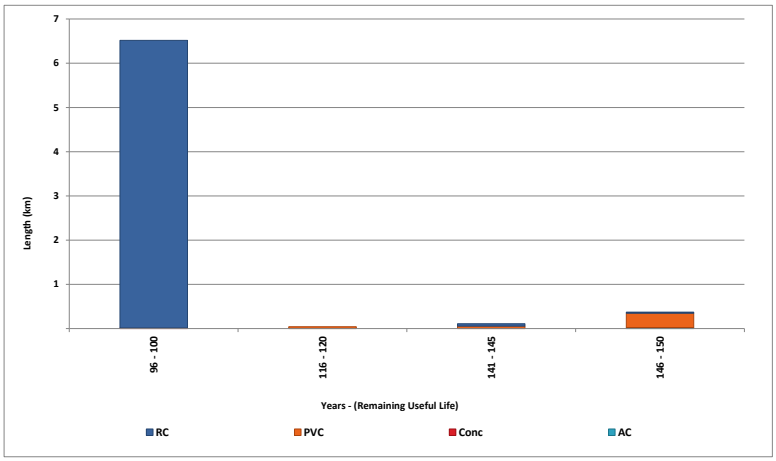
Stormwater pipe make up 81% of the total asset values.

Appendix Figure 10: Stormwater Main Diameters



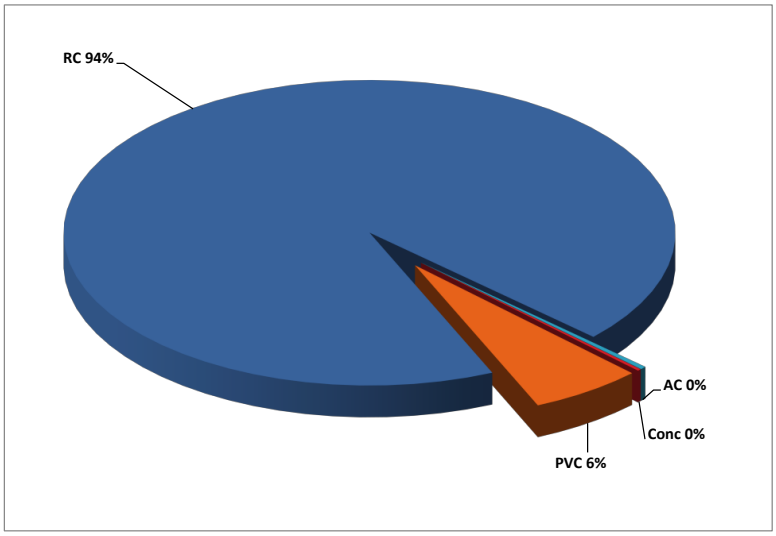
Ø450mm pipe make up 29% of the stormwater main length.
Ø600mm pipe make up 21% of the stormwater main length.

Appendix Figure 11: Pipe Age Group Replacement Cost



There is 6.5km of pipe (Concrete) that will reach the end of its expected useful life during the 96-100 year window.

Appendix Figure 12: Stormwater Main Material



The graph shows that 94% of the reticulation consist of Concrete and 6% of PVC.

A3.7 Twizel Stormwater System Map