WAIMAKARIRI
DISTRICT COUNCIL

Activity Management Plan 2024

Urban Drainage

3 Waters | July 2024

Prepared by

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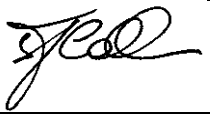
Document Acceptance

Action	Name		Signed	Date
Prepared by	Jason Recker	Drainage Asset Manager		11/12/2023
	Simon Collin	3 Waters Asset Management Advisor		11/12/2023
	Chris Bacon	Network Planning Team Leader		11/12/2023
Reviewed by	Kalley Simpson	3 Waters Manager		10/7/2024
Approved by	Gerard Cleary	General Manager Utilities and Roading		10/7/2024
Adopted by		Utilities & Roading Committee		

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1 EXECUTIVE SUMMARY

What assets do we have?

There are 7 rural and 5 urban rated drainage areas within the Waimakariri District. Together the 5 urban drainage schemes cover approximately 1.2% of the District's land area but service approximately 75% of the District's population. Two separate Activity Management Plans have been prepared, one each for the rural and urban drainage areas.

The urban scheme assets include piped stormwater networks, treatment devices, basins, stormwater pump stations and open drains while in the rural schemes assets are primarily open drains and waterways which the Council maintains.

Levels of Service

In the lead up to the updating of the 2024 AMP's, it was expected that the Council would not be preparing AMPs to support the 2024-2034 LTP, due to the 3 Waters Reform. When the situation changed in May 2023, it was too late to carry out a review of LoS. As a consequence the LoS in this AMP have remained largely unchanged when compared to the 2021 AMP version. The 2021 AMP levels of service were presented to the Council's Utilities and Roading Committee in July 2020, which recommended that the Council include them within the Draft 2021-31 Long Term Plan (refer to report 200406043184).

Error! Reference source not found. in this document shows performance against the levels of service measured at district level, assessed for 2022/23. All of the mandatory levels of service were met, and most of the elective levels. Response times to service requests, overall satisfaction with the drainage services as measured by the community survey, and maintaining dialogue with Te Ngai Tuahuriri Runanga are the three areas where levels of service were not met

Asset Condition

Council has a programme of CCTV inspections for the stormwater pipe network in place. Since the last AMP review the software InfoAsset Manager has been employed, which will enable improved CCTV analysis, and better maintenance and renewals planning.

A condition assessment of all assets at headworks has not yet been carried out, so confidence in asset condition is only moderate. However most of the drainage infrastructure is relatively new, and based on age 99.3% of pipe assets are considered to be in very, good, good or adequate condition. For headworks the percentage is 97.6%.

A full asset inventory has recently been compiled for all of the 3 Waters facilities, the scope of which included identifying assets in particularly poor condition. There were only 21 assets that fitted this category, less than 6 being drainage assets.

Risk

Historically a range of different types of risk assessments has been carried out for the District's drainage supply schemes. The operational risk assessment has previously generated a programme of work to resolve the identified high risks (There were no extreme risks recorded). This work is now largely complete but there are a number of remaining issues.

At the district level risks to pipes and headwalls from earthquake remain. At scheme level Waikuku, Pines and Kairaki Beaches, are still at flooding risk from malfunction of flap valves or from insufficient capacity. Parts of Kaiapoi and Rangiora also remain at risk of flooding from insufficient capacity

Projects to resolve all these flood risks have been identified and programmed.

The vulnerability assessment and criticality assessments provide input data to the renewals programme. The effect of the vulnerability assessment, which only applies to underground pipes, is to accelerate the renewal of old brittle pipework, in areas of high risk of liquefaction.

It is expected that this category of pipes will have been completely replaced by 2033 thereby increasing the resilience of the network.

The Disaster Resilience Assessment considers the risk to above ground assets from a broad range of potential natural disasters.

While much of the work from past assessments will remain relevant, they have become out of date. A new approach has been developed, which brings the three different methodologies noted above into a single risk assessment process. This is expected to make regular updating of the assessments more efficient. The new methodology will be used in 2024 to carry out a complete risk assessment of water services.

Growth and Demand

Growth projections have been updated with base population projections being calculated via a model that provides town by town projections. Subsequent modelling has been carried out to identify new works or upgrades that will be required in the future to service this growth while continuing to meet the agreed levels of service. Where appropriate the necessary works have been incorporated into the capital project budgets.

It is proposed to manage the inherent uncertainty in rate of growth, by carrying out an annual growth review in conjunction with the Development Planning Unit to enable short term capital planning adjustments to be made that respond to changing market requirements. This will avoid unnecessary expenditure on growth works before they are actually needed, or potentially ensure growth related projects are accelerated if growth occurs faster than anticipated.

Note that new developments are required to construct infrastructure that will ensure that discharge from development is treated to the quality standards required by the Regional Council's Land and Water Regional Plan, and also to not discharge at a rate greater than that which existed before the development. Therefore nearly all the cost for capital works for growth falls directly to the developer, and works within the AMP's for growth are minimal.

Capacity and Performance

The capacity and performance of the main reticulated drainage schemes throughout the district are assessed using hydraulic models constructed and maintained by the Council's in house team for each scheme.

Extraordinary rain events, of which there have been a number of late may also identify areas where LOS is not being met.

Programmes of work arising from these sources are ongoing with capital works upgrades planned for Woodend, Waikuku Beach, Kaiapoi, Oxford and Rangiora.

Consents

Under the Land and Water Regional Plan Council is required to obtain consents for discharge of its urban stormwater. Under these consents Council will be required to improve the quality of the water it discharges into streams and rivers. Consents for all the district's urban centres have been lodged, but as of July 2023 the Rangiora consent has been the only one issued. Noting that ECAN does not require any further information from the Council, the outcome is pending on the others. Provisional budgets to meet the expected consent conditions have been included in the relevant scheme budgets, but the exact methodology to be used to meet the consent conditions has yet to be determined.

Operation and Maintenance

Operational and maintenance expenditure for drainage remains largely based on the previous year's expenditure carried forward. The biggest single expenditure item typically being spent on carrying out day to day maintenance – drain cleaning and the like. Drainage maintenance for urban areas is included in the Greenspaces maintenance contract.

In association with a district wide waterways maintenance consent from the Regional Council, Council has developed a Drainage Maintenance Management Plan 2020. While being principally directed at rural waterways, it still has relevance for open urban waterways. It provides a new direction for the way that waterways are maintained, with an emphasis on maintaining and enhancing ecological values, as well as providing for the traditional drainage function. It is hoped that over time, with increased planting, installation of sediment traps and other improvements, streams may be able to be left "unmaintained" in the traditional sense of being cleaned out by digger on a regular basis. Much of the impetus for these changes is being directed by the Canterbury Water Zone Committees, managed by Environment Canterbury.

Renewals

Improvements have been made to the Council's risk based renewals model, so that different levels of acceptable risk can be applied to the various categories of criticality. The model includes that highly critical assets are renewed before 85% of their expected life, while the lowest criticality assets may not be replaced until 120% of their expected life. Based on these risk profiles the model provides a prioritised list of pipe renewals needed across the district, identified by scheme, which Asset Managers assess and adjust as necessary. The model provides an annual expenditure profile for the next 150 years, and also identifies the annual revenue required to ensure that required future renewals are fully funded. The employment of InfoAsset Manager to manage and analysis CCTV pipe inspection data will improve the modelling of pipe renewals through a better understanding of the remaining asset life.

There are no deferred renewals for urban drainage assets

Financial Forecasts

Financial forecasts included within the AMP show projected capital expenditure for growth, level of service, and renewals, together with operational and maintenance expenditure. (Funds carried forward from previous years because capital projects have been delayed are not included.)

Periods shown for the different categories of budget vary, from 30 years for operations and maintenance, through to the full life cycle of long lived assets such as pipelines – 150 years. Forecasts are aggregated up from the different schemes, district wide flood response projects included and then shown graphically. See **Error! Reference source not found.**.

Programmes of district wide improvement works developed in response to a number of flooding events since 2014 are typically funded by a district wide rate, which is part of the General Rate. Additional capital budgets are funded from ratepayers entirely within each scheme.

Future Challenges and key Decisions

Putting aside managing expectations around stormwater levels of service which will remain as an ongoing challenge, the four most significant challenges facing Waimakariri District Council in the drainage area, are global discharge consents, climate change effects, Water Reform, and the effects of the Freshwater National Environmental Standards. The latter applying principally to rural drainage.

- **Discharge Consents**

As noted above Council has applied for discharge consents into receiving waters for all of its urban drainage networks. Although there is now more certainty about the conditions that these consents will impose, challenges remain about how best to comply with the conditions. Further detail on this issue is provided in the Consents section of this overview document.

- **Climate change**

Climate change adaptation is the most significant long term challenge. Research to date has indicated that while low lying coastal areas will remain protected by the dune system, increasing ground water levels will become an issue, and various combinations of storm tide, fluvial events and a rising mean sea level will potentially cause overtopping of stop banks and natural river banks. Farming in these areas may become problematic. Further assessment work is needed, and consideration given to the types of solutions that may be practical.

Potentially increased frequency of high intensity rain events, plus increased community expectations could also lead to pressure for higher levels of service away from the coast, with corresponding greater costs. Current levels of service in many older subdivisions are already not met.

Engagement is required with stakeholders, most notably the Regional Council, and affected communities. Major decisions will need to be made, to agree an adaptive strategy that is acceptable to both the affected communities and the wider district.

- **Water Reform**

The operative water reforms include Taumata Arowai having a role to monitor and report on the environmental performance of drainage networks. What this looks like is not yet known. The wider water reforms to be abandoned or significantly modified under the National led government also create significant uncertainty.

2 INTRODUCTION

The purpose of this Drainage Activity Management Plan (AMP) is to provide an overview of the Councils urban drainage assets, outline the issues associated with these assets and show how the Council proposes to manage them in the future, so as to continue to supply agreed levels of service, growth demand is accommodated, and renewals carried out at the appropriate time.

The Activity Management Plan Utilities and Roading (U&R) Introductory Chapter provides the context for the suite of U&R activity management plans and gives an overview of the department's activities, and asset management practices and processes, and should be read in conjunction with this document.

This document outlines the management approach for the five urban drainage schemes, all of which are rated separately, in addition to a District Wide drainage rate.

All drainage rated schemes are shown in the table below to provide context, although this AMP only covers the urban schemes.

Table 1: All drainage rated schemes

Urban Schemes	Rural Schemes
Kaiapoi	Coastal Rural
Rangiora	Clarkville
Oxford	Central
Pegasus	Ohoka
Coastal	Loburn Lea
	Cust
	Oxford Rural

The 5 urban drainage schemes cover approximately 1.2% of the District's land area and service approximately 75% of the District's population.

The urban scheme assets include piped stormwater networks, treatment devices, basins, stormwater pump stations and open drains which the Council maintains.

In recent years the issue of properties upstream of drainage rated areas contributing to stormwater problems within the rated area became an issue. In addition, the problem of how to manage requests for minor drainage works in areas that are not inside a rated drainage area became more prominent. This latter issue has to some extent been alleviated by the introduction of a modest fixed cost per property district wide rate. Moving more comprehensively to district wide rating has been toyed with for some time, but at the time of this AMP elected members have put consideration of that on hold.

With increasing public awareness and concern about stream water quality, stormwater and drainage management has a much higher profile across the district than was the case a few years ago.

Document structure

The main body of this document contains tables of infrastructure data at both a district wide level, and scheme level. Further detail of the individual schemes is provided by tables of links to other sources. These include:

- Network schematics,
- Pipe condition plans,
- Asset criticality plans
- Pipe renewal timeframes plan
- Capital upgrade works plan
- Scheme Serviced area

There is an appendix for each scheme which contains the Scheme Level of Service Performance table.

Improvement Plan

The assessments carried out as part of the asset management review process are intended to identify issues that need to be addressed. Resolution may include new capital works, or adjusted management or process practices. All these improvements are collated in Table 20

Document Review Process

Review of the AMPs has been carried out by a project team comprising the 3 Waters Manager, the 3 Waters Asset Management Advisor, Asset Managers (Water, Wastewater and Drainage), and the Network Planning Team Leader, with additional technical input from the Network Planning Team. Project Management has been led by the 3 Waters Asset Management Advisor.

The project team met fortnightly, and progress was tracked against a detailed programme that set out the review actions necessary for each section of the document

Internal advice was sought from the Council's Development Planning Team for growth projections, and liaison with the Asset Management Information team occurred during the update of the valuations. Asset Managers worked closely with the Finance Unit during development of the budgets.

Information regarding progress and requirements for both the Infrastructure Strategy and the LTP development was provided via the LTP Project Manager.

Draft versions of the documents were presented to the Utilities and Roading Committee at the end of 2023, with an updated version presented to Council in late January for adoption. Any changes in the AMPs resulting from modifications to the LTP, have been incorporated in the final version by way of an additional section. The final document is published on the Council's webpages after adoption of the 2024-2034 LTP.

Financial Forecasts

The financial forecasts shown in this AMP exclude inflation and any carry-forwards between the 2023/24 and 2024/25 financial years.

District Overview- Key Projects

There are several scheme drainage improvement programmes that are included within the 2024/34 LTP programme of works, some identified as a consequence of recent extraordinary rain events.

In the Coastal Urban scheme, capacity improvements are planned for Woodend, and Waikuku Beach. Minor work is planned for Pines Kairaki.

Notwithstanding significant recent works carried out with funds from government stimulus funding, further work is planned to continue to upgrade the Kaiapoi systems.

Ordinary rain events are known to cause concern for some residents in Oxford and a suite of works is planned to alleviate these concerns in the first three years of the LTP.

There are three projects in Rangiora still to be completed from the programme developed following the 2014 flood event, plus four additional upgrades to improve performance.

In addition, significant sums are included in each of the urban scheme budgets to carry out works to meet the requirements of the new network discharge consents.

3 SCHEME DESCRIPTION (WHAT DO WE HAVE?)

The table below outlines the total area of each urban scheme (ha.) and the total number of properties within each scheme at the time of the 2023/24 Rates Strike. The 5 urban drainage schemes cover approximately 1.2% of the Districts land area and service approximately 75% of the District's population. Table 1 provides an overall summary. Tables 2 and 3 summarise the districts urban network assets. In addition to the individual assets shown in these tables there are 14 stormwater pump stations.

Table 5 shows data references of technical reports and file numbers used to compile the AMP, with links should further details be sought.

An overall map of the District's Council drainage schemes is shown in the AMP Plans and Figures Viewer. Scheme specific plans are also available in the viewer:

- Network Schematics
- Serviced area

Table 2: District Overview – Scheme Summary Information

Drainage Scheme	Rangiora Urban	Kaiapoi Urban	Coastal Urban: Woodend, Pines Kairaki Waikuku Beach	Pegasus Urban	Oxford Urban
Drainage Area	1,029 Ha	884 Ha	386 Ha	282 Ha	174 Ha
Number of properties 2023/24 Rates strike	7,958	5,584	2,655	1,663	760
Pumpstations	1 Groundwater Pumpstation	13 Pumpstations	-	-	-
Stormwater Management Areas	11 Infiltration Ponds 3 Dry Ponds 8 Wet Ponds / Wetlands	10 Dry Ponds 3 Wet Ponds / Wetlands	2 Dry Ponds 4 Wet Ponds	1 Dry Pond 1 Wetland	1 Dry Pond
Stormwater Treatment Devices	1 Stormfilter (Townsend Fields)	3 Stormfilters (Silverstream)	1 Gross Pollutant Trap 1 Jellyfish Filter	2 Stormfilters	-
Receiving Waterways	Ashley River North Brook Middle Brook South Brook South South Brook No 7 Drain	Cam River Kaiapoi River McIntosh Drain Kaikanui Stream Courtenay Stream Silver Stream	Taranaki Stream McIntosh Drain Cam River (via Box Drain and SH1 Drain) Kairaki Creek	Taranaki Stream (via Eastern Conservation Area)	Cust Main Drain (via Findleys Drain and Pearson Drain) Eyre River (Direct and via Flanagans Drain)
Total Replacement Value (2022 Valuation)	$69.6M	$66.8M	$33.5M	$12.1M	$1.6M

Depreciated Replacement Value (2022 Valuation)	$58.7M	$55.8M	$29.7M	$11.0M	$1.5M

Table 3: Pipe & Open Channel Data Summary

Stormwater pipe length (m) by pipe material					
Pipe Material	**Rangiora**	**Kaiapoi**	**Coastal Urban**	**Pegasus**	**Oxford**
Concrete	37,127	35,580	16,138	5,026	844
PE	138	1,496	-	-	-
PVC	6,540	6,642	5,561	1,458	705
Other	477	1,052	466	-	-
Total	**44,282**	**44,770**	**22,165**	**6,484**	**1,726**
Open Drain length (m) lined and unlined					
Unlined Drain	14,197	14,574	6,502	151	17,509
Lined Drain	228	72	1,312	-	-
Total	**14,425**	**14,645**	**7,814**	**151**	**17,509**

Table 4: Other Stormwater Assets data Summary

Other Stormwater Asset types					
Asset Type	**Rangiora**	**Kaiapoi**	**Coastal Urban**	**Pegasus**	**Oxford**
Inlet (sump)	70	58	16	-	5
Manholes	877	842	493	179	27
Nodes	409	395	189	155	97
Valves	10	105	10	-	1
SMA's / Basins	27	13	6	-	1
Treatment Devices	1	5	1	2	-

Table 5: Data References

Data References – District wide	Trim Reference
2021-2022 Waters Asset Valuation	220803132120
2023: 30 year connection and rating unit projection	230413051831
2022 Customer Satisfaction Survey	230504063243
2014 Flood Mitigation works	141009110892
Data References – By Scheme	**Trim Reference**
Rangiora - Northbrook Enhancement Options	191030151124

4 LEVELS OF SERVICE

Levels of Service (LoS) are a measure of the standard of service being provided. The target levels of service are a significant factor in determining the size, capacity and cost of operating each scheme.

There is a hierarchy to the LoS. Some are measured at district wide level, some at scheme level, and some differ depending whether the scheme is urban or rural. The way that LoS measures are assigned, measured, and reported is summarised below, and explained in more detail in the following paragraphs.

Table 6: Summary of Performance Measure Types, and Reporting

	Mandatory Performance Measures	Elective Performance Measures
Set By:	These measures are set by the Department of Internal Affairs (DIA), but the targets set by individual local authorities.	These measures are set by individual local authorities.
Reporting:	Long Term Plan and Annual Report	Individual scheme Activity Management Plans Annual report to Council (future improvement). Some measures are also included within the Long Term Plan and Annual Report.

Changes to LOS for 2024

In early 2023, when the LOS and targets would normally have been reviewed again, the 3 Waters reform based on four new entities to manage 3 Waters infrastructure nationally, was going ahead. A National Transition Unit was operating under the Department of Internal Affairs, and the expectation was that the 2024 AMP's would be prepared by that Unit. By the time that the government changed the planned new structures, and delayed the entire programme it was too late to be able to review LoS, and have them approved by the U&R Committee/Council. Therefore the LoS and targets in the 2024 AMPs, both Mandatory and Elective, are generally unchanged from the 2021 AMPs.

The 2021 set of measures were approved by the Council's Utilities and Roading Committee for inclusion in the 2021 Draft Long Term Plan (report 200406043184[v1]), before being approved by Council.

Mandatory Performance Measures

In 2010, the Local Government Act 2002 was amended (Section 261B) to require new rules specifying non-financial performance measures for local authorities. The measures are intended to help members of the public compare the level of service provided by different councils at District or City level. The Council is required to incorporate the performance measures into their long-term plans and report against them in their annual reports. The element that is measured cannot be

changed (as this is mandatory) but the targets can be changed. Measures are reported at district wide level. This is provided to Council on a quarterly basis, and the annual results are included in Council's Annual Report. Note that Council has chosen to also include some elective LoS in its quarterly and annual reporting.

Elective Levels of Service

The mandatory measures do not replace the scheme specific elective LoS reported in the AMPs and used by the Council to monitor and manage the performance of individual drainage schemes.

Elective LOS are motivated by either legislative requirements (for example, compliance with resource consent conditions) or by established best practice. These are categorised as technical levels of service, and they are to be reported to Council on an annual basis. They have been developed over time, and are guided by a number of factors, including:

- Customer Expectations
- Affordability
- Council Community Outcomes (Strategic goals and objectives)
- Legislative Requirements

Primary customers are households or businesses that are connected to Council drainage schemes, with key stakeholders being Community Boards, Councillors and the Regional Council.

Community Engagement for Levels of Service

The level of service component of the Activity Management Plans was consulted upon comprehensively as part of the 2005 review. While a comprehensive public review has not been carried out since then, levels of service are tested with the public in a number of ways.

- For general feedback the principle method of communicating proposed LoS to customers is via the LTP process. As noted, mandatory performance measures form part of the LTP documentation that goes out for public consultation, during preparation for the LTP.
- The Council's drainage AMP's, which are updated concurrently with preparation for the LTP are made available on Council's website, which allows a channel for feedback from customers who may be interested.
- The general satisfaction of customers with the level of service received is gauged through tracking of complaints through the service request system, as well as through the Council's customer satisfaction survey. Changes to this survey have been made so that information is now available on a per scheme basis. Trends in complaints are available through the Council's Business Intelligence reporting system, allowing easy analysis for trends both at a district level and a scheme level. Where upgrades to schemes have been completed, the positive impacts can be seen to flow through to complaint levels, which provides a useful measure of success of projects.

Council received considerable community criticism after the 2014 flood event, particularly from the Mandeville area. It responded with a new district wide flood rate introduced in the 2015-2025 LTP, and a programme of works to address the concerns of the affected communities.

There have been other significant rain events since that time, and Council now has an established follow up pattern for these events. Council initially carries out an analysis of all the drainage service

requests received during the event. Issues relating to capacity (as against those relating to system blockage, which are mostly dealt with during the event) are investigated and, where warranted, improvements identified and submitted to Council for approval of additional funding. Some improvements are multi-year programmes of work, in which case the additional funding is incorporated in the financial information provided within the following AMP.

Summary reports to Council that have sought funding approvals in this way are TRIM 180809090003, 200709085254, 210817135255[v2], 220825147219[v2], 220923165375

2024 LTP Levels of Service

Error! Reference source not found. is in three sections. The first part sets out the mandatory performance measures and targets for the 2024 AMP. The second part shows the elective performance measures that are included in the quarterly reporting, and the third part shows the remaining elective performance measures.

Table 7: Performance Measures for the 2024 AMP

Level of Service	Performance Measure (2024)	Target	Community Outcomes that this LoS Contributes to
Mandatory Measures – reported quarterly and annually to Council			
Flooding - Dwellings	Urban stormwater a) The number of flooding events that occur * b) For each flooding event, the number of habitable floors affected, expressed per 1000 properties connected to a territorial authority's stormwater system.	a)Nil in less than 50 year storm events b)Nil per 1000 connected properties in less than 50 year storm events	*The natural and built environment in which people live is clean, healthy and safe.*
Consent Breach	Compliance with the territorial authority's resource consents for discharge from its stormwater system, measured by the number of: (a) abatement notices (b) infringement notices (c) enforcement orders, and (d) convictions, Received in relation those resource consents.	a) Nil b) Nil c) Nil d) Nil	*The natural and built environment in which people live is clean, healthy and safe.*
Response time	The median response time to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reach the site.	Less than 180 minutes	*Infrastructure and services are sustainable, resilient, and affordable.*

Level of Service	Performance Measure (2024)	Target	Community Outcomes that this LoS Contributes to
Complaints	The number of complaints received by a territorial authority about the performance of its stormwater system, expressed per 1000 properties connected to the territorial authority's stormwater system.	Fewer than 10	*Infrastructure and services are sustainable, resilient, and affordable.*
Elective Measures reported with Mandatory measures – quarterly and annually to Council			
Response Time	Service Requests: Percentage of service requests relating to any drainage enquiries that are responded to within 5 days	95%	*Infrastructure and services are sustainable, resilient, and affordable.*
Consultation	Maintain dialogue and consultation with Te Ngai Tuahuriri Runanga	Drainage team represented at all scheduled Runanga meetings	*Infrastructure and services are sustainable, resilient, and affordable.*
Consent Breach	Percentage of the total number of Drainage consent conditions that have breaches that result in an Ecan report identifying compliance issues that require action.	0%	*The natural and built environment in which people live is clean, healthy and safe.*
Elective Measures – reported annually and in AMP			
Flooding - Dwellings	Minimum return period of flood event that can be accommodated in the system without having flooding of dwellings.	1 in 50 year	*The natural and built environment in which people live is clean, healthy and safe.*
Flooding - Nuisance or Carriageway	**<u>For urban areas:</u>** For properties or carriageways within urban drainage schemes, the percentage of complaints, about nuisance flooding** caused by lack of capacity, that are investigated and where justified measures implemented to improve the situation. Applies to rain events with an Average Recurrence Interval of 5 years or less.	100%	*The natural and built environment in which people live is clean, healthy and safe.* *Infrastructure and services are sustainable, resilient, and affordable.*
Flooding - CBD Nuisance or Carriageway	For properties or road carriageways in the CDB area, the percentage of complaints, about nuisance flooding** caused by lack of capacity, that are investigated and measures	100%	*The natural and built environment in which people live is clean, healthy and safe.*

Level of Service	Performance Measure (2024)	Target	Community Outcomes that this LoS Contributes to
	implemented to improve the situation. Applies to rain events with an Average Recurrence Interval of 10 years or less.		*Infrastructure and services are sustainable, resilient, and affordable.*
Complaints - Aesthetics - Drain Clearance	Number of complaints, post cleaning, resulting from unsatisfactory drain cleaning operations or service (Reported at district level)	Nil per year	*Infrastructure and services are sustainable, resilient, and affordable.*
Complaints - Odour or Insects - Open Network	Number of complaints about odour, midges or insects in the open network including drains and ponds. (Reported at district level)	Nil per year	*Infrastructure and services are sustainable, resilient, and affordable.*
Customers - % Satisfied	Percentage of respondents to a three-yearly community survey that have an opinion, that rates the service as "Satisfactory" or "Very Satisfactory". (Reported at district and scheme level)	> 90%	*Infrastructure and services are sustainable, resilient, and affordable.*

*Flooding event defined as an overflow of stormwater from a territorial authority's stormwater system that enters a habitable floor

** Nuisance defined as "any flooding that covers footpaths, makes vehicular access difficult (i.e water ponds to a depth of 15 cm or more), or fails to drain away within 6 hours of the rain event that caused the flooding finishing"

District Overview: 2022/23 Levels of Service Performance

Error! Reference source not found. shows both the mandatory and elective levels of service achievement for those measures that are assessed at the district level. Appendices to this document can be referred to for the performance results for the individual schemes, which also show performance history.

Table 8: District Overview - Levels of Service Performance

Performance Measure	Target	Target met 2022/23	Commentary	Action to Address
Mandatory Measures – reported quarterly and annually to Council				
* Urban stormwater a) The number of flooding events that occur as a result of overflow from the stormwater system that enters a habitable floor b) For each flooding event, the number of habitable floors affected, expressed per 1000 properties connected to a territorial authority's stormwater system.	a) Nil in less than 50-year storm events b) Nil per 1000 connected properties in less than 50-year storm events	a) Y b) Y	a) There were no flooding events of habitable floor levels in urban area during this year, as a result of overflow from the stormwater system. On 26 July 2022 an event caused flooding to two habitable floors, but the flooding related to private issues. b) There were no flooding events of habitable floor levels during this year.	a) N/A b) N/A
*Compliance with the territorial authority's resource consents for	a) Nil b) Nil	a) Y b) Y c) Y d) Y	a) No abatement notices were received from Environment Canterbury this year.	a) N/A b) N/A c) N/A

Performance Measure	Target	Target met 2022/23	Commentary	Action to Address
discharge from its stormwater system, measured by the number of: (a) abatement notices (b) infringement notices (c) enforcement orders, and (d) convictions, Received in relation those resource consents.	c) Nil d) Nil		b) No infringement notices were received from Environment Canterbury during this year. c) No enforcement orders were received from Environment Canterbury during this year. d) No convictions were received from Environment Canterbury during this year.	d) N/A
* The median response time to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reach the site.	Less than 180 minutes	Y	There were no flooding events of habitable floor levels during this year.	N/A
*Complaints The number of complaints received by a territorial authority about the performance of its stormwater system, expressed per 1000 properties connected to the territorial authority's stormwater system.	Fewer than 10 complaints per 1000 connections.	Y	There were 57 complaints for the year which equates to 3.2 per 1,000 connections. This is well under the target of 10.	N/A
Elective Measures reported with Mandatory measures – quarterly and annually to Council				
Service Requests: Percentage of service requests relating to any drainage enquiries that are responded to within 5 days	95%	N	62.67% of the service requests during the whole year met the target time. This number is for both urban and rural areas combined. There is still a backlog of service requests that the Drainage Team and Flood Team have been working through following the July 2022 flood events.	Council Staff have requested as part of the 24/34 LTP for the establishment of an Infrastructure Recovery Team of full time Council employees. This team will provide additional capacity to respond to service requests from events, the ability to commence the recovery works

Performance Measure	Target	Target met 2022/23	Commentary	Action to Address
				immediately without the delay of securing external assistance, and resources to implement ongoing upgrades to build resilience and prepare for future events.
Maintain dialogue and consultation with Te Ngai Tuahuriri Runanga	Drainage team represented at all scheduled Runanga meetings	N	No scheduled Runanga meetings have been held to date this year for the Drainage team to attend. (result common to Rural and Urban schemes)	None. The meetings are arranged by the Governance section of Council. 3 Waters attends if there are meetings to attend
Percentage of the total number of Drainage consent conditions that have breaches that result in an Ecan report identifying compliance issues that require action.	0%	Y	There were no compliance reports received from Environment Canterbury regarding a breach of consent condition during the year	N/A
Elective Measures – reported annually and in AMP				
Minimum return period of flood event that can be accommodated in the system without having flooding of dwellings.	1 in 50 years	-	Insufficient data. Cannot be determined unless house floor levels known, and further modelling for 50 year events completed	Complete 50 year event modelling and consider next steps
<u>For urban areas:</u> For properties or carriageways within urban drainage schemes, the percentage of complaints, about nuisance flooding* caused by lack of capacity, that are investigated and where justified measures implemented to improve the situation.	100%	N	Insufficient data available	A mechanism for obtaining this data needs to be investigated and out into place

Performance Measure	Target	Target met 2022/23	Commentary	Action to Address
Applies to rain events with an Average Recurrence Interval of 5 years or less.				
For properties or road carriageways in the CDB area, the percentage of complaints, about nuisance flooding caused by lack of capacity, that are investigated, and measures implemented to improve the situation. Applies to rain events with an Average Recurrence Interval of 10 years or less.	100%	N	Insufficient data available	A mechanism for obtaining this data needs to be investigated and out into place
Number of complaints, post cleaning, resulting from unsatisfactory drain cleaning operations or service	Nil	Y	No complaints reported	N/A
Number of complaints about odour, midges or insects in the open network including drains and ponds.	Nil	Y	No complaints reported	N/A
Percentage of respondents to a three-yearly community survey that have an opinion that rates the service as "Satisfactory" or "Very Satisfactory".	>90%	N	Of those who identified themselves as being within a drainage area, on average across the urban schemes (weighted by sample size) the percentage of satisfied respondents was 79%.	Flood mitigation and protection projects to improve LOS are underway. Budget has been allocated for projects to be implemented as part of the 24/34 LTP.

* Nuisance defined as "any flooding that covers footpaths, makes vehicular access difficult (i.e water ponds to a depth of 15 cm or more), or fails to drain away within 6 hours of the rain event that caused the flooding finishing"

Benchmarking

A number of the performance measures above are collated and reported nationally, and therefore can be benchmarked against other service providers to compare performance. Waimakariri District Council participates in Water NZ's National Performance Review (NPR). The most recent customised report prepared for WDC can be found here: TRIM 230324041126.

The more general report for 2021-22, which still enables comparisons with other Councils can be found here: 2021-22 National Performance Review. Comparisons noted below may look slightly different to the comparisons in previous AMPs as different numbers of Council's participate in the review. (There are 67 territorial authoritories in NZ)

Using the Water NZ National Performance Review most recent results (2021/22):

- 22% of WDC stormwater discharges are consented, with the remainder having been applied for. 8 TLA's have all of their discharges consented, 7 have more than 22% but not 100%, and the remaining 13 have fewer consents
- WDC is among the 21 TLAs which are monitoring stormwater quality, and the 27 that have stormwater catchment management plans in place.
- WDC average annual residential charges are higher at $260 per annum than the average across all TLA's at $193 per annum
- Operational cost per property at $149 p.a. is higher than the national average of $95
- Capital expenditure per property at $347 p.a. is higher than the national average of $129
- Capital expenditure on existing assets as a proportion of depreciation is 552%, indicating the increasing level of service

Scheme differences

New subdivisions such as Pegasus perform better than other urban areas within the District, as they has been designed for higher levels of service. Older areas of Kaipoi and Rangiora were typically build with lower design standards, and retrospectively increasing them to current standards is not considered to be affordable. However the minimum return period for a flood event below which flooding of floor levels must not occur, is a universal LOS across all urban areas. The nuisance flooding LOS is generally aimed at indentifying issues in these older areas, with the intention being to avoid those issues not being addressed.

Parts of old Kaiapoi are low lying and have suffered from sporadic flooding for years. Projects to deal with these problems have recently been completed. They were brought forward from the original programme as a consequence of Covid 19 response funding from central governmen.

Assessment of scheme level performance allows for a comparison between schemes to highlight areas where improvements are required. By addressing the relevant schemes where the scheme specific performance measures are not met, improvements will flow up into the district measure.

Table 9 below shows the 2022/23 elective performance measures for each scheme.

The scheme appendices contain tables that show both the 2022/23 results, and scheme performance history going back to 2008.

Table 9: 2022/23 Scheme performance - elective measures

Performance Measure	Target	Rangiora Urban	Kaiapoi Urban	Coastal Urban: Woodend, Pines Kairaki Waikuku Beach	Pegasus Urban	Oxford Urban
Minimum return period of flood event that can be accommodated in the system without having flooding of dwellings.	1 in 50 years	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data
For properties or carriageways within urban drainage schemes, the percentage of complaints, about nuisance flooding caused by lack of capacity, that are investigated and where justified measures implemented to improve the situation. Applies to rain events with an Average Recurrence Interval of 5 years or less.	100%	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data
For properties or road carriageways in the CDB area, the percentage of complaints, about nuisance flooding caused by lack of capacity, that are investigated and measures implemented to improve the situation. Applies to rain events with an Average Recurrence Interval of 10 years or less.	100%	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data
Number of complaints, post cleaning, resulting from unsatisfactory drain cleaning operations or service	Nil per year	Achieved	Achieved	Achieved	Achieved	Achieved

Number of complaints about odour, midges or insects in the open network including drains and ponds.	Nil per year	Achieved	Achieved	Achieved	Achieved	Achieved
Percentage of respondents to a three-yearly community survey that have an opinion, that rates the service as "Satisfactory" or "Very Satisfactory".	>90%	83%	75%	44% (Average of results from Woodend, Waikuku Beach and Pines/ Kairaki	Achieved	73%

5 ASSET CONDITION

The current assessment of asset condition is based on theoretical remaining useful life derived from component age and adopted useful life. Adjustments to the remaining life are made to individual components where information is available to suggest the theoretical remaining life is inappropriate.

A CCTV programme was started in 2008 to survey the reticulation network and assign evidence based condition ratings.

Nominally drainage pipes are inspected on average every 25 years, but criticality and age are modifying factors as set out below

AA – Every 10 years from 50% life remaining
A – Every 10 years from 40% life remaining
B – Every 10 years from 30% life remaining
C – Every 20 years from 20% life remaining

InfoAsset Manager is the software used to import and analyse CCTV data. When installed it had been the intention to integrate the data that will be imported into InfoAsset Manager with the main asset management system (Technology One) data. This project has been put on hold due to the Council commencing a process to replace the Technology One system, which is also the Council's enterprise wide business platform

Remaining Useful Lives

The useful lives of asset groups as indicated by the valuation are consistent with the asset life assumptions used to develop the renewal forecasts. The assumptions about remaining useful lives of the drainage assets are progressively informed by the ongoing collection and analysis of the asset maintenance and repair data, in conjunction with further CCTV surveys. Full details of the assumptions pertaining to the remaining useful lives of each asset category are included in the Valuation report (TRIM 220803132120).

Assets are normally revalued on a three yearly valuation cycle, to coincide with the three yearly LTP cycle. However with increased inflation over the last few years, the most recent valuation was carried out a year earlier in 2022. The 2022 figures have been adjusted for 2023 using CPI factors.

- ***Reticulation*** The approach of compiling better condition and maintenance information over time, has been considered relatively low risk for reticulation as the average age relative to asset life is reasonably young. The majority of reticulation assets have more than 50% remaining useful life and are considered to be in good condition.

  As noted a CCTV programme is in place to assess the condition and expected life of gravity drainage assets, which will in time improve confidence in asset lives.

- ***Headworks (pump stations)***

  Headworks asset condition is determined using asset age and asset class. No comprehensive asset condition assessment at facilities has yet been carried out so confidence in asset condition is not high. However field staff are required to take note of assets that are deteriorating, when carrying out their normal regular maintenance

checks/inspections. In the recent complete facilities asset inventory work that has been undertaken, the scope included identifying assets in particularly bad condition. No stormwater assets were found that fitted this category.

In the absence of a formal assessment it is believed that the majority of headworks assets have more than 50% remaining useful life (based on age).

Electrical componentry at headworks has received more attention, and a regular inspection programme is in place to identify renewal needs, managed through Council's electrical servicing contractor. Works identified from these assessments are programmed and budgets incorporated in the ten year plan

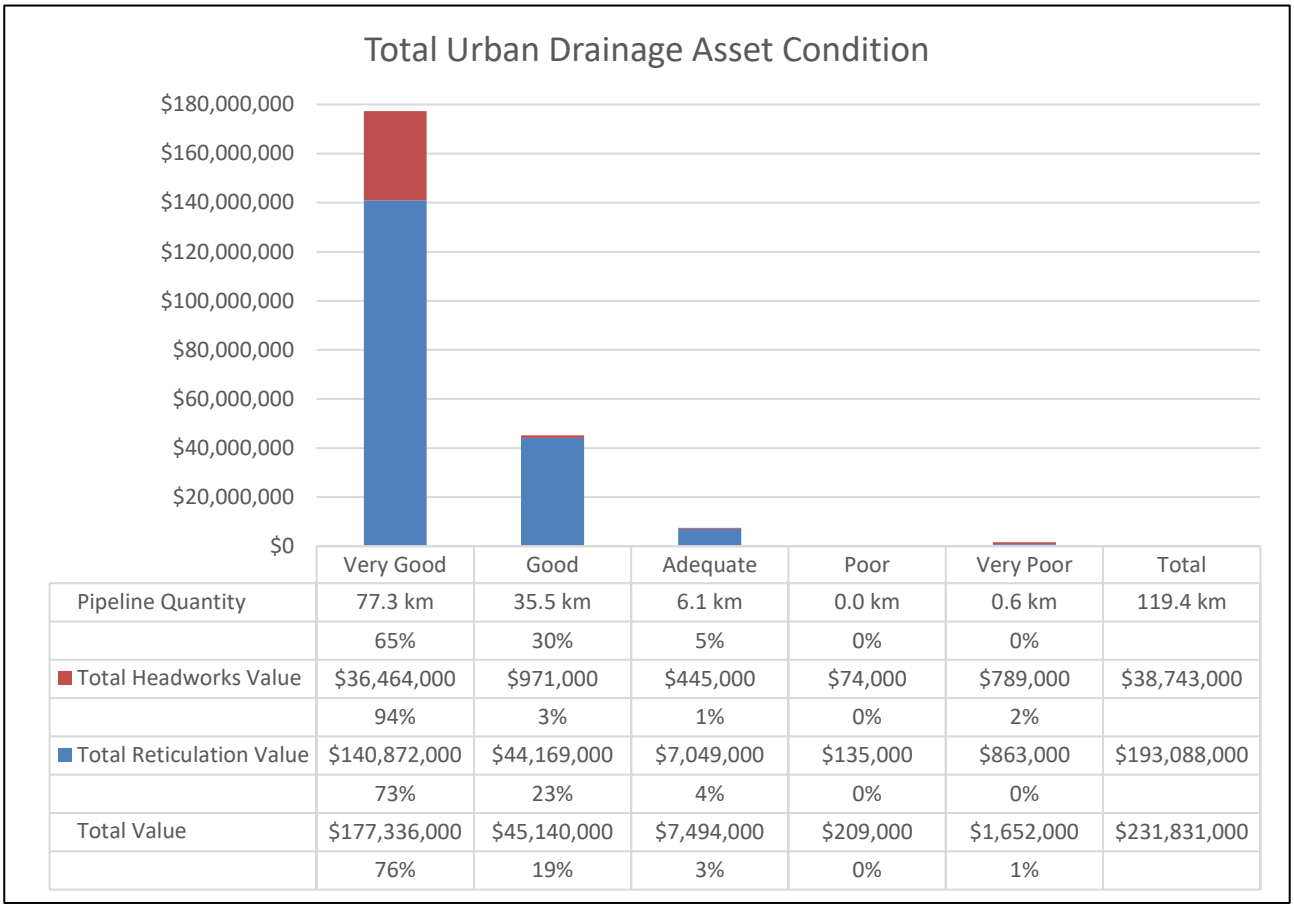
- ***Useful Lives on GIS***

The AMP Plans and Figures Viewer contains links to GIS plans for each scheme that spatially illustrates the remaining useful life of the reticulation assets within the network. This provides a useful picture of the relative asset age and performance.

- ***District Overview***

Figure 2 and Table 10 below summarises assessed asset condition for the 2023 AMP reviews. Note that "Headworks" is inclusive of all above ground assets, while "Reticulation" covers the remainder of the assets, which are typically below ground pipework related assets.

Figure 1: Asset Condition Summary

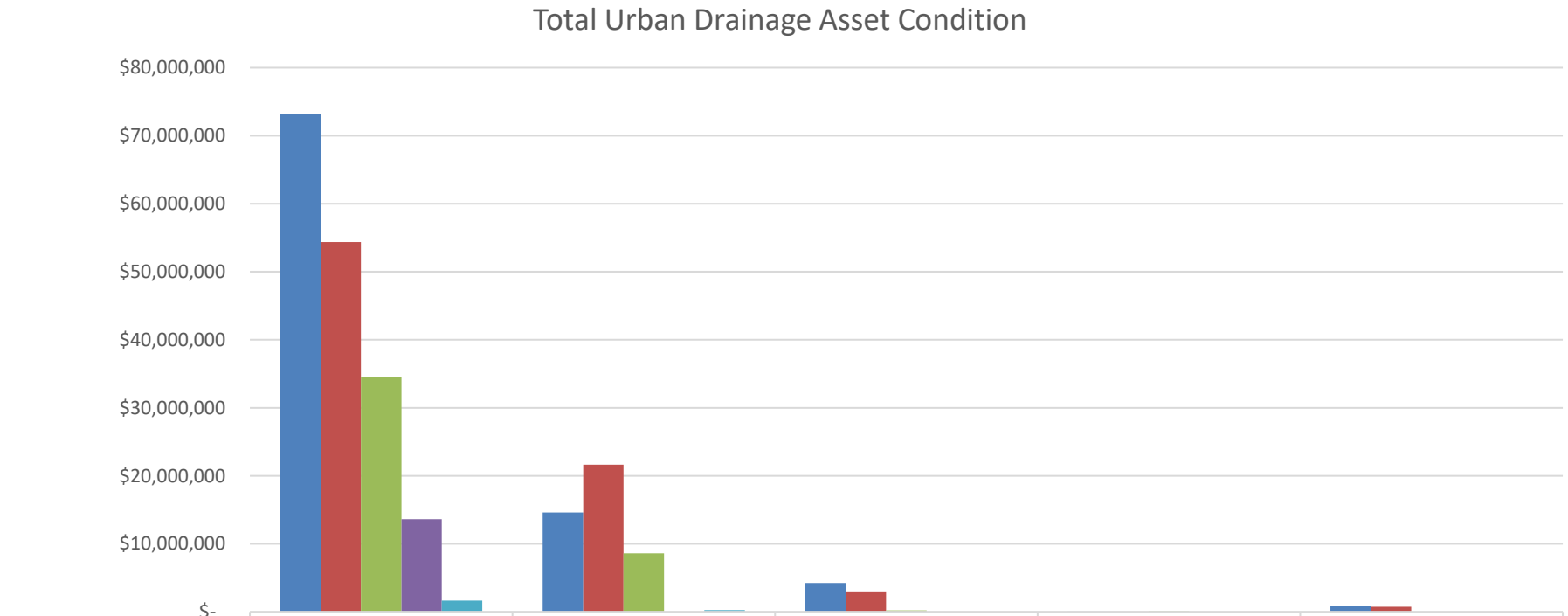


	Very Good	Good	Adequate	Poor	Very Poor	Total
Pipeline Quantity	77.3 km	35.5 km	6.1 km	0.0 km	0.6 km	119.4 km
	65%	30%	5%	0%	0%	
Total Headworks Value	$36,464,000	$971,000	$445,000	$74,000	$789,000	$38,743,000
	94%	3%	1%	0%	2%	
Total Reticulation Value	$140,872,000	$44,169,000	$7,049,000	$135,000	$863,000	$193,088,000
	73%	23%	4%	0%	0%	
Total Value	$177,336,000	$45,140,000	$7,494,000	$209,000	$1,652,000	$231,831,000
	76%	19%	3%	0%	1%	

Table 10: Pipe Condition Summary

Parameter	**Very Good (Grade 1)**	**Good (Grade 2)**	**Adequate (Grade 3)**	**Poor (Grade 4)**	**Very Poor (Grade 5)**
Definition	*More than 80% of life remaining*	*Between 50% and 80% of life remaining*	*Between 20% and 50% of life remaining*	*Between 10% and 20% of life remaining*	*Less than 10% of life remaining*

Figure 2: Asset Condition Summary - Schemes



	Very Good	Good	Adequate	Poor	Very Poor
Kaiapoi Urban Drainage	$73,146,000	$14,607,000	$4,247,000	$43,000	$894,000
Rangiora Urban Drainage	$54,377,000	$21,626,000	$3,011,000	$46,000	$759,000
Coastal Urban Drainage	$34,506,000	$8,617,000	$236,000	$119,000	$-
Pegasus Urban Drainage	$13,643,000	$12,000	$-	$-	$-
Oxford Urban Drainage	$1,663,000	$277,000	$-	$-	$-
Total	$177,335,000	$45,139,000	$771,000	$208,000	$1,653,000

6 CRITICALITY

Criticality is a measure of the importance of a given asset to the overall scheme and is determined by the consequence of failure. Assets for which the financial, business, or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation are considered more highly critical. Critical assets have a lower threshold for action than non-critical assets. Criticality is used as a means to:

- Identify the most important assets in the overall network
- Prioritise assets that warrant specific condition assessment
- Prioritise assets for repair following multiple failures, e.g. following an earthquake
- Quantify the relative consequence of failure, which can then be used to assess the risk of failure and prioritise renewals. Specifically this means that assets with higher criticality rating are renewed before their end of life, while renewal of low criticality assets will be delayed beyond theoretical end of life.
- As an input to the CCTV programme.
- To determine if a "stand over" is necessary by our in-house operations contractor, when external contractors are working on or near WDC assets.

The criticality assessment carried out on the reticulation uses an automated GIS model using both GIS and modelling data to determine the criticality of pipes. The previous critically assessment model for treatment plants and pump stations has been updated and used again in this document, but now that a comprehensive asset stocktake at facilities has been completed, it will enable a new model for assessing the criticality of pump stations and treatment plants to be developed.

WDC have chosen to use a component failure and public-impact based approach to identify and rank critical assets.

For drainage assets "Failure" is defined as any single component malfunctioning causing a loss of service or significant impact to others under normal operating circumstances. "Impact" is defined as:

- Public health impact – the failure of the asset creates an unacceptable impact on public health.
- Socio-economic impact – the failure of the asset creates an unacceptable social and/or economic loss to the community. This includes disruption to essential services, significant economic activities and important roads.
- Financial Loss – The failure of the asset, or the repair of a failed asset, creates an unacceptable financial loss to the community, including the Council.
- Environmental impact – the failure of the asset creates an unacceptable environmental effect.

The stormwater reticulation and pump stations are assessed by five main criteria:

- The number of customers potentially affected by failure of the main or facility
- The diameter of the gravity or pumped stormwater main
- The location of any potential flooding from main, manhole or pump station
- The depth of the stormwater main
- The location of the main, i.e. if it is located in a strategic road, near a train line or a stop bank

Each individual main is then graded between AA and C categories.

Table 11: Criticality Score Categories

Criticality Rank		Criticality Rank Code
High Criticality	Extreme Criticality	AA
	High Criticality	A
Moderate Criticality		B
Low Criticality		C

The table below shows the percentage of mains by length for each criticality rating. Because the pipe criticality assessment is undertaken using GIS data the assessment can be repeated and updated on a more regular basis. Annual updates are planned that will inform each years detailed renewals programme.

An equivalent table for facility assets is not currently possible, but will be when the facility asset inventory project has been finalised, and the facility criticality model linked back to the assets.

District Overview – Reticulation Criticality

Table 12: District Criticality Assessment

Scheme	AA	A	B	C
Coastal Urban Drainage	5%	41%	34%	20%
Kaiapoi Urban Drainage	12%	44%	28%	16%
Oxford Urban Drainage	7%	18%	67%	8%
Pegasus Urban Drainage	0%	32%	29%	39%
Rangiora Urban Drainage	6%	45%	31%	18%
All Urban Schemes	***8%***	***43%***	***31%***	***19%***

Criticality on GIS

The AMP Plans and Figures Viewer contains spatial views of the criticality of pipe and facility assets for each scheme.

7 RISK ASSESSMENT - OVERVIEW

The purpose of carrying out risk assessments on drainage schemes is to identify any risks to the scheme which need to be mitigated, and to prioritise implementation of any mitigation plans.

A number of different risk assessment have been carried out, each one with a specific focus, although there is some overlap. A description, and the purpose of each assessment is provided below

i. ***Operational Risk Assessment*:** This is the broadest scope assessment. Possible causes of failure of the drainage system are examined, together with the consequences of that failure. Failure includes failure caused by natural disasters. This assessment, was last carried out for the 2015 AMP review, but has not been updated for this review. It was originally the intention that a review of these operational risks be carried out in time for this AMP, but as it was subsequently expected that the next AMP would be written by the new entity being set up under the 3 Waters reforms, this was not carried out.

ii. ***Disaster Resilience Assessment*** (DRA): Assesses the risk to above ground assets from a broad range of potential natural disasters. See Section 9

iii. ***Vulnerability Assessment:*** Focuses solely on underground assets, assessing the vulnerability of pipes to damage from natural hazards, and uses an automated approach. For drainage there are no AC or earthenware pipes in areas assessed as vulnerable to liquefaction, so no vulnerability assessment has been needed

iv. ***Corporate Risk:*** High level risk assessment carried out corporately in association with the development of the LTP and Infrastructure Strategy. Covers Environmental, Economic, and Social risks. Council updated its Risk Management Policy and Framework in 2022. TRIM 220428064824 and 220428064825. The most recent corporate risk assessment is available here: TRIM 230321039241

Updating the 3 Waters risk assessments is now a priority. A new approach has been recently developed, which brings the Operational, Disaster Resilience and Vulnerability assessments into a single risk assessment process. This is expected to make regular updating of the assessments less of a hurdle. The new methodology will be used in 2024 to carry out a complete risk assessment of water services.

The new methodology enables consistent, measurable quantifying of risks for customers and the environment from operation of water supply (and also stormwater and wastewater) schemes. Key risks are presented as outcomes such as loss of, or contamination of water supplied to customers, or stormwater or wastewater discharges resulting in flooding or downstream environmental contamination.

The method achieves consistency by assigning numerical values to conditions that lead to events (for example – “pump station failure”) which causes the adverse outcome “loss of supply”.

Likelihood is determined by using preset data to assign values to conditions which are common across schemes. A typical condition is, for example, “average asset condition - % of life remaining”. For this example each percentage range specified in the condition receives a rating of between 1 and 5, with “1” being “almost certain” and “5” being “rare”. Likelihood scores for each condition are averaged to determine an overall likelihood rating for each event. Conditions are measurable,

using asset and scheme operating data, drawing from procedural, mechanical or structural factors or natural hazards which contribute to the events.

The resulting likelihood scores are averaged with consequence scores (comprising agreed severity values modified by scheme exposure) to determine final risk ratings for each event and scheme. “Scheme exposure” is determined by the number of connections to each scheme. This gives an indication of the scale of impact of an event and size of the likely Council response that would be required to resolve it.

Findings from these updated risk assessments will be compared with previous risk assessments, particularly the DRA work as a check.

8 OPERATIONAL RISK ASSESSMENT

The table below details the risks considered under the previous assessment methodology, which was last carried out for the 2015 AMPs. Natural disaster risks were also considered across all asset types: earthquake, tsunami, extreme weather events, and vandalism/terrorism.

Table 13: Risk Events Considered

Process	Event
Collection	Overflow or flooding stormwater from pipes or open drains
	Collapse or failure of pipe or open drains
	Overflow or flooding of stormwater from pump station
Treatment	Overflow or discharge of untreated stormwater
	Stormwater not sufficiently treated
Disposal	Stormwater unable to be discharged or discharged uncontrollably
General	Operations/management failures

Risk Matrix

Possible causes leading to the above events are rated for consequence (1 to 5) and likelihood (A to E) and then combined to give a risk score using the matrix in **Error! Reference source not found.**. The three cells highlighted by a black frame show where the WDC matrix differs from the standard AS/NZ 4360 risk matrix. These changes were made as they better reflect the level of risk accepted by WDC on their 3 Waters assets.

Figure 3: WDC Risk Matrix

Risk Matrix		Consequences				
		Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Likelihood	A Almost certain	M	H	H	E	E
	B Likely	M	H	H	E	E
	C Possible	L	M	H	H	E
	D Unlikely	L	L	M	H	E
	E Rare	L	L	M	H	H

District Overview – Operational Risk

Error! Reference source not found. summarises the number of high risks identified in 2015 now remaining across the urban drainage schemes. All extreme risks have been mitigated.

Note that the planned new comprehensive risk assessment, with completion in 2024 anticipated, will incorporate these previously identified risks

Table 14: District Overview – High Risks remaining (Operational)

Risk Event & Cause – DISTRICT level	**Specific Risk**	**2023 AMP update**	**Project Details - updated**
Natural disaster & other due to earthquake	In **coastal urban** areas, pipe joints and manhole connections could be susceptible to liquefaction	Risk assessment methodology is being reviewed as part of 2021 AMP improvement plan. Risk will be carried forward into new programme, if warranted	Risk assessment update, being carried out by PDU
Natural disaster & other due to earthquake	Failure of stopbanks and floodgates is a possibility. These are the responsibility of ECan	Residual risk now considered acceptable. These assets are in any case not WDC assets. For the risk to eventuate, an earthquake that causes damage to these assets needs to then be followed by a significant rainfall event	N/A
Natural disaster & other due to earthquake	Pipework and headwalls could be damaged by earthquake	Risk assessment methodology is being reviewed as part of 2021 AMP improvement plan. Risk will be carried forward into new programme, if warranted	Risk assessment update, being carried out by PDU
Risk Event & Cause – SCHEME level	**Specific Risk**	**2023 AMP update**	**Project Details - updated**
Natural disaster & other due to earthquake	Pond bunds could be susceptible to liquefaction.	**Kaiapoi**: One pond that is potentially at risk, and the consequences of bund failure are minor. Residual risk acceptable **Pegasus**: No bunded ponds	N/A N/A

Waikuku Beach: Flooding	Overflow or flooding of stormwater from pipes or open drains due to insufficient reticulation capacity	Waikuku Beach has minimal pipework, the drainage system comprising mainly of open drains.	• Temporary pump discharge line to be installed for alleviate Beach Crescent flooding in 2023/24. • Planned improvements for Rotten Row in 2028/29.
Waikuku Beach: Insufficient outfall capacity	Collins Drive flap valve has caused flooding in the past	A recent high intensity rainfall event has shown that when the flap valve operates, unacceptable flooding can occur behind the stop banks	• Maintenance of WDC flap valves to be continued and strengthened. • Liaison with Ecan for maintenance of their flap valves to be strengthened. • Planned Taranaki stream pumpstation in 2034/35.
Kairaki Beach: Flooding	Stormwater unable to be discharged due to failure of outfall	This is a regeneration zone previously damaged by the earthquakes, and the drainage system is poor. New housing is anticipated, and therefore the risk remains	Funding is available for modest system upgrades including an upgrade to the temporary pump
Pines Beach: Insufficient outfall capacity	Outfalls to Waimakariri River via Saltwater Creek. Flap valve has caused flooding in the past	Minor improvements have been made, but ECAN plans a completely new structure downstream of the existing one, within the next three years.	ECAN project within 2024/25 to 26/27 LTP period expected to mitigate risk
	Overflow or flooding of stormwater from pipes or open drains due to insufficient reticulation capacity	"Shovel ready" funding has enabled a suite of drainage improvement works to be completed earlier than planned, but there are still further upgrade works budgeted for	9 upgrade projects planned 2024/25 to 2033/34, amounting to approx. $12M. Details included in AMP Plans and Figures Viewer
	Overflow or flooding of stormwater from pipes or open drains due to poor reticulation condition (blockages), particularly in	Some initial screening work has been carried out to identify at risk pipes. Follow up is required	The list of at risk pipes to be incorporated in the CCTV programme, as a high priority

Kaiapoi: Flooding	drowned pipes that are not regularly maintained		
	Overflow or discharge of stormwater from Beswick Pump Station due to pump failure.	No longer assessed as high risk , as pump station is now in a regeneration zone. Notwithstanding, operational improvements to the P.S. are planned	Operational improvements only. Risk now low
	Overflow or discharge of stormwater from Feldwick Drain Pump Station due to pump failure	Risk now mitigated: Feldwick Flood PS and Rising Main, SMA and Drain Upgrade and SW PS upgrade all completed.	N/A
	Natural disaster & other due to tsunami	Risk assessment methodology is being reviewed as part of 2021 AMP improvement plan. Risk will be carried forward into new programme, if warranted	Risk assessment update, being carried out by PDU
	Debris from storms could interfere with flap valves	Flap valve maintenance project has slipped	• Maintenance of WDC flap valves to be continued and strengthened • Liaison with Ecan for maintenance of their flap valves to be strengthened
Rangiora: Flooding	Overflow or flooding of stormwater from pipes or open drains **due to** insufficient reticulation capacity. The 2014 storm identified overland flow from surrounding farmland as the major issue	Risk reduced through work completed to date but programme of projects identified after the 2014 event still to be finished	Lehmans Rd Stage 2: 2027/28 Wiltshire Green stage 2: 2026/27 West belt trunk: 2028/29

9 DISASTER RESILIENCE ASSESSMENT

The 2009 Disaster Resilience Assessment (DRA) was a desktop assessment of the risk from natural hazard events for all Council operated water supply, wastewater and drainage schemes including above ground and reticulation assets.

In calculating risk the following factors were considered:

- The likelihood of the hazard event occurring, determined from return period
- The resilience or vulnerability of the asset to each hazard (desktop based)
- The consequence of asset failure to the community

The DRA was updated in 2011 to take into account new hazard assessments, in particular the increased seismic risk to the assets throughout the District including further work on areas susceptible to liquefaction. The outputs of new tsunami modelling, a rapid flood hazard assessment and, an updated wildfire threat assessment were also included. This update focused on above ground assets, as the assessment of risk to below ground assets became incorporated from this time on, into the renewals model. The report is available as TRIM 160912093915

A comprehensive review of the DRA Action Plan was carried out in 2014 to update progress made on tasks and prioritise future initiatives. As a result of the review, related tasks were consolidated into one of three improvement projects to be actioned over the following three years. Limited progress has been made on these improvements since the 2015 AMP revision, due to resource constraints.

The new risk assessment methodology described in section 7 above has been developed with the purpose of incorporating the DRA risk analysis within it. It is therefore expected that it will result in similar actions/improvement projects to the DRA, but integrated with the outcomes of the operational risk assessment.

The DRA, together with the risk based renewals assessment, were the Council's 3 Waters department's primary tools in meeting the obligations of the CDEM Act which requires that all lifeline utilities operate to the fullest possible extent before, during and after an emergency. The new risk assessment process and the risk based renewals assessment will be the tools used going forward to meet those obligations.

10 CORPORATE RISKS & ASSUMPTIONS

An assessment of key risks and assumptions was prepared by the Council in preparation for the 2024-34 LTP, and is included in the Infrastructure Strategy. The assessment outlines all of the Key Assumptions and Risks that could potentially impact Council service delivery for the 3 Waters activities. Mitigation measures are explained in response to each identified risk.

The Key Risks and Assumptions table is available at TRIM 240611093590.

The definitions of likelihood and consequence and the overall risk priority used in the Corporate Risk Assessment are included in the Council's Risk Framework Document TRIM 220428064825 .

A number of the financial risks and assumptions identified in this document imply future uncertainty, with future changes potentially affecting the individual scheme financial projections. Changes to corporate assumptions have been taken note of as part of this AMP review and projections and budgets revised accordingly.

11 CLIMATE CHANGE

For some time Waimakariri District Council has been including the expected effects of climate change in both the hydraulic modelling that it carries out, and design work, and has assumed the worst case projection of RCP8.5.

Notwithstanding, in 2022 the Council commissioned NIWA to carry out a district specific climate report, and in June 2022 the Council resolved to

- *Adopt the NIWA climate projections for the RCP 8.5 Scenario as its baseline evidence for corporate planning, including District planning and the 2024 LTP suite of corporate documents (LTP, activity management plans and infrastructure strategy).*

The key findings of the NIWA report are as follows:

- The projected Canterbury temperature changes increase with time and increasing greenhouse gas concentrations. For RCP8.5 the mid-century mean air temperature is projected to increase by 0.9°, with an end of century increase of 2.4°. Diurnal temperature range (i.e., difference between minimum and maximum temperature of a given day) is expected to increase with time and increasing greenhouse gas concentrations.
- For RCP8.5 the mid-century mean maximum air temperature is projected to increase by 1.2°, with an end of century increase of 3.3°. Changes in mean minimum air temperature are largely uniform across the district
- For RCP8.5 the mid-century mean minimum air temperature is projected to increase by 0.5°, with an end of century increase of 1.6°. Changes in mean minimum air temperature are largely uniform across the district
- The average number of hot days (days ≥25°C) is expected to increase with time. 15 by mid century and 44 by end century. Hot days in the Lees Valley and western plains could see the largest increase by the end of century with upwards of 50 additional hot days projected per year.
- The number of frost days (days <0°C) is expected to decrease throughout the region. Largest decreases are expected in inland areas, with frost days reducing by up to 26 per annum by end century.

- Increased rainfall is projected across the lower altitude plains and coastal areas, and no change (or slight decreases) in annual rainfall are projected in the western high-altitude zones. However rainfall intensity is expected to increase. Extreme rainfall will likely increase by approximately 7% per 1 °C of climate warming, and shorter duration rainfall events (e.g., hourly) could increase by as much as 15% per 1 °C of climate warming.
- The future amount of accumulated PED (Potential Evapotranspiration Deficit) is projected to increase, therefore drought potential is projected to increase.
- Mean annual low flow in rivers generally decreases by late century, with decreases of 20%-50%.
- Floods (characterised by the Mean Annual Flood; MAF) are expected to become larger, with increases exceeding 50%. However, as noted in The Canterbury Regional climate change report (Macara et al., 2020), the mean annual flood "should not be considered a comprehensive metric for the possible impact of climate change on New Zealand flooding".
- Sea-level rise will continually lift the base mean sea level on which the tide rides, which means there will be an increasing percentage of normal high tides which exceed a given present-day elevation e.g., street level, berm or stopbank crest.

This report validates the approach 3 waters has been taking with it's modelling and design work.

Previous Climate Change Initiatives

WDC's initial studies carried out on the effects of climate change focused on the coastal fringe. An investigation into groundwater levels, (TRIM 191202168785) concluded that rising groundwater levels will subject underground assets to more frequent inundation, and exacerbate surface flooding. Existing drainage systems are likely to become less effective. However a study of coastal erosion (TRIM 191202168789) found that dune erosion is not likely to follow from sea level rise, as the Waikamariri River delivers enough additional material along the coast to the north of the river, to compensate for any increased rate of erosion. This study also considered coastal inundation, but a further more comprehensive study (TRIM 200312034365) concluded that various combinations of storm tide, fluvial events and a rising mean sea level will cause overtopping of existing stop banks and natural river banks.

More recently a study (TRIM 231115183268) has been carried out of the potential effects of climate change on the Council's infrastructural assets. This study used Council's previous risk assessment and criticality work to consider the likely increase in risk to assets arising from global warming. The conclusion is that the greatest risk come from the increased likelihood of flooding. The key outputs from the report are a comprehensive list of all the assets under threat from the higher flooding risk, and a high level assessment of costs to mitigate the danger. Solutions may include strengthening the asset to enable it to withstand the flooding, moving the facility/asset to a safer site, or accepting the damage, and repairing it when flooding does occur. For some solutions the work will be able to be integrated with the normal renewals programme. However this study is only a first screening, and the assets at risk will need case by case studies to further refine the actual threat, and commence development of a prioritised programme to mitigate risks.

It is proposed that this additional work will be carried out over the next three years. Notwithstanding this additional refining work, the report's future costs to adapt have been included in the 30 year capital programme as place holders in years 11 to 20.

Design and modelling work carried out by WDC for it's 3 Waters infrastructure allow for both increased rainfall intensity and sea level rise using the RCP8.5 scenario, but modelling has not yet incorporated the effect on higher ground water infiltration (GWI) that will be a potential consequence of the increased groundwater levels indicated by the above studies.

Overall the effects of climate change are expected to increase the frequency at which the existing drainage systems become overwhelmed

There were specific actions in the 3 Waters activity area that were identified in the 2021 AMPs that the WDC planned to carry out with respect to reduction of carbon emissions. None of these had any effect on drainage activities, which is a low emissions activity.

Future Climate Change Initiatives

a) Mitigation

Looking forward Council's 3 Waters team plans to carry out more with respect to mitigation and embed climate change consideration into its investment decisions. Within the three year term of the 2024 LTP it intends to use the guidance in the Water NZ publication Navigating to Net Zero to:

- Confirm the operational emissions boundary that 3 Waters intends to use.
- Develop an operational emissions forecast
- Develop a capital emissions baseline. Note the previous focus has been on operational emissions alone, but establishing a "business as usual" capital emissions baseline, will enable emission reduction opportunities from adopting alternative low-carbon approaches to be appropriately assessed. Establishing this baseline will be a significant body of work, and for it to be used effectively, the implication is that all future infrastructural projects will need to be assessed from both a climate and financial perspective once the baseline has been established.

Set carbon reduction targets

b) Adaptation

During the period of the 2024/2034 LTP further assessment work will need to be carried out, and consideration given to the types of solutions that may be practical. Since the Regional Council is responsible for management of the major rivers, Councils role with respect to these will be an advocacy one. The issues will need to start being discussed with affected communities.

12 DEMAND

There are a number of factors that may influence future demand on drainage systems in the district:

- Population trends or growth in population
- Changes in land use
- Changes in legislation
- Climate change
- Changes in public awareness/opinion
- Significant wet weather events

Growth

The overall district population growth scenario used for the 2024 AMPs update was calculated by the consultant Formative under direction from Council's Development Planning Unit (DPU). The Formative data, which shows the population broken down into towns and rural areas is available here: https://formative.shinyapps.io/InformProfile-WaimakaririDistrict/ .

To calculate the growth for urban drainage schemes, population increases were applied to planned growth areas at a densities agreed with the DPU. Account was also taken of the capacity for infill to absorb the necessary increases. In cases where the required increase in population could not be fitted inside growth areas, further discussions were held with the Development Planning Unit to agree on locations where the additional growth should be applied. Drainage scheme growth in connections was then calculated based on the growth areas.

The following growth projection horizons were used;

1	1 – 3 years	(2024/25 to 2026/27)
2	4 – 10 years	(2027/28 to 2033/34)
3	11 – 20 years	(2034/35 to 2043/44)
4	21 – 30 years	(2044/45 to 2053/54)
5	31 – 50 years	(2054/55 to 2073/74)

TRIM 230905137205 shows the projected 50 year increase in drainage serviced properties, by scheme.

As part of all new development work, each development area must ensure that there are appropriate stormwater retention and treatment facilities created that both treat stormwater run-off and ensure that run-off from newly developed areas does not increase pre-existing stormwater flows.

Stormwater treatment and retention ponds are typically built or funded by each developer in the various development areas. The Council takes over the maintenance of these assets once constructed.

The drainage rated boundary areas shown on the drainage servicing plans for each scheme include any new stormwater management areas and their serviced properties.

Growth Uncertainty

The corporate growth model developed by the Council for assessing growth related works is by its nature uncertain as it relies on population projections that are highly dependent on both changing economic and social factors, and changing legislation, for example the 2020 National Policy Statement on Urban development 2020. Generally however, there is a greater degree of certainty in initial years, and greater levels of uncertainty when looking forward to the future. This means that over time, there is the ability for growth projections to be updated and refined over time as contributing factors evolve. There are also a number of other strategies employed to manage this uncertainty, which are outlined below.

A key means of managing this uncertainly has been to use the best available data and consult widely with Council staff in the policy and planning fields for the best information. Note that the policy of requiring developments to undertake work on the development site to ensure stormwater site runoff is not increased by the development, does to a large degree reduce uncertainties for stormwater planning.

To further reduce the uncertainties from the model in terms of when a growth project may be required, when a project is recommended by the Network Planning Team, a catalyst for the project is always included (for example, when a certain parcel of land begins to develop, or when connection numbers exceed a certain value). This means that as a project comes up in an Annual Plan to be constructed, the documented catalyst is reviewed and discussions held with the Network Planning Team to verify that the project is genuinely required to be constructed at that time, or whether it be pushed out further in the budget.

Changes in Land Use

WDC is currently undertaking a District Plan review. The only expected effect on land use from a drainage perspective is in rural areas where it is proposed to move from the currently permitted 4 hectare minimum lot size for rural subdivisions, to 20 hectares. This will have the beneficial effect of reducing potential increased runoff from such developments. The review also includes for a number of smaller lot sized rural residential developments (approx. 5000m2). The effect of these changes may encourage those seeking a lifestyle block to accept smaller lots, from which it is easier to manage overall runoff.

Changes in Public Awareness

There is increasing demand for an improvement to water quality in lowland streams, which is translating into new legislation. Further comment on the effect of this on drainage activity management is provided in the section on consents.

Significant Wet Weather Events

This has been a significant driver of demand over the last 10 years. Typically such events may feature high intensity periods of rainfall in localised parts of a catchment that exposes deficiencies in

particular parts of the drainage system. As noted in the level of service section, Council reacts to these events by additional programmes of works to alleviate the drainage system shortcomings.

13 CAPACITY & PERFORMANCE

District

The existing capacity and performance of the main reticulated drainage schemes throughout the district are assessed using hydraulic models constructed and maintained by the Council's in house team for each scheme. District flood hazard mapping has been carried out by the same modelling team on behalf of the Development Planning/District Plan team, which has been made publicly available. These are used to set floor levels for new dwellings.

One of the LOS for all urban areas is having system capacity, measured from modelling, to ensure a 1 in 50 year event does not cause flooding of dwellings. This cannot be determined unless floor levels are known, which is problematic. Further work is needed and it has been included at the end of this document as an improvement project.

Parts of a scheme that are performing below the required Levels of Service, are most often identified through the occurrence of a high intensity rainfall event. Investigations follow and the models are then used to identify options that will meet the Levels of Service set out in the Engineering Code of Practice. The recommended upgrades are costed and added to the list of AMP capital projects for inclusion in the Council's Long Term Plan.

Issues of underperforming drainage systems have become more common within the last decade. The 2014 floods within the District highlighted a number of capacity problems with the stormwater systems. A subsequent programme of works to resolve the issues, the Flood Response Programme detailed in report TRIM 141009110892, is funded by a district wide rate.

More recent wet weather events, with in some instances heavy localised rainfalls in areas different to the 2014 storms, have identified additional capacity problems within parts of the network. Scheme budgets have been adjusted within the 2024-34 LTP to attend to these issues. Summary reports to Council that have sought funding approvals in this way are TRIM 180809090003, 200709085254, 210817135255[v2], 220825147219[v2], 220923165375

Schemes

1. Coastal Urban

The capacity of the Woodend stormwater system has been assessed using the Councils hydraulic models. Funding has been allocated for capacity improvements, with construction in 2025/26 and 2026/27. Additional improvements to the capacity of the McIntosh Drain have been programmed for 2028/29 in response to development in this area.

The Waikuku Beach system relies largely on roadside drains and swales. The system is subject to backwater effects from sustained high flows in the Ashley River and upgrades to the system featuring a Taranaki Stream pumpstation are planned in 2034/35 to help address these issues.

The performance of the drainage system at Pines / Kairaki largely meets the target service levels for drainage capacity. Upgrades are planned in 2024/25 to help address some minor outstanding issues.

With regard to the piped systems of the stormwater network in general, modelling indicates that there is reasonable capacity particularly for the commercial area where a number of improvement works have been carried out. However some areas of nuisance flooding are indicated by the modelling, and to fully meet the capacity requirement of the 10 ARI level of service, capital works are required.

2. Pegasus Urban

Since it is a new system, developed to the higher standard now required, capacity will be meet the required LOS. The customer satisfaction survey with 100% of the respondents being satisfied or very satisfied, also indicates that the drainage system is performing well

3. Kaiapoi Urban

Recent upgrades undertaken as part of the government 'shovel ready' programme has largely addressed most of the major flooding issues within the urban areas of Kaiapoi. These works featured three new pumpstations at

- Otaki Street
- Beach Road
- McIntosh Drain

A number of additional upgrades have been included in the 10 year LTP programme to address other outstanding issues and include the following works:

- Kaikanui Stream Diversion
- Cridland Street West Pumpstation
- Beswick Street Pumpstation Upgrade
- Feldwick Drain Pumpstation Upgrade
- Dudley Drain Pumpstation Upgrade

4. Oxford Urban

The capacity of the Oxford stormwater system has been assessed using the Councils hydraulic models. Large parts of the system are not meeting the Council 5 year design standard. Ordinary rain events are known to cause ongoing concern to some residents, with issues arising from the limited capacity of the system to drain storm water away in conjunction with the decreasing capacity of the roadside soak pits. Two projects have been included in the scheme budget to address specific concerns:

- Constructon of a secondary overland flow path from Matai Place to Park Avenue (through Ericksons Lane) 2024/25
- Provision of a secondary flow path from Kowhai Street to High Street and through the cemetery. 2026/27

Following the flood events of 2022 additional works have been programmed to alleviate flooding on the Pearson Drain and Flannigan Drain systems

- Bay Road Drainage Upgrade 2024/25
- Flannigans Drain Capacity Upgrade 2024/25

- Burnett Street Capacity Upgrade 2024/25
- Flannigans Drain Downstream Upgrade 2025/26

5. Rangiora Urban

Significant flooding occurred in west Rangiora during the June 2014 flood event, which was above the design standard ARI. This was caused by overland flow from the rural area to the north-west, in combination with undersized section of waterways and reticulated mains in the township. The management of secondary flow paths was a further issue.

A number of new upgrades have been completed, funded by the district wide Flooding Response rate, with three projects still to be completed:

- Overflow pipeline on West Belt from North Brook to Townsend Road extension FY26/27 – 28/29
- Construction of box culverts and wide swale on east side of Lehmans Road (refer TRIM 141010111299). FY 26/27-27/28
- Dockey Creek overflow diversion at Lilly Road to the Cust River FY 24/25-26/27

There are also 4 upgrades planned for Rangiora funded by the scheme to improve performance:

- Blackett Street Piping 2024/25
- Johns Road Stormwater Main 2024/25
- Wiltshire/Green pipe upgrade Stage 2 2024/25
- Belmont Ave Drainage Upgrade 2028/29

With regard to the piped systems of the stormwater network in general, modelling indicates that there is reasonable capacity particularly for the commercial area where a number of improvement works have been carried out. However some areas of nuisance flooding are indicated by the modelling, and to fully meet the capacity requirement of the 10 ARI level of service, further capital works would be required. The current strategy is to analyse and investigate complaints after rain events, to determine if capital works are warranted. A general budget has been allowed to accomodate such works.

Consents

Council has applied for stormwater discharge consents for all of its major town urban reticulated networks. The Rangiora consent has been granted but Council is still waiting for Ecan to release decisions on the other town consent applications (Kaiapoi, Oxford and Woodend). Consent conditions for the other urban areas are expected to be similar to the Rangiora conditions, and provisional budgets have been included in the scheme budgets.

Consent applications propose that by 2025 Council will have developed and costed a strategy for meeting water quality standards that will be implemented in the 2025 to 2040 period. The work on this strategy has recently commenced for Rangiora. The strategy preparation (stormwater management plans) for the other 3 towns are delayed due to their consent decisions not yet being issued by Environment Canterbury.

Potential innovations from overseas and new technologies currently being developed by the University of Canterbury and other NZ education providers for improving water quality in existing urban areas will be investigated and assessed, for possible inclusion in the proposed strategies

The Waimakariri District Council is likely to adopt some form of the "industrial site stormwater audit" now being implemented by the Christchurch City Council under terms of its global stormwater consent. The audit comprises staff site visits to industrial properties, undertaking site runoff sampling, introduction of new products to intercept site pollutants and advising on improved site management practices. The approach involves ongoing negotiation with the site owners/operators and has within its first year of implementation been shown to be effective at reducing contaminant inputs into the stormwater networks.

The cost of retro fitting stormwater treatment to the Council's existing urban networks is likely to be high (roughly estimated at in excess of $100m). The uncertainty arises in part from the fact that worldwide, much of the work in this area is still experimental. Some improvements can only be effected by change that is led at a national level (e.g. a national decision to phase out use of copper brake pads which are a key urban stormwater contamination source would assist all territorial authorities to meet the required water quality standards for dissolved copper discharges).

Council has a global consent for the ongoing maintenance work it carries out on its rural open drainage network, but this does not significantly affect the urban networks.

Council has a range of other drainage consents, many related to stormwater management areas that have been built as part of recent new housing developments. Council's recent engagement of a dedicated consents officer is expected to improve the way it manages it's consents .

14 OPERATION AND MAINTENANCE

Operation and maintenance expenditure incorporates the day to day running of the drainage schemes and allows the system to carry on functioning to deliver the agreed levels of service.

The O&M programme includes a combination of reactive and planned tasks. Examples of the differing nature of these tasks is summarised below:

Table 15: District Overview - Extreme and High Risks (Natural Hazards)

Task	Planned	Reactive
Headworks Maintenance (pump stations)	Frequent inspections (typically weekly) and basic maintenance	If required for particular headworks items in response to alarms, or defects noted as part of inspections.
Generator Checks	Planned monthly, quarterly and annual checks	If required in response to alarms
Pipe repairs	No planned repairs	Repairs undertaken in response to service requests / leaks.
Valve repairs	No planned repairs	Repairs undertaken in response to service requests / leaks.

There are a relatively small number of urban stormwater pump stations in the district, which are maintained on a planned basis. Open drains in urban areas are maintained via the Greenspaces maintenance contract

The CCTV programme will, with time, provide a view of the rate at which some stormwater networks may silt up, which will enable better planning of cleaning, and maintenance of systems. An investigation of pipes which are at high risk of silting up, from being drowned or having very flat grades, has stalled and needs to be re-started.

Since the 2021 AMP review Council has purchased and implemented the widely used InfoAsset Manager software which allows more efficient importing of CCTV data, and proper analysis of that data. This will provide benefits in both maintenance planning, and renewals, through the ability to target CCTV work in a more systematic way.

Operation & Maintenance Expenditure

Budgets are largely based on past expenditure carried forward, which has also been the case for the 2024/34 LTP. However consideration of the effect on drainage maintenance costs of rising groundwater levels in coastal areas caused by sea level rise should be made during the three year period before the next LTP, so that likely increasing costs can start to be factored in

The operation and maintenance (O&M) budgets are currently set up to automatically account for inflation and growth. Inflation is accounted for with a factor set by the Council's Finance Unit, but this is not used in the development of the graphs and tables in the AMP's so as to provide a clearer picture of asset O&M costs year to year

The implication of growth on O&M budgets is accounted for with the inclusion of a formula that increases the O&M costs on a pro rata basis proportionally with the population (as new developments come online). However, depending on asset class the increase in O&M costs may be reduced from being directly proportional.

So for example costs for a particular scheme to maintain the network pipes and valves is expected to increase directly in proportion to increasing numbers of connections, but maintenance of pumps costs are only expected to increase at 50% of the increasing number of connections.

In addition to the automated increases, part of the consideration when setting the O&M budgets across the district's schemes is the potential impact of any new capital projects. These increases are accounted for in two ways:

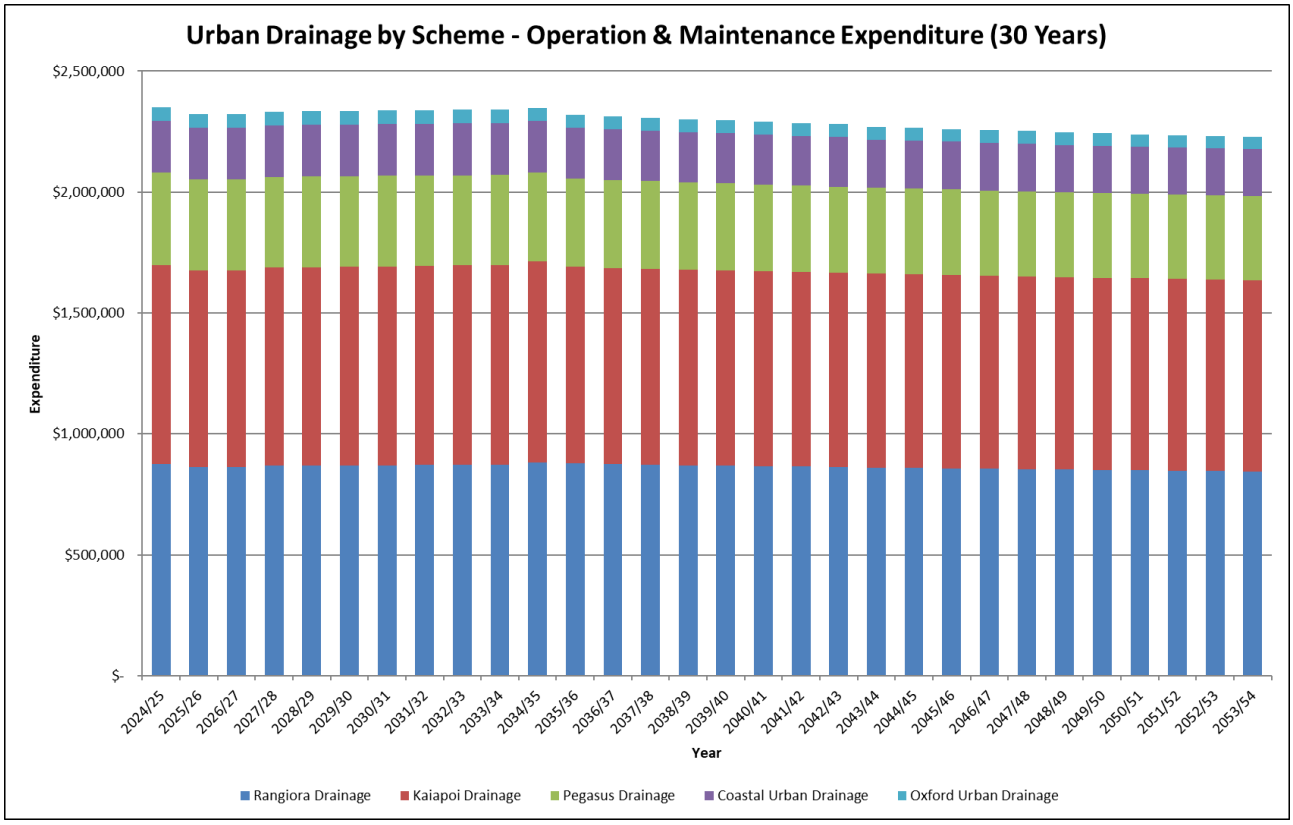
- Direct O&M Increases: Through Asset Managers calculating what areas of the budget that may increase, and manually adjusting the appropriate parts of the budgets from the year following when the capital project will be completed. An example of this would be a new headworks being constructed. This would require power costs to be reviewed (as the new headworks would consume power), as well as items related to headworks inspections and maintenance.

- Depreciation Increases: Changes in depreciation as a result of new capital projects are accounted for by the Council's Finance Team. As a new capital budget is introduced to a scheme, there is a formula to increase the depreciation amount for that scheme based on the size of the capital budget being assumed to represent the value of the assets being added, and the asset life being assigned a representative figure for that scheme (depreciation rates are typically in the order of 1.5% to 2.5% of the value of assets added for example). Normally a comprehensive valuation is carried out every three years, which then assigns accurate valuation rates and base lives to any new assets created in the last 3 years. This refines the accuracy of the depreciation rates further. With increased inflation over the last few years, the most recent valuation has been carried out a year earlier.

  At the end of each FY, a stocktake of new assets is undertaken, including vested assets, and the value included in the Council's financial system

Figure 4**Error! Reference source not found.** presents the forecast Operations and Maintenance Expenditure across all the Council's drainage schemes for the following 30 year period.

Figure 4: District Overview - Projected Operation & Maintenance Expenditure



15 CAPITAL WORKS

The Waimakariri District Council has previously developed a process for justifying any new capital works projects being submitted for inclusion in the draft Annual Plan or LTP. However, this has so far not become well embedded in the Council's processes, and so improvements are now being made, and rolled out in time for the 2024-34 LTP.

In particular, projects in years 1-3 of the LTP with value greater than $500,000 require a "Business Case Light" application, and projects of a greater value than $4M in years 1-3 require a full business case to be written. Projects in years 4-10 with a value greater than $500,000 require a slightly less robust 'Justification Form" application.

In general the forms require:

- Project description and scope;
- Strategic case – LOS, growth or renewal. Contribution to Community Outcomes, national programmes and public value benefits;
- Risks and assumptions;
- Economic case – Preferred option and alternatives considered;
- Financial case – Requested budget, (components –LOS, growth, renewal), expensed component, funding sources (DC's if relevant), effect on rates and budget confidence;
- Management Case – ability to deliver and how.

Through each Annual Plan and Long Term Plan process, Project Justification forms are prepared for projects that meet the criteria for requiring them. These require the relevant Department Manager's approval before being presented to the Council's Management Team as part of submitting the overall budget proposal from each service area. Ultimately what is approved by the Management Team is presented to Council to review as the Draft Long Term Plan or Annual Plan budget.

16 RENEWALS

Renewal expenditure is work that does not increase the capacity of the existing asset, rather it restores the system to its original capacity. Renewal work is funded from a budget generated by the depreciation component of the rates.

Council uses a risk-based renewals programme for pipework which incorporates the following criteria:

- Condition Rating – standard scoring from pipe inspection manual based on CCTV data.
- Remaining Useful Life – based on the design life, as used previously.
- Vulnerability – a function of location, material and joint type calculated as part of the DRA review, which assesses the risk of earthquake damage in areas subject to liquifaction.
- Criticality – the criticality score calculated for each main, which is determined from various factors e.g. pipe material type. Details are shown in Table 11.

The process uses a GIS model that incorporates the above factors and utilises existing Asset Management Information System data in the GIS.

The model enables an assessment to be made of the depreciation required to fund future replacement costs, for different levels of risk. This allows risk and affordability to be balanced. Key outputs from the model are a prioritised list of pipe renewals needed across the district, identified by scheme, and an annual expenditure profile for the next 150 years. A schematic of the modelling process is shown below in Figure 6.

The model developed for headworks uses the same methodology as the pipe renewals model. Since knowledge of the headworks condition is not high, standard industry lives for the relevant asset classes have been used as inputs to the headworks renewals model. As the headworks criticality model is still under development, a simplified renewals assessment methodology has been used in the interim, which does not factor in criticality.

The final decision about pipe renewals to be carried out in a particular year is made by the Asset Manager, taking into account factors such as Roading projects and other utilities renewals and any operational requirements.

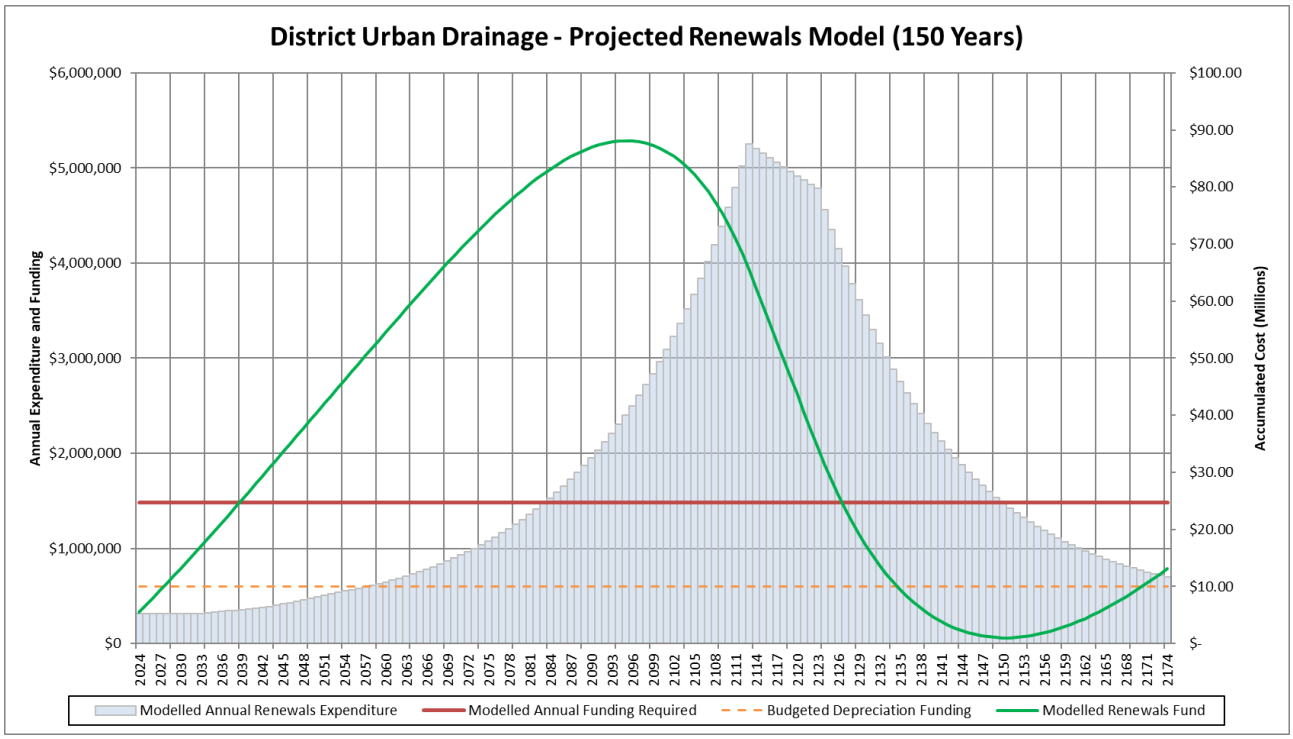
District Wide – Renewals Expenditure

Error! Reference source not found.Error! Reference source not found. presents the forecast Renewals Expenditure across all the Council's urban drainage schemes for the following 150 year period. The horizontal red line is the required level of funding to ensure that renewals are not deferred, and current levels of service are maintained.

The figure only shows the output from the model, so expenditure shown in the graph for the first ten years may be different from the expenditure shown in the LTP, as adjustments may have been made by the Asset Manager to the direct renewals model outputs.

The model is operated at a district wide level. Renewals expenditure by scheme is then determined by breaking down the district wide expenditure in relation to the value and type of the assets within each scheme. Scheme level graphs tend to be less smooth.

Figure 5: District Wide - Projected Renewals Expenditure



The key parameters in the figure above are explained below:

- **Modelled Annual Renewals Expenditure:** This is the direct output from the renewals model, recommending the annual investment to be made in renewals each year.
- **Modelled Annual Funding Required:** This is the amount of annual renewals funding required, to ensure there are sufficient funds available to carry out the recommended annual renewals each year.
- **Budgeted Depreciation Funding:** This is the actual amount of depreciation being collected, which is extracted from the Council's budgets.
- **Modelled Renewals Fund:** This is the modelled balance in the renewals account, assuming the annual funding and annual expenditure is completed as per the recommendations from the renewals model. As can be seen, this account is maintained as a surplus, peaking at approximately $88 million in the year 2096, before being drawn down over the following 80 years.

The key point to note is that the Budgeted Depreciation Funding is less than the Modelled Annual Funding Required. The reason for this discrepancy is as follows:

Depreciation Discount Factor: Council's financing of future renewals incorporates the expectation that depreciation funding can be invested at a higher rate of return over the life of the assets than

inflation. Further information regarding this approach is provided in the Finance Policy. This concept is embodied in the scheme budgets in the form of a discount rate (referred to in the budgets as the 'Depreciation Discount Factor'). This reduces the annual depreciation funding required from rates, while still ensuring that there will be sufficient funding available to renew assets at the end of their useful life. The renewals model assumes funds can be invested at a 1% marginal interest rate higher than inflation when considered over the long term.

It is noted also that there are a wide number of factors influencing specific planning for renewals projects, which mean that the outputs from the renewals model are not strictly followed. In general, district wide final renewals budgets have been set at a lower level than that recommended by the renewals model. The difference is shown in the table below.

Table 16: Planned Budget versus Renewals Model Recommendation 2024-34

	Renewals model recommendation	Planned Budget	Budget as a percentage of model recommendation
Reticulation	$1,450,000	$325,000	22%
Headworks	$1,700,000	$1,720,000	101%
Total	$3,150,000	$2,045,000	65%

It is noted that beyond the first 10 year window, the outputs from the renewals model have been fully adopted to inform the renewals budgets for each scheme.

The annual budget for some renewals line items has been accumulated and delayed until year 4. The annual budget had not been allocated to any specific renewal. However there remains no specific known deferred renewals of assets across the district.

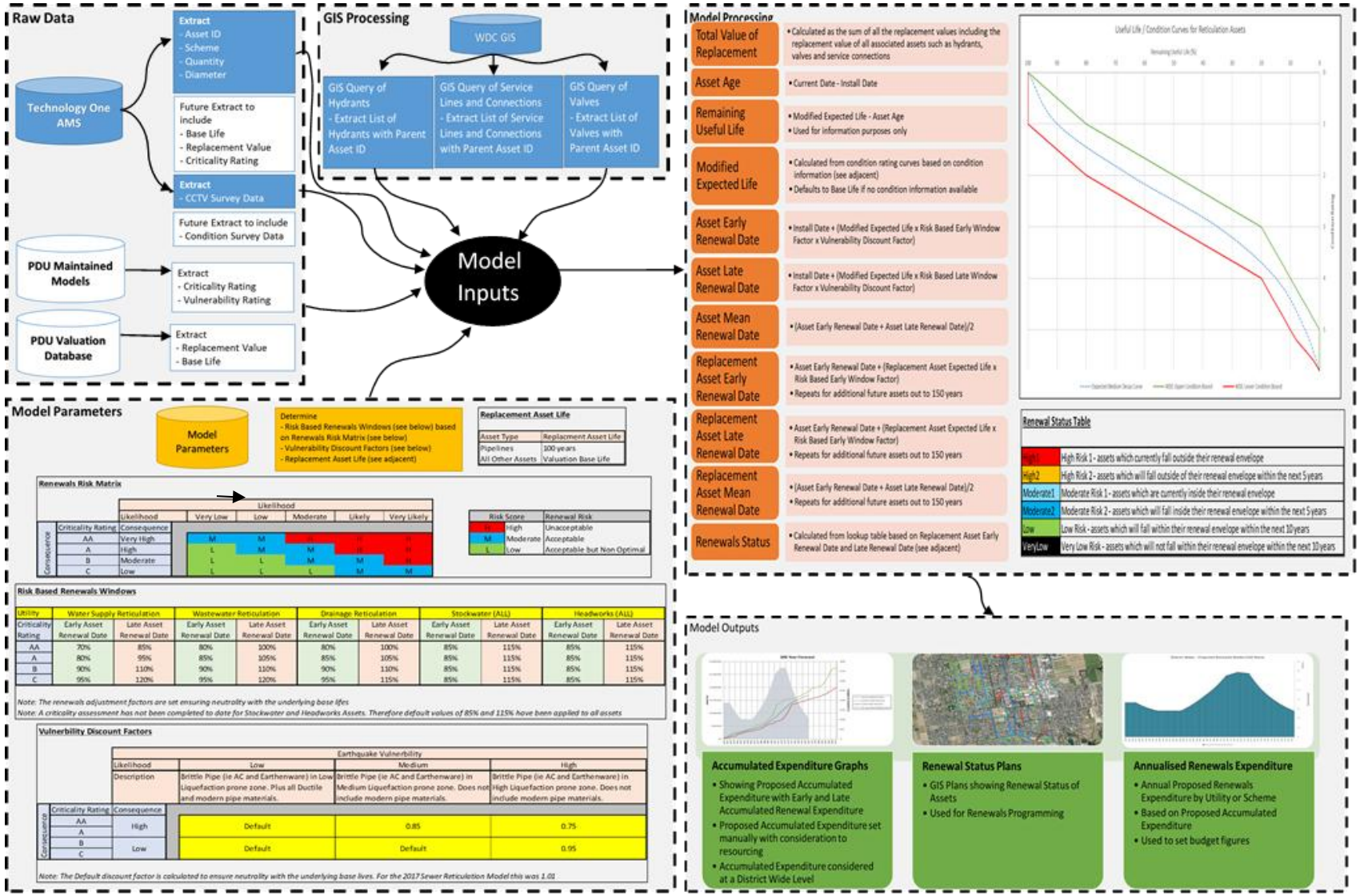
Council has a programme of CCTV inspections for the stormwater pipe network in place. Since the last AMP review the software InfoAsset Manager has been employed, which will enable improved CCTV analysis, and better maintenance and renewals planning. A condition assessment of all assets at headworks has not yet been carried out, so confidence in asset condition is only moderate. As the CCTV program advances, we anticipate achieving a more precise assessment that will enable Council to strategically determine the future expenditure of the renewals funds.

Scheme – Reticulation Renewal Timelines – Spatial View

The GIS viewer at the following link shows plans by scheme of the pipe renewal timeframes generated by the model, in three bands; within 5 years, 15 years and 25 years.

Asset Management Plans GIS Viewer

Figure 6: Renewals Expenditure Model



17 NEW WORKS

There are five main sources of new works in the District that come together to produce the new works programme. These are:

- Modelled capacity assessments provide details on any LOS shortfall on the schemes and new works are prioritised to address these.
- Flooding events. These are the primary source of improvement programmes, an example of which is the 2014 Flood Response Programme.
- The Risk Assessments provide information on the highest risk areas on each drainage scheme, with any extreme or high risks requiring works to mitigate against those risks.
- Works are also identified through the operation of the schemes rather than being identified through the assessment of level of service, capacity, or risk. These works are normally identified by an operator or Asset Manager and include such works as health and safety improvements, and works to ensure assets are maintained in an acceptable condition.

These sources all provide new works projects that populate the budget for the next 50 years. The table below shows the projected budgets for new works for the next 50 years for all the district's urban drainage schemes, including renewals.

When any significant project is being planned, the supporting investigations include assessment of the costs and benefits of all practicable options leading to a decision to undertake capital works. The detailed capital works table which is available in the Asset Management Plans GIS Viewer , shows the project ID for each project. Each project has an entry in the budget spreadsheets Capital Works Budget Sheets , which in turn provide references to supporting documentation.

Table 17: New Works across Urban Drainage Schemes Over 50 Years

Scheme	2024 - 2033	2034 - 2043	2044 - 2053	2054 - 2073	Total
District Flood Area	$25,470,001	$610,507	-	-	$26,080,508
Rangiora Drainage	$18,712,000	$3,854,468	$1,487,425	$4,221,724	$28,275,618
Coastal Urban Drainage	$7,090,000	$6,279,271	$181,501	$1,062,736	$14,613,508
Pegasus Drainage	$165,000	$215,718	$105,122	$213,899	$699,739
Kaiapoi Drainage	$19,576,131	$6,943,123	$3,131,130	$10,322,775	$39,973,159
Oxford Urban Drainage	$4,120,000	$203,213	$101,234	$220,349	$4,644,795
Total	**$75,133,132**	**$18,106,300**	**$5,006,412**	**$16,891,483**	**$114,287,327**

Note: *Dates refer to beginning of financial year (e.g. 2024 is 2024/25 financial year).*

The figures in the table above are based on the assumption that LOS do not change significantly into the future, and that growth forecasts are accurate. Growth projects may be delayed to fit actual growth patterns.

All projects are included in a central database of capital works projects, including renewals Capital Works Budget Sheets.

The front end of the data base has recently been updated to ensure that relevant data to the projects is captured in one place as a "single source of truth". Where possible this data will also be used to populate the "WDC Capital Works Project Justification" template that is required to be filled in for any new project of a higher capital value than $500,000.

When a scheme upgrade is undertaken, the supporting investigations include assessment of the costs and benefits of all practicable options leading to a decision to undertake capital works. These investigative reports are referenced in **Error! Reference source not found.** in Section 3, Scheme Description.

Works Coordination

As well as the processes above identifying works on a scheme by scheme basis, or by service type, further consideration is required to coordinate work programmes between a combination of service types. Utilities Providers Coordination meetings are held quarterly between 3 Waters, Roading, power and telecommunication providers. This enables opportunities for collaboration to be identified. In addition, Council has a GIS tool where future planned works can be overlaid to optimise the coordination process further.

Urban Capital Works

The following graph shows the 50 year budget for all capital works funded by scheme rates, including projects driven by growth and levels of service.

Figure 7: Projected Capital Works Expenditure

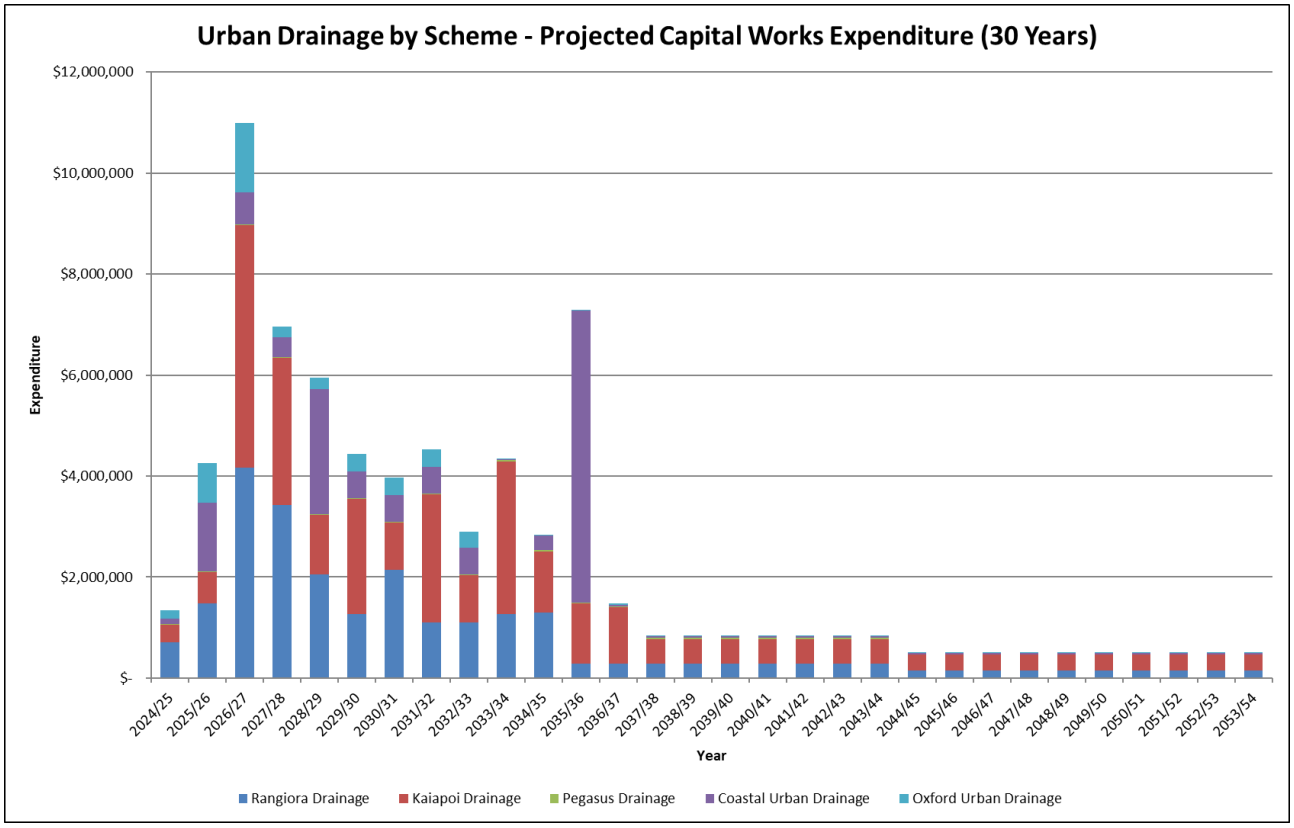


Figure 8 shows peaks from 2026 to 2028 which are due to the following projects:

Kaiapoi

- **Kaikanui Diversion ($1.5M)** – Diversion of the lower reach of the Kaikanui Stream downstream of the railway line.
- **Kaikanui SMA ($1.6M**) – Extension of the Kaikanui SMA into the regeneration area.
- **Cridland Street West Drainage Upgrades ($1.94M)** – Drainage upgrades including new pump station.

Rangiora

- **Blackett Street ($1.2M)** – Pipe upgrade on Blackett Street from King Street to Ashley Street.
- **North Brook Retaining Wall ($880k) –** Installation of timber retaining walls on both sides of the North Brook between Janelle Place and White Street.

Additionally Figure 8 shows a peak in 2035/36 in the Coastal Urban Scheme for the Waikuku Taranaki Stream Pumpstation.

The graph below shows the additional capital budget for projects funded by the district wide rate. It includes both urban and rural area projects. Geographically the majority of these projects are in rural areas.

Figure 8: Projected District Wide Capital Works Expenditure.

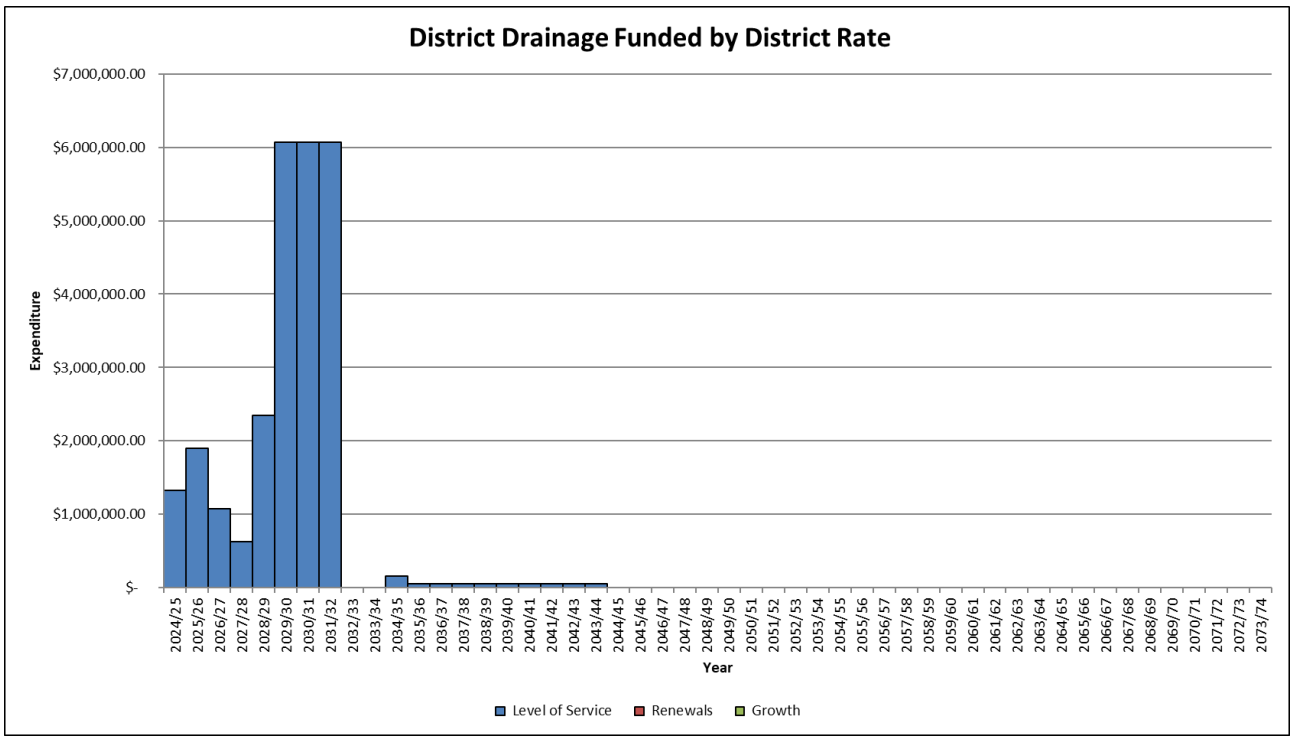


Figure 9 displays peaks corresponding to the Mandeville Resurgence Channel Upgrade Project's Stage 1 (2024-2026) and Stage 2 (2028-2032). Following flooding in June 2014, budget was allocated to improve the drainage in the Mandeville and Ohoka areas.

Additionally, a budget of $20 million spread over the first 10 year (2024/34) of the Long Term Plan is included for Flood Resilience Projects to implement future works cater for the implications of increased weather patterns, climate change and associated impact on our services.

Over the past 10 years additional budget has had to be approved reactively by Council following significant rainfall and flooding events, including $21.5 million following June 2014 event, $3.5 million following May 2021 event, $3.8 million following July 2022 event and $4.0 million following July 2023 event. While some of this expenditure was funded from external sources, such as NZTA Waka Kotahi, a larger portion of the expenditure was funded from rates as unbudgeted expenditure.

The proposed Flood Resilience Projects capital works budget will ensure that there is existing budget available for immediate works and also risk and resilience improvement projects identified following future events.

Included in the Asset Management Plans GIS Viewer is a table that shows all of the planned projects over a 50 year time horizon for all of the urban drainage schemes, and how the cost is spread across the three components - LOS, renewals and growth. The level of confidence in the budget for the works is also presented in the table, as well as references to other documents relevant to the works, such as options studies. The figures presented in the table exclude inflation for ease of comparison across years.

For a discussion on the level of optimisation in project selection, refer to the introductory chapter of the AMP.

Any programme or project that occurs over a number of years, such as the renewals programme, is only shown within the table for the first year in which it occurs. The Project Value indicates the projected full total cost of the project over the number of years it occurs.

Scheme – Capital Upgrade Works – Spatial view

The GIS viewer at the following link shows plans by scheme of the planned capital upgrades in 5 temporal bands over a 50 year time horizon.

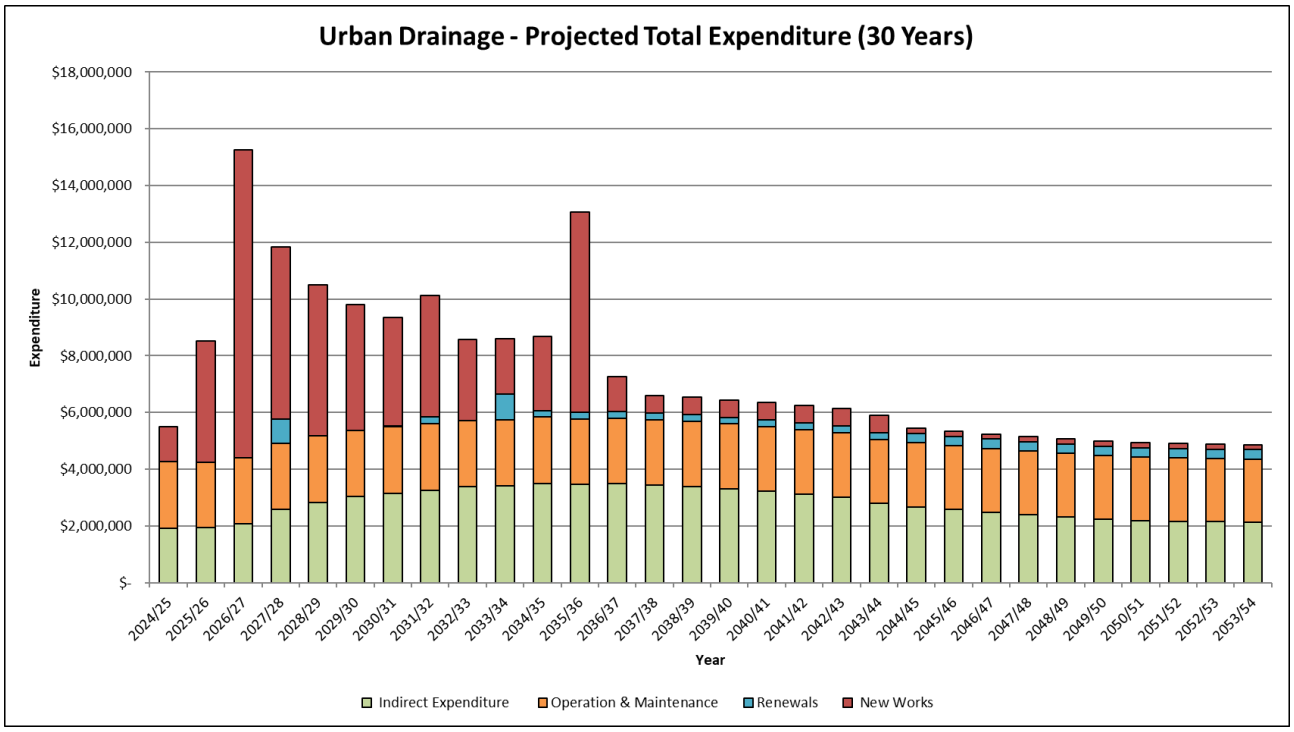
Asset Management Plans GIS Viewer

18 OVERALL FINANCIAL FORECASTS

The following graph summarises the breakdown of projected total expenditure over a 30 year time horizon. It includes both operational and capital expenditure. Operational costs include operations and maintenance, and indirect expenditure.

Indirect expenditure includes interest, rating collection costs, costs associated with maintaining the Asset Register, and internal overhead costs. Capital includes expenditure for growth, levels of service, and renewals, (excluding carry forwards) but excludes Flood Response Programme works funded by the district wide rate.

Figure 9: Projected Total Urban Drainage Expenditure



Financial Forecast Key Assumptions

1. Asset data in the asset register is fit for purpose.

2. Asset lives based on nominal material life, are reasonably accurate.
3. LOS will not change, for example required by legislation.
4. WDC does not suffer any major natural disaster during the period of the financial forecasts.
5. Effects of climate change are not felt during the term of this LTP
6. Growth matches the projected profiles.
7. Maintaining Operational and Maintenance costs at current levels is cost effective

Funding/Revenue Sources

An explanation of the sources of funding for the activity is fully detailed in the Council's Revenue and Financing Policy, published within the 2024-2034 LTP (TRIM 231114183205). This includes the rationale for each source of funding for each scheme, and an explanation of how the different funding methods are applied to each scheme in relation to the service delivered.

Primary sources of funding for all schemes are targeted rates and development contributions for works required to accommodate growth.

In addition a district wide drainage rate, included as part of the General Rate funds drainage upgrades district wide, both rural and urban areas, and without regard to drainage rated areas. Projects are primarily flood response works, but minor drainage works are also included.

All capital works budgets are split into three components, Level of Service, Renewal and Growth. The division may be seen for scheme projects in the Capital Works table contained within the AMP Plans and Figures Viewer

The growth component is recovered through development contributions (DC's), calculated in accordance with Council's Development Contributions Policy, which can be accessed via the link below. For those projects with a growth component an assessment has been made for the 2024-2034 LTP of the value of the DC required per future connection to the scheme, to fully recover the growth component of the capital work. These assessments are updated as part of the Annual Plan process, and are published on the Council's website at the following link https://www.waimakariri.govt.nz/consents-and-licences/resource-consents-and-planning/development-contributions

Summary calculation sheets for individual schemes can be viewed by clicking on links within the main document.

Valuation

A full peer reviewed valuation of assets is normally carried out on a three yearly cycle, using the asset data in our asset management information system. Due to the current much more rapid inflation than has been usual, the most recent valuation has been carried out in 2022 (TRIM 220803132120). The rates from that valuation have been adjusted by the CPI to arrive at "valuation" figures for 2023. Table 18 below provides a summary of the replacement cost, depreciated replacement cost and annual depreciation for the district, and scheme by scheme (urban only).

Table 18: Asset Valuation

Scheme		District	Rangiora Urban	Kaiapoi Urban	Coastal Urban: Woodend, Pines Kairaki, Waikuku Beach	Pegasus Urban	Oxford Urban
Manholes	Quantity	2,270	862	782	424	179	23
	Replacement Cost	$27.4M	$10.4M	$9.4M	$5.3M	$2.1M	$272.1k
	Depreciated Replacement Cost	$23.3M	$8.3M	$8.1M	$4.7M	$1.9M	$250.2k
	Annual Depreciation	$274.3k	$103.9k	$93.7k	$52.7k	$21.2k	$2.7k
Sumps	Quantity	161	89	55	10	2	5
	Replacement Cost	$398.3k	$224.1k	$135.6k	$20.4k	$4.9k	$13.3k
	Depreciated Replacement Cost	$308.0k	$180.5k	$92.5k	$18.3k	$4.5k	$12.3k
	Annual Depreciation	$4.0k	$2.2k	$1.4k	$204	$49	$133
Valves	Quantity	67	5	54	7	-	1
	Replacement Cost	$434.3k	$27.5k	$311.4k	$88.2k	-	$7.2k
	Depreciated Replacement Cost	$314.0k	$22.0k	$202.7k	$82.7k	-	$6.6k
	Annual Depreciation	$4.6k	$312	$3.2k	$1.0k	-	$72
Main	Quantity	109.5 km	43.7 km	38.5 km	19.3 km	6.4 km	1.5 km

	Replacement Cost	$125.6M	$44.8M	$47.3M	$22.8M	$9.6M	$1.0M
	Depreciated Replacement Cost	$104.8M	$36.4M	$39.1M	$19.7M	$8.8M	$0.9M
	Annual Depreciation	$1.3M	$460.8k	$483.3k	$236.4k	$96.5k	$10.6k
Open Channel	Quantity	28.8 km	11.3 km	8.5 km	2.4 km	482 m	6.1 km
	Replacement Cost	$1.6M	$869.5k	$334.2k	$94.3k	$19.0k	$239.4k
	Depreciated Replacement Cost	$1.4M	$758.1k	$329.8k	$93.6k	$19.0k	$239.4k
	Annual Depreciation	$2.7k	$2.5k	$180	$23	$0	$0
Facilities	Replacement Cost	$28.2M	$13.3M	$9.3M	$5.2M	$328.2k	$68.7k
	Depreciated Replacement Cost	$26.5M	$13.0M	$8.0M	$5.1M	$244.7k	$46.2k
	Annual Depreciation	$128.7k	$28.2k	$80.5k	$12.7k	$6.3k	$1.0k
Totals	**Replacement Cost**	$183.6M	$69.6M	$66.8M	$33.5M	$12.1M	$1.6M
	Depreciated Replacement Cost	$156.6M	$58.7M	$55.8M	$29.7M	$11.0M	$1.5M
	Annual Depreciation	$1.7M	$598.0k	$662.2k	$303.0k	$124.0k	$14.6k

19 DATA CONFIDENCE

Data confidence is assessed as part of the AMP review, across a range of asset data and processes. The confidence grading used has been taken from the IIMM as follows:

Confidence Grade	Description
A Highly Reliable	Data based on sound records, procedures, investigations and analysis, documented properly and recognised as the best method of assessment. Dataset accuracy ± 2%
B Reliable	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Data set accuracy ± 10%
C Uncertain	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample. Up to 50% data is extrapolated and accuracy estimated at ± 25%
D Very Uncertain	Data based on unconfirmed verbal reports and/or cursory inspection and analysis, Dataset may not be fully complete and most data is estimated or extrapolated. Accuracy estimated at ± 40%
E Unknown	None or very little data held

Confidence grades have been assessed as:

Table 19: Data Confidence Levels

Element		Grade
Asset Inventory	Reticulation	B
	Headworks	A
Performance and service gap interpretation		B
Asset condition	Reticulation	D
	Headworks	C
Asset remaining lives	Reticulation	C
	Headworks	C
Demand forecasts		B
Valuation and depreciation		B
Financial forecasts		B

Confidence in headworks assets can be seen to be generally lower than reticulation assets. This is a reflection of more focus being placed historically on network assets rather than facilities, as that is where the majority of the maintenance effort is expended. However confidence in the headworks asset inventory has increased considerably since the last LTP, as a full asset inventory has been carried out, although this did not include asset condition assessment.

It is worth noting that because headworks assets are above ground, any assets in poor condition can be readily identified and the risk associated with asset failure mitigated through regular visual inspections that can be carried out when operations staff are carrying out routine maintenance operations.

Note that Demand forecasts and Financial forecasts sections have been assessed on the basis of the confidence in our infrastructure planning given a particular growth scenario. Growth predictions themselves are always inherently uncertain, and elastic. If actual growth is faster or slower than the growth scenario selected, projects to cope with the demand, provided they have been well scoped, can be readily brought forward or delayed as necessary.

20 ASSET MANAGEMENT SYSTEMS

A register of drainage supply assets is held within the Councils Financial Management System and referred to as the Asset Management Information System (AMIS). The register is maintained by the Asset Information Management (AIM) Team on behalf of the 3 Waters Team. The platform is the Council's Finance Management System, Technology One.

The AMIS provides the base data used for the asset criticality model, the drainage network models and RAMM roading data, so it is essential that every effort is made to ensure the dataset in the AMIS is accurate. Current process to deliver the required outcome is as follows.

For new assets, built as part of development, or as stand alone capital projects, the AIM team collates as-built data from as-built engineering plans and incorporates this data into the GIS system and asset database. This data then feeds through into the Council's asset valuation process.

The in-house works order system integrates with the asset management system. Maintenance activity, for example in the form of a pipe fault repair by the Council Water Unit under instruction from a work order is now entered digitally via mobile devices in the field. The field devices record job costs, asset location and any changes to assets, and the information is direct uploaded into asset register. Costs are recorded against the repaired assets.

Service requests are generated out of Council's Property and Rates System and for certain job types automatically raise a work order to be sent to the Water Unit via email. Other service request types are forwarded to 3 Waters team members for triage.

Unfortunately the Council's enterprise system, Technology One is in the process of being replaced, as the company advised that it was moving entirely to a cloud based new platform.

Asset Management Maturity

Asset management maturity assessments (AMMA) have been carried out on two previous occasions, most recently in 2021. The assessment was carried out in house, and a subsequent peer review of the self assessment was carried out. The assessment showed that the Drainage activity was generally operating asset management at a core level of maturity, and scored overall a 57 against a target of 78.

The key areas for improvement for drainage were : *"the asset register data, condition information, risk management and capital works planning".*

The table below shows further high priority improvement recommendations, together with the actions taken since the assessment.

AM Function	Recommendation	Action
Policy and Strategy	Develop an Asset Management Strategy.	No Progress
	Incorporate a workshop with AMP authors early in the AMP development to explain overall themes (in the IS) and ensure they are included in the AMP.	Being integrated with the AMP planning meetings
Forecasting Demand	Undertake sensitivity testing for growth or demand change scenarios such as population demographic shifts and climate change. Incorporate the results into the AMP.	The 3 Waters reform process has left insufficient time for sensitivity analysis, on top of the normal growth work required
Asset Register data	Complete the facilities and headworks asset data and condition information improvements.	Will be complete by end 2023
Asset Performance and Condition	Improve use of asset condition data	InfoAsset Manager is now in operation to make better use of CCTV data. Facilities asset condition assessment yet to be carried out
Decision Making	Introduce a cross activity project prioritisation process to enable better decision making, focusing on the relative priority of level of service improvements.	No formal process developed. Prioritisation carried out by Management Team and elected members
Managing Risk	Review the format, and content of the risk registers and introduce processes to regularly review them and escalate key risks to the corporate register.	Review under way. Expected to be complete late 2023

The self assessment AMMA is available in TRIM 210506072305 and the peer review documents in TRIM 220506071089

21 NEGATIVE EFFECTS

At the District level the activity of providing a drainage service to the various communities has the following negative effects:

- Potential damage to private property through access of machinery used to clean open drains
- Increased silt load in streams, following drain cleaning , particularly if operator not properly aware of the issue
- Potential ecological damage, including fish spawning habitats from open drain maintenance activities

22 SERVICE DELIVERY

Delivery of most capital works is via competitive tendering practice in accordance with the Council's procurement policy (TRIM 220303030172). Design is usually carried out in house, or where resources are insufficient, via external consultants, again engaged in accordance with the procurement policy.

Routine maintenance of the urban drainage network is carried out as an extension to the Greenspaces maintenance contract which is competitively tendered at the end of its term.

23 IMPROVEMENT PLAN

Error! Reference source not found. below summarises the planned AMP improvements applicable district wide, identified as each section has been reviewed. Many of these have been carried forward from the 2021 AMPs. The 3 Waters reform programme meant that little focus was provided on the Improvement Programme from the 2021 AMP.

Projects will be managed under the 2024-27 AMP Improvement Programme full details of which are provided in 2024 Improvement Programme . The summary table below shows which section the AMP that the improvement project was derived from and includes projects that have been completed since the 2021 AMP.

Table 20: 2021 AMP Improvement Plan

Project Ref	AMP Section	Project Description	Priority	Status	Comment
IP002	Asset Management System	Carry out asset inventory check at all facility sites. Record key attributes and condition, and functional descriptions	High	Largely complete	Asset inventory complete. Plan to use TRAKK software to start collecting condition data
IP004	Asset Management System	Integrate Roading & 3 Waters Renewals Programmes	High	Planned for 2024/25	Physical works layer in GIS now used for planning, but further Roading/3 Waters work needed to complete
IP006	Asset Management System	Verify location of critical assets	Medium	Planned 2024-2026	Higher priority now - arising from the Utilities Code of Practice
IP008	Asset Management System	Unify various existing documents into a 3 Waters Emergency Response Plan or Business Continuity Plan	Medium	Planned 2024-2026	A cascading hierarchy of documents for emergency response is required for Council. At 3 Waters a "Business Continuity Plan" is required
IP011	Disaster Resilience	Confirm natural hazard information at facilities sites as part of the site by site asset risk assessment for climate change effects.	High	Incorporated into IP054	Original site risk assessment project now incorporates climate change risk and priority has been increased
IP020	Asset Management System	Ensure AMIS functionality transferred over to new Asset Management System/Council Enterprise system	High	2024/25 onwards	Necessitated by Council's enterprise system changing from Tech One to Datacom
IP022	Asset Management System	Develop system to store and manage consent information	High	2024/25 onwards	Dedicated staff member has been engaged to implement and maintain
IP027	Asset Management System	Establish documentation that specifies asset data that must be included in As Built information supplied to AIM team	High	Planned for 2024/25 onwards	Multi faceted project including updating the Engineering Code of Practise, and them promulgating Council's requirements
IPO34	Asset Management System	3 Waters Strategy	High	2025/26	What do WDC water services look like in 2053 and 2073?

Project Ref	AMP Section	Project Description	Priority	Status	Comment
IP045	Risk Assessment	Update DRA in parallel with Risk Assessment Update using common risk approach. Develop high level framework, seek update of hazard information.	High	Planned for 2024/25	PDU have progressed . To be followed up
IP048	Operations and Maintenance	Standardise operational and maintenance items used in the budget to enable better expenditure monitoring	Medium	On hold	Still nice to have but only medium priority
IP053	Climate groundwater modelling	Work with the Regional Council regarding GW modelling and consideration of effects of SL rise on their infrastructure	High	Planned for 2024/25 onwards	Ongoing
IP054	Risk Assessment	Carry out an assessment of the likely operational and asset management risks associated with climate change in affected areas.	High	Phase 1 complete	Initial screening carried out. Further more detailed work on site by site basis to follow

As an adjunct to this section the 10 key questions that Audit NZ have advised should be responded to, as a high level check on the adequacy of Asset Management Plans has been reproduced below with responses. Additional improvement projects are included in the Improvement Plan table that fill gaps identified through this process.

Audit NZ Question	**Response**
1. Have you got a strategy for the long-term sustainability of your assets?	Council has Activity Management Plans that are reviewed in house, at three yearly intervals, that include a well-developed renewals assessment and funding model that ensures the long term sustainability of its 3 waters assets. The Council does not have an Asset Management Strategy document however
2. Have you set an asset management policy?	Yes. TRIM link to policy
3. Do you have good quality up-to-date asset management plans for achieving your strategy?	Yes. These are comprehensively reviewed every three years and submitted for peer review.
4. Does your organisation have appropriate asset management skills and experience?	Yes. For 3 waters each of the activity areas – water supply, wastewater and drainage, has a dedicated asset manager responsible for the management of the relevant assets
5. Do you know the reliability of your asset information?	Reasonably well. Asset data for our reticulation network is reliable and being improved through analysis of maintenance data. Facility asset data is also reliable, with a comprehensive facilities asset inventory just having been completed
6. Do you have a structured approach to assessing the condition and performance of your assets?	Yes. Noting that the average age of its network assets is relatively young, the condition of water supply reticulation assets has been the subject of recent analysis through examination of pipe performance. This has enabled condition to be inferred in more detail than has previously been the case. For gravity pipes, Council has recently invested in InfoAssets software, which will enable improved management of gravity pipe condition data. A facility assets condition assessment has not yet been carried out. The system that records repair costs against assets, would have improved understanding of performance, especially as it was further developed, but unfortunately it's future is in jeopardy. This is because the Council's enterprise system is to be replaced.
7. Have you defined a clear and comprehensive set of service levels to be delivered or supported by the assets?	Yes. These are generally reviewed and approved by Council in conjunction with the three yearly AMP review. As noted in the LoS section this has not been possible for the 2024 AMP
8. How well do you forecast future demand for the services that are delivered or supported by your assets?	Demand forecast is largely based on growth projections. Improvements could be made by considering other factors such as for example demographic changes, and changing technologies

9. Do you report, and get reports, on achievement of your asset management plan(s)?	Key Levels of Service are reported quarterly to Council, and other LOS are reported annually to Council. Asset Management Plans themselves are generally peer reviewed, although this has not been carried out for the 2024 AMP due to the effect of the 3 Waters Review on AMP timing.
10. Do you have a backlog of repairs, maintenance, and asset renewals? And what are you doing about it?	No. The Asset Management Plan process delivers approved budgets that to date have been sufficient to ensure that there is no appreciable maintenance backlog, and that fully funds future renewals

24 CHANGES TO AMP AS A RESULT OF LONG TERM PLAN CONSULTATION

This section outlines any significant changes to the AMP as a result of the 2024-34 Long Term Plan consultation period.

Some changes to budgets have arisen as a consequence of a staff submission report to Council during LTP hearings 21-23 May (TRIM 240501068341):

In total $460,840 of additional, new budget or advanced budget has been added to the 2024/25 financial year and $628,200 of budget has been brought forward to 2025/26 from 2026/27.

Additional Budgets

- Additional budget of $126,000 in 2024/25 for School Road Drainage Upgrade for pipework and secondary flow path modifications to comply with Council level of service standards and reduce flooding of a property in Woodend. For further information please see attached report (TRIM 240314040024).
- Additional budget of $75,300 in 2024/25 for Matai Place Stage 2 Drainage Upgrade for new pipework that outlets to Flannigan's drain providing a secondary flow path from Matai Place in Oxford.
- Additional budget of $20,000 in 2024/25 for Kaiapoi Underchannel Piping. This is an annual reoccurring budget that contributes to the underchannel piping for the Council Roading Department annual kerb and channel renewal project.

New Budgets

- Allocate Kaiapoi renewals budget of $150,000 of budget in 2024/25 for design and construction of Raven Quay Stormwater Renewals to align with a water and wastewater renewal project.

Advanced Budgets

- Bring forward Woodend Capacity Improvements construction budget of $628,200 to 2025/26 from 2026/27, and design budget of $62,820 to the 2024/25 from 2025/26.

Deferred Budgets

- Defer budget of $837,600 from 2024/25 to 2025/26 financial year giving a total budget of $1,675,200 in 2025/26 for the construction of stage 1 of the Mandeville Resurgence Channel Upgrade Project. For further information please see attached report (TRIM 240507072873).

Scheme	Budget Name	Current Allowance	Recommended Change	Reasons
Kaiapoi	Raven Quay Stormwater Renewal	Nil	Allocate Kaiapoi renewals budget of $150,000 of budget in 2024/25 for design and construction.	Upgrade of stormwater pipe to align with Raven Quay Water and Wastewater upgrades.
Coastal Urban	School Road Drainage Upgrade	$415,000 in 2024/25 for construction.	Allocate additional budget of $126,000 (debt funded) of budget in 2024/25 for construction.	Additional budget for pipework and secondary flow path modifications to comply with Council level of service standards.
Oxford Urban	Matai Place Stage 2 Drainage Upgrade	$20,000 in 2023/24 for design and $104,700 in 2024/25 for construction.	Allocate additional budget of $75,300 (debt funded) of budget in 2024/25 for construction.	Upon completion of the design options memo the estimate has been updated as part of this work and an additional budget of $75,300 is required to implement the preferred option.
Kaiapoi	Underchannel Piping	$20,000 (annually)	Allocate additional budget of $20,000 (debt funded) of budget for a total of $40,000 (annually).	This budget contributes to the underchannel piping for the Roading Department annual kerb and channel renewal project. This increase aligns Kaiapoi's budget more closely with Rangiora's ($60k), as its current allocation is not significant compared to the total project cost.
Coastal Urban	Woodend Capacity Improvements	$62,820 in 2025/26 for design and $628,200 in 2026/27 for construction.	Bring forward $62,820 design budget to the 2024/25 financial year, and the construction budget of $628,200 to the 2025/26 financial year (debt funded).	Following numerous service requests and consultations with residents, it is recommended to prioritise these works.
District Drainage	Mandeville Resurgence Channel Diversion Upgrade Stage 1	$1,675,200, allocated evenly over two years: $837,600 in 24/25 and $837,600 in 25/26 for stage 1 improvement works.	Deferring $837,600 budget from 24/25 to 25/26, giving a total budget of $1,675,200 (debt funded) in 2025/26 for the construction of stage 1.	Deferred budget due to further resident consultation required regarding detailed design of channel improvement works.

Appendix 1: Rangiora Urban Scheme Performance

Table 21: A1 - Rangiora Urban Drainage Scheme Elective Levels of Service Performance - Assessed June 2023

Section	Level of Service	2021 – 2024 Performance Measure	2021 – 2024 Target	2023				Previous Results*				
				Result	Commentary	Status	Action to Address	2020	2017	2014	2011	2008
Flooding	Flooding - Dwellings	Minimum return period of flood event that can be accommodated in the system without having flooding of dwellings.	1 in 50 years	Not known	Insufficient data. Cannot be determined without floor levels	Not Achieved	Update modelling and consider next steps	N	N	N	N	N
	Flooding - Nuisance or Carriageway	The percentage of complaints, about nuisance flooding caused by lack of capacity, that are investigated and where justified measures implemented to improve the situation. Applies to rain events with an Average Recurrence Interval of 5 years or less.	100%	Not known	Insufficient data	Not Achieved	N/A	N	Y	N	N	N
	Flooding - CBD Nuisance or Carriageway	For properties or road carriageways in the CDB area, the percentage of complaints, about nuisance flooding caused by lack of capacity, that are investigated and measures implemented to improve the situation. Applies to rain events with an Average Recurrence Interval of 10 years or less.	100%	Not known	Insufficient data	Not Achieved	N/A	N	N	N	N	N

Section	Level of Service	2021 – 2024 Performance Measure	2021 – 2024 Target	2023				Previous Results*				
				Result	Commentary	Status	Action to Address	2020	2017	2014	2011	2008
Resource Consent	Consent Breach	Number breaches of consent conditions that result in an ECan report that identifies compliance issues.	N/A	N/A	This is reported quarterly and in the Annual Report, at District level and does not need reporting here. Included to show historical results only	N/A	N/A	y	Y	Y	Y	Y
Customer Satisfaction	Overall satisfaction	Percentage of respondents to a three-yearly community survey that have an opinion, that rates the service as "Satisfactory" or "Very Satisfactory".	>90%	83%	While the level of customer satisfaction with the service, as measured by the three yearly survey, is not a level of service at scheme level, the latest survey has enabled that measurement. Only 83% of those surveyed reported a high or very high level of satisfaction. This does not meet the >90% target.	Not achieved	Further initiatives are warranted to improve this figure, will need to be assessed after the current planned capital works have been completed.					

** Note for previous results "Y" indicates that the LOS has been met, and "N" indicates it has not been met . Blank cells indicate measures were not recorded for that year. (the measure was likely not a LOS at that time)*

** Details of performance measures may have been modified between various revisions of the AMP. The Previous Results reported are as assessed against the most relevant performance measure at the time of assessment. For the 2022/23 assessment, the measures from the 2021 AMP have been used.*

Appendix 2: Kaiapoi Urban Scheme Performance

Table 22: Kaiapoi Urban Drainage Scheme Elective Levels of Service Performance - Assessed June 2023

Section	Level of Service	2021 – 2024 Performance Measure	2021 – 2024 Target	2023				Previous Results*				
				Result	Commentary	Status	Action to Address	2020	2017	2014	2011	2008
Flooding	Flooding - Dwellings	Minimum return period of flood event that can be accommodated in the system without having flooding of dwellings.	1 in 50 years	-	Insufficient data. Cannot be determined without floor levels	Not Achieved	Update modelling and consider next steps	N	N	N	N	N
	Flooding - Nuisance or Carriageway	The percentage of complaints, about nuisance flooding caused by lack of capacity, that are investigated and where justified measures implemented to improve the situation. Applies to rain events with an Average Recurrence Interval of 5 years or less.	100%	Not known	Insufficient data	Not Achieved	N/A	Y	N	N	N	N
	Flooding - CBD Nuisance or Carriageway	For properties or road carriageways in the CDB area, the percentage of complaints, about nuisance flooding caused by lack of capacity, that are investigated and measures implemented to improve the situation.	100%	Not known	Insufficient data	Not Achieved	N/A	-	N	N	N	N

Section	Level of Service	2021 – 2024 Performance Measure	2021 – 2024 Target	2023				Previous Results*				
				Result	Commentary	Status	Action to Address	2020	2017	2014	2011	2008
		Applies to rain events with an Average Recurrence Interval of 10 years or less.										
Resource Consent	Consent Breach	Number breaches of consent conditions that result in an ECan report that identifies compliance issues.	N/A	N/A	This is reported quarterly and in the Annual Report, at District level and does not need reporting here. Included to show historical results only	N/A	N/A	Y	Y	Y	Y	Y
Customer Satisfaction	Overall satisfaction	Percentage of respondents to a three-yearly community survey that have an opinion, that rates the service as "Satisfactory" or "Very Satisfactory".	>90%	75%	While the level of customer satisfaction with the service, as measured by the three yearly survey, is not a level of service at scheme level, the latest survey has enabled that measurement. Only 75% of those surveyed reported a high or very high level of satisfaction. This does not meet the >90% target.	Not achieved	Further initiatives are warranted to improve this figure, will need to be assessed after the current planned capital works have been completed.					

** Note for previous results "Y" indicates that the LOS has been met, and "N" indicates it has not been met . Blank cells indicate measures were not recorded for that year. (the measure was likely not a LOS at that time)*

** Details of performance measures may have been modified between various revisions of the AMP. The Previous Results reported are as assessed against the most relevant performance measure at the time of assessment. For the 2022/23 assessment, the measures from the 2021 AMP have been used*

Appendix 3: Coastal Urban Scheme Performance (Woodend, Pines, Kairaki and Waikuku Beach systems)

Table 23: Coastal Urban Scheme Elective Levels of Service Performance - Assessed June 2023

Section	Level of Service	2021 – 2024 Performance Measure	2021 – 2024 Target	2023				Previous Results*				
				Result	Commentary	Status	Action to Address	2020	2017	2014	2011	2008
Flooding	Flooding - Dwellings	Minimum return period of flood event that can be accommodated in the system without having flooding of dwellings.	1 in 50 year	-	Insufficient data. Cannot be determined without floor levels	Not Achieved	Update modelling and consider next steps	Y	Y	Y	Y	Y
	Flooding - Nuisance or Carriageway	The percentage of complaints, about nuisance flooding caused by lack of capacity, that are investigated and where justified measures implemented to improve the situation. Applies to rain events with an Average Recurrence Interval of 5 years or less.	100%	Not known	Insufficient data	Not Achieved	N/A	Y	Y	N	N	N
	Flooding - CBD Nuisance or Carriageway	For properties or road carriageways in the CDB area, the percentage of complaints, about nuisance flooding caused by lack of capacity, that are investigated and measures implemented to improve the situation.	100%	Not known	Insufficient data	Not Achieved	N/A	Y	-	-	-	

Section	Level of Service	2021 – 2024 Performance Measure	2021 – 2024 Target	2023				Previous Results*				
				Result	Commentary	Status	Action to Address	2020	2017	2014	2011	2008
		Applies to rain events with an Average Recurrence Interval of 10 years or less.										
Resource Consent	Consent Breach	Number breaches of consent conditions that result in an ECan report that identifies compliance issues.	N/A	N/A	This is reported quarterly and in the Annual Report, at District level and does not need reporting here. Included to show historical results only	N/A	N/A	Y	Y	Y	Y	Y
Customer Satisfaction	Overall satisfaction	Percentage of respondents to a three-yearly community survey that have an opinion, that rates the service as "Satisfactory" or "Very Satisfactory".	>90%	44% (Average of results from Woodend, Waikuku Beach and Pines/ Kairaki	While the level of customer satisfaction with the service, as measured by the three yearly survey, is not a level of service at scheme level, the latest survey has enabled that measurement. Only 44% of those surveyed reported a high or very high level of satisfaction. This does not meet the >90% target.	Not achieved	Further initiatives are warranted to improve this figure, will need to be assessed after the current planned capital works have been completed.					

** Note for previous results "Y" indicates that the LOS has been met, and "N" indicates it has not been met . Blank cells indicate measures were not recorded for that year. (the measure was likely not a LOS at that time)*

** Details of performance measures may have been modified between various revisions of the AMP. The Previous Results reported are as assessed against the most relevant performance measure at the time of assessment. For the 2022/23 assessment, the measures from the 2021 AMP have been used*

Appendix 4: Pegasus Urban Scheme Performance

Table 24: Pegasus Urban Drainage Scheme Elective Levels of Service Performance - Assessed June 2023

Section	Level of Service	2021 – 2024 Performance Measure	2021 – 2024 Target	2023				Previous Results*				
				Result	Commentary	Status	Action to Address	2020	2017	2014	2011	2008
Flooding	Flooding - Dwellings	Minimum return period of flood event that can be accommodated in the system without having flooding of dwellings.	1 in 50 years	-	Insufficient data. Cannot be determined without floor levels	Not Achieved	Update modelling and consider next steps	Y	N	N	N	N
	Flooding - Nuisance or Carriageway	The percentage of complaints, about nuisance flooding caused by lack of capacity, that are investigated and where justified measures implemented to improve the situation. Applies to rain events with an Average Recurrence Interval of 5 years or less.	100%	Not known	Insufficient data	Not Achieved	N/A	Y	Y	Y	Y	N
	Flooding - CBD Nuisance or Carriageway	For properties or road carriageways in the CDB area, the percentage of complaints, about nuisance flooding caused by lack of capacity, that are investigated and measures implemented to improve the situation.	100%	Not known	Insufficient data	Not Achieved	N/A	Y	Y	Y	Y	N

Section	Level of Service	2021 – 2024 Performance Measure	2021 – 2024 Target	2023				Previous Results*				
				Result	Commentary	Status	Action to Address	2020	2017	2014	2011	2008
		Applies to rain events with an Average Recurrence Interval of 10 years or less.										
Resource Consent	Consent Breach	Number breaches of consent conditions that result in an ECan report that identifies compliance issues.	N/A	N/A	This is reported quarterly and in the Annual Report, at District level and does not need reporting here. Included to show historical results only	N/A	N/A	Y	Y	Y	Y	Y
Customer Satisfaction	Overall satisfaction	Percentage of respondents to a three-yearly community survey that have an opinion, that rates the service as "Satisfactory" or "Very Satisfactory".	>90%	91%	While the level of customer satisfaction with the service, as measured by the three yearly survey, is not a level of service at scheme level, the latest survey has enabled that measurement. 91% of those surveyed reported a high or very high level of satisfaction. This does does meet the >90% target.	Achieved	N/A					

** Note for previous results "Y" indicates that the LOS has been met, and "N" indicates it has not been met . Blank cells indicate measures were not recorded for that year. (the measure was likely not a LOS at that time)*

** Details of performance measures may have been modified between various revisions of the AMP. The Previous Results reported are as assessed against the most relevant performance measure at the time of assessment. For the 2022/23 assessment, the measures from the 2021 AMP have been used*

Appendix 5: Oxford Urban Scheme Performance

Table 25: Oxford Urban Drainage Scheme Elective Levels of Service Performance - Assessed June 2023

Section	Level of Service	2021 – 2024 Performance Measure	2021 – 2024 Target	2023				Previous Results*				
				Result	Commentary	Status	Action to Address	2020	2017	2014	2011	2008
Flooding	Flooding - Dwellings	Minimum return period of flood event that can be accommodated in the system without having flooding of dwellings.	1 in 50 year	-	Insufficient data. Cannot be determined without floor levels	Not Achieved	Update modelling and consider next steps	N	N	Y	Y	Y
	Flooding - Nuisance or Carriageway	The percentage of complaints, about nuisance flooding caused by lack of capacity, that are investigated and where justified measures implemented to improve the situation. Applies to rain events with an Average Recurrence Interval of 5 years or less.	100%	Not known	Insufficient data	Not Achieved	N/A	Y	N	N	N	Y
	Flooding - CBD Nuisance or Carriageway	For properties or road carriageways in the CDB area, the percentage of complaints, about nuisance flooding caused by lack of capacity, that are investigated and measures implemented to improve the situation.	100%	Not known	Insufficient data	Not Achieved	N/A	-	-	-	-	N/A

Section	Level of Service	2021 – 2024 Performance Measure	2021 – 2024 Target	2023				Previous Results*				
				Result	Commentary	Status	Action to Address	2020	2017	2014	2011	2008
		Applies to rain events with an Average Recurrence Interval of 10 years or less.										
Resource Consent	Consent Breach	Number breaches of consent conditions that result in an ECan report that identifies compliance issues.	N/A	N/A	This is reported quarterly and in the Annual Report, at District level and does not need reporting here. Included to show historical results only	N/A	N/A	Y	Y	Y	Y	Y
Customer Satisfaction	Overall satisfaction	Percentage of respondents to a three-yearly community survey that have an opinion, that rates the service as "Satisfactory" or "Very Satisfactory".	>90%	73%	While the level of customer satisfaction with the service, as measured by the three yearly survey, is not a level of service at scheme level, the latest survey has enabled that measurement. Only 73% of those surveyed reported a high or very high level of satisfaction. This does not meet the >90% target.	Not achieved	Further initiatives are warranted to improve this figure, will need to be assessed after the current planned capital works have been completed.					

** Note for previous results "Y" indicates that the LOS has been met, and "N" indicates it has not been met . Blank cells indicate measures were not recorded for that year. (the measure was likely not a LOS at that time)*

** Details of performance measures may have been modified between various revisions of the AMP. The Previous Results reported are as assessed against the most relevant performance measure at the time of assessment. For the 2022/23 assessment, the measures from the 2021 AMP have been used*

Appendix 6 Glossary Of Terms

The following terms and acronyms (in brackets) are used in this Activity Management Plan.

Activity	As defined in the *Local Government Act 2002*: 'Goods or services provided by, or on behalf of a local authority or council-controlled organisation and includes: a) The provision of facilities and amenities. b) The making of grants; and The performance of regulatory and other governmental functions.
Activity Management Plan (AM Plan)	Activity Management Plans are key strategic documents that describe all aspects of the management of assets and services for an activity (including technical and financial) over the lifecycle of the asset in the most cost-effective manner to provide a specified level of service. The documents are an information source for the Council's LTP and IS, and place an emphasis on long term financial planning, community consultation, and a clear definition of service levels and performance standards.
Asset Condition	This describes an asset's structural integrity or ability to deliver the service required from it. The condition can deteriorate slowly over the life of an asset or rapidly if it is damaged.
Annual Plan	The Annual Plan has the meaning given to it in the *Local Government Act 2002.*
Asset	A physical item that enables provision of services and has an economic life of greater than 12 months, has value of at least $250 and is recorded in the asset register.
Asset Management (AM)	The combination of management, financial, economic, engineering and other practices applied systematically to physical assets with the objective of providing the required level of service in the most cost-effective and sustainable manner.
Asset Management System (AMS) (also known as asset register)	A system (usually computerised) for collecting analysing and reporting data on the utilisation, performance, lifecycle management and funding of existing assets.
Asset Management Plan (AMP)	In the Waimakariri District Council's context, this is referred to as an activity management plan.
Asset Management Planning	A set of interrelated or interacting elements of an organisation, including the AM policy, AM objectives, AM Strategy, AM Plans, and the processes to achieve these objectives.
Ancillary	A structure or an arrangement within the drainage collection system such as a pumping station, weir, syphon, or pond.
ARI	Average Recurrence Interval. The statistical period between events (e.g. rainfall or overflows) occurring.
Brownfields	Previously developed land with potential for new development.

Capital Expenditure (CAPEX)	Expenditure used to create new assets, renew assets, expand or upgrade assets or to increase the capacity of existing assets beyond their original design capacity or service potential. CAPEX increases the value of an asset.
CCTV	Closed Circuit Television. It is used to visually assess the condition inside pipe networks.
Condition Monitoring	The inspection, assessment, measurement and interpretation of the resultant data, to indicate the condition of a specific component so as to determine the need for some preventive or remedial action
Connection	From the point of view of the utility provider this relates to the physical connection of a particular customer to the service.
Critical Assets	Assets for which the financial, business or service level consequences of failure are sufficiently severe to justify prioritisation for inspection, rehabilitation or replacement ahead of other assets.
Current Replacement Cost	The cost of replacing an existing asset with an appropriate modern equivalent asset to deliver the same level of service.
Customer	A customer is an individual or business that creates the demand for and is the recipient of goods or services. Customers can be internal or external.
Deferred Maintenance	The shortfall in maintenance or rehabilitation work required to maintain the service potential of an asset.
Demand Management	The active intervention to influence demand for services and assets with forecast consequences, usually to avoid or defer CAPEX expenditure. Demand management may be 'SUPPLY-SIDE' demand management (for example minimising wastage through pipe leak detection) or customer DEMAND-SIDE management, to reduce demand for over-utilised assets or vice versa (for example, through pricing, regulation, education and incentives).
Depreciation	The annual sum budgeted to enable the assets to be replaced at the end of their economic life. It is generally based on the value of the asset divided by its remaining life at that point in time.
Depreciated Replacement Cost (DRC)	The replacement cost of an existing asset after deducting an allowance for wear or consumption to reflect the remaining economic life of the existing asset.
Disaster Resilience Assessment (DRA)	An assessment first carried out in 2007 and updated in 2011/12 to determine the risk to assets from natural hazards.
Disposal	Activities necessary to decommission and dispose of assets that are no longer required.
Economic life	The period from the acquisition of the asset to the time when the asset, while physically able to provide a service, ceases to be the lowest cost alternative to satisfy a particular level of service. The economic life is at the maximum when equal to physical life, however obsolescence will often ensure that the economic life is less than the physical life.
Facility	A complex comprising many assets (eg. swimming pool complex, sewage treatment plant etc.) which represents a single management unit for financial, operational, maintenance or other purposes.

Geographic Information System (GIS)	Software which provides a means of spatially viewing, searching, manipulating, and analysing an electronic data-base
Greenfield Development Area	Existing undeveloped land with potential for development or newly rezoned land that has yet to be developed with the appropriate infrastructure to support a residential or commercial land use.
Infrastructure Assets	Stationary systems forming a network and serving whole communities, where the system as a whole is intended to be maintained indefinitely at a particular level of service potential by the continuing replacement and refurbishment of its components.
Key Performance Indicator (KPI)	A qualitative or quantitative measure of a service or activity used to compare actual performance against a standard or other target. Key performance indicators commonly relate to statutory limits, safety, responsiveness, cost, comfort, asset performance, reliability, efficiency, environmental protection and customer satisfaction. Some of these may be mandatory performance measures as prescribed by central government. Also referred to as performance indicators (PI) or performance measures (PM).
Level of Service (LOS)	A measure of the standard of service that the Council intends to provide. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost.
Life	A measure of the anticipated life of an asset or component; such as time, number of cycles, distance intervals etc.
Life Cycle	The cycle of activities that an asset (or facility) goes through while it retains an identity as a particular asset ie. from planning and design to decommissioning or disposal.
Life Cycle Cost	The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs.
Life Cycle Maintenance	All actions necessary for retaining an asset as near as practicable to its original condition, but excluding rehabilitation or renewal.
Long Term Plan (LTP)	The Long Term Plan (LTP) has the meaning given to it in the Local Government Act 2002.
LGA	Local Government Act 2002.
Maintenance Plan	Details the specific planned or reactive maintenance actions for the optimum maintenance of an asset, or group of assets.
Network Utility Operator	A person or in many cases a local authority that provides a reticulated sewer system.
NZ Treasury Asset Management Maturity Assessment Tool (AMMA)	A tool (in spreadsheet format) that allows organisations to assess the maturity of their current Asset Management Plans, and to define a target maturity to which future Asset management Plans can aspire to, that is appropriate to the activity under consideration.
Optimised Renewal Decision Making (ORDM)	An optimisation process for considering and prioritising all options to rectify performance failures of assets. The process encompasses NPV analysis and risk assessment.

Performance Monitoring	Quantitative and qualitative assessments of the actual performance compared with specific objectives, measures, targets or standards.
Planned Maintenance	Day to day operational activities to keep the asset operating (fixing potholes, clearing drains, repairing leaks, mowing etc.) and which form part of the annual operating budget. These may be cyclic, e.g. on specific timeframe, or needs-based, i.e. where a fault is monitored until it reaches a point at which some action must be taken to ensure continued performance/life of asset.
Rating Charges	This is the unit charge applied to rate payers for a particular service. On some drainage schemes this is per property. On other schemes this is the area of land contributing to the discharge.
Renewal	Works to upgrade, refurbish, rehabilitate or replace existing assets with ones of equivalent capacity or performance capability.
Replacement	The complete replacement of an asset that has reached the end of its life, so as to provide a similar, or agreed alternative, level of service.
Renewal Programme	This is the programmed replacement of like asset with like asset (as opposed to an upgrade), when it reaches the end of its useful life due to deterioration of its condition.
Remaining Economic Life	The time remaining until an asset ceases to provide service level or economic usefulness.
Reticulation	The network of pipes that collects, stores and delivers stormwater to the point of discharge. It includes gravity pipes, open drains, manholes and pump stations.
Risk Assessment	The process of looking at all possible events that might cause the failure of a given asset or component. The risk assessment considers both the probability and consequences of an event occurring. Risks are assessed and prioritised, and appropriate reduction or mitigation measures are implemented.
Risk Cost	The assessed annual cost or benefit relating to the consequence of an event. Risk cost equals the costs relating to the event multiplied by the probability of the event occurring.
Risk Management	Risk management is the identification, assessment, and prioritisation of risks (defined in ISO 31000 as the effect of uncertainty on objectives) followed by coordinated and economical application of resources to minimise, monitor, and control the probability and/or impact of unfortunate events.
Routine Maintenance	Day to day operational activities to keep the asset operating such as replacement of minor equipment, oil and greasing pumps and motors, cleaning of equipment, repairing leaks, etc. It forms part of the annual operating budget, including preventative maintenance.
Service Potential	The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset.
SMA	Stormwater Management Area.
SS	Suspended Solids.
Stormwater / Drainage Catchment	An area containing properties that are connected to the stormwater collection system upstream of a particular point whether it is a particular manhole or a network pumping station.

Unplanned Maintenance (or repair)	Corrective work required in the short term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.
Upgrade	The addition or replacement of an asset, or component of that asset, that materially improves its original service potential.
Valuation	The process of determining the worth of an asset or liability. Assessed asset value, which may depend on the purpose for which the valuation is required, i.e. replacement value for determining maintenance levels, market value for life cycle costing or replacement plus a percentage for insurance purposes.