

Activity Management Plan 2021

Central Rural Drainage Scheme

3 Waters | July 2021








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1 Executive Summary

The following table provides a summary of the key asset management issues of the Central Rural Drainage Scheme identified through consideration of the levels of service, consents, asset condition, risk analysis, disaster resilience, growth projections, and capacity assessment:

Table 1: Key Asset Management Components

Levels of Service	<p>There is only one scheme specific service level which has been met</p> <p>Although not a scheme specific service level, with analysis now possible down to scheme level, customer satisfaction (high and very high) can be reported for this scheme at 83%, although the sample size was very small. The district target is 90%</p> <p>There were no service requests from within the scheme boundaries that met the threshold for a complaint regarding insufficient flood capacity</p>
Resource Consents	<p>No consents relate specifically to this scheme, but a new district wide consent has recently been granted from Ecan for the maintenance of rural waterways</p>
Capacity & Performance	<p>Following the June 2014 rainfall event a capacity assessment of key drains in the Tuahiwi area was undertaken to identify mitigation actions. The works identified have now been completed</p>
Asset Condition	<p>Apart from open drains, there are no substantial land drainage or stormwater assets in this drainage area.</p>
Risk Assessment	<p>There are no extreme or high risks on this scheme as identified through the Risk Assessment.</p>
Disaster Resilience	<p>There are 60m of reticulation mains considered to be at high risk in an earthquake, but there are no plans to replace these assets.</p>
	<p>No specific mitigation actions have been identified for this scheme for facilities or for piped and open drains.</p>
Growth Projections	<p>Future growth will have some impact, but it will be mitigated by the need to control discharges to predevelopment levels.</p>

2 Introduction

The purpose of this Activity Management Plan (AMP) is to outline the significant issues associated with the Council's assets and to show how the Council proposes to manage the schemes in the future.

This plan summarises the various components of the Central Rural Drainage Scheme, its condition and performance, and identifies future funding requirements including upgrades where necessary.

The data that has been relied upon to produce this document was taken at the end of the 19/20 financial year. i.e. 30 June 2020.

Further details of the asset management practices used by Council to manage this scheme are summarised in the District Drainage AMP Overview document.

Projects identified to improve asset management processes for this scheme will also benefit the performance of the other 3 waters schemes and are managed at a District level for efficiency.

Projects are also identified within this AMP that will maintain or improve levels of service.

All figures within this AMP exclude inflation

3 Related Documents

The following related documents have been used as reference documents or for guidance in the development of some of the sections in this Activity Management Plan

- Waimakariri District Plan
- Population in the Waimakariri District (TRIM 170328030077)
- New Projections for LTP 2021-2031 (TRIM 200908117997)
- WDC Asset Management Policy (TRIM 180605062091)
- 2019 Customer satisfaction Survey (TRIM 200313034937)
- Development Contributions Policy 2021/22 (TRIM 200729095963)

4 Scheme Description (What Do We Have?)

The scheme comprises the area ranging from the Mairaki Downs Road in the West and the rural areas between Rangiora, Woodend, Kaiapoi and the Cust Main Drain.

The land can be characterised as low lying with many natural springs and man-made drains and includes the wider catchments for the (lower) Dockey Creek, Cold Stream, North Brook, Middle Brook, South Brook and Ruataniwha or Cam River. Also included is the catchment draining into the Cust Main Drain from the north. The major natural waterway within the catchment is the Cam River.

To the east of Flaxton Road Drain and north of Lineside Road is a low lying shallow basin out of which a number of drains have been constructed to drain a former wetland. Parts of this low area still experience significant ponding in times of heavy rain.

Apart from open drains, natural waterways and some road culverts, there are no assets of note in the Central Rural Drainage Scheme area. The Cust Main Drain and its banks are managed and maintained by Environment Canterbury.

Some key statistics (end of 2019/20 year) of the scheme are shown in Tables 2 to 6.

The extent of the currently serviced area is presented in Appendix A.

Table 2: Scheme Statistics for 2019/2020

Scheme Parameter	Statistics	Source
Drainage System	Gravity	
Drainage Area	5745 ha	Source - GIS Layer
Reticulation and Treatment	Open drains and watercourses, no formal treatment	
Length of Reticulation and Open Channel	0.8 km Main 63.1 km Channel	Drainage Asset Valuation Tables 9-4 and 9-5, pages 66 to 68
Total Replacement Value	\$2,334,579	
Depreciated Replacement Value	\$2,187,626	
Rated Properties	1,034	Source 2019/20 Rating Query

Table 3: Stormwater Pipe Data Summary

	Stormwater pipe length (m) by diameter and pipe material												
Pipe Material	Pipe Diameter (mm)												Total
	100	150	225	300	375	450	525	600	750	900	1050	>1200	
Concrete	0m	0m	555m	5m	0m	0m	0m	0m	0m	0m	0m	32m	591m
Perforated HDPE	0m	0m	0m	0m	0m	0m	0m	0m	0m	0m	0m	0m	0m
Pvc	0m	0m	0m	30m	0m	0m	0m	0m	0m	0m	0m	0m	30m
Other	0m	0m	161m	0m	0m	0m	0m	0m	0m	0m	0m	0m	161m
Total	0m	0m	716m	35m	0m	0m	0m	0m	0m	0m	0m	32m	782m

Table 4: Open Channel Drain Data Summary

Open Channel Drains	
Material	Length (m)
Unlined Drain	62,506
Lined Drain	586
Total	63,092

Table 5: Other Stormwater Asset Data Summary

Stormwater Assets	
Asset Type	Count
Inlet (Sump)	0
Manhole	0
Node	3
Valve	0
Total	3

Table 6: Data References

Data Reference	Trim Reference
2020 3 Waters Asset Valuation	200824109857
Flood Mitigation Works and Funding	141009110892[v2]
2020 50 Year Water and Sewer Growth Forecast	200224024348

5 Scheme Management Issues (What Do We Need to Consider?)

There are a number of key aspects to consider when managing a drainage scheme; these include:

- Desired & actual levels of service
- Asset condition & criticality
- Capacity & performance
- Risks
- Growth predictions for the scheme

These issues have been assessed in detail and are summarised in the following sections.

5.1 Levels of Service

Table 7 sets out the performance measures and targets for the scheme, and performance achievement against targets since 2008.

Mandatory performance measures are measured at the district wide level and are not included in the individual drainage scheme AMPs. They are located in the District Overview Drainage Activity Management Plan. However, there is considerable overlap between the measures at Scheme and District levels. Mandatory measures cover flooding, consent compliance, time to respond to faults, and complaints. The scheme LOS measures include more detail, and cover complaints, consent compliance, flooding, but not response times, which are only measured at scheme level.

None of the WDC targets are planned to change over the 10 year LTP period, so only the one target value has been shown in this document.

Table 7 measured against the performance measures set in 2018, as part of the 2018-28 Long Term Plan process. Going forward from 2021 onwards, performance will be against the modified set of performance measures that were presented to the Council's Utilities and Roading Committee in 2020 (refer report 200406043184[v2]), and subsequently approved by Council. These revised levels and targets are detailed in the District Overview Water Supply Activity Management Plan.

Table 7: Elective (non-mandatory) Levels of Service Targets and Performance Measures as Assessed in 2020

* Note “Y” indicates that the LOS has been met, and “N” indicates it has not been met

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.

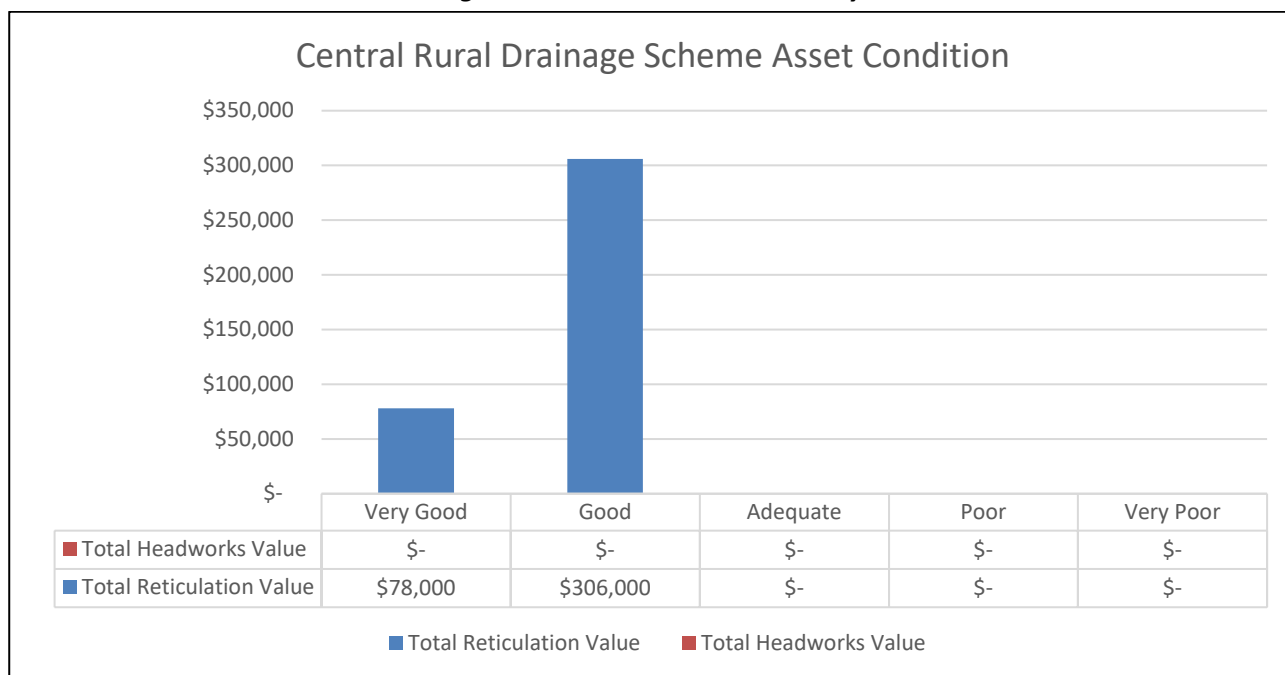
Section	Level of Service	2018 – 2021 Performance Measure	2018 – 2021 Target	2020				Previous Results*			
				Result	Commentary	Status	Action to Address	2017	2014	2011	2008
Resource Consent	Consent Breach	Number breaches of consent conditions that result in an ECan report that identifies compliance issues.	Nil per year	0%	There were no consent breaches that resulted in non-compliance reports being received from Environment Canterbury for FY 19/20.	Achieved	N/A	Y	-	-	-

5.2 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.

Figure 1 summarises the theoretical asset condition for both the network and headworks in a graph, while Table 8 provides more detail about the value of the assets within different asset condition categories.

Figure 1: Asset Condition Summary



“Headworks” is inclusive of all above ground assets associated with the scheme

Table 8: Pipe Condition Summary

Condition Grade	Definition	Pipeline Quantity	Total Reticulation Value	Total Headworks Value	Total Value
1	Very Good <i>More than 80% of life remaining</i>	0.2 km 26%	\$ 78,000 20%	\$ - 0%	\$ 78,000 20%
2	Good <i>Between 50% and 80% of life remaining</i>	0.6 km 74%	\$ 306,000 80%	\$ - 0%	\$ 306,000 80%
3	Adequate <i>Between 20% and 50% of life remaining</i>	0.0 km 0%	\$ - 0%	\$ - 0%	\$ - 0%
4	Poor <i>Between 10% and 20% of life remaining</i>	0.0 km 0%	\$ - 0%	\$ - 0%	\$ - 0%
5	Very Poor <i>Less than 10% of life remaining</i>	0.0 km 0%	\$ - 0%	\$ - 0%	\$ - 0%
Total		0.8 km	\$384,000	\$-	\$384,000

5.3 Asset Criticality

Asset criticality provides an indication of the importance of an individual asset and the corresponding impact on the service delivery should the asset fail for any reason. Criticality is used in risk based investment decisions to help decide when an asset should be replaced to avoid the consequences of failure. For 3 Waters Council has developed an assessment process for pipes and other replaceable assets which scores assets from most critical 'AA' to least critical 'C'. It does not apply to the majority of rural drainage scheme assets, which are open drains and channels which can be effectively maintained in perpetuity.

The criticality assessment is used as an input to the renewals model. Further details of the methodology is covered in the Drainage Overview AMP.

The criticality scoring process, has been significantly improved through automation and dynamic links to GIS data layers for this AMP

5.4 Risk Assessment

An Operational Risk Assessment was first undertaken for the components of the Drainage Scheme in 2004, and it has been regularly updated since that time. It was last updated for the 2015 AMP review.

The District Wide Overview details the risk events considered and includes a summary of the risk assessment results for all the drainage supply schemes and is useful in indicating overall drainage network priorities.

Table 9 summarises the risks for the Central Rural Drainage Scheme.

Table 9: Number of Events per Level of Risk

Risk Level	2004	2008	2011	2014
Extreme risks	0	0	0	0
High risks	0	0	0	0
Moderate risks	6	6	8	9
Low risks	9	9	8	7
Not applicable	12	12	12	12
Total	27	27	28	28

The table shows there are no high or extreme risks on the central rural drainage scheme.

District wide, moderate risks are being deferred until extreme and high risks have been addressed.

5.5 Disaster Resilience Assessment

The 2009 Disaster Resilience Assessment (DRA) is a desk top study that primarily considered the risks to above ground structures presented by natural hazard events across all Council operated 3 Waters schemes. The original assessment was updated in 2012 using revised hazard and asset behaviour information captured during the 2010-11 Canterbury earthquake sequence.

The vulnerability assessment carried out for water and wastewater pipes in areas prone to liquefaction, has not been carried out for this stormwater network, as it contains no AC or earthenware pipes, which are those most vulnerable to damage in an earthquake strong enough to induce liquefaction.

Concrete drainage pipes on the eastern side of the scheme will be vulnerable to damage in such an earthquake but there is no intention to replace these types of pipes because (a) they are expected to be in good condition, and have a high residual value, and (b) the improvement in risk from using other pipe types would be marginal. A length of 0.64km of RRJ concrete pipes has been identified as being at high or extreme risk in these circumstances.

Above Ground Facilities

There are no above ground drainage assets in this rural scheme. Table 10 details the hazard impacts that the scheme is exposed to.

Table 10: Risks to Assets

Threat	Hazard Impact
Flooding	Some breakout flooding from the Ashley River has been modelled to affect parts of this scheme
Earthquake	Vulnerable to shaking effects
Liquefaction	The eastern part of the scheme is located in the liquefaction susceptibility zone
Slope Hazard	Low to very low threat
Tsunami	Inundation from tsunami up to 3 metres in depth has been modelled to affect the coastal parts of this scheme
Wildfire	Wildfire threat ranging from low to extreme across the scheme
Snow	30-40cm could be expected
Wind	Medium and high threat
Lightning	District wide hazard
Terrorism	District wide hazard

The Council's response to these risks is being managed at a district level via the DRA Action Plan and related projects. Refer to the District level AMPs for details. No scheme specific mitigation actions have been identified for this scheme

5.6 Growth Projections

There are a number of factors that are likely to influence future demand on land drainage systems. These may include:

- Population trends
- Changes in land use
- Climate change
- Changes in legislation
- Advancements in drain management

Until recently the Central Rural Drainage Scheme was substantially rural farmland, however a number of farms have been subdivided into four-hectare rural lifestyle blocks or smaller rural residential clusters. The main areas of growth are Fernside and Tuahiwi. This growth of lifestyle blocks and rural residential clusters is expected to continue.

With a policy of runoff being required to be held to predevelopment levels, any new development is intended to avoid impacting on land drainage in the area. However, flooding of roads and private properties during the June 2014 rainfall event in both Fernside and Tuahiwi was extensive. Further issues arose in the 2017 events. Both immediate solutions and a longer term work programme were developed to seek to resolve the land drainage issues for these communities. The programme for Tuahiwi is not complete, and the only outstanding project for Fernside is the Dockey Creek diversion due to be constructed in the 25/26 and 26/27 FY's.

The overall district population growth scenario used for the 2021 AMP update was supplied by Council's Development Planning Unit, broken into towns and rural areas. Stormwater growth projections were calculated using the New Projections for LTP 2021-2031 (TRIM200908117997), which was the basis for infrastructure planning.

Due to issues that have occurred with the Census 2018, the population projections that would normally be used as a basis for updating the work previously developed by the Council's Development Planning Unit have not been released by Stats NZ in time for the development of this assessment.

However, based on the historical growth patterns of new dwelling Building Consents over the last three years (636 in 2017/18, 661 in 2018/19 and 615 in 2019/20), the projections used for the previous LTP/infrastructure strategy remain valid to be used for infrastructure planning. As the timeframe for this infrastructure planning is for the thirty years between 2021 to 2051, the previous population projections have been extended out a further three years, as documented in New Projections for LTP 2021-2031 (TRIM200908117997).

It is important to provide a brief comment on COVID19 and the impact it could have on population projections. At the time of writing this paragraph (August 2020), New Zealand is currently in Level 3 restrictions in Auckland and Level 2 restrictions in the remainder of the country. While international migration is currently low arising from the COVID19 travel restrictions, a significant number of New Zealanders are returning home due to the impact of COVID19 on overseas countries. This has contributed to a high level of population growth nationally over the last six months, which has had a flow on effect to growth in the Greater Christchurch and Waimakariri Districts. How long this might continue for and when international migration (from other countries) might return to pre COVID levels is still to be determined. However the existing population projections remained the most appropriate to use for infrastructure planning at this time.

Growth for the Stormwater schemes was calculated using the WDC population projections (TRIM200908117997). Growth in the number of properties expected to be included within the whole drainage scheme are included in Table 11 below.

Table 11: Growth Projections

	Rates Strike	Years 1 - 3	Years 4 - 10	Years 11 - 20	Years 21 - 30
Central Rural	2019/20	2021/22 to 2023/24	2024/25 to 2030/31	2031/32 to 2040/41	2041-42 to 2050/51
Projected Properties	1034	1134	1274	1463	1631

Note that the time frames have been chosen to reflect the periods 3, 10, 20, 30 and 50 years from the AMP release date, however due to the time it takes to complete the analysis the base rates strike data used was from 2019/20.

To calculate connection growth numbers from the population projections, existing Central Rural drainage connections were counted in Fernside, Tuahiwi and Rural population growth areas, from New Projections for LTP 2021-2031 (TRIM200908117997). The population growth rate from these areas was proportioned and combined to produce a growth rate for Central Rural connections, for the development horizons in Table 11.

5.7 Capacity & Performance

The Central Rural Drainage Scheme does not currently provide sufficient capacity to avoid flooding of private property and road surfaces during large storms. Some surface ponding and nuisance flooding occurs due to the low lying nature of the area. Whether this ponding is outside the target storm event level of service has not been investigated. With the introduction of the recent Freshwater National Policy Statement and accompanying regulations, the status of some of these flooding areas may have changed. As the legislation is interpreted and applied, it may be that they officially become wetlands, for which the ability to drain them in storm events will be severely limited.

Following the June 2014 rainfall event, investigations into land drainage improvements were carried out, the subsequent works from which are now mostly completed. This includes improvements to drainage on Mairaki, O’Roarkes and Oxford Roads, and deepening and widening the channel from Swannanoa to Johns Roads in Fernside. The remaining work of diverting Dockey Creek is due for completion in 2026/27

As most of the system consists of open drains, regular maintenance is required so that capacity can be maintained.

6 Future Works & Financial Projections (What Do We Need To Do?)

This section covers the future works required to meet the target levels of service, maintain the asset in an acceptable condition, reduce the risks to an acceptable level and accommodate growth.

6.1 Operation & Maintenance

Maintenance of the open drains is a combination of proactive and reactive work. Drains known to require clean out are completed on an annual basis, with other drains being cleaned when notification is given by adjacent landowners. Much of the routine work is done in the summer months when weed growth is at its peak. In some locations only hand cleaning and or spraying is possible given the limited access available.

Depending on weed growth, some areas may be cleaned more than once a year. This is particularly so where drains are in highly visual areas such as retention ponds. In addition to weed-spraying, drains are cleaned out generally with a weed rake attached to a digger arm.

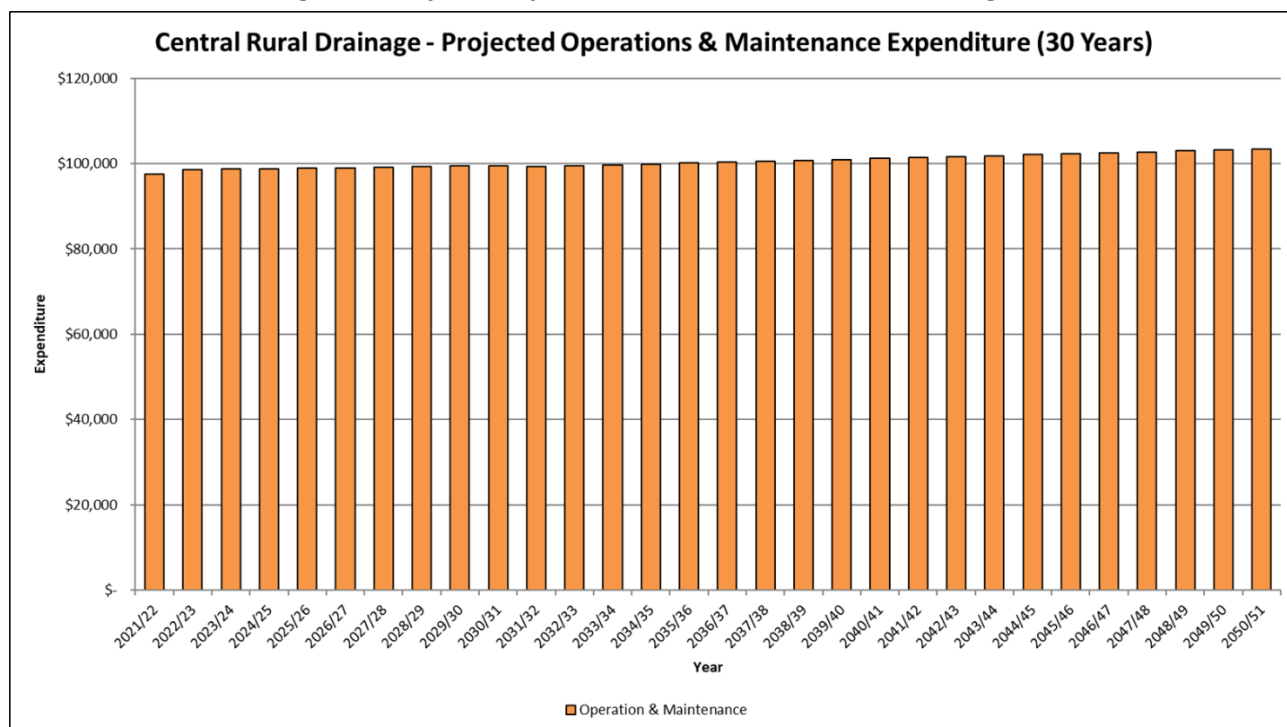
The new district wide consent for drainage maintenance, will change the emphasis of waterway maintenance practices so that environmental and ecological outcomes are ranked equally with drainage outcomes. A comprehensive management plan has been developed to guide this change (TRIM 201203164171) and which forms part of the consent.

There are no pump stations in the Central Rural Drainage Scheme, so Council's Water Unit are not involved in maintenance. Inlet grills and more rural drains are maintained by the WDC Drainage Maintenance Contractor.

Little active maintenance is carried out on the reticulated network. The CCTV programme now under way will provide information as to whether more active maintenance is required.

Figure 2 shows the projected Operations and Maintenance budget over the next 30 years.

Figure 2: Projected Operation & Maintenance 30-Year Budget



6.2 Renewals Programme

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. The annual funding required to ensure long term funding is available to replace assets in the future is shown in Figure 3

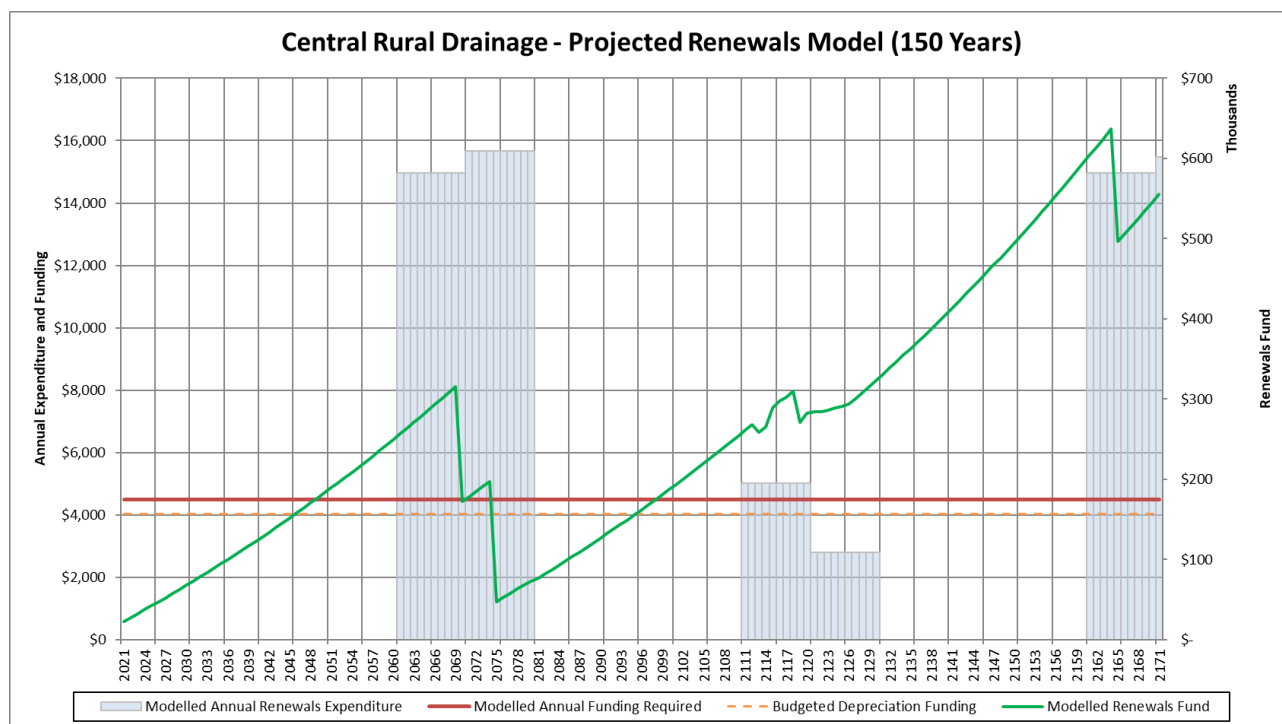
The Central Rural Drainage scheme has few renewable assets so the costs involved are relatively small

Since the average condition of the assets is assumed to be good, and the assets are relatively young, no actual renewals are expected to be needed until at least 2060.

Figure 3 below shows the financial output from the model alone. Over a 150 year period it shows the projected expenditure; the value in the renewals fund; the level of funding required to ensure the fund can meet the required renewals programme, and the annual depreciation, which is the income source for the renewals fund.

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 from the direct renewals model outputs.

Figure 3: Annual Drainage – Projected Renewals 150 year Budget



As may be seen from Figure 3, the budgeted depreciation funding is slightly lower than the annual funding required, notwithstanding the Council's policy of fully funding future renewals

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 takes a simpler and more conservative approach to the way this effect is calculated, which accounts for the small difference shown in Figure 3.

6.3 Capital Works

The following graph shows the 50 year budget for all capital works, which for this scheme are only renewals. It does not show flood improvement works which is expenditure funded by the district drainage rate.

Figure 4: Annual Projected Capital works Expenditure – 50 years

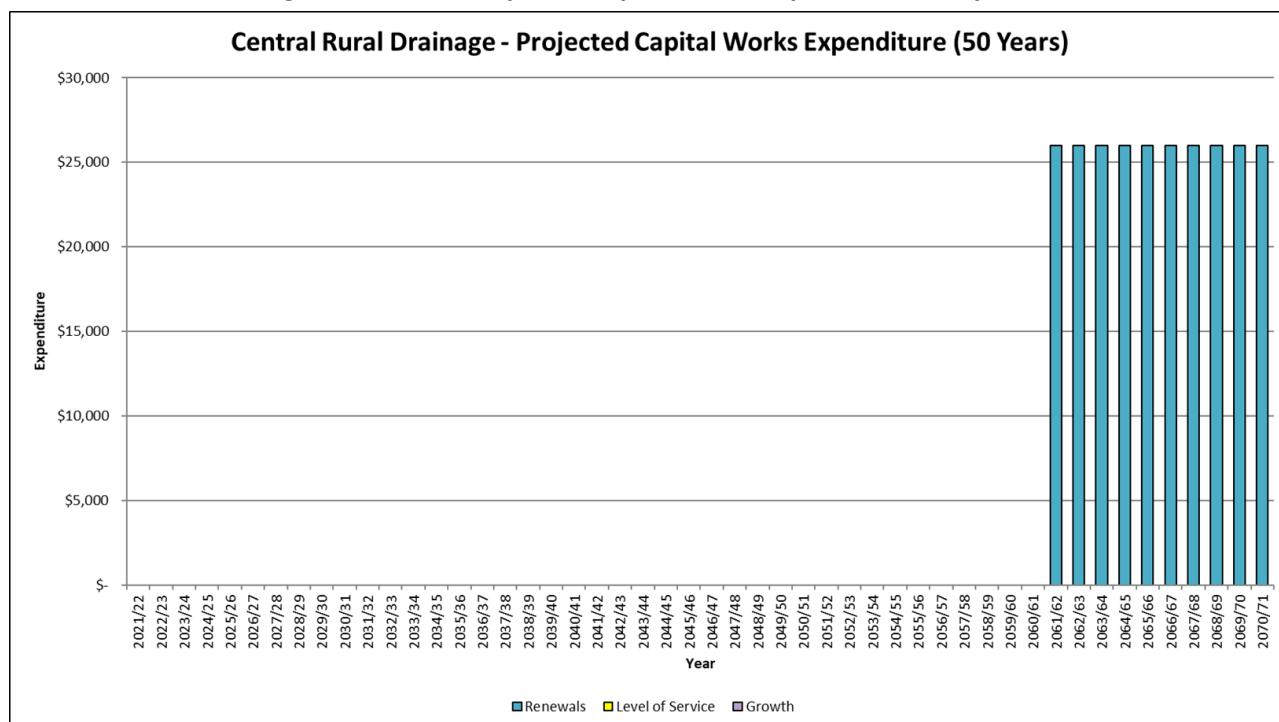


Table 12 also shows all planned capital works over the next 50 years, including renewals, but not flood response works.

The level of confidence in the budget for the works (High / Medium / Low) is presented in the table. For a more complete discussion on the level of optimisation, refer to the introductory chapter of the AMP.

The figures in the table are not adjusted for inflation.

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 total cost of the project over the number of years it occurs.

Table 12: Summary of Capital Works (Includes Renewals)

Year	Project ID	Project Name	Level of Confidence	Project Value	LOS Component	Renewals Component	Growth Component
Year 31 - 50							
2062	URD0080	Central Rural Drainage Long Term Renewals	3 - Low	\$ 259,859	\$ -	\$ 259,859	\$ -
Grand Total				\$ 259,859	\$ -	\$ 259,859	\$ -

Note: the Central Rural Drainage Scheme renewals item indicates the total renewals programme value for the 50 years beginning 2025/26.

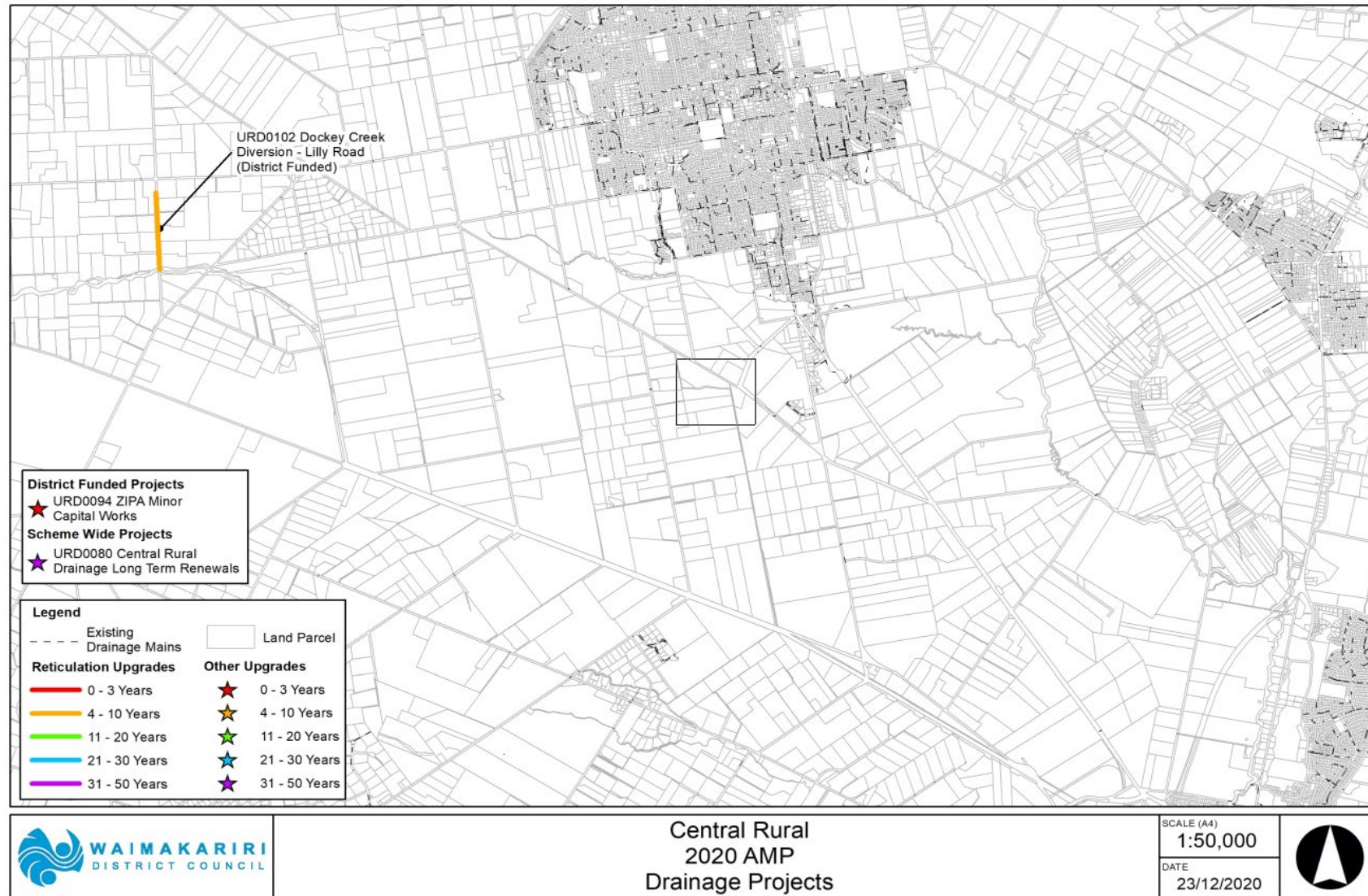
Flood Response Programme

The following additional works, planned within the Central Rural Drainage Scheme geographical boundary, are to be funded by the district wide flood response rate.

Year	Project ID	Project Name	Level of Confidence	Project Value	LOS Component	Renewals Component	Growth Component
Year 1 - 10							
2025	URD0102	Dockey Creek Diversion – Lilly Rd	3 - Low	\$ 1,000,000	\$ 1,000,000	\$ -	\$ -
Grand Total				\$ 1,000,000	\$ 1,000,000	\$ -	\$ -

Figure 5: Projected Capital Upgrade Works (not to scale)

Includes works funded through the flood response works



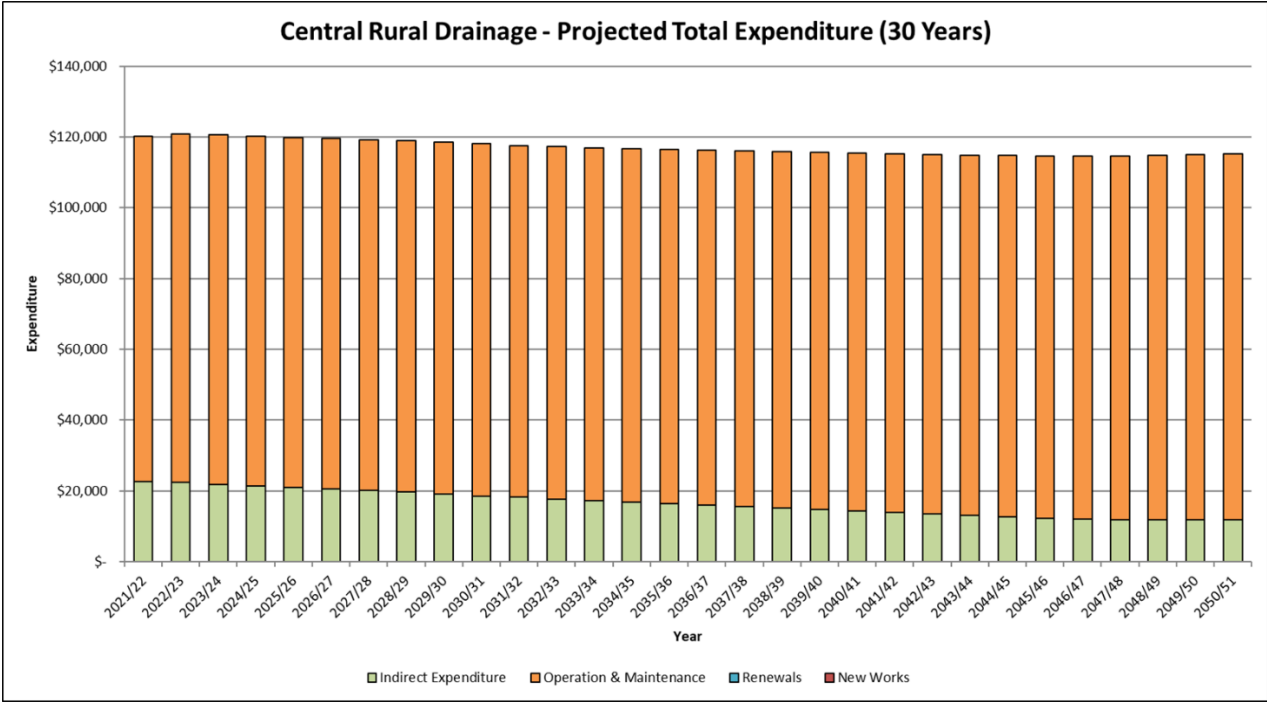
6.4 Financial Projections

The following graph summarises the breakdown of projected total expenditure over a 30 year time horizon. It includes both operational and capital expenditure (with the exception of the flood response works).

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 (including carry forwards), but excludes projects funded by the district wide drainage rate.

Figure 5: Projected Total Expenditure



6.5 Valuation

A full peer reviewed valuation of assets is carried out on a three yearly cycle, using the asset data in our asset management information system. Table 13 below provides a summary of the replacement cost, depreciated replacement cost and annual depreciation for this scheme

Table 13: Asset Valuation

Asset Type	Unit	Quantity	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Manhole	No.	0	\$-	\$-	\$-
Sump	No.	0	\$-	\$-	\$-
Valve	No.	0	\$-	\$-	\$-
Network Main	m	782	\$384,280	\$238,742	\$3,843
Open Channel	m	63,092	\$1,950,299	\$1,948,884	\$177
Facilities			\$-	\$-	\$-
Total			\$2,334,579	\$2,187,626	\$4,020

6.6 Revenue Sources

Revenue is provided from two key sources; targeted rates and Development Contributions. Development contributions are calculated in accordance with Council's Development Contributions Policy (TRIM [191129168016](#)), while targeted rates are charged in accordance with Council's Revenue and Financing Policy (TRIM 180522056008).

Generally rates are targeted rates charged to homeowners within the schemes geographical boundaries. There is also a district wide Flood Response rate which is used to fund flood improvement works anywhere within the district.

7 Improvement Plan

7.1 2021 Improvement Plan

Table 14 details the scheme specific improvements and relevant district wide improvements recommended to address the management issues identified in Section 3. Each improvement item has been tagged to either a capital project or, a process improvement project to help manage and track Councils response. Short term indicates within the first three years of the LTP, long term, out beyond 2021.

If the table is empty, this indicates that all improvements required are either district wide improvements (covered by the Overview AMP), or covered by a capital project or projects, covered in the Capital Works section.

Table 14: 2021 AMP Improvement Plan

Project Ref	AMP Section	Project Description	Priority	Status	Estimated Cost
NA	NA	NA	NA	NA	NA

APPENDIX 'A'. PLANS

Figure 6: A1 - Plan of Serviced Area as of November 2017

