SOUTHLAND
DISTRICT COUNCIL

Stormwater

2021-2031 Activity Management Plan

Southland District Council
Te Rohe Pōtae o Murihiku

PO Box 903
15 Forth Street
Invercargill 9840

0800 732 732
sdc@southlanddc.govt.nz
southlanddc.govt.nz

Table of Contents

Quality assurance statement				
Draft AMP template				
Southland District Council **15 Forth Street** **Invercargill 9840** **Telephone** **0800 732 732** **Fax** **0800 732 329**	Version:		Record No:	
	Status:			
	Project Manager:			
	Prepared By:			
	Reviewed By:			
	Approved for issue:			

Executive summary

The services provided

The stormwater activity in Southland District (SDC) is focused on the achievement of the following objective:

"To provide a reliable stormwater system with adequate capacity, to protect people and property from flooding and minimises the impact of any discharges on the environment?

There are 25 towns in the District that with varying levels of reticulation with Council owned and maintained infrastructure. These public stormwater systems are intended to carry out three main functions:

- protection of property, public safety and access
- protection of public health
- creation of productive land.

Based on current information the schemes have a current replacement cost valuation in excess of $35M.

While Council is the legal entity for the ownership of the asset, the day-to-day operations are delegated to nine community boards as separate governance groups.

The scope and extent of assets varies significantly throughout the District with larger townships such as Winton and Te Anau having areas of large reticulated catchments to smaller townships where open ditches and drains and soakholes are the only means of controlling stormwater.

Council owned and provided facilities are Balfour, Browns, Colac Bay, Dipton, Edendale, Limehills, Lumsden, Manapouri, Monowai, Mossburn, Nightcaps/Wairio, Ohai, Otautau, Riversdale, Riverton, Stewart Island, Te Anau, Thornbury, Tokanui, Tuatapere, Waikaia, Wallacetown, Winton, Woodlands and Wyndham.

Stormwater networks protect buildings, roads and structures from rainfall run off and ponding. Effective management of these systems is critical to limiting erosion and property damage, as well as ensuring public amenity of open spaces and protection of the environment

A key change to this activity for 2021-2031 (form 01 July 2021) is the move to fund the activity on a district wide basis in a similar manner to district funded wastewater and community water supplies and as set out in Councils 2021 Revenue and Financing Policy. Historically the activity has been locally funded which has resulted in a number of communities struggling with costs such as maintenance and renewals. And as a result continued deferral of some works has resulted in a significant backlog of this type of work.

What we aim to achieve

Council's levels of service (LOS), performance measures and targets are illustrated in

STORMWATER: The level of service (LoS) we provide	**LoS xx: Provide a reliable stormwater system that protects public health and the environment**				
How we measure performance	**Current Performance (19/20)**	**Future Performance Targets**			
		Yr 1 (21/22)	**Yr 2 (22/23)**	**Yr 3 (23/24)**	**Yr 4-10 (25-31)**
KPI xx: **System adequacy** - Overflows resulting from the stormwater system that result in the flooding of a habitable floor a) The number of "flooding events" that occur within the district. b) For each flooding event, the number of habitable floors affected (expressed per 1000 properties	a) 0 b) 0	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1

connected to the council stormwater system). Definitions of habitable floor and flooding event in footnote.					
KPI xx: **Response to stormwater issues** - The median response time between the time of notification and the time when service personnel reach the site when "habitable floors" are affected by flooding resulting from faults in the stormwater system.	There were no flooding events to habitable floors in the year	≤ 2 hours	≤ 2 hours	≤ 2 hours	≤ 2 hours
KPI xx: **Customer satisfaction** – The number of complaints received about the performance of the Council's stormwater system, expressed per 1000 properties connected to the stormwater system.	a) 15 per 1000 properties	a) ≤ 15 per 1000 properties	a) ≤ 15 per 1000 properties	a) ≤ 15 per 1000 properties	a) ≤ 15 per 1000 properties
KPI xx: **Discharge compliance -** Compliance with the resource consents for discharge from the stormwater system, measured by the number of: (a) abatement notices (b) infringement notices (c) enforcement orders (d) successful prosecutions, received in relation to those resource consents.	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0
KPI xx: Percentage of monitoring results that show compliance with resource consent conditions.	85%	100%	100%	100%	100%
Habitable floor refers to a floor of a building (including a basement) but does not include ancillary structures such as stand-alone garden sheds or garages. A flooding event means an overflow of stormwater from a territorial authority's stormwater system that enters a habitable floor.					

Table 1. Over the next 30 years, Council's intention for this activity is generally to maintain the current performance in relation to flooding complaints and improve performance in the following areas:

- the delivery of projects
- response to customer requests (improving performance in this area is mainly attributable to a more timely closing out of service requests in the customer service system)
- compliance with resource consent conditions as required by Environmental Southland's (ES) Discharge Plan. Currently the cost of meeting this compliance is not fully understood as further monitoring is required to understand which areas require further investment.

STORMWATER: The level of service (LoS) we provide	**LoS xx: Provide a reliable stormwater system that protects public health and the environment**				
How we measure performance	**Current Performance (19/20)**	**Future Performance Targets**			
		Yr 1 (21/22)	**Yr 2 (22/23)**	**Yr 3 (23/24)**	**Yr 4-10 (25-31)**
KPI xx: **System adequacy** - Overflows resulting from the stormwater system that result in the flooding of a habitable floor c) The number of "flooding events" that occur within the district. d) For each flooding event, the number of habitable floors affected (expressed per 1000 properties connected to the council stormwater system). Definitions of habitable floor and flooding event in footnote.	a) 0 b) 0	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1

KPI xx: **Response to stormwater issues** - The median response time between the time of notification and the time when service personnel reach the site when "habitable floors" are affected by flooding resulting from faults in the stormwater system.	There were no flooding events to habitable floors in the year	≤ 2 hours	≤ 2 hours	≤ 2 hours	≤ 2 hours
KPI xx: **Customer satisfaction** – The number of complaints received about the performance of the Council's stormwater system, expressed per 1000 properties connected to the stormwater system.	a) 15 per 1000 properties	a) ≤ 15 per 1000 properties	a) ≤ 15 per 1000 properties	a) ≤ 15 per 1000 properties	a) ≤ 15 per 1000 properties
KPI xx: **Discharge compliance -** Compliance with the resource consents for discharge from the stormwater system, measured by the number of: (e) abatement notices (f) infringement notices (g) enforcement orders (h) successful prosecutions, received in relation to those resource consents.	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0
KPI xx: Percentage of monitoring results that show compliance with resource consent conditions.	85%	100%	100%	100%	100%
Habitable floor refers to a floor of a building (including a basement) but does not include ancillary structures such as stand-alone garden sheds or garages. A flooding event means an overflow of stormwater from a territorial authority's stormwater system that enters a habitable floor.					

Table 1: Stormwater Performance Management Framework

Managing future demand

Continued steady growth in townships such as Te Anau is projected and future upsizing of assets in these communities may be required if these growth projections eventuate, although none is anticipated in the Long Term Plan and Infrastructure Strategy. Demand for stormwater services in other areas is not expected to change significantly over the plan period. Developer driven demand will be funded privately prior to any assets potentially being vested into Council

Some work will be undertaken to understand the impact of climate change driven demand on the activity.

Lifecycle asset management

To achieve Council's intentions, the general asset management strategy is to:

- maintain the assets to a level fit for purpose
- improve knowledge around age condition and performance of networks through increased condition assessment programme
- work with Council contractors and governance bodies to identify capital or maintenance requirements
- ensure that the asset management requirements (operational and capital) are appropriately funded, prioritised and scheduled
- develop and refine renewal strategies, based on age, condition and best available local knowledge
- ensure appropriate resource consent conditions are met.

The graph below highlights expected capital expenditure and renewals dates for stormwater reticulation across the District based on current expected asset life and level of service expectation. Where differences occur between planned renewals data in Infor (IPS) and capital expenditure planned in the LTP this is generally at the request of the governing board or based on local knowledge and to date, community affordability, however this will continue to be reviewed as Council moved to a district funded approach.

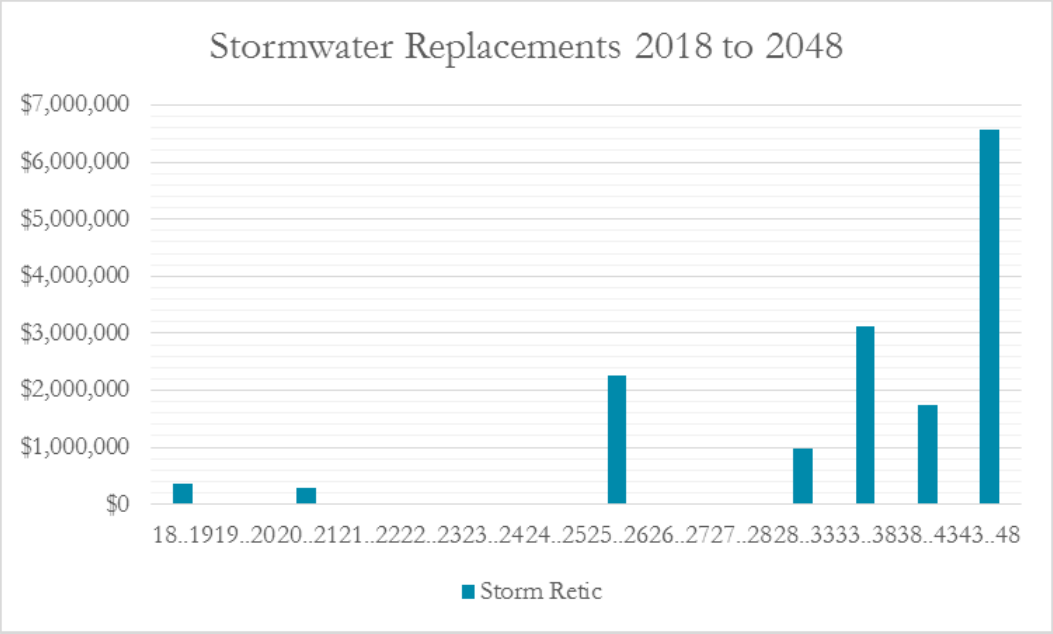

Figure 1: Stormwater Replacements 2018 to 2048

Financial summary

The stormwater activity has historically been funded by each local community through the relevant local general rate; from 2021/2022 the activity is being funded through a district wide rate.

Historically operating expenditure has been consistently low for stormwater, with limited maintenance and capex budgets. With the Water and Land plan being implemented and a better understanding of resource consent requirements operating costs for a number of communities were increased from 2019-20 onwards, however this will need to be reviewed every planning cycle as future information is available. Operating costs also increased in 2019/20 due to the interest costs for the replacement of underground infrastructure in Winton which occurred 2018-19.

Future capital projects have been included to increase levels of service in a number of communities where it is expected that the Water and Land Plan combined with resource consents will require an improvement in the discharge quality to the environment.

Renewal of exiting assets has been occurring over the past few years where there has been issues with failing infrastructure. However this has been typically limited and further investment is required across all networks as they reach end of life. A further area of attention is around our knowledge of the condition and performance of some of the networks. It is planned to address this through an increase in opex budgets to fund additional condition survey work which will ultimately help inform the capital works programme. Infrastructure in Wyndham is the oldest in the district and based on the standard estimated useful life it is programmed for replacement beginning in 2021/22 with further stages is 2025/26 and 2026/27. A significant portion of the stage one work will be undertaken with the aid of Central Government Stimulus funding.

The following graph compares the capital expenditure to depreciation. There are some years where the capital expenditure is greater than depreciation largely as a result of historic deferral or maintenance and renewals. Affordability will be an issue for many communities when the assets need to be replacement or there is a higher cost due to regulatory requirements.

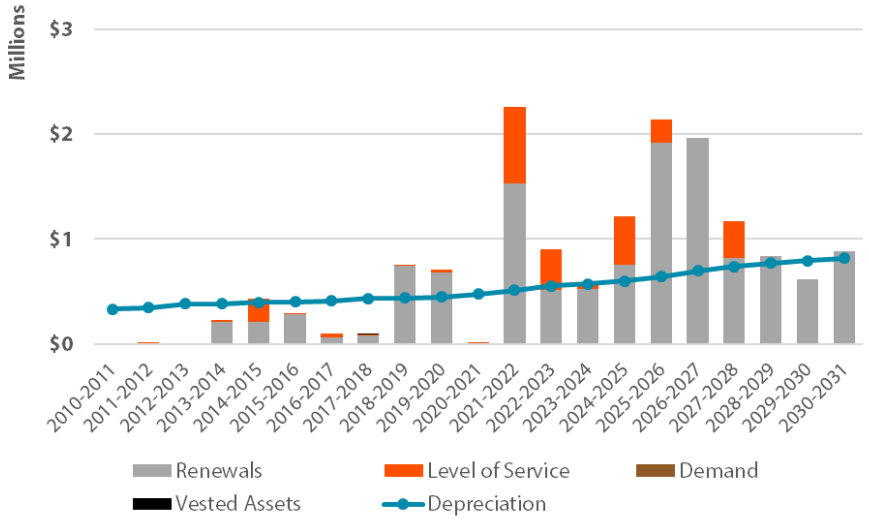

Figure 2: Stormwater Capex Depreciation comparison

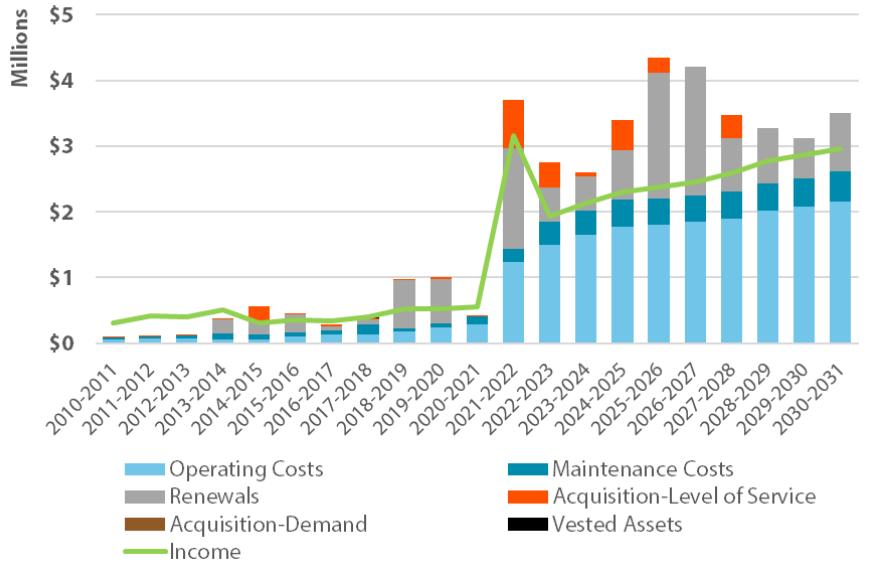

Figure 3: Stormwater Financial Summary (excluding depreciation)

Purpose of the activity management plan

This activity management plan (AMP) describes the strategies and works programmes for the stormwater activity so as to meet the objective of delivering the required level of service for Southland District. It will be reviewed every three years. This AMP informs the Council's Long Term Plan (LTP) and contributes to the goals and objectives Council aims to achieve in order to achieve community outcomes. The AMP covers:

- a description of the activity, including the rationale for Council involvement and any significant negative effects of the activity
- the strategic context for the activity, the key activity management strategies and policies adopted within this environment and the main issues identified for the activity
- a statement of the intended levels of service and performance targets.

This AMP covers a period of 10 years commencing 1 July 2021. The main focus of the analysis is the first three years and for this period specific projects have been identified in more detail. Beyond this period work programmes are generally based on trends or predictions and should be taken as indicative only. All expenditure is based on unit costs as at 1 July 2021.

Plan limitations

- 3 waters review
- key assumptions are correct
- Land and Water Plan costs still to be confirmed.

A status review out of all AMPs for services provided by the water and waste services department was carried out in 2015. The review found that the plans were core status, however annual improvement in data is still proceeding and continued measures are currently programmed for further enhancement of data.

This AMP attempts to address significant stormwater asset management issues in the district. It is a living document which will undergo a formal review every three years to make amendments to reflect changes in LOS, demand projections, risk profile, lifecycle information, or financial information.

This AMP has been developed with the following key limitations:

- projects have been identified and scheduled based on the best information available at the time
- budgets for these projects have been assessed based on the best information available at the time
- projects towards the end of the 10 year period are flagged that work is likely to be needed but it is very much at the concept phase. Options and detailed estimates will be carried out closer to the time
- if an asset fails earlier than planned then emergency works may be required these will be unbudgeted expenditure
- to date there has been limited impact on how the activity is managed as a result of Covid-19.

The completion of projects is limited to resourcing of both Council staff and external engineering support.

Plan framework

The AMP framework is illustrated in below. The strategic context, significant forecasting assumptions and any activity-specific issues are documented in the main body of this plan. Information on locally funded activities and services are included in the appendices to this plan.

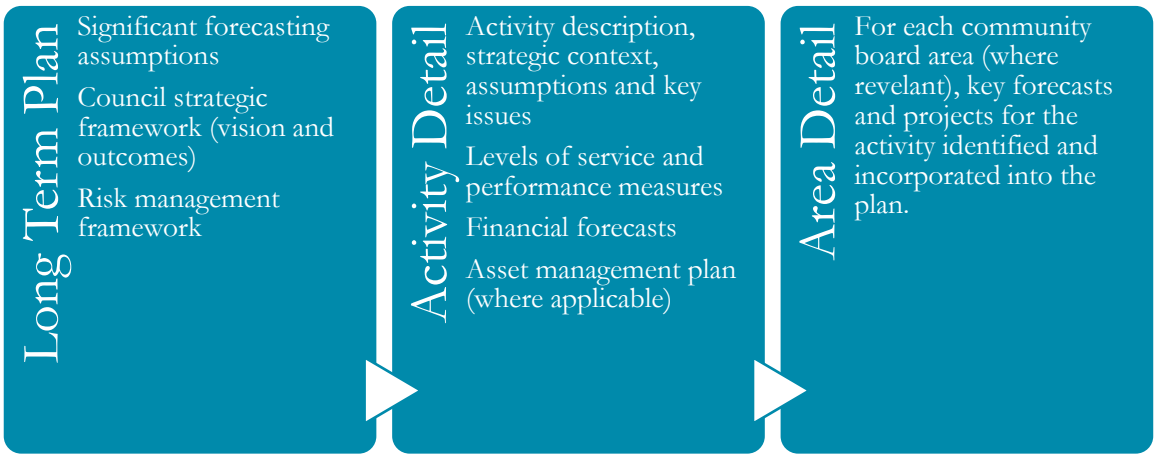

Figure 4: Plan Framework

Activity description

What we do

Council aims to provide a stormwater system that is reliable, has adequate capacity and aims to protect people and property (mainly urban roading networks) from flooding.

The stormwater infrastructure spans across 25 towns in the district. The scope and extent of assets varies significantly throughout the district. Bigger towns have large reticulated catchments while smaller towns have open ditches, drains and soakholes.

Council owned and provided facilities are Balfour, Browns, Colac Bay, Dipton, Edendale, Limehills, Lumsden, Manapouri, Monowai, Mossburn, Nightcaps/Wairio, Ohai, Otautau, Riversdale, Riverton, Stewart Island, Te Anau, Thornbury, Tokanui, Tuatapere, Waikaia, Wallacetown, Winton, Woodlands and Wyndham.

Based on current information the schemes have a current replacement cost valuation in excess of $35M.

While Council is the legal entity for the ownership of the asset, the day-to-day operations are delegated to separate governance groups which are community boards and, with operational work undertaken through roading and township maintenance contracts.

Urban areas serviced by public stormwater system

There are 25 towns in the district that are reticulated with SDC owned and maintained infrastructure as highlighted in the following map. In a number of smaller communities, the infrastructure provided is

limited with a focus on minimising the risk of road flowing. Infrastructure is limited to sumps soakholes and/or open ditches. More extensive reticulation exists in larger townships. These public stormwater systems are intended to carry out three main functions:

Protection of property, public safety and access by the interception of surface and groundwater flows generated by rainfall run-off, conveying a point of discharge and the containment of flood flows within natural and man-made watercourses:

- surface channels and swales
- sumps and inlets
- pipes, culverts and open drains
- secondary flow paths; and
- stop banks (more a function of the regional council).

Protection of public health by controlling the level of pollutants and sediment in stormwater discharged into receiving waters used for recreational and food gathering activities:

- grass swales
- soakage systems; and
- constructed wetlands.

Creation of productive land by managing the level of the natural watertable:

- open drains; and
- sub-soil drains.

A number of other smaller towns have partial services, and Council manages open watercourses in several rural catchments.

In managing the stormwater activity, Council also undertakes:

- planning and building controls such as restrictions on building in high flood risk areas and minimum floor heights for residential buildings
- public education programmes intended to minimise the entry of pollutants to the stormwater system and a variety of traps in the stormwater system designed to reduce the quantities of debris that can be conveyed in the stormwater drains.

It is impractical to provide a primary stormwater system with the capacity to fully accommodate the run-off from all possible storms. The historic design standard for most of the primary Council stormwater system was to transport run-off resulting from a storm with a 10-year return period or with a 10% chance of being exceeded in any year. It is inevitable that the parts of the piped system will be overloaded to varying degrees whenever rainfall with a return period in excess of 10 years occurs.

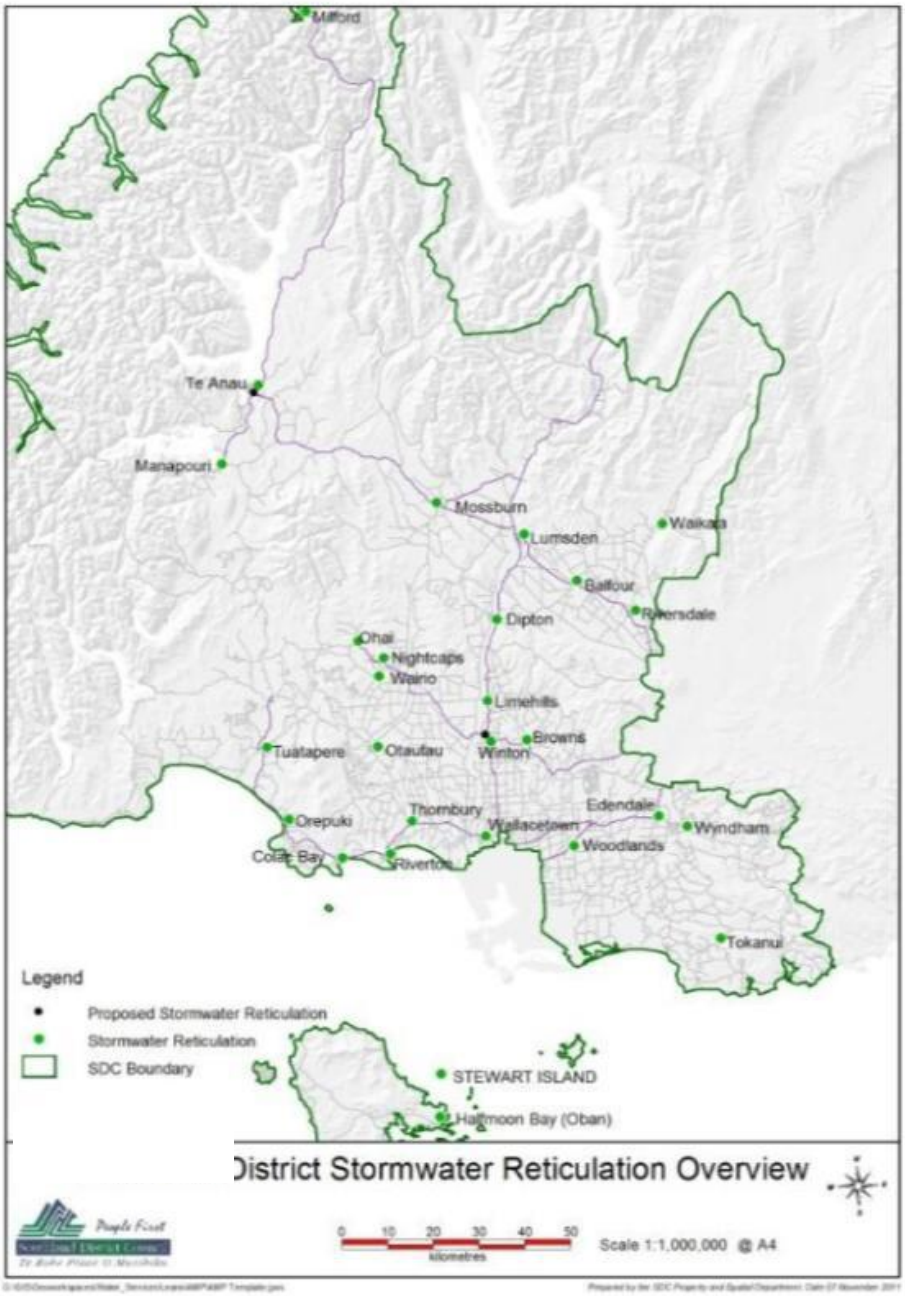

Figure 5: Town Stormwater Reticulation Locations

Rural areas and isolated towns

In small towns and rural areas, it is not as practical to provide piped stormwater systems because of the inability to spread the cost of the infrastructure required across a sufficient number of customers. On-site stormwater disposal is usually acceptable in these areas due to the low density of development. Reticulated stormwater systems are provided when the land use in these areas changes and they are developed for urban housing.

Council versus land owner role

The point of service for stormwater drainage is the junction connection on the Council stormwater main. Where a property is serviced by a pipeline draining to the road kerb, the point of service is the road kerb. Council owns and maintains all stormwater pipelines and public drains up to and including the point of service.

All stormwater drains, pipework and plumbing upstream of the point of service and private watercourses within private property are owned by and are the responsibility of the property owner. This AMP does not cover private stormwater systems.

Why we do it

Stormwater networks are provided to reduce the impact of flooding due to rainfall. The activity protects people's property, improves road safety and mitigates against accessibility/safety issues which may otherwise be caused during flooding events.

The collection, treatment and disposal of stormwater also helps to protect public health and controls the level of pollutants in stormwater discharged to waterways.

Objectives of the stormwater activity

The stormwater activity in Southland District (SDC) is focused on the achievement of the following objective:

To provide a reliable stormwater system with adequate capacity, to protect people and property from flooding and to ensure that the roading network is managed is as safe and efficient manner as possible, and that the impact of discharges on the receiving environment is minimised.

The standard to which this objective will be delivered is outlined by the LOS detailed in a later section of the document.

Strategic considerations

Strategic framework

Council has adopted a strategic framework that identifies where Council wants to be in the future (vision) and the outcomes it aims to achieve to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions (community outcomes). The framework also outlines how it will achieve these (mission and approach) along with the key challenge it faces in doing so and its resulting strategic priorities.

STRATEGIC FRAMEWORK COMPONENT	PROPOSED 2021-2031 STRATEGIC FRAMEWORK
MISSION	Working together for a better Southland
VISION	"Southland – one community offering endless opportunities"
COMMUNITY OUTCOMES	Kaitiakitanga for future generations
	Inclusive connected communities
	A diverse economy creating healthy and affordable lifestyles
	Empowered communities with the right tools to deliver the best outcomes
STRATEGIC PRIORITIES	Improve how we work to build resilience
	Provision of appropriate infrastructure and services
	Better preparing our communities and Council for future changes
	Support healthy environments and sustainable communities

Figure 6: Strategic Framework

The framework guides staff and informs future planning and policy direction and forms the basis for the performance framework. The table below outlines how the Stormwater activity contributes to the Council's community outcomes using a benefits mapping diagram. The full levels of service and performance management framework is presented in a further section later in the document.

Activity – Stormwater							
Outcomes	**Activity contributions**		**Outcome objective**		**Benefit**		**Levels of service (LoS) and key performance indicators (KPI)**
Activity objective:: Reliable stormwater collection, treatment and disposal that protects people and property from flooding and minimises the impact of any discharges on the environment							
Kaitiakitanga for future generations (Environment)	Stormwater collection, treatment (where required) and disposal helps to control the level of pollutants and sediments in stormwater discharged to waterways or coastal areas used for recreation and food gathering		A sustainable impact on the environment		More sustainable environments Improved reliability Enhanced responsiveness		LoS xx: Provide a reliable stormwater system that protects public health and the environment KPI xx: **System adequacy** - Overflows resulting from the stormwater system that result in the flooding of a habitable floor- a) The number of "flooding events" that occur within the district b) For each flooding event, the number of habitable floors affected (expressed per 1000 properties connected the council stormwater system) KPI xx: **Discharge compliance** - Compliance with the resource consents for stormwater system discharges, measured by the number of: (a) abatement notices (b) infringement notices (c) enforcement orders (d) successful prosecutions, received in relation those resource consents. KPI xx: **Response times** – The median response time to attend a flooding event, measured between the time of notification to the time when service personnel reach the site. KPI xx: **Customer satisfaction** – The number of complaints received about the performance of the Council's stormwater system, expressed per 1000 properties connected to the stormwater system KPI xx: Percentage of monitoring results that show compliance with resource consent conditions.
Inclusive, connected communities (Culture)	Stormwater collection, treatment (where required) and disposal also helps to protect public health by providing for general sanitation.		People are well connected		Better connectedness		
A diverse economy creating healthy and affordable	Stormwater helps to prevent flooding which otherwise may		Strong economies		Improved economic wellbeing		

Activity – Stormwater					
lifestyles (Economic)	affect the safety and accessibility of homes,				
Empowered communities with the right tools to deliver the best outcomes (Social)	Stormwater helps to prevent flooding which otherwise may affect the safety and accessibility of homes, businesses and public places	People have everything they need to live, work, play and visit People have a safe and fulfilling life	Improved social wellbeing		

Table 2– Benefits table

Council has identified four priority areas in response to the key strategic challenges facing Council and the community to achieve the vision and community outcomes. The contribution that the activity makes to these strategic priorities are shown in the following table

STRATEGIC PRIORITIES ▸ / CONTRIBUTION AREA ▾	1. IMPROVE HOW WE WORK TO BUILD RESILIENCE	2. PROVIDE APPROPRIATE INFRASTRUCTURE/SERVICES	3. BETTER PREPARING OUR COMMUNITIES AND COUNCIL FOR FUTURE CHANGES	4. SUPPORT HEALTHY ENVIRONMENTS AND SUSTAINABLE COMMUNITIES
WHAT WILL BE DONE IN THE LONG-TERM (NEXT 10 YEARS)	Contribute introduction of appropriate technology to improve how best to deliver service for example mobile field working	Ensure compliance with appropriate national and regional plans	Manage upgrades and renewals in a structured, prioritised programme that can demonstrate value for money.	Applications for new sub divisions will be considered with encouragement for developers to consider a range of measures for management of stormwater
WHAT WILL BE DONE IN THE SHORT-TERM (NEXT 3 YEARS)	Review and improve systems and procedures around data capture, management and storage Understand and implement business case approach during project development Understand implications of climate changes to our communities and how this will impact on the service we deliver Map critical processes	Understand implications of the Proposed Water and Land Plan and how this impact on the service we provide Review contractual arrangements	Review and improve systems and procedures around data capture, management and storage. Consider appropriate funding models that will best deliver improvements	Applications for new sub divisions will be considered with encouragement for developers to consider a range of measures for management of stormwater
KEY ACTIONS AND PROJECTS	Continued development of draft wastewater Strategy document with key stakeholders	Regional stormwater consents now operative	Develop proposals around future funding arrangements for the	None identified

STRATEGIC PRIORITIES ▸ CONTRIBUTION AREA ▾	1. IMPROVE HOW WE WORK TO BUILD RESILIENCE	2. PROVIDE APPROPRIATE INFRASTRUCTURE/SERVICES	3. BETTER PREPARING OUR COMMUNITIES AND COUNCIL FOR FUTURE CHANGES	4. SUPPORT HEALTHY ENVIRONMENTS AND SUSTAINABLE COMMUNITIES
	and look at benefits of incorporating stormwater discharges as well. Continue embedding Infor (IPS) IPS		stormwater activity	
RELATED STRATEGIES / PLANS / POLICIES	Draft wastewater strategy	Proposed Water and Land Plan National policy statement for freshwater management	Draft wastewater strategy as a reference starting point	Sub Division and Land Development Bylaw 2012.

Table 3: Strategic Priorities

Strategic context

The purpose of the Southland District Council Long Term Plan 2031 is to:

- provide a long term focus for Council decisions and activities
- provide an opportunity for community participation in planning for the future
- define the community outcomes desired for the district
- describe the activities undertaken by Council
- provide integrated decision-making between Council and the community
- provide a basis for performance measurement of Council.

Strategic direction setting encompasses Council's high-level goals, particularly the vision for the District, what the outcomes for the community may be, and what the strategic priorities will be for delivering work to the community.

Representation framework

Community representation was amended prior to the 2018 triennial elections. There are now nine community boards that provide representation across the district. These are:

ARDLUSSA	**FIORDLAND**	**NORTHERN**	**ORAKA APARIMA**	**ORETI**
STEWART ISLAND/RAKIURA	**TUATAPERE TE WAEWAE**	**WAIHOPAI TOETOE**	**WALLACE TAKATIMU**	

It is important that Council is seen as a leader in service delivery across the district and through this AMP, will ensure its stormwater services are fit purpose, in appropriate locations and managed cost effectively. Doing so enables Council to provide and deliver quality, professional services to the ratepayer.

Council aim to have a high level of engagement with its customers and elected members to ensure that the minimum levels of service set out in this document represent their expectations.

Key risks, issues and assumptions for the activity

Key strategic risks

The most important issues relating to the stormwater activity for the next ten years are shown in the following tables.

It is noted that the key issues and risks for the stormwater activity align closely with a number of key strategic risks identified at a corporate level the most relevant ones being

- inaccurate data leading to bad decisions/asset failure
- underinvestment in infrastructure
- infrastructure not fit for purpose to withstand climate change
- natural or biosecurity event impacts the wellbeing of the district
- health and safety controls fail to protect staff and contractor safety
- difficulty retaining or recruiting staff affects service levels
- over-commitment leads to inability to deliver agreed work programme

Key Issues

Key issues impacting on the stormwater activity are highlighted below.

KEY ISSUES	OPTIONS	IMPLICATIONS
COMPLIANCE WITH REQUIREMENTS OF DISCHARGE CONSENTS AND UNDERSTANDING THE IMPLICATIONS OF THE PROPOSED WATER AND LAND PLAN FOR SOUTHLAND	Limited options are available given the regulatory requirement, however there may be scope available to prioritise timings of required upgrades and improvements.	Four consents covering 17 townships have now been issued and conditions around monitoring, auditing and reporting are being met. At this stage implications are still not fully understood however it is extremely likely that upgrades will be required across a number of locations. It is widely understood that there will be a need to undertake improvements to discharges from industrial areas such as Winton and Te Anau and as a result allowances have been made in the budgets. Improvements to soakholes in Mossburn and Riversdale have also been budgeted for.
IMPACT OF CLIMATE CHANGE	Climate change will affect the district over the medium to long term in line with predicted national changes such as	Infrastructure planning will need to ensure that future assets are of sufficient standard and have

KEY ISSUES	OPTIONS	IMPLICATIONS
	increased temperatures, increasing sea levels and more extreme weather conditions characterised by extreme heavy rainfall events as well as prolonged drought periods. Climate change and its impacts will be considered as capital programmes are developed and further information is understood around the implications of this. Upcoming LiDAR survey across the whole region will help give a much better understanding of some of the potential impacts across 3 waters activities.	adequate capacity to cater for predicted climate change. Any future infrastructural building work including renewals in coastal areas will be considered against projections of sea level risk. Relocation of assets will also considered if it is believed they are at risk. From a three waters planning perspective the communities likely to be most impacted are the coastal communities of Oban and Riverton although limited Council infrastructure is found at other locations along the coast for example Curio Bay. Through the development of the 2021-31 Long Term Plan, Council staff from across a range of activities along with external expertise will more fully evaluate the risks associated with climate change with further planning allowed for in future LTPs/AMP's. At present there has been no change to future work programmes to address climate issues arising through climate change.
AGEING INFRASTRUCTURE APPROACHING OF LIFE LIKELY TO REQUIRE EXTENSIVE RENEWALS ACROSS A NUMBER OF TOWNSHIPS.	Undertake renewal (subject to further condition assessment), or defer renewal and manage assets through increased maintenance activities.	There is likely to be significant renewals costs associated which will have impact on rates which are reflected in the latest capital programme and a driver towards moving to a district funded model.
FUNDING OF THE ACTIVITY GIVEN THE IMPLICATIONS OF THE TWO ABOVE ISSUES.	Funding options are based around either locally funded or district funded models. Where there is a requirement for compliance with regional or national standards there is certainly more of an argument that this justifies the move to district funding.	District funding will help spread the burden of potentially significant upgrades across a wider rating base, however irrespective of funding models the overall implications of the upgrades need to consider the overall benefit to communities relative to the costs these will incur.
STRATEGIC DIRECTION	While change around how the sector is managed is anticipated the AMP has been developed on the basis of building on the	It is difficult to anticipate what changes are likely to arise following the national 3 waters review. At this stage it is

KEY ISSUES	OPTIONS	IMPLICATIONS
	previous AMP rather than trying to understand the implications of ongoing reviews and inquiries.	understood that the greater impact will be on the water supply and wastewater activities. In anticipation of the outcome of the reviews the AMP adopts a 'holding pattern' while also noting the need to significantly invest in both opex and capex budgets in order to maintain current level of service.
ASSET DATA KNOWLEDGE	While Council has asset registers and many digital systems, processes and records, we do not have complete knowledge of the assets under our ownership. To varying degrees Council has incomplete knowledge of asset location, asset condition, remaining useful life and asset capacities. This shortfall requires assumptions to be made on the total value of the assets owned, the time at which assets will need to be replaced and when new assets will need to be constructed to provide better service.	Council considers these assumptions and uncertainties constitute risk and proposes to address this by introducing an annual budget for condition assessment of assets to improve knowledge around age and condition of stormwater assets. As levels of understanding improve, a better forecast of capital expenditure will be incorporated into future forecasts.
STORMWATER DISCHARGE QUALITY	The current documentation on discharge water quality and receiving environment quality is variable and not collated as sampling in support of consent requirements has only commenced very recently. The quality required of stormwater discharges to at least maintain the existing conditions in receiving waters is therefore not yet fully understood	Money has been allocated for retrofitting stormwater quality devices however in a number of towns, the quantity and spread of the programme will need to be reassessed monitoring results increase. As such the budget allocation for water quality improvements is considered to be sufficient until this level of reporting further develops.

Table 4: Key issues for the activity

Key risks are summarised in the following table. It is noted that issues and risks are broadly similar across all 3 waters activities and align closely with Council corporate risks.

RISK EVENT	CURRENT TREATMENT DETAILS	PROPOSED TREATMENT DETAILS
EVENT - NATURAL DISASTER CAUSING SHORT TERM DISRUPTION TO SERVICE PROVISION.	Identification of alternative short term response and recovery arrangements.	Council and contractor to develop business continuity plans to cover natural disasters.
EVENT EG NATURAL DISASTER CAUSING WIDESPREAD UNAVAILABILITY OF ACTIVITY STAFF.	Temporary or agency staff either from within Council or through external resourcing	Council and contractor to develop contingency plans to cover natural disasters.

RISK EVENT	CURRENT TREATMENT DETAILS	PROPOSED TREATMENT DETAILS
NATURAL DISASTER CAUSES SIGNIFICANT WIDESPREAD DAMAGE TO COUNCIL ASSETS AND INFRASTRUCTURE.	As Council assets are widespread across the District the risk of significant widespread damage is relatively low however the impact on those areas can be relatively high.	Identify strategic sites at risk and develop plan for their maintenance and return to service. Development of wider emergency management plan. Understand location of vulnerable landfill sites and develop plan for their future management.
FUNDING OF ACTIVITIES WILL RESULT IN SIGNIFICANT RATES INCREASES IMPACTING ON COMMUNITY AFFORDABILITY.	Decisions made with based on a trade-off between 'sweating' assets and targeting investments. Has potential to result in a large number of unbudgeted projects required through the course of the planning cycle.	Development of a well informed capital works programme based on known condition and performance of assets.
RISK TO PUBLIC HEALTH AS A RESULT OF COUNCIL ACTIVITY	Installation of multi-barrier protection on all community water supplies along with review and up-dating of Water Safety Plans. Wastewater and stormwater risks are mitigated through achieving compliance with discharge consent conditions and any investigations that may arise as a result.	As current along with any further requirements that may arise following formation of new drinking water regulator.
HEALTH AND SAFETY RISKS (TO STAFF, CONTRACTORS AND PUBLIC) ASSOCIATED WITH OPERATION OF COUNCIL ACTIVITY	All Council sites are secure, fenced off and have appropriate signage warning of multiple risks. Higher risk sites have recently been identified and expenditure approved for increasing security.	Further review of fencing and security arrangements will require additional expenditure through future planning cycles.
BREAKDOWN IN RELATIONSHIP/COMMUNICATION BETWEEN COUNCIL AND CONTRACTOR	Regular communications and partnering approach.	More frequent partnering meetings. Review stakeholder management arrangements through new contract. Possible opportunity to develop Alliance type approach.
FAILURE OF CO-OPERATION WITH OTHER COUNCILS THAT MAY IMPACT ON FUTURE POTENTIAL SERVICE DELIVERY ARRANGEMENTS	New risk that may arise following requirement for councils to work together to review and consider future potential service delivery arrangements.	Agree working protocols among councils and ensure early and regular engagement with elected members to ensure consistent messaging is being fed through to all councils.
LACK OF RESOURCING IMPACTS ON ABILITY TO DELIVER SERVICES THROUGH FAILURE TO ATTRACT	This is an issue of concern nationally and is currently not one that is well managed. On a local level Council have	Continue to support local careers based events while pushing at a more national level (eg through Water NZ) for a co-

RISK EVENT	CURRENT TREATMENT DETAILS	PROPOSED TREATMENT DETAILS
APPROPRIATELY TRAINED STAFF INTO THE SECTOR.	participated in careers events that succeeded in attracting some graduates into the organisation.	ordinated approach to help attract appropriately skilled people into the sector.
LOSS OF ORGANISATIONAL KNOWLEDGE DUE TO SUDDEN LOSS OF KEY ACTIVITY STAFF RESULTING IN INEFFICIENT OF INADEQUATE MANAGEMENT OR OPERATION.	Staff training and succession planning will mitigate risk of frequent staff turnover.	Identify individual staff needs and formulate appropriate training, in conjunction with consultant assistance until skills at appropriate level. Detailed succession planning to ensure institutional knowledge is retained.

Table 5: Key risks

Impact of climate change

Climate change will affect the district over the medium to long term in line with predicted national changes such as increased temperatures, increasing sea levels and more extreme weather conditions characterised by extreme heavy rainfall events as well as prolonged drought periods.

Over the medium to long term as the impact of climate change becomes more prevalent Council will need to be proactive in considering implications on communities and infrastructure.

Infrastructure planning will need to ensure that future assets are of sufficient standard and have adequate capacity to cater for predicted climate change.

Any future infrastructural building work including renewals in coastal areas will be considered against projections of sea level risk. Relocation of assets will also considered if it is believed they are at risk.

From a 3 waters planning perspective the communities likely to be most impacted are the coastal communities of Oban and Riverton although limited Council infrastructure is found at other locations along the coast for example Orepuki and Curio Bay.

Through the development of the 2021-2031 Long Term Plan, Council staff from across a range of activities along with external expertise will more fully evaluate the risks associated with climate change with further planning allowed for in future LPT/AMP's. The proposed regional LIDAR mapping project will greatly assist with planning and mapping particularly for the stormwater activity in relation to management of protection of secondary flow paths for example.

The Climate Change Impact Assessment Report ('the report') was one of the studies commissioned. NIWA (National Institute of Water and Atmosphere) was appointed to undertake the work which commenced in 2017 and was finalised at the end of 2018. The report utilised a comparable methodology to the Climate Change Projections for New Zealand report and the Intergovernmental Panel on Climate Change scenarios. It used two climate change predictions being RCP (Representative Concentration Pathways) 4.5 – meaning that a large reduction in global carbon emissions is achieved and RCP 8.5 - where no reduction in carbon emissions is achieved.

It is widely accepted that the global climate system is changing and so is New Zealand's. In addition to the impacts on weather there will be impacts on water availability and natural hazard exposure. The report calculated the potential impacts of climate change on a range of components of climate, hydrology and coastal process across Southland.

Issues

The key findings of the report are summarised as follows:

Temperature

- the projected Southland temperature changes increase with time and emission scenario. Future annual average warming spans a wide range: 0.5-1°C by 2040, and 0.7-3°C by 2090
- autumn is the season where most of the warming occurs across all time periods and scenarios
- the average number of hot days (maximum temperature >25°C) is expected to increase in a range spanning from 0-10 days by 2040 to 5-55 days by 2090
- the related number of heatwave days (ie, number of consecutive days where the temperature is higher than 25°C) is projected to increase (largest increase with elevation)
- as expected, the number of frost days is expected to decrease by 0-5 days by mid-century, and by 10-20 frost days by the end of the century.

Projected changes in rainfall

- a marked seasonality and variability across the Southland region. Annual rainfall is expected to slightly increase by mid-century (0-5%), while the increase spans 5-20% at the end of the century
- seasonally the largest increases are projected during winter, while summer precipitation is expected to decrease in the Waiau catchment (by up to 10% at the end of the century)
- by mid-century, the number of wet days is expected to decrease by up to 10 days across most of the region. However, wet days are then expected to increase by the end of the century for most of the region, except the Waiau catchment where 10-20 fewer wet days are expected
- by mid-century, decreases in annual maximum 5-day rainfall are projected for the centre of the Southland Region (up to 15 mm) and increases are projected for the rest of the region, with Fiordland facing the largest increases of 15-30 mm in some parts.
- however, at the end of the century, almost the whole Southland region (except the eastern Waiau catchment under mid-range emission scenario) is projected to experience increases in annual maximum 5-day rainfall of up to 15-30 mm and parts of Fiordland facing possible increases 45 to 105mm.

Dry days

- by mid-century the number of dry days are expected in increase up to 10 more days for much of the region
- the central part of the region and northern and western Fiordland can expect up to 10 fewer dry days are expected (ie will remain wetter)
- by the end of century, a decrease in dry days (up to 10-20 days) is projected for most of the region except for the Waiau catchment (increase up to 10-20 days), eastern Fiordland, and Stewart Island
- meteorological drought (a period with abnormal rainfall deficit) – where soil moisture content is reduced and vegetation/pasture growth is hindered. During periods of potential evaporation deficit farms are more likely to need irrigation to maintain crop or pasture growth
- central-northern part of the Southland region is projected to experience the largest increases in potential evaporation deficit in the future across both time slices and all emission scenarios
- by mid-century, potential evaporation deficit is expected to increase by 40-80mm per year for most of the regions, rising to over 100 m per year for the highest emission scenario by 2090.

Changes in sea level-rise

- sea level rise is expected to be between 0.2-0.3 m above present levels by 2040 and increasing to 0.4-0.9 m by 2090
- a present day 1 percent annual exceedance probability (AEP) coastal flood (that is a flood of a size and depth that has a 1 percent chance of happening in any year), will become much more frequent as seas continue to rise, with such large events occurring on average on a yearly basis (100 percent AEP) once sea level rise reaches 0.45 m expected between 2055-2060 and 2100
- moderate coastal flooding events will become even more common, occurring several times a year for that same sea-level rise
- these floods have effects such as salt water on roads and therefore vehicles, saltwater intrusion in underground infrastructure, temporary inundation of open space, agricultural land or natural vegetation. Over time this can the fertility of soils, change plant species or cause accelerated deterioration of public and private infrastructure
- considering tides only, putting aside storm events, the rising sea level will result in an increasing percentage of normal high tides exceeding given present day design for coastal infrastructure and roads
- the replacement costs of buildings exposed in areas where such high resolution LiDAR surveys are already available (mainly low-lying parts of Invercargill City) is considerable at ~$0.6–1.2B (2011 NZ$) for a range from present exposure to 1 percent AEP coastal floods up to a 1.2 m sea-level rise.

The report models the effect of climate change on the "mean annual flood" which is a standard measure of floods likely to occur every 2.33 years. The modelling suggests that the mean annual flood is likely to become larger and this may mean an increase in volume for flooding generally. This requires further detailed consideration.

This regional study is a high level starting point for understanding how our climate is likely to change over the next 50 to 90 years. Given the high level of this report additional more targeted reports and internal work will be required to better understand how these assumptions are going to impact the management of Council assets and what makes Southland an attractive place to live, do business and visit. These detailed studies will help identify any future demand driven climate change work required across all three waters activities.

Regulatory considerations

Legislation, regulation and Council's existing strategies and policies mandate or influence some of the LOS and performance targets we set, as illustrated in the table below for the wastewater activity. A full description of Council policy and planning framework impacting AMPs is included in the LTP.

Below is a list of legislation and regulations that are specific to the stormwater activity. The table also includes relevant bylaws and policies linked to the activity.

LEGISLATION / REGULATION / PLANNING DOCUMENTS	HOW IT (AND ANY CHANGES PROPOSED OR IMPLEMENTED SINCE THE LAST PLAN) AFFECTS LEVELS OF SERVICE AND PERFORMANCE STANDARDS
LOCAL GOVERNMENT ACT 2002	The Local Government Act 2002 requires local authorities enable democratic decision making and action by and on behalf of communities, and 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.

LEGISLATION / REGULATION / PLANNING DOCUMENTS	HOW IT (AND ANY CHANGES PROPOSED OR IMPLEMENTED SINCE THE LAST PLAN) AFFECTS LEVELS OF SERVICE AND PERFORMANCE STANDARDS
	Changes: None.
REGIONAL POLICY STATEMENT 1997 AND 2014, 2017	This documents purpose in relation to stormwater is to ensure the quality of water and the environment is not contaminated by discharges and that waterways show an incremental increase in water quality over time. It aims to provide for current and future generations while aiming to improve the quality of the environment.
	Changes: None.
REGIONAL WATER PLAN FOR SOUTHLAND 2008	While the 2017 Water and Land Plan remains under appeal this plan remains operative. The purpose of this plan is to promote the sustainable management of Southland's rivers, lakes, groundwater and wetland resources. The plan is aimed at enabling the use and development of fresh water where this can be undertaken in a sustainable way, providing a framework for activities such as discharges to water.
	Changes: None.
REGIONAL COASTAL PLAN FOR SOUTHLAND2013	Fundamental principles in the management of the CMA are set out and then sections of the plan deal with discharges that have a range of environmental, social and cultural effects. Environment Southland have indicated the plan is due to be updated however we are currently uncertain of the timing.
	Changes: The plan is currently undergoing a review which takes part in three stages with stages 1 complete and stage2 (pre-notification policy development under way and stage 3 (formal consultation) to follow.
DISTRICT PLAN 2018	Sets out Council's resource management strategy, including how Council will control the effects from a range of activities to ensure that the adverse effects on the environment are avoided.
	Changes: None.
INFRASTRUCTURE STRATEGY	Sets long term direction for the management of assets and infrastructure
	Changes: 2021 Strategy signals the need for greater investment in stormwater from both capex and opex spending as well as condition assessment work required.
UTILITIES ACCESS AMENDED ACT 2010	The purpose of the code is to enable access by utility operators to transport corridors to be managed in a way that disruptions to roads by wastewater pipe installations are kept to a minimum while maintaining safety and maximising the benefits to the public.
	Changes: None.
SUBDIVISION AND LAND DEVELOPMENT STANDARDS BYLAW 2012	Specifies Council's minimum requirements for subdivision and land development while promoting sustainable development.
	Changes: None although it may be opportune to review ahead of its proposed date.
TRADE WASTE BYLAW 2008 WITH 2018 REVISION	Requires persons on trade premises to apply for a permit to discharge to the sewer network and allows conditions to be placed on the wastewater parameters before discharge.

LEGISLATION / REGULATION / PLANNING DOCUMENTS	HOW IT (AND ANY CHANGES PROPOSED OR IMPLEMENTED SINCE THE LAST PLAN) AFFECTS LEVELS OF SERVICE AND PERFORMANCE STANDARDS
	Changes: None.
STORMWATER DRAINAGE BYLAW 2017	Requires all persons to make application before connecting to the stormwater network and outlines conditions for accepting stormwater into Council owned stormwater infrastructure.
	Changes: None.
NZ WATER INDUSTRY NATIONAL ASSET GRADING STANDARDS AND INTERNATIONAL INFRASTRUCTURE MANAGEMENT MANUAL	Provides guidelines on asset grading and asset management
	Changes: None.
PIPE INSPECTION MANUAL	Provides guidelines on CCTV survey procedures and pipe asset grading.
	Changes: Staff work to most up to date version available
HAZARDOUS SUBSTANCES AND NEW ORGANISMS ACT 1996	The purpose of this act is to protect the environment, and the health and safety of people and communities, by preventing or managing the adverse effects of hazardous substances and new organisms.
	Changes: None.
RESOURCE MANAGEMENT ACT 1991	Promotes the sustainable management of natural and physical resources. Regulates land use and subdivisional activity. Regulates discharges to land, air and water. Recognises the principles of the Treaty of Waitangi. Compliance with district and regional plans.
	Changes: None.
NATIONAL POLICY STATEMENT FOR FRESHWATER MANAGEMENT	Sets national policies and bottom line standards for freshwater management and provides Regional Council with the authority and responsibility to develop policies, objectives and rules around how freshwater is managed across the country
	Changes: An updated NPS was released in 2020 and precedes a NES focussing on wastewater and stormwater discharges which is likely to impact on the way that activities are delivered.
PROPOSED WATER AND LAND PLAN	Recent or expected changes: The proposed Water and Land Plan was notified in 2016 with hearings held through 201. Decisions were released in 2018 with a number of appeals (including councils) to a number of objectives policies and rules. Following the first stage of appeals in June 2019 an interim ruling was released by the Environment Court in late 2019 with a second round of appeals expected to be heard in 2021. Essentially the plan builds on the provisions of the current active plan but also indicates a strong preference for wastewater discharges to be land based rather than to water. The objectives and policies are very explicit on this point with a specific rule identifying water based discharges as non-complying activity status.

LEGISLATION / REGULATION / PLANNING DOCUMENTS	HOW IT (AND ANY CHANGES PROPOSED OR IMPLEMENTED SINCE THE LAST PLAN) AFFECTS LEVELS OF SERVICE AND PERFORMANCE STANDARDS
	Changes: While sections of the plan are still under appeal provisions relating to water discharges are operative at this stage but may change depending on appeal outcomes.
TAUMATA AROWAI – WATER SERVICES REGULATOR BILL	The bill establishes Taumata Arowai the water services regulator as a new crown agent and provide for its objectives functions and operating principles. The Bill is part of a broader package of reforms to the regulatory system for 3 waters. The government has indicated a separate bill will be proposed to give effect to decisions to implement system wide reforms to the regulation of drinking and source water and targeted reforms to improve the regulation and performance of wastewater and stormwater networks and will include consideration of future service delivery arrangements.

Table 6: Key regulatory and statutory drivers.

Regulatory reforms

Reform in the three waters sector has been progressing for some time. However, since the Havelock North incident in 2016 it has become an area of high priority for central government.

Following the Havelock North incident, the government commenced a formal inquiry, which recommended a 3 waters review be undertaken. The review considered options for improving regulatory and service delivery arrangements for drinking water, wastewater and stormwater services (Three Waters) to better support New Zealand's prosperity, health, safety and environment. Most three waters assets and services, but not all, are owned and delivered by local authorities.

The government's 3 waters review highlighted that, in many parts of the country, communities cannot be confident that drinking water is safe, or that good environmental outcomes are being achieved. This work also raised concerns about the regulation, sustainability, capacity and capability of a system with a large number of localised providers, many of which are funded by relatively small populations.

Taumata Arowai - the Water Services Regulator Bill has now passed into law with significant work well advance with the establishment of the crown entity. . The bill is relatively simple in that its focus is on establishing the new water regulator as a crown entity, under the Crown Entities Act 2004. The bill also outlines the agencies objectives, functions, operating principles and governance arrangements.

A separate bill will give effect to the decision to implement system-wide reforms to drinking water regulation, alongside targeted reforms to improve the regulation and performance of wastewater and stormwater networks.

The regulatory components of this work are well progressed with the development of new legislation and the creation of Taumata Arowai, the new, independent water services regulator. This new crown entity is currently being built, and will become responsible for drinking water regulation once a separate Water Services Bill, which is currently before parliament, is passed (anticipated mid 2021).

Following the onset of Covid-19, central government have reviewed the approach being followed to three waters reform. This review has in part been driven by a number of factors including:

- a risk that a number of local authorities may look to defer operating and capital expenditure in an attempt to manage rate increases in a post Covid-19 environment
- the desirability of creating a broader economic stimulus for local economies in a post Covid-19 environment.

This process led, in July 2020, to the government announcing a funding package of three waters (drinking water, wastewater, stormwater) infrastructure, and to support the reform of local government water services delivery arrangements.

Council has been allocated $7.03 million by the crown, if it opts in to the reform programme. A further $11.15 million has been allocated to the region to agree an appropriate distribution between participating councils. This funding has been provided as a grant, which does not need to be repaid if Council does not ultimately commit to reform at later stages of the process. The funding must be expended by 31 March 2021. This stimulus funding is centrals government s approach to kick start economic growth post Covid-19.

Since then Council has developed a delivery plan identifying projects that could be grouped to develop a delivery plan which has ultimately been approved by the Department of Internal Affairs and consists of both capital work as well as investing a significant amount to improve knowledge of the condition of assets including wastewater and stormwater condition assessment across targeted networks where known issues have been identified. Further information on work identified under the delivery plan is highlighted in further sections within the plan.

In moving into this environment, the government has indicated that its starting intention is public multi-regional models for water service delivery to realise the benefits of scale for communities and reflect neighbouring catchments and communities of interest. There is a preference that entities will be in shared ownership of local authorities. Design of the proposed new arrangements will be informed by discussion with the local government sector.

In addition in an endeavour to proactively address the range of service delivery options that might exist the Otago Mayoral Forum has initiated a working group process, with external consultant assistance, to explore the range of delivery options that might exist in relation to the delivery of water services across the Otago region. They have also invited the Southland councils to participate in this work with work well progressed in identify future potential service delivery arrangements.

Demand management strategies

This section describes how demand for stormwater is likely to change over the 10 year period of the plan, the impact any changes are likely to have and whether Council is planning to make any changes to the activity as a result.

Predicting future demand for the service

Demand drivers

The factors influencing demand for the service are summarised in the table below. Council has prepared corporate wide assumptions/projections for growth drivers (population, land use, dwellings, tourism) which have been used as the basis for assessing future demand for the service.

Demand for the stormwater service can be measured in theory in terms of cubic metres in run-off (though this data is not collected). It can also be measured by the length of stormwater reticulation (which is available in Infor (IPS) though not formally reported).

The factors influencing demand for Council's stormwater services are summarised below.

DEMAND DRIVER	IMPACT ON FUTURE DEMAND
CLIMATE	Increase in total stormwater volumes from climate change. Further work will be undertaken in the next three year period to more fully understand the

DEMAND DRIVER	IMPACT ON FUTURE DEMAND
	impact of climate change driven demand and is likely to encompass all 3 waters activities.
POPULATION	Growth projected in urban areas can create the need for extensions to the stormwater reticulation however given low growth projections this is not seen as a significant driver.
DEVELOPMENT	Increase in impermeable surfaces cause increase in stormwater run-off and is considered the greatest driver in towns such as Te Anau where there is steady growth. An identified future area of improvement around changing land use and development lies in understanding and protecting secondary overland flow paths to avoid risk of flooding of property. This information will be more readily available following the upcoming (within two years) LIDAR survey of the region.

Table 7: Demand Drivers, Stormwater

Demand forecasts

It has previously been suggested that population will increase by about 10.73% during the period from the 2013 Census to 2031. This is not expected to drive a significant increase in stormwater flows growth may not occur in areas serviced by Council infrastructure..

New subdivisions will require a stormwater network within the subdivision and upgrading of pipes required to increase the capacity of pipes to transport stormwater from new subdivisions. This is generally the responsibility of the developer and must be undertaken following sign off from Council.

Councils 2012 Subdivision and Land Development Bylaw promotes where practicable the construction of low impact infrastructure as an alternative to pipelines.

Through the 2021 LTP, Council plans to undertake investigations into the impact of climate change driven demand of a range of Council services including stormwater resilience.

Implications of growth/demand

Urban growth will require extensions to the stormwater reticulation to service new residential subdivisions and, in some cases, upgrading the capacity of existing pipes.

More stringent environmental standards relating to the quality of stormwater discharges to natural watercourses may require Council to consider options such as:

- management of silt run-off from development earthworks areas
- management of contaminants associated with urban run-off in the urban areas
- management of point source contamination risk from commercial and industrial areas
- management of other point source contamination risk.

Council will continue to work proactively with key stakeholders in this regard, to advocate sensible solutions on behalf of the community and implement strategies and programmes as appropriate.

There are no major projects required to meet increased demand in the 30 year period.

Demand management strategies

Public education

Although there is no formal education programme, WWS publish articles on a regular basis in the Council's "First Edition" quarterly newsletter. The newsletter is distributed to all residents and ratepayers. No specific public education programmes are planned in relation to stormwater.

Low impact design

Rain gardens and swales can provide a mix of storage/detention and soakage. There may be the opportunity in the future to use non-pipe solutions for stormwater issues in some areas. Council reviewed its Subdivision and Land Development Bylaw which enables the implementation of such technologies where appropriate however it is noted that few developers have yet to consider them in much detail. This is also an area that Council will consider in more detail as existing infrastructure reaches the end of its useful asset life.

Detention and retention tanks

Many larger city councils are now insisting on the installation of detention or retention tanks on new houses to take the pressure off infrastructure by removing peak flows. Detention tanks collect stormwater in a rain event and release into the network by a restrictor, thereby preventing excessive return rates or volumes at peak flows.

A retention tank collects stormwater so that it can be used for household use. Many households in rural Southland already collect roof water for drinking but there are opportunities in urban areas to collect roof water for non-potable purposes. This will be further considered through the next review of the Subdivision and Land Development Bylaw where the appropriateness of such measures, especially in areas with limited reticulated assets will be considered. It is noted that a number of Councils are now making this a mandatory requirement for new developments.

Plans programmed to meet growth/demand changes

Given the limited nature of Council stormwater infrastructure and considering that the primary purpose is to manage surface water flooding primarily of the urban roading network, and the limited expected growth it is not anticipated that a specific programme will be required to manage people related growth.

Further work will be undertaken in the upcoming three years to more fully understand the impact of climate change related demand.

Sustainability

The Local Government Act 2002 requires local authorities enable democratic decision making and action by and on behalf of communities, and 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..

At the stormwater activity level, this approach is demonstrated by the following:

- promotion of low impact stormwater design for new developments where appropriate
- further develop an understanding the implications of climate change on the management of the stormwater activity

- undertake appropriate improvements to ensure any consenting requirements are met for the activity in an affordable, sustainable manner

The ability to improve the sustainable outcomes in the provision of infrastructural services is highest during the planning and design phase. Asset type, location and design can significantly impact sustainability outcomes, eg accessibility, urban form, land-use, heritage, health and wellbeing. Good planning and design can lead to improved economic and social benefits.

The operation of infrastructure has ongoing impacts - particularly as they relate to energy use and emissions, runoff, noise, light, ecological impacts, safety, etc. Operation can provide ongoing employment and economic benefit.

The stormwater activity contributes to the sustainable development across the district by provision of:

- adequately sized stormwater collection system to ensure properties are protected from flooding.
- adequate protection of stormwater from contamination with sewage and other contaminants to enhance public and environmental health.

Social and cultural considerations

The stormwater activity provides one of the building blocks for safe, healthy communities. This activity management plan aims to provide a system that is continuously available for the drainage of stormwater. The Plan utilises maintenance and renewal strategies to replace assets prior to failure, and to upgrade capacity where required and to minimise times when the service is unavailable to any property.

Environmental considerations

Council holds consents for the discharge of stormwater to rivers and streams across the district.

The consents include conditions requiring Council to monitor the discharges and where contamination is found, to trace this to source and to have corrected. Further conditions require industrial properties to be audited to ensure production practices are not contaminating stormwater and the hazardous substances are appropriately contained.

Council seeks to operate the activity in ways that minimise the use of resources and effects on the environment. Strategies include:

- selection of plant and pipe material to maximise useful service life
- minimisation of wastage during construction
- where appropriate encourage on site soakage as a means of stormwater management
- use of low impact stormwater designs including attenuation ponds where appropriate to reduce the risk of stormwater contamination.

Economic and financial considerations

Council's goal is to continue to provide the stormwater activity in ways which achieve the desired levels of service in the most effective manner by:

- recognising the consumption of assets over their lifetime and funding renewal through depreciation
- separately itemising capital versus operational expenditure
- allocating costs and preparing forecasts over the long term (30 years and beyond)
- reporting on financial performance
- researching and identifying practical and cost effective alternative service delivery options

Key projects

The following table identifies key projects that it is proposed to undertake through the ten year period of the 2021/31 LTP

LOCATION	DESCRIPTION	BUDGET	YEAR (S)
Riverton	Investigate Havelock St-Kerb and channel	$50K	21/22 - 22/23
Lumsden	Reticulation upgrade Southeast catchment and pre-investigation	$483K	21/22 – 24/25
Various	Coastal Plan Resource Consent preparation Riverton,Waikawa,Stewart Island, Orepuki,Colac bay	$150K	30/31
**Edendale/Wyndham	Investigation - Mains & Manholes renewal - Subsoil drainage required Wyndham	$3190K	21/22 25/26 – 26-27
Limehills	Mechanical cleaning of open drains	$57K	24/25 30/31
Mossburn	Change of soakholes to comply with Discharge Consent	$104K	22/23 – 23/24
Nightcaps	Investigation & stormwater renewals	$444K	24/25 26/27
Ohai	Investigation & stormwater renewals	$455K	25/26 27/28
*Orepuki	Upgrade stormwater main to main road	$240K	22/23
Otautau	Investigation & stormwater renewals	$492K	28/29 30/31
Riversdale	Renew soakholes to comply with Discharge Consent.	$53K	22/23 – 23/24
Riverton	Taramea Bay- outfall improvement investigation	$51K	21/22 – 22/23
*Riverton	Towack Street Upgrade	200K	
*Stewart Island	Stormwater improvement Town Centre, Main St, Ayr St, Argyle Sts	$407K	21/22
Te Anau	Stormwater discharge improvements to surface water	$222K	25/26
*Te Anau	Stormwater improvements to	$60K	21/22

	Mokonui Street / Towncentre junction		
*Waianawa	Replacement of stormwater main	$400K	21/22
Winton	Investigate & replace Storm main.	$5.6M	21/22 – 30/31
Winton	Longwood road to Price Road	$350K	27/28
*Woodlands	Stormwater Upgrade	$400K	21/22
*District Wide	Condition and performance assessment of piped assets	$500K	

Table 8: Key projects

*Denotes funder through Government Stimulus Funding Programme.

** At this stage the stimulus funding will cover the cost of the first tranche of upgrades in Wyndham with others funded through other mechanisms predominantly loans. Further stages are programmed for 2025/26 and 2026/27.

Our levels of service

Levels of service, performance measures and targets

Levels of service (LOS), performance measures and targets form the performance framework for the activity detailing what Council will provide, and to what level or standard:

LOS are the outputs that are expected to be generated by the activity. They demonstrate the value being provided to the community or reflect how the public use or experience the service. A key objective of activity planning is to match the level of service provided with agreed expectations of customers and their willingness to pay for that level of service.

- performance measures are quantifiable means for determining whether a LOS has been delivered
- performance targets are the desired levels of performance against the performance measures.

The levels of service provide the basis for the management strategies and works programmes identified in the AMP. By clarifying and defining the levels of service for the activity (and associated assets), Council can then identify and cost future operations, maintenance, renewal and development works required of the activity (and associated assets) to deliver that service level. This requires converting user's needs, expectations and preferences into meaningful levels of service.

Table 0-8 details the levels of service, performance measures and performance targets for the stormwater activity. The italicised/grey measures are monitored for internal management/self-assessment purposes and as such are not reported publicly in the LTP. The table sets out Council's current performance and the targets it aims to achieve within the next three years and by the end of the next 10 year period.

Removal of LOS category

The main points covered in the LOS below are:

- minimise impact of urban flooding
- promote the environment by using sustainable services

- provide a reliable, efficient stormwater service.

Over the next 10 years, Council's intention for this activity is generally to maintain the current performance in relation to flooding complaints and improve performance in the following areas:

- the delivery of projects
- understand implications of resource consent conditions and prioritise any upgrades in a sustainable manner that delivers best environmental outcomes in an affordable manner.

Response to customer requests (current low performance in this area is mainly attributable to closing out of service requests in the customer service system). Compliance with resource consent conditions as required by Environmental Southland's Discharge Plan. (As the overall cost of meeting this compliance is not fully understood it is only being forecasted to meet 70% compliance by the end of this 10 year period as Council must also consider affordability issues for some of these communities. Agreement will be reached with ES over timing and prioritisation of improvement works).

Changes to the performance framework

- the levels of service and key performance indicators have been reviewed following a benefits mapping exercise to ensure Council's performance framework is focussed on measuring the activity benefits at the outcome and objective level. As a number of measures are mandatory they cannot be significantly altered. Other non-mandatory measures are considered fit for purpose.

STORMWATER: The level of service (LoS) we provide	**LoS xx: Provide a reliable stormwater system that protects public health and the environment**				
How we measure performance	**Current Performance (19/20)**	**Future Performance Targets**			
		Yr 1 (21/22)	**Yr 2 (22/23)**	**Yr 3 (23/24)**	**Yr 4-10 (25-31)**
KPI xx: **System adequacy** - Overflows resulting from the stormwater system that result in the flooding of a habitable floor e) The number of "flooding events" that occur within the district. f) For each flooding event, the number of habitable floors affected (expressed per 1000 properties connected to the council stormwater system). Definitions of habitable floor and flooding event in footnote.	a) 0 b) 0	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1	a) ≤ 5 b) ≤ 1
KPI xx: **Response to stormwater issues** - The median response time between the time of notification and the time when service personnel reach the site when "habitable floors" are affected by flooding resulting from faults in the stormwater system.	There were no flooding events to habitable floors in the year	≤ 2 hours	≤ 2 hours	≤ 2 hours	≤ 2 hours
KPI xx: **Customer satisfaction** – The number of complaints received about the performance of the Council's stormwater system, expressed per 1000 properties connected to the stormwater system.	a) 15 per 1000 properties	a) ≤ 15 per 1000 properties	a) ≤ 15 per 1000 properties	a) ≤ 15 per 1000 properties	a) ≤ 15 per 1000 properties
KPI xx: **Discharge compliance -** Compliance with the resource consents for discharge from the stormwater system, measured by the number of: (i) abatement notices (j) infringement notices (k) enforcement orders (l) successful prosecutions, received in relation to those resource consents.	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0	a) 0 b) 0 c) 0 d) 0

KPI xx: Percentage of monitoring results that show compliance with resource consent conditions.	85%	100%	100%	100%	100%
Habitable floor refers to a floor of a building (including a basement) but does not include ancillary structures such as stand-alone garden sheds or garages. A flooding event means an overflow of stormwater from a territorial authority's stormwater system that enters a habitable floor.					

Table 9: What we plan to do and out levels of service (LoS)

Plans Programmed to meet the Level of Service

The list below details any projects, initiatives, programmes or expenditure that Council is planning to undertake to ensure that the level of service is achieved and/or to address any gaps between the targets and current performance. Where there are capital works projects related to improving levels of service (LoS) or maintaining levels of service (Renewal – R), these are identified in the Activity and Asset management section under the heading: Upgrading and developing new assets for levels of service and demand.

Over the next 10 years, Council's intention for this activity is generally to maintain the current performance in relation to flooding complaints and improve performance in the following areas:

- the delivery of projects
- compliance with expected national and regional plan requirements
- response to customer requests (current low performance in this area is mainly attributable to closing out of service requests in the customer service system)
- comply with resource consent conditions as required by Environmental Southland's Discharge Plan. As the overall cost of meeting this compliance is not fully understood it is only being forecasted to meet 70% compliance by the end of this 10 year period as Council must also consider affordability issues for some of these communities. Agreement will be reached with ES over timing and prioritisation of improvement works.

Stormwater consenting

Applications for resource consent for discharges from 17 townships have recently been finalised and granted by Environment Southland. Four global consents covering 17 townships were issued in late 2018 and take a risk based approach to sampling and monitoring. The applications are being processed based on risk. When considering risk Environment Southland have taken into account the following factors

- scale of discharge
- nature of discharge eg urban, rural, industrial etc
- sensitivity of receiving environment.

Monitoring to date has identified a number of areas where non-compliances indicate areas where further investigation is required – these include Te Anau, and Winton where high levels of E. Coli indicated potential cross connections. The following table summarises the monitoring results of each township (current as of May 2020).

TOWN	NUMBER OF SAMPLE/TEST	NUMBER COMPLIANT	NUMBER NON-COMPLIANT
Balfour	6	6	0
Browns	2	1	1
Dipton	4	3	1

Edendale	12	12	0
Lumsden	6	6	0
Manapouri	8	8	0
Mossburn	9	2	7
Nightcaps	6	5	1
Ohai	6	6	0
Otautau	6	6	0
Riversdale	6	6	0
Te Anau	27	26	1
Tokanui	3	3	0
Tuatapere	4	4	0
Waikaia	2	2	0
Wallacetown	9	9	0
Winton	31	27	4
Totals	**147**	**132**	**15**

Table 10: Monitoring data

Monitoring results have identified a number of areas where further investigation work will be required and potentially drive the need to undertake upgrades in certain areas, particularly in Winton and Mossburn.

Once conditions are more fully understood options for upgrades will be considered. These include attenuation ponds, filtration chambers, grass swales, sub soil drainage and upgraded soak pits. Forecasts include extra costs for monitoring where appropriate and also some capital projects for improvement of the water being discharged.

Activity and asset management

Overview of management

Lifecycle asset management means considering all asset management options and strategies to deliver the agreed level of service and to inform decision-making for asset renewal, replacement, upgrade and disposal. Effective lifecycle planning is about making the right investment at the right time to ensure that the asset delivers the desired level of service over its full-expected life, at the minimum total cost. This section explains the approach for:

Providing new or upgraded assets to improve service levels, providing for growth and demand

Operating and maintaining assets

Renewing or replacing assets

Disposing of assets at the end of their useful life.

All asset data has been extracted/reported as at July 2019.

Overview of the stormwater assets

Southland District Council manages a number of stormwater networks across the district totalling some of 113 km of pipe, most of which is earthenware, concrete or asbestos cement, and estimated to have a design life of 80-100 years. In addition there are approximately 24 km of open drains, mostly situated in the rural areas such as Limehills as well as towns such as Otautau, Lumsden, Winton and Te Anau.

Asset value and depreciation

The scheme values and depreciation information below is from the 2020 valuation.

ASSET COMPONENT	REPLACEMENT COST $	DEPRECIATED ASSET VALUE S	ANNUAL DEPRECIATION $
BALFOUR	487,293	129,690	5,504
BROWNS	150,237	61,250	1,639
COLAC BAY	84,972	48,135	932
DIPTON	106,868	60,104	1,189
EDENDALE	802,927	593,311	9,151
LIMEHILLS	215,442	139,570	2,572
LUMSDEN	961,674	317,899	10,748
MANAPOURI	1,568,311	913,405	17,626
MONOWAI	89,093	52,940	1,048
MOSSBURN	54,546	22,434	609
NIGHTCAPS/WAIRIO	1,467,358	781,134	16,356
STEWART ISLAND	1,359,251	1,035,900	15,257
OHAI	1,282,959	242,015	15,398
OTAUTAU	1,282,740	302,162	14,562
RIVERSDALE	417,337	134,807	4,871
RIVERTON	2,373,192	1,293,803	28,287
TE ANAU	11,363,284	6,912,421	134,185
THORNBURY	130,767	37,450	1,574
TOKANUI	107,458	32,978	1,229
TUATAPERE	1,048,519	456,487	12,208
WAIKAIA	103,975	28,915	1,261
WALLACETOWN	991,372	677,591	10,766
WINTON	8,578,046	3,622,939	98,486
WOODLANDS	23,698	4,323	278
WYNDHAM	3,059,270	164,120	34,265
TOTAL	38,110,600	18,065,759	440,103

Table 11: Asset Value and Depreciation

Information relating to remaining asset lives is available through the Infor (IPS) database and summarised in Council's annual valuation report.

The following assumptions have been made in the preparation of the valuations:

1. That all asset data has been reviewed and updated.
2. That all valuations are based on the "Modern Equivalent Replacement Cost" (MERC) basis.
3. Where new technology is available or where present assets do not require full replacement, adjustments have been made.
4. That stormwater laterals have not been included in the valuation.
5. The asset lives have been reviewed.

Asset condition and performance

Information on condition of the pipe network is limited, with knowledge of condition based on limited maintenance records, and the knowledge and experience of staff and contractors. While there are a relatively small number of pipe system blockages it is considered that given the age of some of the networks that replacement of pipes will be required in the upcoming ten-year periods and that previous deferment of significant renewals is no longer a sustainable asset management option.

The main causes of pipe failure are:

- root intrusion
- open joints on pipes laid prior to 1980 allow the intrusion of roots which can restrict capacity and eventually block the pipe, and is a major maintenance cost, particularly in areas with street trees and stormwater pipes laid in grass berms. Areas of Wyndham and Winton are known to suffer as a result of excess tree route intrusion.
- manholes - many of the manholes constructed before 1950 were of brick construction, and some of these have partially collapsed, with subsequent slumping of road surfaces and have, therefore, required replacement. There is a potential of more of these manholes collapsing.
- open drains - the open drainage system is inspected regularly and maintained in good condition through an active operational maintenance programme which includes control of vegetation by trimming or spraying, regular inspection and removal of rubbish, and annual programme to remove silt as necessary.

The following strategies are used to monitor the condition of stormwater assets to feed into upgrading and renewal programmes, and to ensure that levels of service are maintained, and assets upgraded or renewed in the most timely and cost effective manner. Monitoring of the various assets clauses include:

Pipe networks

- maintenance records: request for service, records of maintenance activities and inspections of pipes during repair are analysed to assist in rating of pipe condition.
- CCTV inspections: critical assets are inspected by CCTV and condition is graded in accordance with the guidelines in the New Zealand Pipe Inspection Manual
- pipe material testing: Samples of pipe are physically tested to determine condition and decay rates.

Future operations and maintenance (O&M) budgets will be increased across the district to allow for an expanded condition assessment programme of works to help gain a better understanding of our networks and to help define, manage and prioritise capital works programmes. As a starting point it is proposed to allow a budget within each year of the plan to undertake condition assessment work across 7.5% of the network per year to allow a more thorough indication of performance and condition of the stormwater networks and use this information to develop more robust capital works renewals programmes.

Open drains are periodically visually inspected with appropriate repair undertaken on damaged sections. In addition regular programmed mechanical cleaning of open drains is undertaken in areas where they are

known to silt up. These include Limehills/Centre Bush and areas such as Orepuki and Colac Bay. In addition stormwater outfalls in Riverton require mechanical cleaning following high tide events in order to prevent them filling with sand and gravel.

At present there is limited information available on the current condition of our stormwater assets. In 2015 a district-wide investigation fund was established to help better understand data requirements and improve data integrity. Significant work was undertaken in Lumsden, Manapouri and Winton in support of this work with data updated in both Infor (IPS) and GIS as a result. This will continue through successive plans. For the 2021 LTP it is proposed to increase the district funded budget to $100K per year (subject to Council approval and noting a move to district funding of the activity as a whole).

The following table provides a high level overview of the age and performance of the networks noting that for a number of schemes there is limited if any information on condition. It is proposed to address this across the life of the LTP by increasing operational budgets to allow for additional condition assessments across all networks.

SCHEME	INSTALLED (DECADE)	COMMENTS
BALFOUR	1950	Resource consent required. No known performance issues. Limited information on condition available.
BROWNS	1955	Potential cross contamination issues require further investigation. Resource consent now operative. Limited information on condition available.
COLAC BAY	1980	No known performance issues. Network condition unknown.
DIPTON	1980	Cross connection issues require further investigation Resource consent now operative. Limited information on condition available.
EDENDALE	Est 1935	Location of a number soakholes are unknown. Known soakholes were re-drilled in June 2011 to remove blockages. Resource consent now operative. Limited information on condition available.
LIMEHILLS/ CENTRE BUSH	1994	Potential contamination from septic tank connections to open ditches. Open channels have programmed cleaning included in budgets.
LUMSDEN	1970	Flooding in certain areas of the southern catchment. Investigation to scope out potential solution will be undertaken 2020/21.

SCHEME	INSTALLED (DECADE)	COMMENTS
		Resource consent now operative. Limited information on condition available.
MANAPOURI	1960	No known performance issues Resource consent now operative. Limited information on condition available
MONOWAI	1979	No known issues. Network condition unknown.
MOSSBURN	1966	Soakholes on state highways known to flood in heavy rain Resource consent now operative. Monitoring indicates contamination potentially from run-off from state highway.
NIGHTCAPS	1953	Resource consent now operative. Upgrades undertaken Dryffe Street 2015. Condition information available for parts of the network.
OHAI	1950	Resource consent now operative. Future renewals require planning before end of life. Limited information on network condition available.
OREPUKI	1980	Potential that stormwater discharge is contributing to erosion which may encroach on neighbouring private property.
OTAUTAU	1949	Resource consent now operative. Limited information on network condition available.
RIVERSDALE	1960	High watertable may be contributing to infiltration in certain areas of the catchment. Resource consent now operative. Future renewals require planning.
RIVERTON	1974	Future renewals require planning. Condition information available for parts of the network.
OBAN	1955	Areas of mixed pipe size/material around village and localised areas of surface flooding around Ayr Street and Main Road-Argyle Street where stormwater system inadequate. Limited information on network condition available.

SCHEME	INSTALLED (DECADE)	COMMENTS
TE ANAU	1960-70	Localised flooding around town centre under heavy rain Resource consent now operative. Condition information available for parts of the network.
THORNBURY	1980	No known issues.
TOKANUI	1958	Resource consent now operative. Limited information on network available
TUATAPERE	1960	No known performance issues Resource consent now operative. Limited information on network condition available
WAIKAIA	1960	Potential contamination from septic tank connections. Resource consent now operative.
WAIKAWA	Unknown	No known issues.
WAIRIO	1953	No known issues
WALLACETOWN	1988	Resource consent now operative. Limited information on network condition available.
WINTON	1930	Further investigations of industrial discharges will be undertaken as part of new consent requirements. Condition information available for parts of the network.
WOODLANDS	1950	Limited Council infrastructure Potential contamination from septic tank connections.
WYNDHAM	1935	Extra drainage work will be required due to ponding after recent sewer upgrade works. Resource consent now operative. Future renewals will need to be phased to ensure affordability. Recent CCTV work has identified areas of priority. Condition information available for parts of the network known to be in poor condition.

Table 12: Stormwater Networks Condition and Performance

The table indicates where there is limited information available to fully understand the age, condition and performance of stormwater assets in a number of areas across the district. As a consequence a key focus of the proposed plan is to improve knowledge in areas through development of a detailed condition assessment programme which will be funded partially through introducing a condition assessment budget as well as utilising the Stimulus funding grant money received from central government.

Asset age and life expectancy

Typical asset lives are detailed in the following table. Where appropriate aged assets will continue to remain operational beyond end of life as a means of deferring significant capital expenditure. This is certainly seen as a prudent strategy in areas with static or declining populations. Where renewals are required consideration will be given to use of 'no dig' technologies including structural liners and pipe bursting.

ASSET TYPE	ASSET DESCRIPTION	LIFE (YEARS)
STORMWATER CLEANING EYE	Cleaning Eye	60
STORMWATER CHANNEL	Channel	80
STORMWATER CULVERT	Culvert	60
STORMWATER MANHOLE	Concrete Manhole	60
STORMWATER SOAKHOLE	Lined Soakhole	35
	Unlined Soakhole	25
STORMWATER GRAVITY MAIN	AC	80
	Concrete	80
	Concrete RRJ	80
	Concrete SR	80
	EW	90
	Plastic	80
	Plastic Slotted	80
	PVC	100
	PVC-FT	90
	PVC-M	100
	PVC-U	100
	Steel	90
	Unknown	65
	VC	90
	Wood	60
STORMWATER SUMP	Sump	60

Table 13 Asset type

Based on these projected lives the following graph provides an indication of expected remaining lives of all stormwater network infrastructure

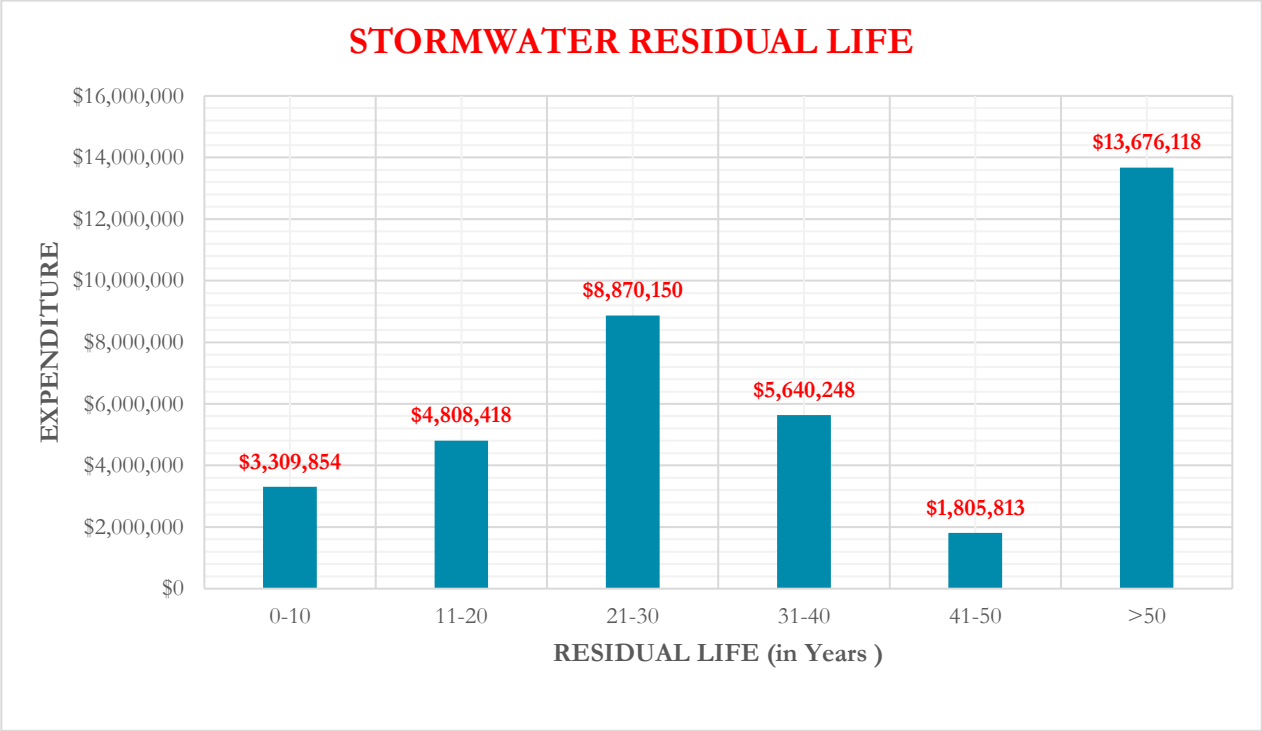

Figure 7: Stormwater residual life

Based on these expected lives and the known age of networks across the district it is apparent that it is appropriate to consider a step change in capital investment required to replace these ageing assets and maintain the current levels of service. This is particularly relevant in older townships including Winton and Wyndham where the oldest infrastructure dates back to the 1930s, and should therefore be considered as aged and therefore ready for replacement.

Where investigations indicate assets are due for renewal Council will consider what if any options are appropriate to consider. It is noted that alternative 'no dig' technologies such as structural lining of existing pipework is becoming a more popular method of extending the life of the pipework. It is noted that such techniques should be undertaken by specialist contractors which may add additional cost. When considering this approach, it is noted that a lining programme is likely to require a reasonably extensive lining programme to be able present itself as a viable alternative to the more traditional open trenching.

Data source and confidence

ACTIVITY	RELIABILITY	COMMENTS
ASSET DESCRIPTION	Uncertain	Description data is available in Infor (IPS) and will be reviewed/updated as further information is received via maintenance contractors
VALUATION	Uncertain	Annual valuation now undertaken. As part of the review process we are considering what opportunities are available to refine the valuations process so that more scheme specific information could be utilised, rather than generic

ACTIVITY	RELIABILITY	COMMENTS
		information. For example, where it is known that the asset life of asbestos cement pipes is adversely affected by ground conditions the asset life of these pipes will be altered to reflect this, this will have an impact on the valuation for that scheme. In addition, stormwater laterals have not been included in valuations to date.
CONDITION AND PERFORMANCE	Uncertain	There is limited data regarding performance of stormwater systems compared with the information available for water and sewerage. Some stormwater sampling is now required through recently issued resource consents. Reactive maintenance will be recorded in Pathway by the roading contractors. Investigation work has been undertaken in Lumsden and Manapouri and with Infor (IPS) and GIS updated as a result.
FINANCIAL FORECASTS	Uncertain	Currently estimates have been made based on current market rates, annual asset valuations and direct enquiries. Projects within the first three years should be expected to have an uncertainty of up to +/- 20% with projects in the outer years up to +/- 50%. Currently no capital work will be carried out without the permission of the local CB however new Boards have been warned of the risk to service from further deferment of capital work to minimise rate impacts. There is also uncertainty around the additional costs associated with meeting consent requirements. To date these have not been included in the AMP review.

Table 14: Data Source and Confidence

Approach to operations and maintenance

The purpose of this section is to outline the broad operations and maintenance philosophies for the assets, understand any underlying issues and trends, and set the basis for the O&M financial forecasts.

Operation and maintenance (O&M) of the stormwater network is carried out by two different mechanisms and administered through roading contract managers and Water and Waste team engineers:

- district funded roading contracts
- future district funded stormwater maintenance budgets.

In places there is limited information available on stormwater assets with a need to invest if future condition assessment programmes to help inform future capital works renewals.

Specific information regarding operation and maintenance trends is discussed in the scheme sections.

There are three road maintenance contracts in operation covering the entire Council road network:

- north-west contract (Waimea Alliance) covering the Mararoa-Waimea Ward and parts of the Waiau-Aparima Ward. Currently awarded to SouthRoads
- central area contract (Central Alliance) covering the Winton-Wallacetown Ward and parts of the Waiau-Aparima Ward. Currently awarded to SouthRoads
- south-eastern area contract (Foveaux Alliance) covering the Waihopai-Toetoes Ward and the Stewart Island Rakiura Ward. Currently awarded to Fulton Hogan.

The road maintenance contracts allow for a sump cleaning schedule in order to protect the roading assets.

Pipework maintenance currently tends to be more reactive in response requests for service and generally arises following flooding events. It is noted that a reliance in reactive maintenance is no longer a sustainable option (especially as more assets approach the end of their asset life) and that maintenance budgets will be increased to develop a planned maintenance schedule based on the output from condition assessment work.

Service delivery review

Section 17A of the Local Government Act 2002 requires all local authorities to review the cost-effectiveness of its current arrangements for delivering good quality local infrastructure, local public services and performance of regulatory functions at least every six years.

In view of the fact that the contract term expires in two years a review was undertaken in November 2020. The review was conducted by Field Force 4 who have significant expertise in undertaking such reviews. Based on feedback from interviews with key staff the review concluded that while it is believed that the current contract arrangements and contractor performance is meeting expectations improvements could be made around contract management, targeted KPIs and proactive asset management.

The review was undertaken in the context of a number of factors coming into play in the nextr 2 years including:

- 3 Waters reform
- Contract expiry in 2 years
- Inclusion of additional O&M work through a variation
- Establishment and embedding of new 3 waters structure
- A desire to better manage stormwater operations and maintenance going forward.

Ultimately the Council contractor model is the preferred method of undertaking the activities. However given the significant degree of change within the sector at present it has been proposed that the contract be extended by a further 12 months to allow a better understanding of the implication of ongoing reforms across all 3 waters activities.

Asset performance monitoring

Information related to the stormwater activity is stored in a number of corporate systems. Information relating to the physical assets are stored in Infor (IPS) and displayed spatially on GIS. An exercise is

currently under way to evaluate the integrity of the data within each system and identify critical areas where this can be improved. Information relating to customer service requests (RFS) are recorded in the Infor Pathways system. Requests for Service are updated by the maintenance contractor once actioned. Information supplied by the contractors will help identify any follow up work required.

Operations and maintenance strategy

O&M is primarily reactive, responding to flooding incidents and other requests for service. Generally, this just involves clearing obstructions such as pipe or sump blockages or cleaning open drains. There are a number of areas that may have a planned maintenance schedule where a local contractor will routinely inspect and clear problem areas for example desilting of outfalls in Riverton.

Maintenance response time may vary depending of the level of flooding severity or where a risk to public safety (for example from displaced manhole covers) has been identified.

There has been an increase in CCTV inspections to date to several communities, with associated condition reporting, with work undertaken at Wyndham, Riverton, Nightcaps, and Ohai. Generally CCTV work has indicated that the pipework is in a condition consistent with the age of the network.

Operations and maintenance trends and forecasts

Typically, the level of maintenance carried out on stormwater assets is low. Local stormwater systems are funded through local rates at present. Roading stormwater systems (not in townships) are funded through the roading rate (refer to the Roading and Transport section). Rates are used for both capital and operating expenditure, loans and reserves may also be used.

Figure presents the 10 year O&M forecasts. O&M costs in the future will rise because of the requirement to meet discharge consent conditions, increased planned maintenance and additional condition assessments across all networks that are yet to be finalised.

Operating costs increase in through the life of the plan. This is in response to the need for an increased level of planned maintenance and investigation work to help develop a fuller understanding of the age and condition of stormwater assets.

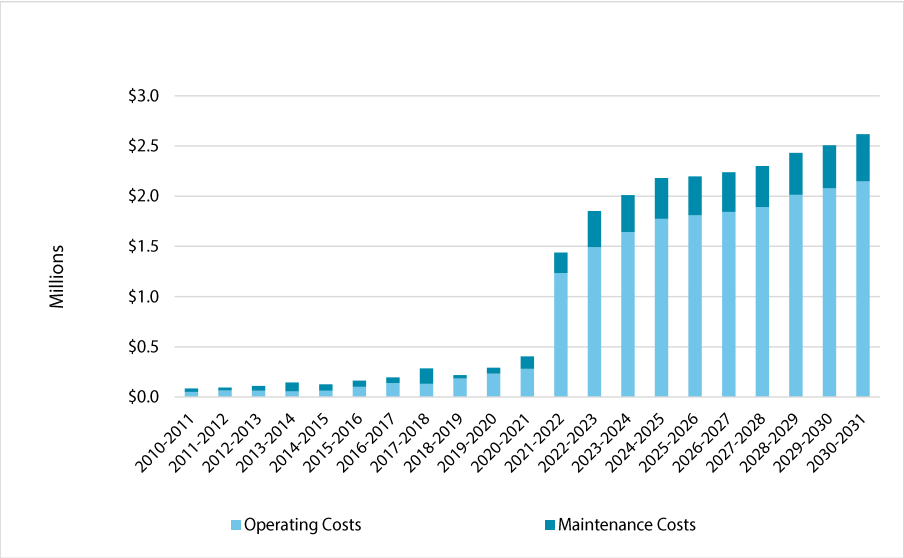

Figure 8: Stormwater Opex Forecasts

Future improvement

There has been an inclusion made in the LTP for ongoing condition assessment and investigation projects. This will be funded as a district wide project to ensure its viability and continued inclusion in future

budgets. Assessment and investigation of the condition of Council owned stormwater assets is viewed as a strategic investment to ensure more thorough and correct data is available to enable future stormwater projects to be properly prioritised.

It is further expected that a number of improvements to discharge arrangements to meet consent requirements.

Approach to renewals

Renewal is the replacement (or rehabilitation) of an existing asset without changing its capacity or level of service beyond the original design.

Renewal strategy

Historically there has been some reluctance to fund significant upgrades with communities citing affordability reasons or a desire to keep local rates as low as possible. This has resulted in a renewals backlog which cannot continue in the same vein.

The ongoing replacement or rehabilitation of the stormwater network is carried out as they reach the end of their useful lives and following condition survey. The remaining life and valuation data is stored in the Infor (IPS) database and is used for budgeting purposes. At present the Infor (IPS) database does not adjust the remaining life to reflect condition and performance so decisions for renewal are made by SDC staff following based on staff and contractor local knowledge

Assets are considered for renewal as they near the end of their effective lives, where the cost of maintenance becomes uneconomical, or when the risk of failure of assets is sufficiently high.

Assets that have reached their predicted expiry date as per Infor (IPS) asset lives, but are still serviceable will not be automatically replaced without a detailed condition survey. They may continue to be operated with a greater inspection frequency to ensure they remain fit for purpose.

Renewal decisions are made by asset managers based on the performance and condition of existing assets, the economics of renewing the asset, and their assessment of the acceptability of the risk of asset failure. Renewal decisions are supported by the maintenance contractor based on their knowledge of the systems. The theoretical life expectancies and replacement costs of asset components are used for financial projections.

Non-performing assets are identified by the monitoring of asset reliability, capacity and efficiency during planned maintenance inspections, operational activity and investigation of customer complaints. Indicators of non-performing assets include:

- structural failure
- repeated asset performance failure
- Overflows
- ineffective and/or uneconomic operation
- insufficient treatment.

The general renewal strategy is to either replace or rehabilitate assets when justified by:

- age and condition - the age or condition of the asset is or will result in a condition based failure
- asset performance - when it fails to meet the required level of service. The monitoring of asset reliability, capacity and efficiency during planned maintenance inspections and operational activity identifies non-performing assets.

- risk - the risk of failure of the asset and associated financial, environmental and social impact justifies action (eg impact and extent of loss of stormwater assets, impact on receiving water body, health risk)
- economics - the cost of maintenance for that asset component is deemed to be uneconomic to continue repairing the asset when the annual cost of repairs exceeds the annual cost of renewal. Economic factors may also come into consideration in order to co-ordinate renewals with the other major works, eg while a tank is empty for inspection or refurbishment/renewal, the associated channels are refurbished at the same time
- to co-ordinate with work on other utilities, eg watermain replacement may be brought forward to coincide with renewals of the footpath under which it runs
- staff knowledge - staff knowledge of the condition may differ to what is stored in the database.

Renewals expenditure may be deferred if the total cost of renewal works is beyond the community's current ability to fund it noting this is not a sustainable approach to sound asset management. If deferral of renewal work is necessary, the impact of this deferral and the ongoing achievement of LOS is assessed. Emphasis is placed on lifecycle planning although the deferral of some renewal works may have no immediate or short-term impact on operations, continued deferral of renewals will eventuate in a liability in the long term. If work is deferred for any reason, this work will be reprioritised alongside the next year's renewal projects and a revised programme established.

Previously some minor renewals have been deferred to undertake through a combined contract with upcoming road works.

Replacement of small items such as culverts and sumps are undertaken by the roading contractor. Major work is designed by engaging appropriate engineering consultants and work undertaken by competitive tender. When looking at renewals, consideration will be given to use of 'no dig' techniques as an alternative to open trench pipe laying.

Renewal past trends and forecasts

The figure below illustrates that historical capital expenditure has not exceeded $500,000 pa. Future renewal expenditure will be dependent on age, condition, affordability and resource consent requirements.

Renewal forecasts are based on age of asset and known information on condition and performance of assets. Condition assessments, CCTV and/or infiltration/inflow assessments will be carried out on any schemes prior to renewal work being undertaken. Expenditure will be deferred where the assessments indicate this is possible to do so.

With the inclusion in the LTP of recurring condition assessment and investigation projects, a more detailed plan will begin to be formed after a number of years of data collection. The collection of the data will enable more specific analysis of remaining asset life to be conducted, this could potentially bring forward or defer planned renewals of stormwater assets based on the findings of the analysis.

The significant expenditure currently forecast in through this ten year plan based on standard estimated useful life shows Wyndham has $3 million renewal in 2027/, this is subject to confirmation from condition assessment of the system in 2025/26 however a number of areas are known to be in poor condition and may be targeted to spread these costs across a number of years.

The graph compares the capital expenditure to depreciation. There are some years where the capital expenditure is greater than depreciation, but in most instances the capital expenditure is lower. Some communities have funds available in reserves, however these reserves are not significant when large replacements such as Winton and Wyndham are required. Affordability will be an issue for many communities when the assets need to be replacement or there is a higher cost due to regulatory requirements. It is also noted that for each year of the Long Term Plan $500K renewals programme has

been identified for the replacement of stormwater mains in Winton. This has been programmed at the request of the Oreti Community Board.

The following graph shows capital expenditure trends and forecasts over the past ten years and the next 10 years for renewals.

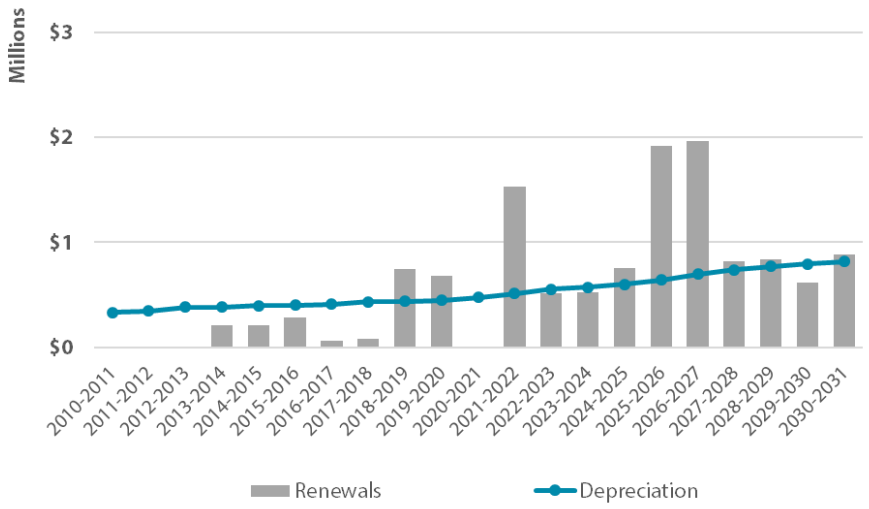

Figure 9: Stormwater Renewal Forecasts (showing depreciation)

Upgrading and developing new assets for levels of service and demand

Capital investment strategy - level of service and demand

The construction of new assets or increases in capacity of existing assets are carried out in order to close the gap between target service standards and the existing standard being delivered. The gaps may increase or decrease independent of capital works due to the growth in townships, changes in demand on the system, changes in LOS, or changes in the capability of the system. Asset development programmed in this activity plan is based on SDC's current understanding of the requirements to meet the target LOS and predicted future demand which is largely as a result of anticipated resource consent conditions and the upgrades that may be required as a result.

Although the overall strategy is to maintain and renew the existing asset network, demand projects were previously included for Te Anau and Manapouri though are unlikely to be undertaken during the 30 year period as economic growth has resulted in a slowdown in the numbers of developments going ahead. No demand related capital expenditure has been identified over the ten year life of the plan.

Capital investment past trends and forecasts - level of service and demand

Most of the recent past expenditure has been incurred in resource consent applications at 17 schemes across the district. In addition, investigation work has also been carried out into poor bacterial levels in Lake Te Anau, with recently identified cross connection issues rectified. More recent work has been undertaken in Te Anau, Nightcaps and Riverton to address localised flooding issues.

Currently all planned LOS expenditure relates to resource consenting requirements for 17 schemes. Previously all stormwater schemes were unconsented, however, these consents are now imminent and investment may be required to comply with conditions. These will likely be in regards to monitoring and treatment. The requirement to have resource consents for our stormwater schemes is driven by changes to ES Regional Water Plan which took effect from 2010, and the currently notified proposed Water and Land Plan.

There are amounts forecasted in Winton and Te Anau to allow for improvements required due to consent conditions.

LOS expenditure across individual schemes is illustrated in

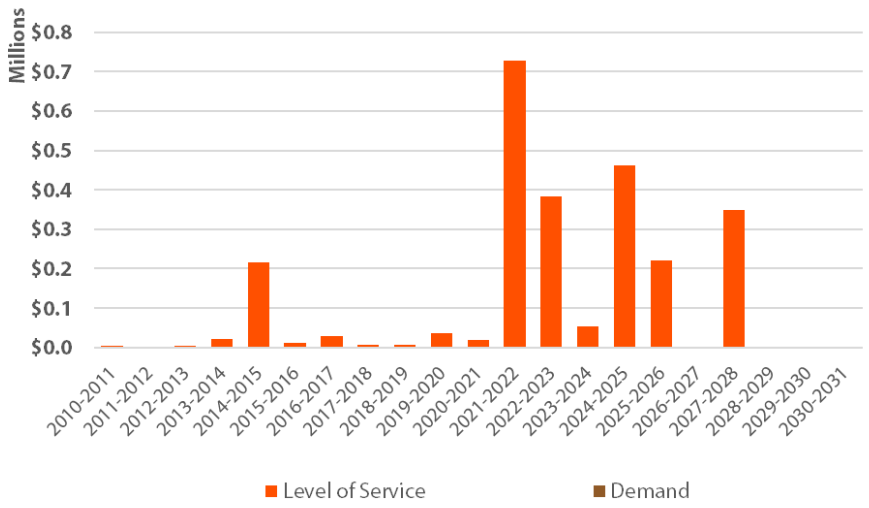

Figure 10: Stormwater LoS and Demand Forecasts

Future improvement

Future improvement will be driven by the requirements of Environment Southland Regional Water Plan, particularly around potential improvement works required as a result of resource consent conditions. Significant investment may be required to meet the conditions imposed by the resource consents. A review of Environment Southlands Coastal Plan may also require discharges from coastal stormwater schemes to be consented in the future. At present the timing of this still remains uncertain. The impacts of the latter requirements are currently unknown and as such no allowance has been made for capital improvements.

Community board area feedback

Through June 2020 to September 2020 staff presented a high level overview of this activity management plan to each of the nine community boards across the district. The aim of the workshops was to flag the key issues affecting the activity and seek feedback from the boards as to how any issues should be reflected in the plans.

At a high level the following key issues were raised with the boards:

- assets are ageing and in some cases reaching the end of their useful lives
- communities need to plan to renew these strategic assets across the life of the 2021-2031 LTP and beyond
- it is not good asset management practice (or appropriate) to continue to 'sweat' the assets further opting to defer replacement thus passing the issue on the next generation
- capital budgets will need to be increased to enable funding of infrastructure that has or will reach the end of life across the current plan period (Oreti CB request to undertake $500K each year of the LTP period).
- operational costs will need to increase to fund planned maintenance and condition surveys across all of our networks

- recent resource consents are now in place for 17 towns across the district. these will require additional operational budgets to undertake necessary auditing and monitoring as well as following up on any non-compliances
- ongoing reviews at national and regional levels may require further (more stringent) discharge conditions

While feedback was well received a number of concerns were raised. These were relatively consistent across each of the boards and included:

- competing priorities with other activities
- stormwater is a locally funded activity (currently)
- increasing operational and capital budgets
- upgrades may not be affordable across some communities
- availability of government subsidy?
- does asset replacement have to be like for like or is new technology considered when planning renewals
- does this present an opportunity for reviewing funding models local v's district. (It is noted that this discussion also formed a part of separate community board workshops based around the Revenue and Financing Policy.

Asset management improvement

This section summarises the AM practices (data, systems, processes) applied to AM planning. It assesses the current and desired level of practice in relation to the 'AM Maturity Index'[1] and identifies an improvement programme for the next three years. The status of this plan has been self-assessed as being of 'core' status in all areas. SDC will be working towards 'intermediate' status for the larger (>2,000 people) communities of Riverton, Te Anau and Winton.

The following table summarises the status of improvement projects identified in the previous improvement plan. While many projects have had some work undertaken, a number are incomplete. To support improved delivery of this AMP improvement plan, it will be subject to formal project management and regular reviews by respective asset managers.

AM AREA	IMPROVEMENT PROJECT	TASK	STATUS
CAPACITY DATA **DEMAND FORECASTING PROCESSES** **CAPEX CONTRACT MANAGEMENT**	Capital development works planning	Understand network capacity.	Partially completed for larger communities. Build knowledge and understanding across next 3 years and beyond.
		Document process for determining demand projections considering all demand influences and analysing	Partially completed though requires review in light of

1 NAMS International Infrastructure Management Manual, 2011

AM AREA	IMPROVEMENT PROJECT	TASK	STATUS
		usage/capacity trend information and identifying implications.	climate change predictions. Ongoing
CONDITION DATA **PERFORMANCE DATA** **ASSET LIFE DATA** **FINANCIAL DATA** **FAILURE PREDICTION** **RISK MANAGEMENT STRATEGY** **OPTIMISED DECISION MAKING**	Capital renewal works planning	Develop and document process for monitoring critical assets. Review CCTV programme.	Partially complete 10 year programme developed
		Document data capture process.	Partially complete – review 2021/22 following implementation of asset meta data standards.
		Review and document processes for capturing and analysing lives, incorporating factors which influence asset lives.	Not completed though asset lives have previously been amended within IPS where data failure rates indicate assets are likely to fail before the end of their useful lives.
		Include unit rates used in current contracts (incorporating factors which influence costs)	Completed.
		Develop process for predicting condition decay based on pipe failure records	Not completed. Consider through 2022
		Identify critical assets and undertake more detailed risk assessment. Develop process for routine review of risk	Partially completed. This will be updated through a future criticality workshop
		Develop process to analyse maintenance/renewal options	Will be updated based on need to start planning for renewals at end of life. To be developed across life of this AMP
ASSET CATEGORISATION **LOCATION DATA** **PHYSICAL ATTRIBUTES DATA** **O & M DATA** **O & M MONITORING** **ASSET REGISTER SYSTEM**	Data collection and processes	Develop documented procedures for collection, entry and quality assurance.	Partially completed with draft Asset Master Data Specification released. Ongoing – complete 2021

AM AREA	IMPROVEMENT PROJECT	TASK	STATUS
MAINTENANCE MANAGEMENT SYSTEM			
RISK MANAGEMENT DATA **AM IMPROVEMENT**	Asset management improvement	Review risk data routinely.	Partially completed - reviewed annually (Estimates process) but not formally recorded.
		Develop project task sheets for each planned improvement activity.	Not completed. To be completed 2021
LEGISLATIVE COMPLIANCE	AM staff resources	Review processes in place to keep staff abreast of legislative change.	To be completed 2021 - library system to be developed and implemented.

Table 15: Improvement projects

Financial summary

Significant issues impacting on stormwater budgets across the life of this plan include:

- there have been significant increases in both opex and capex budgets to allow development of a condition assessment programme to help better understand condition and performance of the networks as well as an increased level of routine maintenance
- it is also proposed to increase the current district funded budget from $33k per year to $100k per year to allow further data quality improvements to be undertaken
- opex budgets also include funding to undertake auditing and investigation of networks where consent monitoring indicates potential non-compliances
- capex budgets have been increased where performance and age profiling indicate that the networks have reached or are close to reaching end of their useful asset lives.

Ten year financial forecast

The following graphs/table summarise the financial forecasts for the activity over the ten years.

Financial summary

Stormwater	2017/2018 Actual ($000)	2018/2019 Actual ($000)	2019/2020 Actual ($000)	2020/2021 Annual Plan ($000)	2021/2022 LTP ($000)	2022/2023 LTP ($000)	2023/2024 LTP ($000)	2024/2025 LTP ($000)	2025/2026 LTP ($000)	2026/2027 LTP ($000)	2027/2028 LTP ($000)	2028/2029 LTP ($000)	2029/2030 LTP ($000)	2030/2031 LTP ($000)
Sources of operating funding														
General rates, uniform annual general charges, rates penalties	-	-	-	-	361	373	386	393	403	416	419	434	451	451
Targeted rates	342	335	446	485	757	1,484	1,666	1,823	1,905	1,973	2,113	2,284	2,363	2,452
Subsidies and grants for operating purposes	-	-	-	-	250	-	-	-	-	-	-	-	-	-
Fees and charges	2	1	1	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads applied	51	52	46	62	77	77	77	77	69	62	63	61	59	60
Local authorities fuel tax, fines, infingement fees, and other receipts	-	-	8	-	-	-	-	-	-	-	-	-	-	-
Total operating funding	**395**	**388**	**502**	**547**	**1,444**	**1,933**	**2,129**	**2,294**	**2,378**	**2,451**	**2,595**	**2,779**	**2,873**	**2,963**
Applications of operating funding														
Payments to staff and suppliers	172	109	163	274	727	1,135	1,257	1,408	1,418	1,455	1,494	1,536	1,579	1,653
Finance costs	-	-	-	-	19	27	43	53	75	99	135	155	162	169
Internal charges and overheads applied	112	109	130	154	711	718	756	772	778	785	806	897	929	966
Other operating funding applications	-	(0)	-	-	-	-	-	-	-	-	-	-	-	-
Total applications of operating funding	**284**	**218**	**293**	**428**	**1,458**	**1,880**	**2,055**	**2,233**	**2,271**	**2,339**	**2,436**	**2,587**	**2,671**	**2,788**
Surplus (deficit) of operating funding	**111**	**170**	**209**	**119**	**(13)**	**53**	**74**	**60**	**106**	**113**	**160**	**191**	**202**	**175**
Sources of capital funding														
Subsidies and grants for capital purposes	-	135	20	-	1,708	-	-	-	-	-	-	-	-	-
Development and financial contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in debt	- 16	398	647	- 33	443	851	580	1,181	1,317	1,967	1,166	599	615	891
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other dedicated capital funding	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding	**(16)**	**532**	**667**	**(33)**	**2,152**	**851**	**580**	**1,181**	**1,317**	**1,967**	**1,166**	**599**	**615**	**891**
Applications of capital funding														
Capital expenditure														
- to meet additional demand	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- to improve the level of service	7	6	35	20	728	383	53	463	222	-	350	-	-	-
- to replace existing assets	80	745	677	-	1,530	515	527	757	1,919	1,967	817	839	615	884
Increase (decrease) in reserves	8	(49)	164	65	- 96	31	98	46	- 694	137	184	- 24	226	206
Increase (decrease) in investments	-	-	-	-	(24)	(24)	(24)	(24)	(24)	(24)	(24)	(24)	(24)	(24)
Total applications of capital funding	**95**	**703**	**876**	**85**	**2,138**	**905**	**654**	**1,241**	**1,423**	**2,080**	**1,326**	**790**	**818**	**1,066**
Surplus (deficit) of capital funding	**(111)**	**(170)**	**(209)**	**(119)**	**13**	**(53)**	**(74)**	**(60)**	**(106)**	**(113)**	**(160)**	**(191)**	**(202)**	**(175)**
Funding balance	**-**	**-**	**(0)**	**-**	**0**	**0**	**- 0**	**- 0**	**- 0**	**0**	**0**	**0**	**-**	**-**

Figure 11: Stormwater budgets

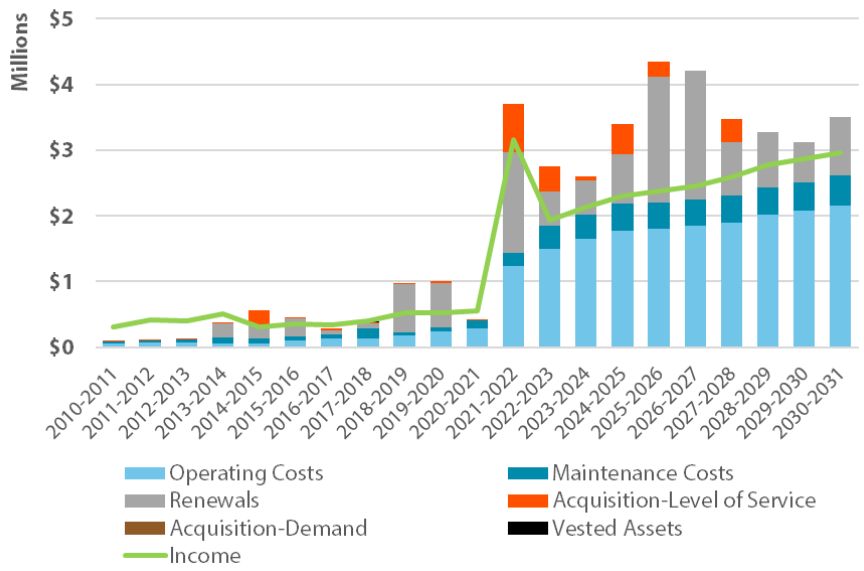

Figure 12: Stormwater total expenditure (district-wide)

Total income

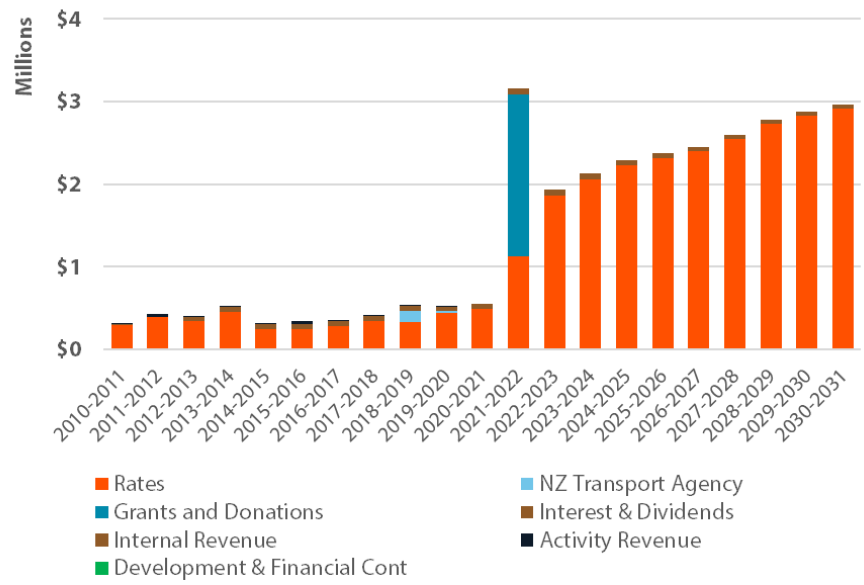

Figure 13: Stormwater total income

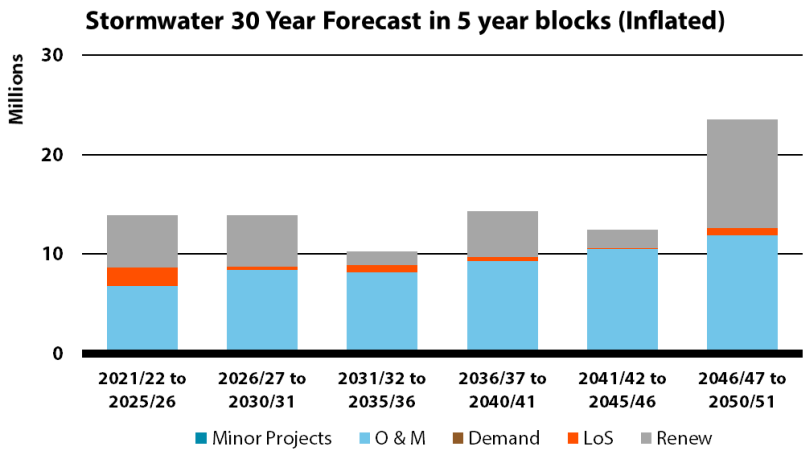

Figure 14: 30 Year Expenditure Forecasts (from Infrastructure Strategy)

Financial forecast summary

In order to ensure the long term sustainability of a number of these schemes future renewals will be planned and prioritised on the basis of age and condition and known issues. As a matter of priority renewals will be planned for the Wyndham and Winton townships – those being the oldest networks.

The following assumptions have been made in the preparation of this activity plan:

1. That information held in the INFOR (IPS) asset register is of a level of accuracy that does not fully allow a programme of works to be established and also relied on staff and contractor knowledge and experience.
2. That all communities strive to achieve the LOS set out within this document.
3. That the options for addressing issues identified during the course of the AMP process should be assessed and that the respective community would prefer the most economically efficient option to be shortlisted against the "do nothing" option. The most economically efficient option was therefore included in the financial programmes.
4. That there will be no material price increases or price increases due to any other industry demands.
5. That legislation will not change during the planning period.

Longer term, renewal requirements will continue to rise as the networks age and level of service expenditure is likely to increase as consent conditions are imposed and more users are required to connect to the system, this is illustrated in the graph below. The graph gives an indicative cost of renewals and LOS based on information related to asset life and capacity predictions. All renewal works will be subject to prior condition assessments and also any other available information including local knowledge.

Given that funding of stormwater improvements is via a local rate, and that some of the communities have a low population base the long-term affordability and sustainability of some these schemes is a high risk to Council.

Future funding options for the delivery of the stormwater activity will be considered through the 2021LTP and will look at a full range of options from fully locally funded through to fully district funded.

Summary of key financial assumptions

This plan has been developed on the assumption that forecast renewals within the ten year period will be subject to additional condition surveys and detailed investigations.

Future changes to operating costs will be influenced by changes to inflation and as a result of scheme upgrades (LOS) to meet resource consent requirements as identified by ES.

Future demand is likely to remain unchanged.

In places there is limited information available on stormwater assets, hence the proposal for at district funded stormwater investigation budget to fund future investigation work to allow improvement in information and thus improve the quality of data in certain areas.

Through the development of the 2021/31 and future LTPs there is an opportunity to review the funding model for the stormwater activity and potentially move more towards a district funded model.

Valuation approach

Statutory financial reporting requirements require SDC to revalue its fixed assets triennially.
Water supply infrastructure assets were last valued as at 30 June 2019 in accordance with New Zealand Accounting Standard 16 (NZIAS-16).

All assets have been valued at the component level (maintenance managed item-MMI) where appropriate.

Funding principles

Section 102(4) (a) of the Local Government Act 2002 requires each Council to adopt a Revenue and Financing Policy. This Policy must state Council's policies in respect of the funding of both capital and operational expenditure for its activities.

In summary, for stormwater, operational and capital expenditure will be funded as follows:

Local stormwater systems are funded through local rates. Roading stormwater systems (not in townships) are funded through the roading rate (refer to the Roading and Transport section). Rates are used for both capital and operating expenditure, loans and reserves may also be used. Changes to the 2021 Revenue and Financing Policy have resulted in funding for the stormwater activity to move from a local rate to a district rate with a full charge for serviced areas and unserviced areas paying a quarter charge.

New developments may also contribute to capital works, or financing costs, through financial or development contributions where applicable. Council's policy around development contributions currently only covers Te Anau, however the policy is currently in remission.

Appendix

Introduction

This section introduces the headings found in the following chapters offering explanations and definitions of information sources, methodologies and terminology common to all networks.

Description

This area describes the current physical scope, condition and performance (measured against target standards) of the assets used in the stormwater activity. This information is the basis for determining future maintenance and capital programmes, and developing appropriate management strategies. Information has been collated from the databases held in SDC's asset registers and will be reviewed in the development of the next AMP.

There is limited information surrounding the number of connections to the stormwater network.

Asset information has been sourced from historical AMPs, Infor (IPS), and scheme working folders.

Asset condition, capacity and performance

Measuring

During the development of the AMP an assessment of condition and performance was made using grades defined by the New Zealand Water Industry National Asset Grading Standards (see tables below). This revision does not regrade each asset but instead updates grades based on recent information. Projected failure dates have been reviewed with Area Engineers and where appropriate have been adjusted based on local knowledge and experience. It is acknowledged that there is a lack of detailed information on condition and performance of stormwater networks. This will be addressed through this and future plans and will provide the platform for a better developed capital works programme.

Condition and performance grades

GRADE	CONDITION	PERFORMANCE	DESCRIPTION
1	Very good	Always meets technical LOS	No significant adverse short-term impact.
2	Good	Almost always meets technical LOS	Failure will cause localised and serious

GRADE	CONDITION	PERFORMANCE	DESCRIPTION
			disruptions to service delivery.
3	Moderate	Generally meets technical LOS.	Failure will cause localised and serious disruptions to service delivery, possible health and safety effects and/or loss of critical data.
4	Poor	Does not generally meets technical LOS.	Failure will cause serious disruption to service delivery over a substantial area, possible health and public safety effects.
5	Very poor	Never meets technical LOS.	Widespread and serious disruption to service delivery, possible health and public safety effects.

Table 16: Condition and performance grade: Courtesy of Maunsell Limited

Confidence grades

GRADE	CONFIDENCE	DESCRIPTION
A	Highly reliable	Data is based on sound records, procedures, investigations and analysis that is properly documented and recognised as the best method of assessment.
B	Reliable	Data is based on sound records, procedures, investigations and analysis that is properly documented but has minor shortcomings; for example the data is old, some documentation is missing and reliance is placed on unconfirmed reports or some extrapolation.
C	Uncertain	Data is based on sound records, procedures, investigations and analysis that is incomplete or unsupported, or extrapolation from a limited sample for which Grade A or B data is available.
D	Poor	Data is based on unconfirmed verbal reports and/or cursory inspection and analysis.

Table 17: Confidence grades: Courtesy of Maunsell Limited

Grades have been assigned by considering information from a number of different sources. Where a piece of information has a primary contributor it has been assigned a number as follows:

1. INFOR (IPS) database.

2. Advice from staff and contractors.
3. Previous Asset Management Plans 2015 and 2018.
4. Assigned by Council staff based on institutional knowledge.

Assets that have reached their predicted expiry date as per Infor (IPS) asset lives, but are still serviceable will not be automatically replaced without a detailed condition survey. They may continue to be operated with a greater inspection frequency to ensure they remain fit for purpose.

Appendix A: Balfour

Description

The Balfour community had a 2013 usually resident population of 126 with a projected 2018 usually resident population of 145. The number of service connections is unknown.

The scheme is governed by the Ardlussa Community Board under the guidance of technical staff at SDC.

History

1950s - The stormwater system was constructed in the 1950s.

1963 - Wastewater reticulated to separate treatment plant.

1987 - Reticulation extended.

2009 - Consent application lodged with ES.

2019 - Consent granted.

Process description

Balfour's stormwater system consists of pipelines, service connections, manholes, sumps, culverts and open drains.

(a) Reticulation

Balfour's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Balfour, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Balfour's total catchment area is approximately 14 ha and for reference purposes has been broken down into three sub-catchment areas. These sub-catchments feed into three defined outlet channels or ditches as follows:

REF.	CATCHMENT	SIZE	DESCRIPTION
A	Queen Street Central	7 ha	Watercourse east of town.
B	Kruger Street	4 ha	Watercourse at east end of Kruger Street.
C	Queen Street South	3 ha	Roadside drain along Glenure Road.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

The three catchments discharge into the watercourse on the east of Balfour (combined with WWTP) and a roadside drain on the western end of the township along Glenure Road.

Balfour has service connections and therefore requires a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	1.92 km	Various	Sufficient
Open drains	0.934 km	Unknown	Sufficient
Sumps	31	Unknown	Sufficient
Manholes	7	Unknown	Sufficient
Soakholes	Nil	N/A	N/A
Culverts	12	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Asset condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

The number and condition of connections is unknown.

(b) Sumps

The overall grading of Balfour's sumps is good with the majority located on kerbs and having single cast iron grate inlets. All sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

All manholes are circular with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. The manholes are haunched with straight through inverts. Many step irons are corroded and not safe (although most manholes do not have step irons).

(d) Pipes

Pipes in the Kruger Street sub-catchments are ageing significantly and their condition should be evaluated by CCTV inspection. There are no CCTV records.

(e) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, with most under Council control having been cleaned within the previous two years. All open ditches are maintained in association with the roading asset, with the exception of the open drain east of the sewerage treatment plant.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	4	B	2027+
	Open drains	3	3	C	Unknown
	Sumps	3	3	C	2027
	Manholes	3	3	C	2027
	Soakholes	-	-	-	-
	Culverts	3	3	C	2027
Treatment	N/A	-	-	-	-

This table shows that the reticulation in Balfour will begin to meet the end of economic life in 2027.

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

No critical assets have been identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

The issue for Balfour is the reticulation begins to meet the end of the design life in 2027 and will be subject to a condition assessment prior to this time.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten-year period.

Appendix B: Browns

Description

The Browns community had a 2013 population of 141 with a projected 2018 population of 142 most of which are outside of the township boundary. There are no service connections.

The scheme is governed by the Oreti Community Board under the guidance of technical staff at SDC.

History

It is not known when the Browns scheme was constructed (though it is estimated to be around the mid 1950s) and no events have been recorded.

2009 - Resource consent application lodged with ES.

2019 - Resource consent granted.

Process description

The Browns stormwater system consists of pipelines, manholes, and sumps. There are no service connections.

(a) Reticulation

Reticulation is limited. Some information has been captured in GIS. Descriptions below have come from historical AMPs and historical knowledge.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge is likely to flow into an unnamed tributary of the Otapiri Stream.

Discharge from the reticulation is very small and unlikely to have adverse effects on the receiving environment. There are very few service connections in Browns. This township requires a discharge permit under the SRWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

(a) Primary system capacity

The primary stormwater system consists of below ground sumps, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Browns act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

The total catchment area is unknown.

Neither the capacity of the ES' flood protection works nor the consequence on Browns of flooding from the failure of these protection works have been considered as part of this plan.

(b) Secondary system capacity

The secondary system capacity (which is the system's ability to avoid flooding of "protected areas") has not been uniquely identified in Browns. Protected areas are those areas where the target

level of service limits the desirable probability of flooding for a particular area/usage, ie road, house, yard garage etc.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	Unknown	Unknown	Sufficient
Open drains	Unknown	Unknown	Sufficient
Sumps	Unknown	Unknown	Sufficient
Manholes	Unknown	Unknown	Sufficient
Soakholes	Unknown	Unknown	Sufficient
Culverts	Unknown	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Sumps

The overall grading of Browns' sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(b) Manholes

There are approximately eight manholes which are square with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. About 80% of manholes have sumps in the base, and the remaining 20% are haunched with straight through inverts. Many step irons are corroded and not safe (although most manholes do not have step irons).

(c) Pipes

The existing condition of the Main Street stormwater main is known to be very poor. These poor performing sections are likely to be repaired within the 2014/15 year. The conditions of the other pipes in the network are unknown but assumed to be poor.

(d) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, with most under Council control having been cleaned within the previous two years. All open ditches are maintained by the community board with the only exception, which is maintained by ES.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	4	4	D	2048
	Open drains	3	3	D	Unknown
	Sumps	3	3	D	2048
	Manholes	4	3	D	2048
	Soakholes	3	3	D	Unknown
	Culverts	3	3	D	Unknown
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

No critical assets have been identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix C: Colac Bay

Description

The Colac Bay community had a 2013 population of 186 with a projected 2018 population of 184.

The scheme is governed by Oraka Aparima Community Board under the guidance of technical staff at SDC.

History

1980s - The stormwater system was constructed.

2000 - New sumps installed on Foreshore Road in conjunction with the protection works contract.

2001 - New sump installed at end of 525 mm diameter line in Colac Bay Road.

Process description

Colac Bay's stormwater system consists of pipelines, manholes, sumps, and open drains. There are no service connections.

Huraki Creek which flows through the centre of the township is maintained by the adjacent land owners. There is no rating for work on this creek by either SDC or ES.

(a) Reticulation

Colac Bay's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/stream.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Colac Bay, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Colac Bay's total catchment area is approximately 15 ha.

ES has no flood protection works in the township area. Huraki Creek is maintained by the adjacent land owners. There is no separate rating district within the ES programmes for the creek.

The maintenance of the outfall is the responsibility of Council.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge of stormwater is into the Huraki Creek and to sea (Coastal Marine Area). Colac Bay has no service connections and is therefore unlikely to require a discharge permit under the Southland Regional Coastal Plan.

Asset capacity

The service provided by the system is generally accepted as being adequate.

(a) Primary system capacity

Stormwater systems are designed for rainfall run-off for storms of a particular probability of occurrence.

This probability is expressed as the Average Recurrence Interval (ARI) in years. The probability is based on historical information and does not consider changing weather patterns.

(b) Secondary system capacity

The secondary system capacity (which is the system's ability to avoid flooding of "protected areas") has not been uniquely identified in Colac Bay. Protected areas are those areas where the target level of service limits the desirable probability of flooding for a particular area/usage, ie road, house, yard garage etc.

Along Colac Bay Foreshore Road in high tide, easterly on-shore conditions cause overlapping of protection works. This generally causes ponding for a period of two-three hours at the peak of the tide and can disrupt sumps along foreshore road with gravel accumulation, requiring the sumps to be cleared out.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	0.251 km	Various	Sufficient
Open drains	0.377 km	Unknown	Sufficient
Sumps	23	Unknown	Sufficient
Manholes	1	Unknown	Sufficient
Soakholes	Nil	N/A	N/A
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Asset condition and performance

The condition of the assets is generally understood to be adequate.

(a) Sumps

The overall grading of Colac Bay's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(b) Manholes

The manholes are round with heavy duty cast-iron lids. Depths range from 1.5 - 2.5 metres. They have sumps on the bottom. Step irons are in good condition.

(c) Pipes

Pipes in the catchment are in good condition. No CCTV recording has been carried out in the township.

(d) Ditches

Outlet ditches are regularly cleared of accumulated sediment. The outlet of Haraki Creek under Council control has been cleaned within the previous two years. Haraki Creek is maintained by the adjacent land owner. There is no separate rating District for maintenance within the ES programmes.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2044
	Open drains	3	3	C	Unknown
	Sumps	3	3	C	2039
	Manholes	3	3	C	2039
	Soakholes	-	-	-	-
	Culverts	-	-	-	-
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

Critical assets

No critical assets have been identified.

Key Issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

The open drain above and below Manuka Street requires a more regular maintenance schedule. Negotiations with adjoining land owners may be required.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix D: Dipton

Description

The Dipton community has an estimated 2013 population of 153 with a projected 2018 population of 154. The number of service connections is unknown.

The scheme is governed by the Oreti Community Board under the guidance of technical staff at SDC.

History

Dates of major works on the stormwater system are not known though it is estimated that the majority of work began around 1980.

2009 - Resource consent application lodged with ES.

2019 - Resource consent granted.

Process description

Dipton's stormwater system consists of pipelines, manholes, sumps, and open drains.

(a) Reticulation

Dipton's primary stormwater system consists of below ground sumps, very limited service connections, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Dipton, act as basins to store run-off until the primary system has the capacity to drain them.
In other areas, run-off bypasses inlet sumps and continues to flow overland.

Dipton's total catchment area is approximately 16 ha.

ES has no flood protection works in the township area. The Level Street open drain is maintained yearly by vegetation control as the vegetation requires it.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

The discharge or disposal is uncertain. Staff understand that any discharge will eventually flow into the nearby Oreti River.

Although Dipton collects stormwater from a small number of houses the discharges are likely to have a negligible effect on the receiving environment but currently still understood to require a resource consent under the SRWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

(a) Primary system capacity

Stormwater systems are designed for rainfall run-off for storms of a particular probability of occurrence. This probability is expressed as the Average Recurrence Interval (ARI) in years. The probability is based on historical information and does not consider changing weather patterns.

(b) Secondary system capacity

The secondary system capacity (which is the system's ability to avoid flooding of "protected areas") has not been uniquely identified in Dipton. Protected areas are those areas where the target level of service limits the desirable probability of flooding for a particular area/usage, ie road, house, yard garage etc.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	Unknown	Unknown	Sufficient
Open drains	Unknown	Unknown	Sufficient
Sumps	Unknown	Unknown	Sufficient
Manholes	Unknown	Unknown	Sufficient
Soakholes	Unknown	Unknown	Sufficient
Culverts	Unknown	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Sumps

The overall grading of Dipton's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(b) Manholes

The manholes are round with heavy duty cast-iron lids. Depths range from 1.5 - 2.0 metres. They have sumps in the bottom. Step irons are in fair condition.

(c) Pipes

Pipes in the catchment have not been identified for condition. No CCTV recordings have been carried out in the township. Level Street has a problem conveying stormwater away indicating the pipe may have collapsed.

(d) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment.
The outlet under Council control has been cleaned within the previous two years.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	4	3	C	2044
	Open drains	3	3	C	Unknown
	Sumps	3	3	C	2039
	Manholes	3	3	C	2039
	Soakholes	3	3	C	Unknown

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
	Culverts	3	3	C	Unknown
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs. Operating costs drop after the first four years as it is anticipated that a less extensive monitoring regime will be required.

Critical assets

No critical assets have been identified.

Key Issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Investigations are required in Level Street to identify a potential drainage issue.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix E: Edendale

Description

The Edendale community has an estimated 2013 population of 558 with a projected 2018 population of 491. There are no recorded service connections.

The earliest parts of the scheme were constructed around 1935 and is governed by the Waihopai Toetoes Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed in response to flooding over many years.

1985 - Salford Street catchment serviced.

2005 - Seaward Road catchment serviced.

2009 - Extension of system along Seaward Road to Hunter Street.

2009 - Resource consent lodged with ES.

2014 - New soakholes constructed.

2019 - Consent granted.

Process description

Edendale's stormwater system consists of pipelines, manholes, sumps, soakholes and open drains.

(a) Reticulation

Edendale's primary stormwater system consists of below ground sumps, soakholes, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Edendale, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Edendale's total catchment area is closely related to Salford Street (State Highway 1) and Seaward Road drainage and for reference purposes has been broken down into four sub-catchment areas. These sub-catchments feed into soakholes or the Oteramika Stream as follows:

REF.	CATCHMENT	DESCRIPTION
A	Salford Street catchment	Covers the east-west leg of State Highway 1 and consists of a piped system with an outlet to the Oteramika Stream at the eastern boundary of the town.
B	Seaward Road catchment	Covers the majority of the town and is based around Seaward Road as far south as Grange Street. A piped system constructed in 2003 runs through "Herberts Transport" to an open drain alongside the railway line, this drain joins the Oteramika Stream east of Grange Street.
C	Seaward Down Road catchment	The area south of Grange Street is more rural in nature and is served by an open drain alongside Seaward Road. This drain discharges to the Oteramika Stream via field tile through a farm paddock.
D	Ferry Road catchment	The road towards Wyndham has no formal system and water flows overland or soaks away through constructed soakholes.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Oteramika Stream, overland or to soakaways. Although Edendale has no recorded service connections it requires a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	1.804 km	Various	Sufficient
Open drains	unavailable	Unknown	Sufficient
Sumps	70	Unknown	Sufficient
Manholes	18	Unknown	Sufficient
Soakholes	17	Unknown	Sufficient
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

There are no property connections. With the installation of the new water supply there have been instances of inadequate capacity due to increased loading on the stormwater system. The construction of additional soakholes has been a response to this. Most properties have stormwater flowing overland to kerb.

(b) Sumps

The overall grading of Edendale's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Many sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

A majority of the manholes are circular with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. About 80% of manholes have sumps in the base, and the remaining 20% are haunched with straight through inverts. Many step irons are corroded and not safe (although most manholes do not have step irons).

(d) Soakholes

There is a combination of lined and unlined soakholes in the township. These silt up over time and only the lined ones can be cleaned out.

(e) Pipes

Pipe ages vary throughout the town and little is known at this stage. There are no CCTV records.

(f) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, as required. All open ditches are maintained by the community board.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2044
	Open drains	-	-	-	-
	Sumps	3	3	C	2044
	Manholes	3	3	C	2044
	Soakholes	3	3	C	2044
	Culverts	-	-	-	-
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget. There are no emerging trends caused by increased maintenance costs.

Operating costs drop after the first four years as it is anticipated that a less extensive monitoring regime will be required.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Instances of surface flooding on the corner of Melvin Street and Ferry Road affecting private property.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Edendale-Wyndham
Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Investigation	STO960	Investigation of pipework to determine what replacements will be required	REN	25/26	58,799	Reserves
Pipework mains and manholes - Wyndham	STO1674	Pipework mains and manholes - Wyndham	REN	27/28	3,084,957	Loan & Reserves

Appendix F: Limehills/Centre Bush

Description

The Limehills/Centre Bush community has an estimated 2013 population of 165 with a projected 2018 population of 167. There are no service connections.

The scheme is governed by the Oreti Community Board under the guidance of technical staff at SDC.

History

1994 - Open drains constructed.

2008 - Cleaning of open drains carried out.

Process Description

Limehills/Centre Bush stormwater system consists of pipelines, soakholes and open drains.

(a) Reticulation

Limehills/Centre Bush primary stormwater system consists of open drains.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Limehills/Centre Bush act as basins to store run-off until the primary system has the capacity to drain them.

ES has not implemented flood protection works in the Limehills/Centre Bush area other than the Oreti River stopbanks.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

It is believed a general southern flow direction of the open drains, these discharge to a small creek on Pisa Road.

Limehills has service connections to open drains via field tiles and therefore may require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

Urbanisation of Limehills/Centre Bush has not impacted on the drain capacity.

A summary inventory of the stormwater assets is given below:

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

There are numerous property connections. These discharge to open drains via field tiles.

(b) Sumps

Condition is uncertain.

(c) Manholes

Condition is uncertain.

(d) Pipes

No CCTV work has been carried out in the pipe network - mainly culverts.

(e) Ditches

All drains require yearly weed spraying and mechanical cleaning is carried out when required.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	D	2080
	Open drains	3	3	D	2070
	Sumps	3	3	D	Unknown
	Manholes	3	3	D	2050
	Soakholes	3	3	D	2025
	Culverts	3	3	D	2050
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Limehills

Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Mechanical cleaning of open drains	726	Mechanical cleaning of open drains	O&M	20/21	22,456	Reserves
Mechanical cleaning of open drains	726	Mechanical cleaning of open drains	O&M	24/25	24,643	Reserves

Appendix G: Lumsden

Description

The Lumsden community has an estimated 2013 population of 453 with a projected 2018 population of 465. There are no service connections recorded.

The scheme is governed by the Northern Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed in the 1950s and largely upgraded in 1970.

1970-80s - Upgraded old pipes to PVC.

2000 - Farm Street drain renewed with PVC.

2008 - New soakholes installed.

2009 - Application lodged with ES for resource consent.

2019 - Resource consent granted.

Process description

(a) Reticulation

Lumsden is served by a limited piped stormwater primary network. The majority of the stormwater network consists of localised sumps, culverts and open channels which feed natural watercourses to the south and west of the town. The open channels are largely modified from the original watercourses which ran through the town. A large rural catchment to the north east of town is drained through Lumsden to the south. The topography flattens out on the south side of Lumsden near the Hedley Transport Yard.

Lumsden's total catchment area is approximately 82.4 ha and for reference purposes has been broken down into three sub-catchment areas. These sub-catchments feed into three defined outlet channels or ditches as follows:

REF.	CATCHMENT	SIZE
A	Diana Street/Town Centre	4.8 ha
B	Pluto Street Outfall	36 ha
C	Lydia Street Outfall	41.6 ha

Much of the stormwater from dwellings is understood to be disposed of into the sewer, or to piped drains/open ditches. It is understood that residents were asked to connect their stormwater to the sewers to aid the establishment of the oxidation pond (1972/73) but that these connections were never removed. The northern parts of the town are largely served by cut-off ditches which convey stormwater away via open channels. Occasional surface ponding on properties occurs after heavy rain. More regular flooding has occurred in the vicinity of Hedley Transport's yard.

ES has implemented flood protection works in the area north of the township to protect the township from high levels of the Oreti River.

Neither the capacity of the ES' flood protection works nor the consequence on Lumsden of flooding from the failure of these protection works have been considered as part of this plan.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the local streams and the Oreti River.

Although Lumsden has no recorded service connections they are known to exist. It therefore requires a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	1.879 km	Various	Sufficient
Open drains	0.492 km	Unknown	Sufficient
Sumps	76	Unknown	Sufficient
Manholes	38	Unknown	Sufficient
Soakholes	4	Unknown	Sufficient
Culverts	13	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

Very little information has been captured in GIS. The following description has come from historical AMPs and historical knowledge. Confidence in the service connection information is low.

The condition of most connections is good. All new and replacement connections are 100 - 150 mm diameter uPVC and are estimated to be about 10% of all connections. It is estimated that 50% of connections discharge directly into the piped system and the remaining 50% either have no connection or discharge ground recharge or open ditches.

(b) Sumps

The overall grading of Lumsden's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

Approximately 80% of the manholes are square with heavy duty cast iron lids and frames. Typically, depths range from 1.5 to 2.5 metres. About 30% of manholes have sumps in the base, and the remaining 70% are haunched with straight through inverts.

(d) Pipes

Based on limited knowledge of the network in Lumsden, pipes are thought to be in moderate to good condition. Problems due to blockage are not common except where sections of ditches have been filled in over 44 gallon drums. These sections of the network are in very poor condition and are at risk of collapse due to corrosion.

No CCTV records have been carried out.

(e) Ditches

Lumsden has an extensive network of ditches as part of the stormwater network. The ditches are systematically cleaned either by excavator or by hand. The condition of the ditches is known to vary widely. All open ditches from A to C catchments are maintained by the community board.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2021
	Open drains	3	3	C	2035
	Sumps	3	3	C	2018
	Manholes	3	3	C	2018
	Soakholes	3	3	C	2035
	Culverts	3	3	C	2035
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs:

Critical assets

None identified.

Key Issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

The pipework begins to meet the end of the design life in 2021. A condition assessment is programmed prior to the failure dates. Approximately 439 m of pipe ranging from 375-825 mm diameter.

Periodical flooding issues in the southern catchment.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Lumsden

Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Reticulation Upgrade SE Catchment	STO173	MS Project detail: Proj Prefix: X Project Number: 173	LOS	19/20	428,112	Loan & Reserves

Appendix H: Manapouri

Description

The Manapouri community has an estimated 2013 population of 228 with a projected 2018 population of 332. The peak population for Manapouri is estimated at 836 in 2018. The number of service connections is unknown however it is believed that most of the township is served by stormwater reticulation.

The scheme is governed by the Fiordland Community Board under the guidance of technical staff at SDC.

History

1960s - Stormwater system was constructed.

1995/96 - Home and View Streets improvements were carried out.

1996 - Asset Management Plan completed.

2003 - Asset Management Plan revised.

2005 - Motu-au Close subdivision completed.

- Activity Management Plan produced.

2009 - Resource consent lodged with ES.

2010 - Upgrade of View Street reticulation.

2019 - Resource consent granted

Process description

The Manapouri stormwater system consists of pipelines, manholes, sumps, and open drains.

(a) Reticulation

Manapouri's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/streams.

Manapouri's total catchment area is approximately 80 ha and for reference purposes has been broken down into five sub-catchment areas as follows:

REF.	CATCHMENT	DESCRIPTION
A	Te Aika Block	
B	NZED Village	
C	Home Street area	
D	View Street area	Includes Motu-au Close
E	Murrell Peninsular	

These sub-catchments feed into two outfall areas, which flow to Lake Manapouri and the Waiau River. Manapouri has three natural watercourses which receive stormwater run-off being: Lake Manapouri, Home Creek, and Waiau River.

The southern catchments (C and D) generally fall/drain to the Waiau River, the lakeside catchments (A and E) generally fall/drain to the lake and the central catchment (B) generally falls/drains to Home Creek.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Waiau River, Home Creek and Lake Manapouri.

Manapouri has service connections and will therefore requires a discharge permit under the RWP. Lake Manapouri is a Natural State Water as defined by the RWP since it is within a National Park. This could mean more stringent water quality demands for any discharge permit.

Asset capacity

The service provided by the system is generally accepted as being adequate, although there have been instances of surcharging of manhole covers.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	4.818 km	Various	Sufficient
Open drains	0.025 km	Unknown	Sufficient
Sumps	68	Unknown	Sufficient
Manholes	51	Unknown	Sufficient
Soakholes	Nil	N/A	N/A
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

Council currently has limited knowledge about the condition and extent of Manapouri's service connections. It is estimated that three fifths of all connections discharge to an open drain system such as watertable drains or ditches. Based on the low level of reactive maintenance repairs undertaken in response to consumer complaints and a limited number of visual inspections the condition of the connections is thought to be moderate.

(b) Sumps

Most sumps are thought to have siphon type traps which assist in the point source collection of sediment and floating debris. New sumps are in good condition and the other older sumps are in a moderate condition and some are thought to be not siphoned. The condition data confidence is not high. The verge sumps along View Street East collect a heavy sediment load and require frequent cleaning.

(c) Manholes

Most manholes are thought to be in moderate to good condition based on Council's experience and the results of recent (1996/97) asset inspection surveys (which recorded data on sizes, depth, direction of flow, and any obvious faults). Specific condition data (except for faults) is not currently available for these assets.

(d) Pipes

Based on Council's limited knowledge, the pipes are generally thought to be nearing end of life sooner than predicted.

(e) Ditches

Ditches and outlets are regularly cleared of vegetation, accumulated sediment and gravel build up as required.

(f) Safety

Most of the original manholes are either without ladder, step irons or the step irons are dangerously corroded. Current practice is not to provide fixed step irons in manholes. Access is gained by using portable ladders and appropriate surface barricades.

The occasional displacement or removal of sump grates or manhole lids creates a potential safety hazard for tripping and falling. By using heavy duty well seated grates and lids, the risk of accidental dislodgment or removal is limited. However, the malicious removal of lids and grates is very difficult to combat and at this time mechanically fixing the lids and grates down to the frames is not seen as a viable option. This will be reviewed if the incidence or risk of grate lid removal increases.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	4	4	B	2029
	Open drains	3	3	C	2051
	Sumps	3	3	C	2024
	Manholes	3	3	C	2024
	Soakholes	-	-	-	-
	Culverts	-	-	-	-
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

The issue for Manapouri is that the reticulation meets the end of its design life in 2024-2029 however, it is believed that the condition of the reticulation may not be as good as predicted in places. A programme to renew the will be established.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix I: Monowai

Description

The Monowai community has an estimated 2005 usually resident population of 27. There is no update on this estimate in the census data.

The scheme is governed by the Tuatapere Te Waewae under the guidance of technical staff at SDC.

History

It is estimated that the stormwater system in Monowai was constructed in the late 1970s with sumps/soakholes constructed to accept stormwater run-off from the road.

Process description

There is limited stormwater infrastructure in Monowai.

(a) Reticulation

All stormwater assets located within the Monowai settlement have developed either in association with roading asset or the realignment of ditches that drain low-lying areas.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge is to ground.

Monowai has no service connections and therefore currently does not require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

(a) Primary system capacity

There is no piped system beyond the culverts that exist where watercourses bisect the roading network.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	Unknown	Unknown	Sufficient
Open drains	Unknown	Unknown	Sufficient
Sumps	Unknown	Unknown	Sufficient
Manholes	Unknown	Unknown	Sufficient
Soakholes	Unknown	Unknown	Sufficient
Culverts	Unknown	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate in that there are no known issues. The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	3	Unknown
	Open drains	3	3	C	Unknown
	Sumps	3	3	C	Unknown
	Manholes	3	3	C	Unknown
	Soakholes	3	3	C	Unknown
	Culverts	3	3	C	Unknown
Treatment	N/A	-	-	-	-

Operation and maintenance

No issues.

No planned expenditure.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix J: Mossburn

Description

The Mossburn community has an estimated 2013 population of 201 with a projected 2018 population of 222. There are no service connections.

The scheme is governed by the Northern Community Board under the guidance of technical staff at SDC.

History

Dates of major works on the stormwater system are not known though it is believed that construction began in the mid 1960s.

2008 - New soakhole constructed within private property at 47 Devon Street.

2009 - Resource consent application lodged with ES.

2019 - Consent granted

Process description

The Mossburn stormwater system consists of pipelines, manholes, sumps, and soakholes.

(a) Reticulation

The Mossburn township is situated on an elevated terrace adjacent to the Oreti River. The stormwater systems are intended to receive and dispose of stormwater to avoid surface flooding within the urban area of Mossburn.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into soakaways.

Asset capacity

The service provided by the system is generally accepted as being adequate.

From inspection of the township and discussions with the it appears that the GIS drawings correctly show the sumps and manholes but may be incomplete regarding soakaways and underground pipework. The drawings show a total of 11 soakaways but it is understood there may be more.

A general principle of one soak-away per two sumps has been followed throughout the town. The sumps feed the soakaways by underground pipework.

There is an indication from complaints that the stormwater facilities are substantially under capacity only on State Highway 94 (Devon Street) when measured against the desired level of service. This includes that localised flooding should not remain for longer than two hours under typical annual return period rain storms. Monitoring of the performance of the stormwater system against the desired LOS will provide a qualitative assessment of the system capacity.

There has been some localised flooding outside the RSA.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	0.191 km	Various	Sufficient
Open drains	Nil	N/A	N/A
Sumps	51	Unknown	Sufficient

ASSET TYPE		CAPACITY	
Manholes	2	Unknown	Sufficient
Soakholes	8	Unknown	Sufficient
Culverts	1	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate. Mossburn is situated on very free draining soils only requiring a small amount of stormwater infrastructure.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2031
	Open drains	-	-	-	-
	Sumps	3	3	C	2026
	Manholes	3	4	B	2026
	Soakholes	3	3	C	2030
	Culverts	3	3	C	2026
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs:

Critical assets

None identified.

Key Issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work. Resource consent has now been granted with associated monitoring and reporting under way.

High water table means that soakholes will discharge directly into the aquifer and likely require some remediation to mitigate against contamination of groundwater. Money has been included in the LTP to address highest risk soakholes.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Mossburn
Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Change of soakholes to comply with ground water requirements	STO1500	Estimated amount included in 18-28	LOS	22/23	27,300	Reserves

Appendix K: Nightcaps

Description

The Nightcaps community has an estimated 2013 population of 306 with a projected 2018 population of 299. The number of service connections is unknown. Most of the township is served by stormwater reticulation.

The scheme is governed by the Wallace Takitimu Community Board under the guidance of technical staff at SDC.

History

It is believed the stormwater system was constructed in the 1950s.

1998 - Major investigation work and installation of six new manholes.

1999 - Renewal of 127 m section in Moffat Street to 250 diameter PVC line renewed along with two new manholes.

1999 - Two manholes installed in existing line Evan Street.

2009 - Resource consent application lodged with ES.

2014 - Reticulation upgrade Dryffe Street.

2019 - Resource consent granted.

Process description

The Nightcaps stormwater system consists of pipelines, manholes, sumps, and soakholes.

(a) Reticulation

Nightcaps primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/streams.

Nightcaps total catchment area is approximately 109 ha which is broken down into a number of sub-catchments.

These sub-catchments feed into five defined outlet channels or ditches, which flow into the Wairio Stream on the west side of the township and the Waicola Stream on the east side of the township. Both these streams flow into the Otautau Stream north of Otautau.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the ditch adjacent to the WWTP and then into the Wairio Stream. There is also discharge into the Waicola Stream.

Nightcaps has service connections and therefore requires a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

Urbanisation of Nightcaps and increase in impervious areas have resulted in significant drain under-capacity, which in turn has resulted in some minor flooding following heavy rainfall. This surface flooding does recede quickly upon the cessation of rain.

There has been localised flooding recorded in High Street West.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	6.106 km	Various	Sufficient
Open drains	Nil	N/A	N/A
Sumps	69	Unknown	Sufficient
Manholes	46	Unknown	Sufficient
Soakholes	1	N/A	Sufficient
Culverts	3	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

The condition of most connections is good.

(b) Sumps

The overall grading of Nightcaps sumps is not good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are not syphoned.

(c) Manholes

To date no manhole rating has been carried out.

(d) Pipes

CCTV work has been carried out in and around 75% of the pipe network indicating that the pipework is in a reasonable condition and may not need replacing at end of life.

(e) Ditches

There are no outfall ditches that require regular maintenance.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2020
	Open drains	-	-	-	-
	Sumps	3	3	C	2025
	Manholes	3	3	C	2025
	Soakholes	3	3	C	Unknown
	Culverts	3	3	C	2025
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

None identified.

Key Issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

The issue for Nightcaps is that the reticulation meets the end of its design life in condition assessments indicate that pipework life can be extended.

There has been localised flooding in High Street West.

Capital expenditure plan

The community board have identified localised renewals are required with funding programmed across the second half of the plan.

Appendix L: Ohai

Description

The Ohai community has an estimated 2013 population of 303 with a projected 2018 population of 307. The number of service connections is unknown. Most of the township is served by stormwater reticulation.

The scheme is governed by the Wallace Takitimu Community Board under the guidance of technical staff at SDC.

History

It is believed the stormwater system was constructed around 1950. Since 1990 the only major work was the realigning of the Milton Street outfall piped drain.

2009 - Application for resource consent lodged with ES.

2013 - CCTV survey.

Process description

The Ohai stormwater system consists of pipelines, manholes, sumps, soakholes and open drains.

(a) Reticulation

Ohai's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Ohai, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses and inlet sumps and continue to flow overland.

Ohai's total catchment area is approximately 78.9 ha which can be broken down into a number of sub-catchments.

These sub-catchments feed into three defined outlet channels or ditches, which flow through farm drainage systems. These farm drains flow to either the Morley Stream at the north or to the Orauea Stream to the south. Both these streams flow into the Orauea River.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Morley Stream at the north and Orauea Stream to the south, both flow into Orauea River.

Ohai has service connections and requires a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	4.106 km	Various	Sufficient
Open drains	0.916 km	Unknown	Sufficient
Sumps	107	Unknown	Sufficient
Manholes	21	Unknown	Sufficient
Soakholes	2	Unknown	Sufficient
Culverts	32	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

The condition of most connections is good.

(b) Sumps

The overall grading of Ohai's sumps is not good with the majority located directly over the pipe system and having single cast iron grate inlets. Most sumps are not syphoned.

(c) Manholes

To date no manhole rating has been carried out.

(d) Pipes

CCTV work has been carried out in around 50% of the pipe network and rating of the system is yet to be carried out.

(e) Ditches

Outlet ditches are cleared of vegetation and accumulated sediment when required.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2035
	Open drains	3	3	C	2030
	Sumps	3	3	C	2030
	Manholes	3	3	C	2035
	Soakholes	3	3	C	2005
	Culverts	3	3	C	2030
Treatment	N/A	-	-	-	-

** SDC staff assumption (Not assessed during technical assessment).*

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs. Operating costs drop after the first four years as it is anticipated that a less extensive monitoring regime will be required.

Critical assets

None identified.

Key issues

A condition assessment is programmed prior to the end of life dates. The reticulation renewal will be carried out in stages the first stage of which is programmed in this planning period.

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Capital expenditure plan

Renewals are programmed across the second half of the plan period.

Appendix M: Orepuki

Description

The Orepuki community has an estimated 2013 population of 54 with a projected 2018 population of 51. There are no connections to the scheme. The scheme is governed by the Oraka Aparima Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed in the 1980s.

1997 - New soakhole installed in Bolton Street.

2000 - New sump and connection to existing sump in Oldham Street West.

2001 - New sump and connection to outfall Bolton/Denbigh Streets.

Process description

The Orepuki stormwater system consists of pipelines and sumps. There are no plans to extend the stormwater system.

(a) Reticulation

Orepuki's primary stormwater system consists of below ground sumps, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Orepuki, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Orepuki's total catchment area is approximately 5 ha.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge is via a coastal outlet.

Orepuki has no service connections and therefore currently does not require a discharge permit under the RWP.

Asset Capacity

The service provided by the system requires investigation into the performance due to the limited information available on the scheme.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years.

A summary inventory of the stormwater assets is given below:

Asset Type		Capacity	
Reticulation	Unknown	Unknown	Sufficient
Open drains	Nil	N/A	N/A
Sumps	17	Unknown	Sufficient
Manholes	Nil	N/A	N/A

Asset Type		Capacity	
Soakholes	Nil	N/A	N/A
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Sumps

The overall grading of Orepuki's sumps is good with 16 located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system. The remainder have concrete lids. Discharge from the majority of these sumps is through a soakage system with very little inter-connection.

(b) Pipes

Pipes in the catchment are in good condition. No CCTV recording has been carried out in the township.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	-	-	-	-
	Open drains	-	-	-	-
	Sumps	3	3	C	2039
	Manholes	-	-	-	-
	Soakholes	-	-	-	-
	Culverts	-	-	-	-
Treatment	Nil	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work. Investigation required to determine any location of cross contamination.

Critical assets

None identified.

Key issues

There is serious erosion around the pipe outfall at the coast. This requires stabilising to ensure no further undermining of the pipeline occurs for the future protection of the asset.

Occurrences of surface flooding on Stratford Street (SH 99), due to low point in water channel without sump or discharge flow path.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix N: Otautau

Description

The Otautau community has an estimated 2013 population of 798 with a projected 2018 population of 892. There are no recorded service connections.

The scheme is governed by the Wallace Takitimu Community Board under the guidance of technical staff at SDC and was constructed around 1949/50.

History

1998 - Chester Street from Queen Street to Main Street. Queen Street at Chester Street intersection.

2000 - Rochdale Street upgrade from Main Street to Queen Street.

2006 - Soakholes installed on the northern side of town.

2009 - Resource consent application lodged with ES.

2010 - Open ditch piped from Clitheroe Street to Devon Street.

2019 - Consent granted

Process description

The Otautau stormwater system consists of pipelines, manholes, sumps, soakholes and open drains.

(a) Reticulation

The general topography of Otautau is flat. Stormwater from approximately 60% of the roads and properties in the township is disposed of by way of strategically placed sumps draining localised catchment areas which discharge to soakaways. Stormwater from the remainder of the township area is conveyed by open drains and various sized pipe drains to flap gated outfalls laid through the stopbanking system which surrounds the township.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows to ground soakage and the Otautau Stream.

Although Otautau has no recorded service connections they are known to exist.
As a result a resource consent is required under the RWP. The application for this was lodged in 2009.

Asset capacity

The service provided by the system is generally accepted as being adequate.

ES has implemented flood protection works in the area including flood banks to the Aparima River and Otautau Stream. These measures are intended to protect property, including Otautau township, from inundation from upstream floodwaters. Otautau's stormwater asset is intended to cope with run-off from the town's catchment only.

Neither the capacity of the ES' flood protection works nor the consequence on Otautau of flooding from the failure of these protection works have been considered as part of this plan.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	3.310 km	Various	Sufficient
Open drains	3.189 km	Unknown	Sufficient
Sumps	94	Unknown	Sufficient
Manholes	33	Unknown	Sufficient
Soakholes	31	Unknown	Sufficient
Culverts	34	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

Very little information on service connections has been captured in GIS. The following description has come from historical AMPs and historical knowledge. Confidence in the service connection information is low.

The condition of most connections is good. Several blockages per year occur as a result of root intrusion. Connection pipes are mostly earthenware (estimated 90%). All new and replacement connections are 100 - 150 mm diameter uPVC and are estimated to be about 10% of all connections. It is estimated that 98% of connections discharge directly into the piped system and the remaining 2% either have no connection or discharge to the street kerb.

(b) Sumps

The overall grading of Otautau's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps constructed since 1995 are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

No information available at this stage.

(d) Pipes

Based on Council's limited knowledge, the pipes are generally thought to be in reasonably good condition.

(e) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, with most under Council control having been cleaned within the previous two years. Open ditches maintained by the community board are:

Holt Park to south end.

Harbison/Russell Esplanade drain.

Some of these ditches are starting to become dangerous especially where there are crossings for driveways into houses.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2029
	Open drains	3	3	C	2029
	Sumps	3	3	C	2009
	Manholes	3	3	C	2029
	Soakholes	4	4	B	2029
	Culverts	3	3	C	2029
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Intermittent surface flooding during heavy rain on footpaths on Rye Street, between Orderly and Chester Streets.

Capital expenditure plan

The community board have identified the need for targeted renewals across the life of the plan.

Appendix O: Riversdale

Description

The Riversdale community has an estimated 2013 population of 456 with a projected 2018 population of 505. In anticipation of potential growth, the local community is looking at mechanisms for growth. There are no service connections.

The scheme is governed by the Ardlussa Community Board under the guidance of technical staff at SDC.

History

The stormwater system was initially constructed in the 1960s.

1975 - Separate sewerage scheme installed.

2009 - Resource consent application lodged with ES.

2019 - Consent granted.

Process description

The Riversdale stormwater system consists of pipelines, manholes, and street sumps.
The good natural drainage in the area means the pipe systems drain only large areas of road.

(a) Reticulation

Riversdale's primary stormwater system consists of below ground sumps, manholes, connecting pipework and outlet ditches/streams, which are the first intended flow paths for rainfall run-off that is directed into the system. There are also a number of shallow soakholes which perform very well. The primary stormwater system makes up the majority of the stormwater asset.

Riversdale's total catchment area is approximately seven ha and for reference purposes has been broken down into two sub-catchment areas as follows:

REF.	CATCHMENT	SIZE	DESCRIPTION
A	Berwick Street	3.5 ha	
B	Newcastle Street	3.5 ha	Drainage for State Highway 94

These sub-catchments feed a piped drain through the golf course.
The Newcastle Street catchment serves as drainage for State Highway 94.

ES has implemented flood protection works in the greater area including floodbanks on the Mataura River.

Neither the capacity of the ES' flood protection works nor the consequence on Riversdale of flooding from the failure of these protection works have been considered as part of this plan.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into a drain through the golf course. It is uncertain where this drain discharges.

Riversdale has no service connections but does require a discharge permit under the RWP. The application for the consent was lodged in 2009.

Asset capacity

The service provided by the system is generally accepted as being adequate.

Situated on free-flowing gravels Riversdale has very good drainage. Soakholes can be easily established at less than two metres in depth to provide drainage for isolated areas. Accordingly, the only two areas where a piped system is required is where there are large areas of road formation. To date the performance of these systems has been very satisfactory.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years. However, sandbagging of properties has been required during major flood events.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	1.39 km	Various	Sufficient
Open drains	Nil	N/A	N/A
Sumps	40	Unknown	Sufficient
Manholes	18	Unknown	Sufficient
Soakholes	6	Unknown	Sufficient
Culverts	5	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

There are no service connections. Most properties deal with surface water on site and collect roof water for drinking.

(b) Sumps

The overall grading of Riversdale's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

Approximately half of the manholes are square with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. About 80% of manholes have sumps in the base, and the remaining 20% are haunched with straight through inverts. Many step irons are corroded and not safe (although most manholes do not have step irons).

(d) Pipes

There is little information known about the condition of the pipework and limited CCTV has been undertaken.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2024
	Open drains	-	-	-	-

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
	Sumps	3	3	C	2029
	Manholes	3	3	C	2019
	Soakholes	3	3	C	2025
	Culverts	3	3	C	2029
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

Critical assets identified are:

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

High watertable leads to infiltration issues in areas of the town.

High water table means that soakholes will discharge directly into the aquifer and likely require some remediation to mitigate against contamination of groundwater. Money is included in LTP within the first five years to address highest risk soakholes.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Riversdale

Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Change of soakholes to comply with ground water requirements	STO1502	estimate introduced as part of 18-28 LTP	LOS	22/23	27,300	Loan & Reserves

Appendix P: Riverton

Description

The Riverton community has an estimated 2013 population of 1,506 with a projected 2018 population of 1,655. The estimated peak population for Riverton is projected to be 5,524 in 2018. The number of service connections is unknown. Most of the township is served by stormwater reticulation.

The scheme is governed by the Oraka Aparima Community Board under the guidance of technical staff at SDC.

History

The stormwater system was initially constructed in 1974 carrying on from piecemeal installations dating back to pre-war times. This construction covered Taramea Bay Road, Delhi, Havelock, Leader, Morton, Napier, Palmerston, Princess, Trotter, Verdun and Walker Streets and also Thames, Solent, Shrewsbury, Herbert, Milton, Osborne, Dallas, Brooke and Richard Streets, Orepuki-Riverton Highway and Bay and Bath Roads. Dates of major works on the Riverton stormwater system are as follows:

1994 - Addition in Bates Street.

1995 - Addition in Roy Street and Rocks Highway. System extended in Walker and Leader Streets.

1996 - Addition in Hamlet and Marne Streets.

1996 - System extended in Walker Street.

1997 - System extended in Upper Marne and Walker Streets.

2003 - Upgrade of systems in Walker, Church and Leader Streets.

2013 - Renewal of stormwater pipe from corner Napier and Ngarimu Streets to estuary.

2014 - CCTV survey - Palmerston and Jetty Streets.

2015 - Renewal of stormwater pipework – Palmerston street

Process description

The Riverton stormwater system consists of pipelines, manholes, sumps, soakholes and open drains.

(a) Reticulation

Riverton's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Riverton's total catchment area is approximately 85 ha which can be broken down into a number of sub catchments.

These sub-catchments feed into defined outlet channels or ditches, which flow to either the Aparima River or the sea. Outlets to the Aparima River from the New Windsor Catchment are good while those from either side of the river below the state highway bridge are subject to tidal influences. The outlet drains to Taramea Bay are also subject to tidal factors and have to be physically cleared at regular intervals.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Aparima River or to the sea (Coastal Marine Area) or to ground. The townside goes into the estuary near the Rugby Club. Riverton has service connections and is therefore likely to require a discharge permit under the Southland Regional Coastal Plan.

Asset capacity

The service provided by the system is generally accepted as being adequate although a number of localised problems are known to exist.

The progressive urbanisation of Riverton and increase in impervious areas have resulted in significant drain under-capacity, which in turn has resulted in repeated surface flooding in several areas following heavy rainfall. The surface flooding does recede quickly upon the cessation of rain. High tides occurring during rainfall events delay the reduction in surface flooding because of restrictions to outfalls.

The area of Lucknow Street is showing signs of surface flooding.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years. Five occurrences of garage inundation are thought to have occurred over the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	6,181 km	Various	Sufficient
Open drains	0.188 km	Unknown	Sufficient
Sumps	311	Unknown	Sufficient
Manholes	78	Unknown	Sufficient
Soakholes	1	Unknown	Sufficient
Culverts	11	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

The condition of most connections is good. Connection pipes are mostly earthenware. All new and replacement connections are 100 - 150 mm diameter uPVC.

(b) Sumps

The overall grading of Riverton's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

Approximately 75% of the manholes are square with heavy duty cast iron lids and frames. The remainder are of round concrete construction. Typically depths range from 1.5 to 2.5 metres. Few manholes have step irons.

(d) Pipes

Pipe conditions have not been rated but are considered to be in reasonable condition. The majority of the pipes are close to 50 years old and are therefore well through their life cycle.

CCTV records undertaken prior to 1994 relate to the townside catchment. An area of the Church Street catchment was done in 2003.

(e) Ditches

Outlet ditches are regularly cleared of vegetation/accumulated sediment, with all under Council control and cleaned within the previous two years. All open ditches are maintained by the community board.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	4	4	B	2038
	Open drains	3	3	C	2053
	Sumps	3	3	C	2033
	Manholes	3	3	C	2033
	Soakholes	3	3	C	Unknown
	Culverts	3	3	C	2033 -
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

Outlets in some areas discharging into the estuary are becoming more frequently blocked by sand.

Critical assets

None identified.

Key issues

The reticulation near the sound shell is in poor condition and needs renewal.

Limited accurate information is available regarding scheme condition and details.

Open drain between Palmerston Street and Lucknow Street which runs out to the estuary creates a potential hazard and would a safer, more reliable asset if it were to be piped.

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Ongoing issues with stormwater main on Shrewsbury Street between Church Street and Herbert Street.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Riverton/Aparima
Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Investigate Stormwater discharge around Soundshell area due to blocked outlets	STO1508	Additional project 18-28	LOS	18/19	10,000	Reserves
Convert ditches to piped services	STO551	Convert ditches to piped services	LOS	23/24	111,822	Loan & Reserves

Appendix Q: Stewart Island

Description

The Stewart Island community has an estimated 2013 population of 378 with a projected 2018 population of 434. The estimated peak population for Stewart Island projected to be 1,165 in 2018. Most of the township is served by stormwater reticulation.

The scheme is governed by the Stewart Island/Rakiura Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed in the mid 1950s.

1992 - New pipes laid in Ayr Street.

1994 - Upgrade of part of Main Road drain.

1996 - Asset Management Plan completed.

2002 - Realignment in front of Museum, Ayr Street.

2003 - Asset Management Plan revised.

2005 - Activity Management Plan produced.

2006 - Oban township stormwater upgrade.

2007 - Upgrade of pipes in Ayr Street to alleviate flooding.

2009 - Asset Management Plan reviewed.

2014 - Main Road upgrade.

Process description

The Stewart Island stormwater system consists of pipelines, manholes, sumps, and open drains.
The majority of the population lives in Stewart Island. Most properties collect roof water for drinking.

(a) Reticulation

Stewart Island's primary stormwater system consists of below ground sumps, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. In other areas, run-off bypasses inlet sumps and continues to flow overland. Stewart Island's total catchment area is approximately 50 ha and for reference purposes has been broken down into two sub-catchment areas. These sub-catchments flow to Halfmoon Bay as follows:

REF.	CATCHMENT	SIZE	DESCRIPTION
A	Main Road network		Main Road and Argyle Street area.
B	Ayr Street network		Sub-catchment to south and west of Ayr Street.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Mill Creek or into the sea (Coastal Marine Area). Stewart Island has service connections and is therefore likely to require a discharge permit under the

Southland Regional Coastal Plan. However Halfmoon Bay is defined as a Natural State Water outside a National Park in the RWP. This could mean more stringent water quality demands for any discharge permit under the plans, however, the implications of this are not yet fully understood.

Asset capacity

The service provided by the system is generally accepted as being adequate.

Localised flooding threatens shops in Main Road (approximately annually) and there is frequent surface flooding to footpaths in Argyle Street and Main Road.

Secondary system ponding during and for short periods after moderate to high intensity storms have been observed in the following areas:

- the drain behind Main Road between Morris Street.
- the outlet to the main system in Main Road.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	1.85 km	Various	Sufficient
Open drains	0.852 km	Unknown	Sufficient
Sumps	30	Unknown	Sufficient
Manholes	31	Unknown	Sufficient
Soakholes	1	Unknown	Sufficient
Culverts	20	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate however there is a mix of conditions of assets due to recent renewals while many areas still suffer from aging infrastructure.

(a) Sumps

The overall grading of Stewart Island's sumps is moderate with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(b) Manholes

Approximately 25% of the manholes are round with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. The remainder are square with wooden lids. The majority do not have step irons.

(c) Pipes

Pipes conditions have not been rated but are considered to be moderate.
The majority of pipes still have a 30 year life span while the newer ones have a 70 year life span.
No CCTV data has been obtained.

(d) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, with most under Council control having been cleaned within the previous two years. All open ditches are maintained by the Community Board.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2054
	Open drains	3	3	C	2067
	Sumps	3	3	C	2049
	Manholes	3	3	C	2054
	Soakholes	3	3	C	Unknown
	Culverts	3	3	C	2049
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the Roading Contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Project for CCTV in maintenance.

Critical assets

None identified.

Key issues

Capacity assessment required to improve level of confidence in captured asset data.

Localised flooding on Main Road near DOC office – will be addressed when the new visitor centre construction is under way.

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix R: Te Anau

Description

The Te Anau community has an estimated 2013 population of 2628 with a projected 2018 population of 2,938. The estimated peak population for Te Anau is projected to be 7,472 in 2018. The number of service connections is unknown. Most of the township is served by stormwater reticulation.

The scheme is governed by the Fiordland Community Board under the guidance of technical staff at SDC.

History

The major areas were installed in the 1960s and 1970s and have expanded significantly as new subdivisions have been completed.

1985 - Eglinton Place (Luxmore Stage II).

1986 - Donald Ross Place (Luxmore Stage III).

1987 - Sylvia Baker Place (Luxmore Stage IV).

1989 - Blairs Place (Luxmore Stage V).

1990s - The Crescent area.

1993 - Bowen Street South (Luxmore Stage VI).

1994 - Kepler/Ritchie (Luxmore Stage VII).

1995 - Dalhousie Place (Kepler Stage I).

1996 - Jackson, Melland, Dorizac and Pop Andrews (Luxmore Stage VIII).

- Asset Management Plan completed.

1997 - Thomson Place.

2000 - Town Service Lane.

2002 - Lawson Burrows Crescent (Luxmore Stage IX).

2003 - Lawson Burrows and Earl Place (Luxmore Stage X).

- Patience Bay Drive (Patience Bay Stage II).
- Asset Management Plan revised.

2005 - Activity Management Plan produced.

2007 - Heritage (on-site disposal) and Delta subdivisions (reticulated) completed.

2008 - Alpine Terrace Stage 3 complete (on-site disposal).

- Kepler Heights Stage 2 complete (on-site disposal).
- Aerial photos and contour model developed as part of strategic assessment.

2009 - Application for resource consent lodged with ES.

2014 - Cross connections on lakefront addressed.

2015 - Flooding issues on Caswell Road – SH 94 junction addressed.

2019 - Resource consent granted

2020 - Further cross connections identified and resolved.

Process description

The Te Anau stormwater system consists of pipelines, manholes, sumps, soakholes and open drains. Some newer subdivisions have installed on-site disposal due to well-draining soils as well as a lack of available infrastructure.

(a) Reticulation

Te Anau's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlets to the Lake.

Te Anau's total catchment area is approximately 336 ha and for reference purposes has been broken down into seven sub-catchment areas.

REF.	CATCHMENT	DESCRIPTION
A	Dusky Street outlet	Fergus Square to Bligh Street.
B	Matai Street outlet	Lake to Howden Street.
C	Town centre	Town centre and service lane discharges through a clarifier.
D	Mokoroa Street	Luxmore Subdivision - Quinton Drive to Dalhousie Place.
E	Quintin Drive	Part of Quintin Drive and the Water Park.
F	Industrial Area	Discharge into the Upuk and overland after being piped under the Te Anau Milford Highway.
G	Delta area	Receives stormwater from the Delta subdivision into a detention basin for disposal to ground. There is an overflow swale into Lake Te Anau.

All the catchments discharge into Lake Te Anau. The five main discharge points are supplemented with sumps on the Lakefront streets discharging directly from their own outlets to the lake. Stormwater disposal in the new subdivisions at the Heritage and on the upper terraces is to ground, ie on-site disposal.

(b) Treatment

Catchment C discharges through a filter that removes gross pollutants before reaching the lake. This requires cleaning three times a year with the costs being met from the maintenance budget, which amounts to under $2,000 per annum.

(c) Discharge

Discharge flows into Lake Te Anau, the Upukerora River or to ground.

Te Anau has service connections which will require a discharge permit under the RWP. This was lodged with ES in 2009. Lake Te Anau is a Natural State Water as defined by the RWP since it is within a National Park.

Asset capacity

The service provided by the system is generally accepted as being adequate.

The progressive urbanisation of Te Anau and increase in impervious areas may result in significant drain under-capacity and surface flooding in several areas following heavy rainfall. The surface flooding does recede quickly upon the cessation of rain.

There is localised flooding in Mokonui Street due to inadequate sump spacing. Cleddau Street also suffers from occasional surface flooding.

The industrial area in Caswell Road also suffers from flooding caused by conveyance restrictions in the Pukutahi Boulevard area.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	27.279 km	Various	Sufficient
Open drains	1.432 km	Unknown	Sufficient
Sumps	777	Unknown	Sufficient
Manholes	361	Unknown	Sufficient
Soakholes	91	Unknown	Sufficient
Culverts	9	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

Council has limited knowledge of connections. It is estimated that 30% discharges directly to ground or into soakholes on their own property.

(b) Sumps

Most sumps are thought to have siphon type traps which assist in the point source collection of sediment and floating debris. New sumps are in good condition and the other older sumps are in a moderate condition and some are thought to be not siphoned

(c) Manholes

Most manholes are thought to be in moderate to good condition based on Council's experience and the results of recent (1996/97) asset inspection surveys (which recorded data on sizes, depth, direction of flow and any obvious faults). Specific condition data (except for faults) is not currently available for these assets.

(d) Pipes

Based on Council's limited knowledge, the pipes are generally thought to be in reasonably good condition.

(e) Safety

Most of the original manholes are either without ladder, step irons or the step irons are dangerously corroded. Current practice is not to provide fixed step irons in manholes. Access is gained by using portable ladders and appropriate surface barricades.

The occasional displacement or removal of sump grates or manhole lids creates a potential safety hazard for tripping and falling. By using heavy duty well seated grates and lids, the risk of accidental dislodgment or removal is limited. However, the malicious removal of lids and grates is very difficult to combat and at this time mechanically fixing the lids and grates down to the frames is not seen as a viable option. This will be reviewed if the incidence or risk of grate lid removal increases.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	4	4	B	2031
	Open drains	3	3	C	2046
	Sumps	3	3	C	2026
	Manholes	3	3	C	2026
	Soakholes	3	3	C	2039
	Culverts	3	3	C	2026
Treatment	Filter	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

CCTV inspections have been programmed in the maintenance budget to investigate the flooding issues in Mokonui and Cleddau Streets.

Critical assets

None identified.

Key issues

The issue for Te Anau is that the reticulation meets the end of its design life in 2026-31. Condition assessments are programmed prior to these failure dates. The reticulation renewal will be carried out in stages, the first three stages of which are programmed in this planning period. Preliminary investigations have identified the following areas that will require upgrading:

- Town Centre area.
- DOC area.
- Unconfirmed (pending assessments).

- opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.
- resource consent has now been granted with associated monitoring and reporting under way.

On-going issues with gravel build up at the stormwater discharge into the Upukerora River. This creates issues with stormwater backing up through the pipeline as it is restricted in entering the river.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Te Anau
Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Stormwater discharge improvements to groundwater	STO1503	Estimate introduced as part of 18-28 LTP	LOS	25/26	176,397	Reserves

Appendix S: Thornbury

Description

The Thornbury community has an estimated 2013 population of 126 with a projected 2018 population of 134. There are no service connections.

The scheme is governed by the Oraka Aparima Community Board under the guidance of technical staff at SDC.

History

The stormwater system was initially constructed in the 1980s.

2000 - Middleton Street - construction of swale on north side of street discharging via a sump into a PVC pipeline that then discharges into open channel.

2000 - Murchie Street - four sumps installed along with PVC pipeline as part of frontage upgrade of new court complex. This line discharges through an established private line to the open channel.

Process description

The Thornbury stormwater system consists of pipelines, sumps and open drains. The open drains are maintained by ES. Most properties collect roof water for drinking.

(a) Reticulation

Thornbury's primary stormwater system consists of below ground sumps, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Thornbury, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Thornbury's total catchment area is approximately 19 ha and three sub-catchments. These sub-catchments feed into one defined outlet channel or ditch, which flows to the Aparima River.

ES has implemented flood protection works in the area including the open drain running through the township.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into a creek and then the Aparima River.

Thornbury has no service connections and is therefore unlikely to require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

The drains are of sufficient capacity to meet the requirements of the township.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	0.424 km	Various	Sufficient
Open drains	Nil	N/A	N/A
Sumps	16	Unknown	Sufficient
Manholes	Nil	N/A	N/A
Soakholes	Nil	N/A	N/A
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Sumps

The overall grading of Thornbury's sumps is good with 50% located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system. The remainder have concrete lids with holes in them.

(b) Pipes

Pipes in all sub-catchments are in good condition. No CCTV recording has been carried out in the township.

(c) Ditches

The outlet ditch is regularly cleared of vegetation and accumulated sediment, having been cleaned within the previous two years by ES.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2034
	Open drains	-	-	-	-
	Sumps	3	3	C	2034
	Manholes	-	-	-	-
	Soakholes	-	-	-	-
	Culverts	-	-	-	-
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

No operational expenditure identified.

Critical Assets

None identified.

Key Issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Capital Expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix T: Tokanui

Description

The Tokanui community has an estimated 2013 population of 1502 with a projected 2018 population of 147. There are no service connections.

The scheme is governed by the Waihopai Toetoes Community Board with technical input from SDC staff.

History

The stormwater system was constructed from 1958.

2009 - Application for resource consent lodged with ES.

2019 - Consent granted.

Process description

The Tokanui stormwater system consists of pipelines, manholes, sumps and open drains. Most properties collect roof water for drinking.

(a) Reticulation

Tokanui's primary stormwater system consists of below ground sumps, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Tokanui, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Three of the five identified sub-catchments feed into three defined outlet channels or ditches, which flow to the Tokanui Stream, the other two drain directly to the Tokanui Stream.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Tokanui Stream.

Tokanui has no service connections but is required to have a discharge permit under the RWP. This was lodged with ES in 2009.

Asset capacity

The service provided by the system is generally accepted as being adequate.

The progressive urbanisation of Tokanui and increase in impervious areas have resulted in isolated drain under-capacity, which in turn has resulted in some surface flooding in several areas following heavy rainfall. The surface flooding does recede quickly upon the cessation of rain.

Vegetation growth and silting in the outlet ditches are significant capacity limiting factors.

Tokanui has localised flooding in Buckingham Street. Work is continuing to alleviate this by more maintenance of the ditches.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	0.260 km	Various	Sufficient
Open drains	0.153 km	Unknown	Sufficient
Sumps	20	Unknown	Sufficient
Manholes	3	Unknown	Sufficient
Soakholes	Nil	N/A	N/A
Culverts	5	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Connections

Most properties deal with surface water on site and collect roof water for drinking.

(b) Sumps

The overall grading of Tokanui's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

Manholes are circular with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. Many step irons are corroded and not safe (although most manholes do not have step irons).

(d) Pipes

A full CCTV survey was completed in Tokanui in September 2014. This is yet to be analysed to determine the current condition of pipes.

(e) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, with most under Council control having been cleaned as sediment and vegetation build up. All open ditches are maintained by the Council with the exception of drains through farmland.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2043
	Open drains	3	3	C	2038
	Sumps	3	3	C	2018
	Manholes	3	3	C	2043
	Soakholes	3	3	C	2038
	Culverts	3	3	C	2038
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

None identified.

Key Issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix U: Tuatapere

Description

The Tuatapere community has an estimated 2013 population of 561 with a projected 2018 population of 557. The number of service connections is unknown. Most of the township is served by stormwater reticulation.

The scheme is governed by the Tuatapere Te Waewae Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed in approximately 1960 as a best guess.

1996 - Asset Management Plan completed.

1999 - New 200 mm line from Orawia Road at back of properties on south side of Carlyle Street to link to line running south through primary school.

2000 - Replacement of 50% of 200 mm line adjacent to 59 Main Road. This replaced the section of line on the boundary of 57 and 59 Main Road that was capacity-reduced due to tree root intrusion.

2006 - New sump installed in Orawia Road connecting to kerb and channel.

2009 - Resource consent application lodged with ES.

2019 - Consent granted

Process description

Tuatapere's stormwater system consists of pipelines, manholes, sumps, soakholes, and open drains. Only part of the township is serviced by a stormwater system. The remaining area has soakholes.

(a) Reticulation

Tuatapere's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlets.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Tuatapere, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Tuatapere's total catchment area is approximately 125 ha which can be further broken down into five sub-catchments.

These sub-catchments feed into outlets, four of which discharge to the Waiau River and one to Boundary Creek.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Boundary Creek and the Waiau River.

Tuatapere has service connections and will therefore require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

Localised flooding is occurring in parts of Orawia Road. This area needs to be investigated to check for conveyance restrictions and for potential upgrade works.

Morton Street where the property at No. 3 is on a secondary flood path has been purchased by Council to prevent it being built on.

There is one well-recorded instance of houses and commercial buildings being inundated with stormwater in the last 25 years. This occurred in 1984 when the Waiau River mouth blocked during a period of high river flow and heavy rainfall.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	3.428 km	Various	Sufficient
Open drains	0.542 km	Unknown	Sufficient
Sumps	135	Unknown	Sufficient
Manholes	22	Unknown	Sufficient
Soakholes	12	Unknown	Sufficient
Culverts	13	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

(a) Sumps

The majority of Tuatapere's sumps are located on kerbs and have single cast iron grate inlets. Many sumps are of the bottomless type and do not trap sediment prior to it entering the system. There is an ongoing process of upgrading of these to the silt trap variety.

(b) Manholes

Approximately 50% of the manholes are square with heavy duty cast iron lids and frames. The remainder are round with concrete lids. Typically depths range from 1.5 to 2.5 metres.

(c) Pipes

No CCTV recording has been undertaken in the township.

(d) Ditches

The outlet ditch in King Street is regularly cleared of vegetation and accumulated sediment. All open ditches are maintained by the community board.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2033
	Open drains	3	3	C	2048
	Sumps	3	3	C	2028

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
	Manholes	3	3	C	2028
	Soakholes	3	3	C	2025
	Culverts	3	3	C	2028
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There is an increasing trend in sump cleaning and maintenance. It is understood that the cause may be due to an increasing frequency of logging trucks leaving debris on the road which washes into the sumps.

Critical assets

None identified.

Key issues

There is a lack of historical information on the age and condition of the stormwater system components. This will be rectified by future condition assessment and CCTV survey.

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix V: Waikaia

Description

The Waikaia community has an estimated 2013 population of 162 with a projected 2018 population of 169. The estimated peak population for Waikaia is projected to 2,490 in 2018. There are no service connections. Most properties collect roof water for drinking.

The scheme is governed by the Ardlussa Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed from 1960.

1983 - Western end of Newburn Street.

1993 - Eastern end of Newburn Street, Scotswood Street and Westoe Street.

2009 - Resource consent application lodged with ES.

2019 - Consent granted

Process description

The Waikaia stormwater system consists of pipelines, manholes, street sumps and open drains. The system performs well and improvements over time will be related to piping open drains for aesthetic reasons.

(a) Reticulation

Waikaia's primary stormwater system consists of below ground sumps, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Waikaia, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

ES has implemented flood protection works in the area including flood banking along the Waikaia River and Winding Creek.

Neither the capacity of the ES' flood protection works nor the consequence on Waikaia of flooding from the failure of these protection works have been considered as part of this plan.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows to ground and to the Waikaia River.

Waikaia has no service connections but will require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

The low rainfall in Waikaia combined with good overland flow results in satisfactory performance.

Vegetation growth and silting in the outlet ditches are significant capacity limiting factors. A summary inventory of the stormwater assets is given below.

ASSET TYPE		CAPACITY	
Reticulation	Unknown	Unknown	Sufficient
Open drains	Unknown	Unknown	Sufficient
Sumps	Unknown	Unknown	Sufficient
Manholes	Unknown	Unknown	Sufficient
Soakholes	Unknown	Unknown	Sufficient
Culverts	Unknown	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate.

There is little data on the assets.

(a) Connections

Most properties deal with surface water on site and collect roof water for drinking.

(b) Sumps

The overall grading of Waikaia's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

Most manholes are concrete with heavy concrete lids. Typically, depths range from 1.5 to 2.5 metres.

(d) Pipes

Pipes are generally considered to be in moderate to good condition. There are no CCTV records for the system.

(e) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, with most under Council control having been cleaned as required.

The current condition and performance grading of the stormwater system is shown in the table below.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	Unknown
	Open drains	4	4	B	2039
	Sumps	3	3	C	2019
	Manholes	3	3	C	2019
	Soakholes	3	3	C	2025
	Culverts	3	3	C	Unknown
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the Roading Contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs. Operating costs drop after the first four years as it is anticipated that a less extensive monitoring regime will be required.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

High water table means that soakholes will discharge directly into the aquifer and likely require some remediation to mitigate against contamination of groundwater. Money has been included within the first five years.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Waikaia

Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Change of soakholes to comply with ground water requirements	STO1501	estimate introduced in 18-28 LTP	LOS	22/23	3,276	Reserves

Appendix W: Wairio

Description

The scheme is governed by the Wallace Takitimu Community Board under the guidance of technical staff at SDC.

History

1953 - Stormwater network constructed.

Process Description

There is very little stormwater infrastructure in Wairio.

(a) Reticulation

The stormwater network consists of approximately 200 m of 100 diameter pipe complemented by stormwater channels, culverts and sumps.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into an unknown receiving environment.

Wairio has no service connections and does not currently require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

A lack of complaints would indicate that the current system copes adequately.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	0.2 km	□ 100	Sufficient
Open drains	Unknown	Unknown	Sufficient
Sumps	Unknown	Unknown	Sufficient
Manholes	Unknown	Unknown	Sufficient
Soakholes	Unknown	Unknown	Sufficient
Culverts	Unknown	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate. The current condition and performance grading of the stormwater system is shown in the table below.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	Unknown

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
	Open drains	3	3	C	Unknown
	Sumps	3	3	C	Unknown
	Manholes	3	3	C	Unknown
	Soakholes	-	-	-	-
	Culverts	3	3	C	Unknown
Treatment	N/A	-	-	-	-

Operation and maintenance

No issues.

No expenditure planned.

Critical assets

None identified.

Key issues

None identified.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix X: Wallacetown

Description

The Wallacetown community has an estimated 2013 population of 681 with a projected 2018 population of 680. The number of service connections is unknown. Most of the township is served by stormwater reticulation. Most properties collect roof water for drinking.

The scheme is governed by the Oreti Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed from 1988.

1988 - Ailsa Street/Irvine Street drainage.

1985 - Kirkbride Street soak-holes and pipe under Cumnock Street.

1992 - Girvan and Kirkoswald Streets drainage.

1994 - Kilmarnock Street drainage.

1998 - Soakhole corner Dunlop Street and Kirkoswald Street north-east corner.

1999 - Dalwharn Street pipeline and two sumps replacing soakholes.

2009 - Application for resource consent lodged with ES.

2015 - Proposed outfall improvements deferred by Community Board

2018 - Outfalls refurbished

2019 - Consent granted.

Process description

The Wallacetown stormwater system consists of pipelines, manholes, sumps, and soakholes.
The stormwater system has been constructed in a piecemeal fashion over a number of years. It is predominantly made up of several small isolated networks of sumps and pipelines that discharge into neighbouring water ways. The remainder discharges into soakaways.

(a) Reticulation

Wallacetown's primary stormwater system consists of overland flow by means of kerb and channel on the Main Street and part of Dunlop Street. In other streets swales constructed in the grass areas channel water to soakholes and in around 20% of the township into sumps then pipe network.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows to ground and the Makarewa River.

Wallacetown is reported to have service connections although this is unlikely as there is no town water supply. The majority of properties would be collecting roof water for drinking. The scheme is required to have a discharge permit under the RWP. Application for the consent was lodged in 2009.

Asset Capacity

The service provided by the system is generally accepted as being adequate.

Wallacetown has not been surveyed for catchment areas but the area falls into roughly 10 catchment areas. These catchment areas need to be defined sometime in the future, however there are no known capacity issues with a lot of adequately sized swales and intermittent pipework.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	2.887 km	Various	Sufficient
Open drains	Nil	N/A	N/A
Sumps	77	Unknown	Sufficient
Manholes	27	Unknown	Sufficient
Soakholes	6	Unknown	Sufficient
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate. The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2052
	Open drains	-	-	-	-
	Sumps	3	3	C	2047
	Manholes	3	3	C	2047
	Soakholes	3	3	C	2032
	Culverts	-	-	-	-
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs. Operating costs drop after the first four years as it is anticipated that a less extensive monitoring regime will be required.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

South-east and western catchments require upgrading.

Limited information available for scheme.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Wallacetown

Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Outfall Improvement - West & South	STO760	MS Project detail Proj Profile: X Project No: 760	LOS	18/19	25,000	Reserves

Appendix Y: Winton

Description

The Winton community has an estimated 2013 population of 2,436 with a projected 2018 population of 2,430. The number of service connections is unknown. Most of the township is served by stormwater reticulation.

The scheme is governed by the Oreti Community Board under the guidance of technical staff at SDC.

History

The stormwater system was initially constructed in the 1930s depression. About 70% of the existing system dates from the 1930s and consists of earthenware pipes ranging in size from 100 mm to 375 mm in diameter. The gravity piped system functioned as a combined sewer until a separate wastewater system was built in 1956.

1930s	-	Combined system built.
1956	-	Separate wastewater system built.
1960s	-	300 to 375 diameter concrete pipes (no rubbers used) Albert from Durham to Jane Streets and the south end of Great North Road.
1971	-	300 diameter concrete pipe in Arthur Street from McKenzie to outfall.
1978	-	300 - 700 diameter concrete pipes down Welsh Road.
1982	-	150 diameter uPVC along Great North Road from Grange Street to Welsh Road.
1991	-	Park Street South 600 and 750 mm diameter concrete pipes.
1993-95	-	Installation of 24 new manholes, where there were none previously.
1993-95	-	Closed circuit television (CCTV) inspections and water-jetting (1 and 2).
1999-00	-	Western channel deepened from Gap Road to Eglinton Street.
2000-01	-	Pipework upgraded from No. 1 outlet at Eglinton Street to John Street and also along John Street from Durham Street to No. 24.
2006	-	Sections of Grange Street upgraded (from Park to Mackenzie).
2007	-	Emergency renewals carried out in Mackenzie Street (from Arthur to John).
2008	-	Welsh Road subdivision completed.
2009	-	Application for resource consent lodged with ES.
2015	-	CCTV work undertaken around Meldrum street catchment
2017	-	Emergency repair work undertaken Bute Street.
2018	-	Upgrade to Great North Road reticulation
2019	-	Consent Granted

Process description

The Winton stormwater system consists of pipelines, manholes, street sumps, and open drains.

(a) Reticulation

Winton's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Winton, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Winton's total catchment area is approximately 130 ha and for reference purposes has been broken down into 13 sub-catchment areas.

These sub-catchments feed into three defined outlet channels or ditches, which flow to the south of Winton, and eventually into the Oreti River, as follows:

- Outlet 1 drains Sub-catchments 1 - 9 (84 ha or 65% of the township).

  It is formed by an open ditch, which bounds the west of Winton and flows south to eventually discharge into the Winton Creek at the intersection of Substation Road. Within these sub-catchments the oldest and largest area is generally from Eglinton Street to Grange Street, between State Highway 1 (Main Street) and Mackenzie Street. Stormwater pipes in this area are mostly earthenware and range in size up to 375 mm in diameter. The newer areas west of Mackenzie Street, have a mixture of concrete and earthenware pipes, and the area to the north of Grange Street contains mostly uPVC and concrete pipes.
- Outlet 2 drains 40 ha or 31% of the township catchment and is formed by an open ditch south of Park Street, which flows to the south west and joins the Winton Stream prior to discharging into the Oreti River. Sub-catchments 10A, 10B and 11 drain to this outlet and are generally bounded by State Highway 1 to the east, Bute and Eglinton Streets to the north, and to the urban limits to the north. Pipe materials in this area are a mixture of concrete, earthenware and some uPVC. An upgrade programme has been completed along Park Street from Dejoux Road to Essex Street.
- Outlet 3 drains 6 ha or 5% of the township catchment and is formed by an open ditch, which flows into the Winton Stream to the east of Winton. Sub-catchments 12 and 13 to this outlet. The Central Business District and minor eastern catchments make up this small contributory area about State Highway 1, which spans from Bute Street to Grange Street. Pipe materials in this sub-catchment are mostly earthenware, with some concrete in the newer eastern areas.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into three outlets to the south of Winton and then into the Oreti River. Winton has service connections and will therefore require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

The progressive urbanisation of Winton and increase in impervious areas have resulted in significant drain under-capacity, which in turn has resulted in repeated surface flooding in several areas following heavy rainfall. The surface flooding does recede quickly upon the cessation of rain.

The primary system capacities vary over a significant range for each of the 13 identified sub-catchments. The system capacities expressed as a percentage of the five year ARI range from 7.5% to 91%.

Vegetation growth and silting in the outlet ditches are significant capacity limiting factors.

Secondary system ponding during and for short periods after moderate to high intensity storms have been observed in the following areas:

- Middle of Arthur Street.
- Durham Street between Homes and Albert Street.

- East end of Union Street.
- East end of Church Street.
- East end of Anne Street.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years. Two or three occurrences of garage inundation are thought to have occurred over the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	25.199 km	Various	Sufficient
Open drains	4.723 km	Unknown	Sufficient
Sumps	431	Unknown	Sufficient
Manholes	195	Unknown	Sufficient
Soakholes	Nil	N/A	N/A
Culverts	8	Unknown	Sufficient
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be poor. Winton is beginning to have more problems with ageing infrastructure causing pipe failures and localised flooding. Tree root infiltration is contributing significantly to poor asset performance also.

(a) Connections

The condition of most connections is good. Several blockages per year occur as a result of root intrusion. Connection pipes are mostly earthenware (estimated 90%). All new and replacement connections are 100 - 150 mm diameter uPVC and are estimated to be about 10% of all connections. It is estimated that 98% of connections discharge directly into the piped system and the remaining 2% either have no connection or discharge to the street kerb.

(b) Sumps

The overall grading of Winton's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

Approximately 70% of the manholes are square with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. About 80% of manholes have sumps in the base, and the remaining 20% are haunched with straight through inverts. Many step irons are corroded and not safe (although most manholes do not have step irons).

(d) Pipes

Pipes in sub-catchments 11 and 12 around the town centre and just to the south of it have a poor condition grading. The central western Sub-catchments 1 - 6 have pipes with a moderate condition grading and pipes to the north and south in Sub-catchments 7, 8, 9, 10 and 13 have a good condition grading.

CCTV records show that an estimated 20% of the old earthenware pipes are misaligned at joints and hold water through dips in vertical alignment. The capacity of these pipes and additional loading from ground water infiltration significantly reduces its capacity to convey stormwater run-off. Pipe material integrity generally appears to be satisfactory with several isolated exceptions identified by the CCTV inspections.

(e) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment, with most under Council control having been cleaned within the previous two years.
All open ditches from Welsh Road to Dejoux Road are maintained by the Community Board with the only exception being the western channel from Welsh Road to Price Road, which is maintained by ES.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	3	3	C	2041
	Open drains	3	3	C	2036
	Sumps	3	3	C	2036
	Manholes	3	3	C	2041
	Soakholes	-	-	-	-
	Culverts	3	3	C	2036
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the Roading Contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There is an emerging trend of increasing maintenance in root cutting and blockage clearing due to failure of pipe joints. Approximately 30% of pipelines are old earthenware with joint failure issues and at least half of all stormwater pipelines less than 150 mm diameter.

Critical assets

None identified.

Key issues

The issue for Winton is that the reticulation meets the end of its design life in 2016-2021. Many of the pipes are earthenware and due for replacement. A programme has been initiated for replacement.

A programme is required to initiate renewal in line with priority areas and the road reseal programme.

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Resource consent has now been granted with associated monitoring and reporting under way.

Tree root infiltration is having a significant detrimental effect on scheme performance.

Capital expenditure plan

The community board have acknowledged the need for a detailed renewals programme and have requested an allowance of $500K per annum to be included across the life of the plan.

Winton

Stormwater

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Storm Main Replacement	STO1718	Expected replacement as a result of STO789 in the 17/18 financial year. Unsure of amount have used $1,000,000 as an estimate pending investigation.	REN	18/19	1,000,000	Loan
Storm Main Replacement	STO1718	Expected replacement as a result of STO789 in the 17/18 financial year. Unsure of amount have used $1,000,000 as an estimate pending investigation.	REN	19/20	876,518	Loan
Stormwater discharge improvements to groundwater	STO1507	Estimate introduced as part of 18-28 LTP	LOS	25/26	88,198	Loan & Reserves

Appendix Z: Woodlands

Description

The Woodlands community has an estimated 2013 population of 246 with a projected 2018 population of 213. There are no service connections. Most properties collect roof water for drinking.

The scheme is governed by the Waihopai Toetoes Community Board under the guidance of technical staff at SDC.

History

The stormwater system was constructed from 1950.

2000 - Woodlands South Road (reconstruction and drainage).

Process description

The Woodlands stormwater system consists of pipelines, manholes, sumps and open drains.

(a) Reticulation

Woodlands primary stormwater system consists of below ground sumps, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Woodlands, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

An inspection of the network is required to collect information about the components that make up the network and ensure the plan is drawn with the correct connectivity.

Woodlands total catchment area is predominantly rural and for reference purposes has been broken down into five sub-catchment areas as shown in the attached map.
These sub-catchments feed into three defined outlet channels or ditches, which flow to the Waihopai Stream.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows into the Waihopai Stream.

Woodlands has no service connections and does not currently require a discharge permit under the RWP.

Asset capacity

The service provided by the system is generally accepted as being adequate.

Vegetation growth and silting in the outlet ditches are significant capacity limiting factors.

There are no known records of any houses or commercial buildings being inundated with stormwater in the last 25 years.

A summary inventory of the stormwater assets is given below:

ASSET TYPE		CAPACITY	
Reticulation	Unknown	Unknown	Sufficient
Open drains	Nil	N/A	N/A
Sumps	19	Unknown	Sufficient
Manholes	10	Unknown	Sufficient
Soakholes	Nil	N/A	N/A
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate. The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	-	-	-	-
	Open drains	-	-	-	-
	Sumps	3	3	C	unknown
	Manholes	3	3	C	unknown
	Soakholes	-	-	-	-
	Culverts	-	-	-	-
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs.

Critical assets

None identified.

Key issues

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Significant flooding occurred in spring 2020 with follow up investigation showing the need for large scale replacement of damaged pipework.

Capital expenditure plan

No capital expenditure is planned for the upcoming ten year period.

Appendix AA: Wyndham

Description

The Wyndham community has an estimated 2013 population of 594 with a projected 2018 population of 555. The number of service connections is unknown. Most of the township is served by stormwater reticulation.

The scheme is governed by the Waihopai Toetoes Community Board under the guidance of technical staff at SDC.

History

The stormwater system was initially constructed in 1935 with various additions since then.

2005 - Consent granted to discharge stormwater and septic tank effluent into the Mataura River.

- Activity Management Plan produced.

2008 - Septic tank effluent removed from the stormwater system. A separate sewerage scheme was constructed under the Ministry of Health's SWSS.

2009 - Application for resource consent lodged with ES.

2013 - CCTV survey completed.

Process description

Wyndham's stormwater system was designed as a combined stormwater and septic tank effluent system consisting of pipelines, manholes and street sumps. The capacity of the stormwater system is difficult to determine based on existing data. It is calculated that capacity would be sufficient to dispose of the run-off from a 10 year return period storm without 'heading up'. It is considered that in a 50 year return period storm there would be surface flooding but it should not be sufficient to flood buildings.

(a) Reticulation

Wyndham's primary stormwater system consists of below ground sumps, service connections, manholes, connecting pipework and outlet ditches/streams.

The secondary stormwater system is overland flow paths formed by roads and other low lying areas. Some sections of the roads and rural land about Wyndham, act as basins to store run-off until the primary system has the capacity to drain them. In other areas, run-off bypasses inlet sumps and continues to flow overland.

Wyndham's total catchment area is approximately 100 ha and is effectively one catchment. The system discharges into a branch of the Mataura River south of Cardigan Road West.

In extreme events the line to the outlet becomes overloaded and the surplus flows overland.

(b) Treatment

There is no stormwater treatment in place.

(c) Discharge

Discharge flows through a diffuser into the Mataura River. The existing resource consent to discharge stormwater and septic tank effluent expired in 2009. A new consent has been granted by ES to discharge stormwater only through a diffuser into the Mataura River. This new consent expires in 2034. A separate consent for discharge of treated wastewater from Wyndham has been granted, see Wastewater Activity Plan.

Wyndham has service connections and will require a discharge permit under the RWP. The application has been lodged with ES in 2009.

Asset capacity

The service provided by the system is generally accepted as being adequate.

Indicative calculations confirm there is sufficient capacity to pass a ten year storm.

A summary inventory of the stormwater assets is given below.

ASSET TYPE		CAPACITY	
Reticulation	10.977 km	Various	Sufficient
Open drains	Nil	N/A	N/A
Sumps	132	Unknown	Sufficient
Manholes	76	Unknown	Sufficient
Soakholes	2	Unknown	Sufficient
Culverts	Nil	N/A	N/A
Treatment	N/A	N/A	N/A

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The condition of the assets is generally understood to be adequate. However, the majority of the network has been the end of the (adopted) economic life and can be expected to begin to show signs of failure.

(a) Connections

The condition of most connections is good. Few blockages per year occur as a result of root intrusion. Connection pipes are mostly earthenware (estimated 90%).
All new and replacement connections are 100 mm diameter uPVC and are estimated to be about 10% of all connections. However, with the installation of the new water supply there may be increasing issues caused by stormwater redirected from household storage tanks.

(b) Sumps

The overall grading of Wyndham's sumps is good with the majority located on kerbs and having single cast iron grate inlets. Most sumps are of the syphoned type and are intended to collect and trap sediment and refuse to prevent it from entering the system.

(c) Manholes

Most manholes are circular with heavy duty cast iron lids and frames. Typically depths range from 1.5 to 2.5 metres. About 80% of manholes have sumps in the base, and the remaining 20% are haunched with straight through inverts. Many step irons are corroded and not safe and many manholes do not have step irons.

(d) Pipes

A CCTV survey has now been completed for the whole network. Analysis of the footage has been carried out and a more accurate condition has been applied to the piped assets. A renewals programme has been set to replace assets which are at the end of their functional life.

(e) Ditches

Outlet ditches are regularly cleared of vegetation and accumulated sediment. ES maintains flap gates through stopbanks and monitors outlet drains.

The current condition and performance grading of the stormwater system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (INFOR (IPS))
Reticulation	Pipework	5	5	A	2035
	Open drains	-	-	-	-
	Sumps	3	3	C	2035
	Manholes	3	3	C	2035
	Soakholes	3	3	C	2035
	Culverts	-	-	-	-
Treatment	N/A	-	-	-	-

Operation and maintenance

Sump maintenance costs will be met under the roading contract. Cleaning roadside ditches and clearing blocked pipes is carried out from the district funded stormwater maintenance budget.

There are no emerging trends caused by increased maintenance costs. The majority of historical maintenance issues were traced back to poor maintenance of private septic tanks. It is expected that this issue will be alleviated by the removal of septic tank effluent from the system.

A CCTV inspection programme has been completed and a renewals programme has been set.

Critical assets

No critical assets have been identified.

Key issues

The issue for Wyndham is the reticulation is expected to meet the end of the design life within the upcoming period of the AMP a current replacement value of the estimated in the region of $3 million..

Opex budgets have been increased to allow for an increase in planned maintenance and condition assessment work.

Renewals will be subject to analysis of the CCTV condition assessment footage.

During periods of heavy rain which cause the river to rise to high levels, areas of Wyndham surrounding the Wyndham-Mokoreta Road suffer surface flooding. Under certain conditions this can also cause surface flooding issues for Malta Street and the surrounding properties.

Capital expenditure plan

The community board have acknowledged the need to undertake renewal of the aged network which is programmed to occur across the life of the plan.