Mackenzie District Council

Stormwater Activity Management Plan

2018 – 2028

UPDATE REGISTER

Number	Date	Description of Update	Updated by
Version 1	April 2006	Revision of the second AMP produced by MDC	Waugh Consulting
Version 2	2004	Revision of the first AMP produced by Waugh Consulting	MDC
Version 3	April 2006	Revision of the second AMP produced by MDC	MDC
Version 4	April 2013	Full update to Version 3	MDC
Version 5	February 2015	Revision to incorporate the issues determined by the 30 year Infrastructure Strategy and Environment Canterbury's Land and Water Regional Plan.	MDC
Version 6	October 2017	General review using Waugh template to incorporate recommendations from the 2015 IIMM manual	Waugh Consulting & MDC

Quality Record Sheet

Mackenzie District Council

Stormwater Activity Management Plan

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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.
COMPLIANCE	**Resource Consents** - Council has a number of 3 Waters (water, wastewater and stormwater)[1] related resource consents and aims to achieve compliance with all resource consent conditions. Regular compliance monitoring and reporting is undertaken Catchment management plans are required under the new 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

[1] '3 Waters' in this document refers to water supplies, stormwater and wastewater activities.

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 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 (LGA) 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
A fit and healthy community	Manage flooding events in urban areas
Safe, effective and sustainable infrastructure	Timely response to service requests and system failures
An attractive and highly valued natural environment	Providing a stormwater service that acknowledge and incorporates the natural environment in design, construction, operation and maintenance
A thriving 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

The main issue facing Council over the next ten years for the stormwater activity is likely to be meeting existing and new requirements of regional rules and standards that place greater emphasis on protecting the environment.

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 a fair state of repair and is maintained and renewed regularly. The service can be expected to last indefinitely, without any significantly abnormal costs having to be incurred.

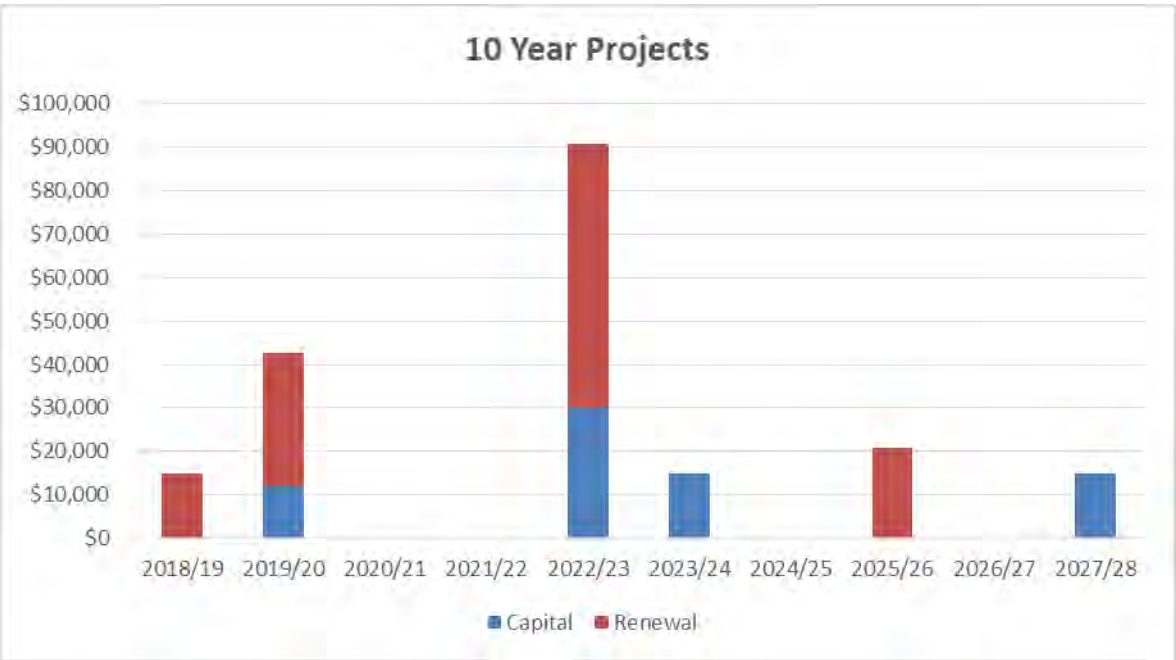
2.4 How will we get there?

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
- Implement Catchment Management Plans
- Plan for future development and needs
- Consult with the community as necessary on issues such as health and legislative compliance issues

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

Project Description	Year	Amount
New Capital works -		
Implement Catchment Management Plans	2019/20	$12,000
Treatment solutions – Tekapo (Humeceptor)	2022/23	$30,000
Treatment solutions – Twizel (Humeceptor)	2023/24	$15,000
Treatment solutions – Fairlie (Humeceptor)	2027/28	$15,000
Total		**$72,000**
Renewals		
Pipe renewals – Fairlie (Regent Street)	2018/19	$15,000
Revegetation & Valuation	2019/20	$30,751
Replace timber systems (Fairlie) & Valuation	2022/23	$60,751
Valuation	2025/26	$20,751
Total		**$127,253**



Key projects:

- Implementation of actions out of Stormwater Management Plans presently being developed as required by the Canterbury Land and Water Regional Plan
- Installation of treatment solutions in selected locations
- Renewals – refurbishment, replacement of stormwater assets estimated to be $0.13M over the next 10 years. All stormwater system renewal work will be funded by the annual depreciation provision where funds are available

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 LGA, 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
A fit and healthy community	Manage flooding events in urban areas	System adequacy – the stormwater system is adequately sized and maintained	Number of flooding events
Safe, effective and sustainable infrastructure	Timely response to service requests and system failures	Response times – flooding from events from the stormwater system are promptly attended to	Response & resolution
An attractive and highly valued natural environment	Providing a stormwater service that acknowledge and incorporates the natural environment in design, construction, operation and maintenance	Discharge compliance – the sw system is managed in accordance with consent conditions	Compliance with resource consent conditions Response & resolution
A thriving 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 five full time equivalent staff. The Essential Services Group provides management and engineering expertise to the Water, Wastewater, Stormwater, Solid Wastes 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 stormwater systems in three communities, being Tekapo, Fairlie and Twizel:

- Length of stormwater mains 18km
- Number of retention/treatment areas 5
- Number of manholes 244
- Number of sumps 290

The latest valuation (July 2016) estimates the replacement value of the stormwater network including treatment facilities and reticulation to be $5,467,670.

2.7 Who pays for it?

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

3.0 INTRODUCTION

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

3.1 Purpose

3.1.1 Purpose of this Activity Management Plan

The purpose of this AMP is to outline the Council's long-term asset management approach for the provision and intergenerational management of stormwater 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 LGA - 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 LGA 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 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 LTP.

3.3 Links to Council Vision, Mission, Goals and Objectives

3.3.1 Vision

Mackenzie will be a district in which:

- We foster the unique attributes and strong sense of community that makes the Mackenzie District special.
- Our natural environment is protected and enhanced in balance with achieving social and commercial objectives.
- A dynamic economy provides employment and investment opportunities consistent with the quality of life aspirations of existing and future generations.
- Democracy is respected and equal opportunity and the rights of the individual are upheld.
- A variety of sporting, recreational, cultural, spiritual, welfare and educational resources are available to enrich the lives of our people.
- Safe, effective, sustainable water, waste, communication, energy and transport systems are in place.
- People are encouraged to use their skills and talents for the benefit of the community.

The Council's outcomes and objectives for the stormwater network are stated in the LTP 2018 – 2028.

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 principal goal is to provide an effective, efficient, accountable and sustainable range of services that meets the needs of 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 LGA requires local authorities to:

- 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 AMPs will aid compliance with these requirements. AMPs (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.

A local authority is also required to prepare and adopt, as part of its LTP, 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

Activity Management (AM) Planning demonstrates how the Council is addressing sustainable management of its physical resources while providing for the protection of the environment as required under the provisions of the Resource Management Act.

3.4.4 Safety

AM planning addresses the Council'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

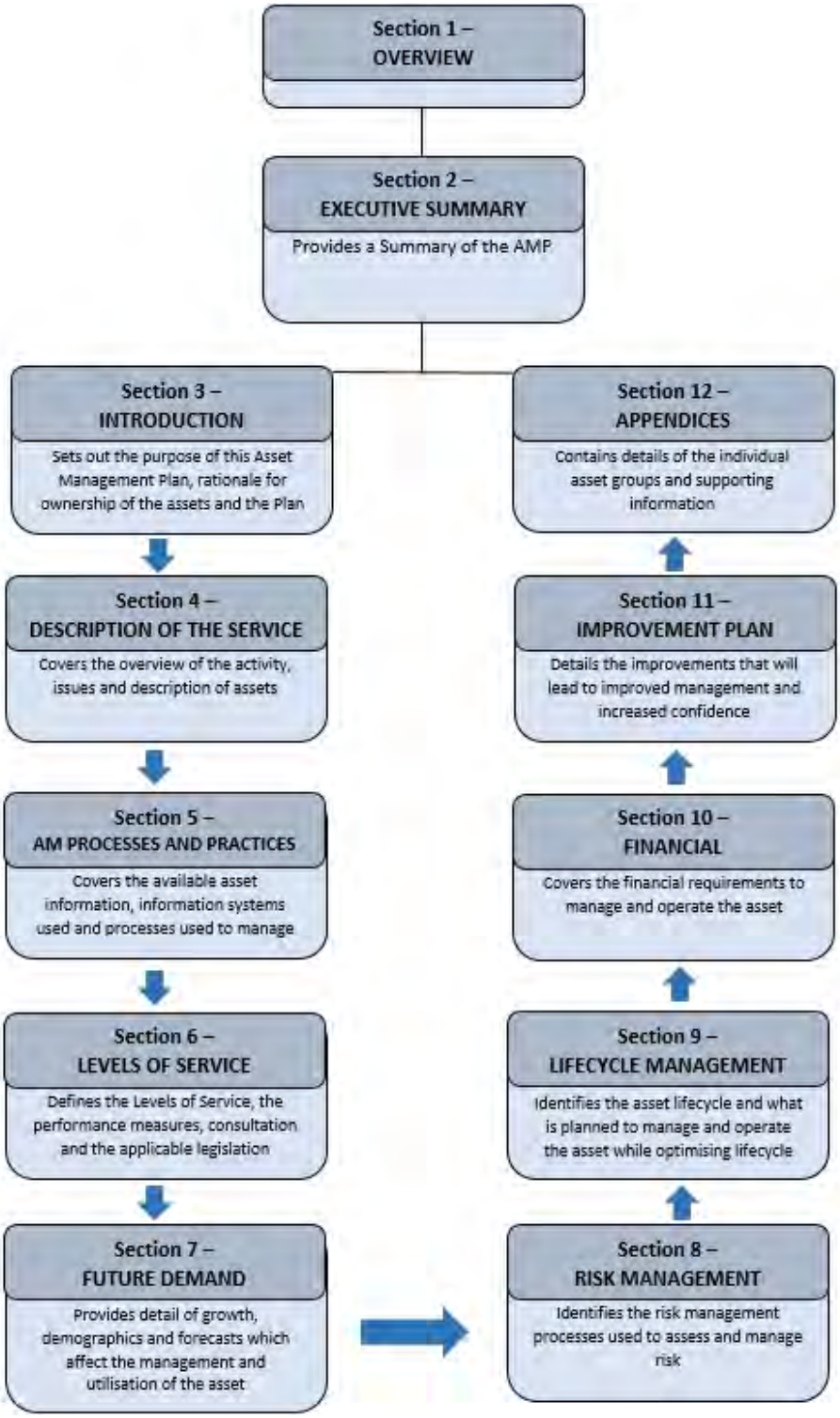
3.4.6 Achieve Strategic Goals

The Council has 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:

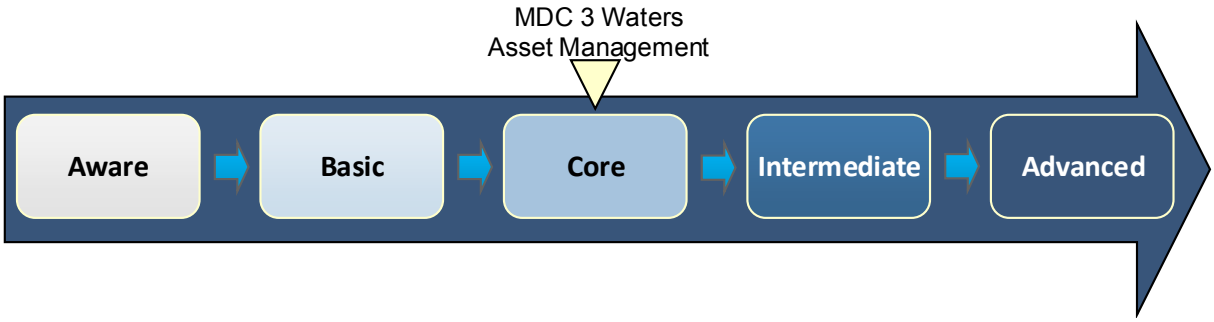
Figure 3-1: AMP Framework



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.

The Council 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 the 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 Council is a provider of "core" activities, which are the delivery of water (urban and rural), wastewater (sewerage), water races and stormwater services.

Council has consistently regarded the provision of these 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 in Fairlie, Lake Tekapo and Twizel.

4.2 Description of Assets

Overall there are 18.2 kilometres of reticulation, 248 manholes, 290 sumps and 5 retention/treatment areas. The reticulation varies from 100mm to 1,050mm in diameter.

Total operating costs are estimated to be $32,000 gradually increasing from 2018/19 over the ten years to $40,000 in 2028/2029. Replacement value of treatment plants and reticulation is approximately $5.4M as at July 2016.

System	Population (UR)	Length of Pipe Reticulation (km)	Manholes	Sumps	Pump Stations	Retention/ Treatment area
Fairlie	**693**	5.0	36	6	-	-
Lake Tekapo	**369**	6.6	121	137	-	5
Twizel	**1,137**	6.6	87	147	-	-
Total	**2,199**	18.2	248	**290**	**-**	**5**

4.3 Key Issues

The following key issues are associated with the Stormwater Systems:

- Increased environmental conditions and compliance parameters

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.
Fairlie	

Issues	Resolution
Old timber stormwater systems	Investigate issues and resolution options
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
Old discharge points and retention basins	
Twizel	
No known issues	

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.

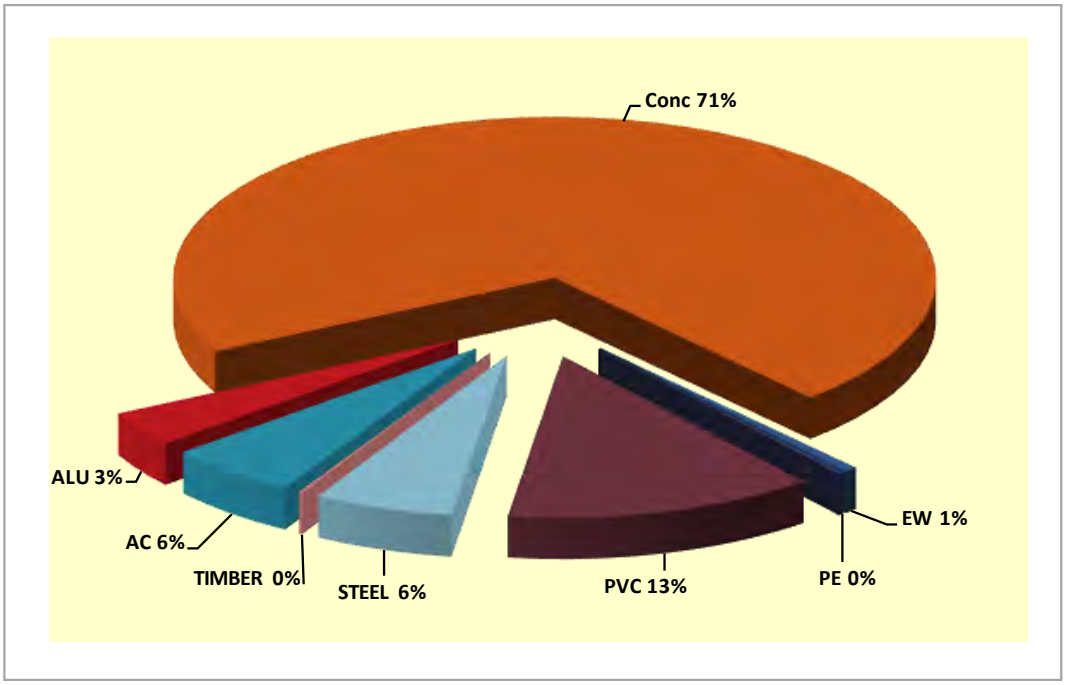
Individual properties that are connected to the stormwater service are responsible for their service laterals, up to and including the service lateral connection at the stormwater main.

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.

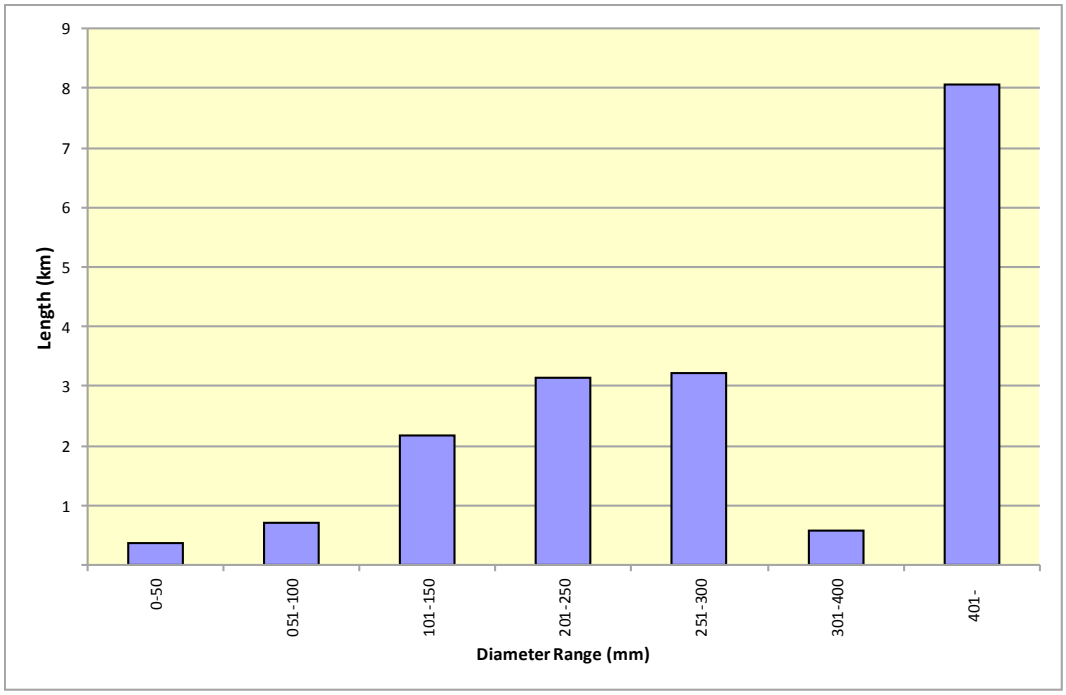
All of the reticulation is via gravity with pipes ranging from 100mm to 1,050mm diameter.

Figure 4-1: District wide stormwater main material distribution



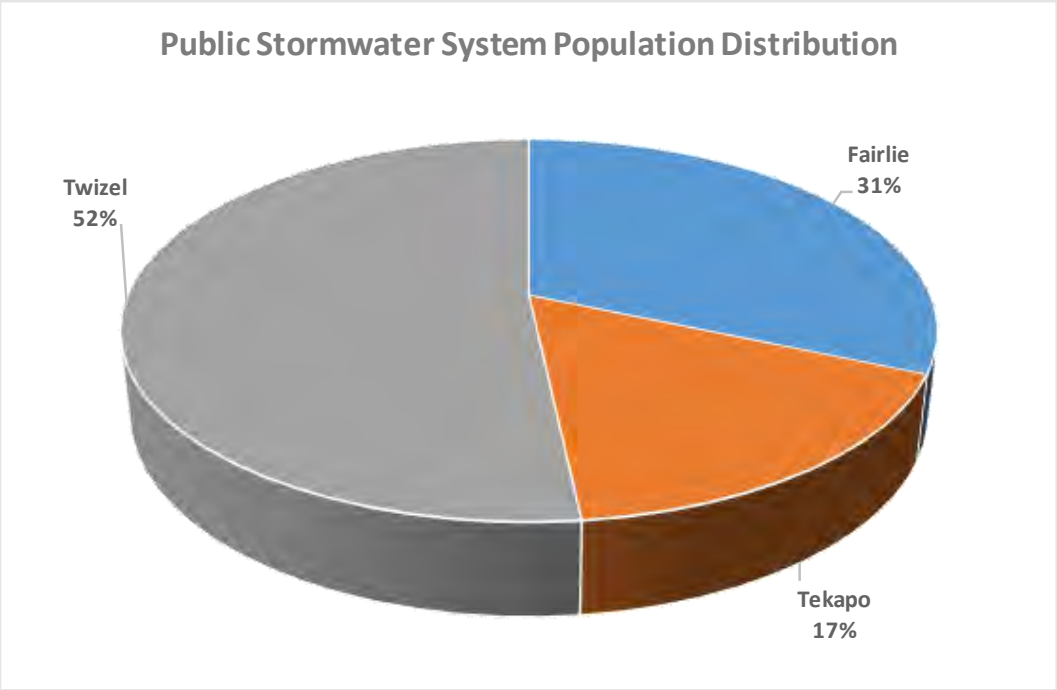
71% of the pipe reticulation consist of concrete.
The majority of the remaining 29% consists of PVC (13%); Steel (6%); and AC (6%).

Figure 4-2: District wide water main size distribution



44% of the reticulation is > 400mm diameter.
18% of the reticulation is ≤150mm diameter.

Figure 4-3: District wide Public Wastewater 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 Council's 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 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 or to water. The resource consent conditions sets 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 included as an Improvement Item (**IP 1**).

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 Council's organisational structure and Group structure is shown below.

Figure 5-1: Council's Organisational Structure

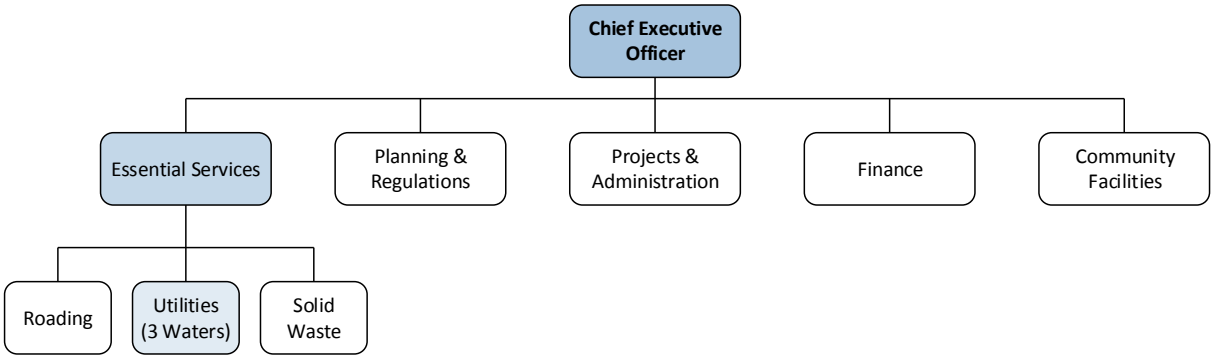
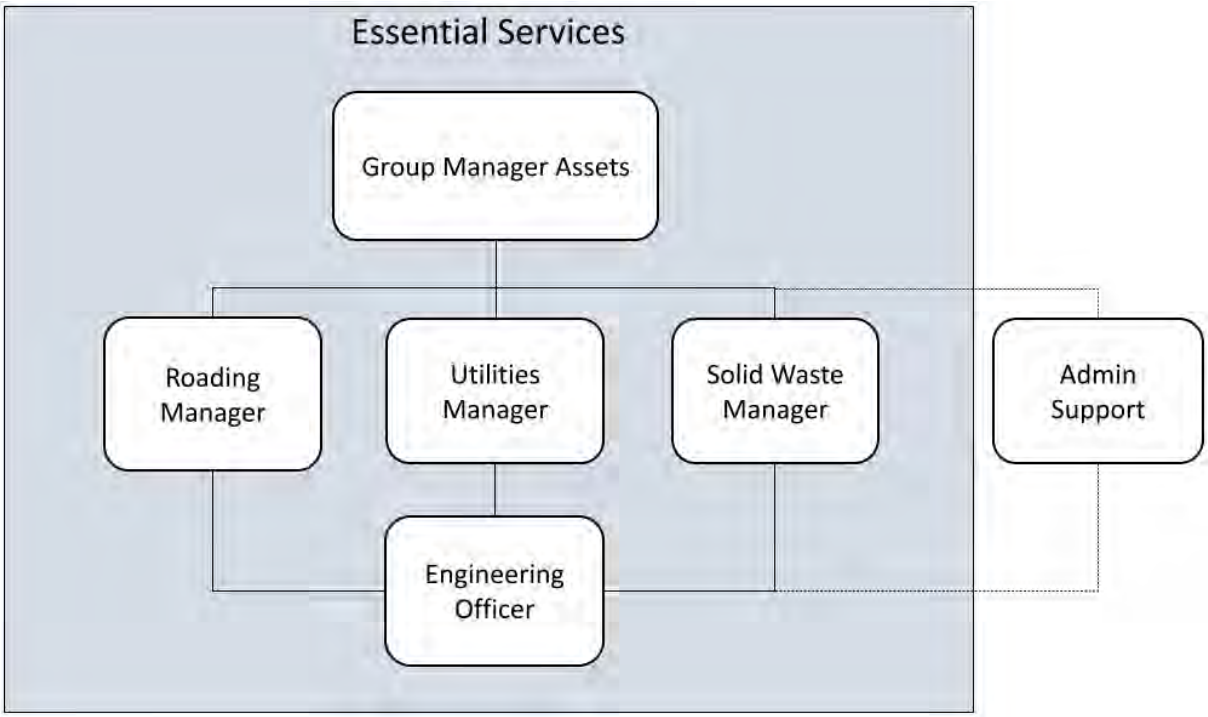


Figure 5-2: Essential Services Group Structure



The Council has an Asset Manager, Utilities Manager and a Technician 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 Utilities 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.

The Council 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.

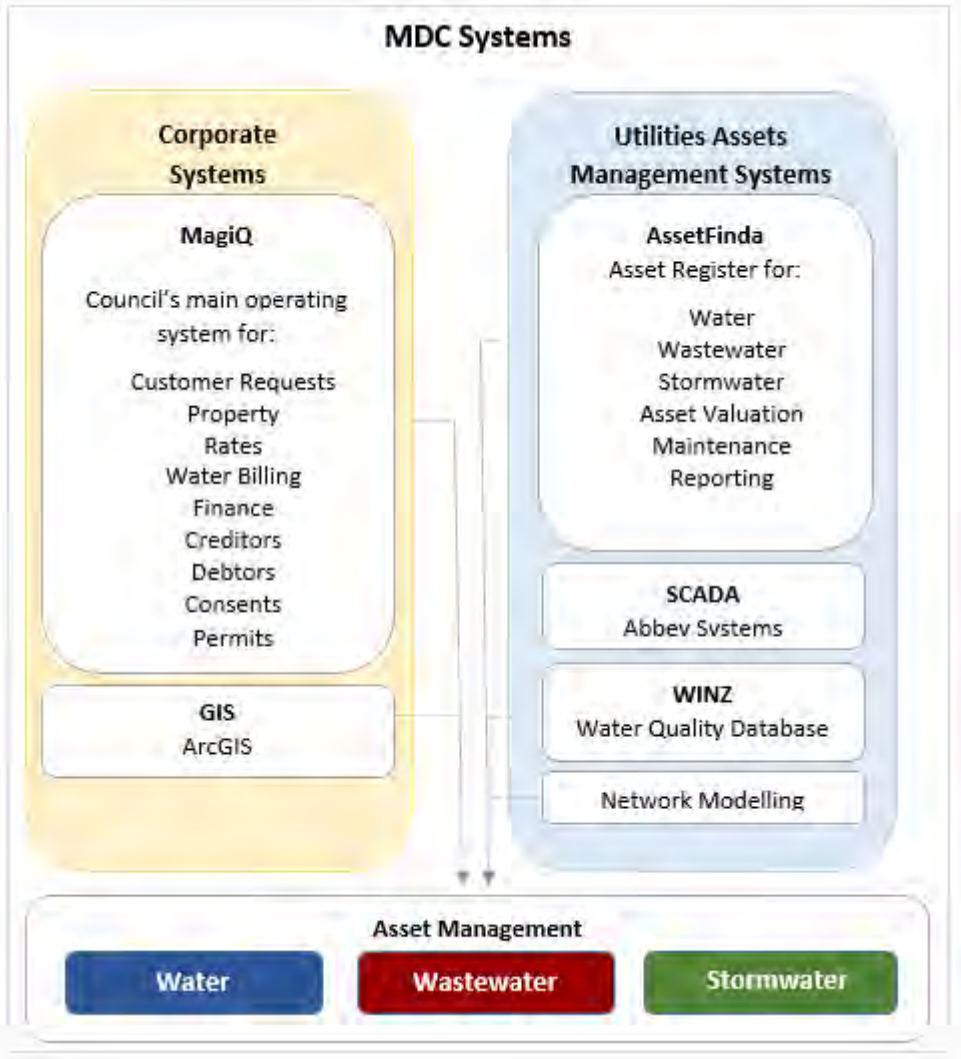
All contract works are claimed monthly against each of the contract item numbers by the physical works and professional services contractors. The Council and/or consultants confirm the payment value for all physical works and the Council confirms the payment of any professional services. The accounts job number and account codes are included on the payment certificate. These certificates are forwarded to the Council 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 (water, wastewater and stormwater). The information and data systems available to staff are shown below and discussed within this section.

Figure 5-3: Council 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
- Drainage
- Wastewater

The Asset Register contained within AssetFinda/ArcGIS (previously MapInfo) 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

There is no SCADA used within the stormwater system as Council does not monitor inflows or outflows from any of the treatment sites and there is no intention to do so.

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 work orders 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 Council systems on a regular basis.

New subdivisions in the district result in additions to the pipeline infrastructure. In the past there have been difficulties in capturing the resulting updated and additional asset information. 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.

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. 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

Valuation element	Pipelines
Attribute details	G
Asset category	G
Optimisation information	A
Asset Lives	G
Condition	H
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 wastewater 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.

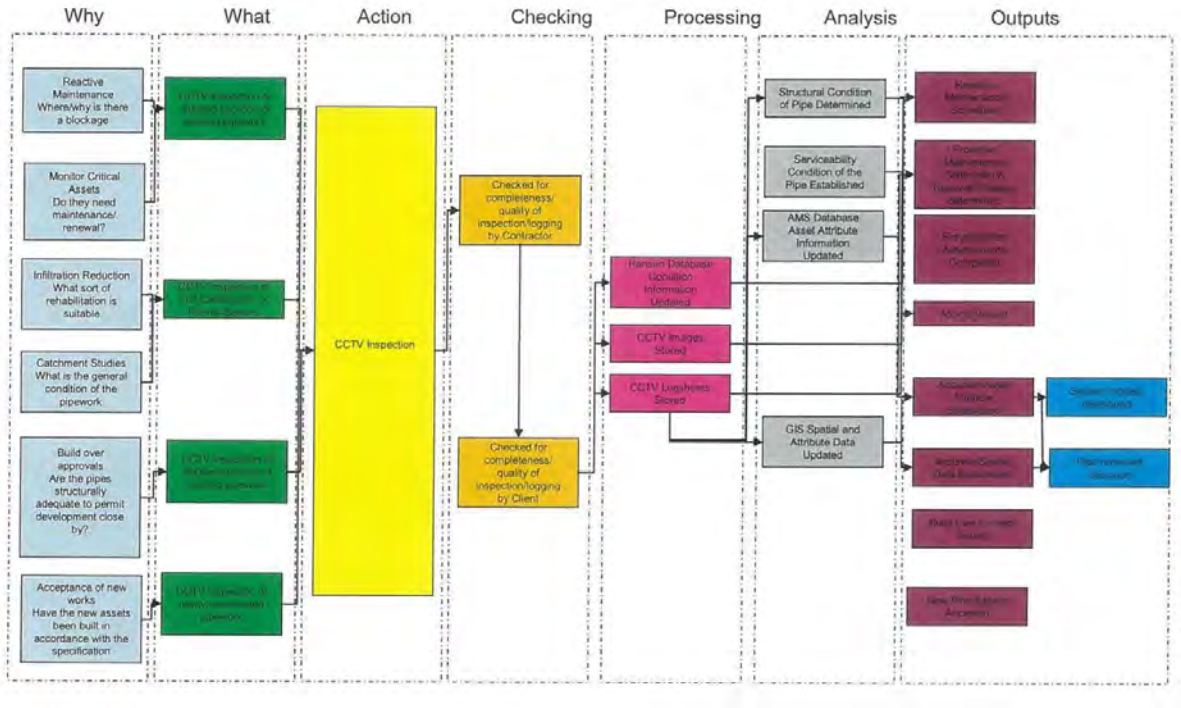
A CCTV inspection provides information for asset management, maintenance and rehabilitation purposes. CCTV inspections view the condition of assets, and provide information on attributes. Condition data can be used to:

- 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 wastewater and 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 backed up daily and backup files are stored in a secure place. Data manuals are available that explain the various procedures.

5.6 AMP Preparation

Council engaged Waugh Infrastructure Management Ltd (WIML) to assist with the review and update of the AMPs. The review consisted of the following analysis:

- Review of Council's Utilities AMPs against general industry practice as observed by Waugh Infrastructure in the past 12 months
- Review and commentary on the adequacy of the AMP structure against current industry practice and requirements
- Analysis of AMP individual section strengths and emphasis, including analysis of overall AMP 'message' versus issues identified
- ISO 55000 considerations in AMP updating, structure and messaging
- Analysis of the AMPs against LGA amendment requirements, both 2012, and 2014 – identification of any issues or 'misses'
- Provide review comments of AMP strengths and weaknesses identified, with commentary on any suggested priority changes to be completed as part of the 2018 LTP process

Following the review Council engineers consider review recommendations and use these as guidance where appropriate. The AMPS are then updated through a process of regular meetings between Council engineers and WIML staff to identify:

- Status and changes, including but not limited to:
    - Legislation
    - Levels of Service
    - Assets
    - Processes & Systems
    - Demand & demographics
    - Organisation
    - Asset Values
    - Projects
    - Council direction

This information is then used to ensure the AMP demonstrates:

- all 3 Waters (water, wastewater and stormwater) asset based activities of Council are supported through the AMP
- 3 Waters (water, wastewater and stormwater) AMPs are easy to read, and follow the same agreed format
- the underlying activity management planning processes occurring for each activity, including improvements made as a result of the review
- 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 (water, wastewater and stormwater) 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 activity 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 use iPads in the field to check and capture data for updating the asset registers. This information is confirmed by Council staff prior acceptance into the asset register.

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

Competitively tendered contract is entered into approximately every five years to deliver the maintenance of this activity. 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

Council uses established procedures during the project evaluation and design phases. The 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 the Council 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 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 engineering staff have qualifications, skills and experience that are adequate and appropriate for carrying out the asset management function of the Council, provided specialised external support is available as the need arises.

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 is on more holistic approach to 3Waters management including improved management of stormwater. Regional Councils are imposing tighter discharge consent conditions to ensure appropriate management of discharge quality and methods. Increasing conditions will lead to a need for investment in additional infrastructure.

The LGA requires local authorities to take a sustainable development approach. 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. 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
- Discharges are consented
- Efficient operation of facilities
- Improving discharge 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. SCADA is a good example in the 3Waters area. Investigation of options found the best option to be part of the existing Timaru District Council SCADA system.

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
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 discharges which may enter water 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 discharge permits that are presently held:

System	Consent #	Description	Expiry Date
Fairlie	No resource consents		
Lake Tekapo	CRC042748	Sealy Street Discharge - to discharge stormwater to water from the low lying area at the eastern end of Sealy Street by	18 February 2040

System	Consent #	Description	Expiry Date
		way of open drain along Murray Park and pipe along Sealy Street into Lake Tekapo	
	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
Lakeside Drive			
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

5.9.2 Consent Monitoring and Reporting

Consent reporting for Water, Wastewater and Stormwater is the responsibility of the Utilities Manager. Information for consent compliance is provided by the Council's Regulatory Department and the Contractor (information drawn from SCADA) and forwarded 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.

Compliance with the LWRP will be a major focus for the stormwater activity. Investigations into the specific application of the LWRP to each stormwater system within the Mackenzie District and potential issues, options and recommended solutions following from the development of Stormwater Management Plans is required. This is included as an Improvement item (**IP 2**). The Stormwater Management Plans programmed for completion during the 2017/18 year will determine what treatment upgrades, if any, are required and the associated timeframes.

The LWRP and its implication is also discussed in Section 7.5.1 under Upcoming Issues.

6.0 LEVELS OF SERVICE

6.1 Defining the Levels of Service

Activity 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 Council's 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 Council 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

The Council's mission statement is: "**FOSTERING OUR COMMUNITY**". The particular aspects of the overall mission that relate to the stormwater activity are:

SERVICE
We are a service organisation. Providing efficient and cost-effective services is our prime responsibility.

SUSTAINABILITY
We are committed to the sustainable management of all the resources of the district.

6.2.2 Stormwater Activity Goal and Principal Objectives

As outlined in Council's 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.

Local authorities are required to use a set of mandatory 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.

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 LGA, 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.

The 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
A fit and healthy community	Manage flooding events in urban areas	System adequacy – the stormwater system is adequately sized and maintained	Number of flooding events
Safe, effective and sustainable infrastructure	Timely response to service requests and system failures	Response times – flooding from events from the stormwater system are promptly attended to	Response & resolution
An attractive and highly valued natural environment	Providing a stormwater service that acknowledge and incorporates the natural environment in design, construction, operation and maintenance	Discharge compliance – the s/w system is managed in accordance with consent conditions	Compliance with resource consent conditions Response & resolution
A thriving economy	Council priority is maintaining quality and continuity of stormwater services	Customer satisfaction – the s/w system is managed to an appropriate quality of service	Response & resolution Number of complaints
A democracy that upholds the rights of the individual	Not applicable to stormwater		
A supportive and contributing community	Not applicable to stormwater		

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.

6.3.3 Secondary Levels of Service

These are technical measures included in the Infrastructural Services Contract.

Council 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

The Council 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	Sumps – detritus in sump shall be the lesser of not exceeding 50mm in depth or be closer than 50mm to outlet invert Cleaned out at least twice a year. Cut out Drains – Water flows freely from outlet into target discharge structure Water flows freely from open drain into pipeline or inlet structure No structural damage	24hrs for routine clearing 2hrs to relieve surface flooding 4hrs for matters advised as urgent by Engineer Inspected at least 6 monthly 48hrs to clear blockages Inspected at least 6 monthly 48hrs to clear blockages

6.4 Levels of Service Development

The current LOS being provided has been established through Council's previous LTP processes. 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.

6.4.1 Levels of Service Definition

The current LOS are documented as a combination of:

- LTP LOS documentation based on 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.

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 (Water, Wastewater, and Stormwater) and Flood Control that came into force on 1 July 2014.

These mandatory performance measures have been adopted by Council for inclusion in the 2018-28 LTP and no other measures will be used.

Levels of Service	Performance Measure	Actual 2013/14	Targets 2015/16	Targets 2016/17	Targets 2017/18	Targets 2018-2025
System adequacy – The stormwater system is adequately sized and maintained.	The number of flooding events that occur in the district.*	Nil	Less than or equal to two flooding events.	Less than or equal to two flooding events.	Less than or equal to two flooding events.	Less than or equal to two flooding events.
	For each flooding event, the number of habitable floors affected (per 1000 properties connected to the Council's stormwater system)*	Nil in 2013/14. There were no reports of flood water entering houses.	Less than or equal to two per flooding event, per 1000 properties connected to the stormwater system.	Less than or equal to two per flooding event, per 1000 properties connected to the stormwater system.	Less than or equal to two per flooding event, per 1000 properties connected to the stormwater system.	Less than or equal to two per flooding event, per 1000 properties connected to the stormwater system.
Discharge compliance – The stormwater system is managed in accordance with consent conditions.	Compliance with the Council's resource consents for discharge from its stormwater system, measured by the number of abatement	New measure	Nil abatement notices Nil infringement notices Nil enforcement orders Nil convictions	Nil abatement notices Nil infringement notices Nil enforcement orders Nil convictions	Nil abatement notices Nil infringement notices Nil enforcement orders Nil convictions	Nil abatement notices Nil infringement notices Nil enforcement orders Nil convictions

Levels of Service	Performance Measure	Actual 2013/14	Targets 2015/16	Targets 2016/17	Targets 2017/18	Targets 2018-2025
	notices, infringement notices, enforcement orders, and convictions*					
Response times – Flooding events from the stormwater system are promptly attended to.	The median response time to attend a flooding event, measured from the time that the Council receives notification to the time that service personnel reach the site*	100% of events were responded to within one hour	2 hours, including travel time to remote parts of the district.	2 hours, including travel time to remote parts of the district.	2 hours, including travel time to remote parts of the district.	2 hours, including travel time to remote parts of the district.
Customer satisfaction – The stormwater system is managed to an appropriate quality of service.	The number of complaints received by the Council about the performance of its stormwater system, expressed per 1000 properties connected to the stormwater system.*	New measure	Less than five complaints per 1000 properties connected to the stormwater system.	Less than five complaints per 1000 properties connected to the stormwater system.	Less than five complaints per 1000 properties connected to the stormwater system.	Less than five complaints per 1000 properties connected to the stormwater system.

* Mandatory Performance Measure

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.

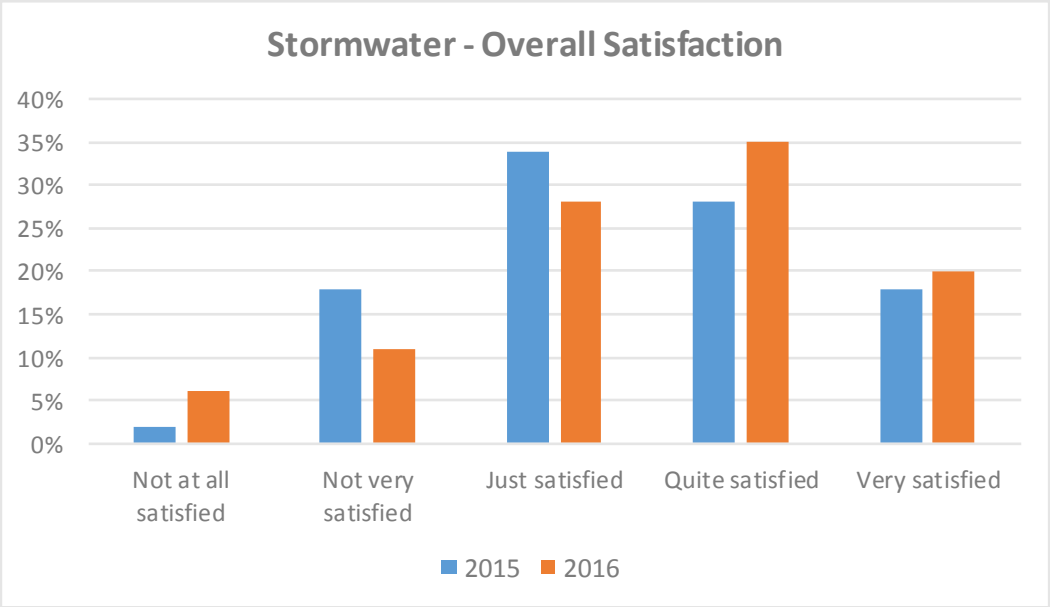
6.7 Reporting

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 2016 provides useful commentary on issues that concern residents.

Figure 6-1: Stormwater Service - Satisfaction Rates



The survey identified that 83% of the respondents were satisfied with the overall stormwater activity. This is a 3% increase in satisfaction levels from the 2015 survey. Dissatisfaction responses included 'water lying around sometimes' and 'drains need cleaning out more often'. 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.

Reporting on the achievement of Customer Levels of Service can be compared across different activity groups to provide internal benchmarking within Council, and combined to provide an indication of the contribution towards community outcomes and well-beings. Stormwater among others such as water quality and swimming pools had the largest increases in satisfaction since 2015.

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 LGA. This occurs in the following situations:

- Adopting or amending the 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, 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 may require amendments to the LTP.

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 may be identified and notified 72 hours prior work affecting their service
- use of facebook page or website

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

6.8.3 Key Stakeholders

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

- Extensive public consultation
- Customer surveys
- Project teams for specific significant community projects
- Council website/facebook page

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 stormwater services the Council monitors central government and industry direction for 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.

The following themes are signalled:

Theme	Source
Information • how local authorities identify the right information that provides the evidence on what they need to understand about their assets, and how they collect, capture, and share that information? • how well local authorities are managing and planning to provide services now and into the future? • how good is the knowledge on asset condition and how is it used to determine the nature and frequency of maintenance and renewals? • how is asset information used to make decisions and enable sustainable service delivery?	Office of the Auditor General (multi-year themed work programme 2016/17)
Water *Our proposed theme for 2017/18 is Water. We are interested in water because it is of significant and growing interest to Parliament and citizens here and internationally, in terms of both water quality and quantity. It is a broad topic that spans central and local government, the environment, the economy, and society.* *It therefore provides a focused and useful introduction to our proposed 2018/19 theme of Sustainable development. We are currently considering the scope of work under our proposed sustainable development theme. (*Source – OAG 2016/17 Annual Plan*)*	Office of the Auditor General (multi-year themed work programme 2017/18)
Improving New Zealand's Water, Wastewater & Stormwater Sector A position paper prepared by LGNZ identifies three areas for improvement within the Water Service area: • increasing need to renew and replace assets, • Service providers are being asked to meet higher standards of quality • There is not enough information on performance	Local Government NZ
Metadata Standards To ensure the correct asset data is collected and in the correct manner, LINZ and MBIE gained funding from Treasury to work with local councils and central government agencies to develop national metadata standards for the 3-waters (potable, waste and storm) network, and for residential and light commercial buildings. Draft standards have been developed for capturing, describing and storing data for potable water, and residential housing and light commercial buildings. The roll out of these data standards is expected to start mid 2017.	LINZ & MBIE
Earthquake damage & pipe renewals The 2011 Canterbury earthquake has led to a major project which could impact on cost of replacing water pipes. A joint venture between Water New Zealand, the Institute of Public Works Engineering Australasia (IPWEA) and the Quake Centre based at Canterbury University, is aimed at providing tools to enable better and more nationally consistent decisions on where and how to renew and replace water piping. This venture may result in significant savings through improved decision-making. The first stage aims to bring together guidance documents and tools to enable Council staff to make evidence based decisions relating to the management and renewal of their drinking, storm and wastewater pipe networks. The programme covers inspection, maintenance and renewal strategies	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 (RMA).

National Infrastructure Plan

The National Infrastructure Plan 2015 (NIP 2015) is the third National Infrastructure Plan to be released by the Government.

The NIP 2015 confirms the Government's long term vision for infrastructure and is designed to reduce uncertainty for businesses by outlining the Government's intentions for infrastructure development over a 20 year timeframe. It provides a framework for infrastructure development rather than a detailed list of projects and it includes a series of actions.

The NIP provides the following vision for New Zealand's Infrastructure: *By 2045 New Zealand's infrastructure is resilient and coordinated and contributes to a strong economy and high living standards*.

The NIP 2015 is the first Infrastructure Plan that details a comprehensive suite of actions that will be undertaken to deliver on this approach. The actions are focussed on what central government, local government and infrastructure peak bodies will do, reflecting the collaborative effort required to change how infrastructure is planned, developed and managed in New Zealand. Significant policy work and consultation will be required to develop the detail. The following list of actions are taken from the NIP 2015.

The Action Plan for **Asset Management** means:'

- Local government will have a long-term view of their investment requirements to make more informed decisions. The Local Government Amendment Act 2014 is a step towards this, requiring an infrastructure strategy for at least a 30-year period;
- Infrastructure providers will develop a more sophisticated approach to understanding the condition of those assets, the timing of renewals, and how they are performing in comparison to similar networks. This be will progressed through the establishment of shared metadata standards across roading, the three waters (water, wastewater and stormwater), and government built assets
- Infrastructure providers will be able to understand how their networks interact with other infrastructure networks as well as the implications for land use planning and the end user of infrastructure services.
- Individual sectors will progress specific programmes to improve their asset management maturity including:
- the establishment of a programme to enhance the capability, productivity and leadership in asset management throughout the public sector in New Zealand by IPWEA New Zealand and the NIU;

The Action Plan for the **3 Waters** (water, wastewater and stormwater) means:
The sector will be recognised for its mature asset management practices across all providers, underpinned by reliable and accurate data on the state and performance of the network to support better decision-making. A key focus is optimising the existing three waters (water, wastewater and stormwater) network. This will be achieved through:

Developing national metadata standards for water infrastructure to ensure a consistent base to build evidence, undertake forecasting, deepen capability (LINZ, NIU, local authorities, and sector bodies).

- Establishing centres of excellence responsible for collating the data obtained through the shared metadata standards, providing the necessary analytics and supporting local decision-making (NIU, sector bodies, and local authorities).
- EquiP LP, Local Government New Zealand's centre of excellence, is developing a Governance Development programme and an Organisational Performance programme to assist councils in raising the standard of governance, performance and asset management (LGNZ).
- The LGNZ 3 Waters (water, wastewater and stormwater) project to lift the performance of our potable water, wastewater and stormwater services and infrastructure. The project established a National Information Framework survey in 2014 and the issues paper released in October 2014 explores the issues facing New Zealand's three waters (water, wastewater and stormwater) sector. LGNZ will be releasing a position paper in 2015 to outline what a well

performing three waters (water, wastewater and stormwater) sector should look like and propose options for a sector led approach to improving performance in the future.

Infrastructure providers collaborate more effectively within and across regions, taking a long-term view and ensuring adequate investment in high-growth communities. This will be achieved through: Investigating options to support long-term integrated regional infrastructure plans, potentially with legislative recognition incorporating central, regional and local government objectives (NIU).

- Recognising the importance of aligning infrastructure delivery with planning
- Investigating how to manage water, wastewater and stormwater services across the subregion

National Policy Statement for Freshwater

The National Policy Statement for Freshwater Management 2014 (NPS-FM 2014) sets out the objectives and policies for freshwater management under the RMA.

The NPS-FM 2014 came into effect on 1 August 2014.

The NPS-FM is one of the initiatives developed as part of the Government's programme of water reform. The NPS-FM:

- requires regional councils to set freshwater objectives for fresh water, and provides a process for setting them
- requires councils to account for freshwater takes and contaminants, which will provide information for setting and managing to freshwater objectives and limits
- provides for Councils to set the limits and methods which will affect how water is used, and this may require water resources users to adjust their practices
- requires regional councils to involve iwi and hapū in the management of fresh water, and to work with them to identify tāngata whenua values and interests, and reflect these in the management of, and decision-making about, fresh water.

National Policy Statement for Urban Development Capacity

The National Policy Statement on Urban Development Capacity 2016 (NPS-UDC) sets out the objectives and policies for providing development capacity under the RMA.
The NPS-UDC came into effect on 1 December 2016.

The NPS-UDC 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 NPS-UDC contains objectives and policies that local authorities must give effect to in their resource management decisions that provide direction on:

1. the outcomes that urban planning decisions should achieve
2. the evidence underpinning those decisions
3. responsive planning approaches
4. coordination between local authorities and providers of infrastructure.

Within these four, the NPS-UDC targets the more challenging requirements for urban areas experiencing the most significant growth.

The New Zealand 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.

Local Government Regulation
During May 2012 and inquiry was commissioned to contribute to the Government's 'Better Local Government' initiative to improve the legislative framework for New Zealand's councils.
The Commission was asked to:

- develop principles to guide decisions on which regulatory functions are best undertaken by local or central government;
- identify opportunities to improve the regulatory performance of local government; and
- recommend options for regularly assessing the regulatory performance of the local government sector.

Amongst the Commission's recommendations for improving regulation are:

- a tool for helping to decide what regulations, and which parts of implementing regulation, are best performed by Government or councils;
- use of standardised formats and increased transparency to better demonstrate how key council regulatory decisions have been made;
- more focus by government departments, when preparing new regulation intended to be implemented by councils, on the costs and benefits of the proposed regulation, where those costs and benefits will fall, whether or not councils have the capability and capacity required to effectively implement the new regulation, and the likely costs of building that capability and capacity where it does not exist;
- the development of a 'Partners in Regulation' protocol to better guide Government/council engagement;
- the development of new or enhanced joint Government/council forums for overseeing improvements; and
- greater use of risk-based approaches to monitoring and enforcement of regulation by councils, together with enabling greater use of infringement notices to support regulations in place of more costly formal prosecutions.

Urban Planning
During 2015 the Productivity Commission was tasked to look at ways of improving New Zealand's urban planning system. This is a follow up on the Commission's findings that New Zealand's urban planning laws and processes were unnecessarily complicated, slow to respond to change and did not meet the needs of cities.

The report found the following deficiencies:

- the current planning system is slow to adapt and is risk averse.
- Processes for updating land use rules are slow and uncertain.
- There is too much unnecessary, poorly-targeted regulation.
- Resistance to change from local residents and barriers to funding new infrastructure also inhibit a city's ability to grow and respond to change.
- Ambiguous and broad language in current planning laws has led to overly restrictive rules in urban areas, 'scope creep', and an under-emphasis on the natural environment.
- The relevant primary legislation does not give prominence to urban issues, and it is difficult to set clear priorities for the natural environment.
- The lack of central government guidance has led to decisions that suit local interests, but which have negative wider impacts such as rising land and housing prices.

The report recommends:

- a more restrained approach to land use regulation,
- infrastructure that is delivered at the right time and at the right place, and
- infrastructure pricing and funding that more accurately reflects actual costs, use and impacts.

- a clearer distinction between the built and natural environment and unambiguously state the important priorities, especially at the national level.
- stronger professional capabilities at both the local and central government level is required, along with an organisational culture that is fit for purpose to meet the new demands of a future planning system.
- a different relationship between both levels of government will be required, one that is based on mutual understanding, collegiality and effective interactions, as both are mutually dependent on each other for their success.

It is important for Council to stay abreast of any local government related inquiries conducted by the Productivity Commission. These may inform or effect policy changes from central government.

6.9.2 Key Legislation

Council must comply with any relevant legislation enacted by Parliament. 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 stormwater 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. 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

Local Government Act 2002
The LGA 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. It also contains provisions relating to Council infrastructure, funding, and governance.

Local Government Act 1974
Part XXVI Wastewater and Stormwater, sections 440-469 provide council with authority to construct, maintain and operate the wastewater 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
This Act governs discharges of water and contaminants to land and/or water. Resource consents obtained for discharge activities often require parameters such as volume and quality to be monitored as well as mitigation of any adverse effects that may occur through the activity.

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.

The initial KPI data identified several issues including a lack of consistency, along with the fact that not all reporting entities had sent in their returns, meaning that any comparisons were incomplete. The situation was exacerbated by the fact that only 1 year's results are available, with any real value to come from analysis of changing trends over time. Refining of the data collection requirements will be a major focus moving forward, resulting in a more comprehensive reporting and analysis to be provided following the receipt of 2016-17 KPI data.

6.9.3 Standards, Codes of Practice & Guidelines

National Environmental Standards
National environmental standards are regulations issued under the RMA (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.

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

Canterbury Land and Water Plan
The Land & Water Regional Plan (LWRP) is a planning framework for Canterbury which aims to provide clear direction on how land and water are to be managed and help deliver community aspirations for water quality in both urban and rural areas.

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

6.9.5 Council Strategies, Plans, Bylaws and Policies

Mackenzie District Council Long Term Plan
The LGA requires local authorities in New Zealand to prepare a LTP that sets out Council's intentions over a ten-year period. The Act is prescriptive as to 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. Stormwater is considered to be a significant/core activity.

The LTP 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 LTP 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 LGA 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 requires the Council to have at all times a District Plan for its District.

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. 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
The LGA requires that a local authority must prepare and adopt, as part of its LTP, 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 LGA 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

At the time of writing no Section 17A review has been completed.

Activity Management Plans

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

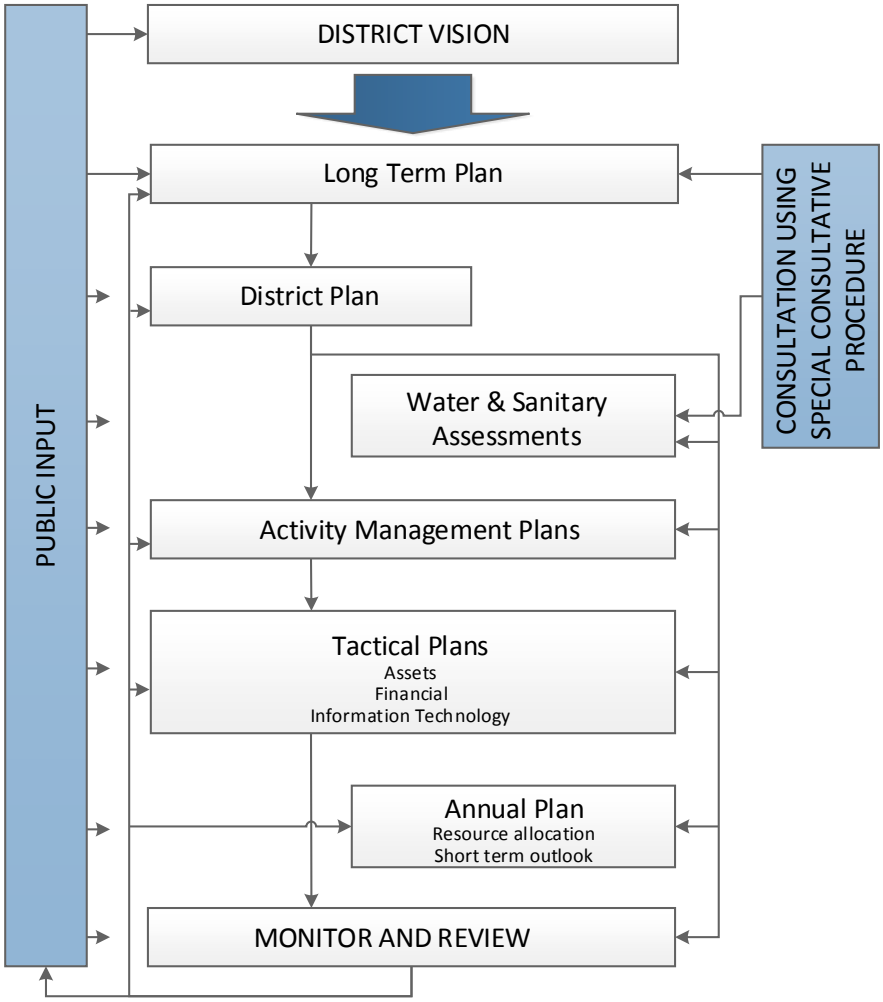
AMPs are a key component of Council's planning process. They are prepared within the context and framework of the LTP, District Plan, Annual Plan and Funding Policy. Figure 6-2: Corporate links to AMPs depicts the links and information flows with the AMP, other corporate plans and public consultation.

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 is a supporting document for the Council's LTP 2018-2028.

Figure 6-2: Corporate links to AMPs



This AMP is intended to be read in conjunction with the LTP and fulfils requirements of the LGA – 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; the Council has developed a suite of AMPs for its Core Infrastructural Services. 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

There is no bylaw that applies to the Stormwater service.

6.9.7 Policies

Significance and Engagement Policy 2014
The purpose of the Council's Significance and Engagement Policy is:

- 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 stormwater reticulation systems at Fairlie, Lake Tekapo and Twizel as strategic assets.

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 Councils 3 Waters (water, wastewater and stormwater) Systems.

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

7.3.1 Growth Trends –

Population Projections
Mackenzie's population growth is expected to follow the medium projection issued by Statistics NZ in December 2016. It is anticipated that over the next ten years (2018-28) Mackenzie District will have a

growth in population of around 13%, from around 4,300 at present to .4,880. Like much of New Zealand, the proportion of people aged 65 years and older will grow within the district. It is anticipated that projected population growth will not impact significantly on the operation and maintenance of our stormwater activity.

Household Growth
It is projected that over the next ten years Mackenzie District will have:

- A growth in household numbers consistent with the population growth trajectory;
- Household numbers are projected to increase to 2,200 (+16 per cent) by 2028 (Statistics New Zealand) - the higher percentage increase in households relative to population increase in 2028 reflects a projected increased in single person households;
- With a greater number of older people living alone, a reflection of structural ageing, one-person households are projected to increase by 15 percent by 2028 (Natalie Jackson Demographics Ltd, Sept 2014);
- Future demand in the Mackenzie District will be increasingly driven by one-person households and couples without children, characteristic of population ageing.

Development
Analysis of the future urban and rural residential subdivision over the next 4 years shows an average of 10 sections per year, along with associated infrastructure, to be vested in Tekapo and an average of 46 per year in Twizel.

During the 2015/17, 843m of stormwater network, including sumps and manholes, was vested in Council. Whilst developers have to construct this to Councils standard before vesting the ongoing maintenance and depreciation costs have to be allowed for.

Initially it is assumed that the level of development experienced during 2015-18 would slow down to about a third of this but this has proved not to be the case.

7.3.2 Economic Changes -

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.

Tourism
Mackenzie has experienced unprecedented growth in visitor numbers (both domestic and international) in recent years. However tourism growth is not expected to impact on Council's stormwater activity. The influx of domestic holiday-makers into the district has little impact on the stormwater network. 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.

7.3.3 Climate Change

The Mackenzie District is likely be affected by climate change. In preparing the LTP, the Council has reviewed Ministry for the Environment climate reporting[2] and regional projections calculated for the

[2] Ministry for the Environment & Stats NZ (2017). New Zealand's Environmental reporting Series: Our atmosphere and c*limate 2017*. Retrieved from www.mfe.govt.nz and www.stats.govt.nz.

period from now to 2100[3]. The LTP assumes that climate change is happening, and while the impacts are expected to be relatively minor within the period covered by the Plan, they will increase in future.

Influences of climate change on our stormwater activity and possible effects are outlined below.

Function	Affected Assets or Activities	Key Climate Influences	Possible Effects
Stormwater	Infrastructure	– Increased frequency & severity of extreme weather events (rainfall)	– Increased frequency and/or volume of system flooding, increased surface flooding and stormwater flows. – Increased peak flows in streams and related erosion – These events, coupled with increasingly frequent winter floods will result in changes in flood plains and a greater likelihood of damage to properties and infrastructure.

7.3.4 Improvements to Levels of Service

Changes in Customer Expectations
In recent years there has been an increasing awareness by the community of 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 3 are considered to be representative of the service demands of the current and the future community.

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.

National Infrastructure Plan
Refer to Section 6.9.1 detailing the National Infrastructure Plan and the implications for Asset Management and the 3 Waters (water, wastewater and stormwater) Utilities.

Financial Contributions
Financial Contributions are another means of funding network infrastructure, reserves or community infrastructure. The 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:

[3] Ministry for the Environment (2016). *Climate change projections for New Zealand: Atmosphere projections based on simulations undertaken for the IPCC 5th assessment*. Retrieved from www.mfe.govt.nz.

(Asset Valuation – Debt Loading)/the number of connectable properties to the Scheme

For 2017/18, the financial contribution payable on each lot created at the time of subdivision is calculated at $1,442. This amount is GST exclusive.

The financial contribution figures are reviewed annually.

Canterbury Land and Water Plan (LWRP)

Clause 5.93 states:

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.

7.4 Demand Impacts on Assets

Overall implications for the network of continual demand for improvement in levels of service 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 limited ratepayer base to fund Council's contribution to the 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 run off.

There are minimal asset based demand options that do not have a significant cost attached.

Upcoming issues during the next ten years

The LWRP is a key driver for the stormwater activity, as its provisions impose increased environmental requirements for stormwater discharges.

Discharges to ground or waterways require resource consent. Council may apply for global stormwater discharge consents where appropriate. The Council will be liable for any non-compliances with the resource consent. Where the consent outcomes are not being met, Council will ensure every individual under the consent takes responsibility for stormwater management through appropriate methods, such as policy and guidelines.

Compliance with the LWRP will be a major focus for the stormwater activity. Investigations into the specific application of the LWRP to each stormwater system within the Mackenzie district and potential issues, options and recommended solutions (following the development of Stormwater Management Plans) is required. This is included as an Improvement item (**IP 2**).

Fairlie
Both stormwater lines in Princes Street (west of Alloway Street) and Regent Street (complete length) have only limited life remaining.

The Princes Street main is made up of various pipe systems, being an old ditch filled in with various pipe systems that allow tree root intrusion and block accordingly.

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/Sloane Street storm water pipe in 2018/19 to assess its condition. Depending on the results of that inspection it may be necessary to programme replacement sometime in the next 10 years.

In terms of the roading programme, there is a possibility that both streets may be upgraded within the next two years. This may result in timing issues, with the possibility of the Council having to replace the pipe early or delay the upgrade work on the west side of the street until the replacement is complete.

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

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 resource consent is a developer owned resource consent and will remain in the name of the developer until the assets are vested in Council and the consent transferred.

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 2019/20.

The likely upgrade to meet the requirements of the LWRP 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.

Twizel
To meet the requirements of the LWRP by 2025, improvements identified in the Stormwater Management Plan presently being developed should be implemented in 2024.

It is suggested that the only site that will require improvements is the discharge from Glen Lyon Drive, and the likely upgrade would be the installation of a Humeceptor on the outfall. This is programmed for 2023/24 at an estimated cost of $30,000.

The 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 the Council 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

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 the Council 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 changed over time. Traditionally, the stormwater systems were built to collect and convey stormwater, with the objective being rapid disposal. 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 has introduced a new range of issues that has resulted in basic changes in stormwater planning, design, operation and maintenance, construction, and financing. Costs associated with managing increased expectations have increased. The Council's focus is 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.

The following table details proposed capital requirements for the period 2018/19 to 2027/28. It can be seen that the new capital is primarily driven by environmental compliance.

Table 7-1: Stormwater Capital Projects

				Current LTP cycle			2018 -2028 LTP period									
				Financial Year												
	Stormwater System	Project	Funding	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
Capital Projects	Fairlie	Management plan	Capital	x	x	x	x	$2,000	x	x	x	x	x	x	x	x
	Lake Tekapo	Management plan		x	x	x	x	$5,000	x	x	x	x	x	x	x	x
	Fairlie	Humeceptor		x	x	x	x	x	x	x	x	x	x	x	x	$15,000
	Tekapo	Humeceptor		x	x	x	x	x	x	x	$30,000	x	x	x	x	x
	Twizel	Management plan		x	x	x	x	$5,000	x	x	x	x	x	x	x	x
	Twizel	Humeceptor		x	x	x	x	x	x	x	x	$15,000	x	x	x	x
	Total			**$0**	**$0**	**$0**	**$90,000**	**$12,000**	**$0**	**$0**	**$30,000**	**$15,000**	**$0**	**$0**	**$0**	**$15,000**
Renewals	Fairlie	Old timber systems	Depreciation	x	x	x					$40,000					
	Fairlie	Regent Street - Steel pipe		x	x	x	$15,000									
	Tekapo	Revegetate Lochinver		x	x	x		$10,000								
	All schemes	Revaluation	Depreciation	x	$20,751	x		$20,751			$20,751			$20,751		
				x	x	x										
	Lake Tekapo RC Renewal	CRC146447		x	x	x										
	Lake Tekapo RC Renewal	CRC042748		x	x	x										
	Lake Tekapo RC Renewal	CRC141077		x	x	x										
	Twizel RC renewal	CRC042742		x	x	x										
	Pukaki Airport RC	CRC081120		x	x	x										
	Total			**$0**	**$20,751**	**$0**	**$15,000**	**$30,751**	**$0**	**$0**	**$60,751**	**$0**	**$0**	**$20,751**	**$0**	**$0**
	GRAND TOTAL			**$0**	**$20,751**	**$0**	**$105,000**	**$42,751**	**$0**	**$0**	**$90,751**	**$15,000**	**$0**	**$20,751**	**$0**	**$15,000**

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

The Council is responsible for providing a safe work environment for its staff and public. The Council has aligned its Health and Safety practices with the Health and Safety at Work Act 2015. A voluntary Health and Safety group meets regularly, acting as a point of contact for staff, providing feedback to management on any issues, carrying out some monitoring and audit duties in relation to the Council office buildings. Health and safety is also a standing item on the Audit and Risk Committee agenda and at management meetings.

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, Council's Health and Safety Manual and their own health and safety plans.

8.3.4 Business Continuity Plan

No business, financial & operational continuity plan has been developed for the stormwater 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 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 plans.

The Canterbury CDEM Group Plan (June 2014) 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.

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

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.

Emergency response planning in New Zealand, and most other comparable nations, takes an “all hazards” approach, where response resources and coordination arrangements are assumed to be sufficient to meet the needs of any hazard that might occur. The “all hazards” planning provides broad and solid basis for response planning, but it lacks specificity about the sorts of impacts and consequences that individual, large-scale or complex hazards, like major earthquakes, will bring with them, or the community, organisation, and government agency responses that are likely to be required to reduce damage, loss or suffering.

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. Council will continue to monitor results from the project and any response actions.

8.4 Resilience

Council 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.

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 keeps a $3M cash reserve balance to part fund any repairs and would rely on central government assistance for repairs as a result of any natural event. In addition, Council is relying on its strong balance sheet to borrow sufficient funds to replace those assets in the unlikely event that there is widespread damage to those assets.

8.6 Assumptions and Uncertainties

The LGA Schedule 10, Part 1 (11) requires the Council to clearly define 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

Assumption	Level of uncertainty *(High/Medium/Low)*			Risk	Impact of variation to assumption	Management of risk
	H	M	L			
Population Growth It is assumed that growth in the district's population will generally be consistent with the medium projections issued by Statistics NZ in December 2016, which are that the district's population will grow by a little over 4 percent from 2018 to 2028 (from 4680 to 4880 people). It is not expected that this level of population growth will have any significant impact on demand for infrastructure or services.		✓		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 deliver some services to existing 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 Mackenzie 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.
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.

Assumption	Level of uncertainty *(High/Medium/Low)*			Risk	Impact of variation to assumption	Management of risk
	H	M	L			
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 (75%) and Twizel (66%), 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.
Tourism Growth It is assumed the average growth in international visitors to Mackenzie District will be at least equivalent to, or greater than, the growth in international visitors forecast for New Zealand over the coming ten years (an average increase of 5.4% per annum). This is based on current data which indicates growth in international visitors to Mackenzie District is occurring at a rate higher than the national average and forecast growth. It is also assumed growth in domestic visitors to Mackenzie District will continue to occur at a rate similar to international visitor numbers. However, there is more uncertainty around this assumption based on the lack of current domestic visitor survey data.		✓		Change to tourism 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.
Climate Change It is assumed that climate change is happening, and the Council will take into account the predicted impacts of climate change as it plans, builds and renews its infrastructure. The impacts are expected to be relatively minor within the period covered by the Long Term Plan, but increasing in the future.		✓		There is a risk that climate change will happen more quickly than expected and require changes to the Council's activities.	If climate change happens more quickly, the Council may need to carry out work on its infrastructure assets. Additional costs may be incurred to mitigate impacts. Council's business units may not recognise climate change in the delivery of their services. Decisions made now without these	Council activities will build appropriate mitigation responses into resilient infrastructure development. The Council will continue to monitor climate change science and the response of central government and adapt its response where required.

Assumption	Level of uncertainty *(High/Medium/Low)*			Risk	Impact of variation to assumption	Management of risk
	H	M	L			
					considerations may have intergenerational effects on land use decisions, environmental policy and infrastructure decisions e.g. relying on undersized assets and resources in highly vulnerable parts of the district.	
Natural Hazards / Local Natural Disasters It assumed that there will be no major adverse events during the period covered by this Long Term Plan. *Note: the district is at risk from natural hazards such as flooding, earthquake, and storms. These events can occur at any time, without warning.* 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.	The 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.
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.
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.		✓		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	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.	

Assumption	Level of uncertainty *(High/Medium/Low)*			Risk	Impact of variation to assumption	Management of risk
	H	M	L			
Council will continue to consider collaboration opportunities and assess changes to service delivery on a case by case basis.				prices will be higher than anticipated.		
Planning Horizons 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.		
Legislative Demands 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 review of legislation depends largely on the policy direction and priorities of the government of the day. While we anticipate changes to the Resource Management Act 1991 and Local Government Act 2002 during the life of this Long Term Plan, we have assumed that these and any other changes to legislation will not have a significant effect on our business. The LTP assumes that existing legislation will remain in place and that the structure and responsibilities of the Council will remain the same over the period covered by the plan. It also assumes the Council will remain an independent unit of local government during the next 10 years. The Council sees merit in continuing with shared services where this allows more efficient use of skills and resources.			✓	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, and the mechanisms required to fund any new services.

Assumption	Level of uncertainty *(High/Medium/Low)*			Risk	Impact of variation to assumption	Management of risk
	H	M	L			
Legislation Change – Development Contributions It is recognised that the ability to levy financial contributions under the Resource Management Act 1991 will be revoked, effective from 18 April 2022. Council will then recover development contributions. For financial forecasting purposes the Council has assumed that development contributions will provide a similar level of funding and outcomes to financial contributions when this change occurs.			✓	The ability to levy development contributions is not comparable to existing financial contribution provisions.	Council does not recoup costs associated with meeting infrastructure demands of development.	Council will review its Development Contributions and Financial Contributions policy prior 18 April 2022. This work will involve clearly determining the demand for services and the costs of meeting that demand.
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.		In preparing the LTP, the Council is required to use best estimates in determining the level of costs to be budgeted in the future. As a result, Council is required to account for the effect of price changes or inflation that is expected to occur over the ten year period. 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. 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. However, these costs will be mitigated through the annual plan process where the annual adjustment can be made.
Borrowing Borrowing costs are assumed to be as included in Financial Forecasts.		✓		Forecast interest rates on borrowing are	Council costs could increase or decrease as interest rates fluctuate up or down.	

Assumption	Level of uncertainty *(High/Medium/Low)*			Risk	Impact of variation to assumption	Management of risk
	H	M	L			
				higher or lower than forecast.		
Interest Rates Council assumptions on interest rates are based on the Official Cash Rate (OCR). 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.	Council is setting its internal funding interest rate six months in advance and holding it stable for the next twelve months. There is a risk its estimates may not correlate with external interest movements which may mean Council is not optimising its returns. However, Council believes that is outweighed by the certainty of internal return it can give to the capital reserves over the financial year.
Insurance It is assumed that an appropriate level of insurance will be secured by Council. There is less certainty that Central Government will provide a sufficient share for post event works. Underground assets will be partly self- insured and that sufficient emergency funding will be available from NZTA for damage to roading assets caused by extraordinary events. It is also assumed that increases in Insurance Premiums will be larger than CPI.	✓			There is a risk that insurance will be difficult to secure and that NZTA will not provide adequate emergency funding to reinstate damaged services. There is a risk that insurance premiums will rise more rapidly than expected.	Council's assets may not be able to be insured in a similar manner to the current approach and different options may need to be considered. This includes increasing reserve funds and higher excess sums. Premiums will exceed budget allocation and savings will be required in insurance policies or funds will need to be reallocated from other areas of expenditure.	
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.	If projects do not occur as planned, capital expenditure in any year may differ from that forecast and delay may also change the cost of individual projects.	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)*			Risk	Impact of variation to assumption	Management of risk
	H	M	L			
				Transport projects seeking subsidy will need a Business Case approach to NZTA which may change originally anticipated outcomes.		
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.	Planning of projects will take in to account compliance requirements.
Effects of Assets Vested to Council It is Council policy to accept the vesting of the assets in the year that the Council is able to rate the individual sections created. To determine the value of the assets to be vested, the Council made assumptions based on an analysis of the costs of recent subdivisions in the District. The average costs were assumed as follows: (TBC) • Roading (incl Footpaths) $5,406 per section; • Sewer $8,300 per section; • Stormwater $3,120 per section; • Water $5,500 per section. These amounts will be applicable to all three townships and the amounts will be multiplied by the numbers of urban sections created in each year to arrive at the total assets to be added to the Council's asset register. This will also be inflation-adjusted each year according to the BERL inflation forecasts as described in the assumption for inflation			✓ ✓	The assumption has based the level of assets vested to Council on an analysis of recent major subdivisions carried out in the District. Some subdivisions may not result in any further assets to be vested in the Council as there has already been adequate capacity provided for the new sections and some subdivisions may have a greater amount of assets vested into Council as there may be a greater per property		

Assumption	Level of uncertainty *(High/Medium/Low)*			Risk	Impact of variation to assumption	Management of risk
	H	M	L			
Each addition to the asset register will be depreciated by any appropriate depreciation charge. No vested assets will be applied to rural sections. To balance the books, the introduction of the asset value needs to be reflected in income, therefore, there will be a corresponding income line called "Vested Assets Income". This income will be treated the same as financial contributions as it is deemed to be capital income rather than operational income. The amount of this income plus the amount of the vested asset will be accounted for in the capital reserve of each asset.			✓ ✓ ✓	costs associated with the subdivision.		
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 and a full proposal with options to be considered would be provided to the community for feedback as part of a special consultation process.
Asset Revaluations The Council has a policy of revaluing its buildings, land and infrastructural assets on a three yearly basis. The Long Term Plan assumes that the book values of the relevant assets as at the revaluation dates will be increased by inflation rates as per the BERL inflation forecasts as described in the Inflation assumption above.			✓	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.	
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 than the lives assumed.		

Operational assets	Depreciation method	Life (years)	Operational assets	Depreciation method	Life (years)
Stormwater			**Resource consents**	Straight line	Over the life of the consent
Lines	Straight line	60-80			
Manholes	Straight line	15			
Open drains	Not depreciated	-			

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 programme 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 covers 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 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:

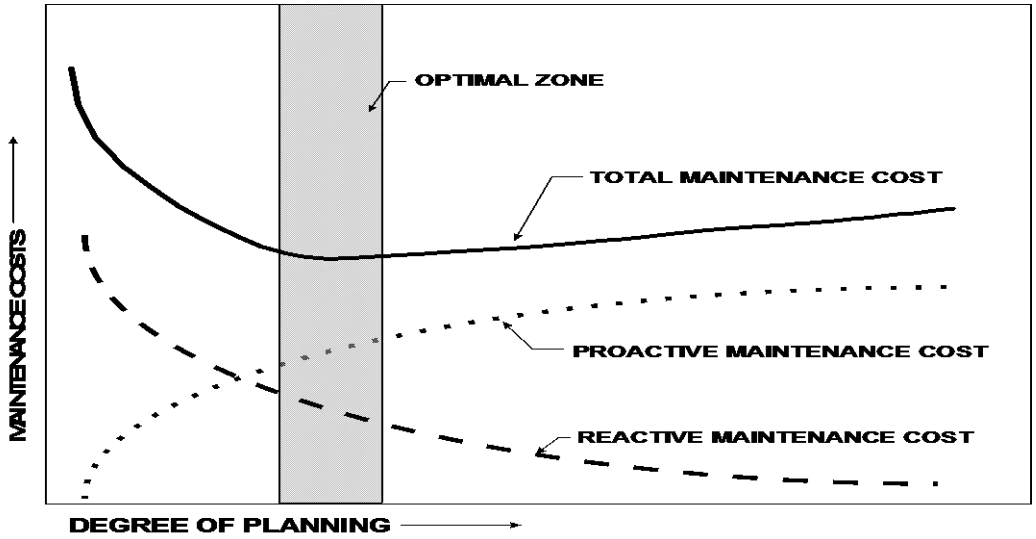
- Current trends and issues
- Maintenance decision making process
- Strategies required to meet levels of service
- How tasks are prioritised
- Summary of future costs
- Any deferred work and associated risks

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 activity 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
1213 - Utilities Services Contract 2013-2016	3+1+1	**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	Council	

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
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 Council 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?)

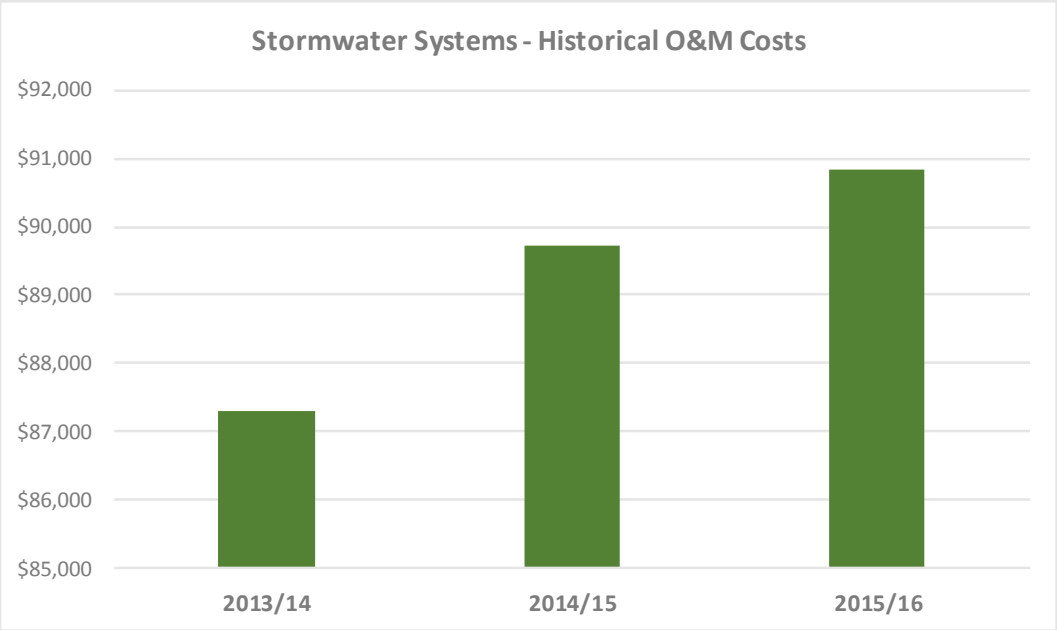
- improving drainage where storm events cause flooding problems
- stormwater entrance capacity to culverts
- conformity with standards (kerb and channel in all urban streets)

Overall the performance of drainage assets is adequate. The main concern is coverage with a number of urban streets without any kerb and channel. Most existing drainage assets are performing well and have been adequately designed. Some swale drains are still being developed.

9.3.6 Operation and Maintenance Costs

The average annual expenditure for operation and maintenance over the three years 2013/14 to 2015/16 equates to $89,288.

Figure 9-2: Historical O&M Costs



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
Council standards for replacement infrastructure are based on NZS 4404:2010. The O&M Contract specifies 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.

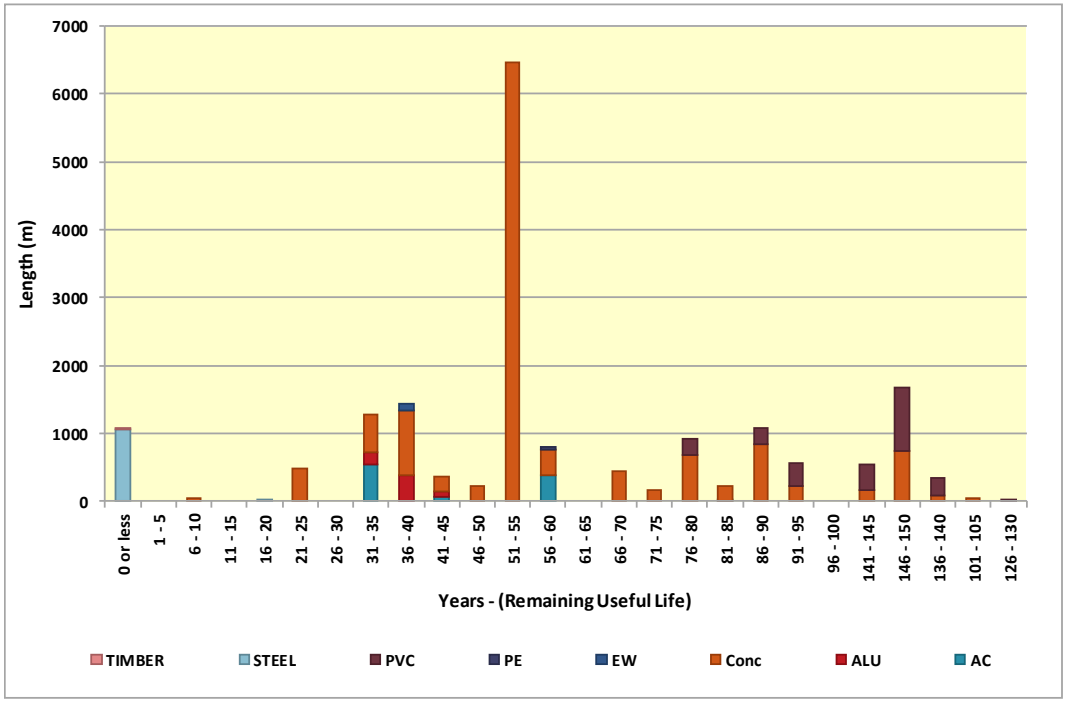
No formal criticality assessment has been documented, but Council engineers use practical experience and skilled application of staff and service providers in consideration of critical assets. This allows for different strategies to be applied depending on priority. For example, a "run to failure strategy" 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 shows that there are 1.1km of Steel pipe and 0.03 km of timber pipe that have reached the end of its expected useful lives. There is 0.5km of Concrete pipe that will reach the end of its expected useful life within the 21-25 year window.

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 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.

9.4.3 Deferred Renewals

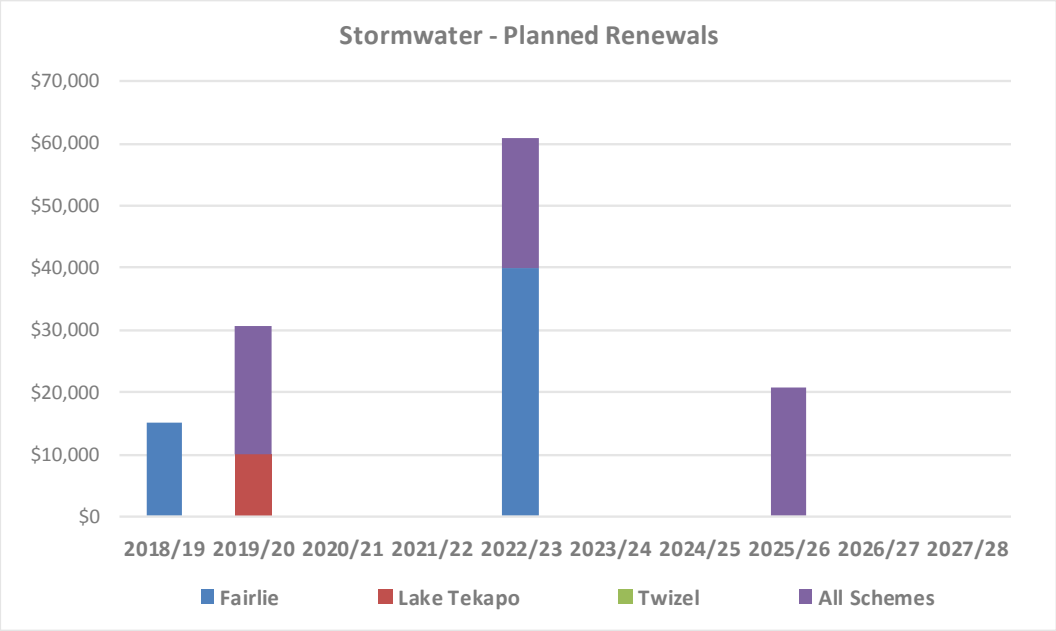
There is no deferred work associated with the stormwater system.

9.4.4 Planned Renewals

The planned renewals for the next 10 years are listed in Table 9 7: Planned Renewals below. This summarise 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

	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
Fairlie	$15,000	$0	$0	$0	$40,000	$0	$0	$0	$0	$0
Lake Tekapo	$0	$10,000	$0	$0	$0	$0	$0	$0	$0	$0
Twizel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
All Schemes	$0	$20,751	$0	$0	$20,751	$0	$0	$20,751	$0	$0
TOTAL	**$15,000**	**$30,751**	**$0**	**$0**	**$60,751**	**$0**	**$0**	**$20,751**	**$0**	**$0**



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
The Council 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 LGA, 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 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 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.

These factors include:

a) Tourism and visitor growth
b) Land use change
c) Climate change and community resilience
d) Infrastructure capital costs

Of these, infrastructure capital costs is of relevance to the stormwater activity. Upgrades to stormwater systems are required in the LTP period.

While no significant change to the operation of most of the Council's stormwater assets is proposed, the Council is required to implement the provisions of the stormwater management plans it is presently developing. We know that stormwater discharges will be required to be progressively upgraded to improve discharge quality.

10.1.2 Rating & Borrowing

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.

The Council will borrow to fund these works and other significant capital expenditure on the 3 waters (water, wastewater and stormwater). This borrowing will be repaid through targeted rates.

10.1.3 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.

Year Ending	Roading	Planning and regulation	Water, sewer, drainage, and waste services	Water and Environmental	Local government administration	Community activities	Earthmoving and site work	Pipelines	All salary and wage rates - Local Govt sector
Jun-17	3.2	2.2	3.8	3.1	2.0	3.2	3.9	1.7	2.4

Jun-18	5.4	3.9	6.6	5.5	3.5	5.0	6.5	3.9	3.5
Jun-19	8.8	5.9	9.2	8.4	5.1	7.7	11.0	6.7	4.7
Jun-20	12.2	8.1	11.8	11.4	6.8	10.4	15.5	9.6	6.0
Jun-21	15.6	10.5	14.8	14.5	8.7	13.2	19.9	12.9	7.5
Jun-22	19.1	12.9	18.0	17.7	10.9	16.0	24.2	16.1	9.1
Jun-23	22.5	15.5	21.6	21.1	13.2	18.9	28.3	19.3	10.8
Jun-24	25.9	18.2	25.5	24.5	15.8	21.8	32.3	22.6	12.7
Jun-25	29.3	21.0	29.8	28.1	18.6	24.8	36.1	25.8	14.8
Jun-26	32.6	24.0	34.5	31.8	21.7	27.8	39.7	29.0	17.0
Jun-27	35.9	27.1	39.7	35.6	25.0	30.8	43.0	32.2	19.5

10.1.4 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 records 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.

10.1.5 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 LTP.

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 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.

10.2 Asset Valuation

The last valuation of the Stormwater infrastructural network and associated assets was undertaken as at 1 July 2016 and is summarised in the following table. 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.

Table 10-1: Asset Valuation

Asset Type	Optimised Replacement Cost/ORC ($)	Optimised Depreciated Replacement Cost/ODRC ($)	Annual Depreciation ($)
Lines	5,926,243	4,210,955	39,521
Manholes	1,090,298	854,339	7,269
Open drains	23,050	23,050	-
Treatment	379,326	379,326	-
TOTAL	**7,418,917**	**5,467,670**	**46,790**

The total optimised replacement cost of stormwater assets was assessed to be $5,983,103 as at 1 July 2013. The total optimised depreciated replacement cost was assessed to be $3,480,263.

The annual depreciation has been determined to be $59,627 per annum.

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.

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 Improvements and Infrastructure Asset Valuation.

Borrowing costs were excluded from the valuation.

The primary data source for this revaluation was the Council'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, wastewater 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 below:

Figure 10-1: Proposed Future Capital Works

STORMWATER	LTP Budget Yr 1 2019	LTP Budget Yr 2 2020	LTP Budget Yr 3 2021	LTP Budget Yr 4 2022	LTP Budget Yr 5 2023	LTP Budget Yr 6 2024	LTP Budget Yr 7 2025	LTP Budget Yr 8 2026	LTP Budget Yr 9 2027	LTP Budget Yr 10 2028
					(thousands)					
Urban Stormwater										
0258193. Vested Assets	1,150	1,068	617	0	2,098	0	0	2,602	0	0
0258401. Sewer Reticulation Renewal	84	1,136	15	0	0	631	292	623	299	168
0258807. Resource Consent Costs	0	62	0	0	0	0	0	0	0	0
Total Stormwater Capital Expenditure	**1,234**	**2,266**	**631**	**0**	**2,098**	**631**	**292**	**3,225**	**299**	**168**

Table 10-2: Annual Net Cost - Funding Impact Statement

	Annual Plan 2017/18	Long-term Plan 2018/19	Long-term Plan 2019/20	Long-term Plan 2020/21	Long-term Plan 2021/22	Long-term Plan 2022/23	Long-term Plan 2023/24	Long-term Plan 2024/25	Long-term Plan 2025/26	Long-term Plan 2026/27	Long-term Plan 2027/28
						(thousands)					
Targeted rates	195	113	141	139	143	158	177	180	197	222	227
Internal charges and overheads recovered	7	0	0	0	0	0	0	0	0	0	0
Total operating funding (A)	**202**	**113**	**141**	**139**	**143**	**158**	**177**	**180**	**197**	**222**	**227**
Payments to staff and suppliers	115	35	48	37	38	51	40	41	55	43	44
Internal charges and overheads applied	0	14	14	14	13	13	12	11	11	10	9

	Annual Plan 2017/18	Long-term Plan 2018/19	Long-term Plan 2019/20	Long-term Plan 2020/21	Long-term Plan 2021/22	Long-term Plan 2022/23	Long-term Plan 2023/24	Long-term Plan 2024/25	Long-term Plan 2025/26	Long-term Plan 2026/27	Long-term Plan 2027/28
						(thousands)					
Total applications of operating funding (B)	**115**	**49**	**62**	**51**	**51**	**64**	**52**	**52**	**66**	**53**	**53**
Surplus (deficit) of operating funding (A-B)	**87**	**64**	**79**	**88**	**92**	**94**	**125**	**128**	**131**	**169**	**174**
Development and financial contributions	57	0	0	128	0	0	206	0	0	509	0
Total sources of capital funding (C)	**57**	**0**	**0**	**128**	**0**	**0**	**206**	**0**	**0**	**509**	**0**
Capital expenditure											
To meet additional demand	321	0	0	0	0	0	0	0	0	0	0
To improve the level of service	0	0	0	0	0	78	17	0	0	18	0
To replace existing assets	0	0	0	0	0	0	0	0	0	0	0
	321	**0**	**0**	**0**	**0**	**78**	**17**	**0**	**0**	**18**	**0**
Increase (decrease) in reserves	-177	64	79	216	92	16	314	128	131	660	174
Total applications of capital funding (D)	**144**	**64**	**79**	**216**	**92**	**94**	**331**	**128**	**131**	**678**	**174**
Surplus (deficit) of capital funding (C-D)	-87	-64	-79	-88	-92	-94	-125	-128	-131	-169	-174
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 in the 2015 Activity Management Plan have been achieved by the time of this review in 2017. The following table details improvements achieved to date.

Table 11-1: 2015 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	Programmed for 2017/18
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 5.8.3
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 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 –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 LTP are considered to be highly relevant, over the following two years some become less appropriate. 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 LTP 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 2020. 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 Utilities Manager.

APPENDIX A INDIVIDUAL SYSTEMS DESCRIPTION

A1 Fairlie Stormwater System

A1.1 Overview

Description		Quantity
Population Served 20** % 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		Opihi River
Financial	Funding	Universal rate

A1.2 Key Issues for Service

Issues	Resolution
Old timber stormwater systems	Investigate issues and resolution options
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 Council 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 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 into the Opihi River, but is collected by and discharges via vegetated swales that provide a measure of primary treatment.

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

There are no resource consents associated with the Fairlie stormwater system.

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

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

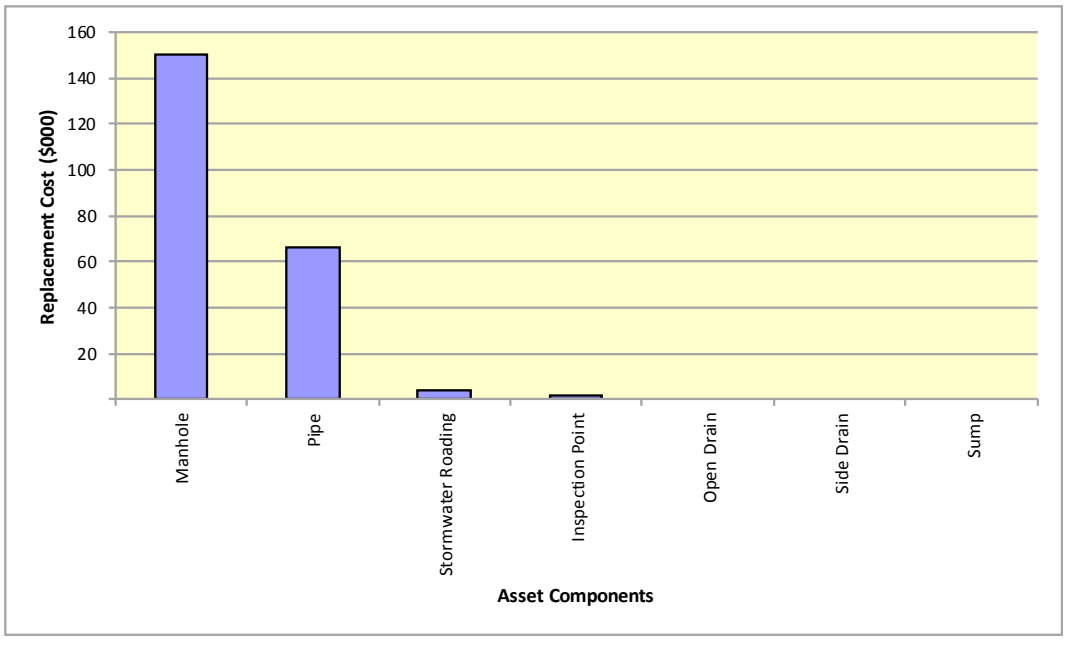
Over winter problems can occur with snow or hail blocking stormwater drains and sump inlets causing localised flooding and ice hazards. It is the responsibility of the road or village maintenance contractors to take all practical steps to rectify these situations when they occur.

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

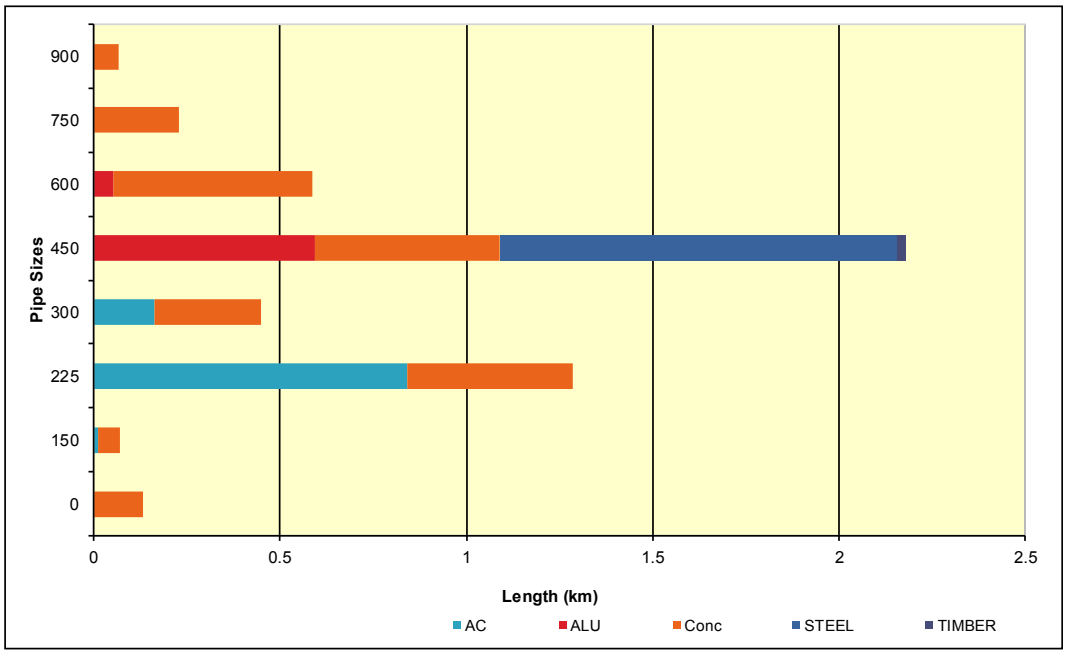
A1.6 Asset Details

Appendix Figure 1: Replacement Costs Reticulation



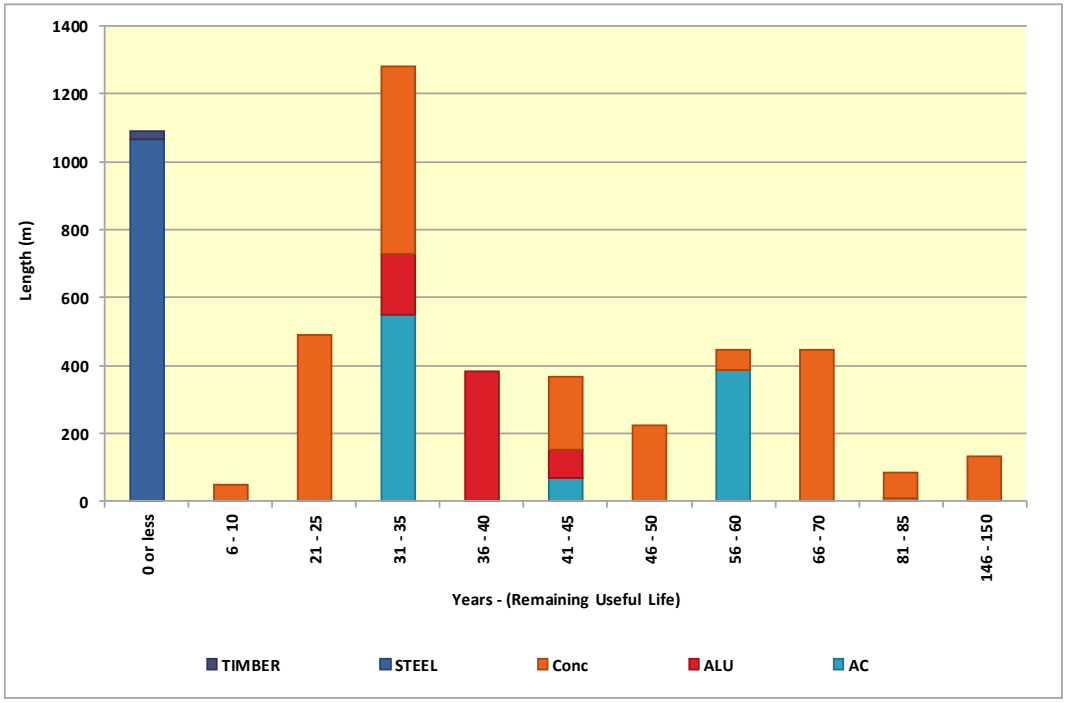
Manholes make up 79% of the total asset values. The replacement costs of a significant number of pipes are not recorded within the Asset Register (**IP 6**)

Appendix Figure 2: Stormwater Main Diameters



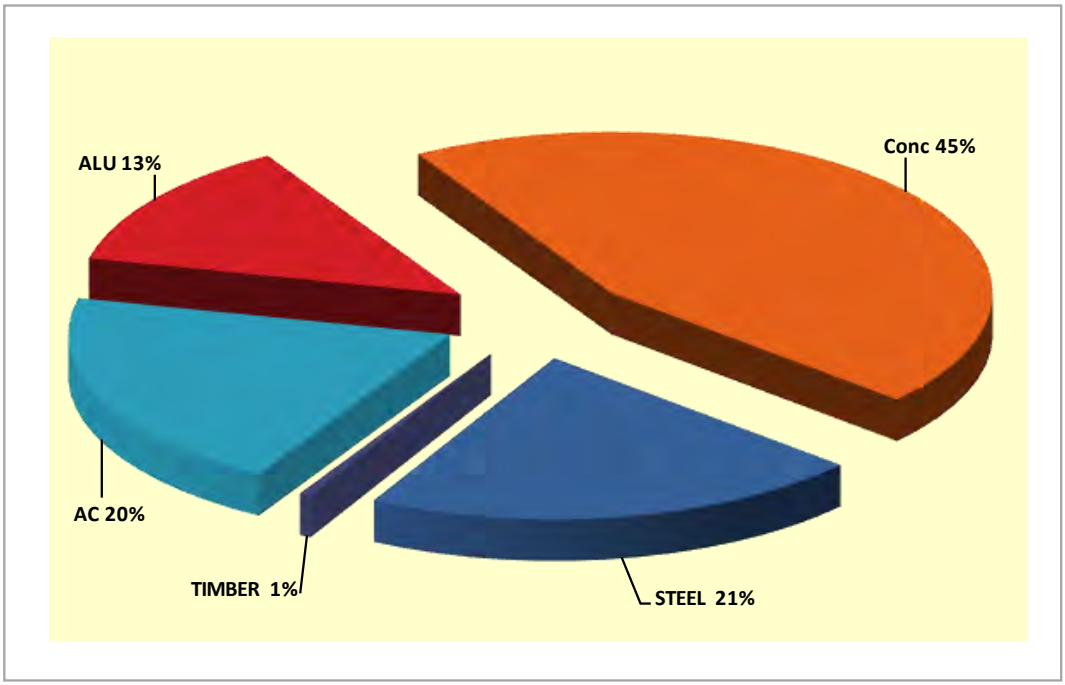
Ø450mm pipe make up 44% of the stormwater main length.
Ø225mm pipe make up 26% of the stormwater main length

Appendix Figure 3: Pipe Age Group Replacement Cost



There is 1.1km of pipe (mainly Steel) that has reached the end of its expected useful life (top end of Regent Street). There is 1.3km of pipe (a mix of Concrete, AC and Aluminium) that will reach the end of its expected useful life within the 31-35 year window.

Appendix Figure 4: Stormwater Main Material



The graph shows that 45% of the reticulation consist of Concrete, 21% of Steel and 20% of AC. The remainder is made up of Aluminium and Timber

A1.7 Data Confidence

Appendix Table 1: Data Confidence

Scheme	Component	Reticulation	Manholes
Fairlie SW	Asset Attributes	G	G
	Condition	G	G
	Performance	G	G

Where

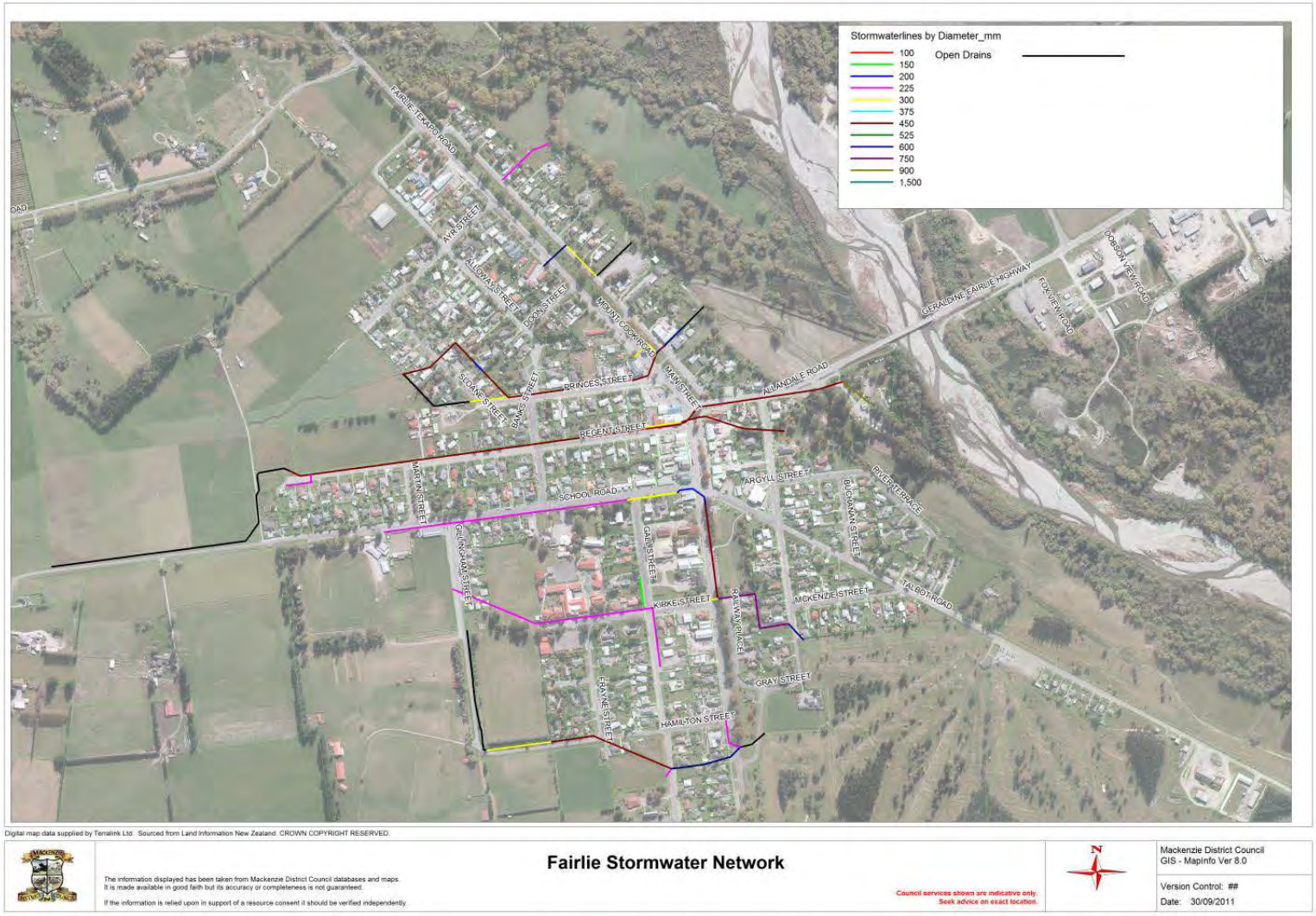
Score	Description	Definition
1	Accurate	100%
2	Minor inaccuracies	± 5%
3	50% estimated	± 20%
4	Significant data estimated	± 30%
5	All data estimated	± 40%
X	No asset	

A1.8 Capital Projects

Appendix Table 2: Capital Projects

Name	Type	Value	When
Management Plan	AM	$32,000	2018-2020
Humeceptor – sw treatment	Level of Service	$15,000	2027/28
Replace old timber systems	Renewal	$40,000	2022/23
Replace steel pipe -Regent Street	Renewal	$15,000	2018/19

A1.9 Fairlie Stormwater Map



A2 Lake Tekapo Stormwater System

A2.1 Overview

Description		Quantity
Population Served 2009 % 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		6.6 km
Number of manholes		121
Number of sumps		137
Number of pump stations		-
Length of open drains		0.7 km
Retention/Treatment Areas		-
Treatment	Treatment	None
Discharge flows to		Lake Tekapo & Tekapo River
Financial	Funding	Universal rate

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**)

A2.3 Overview & History

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

One potential issue 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 Council 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 Council 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 will be 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 resource consent for The Cairns is in private ownership. This resource consent will remain with the developer 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 2019/20.

Council has recently constructed treatment facilities in Domain Road and two on Lakeside Drive to treat the stormwater from those before finally discharging into gravels on the shore of Lake Tekapo. These discharges have a 35 year term for their discharge consents.

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.

The developer 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.

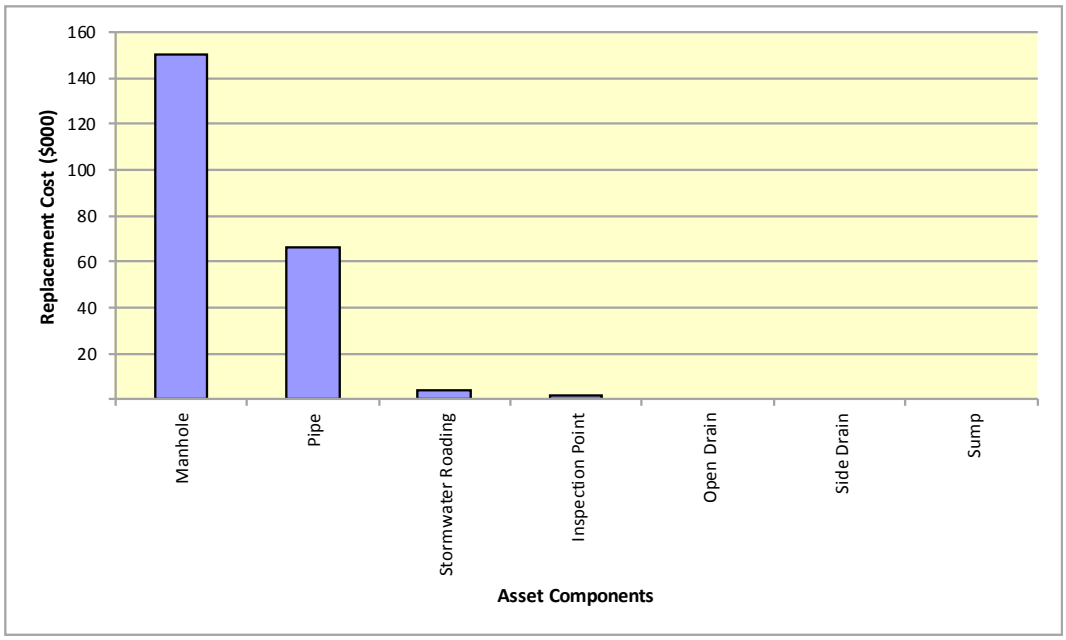
A2.5 Environmental Management

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

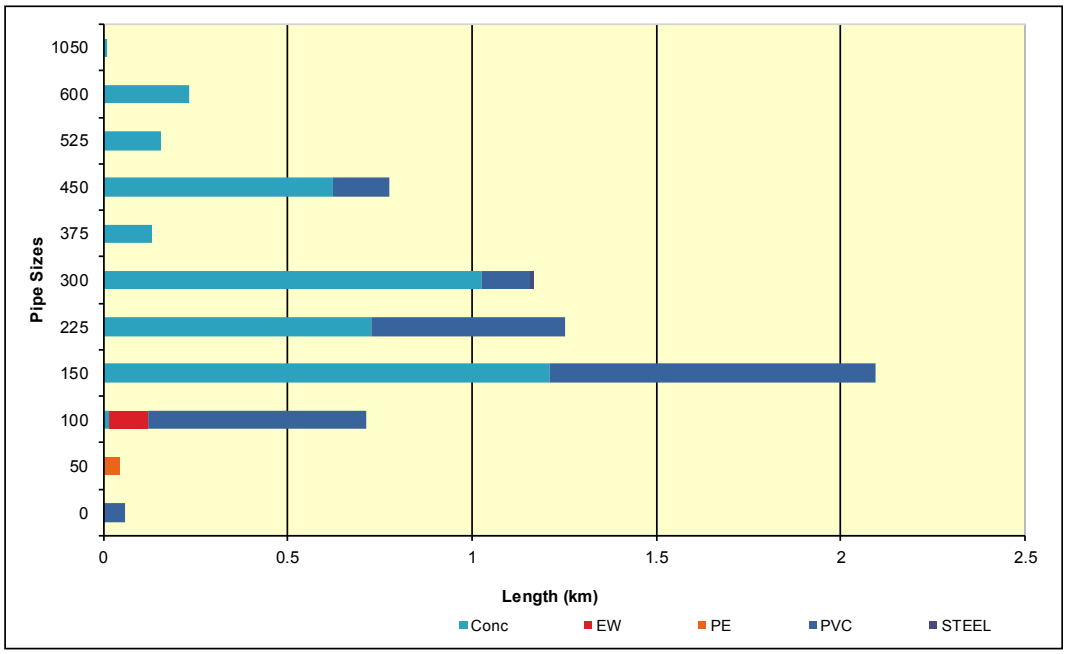
A2.6 Asset Details

Appendix Figure 5: Replacement Costs Reticulation



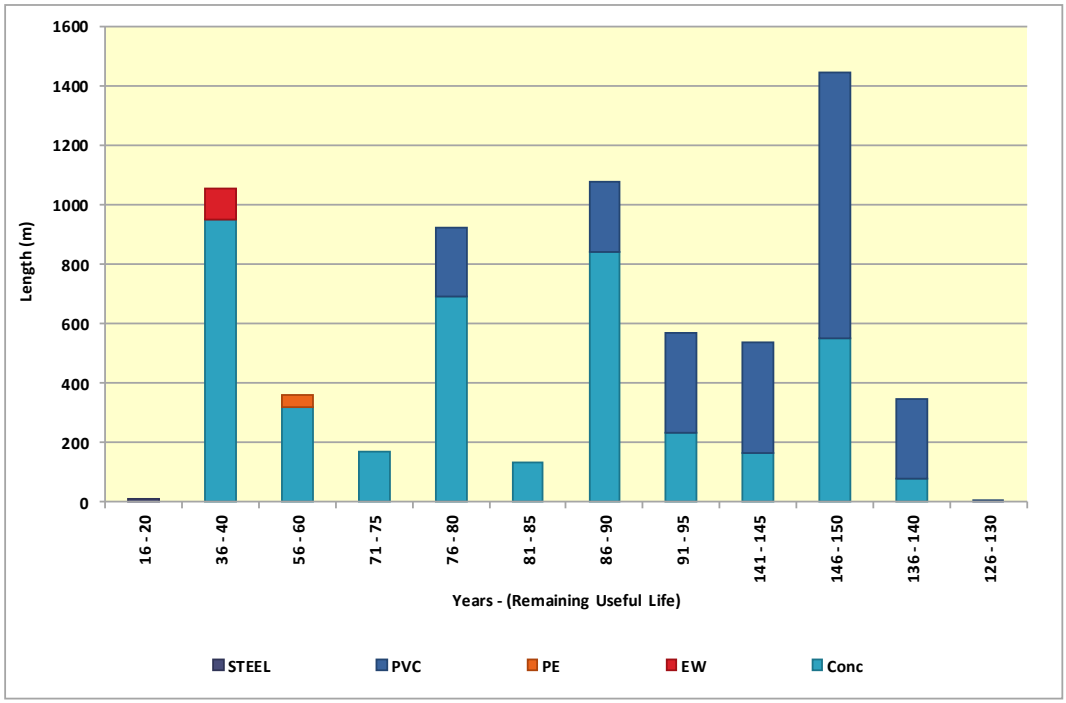
Manholes make up 52% of the total asset values
The replacement costs of a significant number of pipes are not recorded within the Asset Register (**IP 6**).

Appendix Figure 6: Stormwater Main Diameters



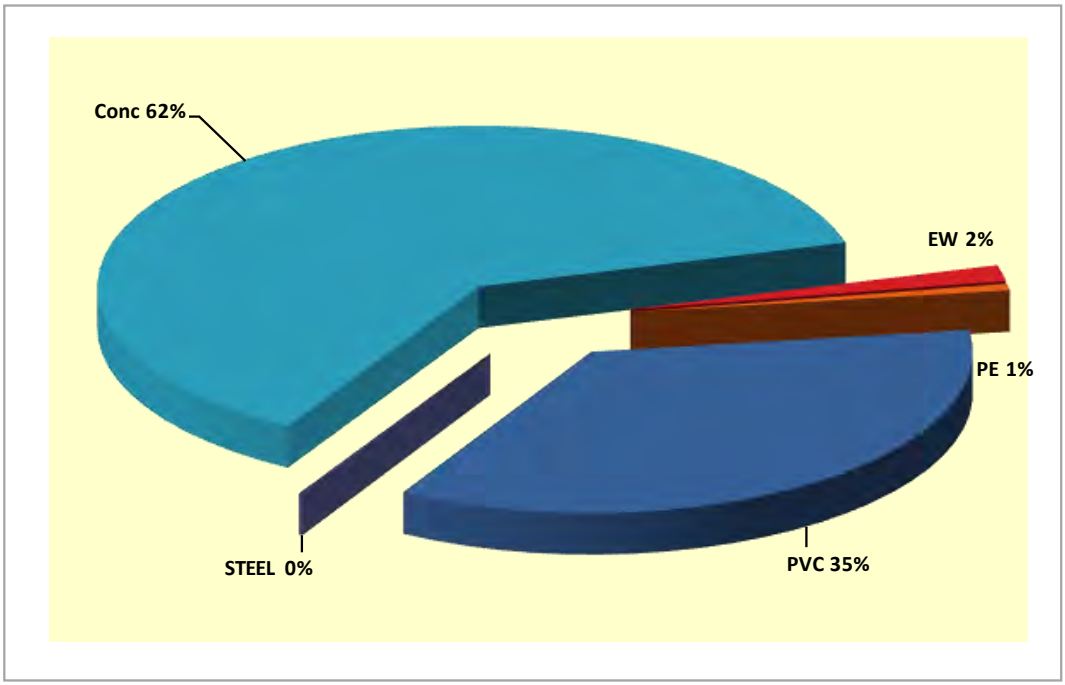
Ø150mm pipe make up 32% of the stormwater main length.
Ø225mm pipe make up 19% and Ø300mm pipe make up 18% of the stormwater main length.

Appendix Figure 7: Pipe Age Group Replacement Cost



There is 1.1km of pipe (mainly Concrete) that will reach the end of its expected useful life during the 36-40 year window. There is 0.3km of pipe (mainly Concrete) that will reach the end of its expected useful life within the 56-60 year window.

Appendix Figure 8: Stormwater Main Material



The graph shows that 62% of the reticulation consist of Concrete and 35% of PVC. The remainder is made up of EW, PE and Steel.

A2.7 Data Confidence

Appendix Table 3: Data Confidence

Scheme	Component	Reticulation	Manholes
Lake Tekapo SW	Asset Attributes	G	G
	Condition	G	G
	Performance	G	G

Where

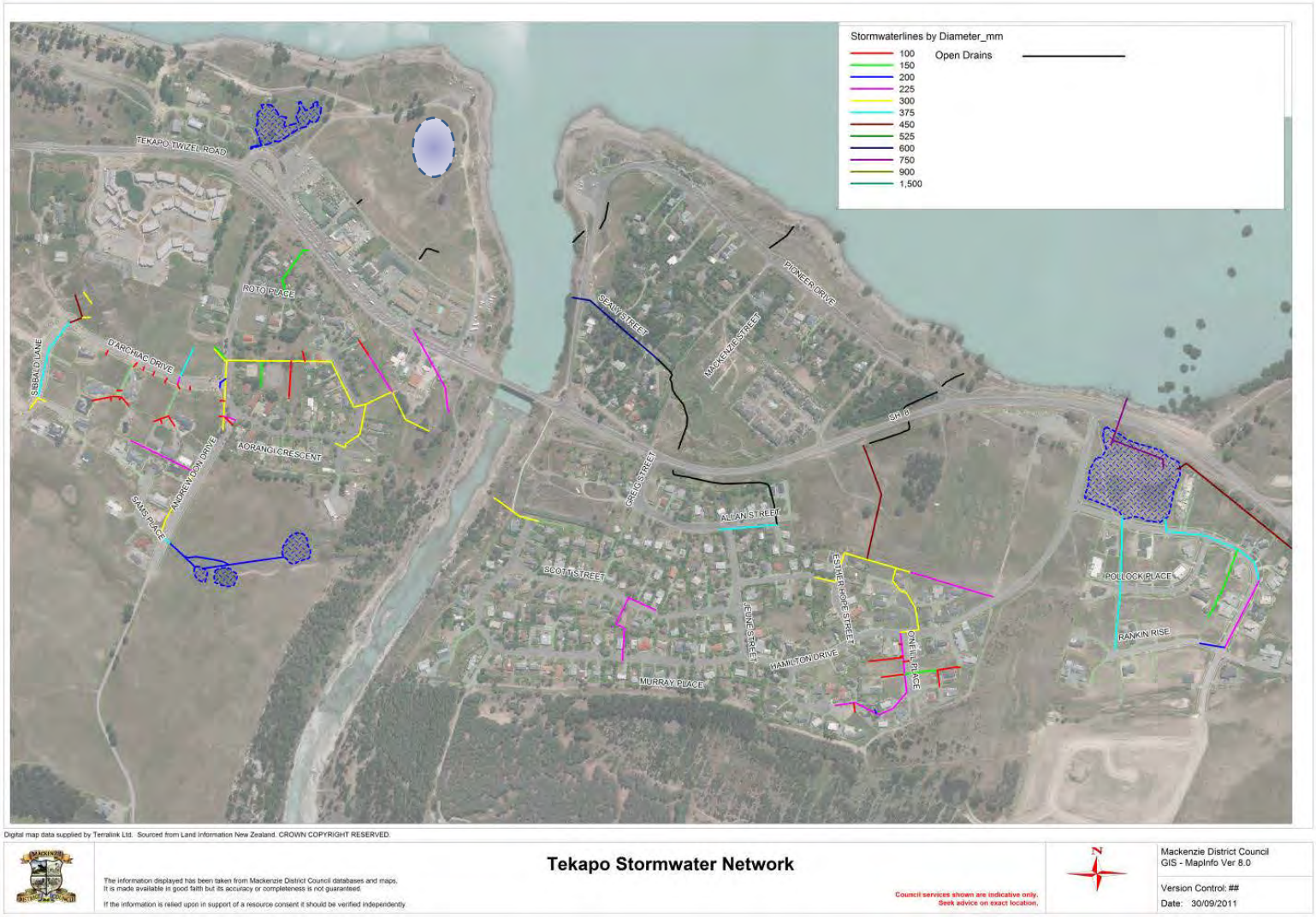
Score	Description	Definition
1	Accurate	100%
2	Minor inaccuracies	± 5%
3	50% estimated	± 20%
4	Significant data estimated	± 30%
5	All data estimated	± 40%
X	No asset	

A2.8 Capital Projects

Appendix Table 4: Capital Projects

Name	Type	Value	When
Management Plan	AM	$35,000	2018-2020
Humeceptor – sw treatment	Level of Service	$30,000	2022/23
Revegetate Lochinver	Renewal	$10,000	2019/20

A2.9 Lake Tekapo Stormwater System Map



A3 Twizel Stormwater System

A3.1 Overview

Description		Quantity
Population Served 2009 % 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		6.6 km
Number of manholes		87
Number of sumps		147
Number of pump stations		-
Length of open drains		3.9 km
Retention/Treatment Areas		-
Treatment	Treatment	None
Discharge flows to		Twizel River
Financial	Funding	Universal rate

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**)

A3.3 Overview & History

Twizel is fortunate in having a stormwater system that was designed as a one off for the whole town. One issue with the Twizel stormwater system is the localised ponding that can occur at siphon type sumps. In the winter 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 Council 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 Council 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 will be set up to record areas of ponding and poor performance during storms (**IP 5**).

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.

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

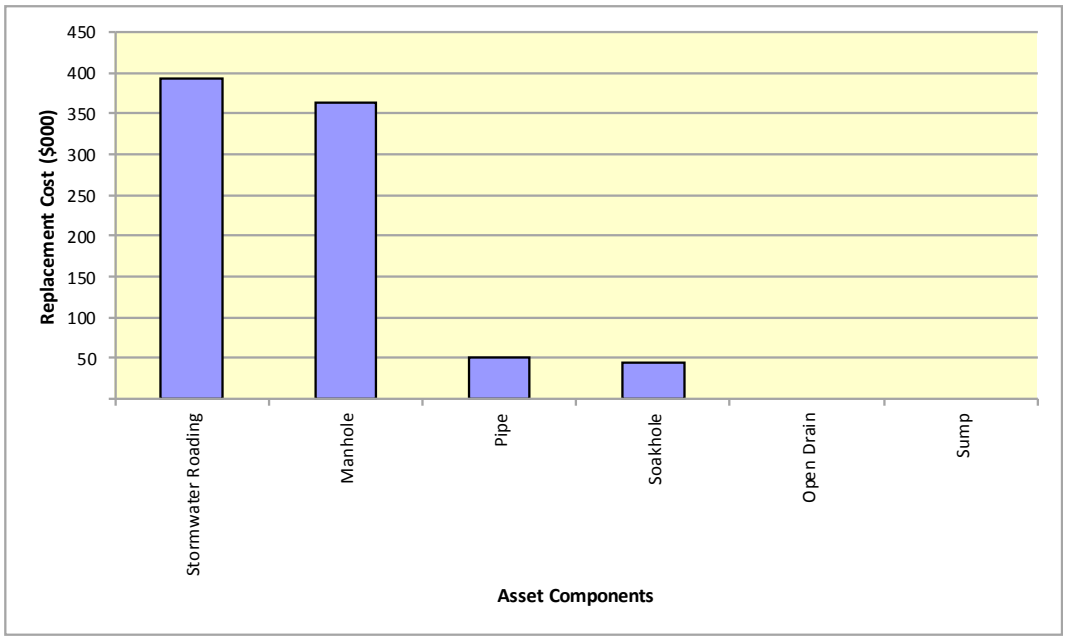
The following table list the resource consent associated with the Twizel Stormwater System.

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

There will always be instances 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.

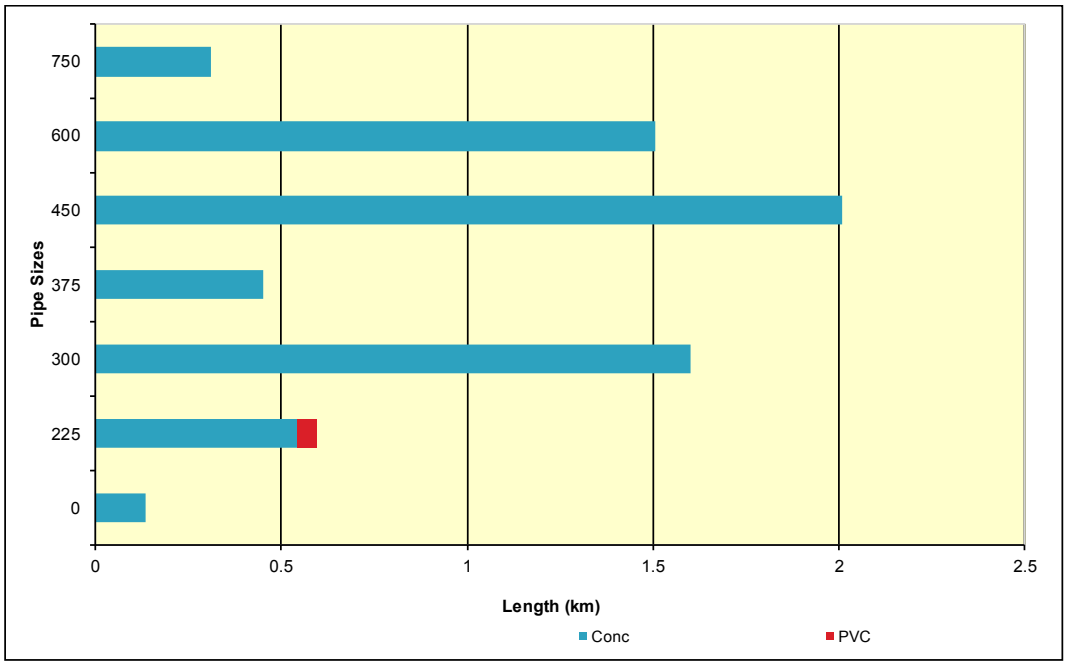
A3.6 Asset Details

Appendix Figure 9: Replacement Costs Reticulation



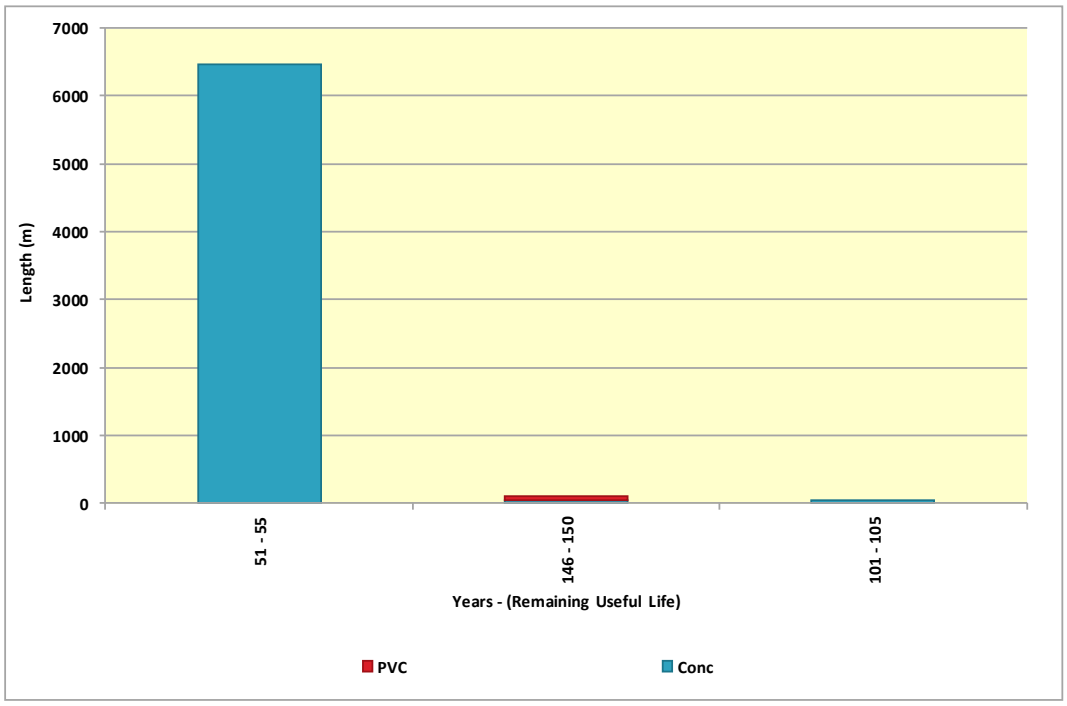
Stormwater Roading make up 42% of the total asset values. The replacement costs of a significant number of pipes are not recorded within the Asset Register (**IP 6**).

Appendix Figure 10: Stormwater Main Diameters



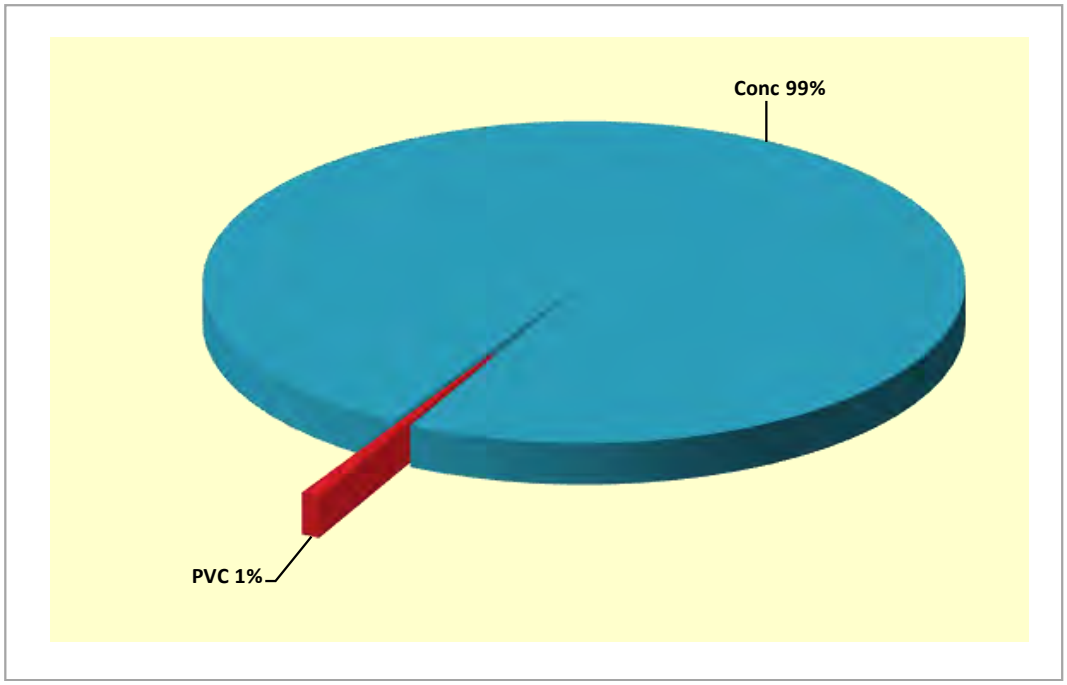
Ø450mm pipe make up 30% of the stormwater main length.
Ø600mm pipe make up 23% of the stormwater main length.

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 51-55 year window.

Appendix Figure 12: Stormwater Main Material



The graph shows that 99% of the reticulation consist of Concrete and 1% of PVC.

A3.7 Data Confidence

Appendix Table 5: Data Confidence

Scheme	Component	Reticulation	Manholes
Twizel SW	Asset Attributes	G	G
	Condition	G	G
	Performance	G	G

Where

Score	Description	Definition
1	Accurate	100%
2	Minor inaccuracies	± 5%
3	50% estimated	± 20%
4	Significant data estimated	± 30%
5	All data estimated	± 40%
X	No asset	

A3.8 Capital Projects

Appendix Table 6: Capital Projects

Name	Type	Value	When
Management Plan	AM	$35,000	2018-2020
Humeceptor – sw treatment	Level of Service	$15,000	2023/24

A3.9 Twizel Stormwater System Map