HOPUA WAI - WATER SUPPLY
Asset Management Plan

MASTERTON DISTRICT COUNCIL 2021 - 2031

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MASTERTON DISTRICT COUNCIL
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DOCUMENT CONTROL

Masterton District Council

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11	12/03/2018	Total Plan review	D Mawson
12	25/03/2021	Total plan review for Audit	D Mawson
13	29/03/2021	Updated from council deliberations for final adoption	D Mawson

EXECUTIVE SUMMARY

Summary

This Water Supply Asset Management Plan covers the water supply assets that Masterton District Council currently owns and operates.

Within the supplied networks Council also provides a number of Upper Plain residents with potable water.

Council owns non-potable rural water supplies at the Castlepoint (toilets), Wainuioru and Taueru areas, due to their small size, their local management and being non-potable supplies these supplies are not currently included in this plan, but it is expected that the Plan may be extended to include their management in the future if the scope of these supplies is developed.

Council supports, but does not own, a small number of rural water supplies at other locations (e.g., Castlepoint, Fernridge and Opaki). However, because these networks are not owned by Council these supplies will not be included in this Plan. But the exclusion of these supplies from the Plan may be reviewed at a future date dependant on changes to legislation.

This asset management plan should be read in conjunction with the Long-Term Plan (LTP 2021-31) which is the districts overall plan for the next ten years to promote the social, economic, environmental and cultural well-being of the community now and in the future.

The plan contributes towards achieving the Masterton District Councils stated community outcomes of being an easy place to move around, achieving a strong sustainable economy, having an active, involved & caring community. Making us a sustainable, healthy natural environment, and creating a knowledgeable resilient community.

Strategic and tactical asset management also plays a role in improving social and environmental outcomes for Masterton.

The Council owned water supplies comprise of the following, approximately 202 km of reticulation pipes varying diameters, material and condition. Including 13,000m3 of water storage in 5 reservoirs, a booster pump, & the treatment facility at Kaituna & Tinui. From the information in the Councils rates records water is supplied to 8,351 customers.

The delivery of water is funded through targeted location and usage rates per property. The total optimised replacement cost of water assets inclusive of supply, reticulation & rural supply's as of 1 July 2020 was $102,755,668. With an optimised depreciated replacement cost of $61,389,728

Potential new Water assets are also funded from private developments.

There are risks associated with the supply of water and these water assets, and the main risk identified that may pose a threat to the Councils water assets is earthquake damage which could affect the supply to our customers. Possible solutions to mitigate this risk is to create alternative sources of supply to our community. The main risk to the community is a treatment failure causing a pathogen outbreak. This risk is being managed through chlorination of the urban water supplies and by ongoing management of the Water Safety Plan for the district. For more information see Council's Potable Water Demand Management Plan (MDC, July 2017).

Council believes it presently has sufficient capacity within its Masterton water supply infrastructure to continue to supply the current levels of potable water from Kaituna & Tinui to service and absorb possible expansions in its water network.

Although the capacity of Masterton's reticulation network is adequate to meet current and forecast demand for water supply, many of its age and condition does vary considerably.

Current installation of Smart Water meter on all Masterton residential urban properties will help with Water demand measurement, identify leaks and aid water use behaviours. This work is due to be completed in 2021.

INTRODUCTION

Background

The purpose of this Water Asset Management Plan ("the Plan") is to provide Masterton District Council ("Council") with a tool to assist with the management of its water supply assets ("the assets"). This tool combine's management, financial, engineering and technical practices and is intended to:

- Ensure that an agreed level of service is provided to defined standards at optimum cost.
- Be sustainable in the long term.
- Comply with regulatory requirements.
- Aid Council to achieve the outcomes the community has defined.

This Plan, prepared in 2021, supersedes Councils "Water Supply Asset Management Plan 2018".

Scope of plan

Council owns, operates and maintains public water assets within the Masterton district located at Kaituna and Tinui. The Wainuioru scheme is managed by a committee which is comprised of connected property owners. Council also supports, but does not own, several smaller water schemes in rural locations. These smaller, privately owned schemes and Wainuioru scheme are not currently included in this Plan.

This Plan was developed to provide Council with a long-term view of:

- Where its water assets (those Council owns) are currently at
- What issues are likely to impact on these assets in the future?
- What level of service should be provided to the community in the future at a cost that can be afforded?

All the figures in this plan are expressed in New Zealand dollar values as of 30 June 2020 and unless noted otherwise, are in GST exclusive terms.

Summary of Assets

Water and Sanitary Review (2005 WPS-Opus and updated in 2016 by Masterton District Council) grouped each population centre in the Masterton district into water aggregated communities for analysis. For the purposes of the assessment, only water supplies that have the potential to affect public health were considered (I.e., not for irrigation or industrial processes). The different water communities identified were:

- Urban fully served. Masterton and Tinui is the only community in this group to date.
- Semi served (Non potable water only). Taueru, Castlepoint toilets and Wainuioru is the only community in this group to date.
- Unserved (roof water). Includes:
  - Whakataki
  - Mataikona
  - Rural Schools (e.g., Mauriceville, Whareama)
  - Rural halls
  - Private rural facilities (e.g., Ararangi Camp, Camp Anderson, Riversdale Motor Camp)
- Unserved (ground/surface water). See above.

- Unserved limited population. Not applicable to Masterton.
- Industrial communities with Building Act requirements for water & wastewater
- Private water supplies. This includes Castlepoint, Fernridge, Upper Plain, Mauriceville, Opaki and Taueru (Taueru).

Summary of Total Masterton Urban and Rural Water Supply Assets

ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
1	Water Intakes	Ea.	1	Masterton
2	Bores / springs	Ea.	1	Tinui
3	Treatment Plants	Ea.	2	Kaituna (Masterton) & Tinui
4	Storage Tanks & Reservoirs	m^3	13,000	Approximate capacity when full to specification
		No.	8	
5	Pipelines	km	202	20 to 600 mm dia.
6	Pumping Stations	Ea.	1	Masterton boost
7	Valves	Ea.	1048	Various use & sizes
8	Connections	Ea.	9,300	Based on the no. of rateable properties
9	Identified Toby's	Ea.	8,659	Water smart-meter project data
10	Hydrants	Ea.	1110	Various sizes

Asset Management Drivers (Water)

The delivery of water supplies is regulated and controlled by central government. Council's role in advocating on behalf of the region's water users, ratepayers and residents is a key driver of the asset management process. It enables sound arguments to be put to the appropriate bodies to ensure equitable access to, and funding for, the water supply networks. Asset management plans clearly define the communities, Council objectives and how these can be successfully delivered.

Goals and objectives of asset ownership

Council has adopted a funder-provider role and elected to deliver the water supply service using a combination of in-house (treatment works only) and contracted labour. Council attaches a high priority to the role that it plays in the provision of water supply services.

Council has developed strategies for continued infrastructural development to meet the community's requirements that minimise the adverse effects on the environment. These strategies also offer continued support for emergency preparedness measures throughout the district.

Councils' overall objectives for the water supply service are to:

- Treat and distribute an adequate supply of potable water for human and commercial use in urban areas.
- Support the provision of non-potable and water race supply in rural areas.
- Provide an adequate capacity and pressure for fire fighters.
- Ensure an effective, economic and secure distribution of potable water.
- Ensure compliance with legislative requirements.

The reasons why Council is involved in this activity are:

- The effective management of water supply services is necessary in order to protect public health and the environment.
- The Health Act 1956 requires every territorial authority to improve, promote and protect public health within its district.

Asset management systems

Council's services contract requires ongoing administration and monitoring of the works. This is to ensure the work is being carried out to Council's satisfaction and in a cost-effective manner.

This contract has allowed for increased reporting on the information held on the asset. Further work is also anticipated in terms of physical inspection of the service.

The WTP staff have developed an emergency response plan for the plant's operation principally after a major earthquake disrupts the water supply.

Council has implemented an asset Management system called "Assetic" which is a central strategic register and asset management system for all asset classes. It includes in-built reporting, works tracking and life-cycle costing. It will be integrated with 'Predictor' (a standalone programme within Assetic) for a complete Strategic Asset Management planning and operational system capable of holding all water asset information.

Council has also developed an Engineering Lifelines plan, which identifies vulnerable components of the water supply asset and ways of mitigating the degree of disruption likely to be incurred in a civil emergency. Mitigating work identified in the plan will be progressively implemented.

Standards and guidelines (Water)

In operating and maintaining its water supply assets, Council currently use the following standards and guidelines on a regular basis as appropriate:

- Ministry of Health (2005) Drinking Water Standards for New Zealand (Revised 2018)
- Standards New Zealand (2004) NZS4404: 2010 Land Development and Subdivision Engineering.
- NZS 3910 Conditions of contract for building and civil engineering construction (2013)
- NZS 3916 Conditions of contract for building and civil engineering - Design and construct
- Standards New Zealand (2003) NZS3910: 2003 Conditions of Contract for Building and Civil Engineering Construction.

Asset plan sophistication target level

The level of sophistication refers to the degree to which core and advanced criteria for asset management planning have been achieved. Criteria for core and advanced asset management planning are set out in the International Infrastructure Management Manual. (IIMM)

This plan sets out to achieve the minimum level of sophistication where corporate expectations are expressed informally and simply.

Summary of asset management practice

The table below compares our current practice with appropriate and best asset management practice. (Based on International Infrastructure Management Manual - IIMM guidelines)

Asset plan sophistication target level

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This plan sets out to achieve the minimum level of sophistication where corporate expectations are expressed informally and simply.

Water Supply Asset Management Processes

Asset Management Activity	Current practice	Appropriate	Best practice
1. Level of service	Review LOS & consult with community at least every 3 years	√	
2. Knowledge of assets	Asset management system containing all assets maintained. Supplemented by contractor/specialist reports on serviceability & condition.	√	
3. Risk management	Strategic risk assessment at least every 6 years. Operational risk assessment at least every 3 years. Emergency response plans have been developed.	√	
4. Condition assessment	Largely based on contractor's service records & Council records e.g., Resource consents. Specialist studies/reports supplement these records to build knowledge e.g., Leak Detection Study.	√	
5. Accounting / Economics	NCS accounting system. Accrual based system.	√	
6. Operations	Service contractors are monitor & report on any operational issues. Operated to appropriate MOH guidelines & NZ standards.		√
7. Maintenance	Service contractors monitor the system and undertake/report on any maintenance work required. Maintained to appropriate MOH guidelines & NZ standards.		√
8. Performance monitoring	Reported annually as part of the Annual Report process.		√
9. Optimised lifecycle strategy	Performance assessment used to prioritise lifecycle strategy.	√	
10. Design Project/Management	Expertise is contracted as required.		√
11. Asset utilisation /Demand modelling	Utilisation derived from water use data. Demand forecasting reliant on historic usage records, staff knowledge, census and demographic data and Assetic asset modelling	√	
12. Quality Assurance /Continuous improvement	Improvements identified and compiled into a plan.		√

LEVELS OF SERVICE

Introduction

This Water Supply Asset Management Plan intends to match the level of service the asset provides with the expectations of customers given financial, technical and legislative constraints.

Asset activity plans can be readily aligned with strategic financial planning. Formalised asset management systems and practices provide the Council with key benefits, such as:

- Improved understanding of service level options and requirements.
- Minimum life cycle (long term) costs for an agreed level of service.
- Better understanding and forecasting of asset related management options and costs.
- Managed risk of asset failure.
- Improved decision making based on costs and benefits of alternatives.
- Clear justification for forward works programmes and funding requirements.
- Improved accountability over the use of public resources.
- Improved customer satisfaction and organisation image.

Pursuing formal asset management planning enables council, as owners of a comprehensive range of assets, to demonstrate to their customers and other stakeholders that services are being delivered in the most effective manner.

The purpose of this Asset management Plan is to report on the current service levels for each asset stream and how council operates these on the community's behalf. Options to vary the level of service are also reported, resulting in the presentation of a series of possible options for future maintenance or improvement.

Customers and stakeholders

Council's water supply service customers include, Ratepayers, Residents, Local industries, Businesses, Health and Educational institutions, Fire service, Parks, Emergency services, and Carterton District Council.

Council's water supply service stakeholders include, Ministry for the Environment, Ministry of Health, Ministry of Agriculture and Fisheries, Carterton District Council, Local Iwi including, Rangitāne o Wairarapa, & Ngāti Kahungunu ki Wairarapa, Department of Conservation, Wairarapa District Health Board, Federated Farmers, Greater Wellington Regional Council, Contractors, Subdivision developers, Landowners, and Fish & Game.

Annual residents survey

2020 resident survey Water Supply

The most recent survey was done in 2020 (Keyresearch May 2020). Current performance based on recent survey results and compared to national and peer group averages is assessed as being adequate for the level of service desired by the community.

Introduction

The Masterton District Council has a requirement to measure how satisfied residents are with the resources, facilities and services provided by Council, and to prioritise improvement opportunities that will be valued by the community.

Research objectives

- To provide a robust measure of satisfaction with Council's performance in relation to service delivery
- To determine performance drivers and assist Council to identify the best opportunities to further improve satisfaction, including satisfaction amongst defined groups within the district.
- To assess changes in satisfaction over time and measure progress towards the long-term objectives

Methodology

- A statistically robust survey conducted online and via postal survey with a sample of n=579 residents across the Masterton District area
- Post data collection the sample has been weighted so it is aligned with known population distributions for the Masterton District Council area, as per the Census 2018 results, based on age, gender and ethnicity.
- A total of 3,000 invitations were posted. At an aggregate level, the sample has an expected 95% confidence interval (margin of error) of +/ 4.1%.
- Data collection took place between 16 April and 24 May 2020

Notes

Due to rounding, percentages may add to just over or under (+/ 1%) totals

Historical residential surveys

Council conducts a resident's survey and meets with focus groups to gain feedback on community perceptions of Council every year. The National Research Bureau (NRB) has carried out 'Communitrak' surveys for Council every year since 1993. This is a means of measuring Council's effectiveness in representing the wishes and viewpoints of our residents. It provides a comparison for Council on major issues, and on our performance relative to the performance of our peer group. It also compares Council to other Local Authorities throughout New Zealand and to previous Communitrak results, where applicable.

The following table shows the high-level results of the 2020 survey and the historical Communitrak Surveys rating the level of service for water supply.

Results of Masterton's Communitrak Survey for Water Supply (Urban Ward Residents Only)					
Survey year	Very Satisfied %	satisfied %	Neutral %	Dissatisfied %	Very dissatisfied %
2020	23	39	18	5	0
Survey year	Very satisfied %	Satisfied %	Not very satisfied %	* Very dissatisfied %	Do not know
2018	31	55	10	3	1
2017	33	56	8	2	1
2016	36	53	9	2	1
2015	28	53	9	2	1
2014	25	68	6	1	0
2012	56	40	3	n/a	1
2011	48	41	11	n/a	0
2010	48	42	9	n/a	1
2009	50	44	6	n/a	0
Peer-group (size)	56	37	5	n/a	2
National average	55	38	6	n/a	1

*Different survey provider for 2020 and different satisfaction scale.

*Readings prior to 2014 had a different satisfaction scale. No survey in 2013 or 2019.

Public meetings on special projects

The Council's current policy is to ensure public consultation when undertaking any major special projects as per our significance and engagement framework.

Community outcomes consultation

Council's levels of service contribute to achieving the following community outcomes as listed below. The Community Outcomes were identified as part of the 2021 -31 Long term Plan (LTP) process and were widely consulted on at that time.

Community Outcomes

Community Outcome	How Water Assets contribute
A thriving and resilient economy	Ensure a continuous potable water supply for industrial and/or commercial purposes
An engaged and empowered community	• Ensure a continuous potable water supply that meets the DWSNZ (2005) and contributes to the health of the community. • Ensure a fair distribution of potable water supply to all parts of the community, delivered in a culturally sensitive manner
A sustainable and healthy natural environment	Extract, treat and distribute an optimum quantity of potable water to meet the demand of current and future customers, whilst complying with relevant resource consents

Legislative and other requirements

Statutory requirements set the framework for the minimum standards of service, which the water assets must be met, and are generally non-negotiable. The key legislation and policies relating to the management of the assets are listed below.

Relevant legislation affecting this asset.

- The Local Government Act 1974 (Part XXXI).
- The Local Government Act 2002.
- The Climate Change Response Act. And Zero Carbon Act 2019
- The Civil Defence Emergency Management Act 2002 (Lifelines Amend Act 2016).
- The Health Act 1956.
- Health (Drinking Water Amendment Act) 2007.
- The Resource Management Act 1991.
- Building Act 1991.
- Water Supply Protection Regulations 1961.
- Health and Safety in Employment Act 1999.
- The Local Government (Rating) Act 2002.
- Public Bodies Contracts Act 1959.
- Fire Service Act.
- Fire Service Code of Practice.
- Public Works Act 1981.

Relevant regulations affecting this asset.

- Drinking Water Standards NZ 2005 (Rev 2018)

Council policies affecting this asset.

- Wairarapa Combined District Plan 2011
- Financial/Rates Policies
- Water Supply Bylaw 2012
- Asset Management Policy (2018) Next update 2021

Regional council policies and plans affecting this asset.

- Regional Policy Statement
- Natural Resources Plan

Council strategic planning and other documents affecting this asset.

- Long Term Plan (LTP) 2021-31
  - Other planning and other reference documents
- NZS4404: 2010 Land Development and Subdivision Engineering Code of Practice

Other organisations and bodies that council intends to work with relating to this asset.

- Central Government
- Greater Wellington Regional Council
- Masterton District Council
- Carterton District Council
- Rangitāne o Wairarapa
- Ngāti Kahungunu ki Wairarapa
- The Department of Conservation
- Wairarapa District Health Board including Wairarapa Public Health
- Regional Public Health

Bylaws affecting this asset.

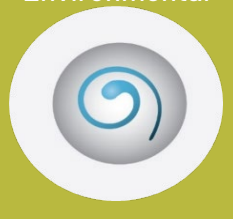
The Water Supply Bylaw Council enacted under the provisions of the Local Government Act 2002, the Health Act 1965 and the Ratings Powers Act 1988 covers:

- Types of supply (definition of ordinary, extraordinary and restricted supply)
- Use of fire hydrants.
- Working around buried services
- Protection of water supply (entry to water reserves)
- Conditions of supply (application for service, point of supply, metering level of service)
- Continuity of supply (water restrictions, emergencies, scheduled maintenance / repair and liabilities)
- Customer responsibilities (plumbing design and maintenance, provision of access for Council staff, back flow protection and payment of services)
- Breaches, offences and disputes

Other corporate objectives

The Local Government Act 2002 (Schedule 10) states that a purpose of local government is to promote the social, cultural, economic and environmental well-being of its communities, now and for the future. Council's decision-making processes are structured to reinforce this sustainable approach and the table outlines how Council is guided by these principles.

Council Decision Making Guidelines for Sustainable Development

Well-Being	Decision making guidelines
Social 	• Community development initiatives will be supported. • Opportunities for community activities and events will be promoted. • Standards to support health and well-being will be maintained. • Social needs will be considered in all infrastructural planning.
Cultural 	• The perspectives and cultural needs of all members of the community will be considered when making decisions, particularly those of local Iwi. • Community activities and initiatives to promote and celebrate diversity will be encouraged. • Arts, culture and heritage initiatives are recognised as being the 'heart' of our community and will be encouraged.
Economic 	• Depreciation will be funded as appropriate to each asset, taking into account the asset's strategic value, anticipated future of the asset and expectations for the availability of funding for replacement or renewal. • Funding policies will include an intergenerational equity clause. • Energy efficiency cost savings will be pursued where feasible. • Initiatives to attract and retain skilled residents will be supported and promoted. • Affordability will be a key consideration in all decisions made.
Environmental 	• Initiatives to protect and/or enhance our natural environment will be supported. • Actions consistent with the objectives of the Wairarapa Combined District Plan and the Wellington Regional Policy Statement re sustainability will be pursued. • Opportunities to be more energy efficient and to minimise our carbon footprint will be sought. • The potential impacts of climate change will be considered and actions to mitigate and/or adapt supported.

Register of Community drinking water supplies.

The Ministry of Health maintains the Register of Community Drinking Water Supplies in New Zealand. It provides a grading for all community water supplies based on the following:

- The first letter of the grading relates to the source water and treatment plant.
- The second letter relates to the distribution zone.

Register of community drinking water supplies grading system

Source/ Treatment grading	Distribution grading	Description
A1	a1	Completely satisfactory, negligible level of risk, demonstrably high quality.
A	a	Completely satisfactory, extremely low level of risk.
B	b	Satisfactory, very low level of risk.
C	c	Marginally satisfactory, low level of microbiological risk, moderate level of risk.
D	d	Unsatisfactory level of risk.
E	e	Unacceptable level of risk.
U	u	Un-graded.

The following shows the grading for the Masterton water supply from 2008 to 2019. Although these grades are not currently in Council's level of service, it is considered useful to note them here. They may in future become part of Councils level of service. In 2018 the Drinking Water Standards (DWSNZ) changed to require routine monitoring of total coliforms, and enumeration testing for E. coli and total coliforms,

Masterton community drinking water supplies grades

Year	Grade
2020	Fully compliant with DWSNZ 2018
2019	Fully compliant with DWSNZ 2018 – New DHB compliance classification introduced
2018	Aa
2017	Aa
2016	Aa
2015	Aa
2014	Aa
2013	Aa
2012	Aa

Levels of service and performance measures

Levels of service, performance measures & targets

- Council developed the current water asset levels of service, performance measures and targets shown in the following table to reflect:
- Industry standards
- Customer research and expectations
- Legislative and other requirements
- Strategic and corporate goals

Levels of service were reviewed by consultation with the community in 2014 & 2015, the following table has been adopted by Council through the LTP process and continues in LTP 2021 – 31

Levels of Service, Performance Measures & Targets for Water Supply (2021)

Why Measure This?	Measure	Baseline 2018	Performance Targets			
			2021/22	2022/23	2023/24	Years 4-10
To provide efficient and effective Water Supply systems	Customer satisfaction with urban water supply services	96% satisfaction (includes neutrals)	Maintain or improve satisfaction level over an average of the last three surveys	Maintain or improve satisfaction level over an average of the last three surveys	Maintain or improve satisfaction level over an average of the last three surveys	Maintain or improve satisfaction level over an average of the last three surveys
	Mandatory Measures: The total number of complaints received by the local authority about any of the following:					
	Measure	Baseline	Performance Targets			
			2021/22	2022/23	2023/24	Years 4-10
	Drinking water clarity	1.66/1000 requests were received.	Less than or equal to 1.66/1000 requests were received	Less than or equal to 1.66/1000 requests were received	Less than or equal to 1.66/1000 requests were received	Less than or equal to 1.66/1000 requests were received
	Drinking water taste	0.22/1000 requests were received	Less than or equal to 0.22/1000 requests were received	Less than or equal to 0.22/1000 requests were received	Less than or equal to 0.22/1000 requests were received	Less than or equal to 0.22/1000 requests were received
	Drinking water odour	0.5/1000 requests were received	Less than or equal to 0.5/1000 requests were received	Less than or equal to 0.5/1000 requests were received	Less than or equal to 0.5/1000 requests were received	Less than or equal to 0.5/1000 requests were received

	Drinking water pressure or flow	0.55/1000 requests were received	0.55/1000 requests were received	0.55/1000 requests were received	0.55/1000 requests were received	0.55/1000 requests were received
	Continuity of supply	2.33/1000 requests were received	2.33/1000 requests were received	2.33/1000 requests were received	2.33/1000 requests were received	2.33/1000 requests were received
	The local authority's response to any of these issues	100%	100%	100%	100%	100%
Level of service	**Measure**	**Baseline**	**Performance Targets**			
			2021/22	**2022/23**	**2023/24**	**Years 4-10**
To provide efficient and effective Water Supply systems	Mandatory: Where the local authority attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times measured:					
	Attendance for urgent callouts: from the time that the local authority receives notification to the time that service personnel reach the site. Baseline: 60 minutes		≤60 minutes	≤60 minutes	≤60 minutes	≤60 minutes
	Resolution of urgent callouts: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption. Baseline: 480 minutes		≤480 minutes	≤480 minutes	≤480 minutes	≤480 minutes

	Attendance for non-urgent callouts: from the time that the local authority receives notification to the time that service personnel reach the site. Baseline: 7 days	≤7 days	≤7 days	≤7 days	≤7 days
	Resolution of non-urgent callouts: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption. Baseline: 3 months	≤3 months	≤3 months	≤3 months	≤3 months

Level of service	Measure	Baseline	Performance Targets			
			2021/22	2022/23	2023/24	Years 4-10
Provide water supply services in a way that is acceptable, safe and has minimal environmental impact.	Mandatory: The extent to which the local authority's drinking water supply complies with: (a) part 4 of the drinking-water standards (bacteria compliance criteria). (b) part 5 of the drinking-water standards (protozoal compliance criteria).	Fully compliant 100%	100% 100%	100% 100%	100% 100%	100% 100%

	Mandatory: The percentage of real water loss from the local authority's reticulation system (calculated using minimum night flow).	37% water loss	Reduction on previous years	Reduction on previous years	Reduction on previous years	Reduction on previous years
	Mandatory: The average consumption of drinking water per day per resident within the district.	609 (2018) litres/person/day (Supplied water)	Reduction on previous years	Reduction on previous years	Reduction on previous years	Reduction on previous years

Past performance measures

The following table shows the performance measures for the water supply activity, and whether Council has achieved them. This information was obtained from the Annual Reports for each year. Note it gives a reasonably simplistic view of Councils performance and the reader is referred to the Annual Reports for further details.

Past Masterton District Water Supply Performance Trends

Performance Measure	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
100% compliance with DWSNZ for urban supply	Achieved	Achieved	Achieved	Achieved	Achieved	Achieved	Achieved
Continuous supply of water except for planned or emergency shutdowns. Shutdowns no longer than 2 hours on 95% of occasions	Not Achieved	Achieved	Not Achieved	Not Achieved	Achieved	Achieved	Achieved
Urban water supply satisfaction level >than peer group average	Achieved	Achieved	Achieved	Achieved	Achieved	Achieved	Achieved

Compliance with microbiological criteria (DWSNZ) for Tinui supply	Achieved	Achieved	Achieved	Achieved	Achieved	Achieved	Achieved
Water supply assets managed to a level specified and agreed to in the AMP	Note 1	Not achieved	Note 1	Note 1	Note 1	Note 1	Note 1
100% compliance with resource consents for drawing water	Achieved	Achieved	Achieved	Achieved	Achieved	Achieved	Achieved
The percentage of real water loss from the local authority's reticulation system (calculated using minimum night flow).	Note 1	30%	32%	32%	36%	37%	37%
Reduction in average consumption of water (supplied)	Note 1	Base year 923.l/p/d	Achieved 811.l/p/d	New base year 655 l/p/d	Achieved 646.l/p/d	Achieved 609.l/p/d	Achieved 601.l/p/d

*Note 1- Performance measure not used for this year.

NB: Average consumption for water included supplied water, calculated leakage and commercial use. The Masterton urban water use for 2019/20 is then approximated at 340 l/p/d. Once water meters are operational data confidence will increase.

How Water Supply levels of service contribute to our community outcomes					
Community Outcomes					
Levels of Service	A strong resilient economy	A sustainable, healthy environment	An active, involved and caring community	A knowledgeable community	An easy place to move around
Provide an efficient and effective water supply system	√	√	√		
This level of service aims to ensure the needs of local communities are met regarding the treatment and supply of domestic and industrial water requirements. This contributes to both the public health of the community and the community's capacity for growth and economic development, now and in the future.					
Provide water supply services in a manner that is acceptable, safe and has minimal environmental impact	√	√	√		
This level of service aims to ensure that services are provided in a way that is equitable and culturally acceptable, whilst maximising public health opportunities and minimising environmental impact.					

Current level of service

The current levels of service were originally agreed with our community in 2006 and have changed and evolved through each iteration Annual plans, Asset Management plans and Long-Term plans.

The results of the Public Health Risk Management Plan review, further leak detection studies and/or the planned network condition assessment may identify level of service 'gaps and thus improvements to be made. Any identified opportunities for improvement will be incorporated into this.

Desired levels of service

Councilors and Council staff have reviewed and workshopped the Level of Service in 2020/21 by further improving the effectiveness and efficiency of its systems Council could improve service delivery.

For example, by reducing leakage, we could enhance the system's capacity especially during hot, dry seasons.

Undertaking strategic reviews of water supply services will identify ways in which Council can further enhance the effectiveness and efficiency of the system. Through such reviews specific work and/or projects could be identified and assessed for affordability versus potential benefit.

Options to Enhancements and or Improvements to Levels of Service			
Option to improve level of service	Justification	Benefit	Cost
Enhance the water conservation programme to better educate the community and commercial users on more efficient water use	Demand management	Potential to enhance the programmes reach and impact	$20,000 pa
Enhance water conservation by completing installation of water meters	Demand management (post installation management)	Improve data provision to customers	$100,000
Review operation of rural water schemes	To provide adequate water treatment to achieve DWSNZ for Wainuioru scheme, Mauriceville and Rural Hall users	Increased water quality	$780,000 Wainuioru $120,000 Rural Halls $400,000 Mauriceville
Improve perceived taste of the urban water supply by increasing flushing and managing raw water intake flows	Customer feedback Opportunity to add value and enhance service	Better able to meet consumer needs. Enhances user services	$2,000
Improve taste by installing carbon filtration	Customer feedback Opportunity to add value and enhance service	Better able to meet consumer needs. Enhances user services	$1,500,000
Sediment control by increased pipe renewals (remove older steel pipes)	Customer feedback Opportunity to add value and enhance service	Better able to meet consumer needs. Enhances user services	$1,600,000 PA for 5 years

Extended urban supply area	Customer feedback Opportunity to add value and enhance service.	Better able to meet consumer needs. Enhances user services	Cost is location specific
Install 'slam shut' seismic valves to reservoirs and wave curtains	To stop the flow of water from storage reservoirs in the event of an earthquake	Enhanced risk management processes	$200,000

Financial summary

Current Costs

In 2020/21 forecast Urban Water Supply Services, delivered at current levels of service produced.

- Operating costs of $3,857,629
- Rate's funding of this was $3,387,678
- Proportion of Total Cost: 88%

In 2020/21 Rural Water Supply Services, delivered at current levels of service produced.

- Operating costs of $340,884
- Rate's funding of this was $103,545
- Proportion of Total Cost: 30.3%

Note: Wainuioru Water Supply is funded by a directly invoiced charge rather than a property rate, hence the lower % of costs funded by rates.

Source 2020/21 Annual plan.

To maintain these current levels of service, maintenance and renewal work will need to be undertaken, as detailed in this AMP. For more information re specific projects identified, please refer to sections: 4 Future Growth and Demand; 5 Risk Management and 6 Life Cycle Management Plans.

Cost of enhancing current levels of service (LOS)

A number of projects and activities have been proposed as suggested increases or decreases in the current service levels. None of the projects are required to maintain existing levels of service and have been included in this Plan to facilitate decision-making at Council level. The cost benefits have not been quantified in the following Table.

It should be noted that the level of services provided through the upgrading of assets is subject to the availability of capital contributions for that service.

Work and cost required to enhance current level of service				
Action/Work	Driver	Estimated cost	Scheduling	How this is funded
Enhance water conservation programme	Potential to enhance current LOS and reduce water restrictions at peak periods	$20,000 pa is currently allocated to water conservation initiatives. Any spend beyond this would be used to enhance the programme	2021/22 and ongoing	Rates
Improve perceived taste of the urban water supply by increasing flushing and managing raw water intake flows	Customer feedback & opportunity to add value and enhance service	$2,000	2021/22	Rates
Review operation of rural water schemes	To provide adequate water treatment to achieve DWSNZ for Wainuioru scheme, Mauriceville and Rural Hall users	Increased water quality	$780,000 Wainuioru $120,000 Rural Halls $400,000 Mauriceville	External funding
Sediment Control – Increase metal pipe renewals	Customer feedback & opportunity to add value and enhance service	See pipe renewal costings	2021/22 - 2031	Depreciation
Completion of water meters project	Demand management	$100,000	2021/22	Loan

Town centre revamp project	Enhance customer experience	$950,000 over 10 years	2021 – 2031	Included in renewal budgets

FUTURE GROWTH AND DEMAND

Introduction

The objective of asset management is to create, operate, maintain, rehabilitate and replace assets at the required level of service for present and future customers in a cost effective and sustainable manner. This Plan must therefore forecast the needs and demands of the community now and in the future and outline strategies to develop the assets to meet current and future needs.

Council has considered the following factors in for the water supply in addition to those described in LTP assumptions to predict future demands:

- Water demand and delivery of service
- Tourism
- Land use (including timber processing)
- Changing legislative requirements
- Commercial influences such as industrial expansion at Waingawa may increase demand for services or result in demand for different types of services.
- Private water schemes requiring intervention by Council.
- Population effect

Population effect

With a 1% yearly forecast growth population, Council does not expect the demand on water supply quantities to change significantly. The household distribution and urban/rural split should continue to be monitored. If the rural population does continue to increase on the outskirts of the urban area, this growth could be accommodated by expanding existing urban facilities.

Some rural areas that have experienced population growth, such as Opaki, have their own water supply service and therefore growth in this area is currently beyond the scope of this Plan. However, this may be something Council will need to consider in the future if development in the Opaki area continues. At some stage, the Opaki scheme may not be able to support its community and some Council assistance may be required.

Commercial influences

The key impact of industrial and commercial use on the water supply service is likely to come from industrial activity in the Waingawa area, and particularly industry related to forestry activity. There has been expansion in the Waingawa Industrial area and although this area officially sits in the Carterton District, water is supplied by Masterton. Masterton and Carterton District Councils have negotiated an agreement to provide water to the south of the Waingawa River from the Masterton water network. This agreement has a maximum take of 35 litres per second associated with 30 meters of residual pressure.

There is no forecasted growth of the Industrial area that is beyond its current capacity.

Climate change

Climate change is expected to influence the water supply service, from both a supply and demand perspective. It could result in both a shortage of water for supply and at the same time, increased demand for services.

Demand management practices can be used to help manage this. Council currently applies and enforces water restrictions in the hottest and driest months of the year and periodically publishes educational material re water conservation. For more information

about Council's demand management tactics please refer to the Potable Water Demand Management Plan There are projects underway that will ultimately enhance Council's ability to supply water services. Ongoing leak detection surveys network condition assessments occur annually. This work helps inform Council and direct its maintenance and renewal programme. Repairs and improvements, once complete, will reduce the amount of water 'lost' in future years.

Further monitoring and analysis work are recommended to gain a better understanding of how climate change may impact on water supply services in the Masterton District.

See risk section and LTP for climate change assumptions.

Demand for improvement in the service level

Feedback from customers and consultation processes suggest that, in general, the community is happy with the current level of service provided by Council.

As a result of changes in Ministry of Health legislation, new standards have applied to the Tinui scheme from 2015 and council has enhanced its protozoa treatment performance to meet these new standards.

Demand forecast

Impact of the demand drives can be summarised in the following table,

Water supply demand forecast for Masterton District		
Demand driver	Future impact	Future demand (10 years)
Population	Low/Med	Demand is expecting a slight increase on total demand. This demand is expected to be offset by water reductions
Commercial influences	Low/Med	Demand is expected to increase at the Waingawa Industrial area
Climate	Med	Demand likely to increase in hotter/ drier periods and ability to supply may be reduced
Tourism	No/Low	Unlikely to impact on demand
Land use	Low/Med	Demand may increase from large wood processing sites supplied by Kaituna and/or Tinui
Improvement in the level of service	Low/Med	Although demand for quantity is not expected to change, demand for improvement in water quality is anticipated

Options of responding to Growth and Demand changes

As noted, no specific work has been identified at this time. The key actions and issues identified in this section that may require attention and/or intervention, and the costs associated with the proposed work, are outlined in the following table.

Water supply 'options' for Masterton District		
Demand driver	Work options	Estimated Cost and funding source
Climate Change	Climate change impacts will require future work to mitigate and/or adapt. MFE estimates for Wairarapa are now available for climate change in the Wellington & Wairarapa region.	New projects, renewals and upgrades will factor in the latest climate change projections
Resilience	Install new Lansdowne reservoir	$800,000 in year 2021 - 2022
Resilience legislation	Construct new raw water reservoir or contribute to Wairarapa Water Use Project (WWL) (MDC's raw water storage will be a 40-day raw water storage reservoir – increased from last LTP – and will be built if the WWL dam is not continued.	$7,400,000 in year 2023 - 2024 (new MDC urban reservoir - storage) Or - contribute to WWL
Resilience	Deep water bore(s) for urban water supply resilience	$100,000 Investigation work $2,500,000 construction
Resilience	Complete water resilience strategy and implement work programme	Work cost to be determined from strategy analysis.
Demand management	Bulk water takes. Water tanker fill station and metering point.	$100,000
Resilience	Construction of additional standby/emergency water treatment plants	$100,000 each
Environmental	Adapt Opaki Water race from an open water race to a piped water race. (For domestic stock water)	$1,200,000

Cost and actions of responding to growth and demand changes.

Water supply 'actions' for Masterton District				
Demand driver	Work action	Estimated Cost	When	Funding source
Climate Change	Climate change impacts will require future work to mitigate and/or adapt. MFE estimates for Wairarapa are now available for climate change in the Wellington & Wairarapa region.	New projects and upgrades will factor in the latest climate change projections. Cost specific to each project.	Continuous	TBA
Resilience	Install new Lansdowne reservoir	$800,000 in year 2021 - 2022	From 2021 -22	External funding
Resilience legislation	Construct new raw water reservoir	$7,400,000 in year 2023 - 2025 (new raw water storage reservoir)	2023 (dependent on Wairarapa Water Ltd dam decision due in 2021)	Loan
Demand management	Bulk Water Take: Water tanker fill station and metering point.	$100,000	2021	Loan
Resilience	Complete water resilience strategy and implement work programme	TBC	From 2021	TBC

Conclusion

Masterton Urban Water Supply

Council's water supply planning assumes that the impact of population growth on the infrastructure over the next ten years will be minimal. Council believes that it has spare capacity within its water infrastructure to absorb the impact of any projected population growth that does occur.

Any increase in demand is more likely to come from industrial sectors, for example the Waingawa Industrial Park. Council believes that it has the spare capacity within its water infrastructure to absorb the impact of any expansion in its industrial base.

Current demand management practices are limited to garden sprinkler restrictions during the summer months, with enforcement by Council staff and contracted security services. Water restrictions and water conservation messages are promoted via local media. See Council's Potable Water Demand Management Plan for more information.

Water use per capita for urban Masterton residential is still significant but reducing year on year, at 340 l/p/d*, after leakage rates and commercial use are accounted for from the reticulation. Leak detection programme commenced in 2008 and a condition assessment commenced in 2009. Smart meters are currently being installed (2020/21) and this work will help identify leakage This work is ongoing with the findings informing Council's maintenance and renewal programme.

An alternative water source from the Waipoua River has been identified as a short-term option to be used in a civil emergency should the existing source become unavailable.

Council will develop strategies for the various possible projections as to the likely risks of climate changes and earthquake resilience.

Tinui water supply

Population growth is not expected to provide any constraints to the Tinui water supply in the context of the current consent.

The local users administer this scheme, which Council owns, and currently no known demand management techniques are in place. However, media promotion of water conservation in the summer months does reach this area.

The level of unaccounted for water (and potentially leakage) in Tinui is currently unknown.

The current covered storage capacity for treated water is adequate to meet future demands.

*National Performance Review 2019/20- WaterNZ.

RISK MANAGEMENT

Introduction

Risk management is the term applied to a logical and systematic method of establishing the context, identifying, analysing, evaluating, treating, monitoring and communicating risks associated with any activity, function or process in a way that will enable organisations to minimize losses and maximize opportunities. Risk management is as much about identifying opportunities as avoiding or mitigating losses.

Risk management process

The process followed for this Plan was:

Strategic level risk assessment:

- Initiation of Risk Management Project in November 2005 to support Council's asset management planning processes and the LTP.
- Introduction of Council staff to concepts of risk management via training workshops.
- Preparation of draft risk assessments by Council asset managers for their respective areas of responsibility, which were then reviewed by Waugh Consultants Ltd
- Production of a report: Masterton District Council Asset Management Processes Risk Management (Waugh Consultants, 2006)
- Identification of issues to be followed up.
- Review of Masterton District Council Asset Management Processes Risk Management (Waugh Consultants, 2006) in conjunction with asset managers and production of a revised report: Masterton District Council Asset Management Processes Risk Management (Waugh Consultants, 2011)
- Risk Management Update (Waugh Consultants, 2014)
- The impact of the Waugh Update (2011 & 2014) was reviewed at a strategic level in conjunction with the risk assessments carried out by Council staff. The risk management analysis is now consistently incorporated into all respective asset management plans.
- 2017 Council risk review undertaken following the Waugh Risk management assessments.
- Production of a report: Masterton District Council Asset Management Processes Risk Management (Waugh Consultants, 2020)

Natural resources plan

Greater Wellington Regional Council has released their Natural Resources Plan (to replace the existing Regional Plan) and are currently dealing with the appeals via the Environment Court. This document will need to be further modified to bring in rules specific to water use and allocation, and the Regional Council is proposing to do this though the Whaitua Process. The Natural Resources Plan sets targets and rules for all activities in the Wellington region that have the potential to affect the natural environment, biodiversity and landscape values. In particular, the water use provisions have the potential to significantly impact on Council's infrastructure requirements, especially on the potable water and wastewater treatment plants, and the stormwater network. In preparing the asset management plans and infrastructure strategy we have allowed for what we believe to be the most likely requirements when the Natural Resources Plan is in place. However, the plan remains in its appeals phase with the rules and standards subject to change.

Operational level risk assessment:

Some of the inherent seismic vulnerabilities of water and wastewater systems include,

- Many critical facilities, such as reservoirs, pump stations, and treatment plants, were designed and constructed before the adoption of seismic design standards that reflect the current state of knowledge of regional seismicity.
- Pipeline networks include extensive use of non-ductile (inflexible) materials, such as concrete and cast-iron pipe, which tend to fail during strong ground motion. Pipelines are especially vulnerable to failure from permanent ground deformation (resulting from liquefaction) because the deformation causes push-on pipe joints to separate.

The option to install seismic curtains and Seismic 'Slam Shut' valves has been investigated as an option to retro fitting into the water reservoirs This work has not been implemented because of the small scale of storage the Masterton community has. This option will be raised again when more storage capacity is installed.

Summary of trends in risk assessment

The Waugh Update (2020) showed that there were a number of risk themes that were common to many activities. These themes are outlined in the Waugh Report and are identified for Council's consideration, rather than as a list of individual risk issues against each activity. Themes included:

- CAPEX Programme Management and future funding
- Unforeseen Natural Events/Pandemic's
- Health & Safety
- Legislative Compliance
- Policy & Process Development
- Asset Renewals, Operations & Maintenance
- Staff Resourcing & Training

Critical Water Supply Assets

Council has identified the critical water supply assets as being.

- The Kaituna Water Treatment Plant.
- The trunk main from Kaituna to the Masterton urban area.
  NB: Masterton District Council maintains a storage of spare main trunk pipe that is available as required for maintenance repairs or in the event of a lateral displacement fault.
- Urban storage reservoirs, Upper Plain, Titoki Street & Manuka Street.

Risk analysis

The risks specific to this asset plan were identified and assessed based on existing conditions. See following risk tables the higher the risk scores the higher the risk potential.

Risk review 2020

The 2020 risk management review process included:

- A review of the MDC Risk Management Policy and Corporate Risk framework
- Risk review workshops with Council's Infrastructure managers
- Review of and alignment of risk register format with the Corporate Risk Register
- Update of the risk registers.

Risk review objectives

The objectives of the 2020 Risk Management Review process include:

- Update the MDC risk assessments and mitigation measures reflecting latest MDC risk management policy and practice.
- Detailed risk registers that record latent (untreated) risk scores, current practise risk scores and residual risk (when identified improvement s have been implemented).
- Support the 2021-31 LTP financial programme development where risk is a driver for capital or operational funding.

Staff Workshops

The 2020 risk review process and results presented in this report are based on the opinions and perspectives of asset management on operational MDC staff. Risk assessments based on opinion are particularly useful in extracting perceived issues/problems relating to an activity, and in provoking discussion as to why one issue has a higher risk than another. Much of the value of this type of risk assessment exercise is gained when it is completed by groups of staff, as it tends to lead to questioning of assumptions surrounding the activity that may no longer be valid. The results presented should be challenged and reviewed as necessary within the wider corporate context and whenever additional asset information is obtained.

Qualitative asset condition and performance information is an important indicator of physical asset risk. Whilst specific asset condition has not been investigated in detail as part of work, asset condition and performance issues have been identified in the risk registers.

Risk Register Update

Improvements

The updated risk registers have been further developed to include likelihood and consequence scorning for the following, three stages of risk exposure:

- Un-treated risk,
- Current or existing [E] risk rating, recognising existing processes that manage or mitigate the risk,
- Residual risk or proposed [P] risk rating, a proposed process that if implemented will manage or mitigate the risk to its lowest level.

Current risks with a score of 12 or higher, have been included in the improvement plans. The residual risk actions help to define the improvement actions.

Risk Methodology & Scores

– Risk Stages

As mentioned, the risk registers have 3 risk scores 1 for each stage i.e., untreated, current practice and residual risk

– Risk Scoring Process

Step 1:

Every risk is scored by assessing and allocating a score for both the likelihood and consequence of each score the scoring is based on the following tables:

LIKELIHOOD TABLE AND SCORES	
Likelihood	Score
Rare	1

Unlikely	2
Moderate	3
Likely	4
Almost certain	5

CONSEQUENCE TABLE AND SCORES	
Likelihood	Score
Insignificant	1
Minor	2
Moderate	3
Major	4
Catastrophic	5

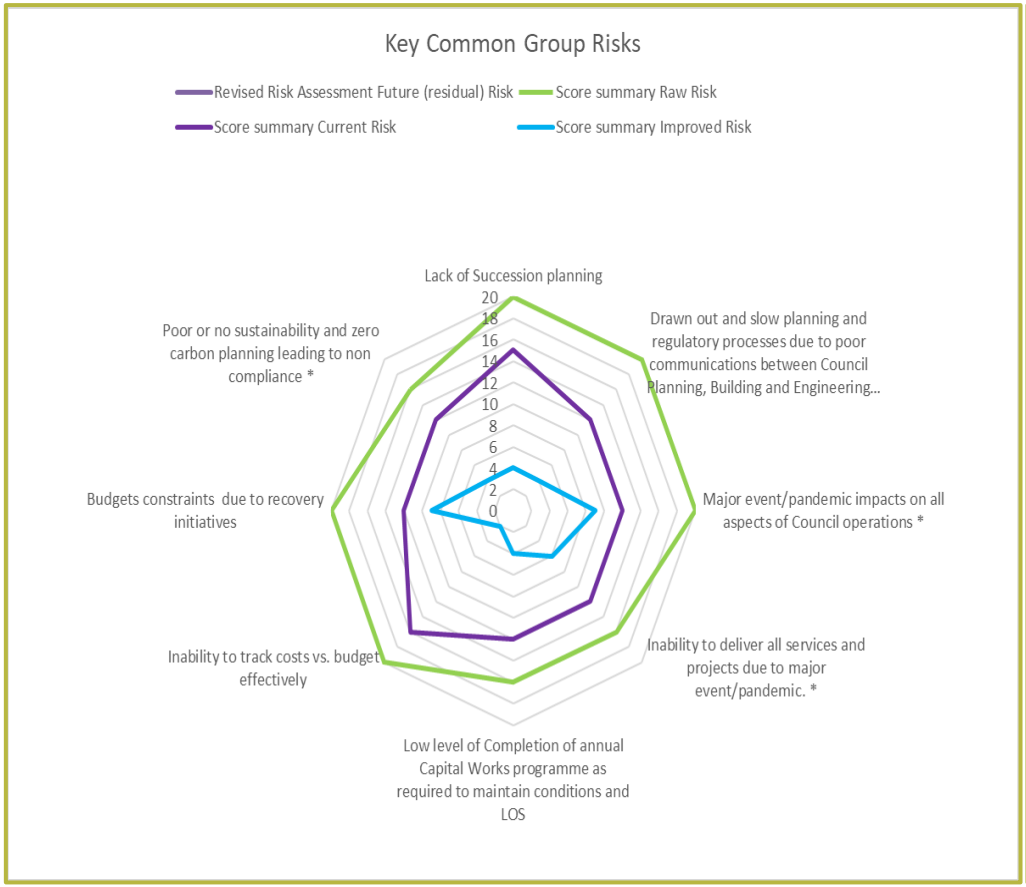
Step 2:

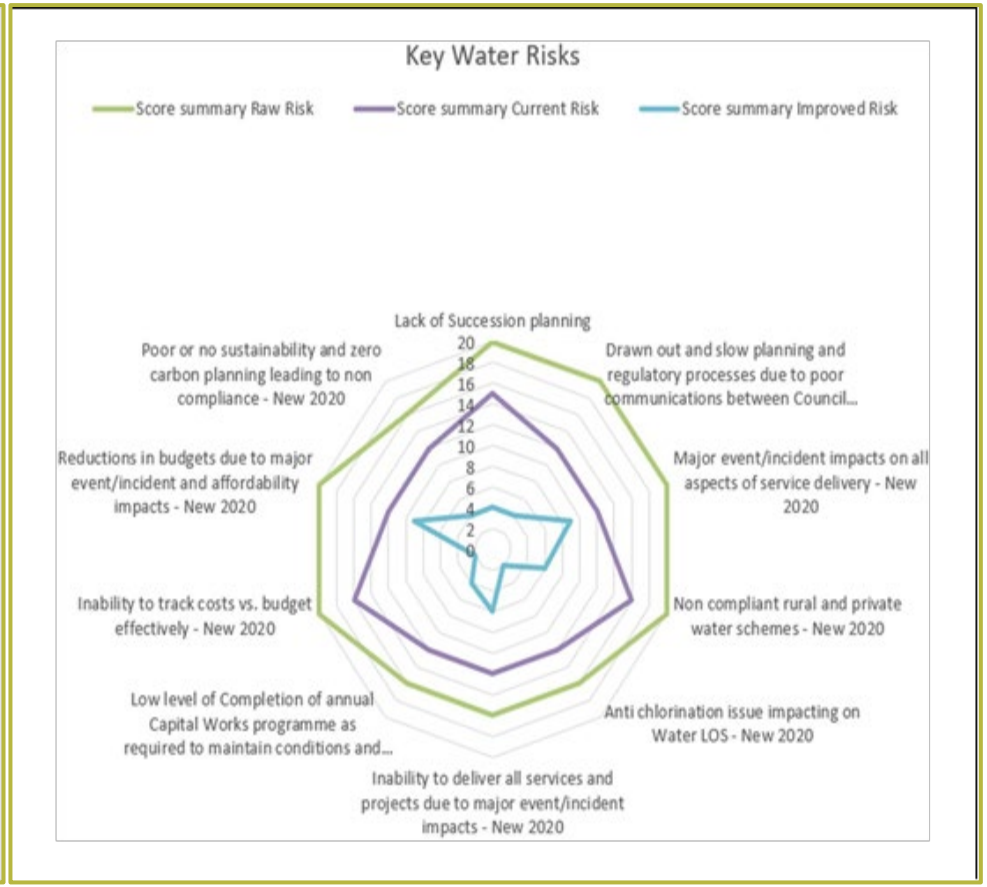
The risk score is calculated by multiplying the 'likelihood' score by the 'consequence' score.

Likelihood score x consequence score = Risk score

This scoring process is repeated for each of the 3 risk stages.

The table below details the Risk Rating categories and potential implications for the following areas legislation, Community expectation financial and environmental.





RISK RATING CATEGORIES					
Risk Rating	Risk Scores	Legislation	Community Expectation	Financial	Environment
Critical (4)	> 19	Commissioners Appointed	Expectations not obtainable	Detrimental effects > $0.5m	Widespread long-term effect
High (3)	12 to 19	Adverse Audit Opinion or Disclaimer	Expectations not obtainable medium term	Detrimental effects > $50k	Long term effect
Moderate (2)	5 to 11	Qualified Opinion; Warning over non-compliance.	Expectations not obtainable in short term	Detrimental effects between $10k - $50k	Short term reversible effect
Low (1)	3 to 4	Minor non-compliance	Faults within agreed LoS	Detrimental effects <$10k	Reversible and contained effect.
Insignificant (0)	2 or lower	Compliance	Expectations reached	No effect	No effect

Risk review outcomes

This section of the report provides an overview of the critical and high risks per activity, with the detailed risk registers attached as appendices.

Assets and Operations Group Risks

A number of Assets and Operations Group risks common to all the activities were identified. These risks have been grouped together as common group risks in this section of the report. Doing this reduces duplication of these risks in each individual activity risk register, streamlining the management and reporting of these risks.

Some of these common Group risks have different responses and mitigations measures in the different activities. Where this is the case, the risks are included in the activity specific risk registers.

Key Risks & Group improvement items

The tables below summary the Assets and Operations Group key risks, highlighting the raw risk, current risk and potential improved risk scores if improvement actions are implemented:

The table below also summarises the improvement actions that if implemented reduces the individual risk scores:

For full 2020 risk report see MDC Assets and Operations Group Risk Review and associated Risk registers.

WATER SUPPLY IMPROVEMENT ITEMS

Risk Description	Score summary			Improvement Items
	Raw Risk	Current Risk	Improved Risk	
Lack of Succession planning	20	15	4	[P] develop robust succession plans for key positions. Develop staff recruitment/retention strategies
New- Drawn out and slow planning and regulatory processes due to poor communications between Council Planning, Building and Engineering Depts (i.e., working in silos)	20	12	4	[P] review reg /planning processes and engineering interface
New-Pandemic impacts on all aspects of service delivery	20	12	9	[P] ongoing recovery response planning and reviews
New- Noncompliant				[P] Review rural supplies governance arrangements.

WATER SUPPLY IMPROVEMENT ITEMS

Risk Description	Score summary			Improvement Items
	Raw Risk	Current Risk	Improved Risk	
rural and private water schemes	20	16	6	[P] Identify and update in line with WSP and DW regulation requirements. [P] council review and planning regarding taking over mgt of private schemes
New-Anti chlorination issue impacting on Water LOS	12	12	2	[P] Implement outcomes of water reform process [P]options review of water LOS and treatment options. [P] community consultation [p]review and update los
New-Inability to deliver all services and projects due to pandemic impacts	16	12	6	[P] Monitoring impacts and revision responses and budgets
New-Inability to deliver all services and projects due to pandemic impacts	16	12	6	[P] monitoring impacts and revision responses and budgets

WATER SUPPLY IMPROVEMENT ITEMS

Risk Description	Score summary			Improvement Items
	Raw Risk	Current Risk	Improved Risk	
Low level of Completion of annual Capital Works programmes as required to maintain conditions and LOS	16	12	4	[P] Obtain executive agreement so that desire to employ locally is balanced against need to attract resource from outside of MDC to deliver on time. [P] Capital delivery process & procurement planning review and improvement
New-Inability to track costs vs. budget effectively	20	16	2	[P] Review project budget management requirements. [P] Id and implement system improvements and or user training
New-Reductions in budgets due to recovery initiatives and affordability	20	12	9	[P] Monitoring impacts and revision responses and budgets

WATER SUPPLY IMPROVEMENT ITEMS

Risk Description	Score summary			Improvement Items
	Raw Risk	Current Risk	Improved Risk	
impacts				
New-Poor or no sustainability and zero carbon planning leading to non-compliance	16	12	4	[P] Develop activity plans and actions based on council objectives and policy

Options for Risk mitigation work

The following table identifies work which council have considered but have not planned within this Asset Management Plan timeframe. These options may be included as required by future assessments.

Options for Improvement plan to mitigate identified risks			
Justification	Action/Work	Benefit	Estimated cost
Health & Safety Improvements	Install backflow preventers on all Residential properties	To improve a secure water supply	$2,000,000
Health & Safety Improvements	Alternative bore or connect Wainuioru Rural Non potable water supply to the Masterton Urban Potable network.	Reduce nitrate levels and improve safe water supply	$2,000,000

Cost of mitigating identified risks or improvement.

The key risks identified in this section that requires attention and/or intervention, and the costs associated with proposed work, are outlined in the following table.

Work and cost required to mitigate identified risks				
Action/Work	Driver for Action	Estimated cost	Scheduling	How this is funded
Health & Safety Improvements	Compliance with health and safety requirements. Risk mitigation. Update Water Safety Plan & Review response plan	$10,000 p/a	Masterton – 2022 Tinui - 2025	Rates – O&M
	The review and updating of the WSP is a legal requirement and must be completed.	$30,000	2023 2026	Rates – O&M

Public Health Assessments and Strategic Reviews			2029	
	Legislation also requires a Sanitary Services Review every 6 years.	$10,000	2034/25 & 2030/31	Rates – O&M
	Specific work and/or projects to reduce risk factors may be identified as part of these assessments/ reviews.			
Leak Detection Studies	Potential risk factors or projects to address these may be identified once the results of this study are collated.	Within water renewal costs	Yearly studies	Within existing budgets
Network condition assessment	Specific work and/or projects may be identified once the results of this study are collated.	This is completed internally as part of current operating costs.	Per year	No additional cost – work to be completed in house
Additional technical investigations, monitoring and reporting	To improve knowledge of asset condition, enabling better management of the water supply network.	To be confirmed	Per year	Rates – O&M
Treatment plant condition assessment	Regular check of treatment plant structures and seismic restraints	Within current budgets	On-going	Rates – O&M
A range of risks relevant to systems, processes and planning were identified.	Mitigation options identified and required planning and policy work and/or the review or development of systems and procedures.	Incorporate into work plans for appropriate staff.	On-going	Rates – O&M

Wairarapa engineering lifelines association (WELA)	Review of the WELA 2003 report on the possible effects from natural disasters including any possible climate change implications	$30,000 for two years in conjunction with the Territorial Authorities	2021/22	Rates – O&M
Resilience	Waingawa water intake siphon. New siphon and work associated to protect siphon. E.g., rock groynes and erosion protection - this work is also outlined in the stormwater amp. (River protection with GWRC)	Funding and estimates include within the stormwater AMP.	By 2022/23	See estimated cost comment
Health and Safety	Prioritise removal on Steel water pipe main with renewal programme.	With renewal budgets	From 2021	Depreciation and Loan

Climate change and stormwater protection

Climate change will increase the risks from natural hazard events that already occur within the district, particularly as a result of:

- sea level rise, exacerbating the effects of coastal erosion and inundation and of river flooding in low lying areas, especially during storm surge;
- increased frequency and intensity of storm events, adding to the risk from floods, landslides, severe wind, storm surge, coastal erosion and inundation; and
- increased frequency of drought, placing pressure on water resources and increasing the wildfire risk.

More frequent droughts may also affect the security of water supply. Currently we rely on adequate water flows from the Waingawa River and have no stored water for a prolonged drought.

Our overall approach in response to these effects is to manage through mitigation of causes and adaptation to effects. Policies and responses will need to be robust to a range of possible futures, rather than relying on a single 'forecast'.

Climate change is projected to have the impacts shown in the table below on the Masterton district coast. These are expressed as a range, as there are several scenarios considered when making projections.

We have based our planning on the NIWA modelled regional climate change projections (known as the Whaitua tables). The scenarios are

expressed as a range, from higher emissions to lower emissions for a number of climate related parameters.

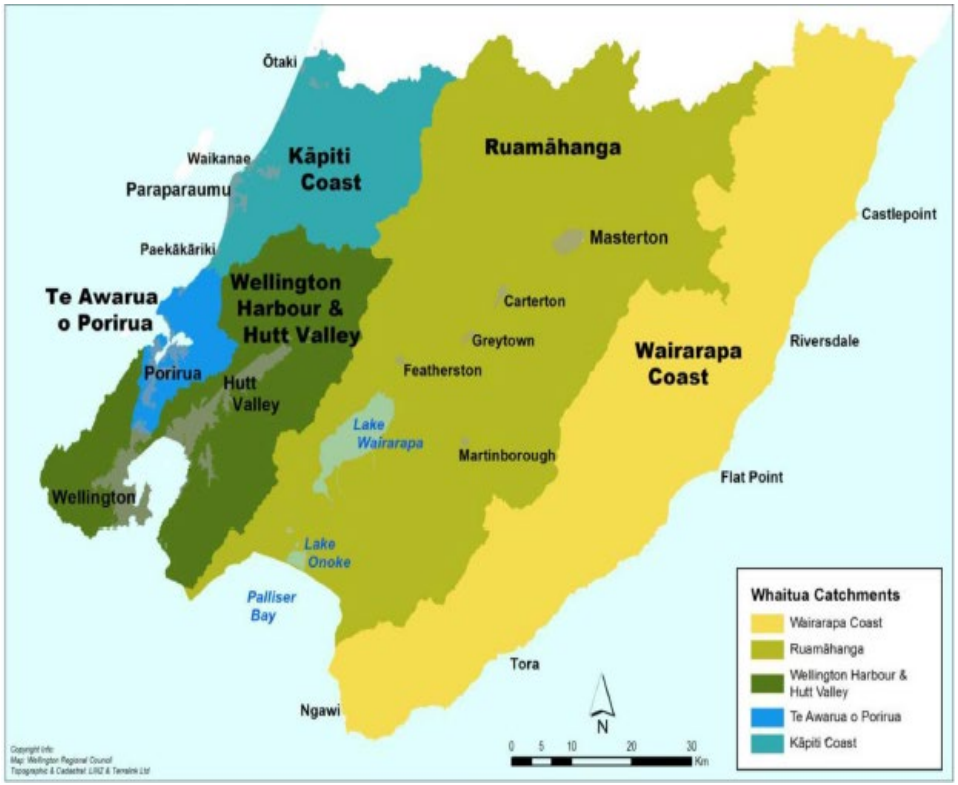
Council is preparing a Climate Change mitigation strategy during 2021/22. Projects from investigations as this strategy to being developed may change current and forecast project, work and maintenance programmes.

Notes

https://www.gw.govt.nz/assets/Uploads/WhaituaClimateChangeprojectionsMarch2020.pdf

Rcp4.5 mid-range scenarios where greenhouse gas concentrations stabilise by 2100.

Rcp8.5 is a high concentration scenario where the ghg emissions continuing very high. In the light of new technologies and improvements it remains a valid way to test the sensitivity of the climate variables.



Climate Change Wairarapa			
By 2040, seasonally the region could expect*:			Impacts
Ruamahanga	• 0.7°C to 1°C temperature rise • Up to 30 Increased hot days over 25°C	• Between 5 % less rain, to 5 % more rainfall • 0.12 to 0.24 metres above present	• Increased human heat stress and mental health issues, rurally and in urban centres. • Increased temperatures in urban centres due to human activities, large areas of concrete, buildings and vehicles • Increased risks of pests (such as wasps, rodents and fruit flies) and diseases (including risks to human health) and biodiversity losses. • Increased air pollution and seasonal allergies • Higher demand for drinking water at times when water is likely to be scarcer. • Stress on ecosystems and associated impacts on health and economy • Range and habitat of native plants and animals will change-extinction of some species. • Higher temperatures may allow for different crops to be grown. • Timing of seasonal activities such as flowering, breeding and migration will change. • •Several fold increase in urban and rural wildfire risk – a particular concern for water supply	• Increased prevalence of drought delivering urban and rural water shortages, and increased pressure on water infrastructure, including water storage. • Saltwater intrusion on groundwater • Decreased water quality and increased levels of toxic algae which impacts biodiversity, recreation and drinking water sources. • Increased flooding, slips and landslides affecting land, houses, roads and other assets, public transport and rural productivity. • Flood protection infrastructure Levels of Service reduced overtime. • Impacted rural community due to reduced agricultural production. • Reduced soil fertility. • Regional parks negatively affected by both drought and flooding. • Higher stress on indigenous ecosystems, plants and animals, especially with drought • Reduced workplace productivity
Wairarapa Coast	• 0.5°C to 1°C temperature rise • Up to 30 Increased hot days over 25°C	• Between 0 % less rain, to 5 % more rainfall • 0.12 to 0.24 metres above present		
By 2090, seasonally the region could expect*:				
Ruamahanga	• 1.2°C to 3°C temperature rise • Up to 80 Increased hot days over 25°C	• Between 0 % less rain, to 10 % more rainfall • 0.68 to 1.75 metres above present		
Wairarapa Coast	• 1°C to 3°C temperature rise • Up to 60 Increased hot days over 25°C	• Between 10 % less rain, to 5 % more rainfall • 0.68 to 1.75 metres above present		

– **Source: MFE, GWRC and NIWA climate change summaries. Updated 2020*Projected changes are relative to 1995 levels. The numbers provided are mid-range estimates of what the change is projected to be and should not be taken as definitive values.**

Increased flood risk

As well as the main township of Masterton, our district has other smaller communities such as Castlepoint, Taueru, Tinui, Mauriceville and Riversdale. Two of these communities are situated along its coastal edge. The urban developments are subject to flooding from the many streams and rivers which drop fast out of the ranges and then slow down and spread out on the plain on their way to the sea.

In high rainfall events, the volume and rate of flow of the water coming down the waterways rises quickly and residual ponding, once the waterway levels have dropped, can be significant.

The climate change projections suggest that very heavy rainfall events are likely to become more frequent, especially in the Tararua ranges during north-westerly storms and the Wairarapa during southerly storms. This will present very significant challenges in how we manage our assets.

Stormwater eventually finds its way to the sea. The level of the sea at the time the stormwater is flowing down the rivers influences how fast and how much of the stormwater can drain away. If the sea level is high enough, it can prevent the water flowing away out to sea causing it to back up and overflow inland. The rise in base sea level is caused in part by rising ocean temperatures – heated water expands.

In addition to this effect, rising ocean temperatures mean that storms generated at sea will contain more energy, for example be more intense. This in turn means that storm surges and wave heights will be higher. All these factors combine to significantly increase the risk of inland flooding on the district's coastal plains.

GWRC has recently collated data gathered from 20 years' research and new data using aerial photos, electronic flood mapping tools and a range of analytical techniques to identify hundreds of Masterton properties as being at potential increased risk of flooding.

We are working with GWRC to confirm predictions for flood events. The overriding issue is to ensure timely protection measures are in place against a 1 in 100-year flood to preserve our community and our economy. Until levels are confirmed, and any mitigation required is in place, there may be implications for any proposed developments in the town centre, the library project and the town's overall economic development.

Earthquake resilience risks

Parts of Masterton are built on old flood plains that could be subject to liquefaction in a major earthquake. Part of MDC's bridge and reticulation renewals programme involves using different construction methods and materials to provide greater earthquake resilience in pipelines.

We do not consider that this risk is so great that the renewals programme should be brought forward. Instead, we will address resilience at the time pipes and bridges are replaced.

Three Waters Reform

The Three Waters Reform is a process that central government is leading to consider the future of the three water services councils currently deliver – drinking water supply, wastewater and stormwater - and who is best placed to provide these in future.

The Council has signed a Memorandum of Understanding (MoU) with central government agreeing to take part in exploring options for the future. The work we are doing with central government is to identify approaches that could benefit the future delivery of these services.

We expect to have more information on the proposal for Three Waters in May 2021. Once we know what central government is suggesting, we will assess what that means for our community and come back to the community before we decide whether to continue to participate in the reform process or opt out.

We expect to have to make that decision later in 2021. If we choose to participate, the proposal is likely to be implemented during the 2023/24 financial year.

Regardless of the outcome of the reform process, we know communities will need drinking water and wastewater services, whether they are delivered by the Council or another organisation.

The Three Waters activities are included in our financial strategy and the infrastructure strategy. These strategies, along with other supporting information like our forecasting assumptions and disclosures, give a complete and accurate set of information on the medium-term and long-term financial situation for these services.

More information on the Government's reform strategy and timeline is available at https://www.dia.govt.nz/Three-Waters-Reform-Programme

Conclusion

Risks, at a strategic level, relevant to the water supply assets were identified and assessed by both Council staff and Waugh Consultants Ltd.

Risks, at an operational level, relevant to the water supply assets have been identified as a result of this work, the 2017 WSP review, Leak Detection Studies, council workshops and Condition Assessment. Operational risks identified through these projects have been assessed and incorporated into this Plan.

LIFE CYCLE MANAGEMENT PLANS

Introduction

Life cycle management plans were prepared for the water supply schemes that Masterton District Council owns and operates, i.e., Urban Masterton, Castlepoint, and Tinui. Other water schemes do exist within the district; however, these are privately owned or are operated independently and are outside the scope of this Plan.

Each lifecycle management plan includes the following information:

- Asset description (including physical parameters, capacity/performance, condition, valuation, historical expenditure, critical assets, significant negative effects, resource consents, data confidence levels)
- Design standards
- Maintenance plan
- Renewal/replacement plan
- Asset creation plan
- Financial forecast
- Disposal plan

Masterton's urban water supply

This lifecycle management plan covers the water supply in the Masterton urban area, which is summarised in the table below.

Masterton water supply key features

Parameter	Unit	Quantity	Comments
Properties Connected	Number	8,955	Based on the number of urban ratable properties and the number of commercial properties.
Estimated Population Served	Capita	20204	Source - 2019 Water NZ Nation performance review survey
Catchment area	km^2	150	Approximately 20-30km^2 is farmed. The remaining area is Tararua Forest Park
Intakes	Number	1	Waingawa River Siphon
Storage	Number Reservoirs	5	
Storage	m3	13,000	1,000m^3; 9,000 m3 And2,250 m3 Concrete; 2 @ 250 m3 timber

Masterton water supply key features			
Parameter	Unit	Quantity	Comments
Storage	Days in winter	1	
Storage	Days in summer	0.5	
Treatment			Pre-sedimentation, coagulation, sedimentation, filtration, chlorination, pH correction & fluoridation
Pressure Zones			Single (10m – 120m head)
Pumped/Gravity			Gravity fed from reservoirs with booster pump at Manuka Street
Average Daily Demand	m^3/day (winter) m^3/day (summer)	11,800 14,400	
Maximum Take (allowed)	m^3/day	40,000	Reduces to 22,500 m^3/day when the river flow drops to 1,900 l/s
Resource Consent Number			WAR 170176 (Water usage records sent to GWRC on a monthly basis.)
Consent Expiry			23 Apr 2023
Water Grading (source & treatment distribution)			Aa (2020)

Source and Abstraction

Waingawa River, water enters the system from the Waingawa River, which has a catchment area of approximately 150km^2. This catchment is principally unprotected bush on land principally owned by the Department of Conservation, with some low intensity farming (cattle and sheep) immediately upstream of the intake.

Treatment and Delivery

Masterton Kaituna Water Treatment Plant (WTP)

Water is siphoned via a 600mm diameter raw main to three raw water settlement ponds (60,000m^3 total capacity). Automatic turbidity monitoring of the raw water aims to maximize the utilisation of the ponds and excess abstraction is returned to the river to achieve resource consent compliance.

Water from the settlement ponds is treated using the following processes:

- Coagulation, flocculation and separation in a centrifloc clarifier
- Rapid sand filtration
- pH correction using hydrated lime.
- Disinfection using chlorine.
- Fluoridation

Contact time for chlorination is achieved by passing water through the new 1,000m^3 clear water tank reservoir and by utilising the time taken to travel through the trunk main from the plant to the Upper Plain Reservoir.

Chlorine is added as a disinfectant to water to ensure a minimum free chlorine residual of 0.4mg/l is maintained throughout the reticulation system.

Reticulation and Storage

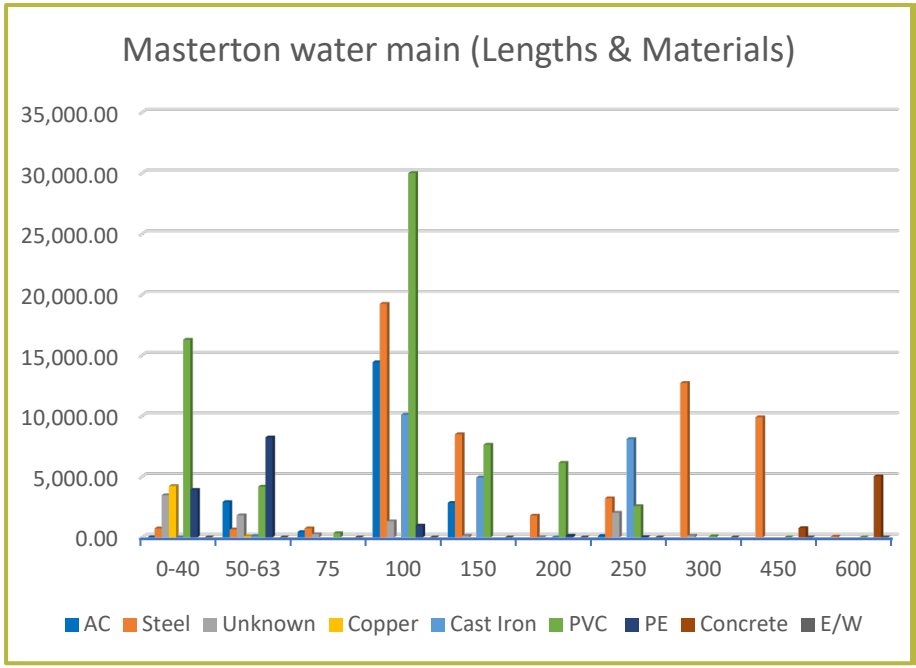
There is approximately 198 km of reticulation pipework in Masterton. This pipe work varies in size from 12mm water laterals up to 600mm intake pipes at Kaituna. The pipe material is a mix of cast iron with lead packed joints, steel, asbestos, PVC and polyethylene with ages from the early 1900s up to the present day.

Water pipe materials and lengths

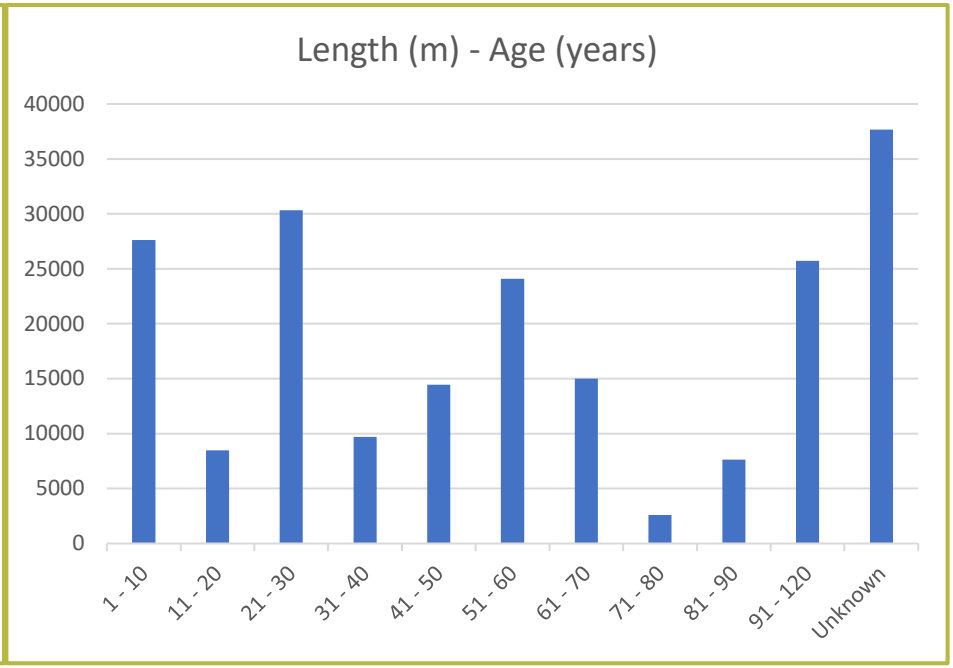
The following table shows the lengths of Masterton's water supply reticulation pipework by material and diameter.

Masterton urban water supply pipeline lengths & materials								
Diameter	AC	Steel	Unknown	Copper	Cast Iron	PVC	PE	Concrete
mm	m	m	m	m	m	m	m	m
0-40	8.35	728.86	3,465.59	4,213.65	0.00	16,281.62	3,914.45	
50-63	2,904.90	647.93	1,814.30	90.72	107.39	4,178.10	8,233.43	
75	437.42	743.34	258.55			336.40		
100	14,436.31	19,244.04	1,325.57		10,111.75	30,013.22	964.72	
150	2,837.61	8,486.93	135.12		4,927.03	7,631.79		
200		1,790.53	15.08		0.00	6,140.88	130.60	
250	113.22	3,220.54	2,025.32		8,099.25	2,566.99	13.39	
300		12,714.25	136.85			84.81		
450		9,894.54				0.00		762.76
600		60.82				0.00		5,038.11
TOTAL	20,738	57,532	9,176	4,304	23,245	67,234	13,257	5,801

Water pipe materials



Average pipe age and network length



It can be seen in the above table and figures that there is a reasonably high proportion of pipes that are older than the generally expected lifespan of 60 years. The pipe lengths shown include the trunk mains.

These pipes can still perform satisfactorily within the network. It would prove uneconomic to base renewal or replacement decisions for these pipelines based solely on an expiry date when the performance of these pipes has not diminished. Continued assessments and monitoring by Council Staff of these pipelines will assist with the renewal replacement programme considerations.

The reticulation system is predominantly a single pressure zone – with a small high-level zone feeding parts of Lansdowne.

The main town water storage reservoir of 9,000m^3 is situated on an elevated terrace 5km west of Masterton. It was built in 1980/82 of reinforced concrete and pre-stressed panels. A single trunk main

from a boost pump supplies this reservoir (600mm diameter concrete and 450mm diameter concrete lined steel) from the treatment plant.

Two mains (450mm diameter concrete lined steel) take water away from the reservoir until they split into smaller feeder mains (250mm diameter cast iron, 300mm diameter steel riveted and 450mm diameter concrete lined steel) to supply the town. A 2,250m^3 concrete reservoir is located on Titoki Street, Lansdowne and two 250m^3 timber stave reservoirs are used to provide storage in a small high-level area of Lansdowne.

Note:

- The 300mm diameter steel main was the original supply main to Masterton, laid in the late 1800s.
- At Fernridge School on Upper Plain Road the three supply mains interlink, and a new (1992) 450mm diameter concrete lined fully welded joint steel pipe runs across farmland to Westbush Road linking Ngaumutawa Road to boost supply to the south end of town.
- The three supply mains again interlink at Ngaumutawa Road/Renall Street corner to feed the town with a 300mm diameter concrete lined steel pipe running north on Ngaumutawa Road to cross the Waipoua River on the railway bridge and end up in a 2,250m^3 concrete reservoir built in 1962 on Titoki Street in Lansdowne. Two 250m^3 timber stave reservoirs built in 1982 provide high level storage above the Lansdowne Golf Course to feed a high-level zone of Lansdowne.

Council uses electronic telemetry to monitor and manage the distribution process.

Asset Capacity/Performance

– Extraction and Treatment

The extraction siphon can draw up to 38,000m^3 per day depending on river levels. The treatment plant can treat up to 35,000m^3 per day. The current resource consent (renewed in 2017) allows the abstraction of up to 40,000m^3 per day when river flow is above 1.9m^3/s and 22,500m^3 per day when river flow falls below this level.

Daily demand ranges from 11,800m^3/day in winter to 14,400m^3/day in summer, so the Water Treatment Plant has the capacity to deliver beyond current peak demand. This daily demand has reduced from 17,000m^3/day in winter to 28,000m^3/day in summer in 2015.

The performance of the treatment plant was subject to a major review in 2003/04 after the discovery of cryptosporidium in the treated water. The treatment plant operation achieves compliance with DWSNZ (2005). A comprehensive monitoring regime for water leaving the treatment plant and for water in the distribution zone provides evidence of compliance. Furthermore, a comprehensive PHRMP was prepared in 2004, reviewed in 2009, 2011, & 2017 (WSP). This identifies any gaps in Council's existing risk prevention measures and monitoring for the water supply system. It also identifies new measures for future programmes that should be implemented in priority of evaluated risk.

The following table summarises the water quality targets for water leaving the WTP.

Masterton water supply treatment compliance targets			
Parameter	Unit	Target	Notes
Filtered Water Turbidity	NTU	<0.1	Continuously
Treated Water pH	N/A	7.5	Continuously
Chlorine Residual	g/m^3	0.4 minimum	Continuously
Fluoride	g/m^3	0.7	Minimum 13 times per quarter
E. Coli	ml	0/100	Minimum 25 times per quarter

- Storage and Reticulation

The principal reticulation network was modelled in 1991 using KY Pipe software to predict pressures and flows. Recommended improvements from that work were the subject of TC Consultants et al (1991) and were carried out between 1992 and 1995.

The predominant material is PVC with concrete lined steel ranking second. To date the performance of both materials has a better The compacted earth construction of the raw water storage dams is deemed to be a risk, potentially requiring replacement or upgrading. However, the failure mechanism is such that it is impossible to predict when failure might occur, nor the scale of such a failure.

maintenance record than asbestos cement, which represents only 11% by length of the mains reticulation.

The reticulation system for Masterton is 'a' (completely satisfactory, extremely low risk). Public health risk mitigation measures for reticulation management are comprehensively addressed in the WSP.

Asset Condition

Councils WTP staff have assessed the condition of the various components of the treatment plant. A plant item inventory that has the maintenance schedule for each item of plant is continuously updated. Treatment plant equipment dates in age from 1980 to the present day.

The intake and the raw water storage dams were installed in 1970. The extraction pipeline is a new CLMS 700mm welded line and was installed in 2006. The WTP and clarifier are 24 years old. Three original filters were replaced in 2017 with three new filters. Past maintenance work has ensured that these remain in good condition, and, in the opinion of Council staff, they will (with the exception of the raw water storage dams) last a further 30 years before they will need to be replaced. They are more than capable of meeting not only current and forecast demand for treated water, but also of ensuring that it meets current and anticipated water quality standards.

The clear water storage reservoir was originally of compacted earth construction as well. However, it was replaced in 2004 with a $1,000m^3$ concrete tank after the cryptosporidium incident.

- Storage and Reticulation

Although the capacity of Masterton's reticulation network is adequate to meet current and forecast demand for water supply, its age and condition varies considerably. One of the supply mains constructed in the late 1800s is still in use today, while other parts of the network are less than a year old and have an estimated service life in excess of 60 years. Some pipelines require minimal maintenance while others are in constant need of patch repair.

Work towards a Network Condition Assessment commenced in 2009 and is ongoing. Historical repair records are being analysed and a list of Grade 5 water mains identified.

The grading system given in NZ Infrastructure Asset Management Manual is being used to assess the condition of the reticulation.

This grades the network from 1 (very good) to 5 (very poor).

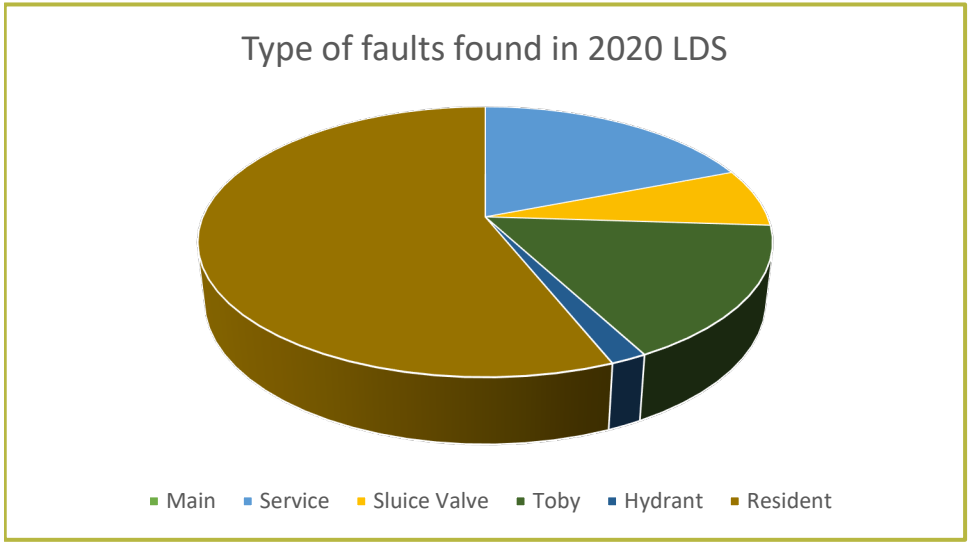
Pipeline age is not the sole determining factor for its projected lifecycle. Performance and condition assessments of pipelines along with the records of any pipeline failures assist with identification for renewal programmes by Council Staff.

– Leak Detection Study Findings

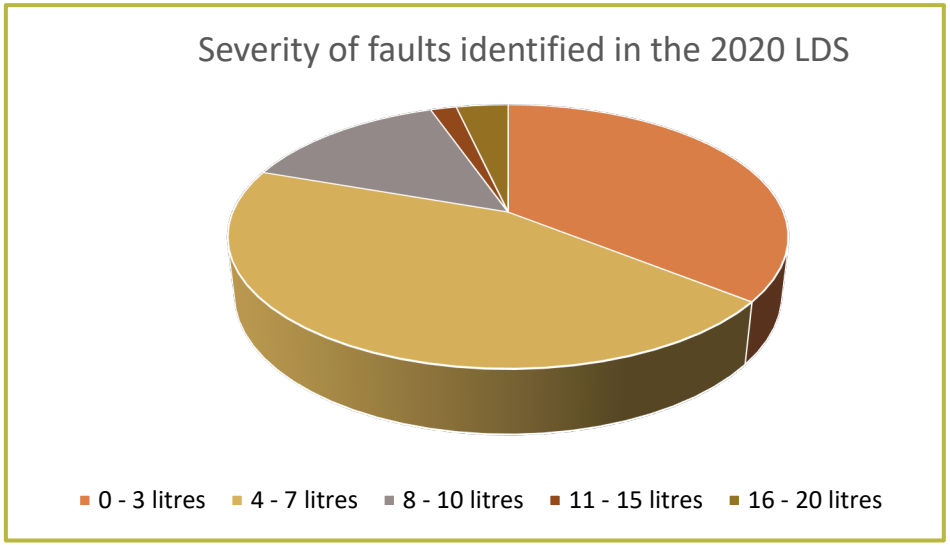
Findings from the Leak Detection Studies that commenced in 2008 are being used to build a better understanding of the condition of Council's water supply network and to inform Council's repair and maintenance programme.

The follow charts reflect the number and severity of faults identified in the 2020 survey

Number of Faults Identified in 2020 Leak Detection Survey (LDS)



Severity of Faults Identified in 2020 Leak Detection Survey (LDS)



Total Loss Breakdown from 2020 Leak Detection Survey			
Zone	Council Leaks	Residential Leaks	Total
Totals	83	97	180

Leak Type from 2020 Leak Detection Survey						
Asset Type	Main	Service Connection	Sluice Valve	Toby	Hydrant	Res
Number	0	33	12	28	3	97

Urban leakage rates, percentage of supplied water and associated costs			
Year	17/18	18/19	19/20
Total supplied (Mill m3/y)	4,736,550	4,415,155	4,522,793
loss as % of supply	36%	37%	37%

– Minimum Night Flow Water Loss

A part of the mandatory reporting measures an estimate of the supply network water loss has been undertaken using a minimum night flow analysis. This analysis involves measuring the minimum flow supplied to the network over a 5-day period in the year when demand is lowest. This flow, after storage reservoir level changes and an allowance for 24 hour and night use is deducted, estimates the network losses for 2020 at 52.69 l/s or 37% of the annual water volume supplied.

This measure will be reported annually as part of the new mandatory performance measure for evaluating the effectiveness of the leak reduction programme.

– Reticulation Modelling

The use of reticulation network modelling to assist with demand and pressure management and leak detection will be reviewed with this AMP and implemented if cost benefits are identified.

Asset Valuation

The water supply asset components were valued as follows, as of 30th June 2020. Data was sourced from the Opus valuation report 2020.

– Masterton Water Supply Assets Valuation

Masterton Water Supply Assets Valuation 2020			
Item	Optimised Replacement Cost ($)	Optimised Depreciated Replacement Cost ($)	Annual Depreciation ($)
Intake, Vacuum System	347,056	107,180	14,619
Trunk Mains (intake to res)	897,343	263,792	39,270
Water Treat Plant	16,011,674	5,224,118	394,068
Reservoirs	6,727,114	2,293,707	118,986
Fire Hydrants, Valves, Connections	7,210,948	3,732,121	96,146
Reticulation Pipelines	63,783,339	26,094,697	772,482

Valuation as of 30 June 2020.

Masterton Water Supply Assets Valuation 2017 (update due in 2021)				
Location	Assessment No.	Area (Ha)	Use	2017 Value
Upper Plain Road	1792024100	12.000	Waterworks	360,000
Norfolk Rd, Carterton	1814001600	1.285	Water intake & pipeline	18,600
Mstn/Castlepoint Rd.	1800001200	1.1625	Taueru water supply	132,000
Manawa Road	1797006300	4.2462	Tinui water supply - Forestry	21,200
Upper Plain Road	1792025600	0.7344	Waterworks - reservoir	103,000
Manuka St	1792075000	0.0180	Water Reservoir	13,000
Te Ore Ore Rd	1792076700	0.0394	Water Test Bores Site	21,000
Titoki St	1803059100	0.1520	Reservoir	140,000

Replacement cost is the cost of building a new infrastructure using present day technology but maintaining the originally designed level of service. Assuming current technology ensures that no value results from the additional cost of outdated and expensive methods of construction. Maintaining the original level of service ensures that the existing asset with all its faults is valued, not the currently desirable alternative.

Values include actual purchase/construction price plus expenses incidental to their acquisition and all costs directly attributable to bringing the asset into working condition and location. These additional costs include:

- Professional fees of all types.
- Delivery charges.
- Costs of site preparation and installation.
- Non-recoverable GST and other duties and taxes.

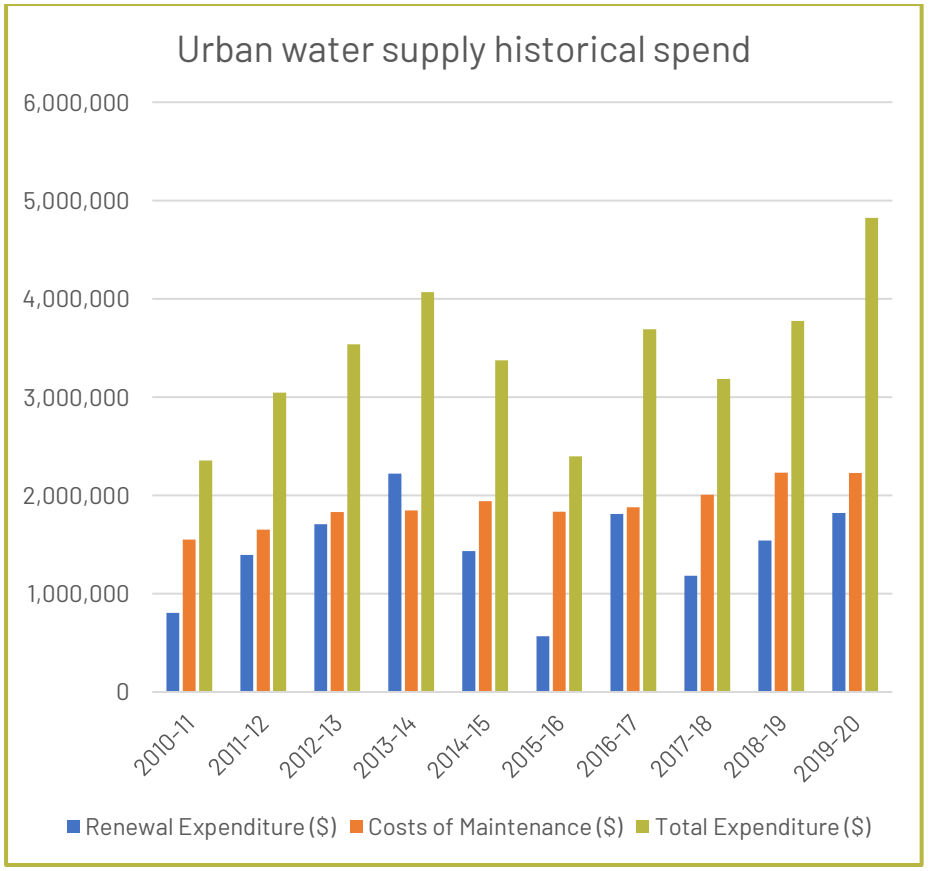
An additional 6%, 10% or 12% (depending on the complexity of the construction) has been added to construction costs to cover these items, apart from the valuation of land, where a fee of 16% has been used, following discussions with Valuation New Zealand. An establishment fee has also been added to some of the files as it is estimated that the establishment of these components is higher than other components.

The basic value of the assets reduces in accordance with the wear and tear and deterioration undergone over their lives. This reduced value is called the depreciated replacement value and has been calculated as the replacement cost proportioned by the ratio of remaining useful life to economic life on a straight-line basis. This method provides an accurate reflection of the service potential of the assets.

Historical Expenditure

Council's annual reports provide historical information in the financial costs for water supply along with commentary on the performance of the asset. The annual operational and capital expenditures over the last ten years are summarised in the following tables.

Masterton Urban Water Supply Historical Expenditure			
Year	Renewal Expenditure ($)	Costs of Maintenance ($)	Total Expenditure ($)
2010-11	805,233	1,549,945	2,355,178
2011-12	1,395,216	1,651,521	3,046,737
2012-13	1,705,770	1,830,399	3,536,169
2013-14	2,221,656	1,847,675	4,069,331
2014-15	1,432,852	1,940,108	3,372,960
2015-16	565,517	1,833,307	2,398,824
2016-17	1,810,000	1,878,948	3,688,948
2017-18	1,182,108	2,004,796	3,186,904
2018-19	1,541,341	2,232,388	3,773,729
2019-20	1,821,347	2,227,368	4,823,905



Critical Assets

Council has identified the critical water supply assets as being.

- The Kaituna Water Treatment Plant.
- The trunk main from Kaituna to the Masterton urban area.
- Urban storage reservoirs, Upper Plain, Titoki Street & Manuka Street.

Significant Negative Effects

The significant negative effects of the water supply are outlined in the following table.

Significant negative effects of the Masterton water supply		
	Significant Negative Effects	How We Will/Do Mitigate
Social	Normally, there would not be any significant negative effects from a social perspective. However, the consequences of a contaminated water supply could be severe.	Council has adopted practices in order to minimise this risk, for example regular water quality testing and sampling.
Cultural	None identified	
Environmental	Normally, there would not be any significant negative effects from an environmental perspective. However, over-extraction from the water source would have significant environmental effects, not to mention the effects on any downstream users.	Council has adopted practices in order to minimise this risk, including operating within its resource consent, enforcing water restriction during peak demand, promoting water conservation etc.
Economic	None identified	

Reserve Consents

Masterton Water Supply Resource Consents				
Location	Consent No.	Purpose	Date Granted	Date of Expiry
Waingawa River	WAR 940080	To take up to 40,000m^3 of water/day (463 L/P/S) from the Waingawa River for public water supply.	28 April 1997	March 2023
Upper Plain Road, Masterton	WAR 120241	To discharge supernatant to water from the water treatment plant backwash recovery pond and to discharge sludge leachate to land from sludge dewatering ponds.	16 Sept 2014	16 Sept 2029

Data Confidence Levels

The data confidence levels for this asset are shown in Table 6.12 where, A = Highly Reliable, B = Reliable, C = Uncertain, D = Very uncertain

Water Supply Data Confidence Levels				
Attribute	D	C	B	A
Physical Parameters				
Asset Capacity				
Asset Condition				
Valuations				
Historical Expenditures				
Design Standards				

Design Standards

All water supply infrastructure installed in areas of new development must meet the requirements outlined in NZS4404: 2004 Land Development and Subdivision Engineering.

The policy for reticulation network design, endeavours to provide a grid network – and where "dead end" streets are unavoidable, rider mains are installed to minimise circulation problems (approximately 49% of installed water main lengths are rider mains).

The current policy for backflow prevention is to install appropriate backflow devices on commercial premises according to the assessed level of risk.

Maintenance plan

Maintenance of the water supply in the Masterton urban area includes the following items:

- Water main repairs, flushing and inspections.
- Water quality testing
- Reservoir maintenance
- WTP maintenance

Council commenced Leak Detection Studies in 2008 and is now yearly. A Network Condition Assessment was undertaken in in 2016 and this work continues from our asset management data work. Funding has been allocated to repairing leaks identified through these studies.

A review of the Water Safety plan was completed in 2009, and a further review was completed in 2017. The findings of these studies will assist with planning maintenance works. The next review is in 2022.

Water main repairs, flushing and inspections.

These tasks are currently carried out by Council's maintenance contractor, City Care Limited. They won Council's water, wastewater and stormwater services maintenance. The term of contract has been granted extensions until 2022, as the Contractor has met the performance requirements specified in the contract.

Their proposal included substantial added value in job management and asset data systems that will significantly advance the knowledge of our assets. Note:

- The contract is a services delivery contract for the continued operation and maintenance of Council's water, sewerage and stormwater services.
- It excludes the water and sewerage treatment assets.
- It is based on NZS3910 Conditions of Contract for Building and Civil Engineering Construction.
- Water mains are to be repaired as and when reported both by Council's maintenance contractors, Council staff and the general public.
- Allowance is also made each year for pro-active leak detection to be carried out on the mains.
- A mains flushing programme is carried out each year with all dead-end mains to be flushed once a year, together with all scour valves.
- Additional flushing is carried out when ordered, usually following a complaint on water quality which flushing would correct.
- All hydrants are inspected, operated, repaired if necessary and lids painted once a year.

- The cross-country mains are inspected once a year for leaks, and fittings accessible from the surface are inspected.
- All water meters are read at three monthly intervals and any faults recorded for repair.

Results of the Leak Detection Study and Network Condition Assessment are being used to inform maintenance and renewal programmes.

Water quality testing

Water quality testing is carried out to meet the DWSNZ (2005). Currently 25 samples per quarter are taken from sites that are representative of the water in the distribution zone. Monitoring is carried out on different days throughout the week with a maximum interval between samples of 6 days. In addition, monthly samples are taken from the 3 reservoir sites.

- Total and faecal coliforms
- pH
- Free available chlorine
- Turbidity
- Heterotrophic plate counts. Evidence of heterotrophic counts is acted on by ordering the main to be flushed.

Reservoir Maintenance

The Manuka Street, Titoki Street and Upper Plain Reservoirs and the Upper Plain clear water tank all have monthly security checks. The need to dewater, check seals and clean the reservoirs is assessed as it is required, the last reservoir clean was in 2020 and the expectation is for the next clean to be in 2025.

In addition, power supply and telemetry maintenance are undertaken monthly, and random site maintenance is undertaken as required.

Water Treatment Plant Maintenance

Maintenance at the WTP is scheduled using a Microsoft Access database, worked in conjunction with a manual diary system, which has all items of plant recorded with its own maintenance schedule. This gives frequency of inspection and details items to be maintained/checked with each inspection. This schedule covers all Council's WTP and wastewater treatment plant (WWTP) mechanical items. From these inspections any plant requiring more than the normal maintenance work is scheduled for the necessary repair work.

Renewal/Replacement Plan

The following renewals are proposed for the future:

- Reticulation mains renewals, an estimated length of 2.5km annually based on asset condition data and information.
- The scheduled replacement of 6.3km of trunk mains.
- The ongoing review of equipment renewals relative to deterioration and legislation requirements at the water treatment plant will include such items as the WTP filters.
- Reservoir refurbishment and improvements
- Leak Detection Studies commenced in 2008 this work is ongoing and will assist with planning renewal and replacement works.
- The ongoing programme of water connection replacement.
- Lansdowne Reservoir upgrade.
- Water storage dam expansion / Urban water Supply

Renewal Strategy – Optimised renewal decision-making (ORDM) framework

The ORDM process is a risk-based methodology which assesses the probability of each failure mode (including structural, hydraulic capacity, performance, operational and performance) and the consequence (or damages) of the failures.

A scoring system of 1 to 5 is employed to quantitatively assess the risk components. For example, structurally failed sections will attract a failure mode probability of 5. The risks of failure (for each failure mode) of each section are assessed and calculated by quantifying the product of their probability and consequence of failure.

Pipe sections with a high risk of failure are then ranked and the top group is included in the priority 1 list.

However, it must be noted that the ongoing programme of collecting further asset information and variation of market prices for water main renewal/replacement, as well new technology advances in the industry, mean that the priority list is provisional and will be subject to change with new information.

ORDM inputs for Water reticulation

ORDM used the following information to assess the probability of water reticulation failure:

- Structural Failure: Age profiles, Material profiles, soil type profiles.
- Hydraulic/Capacity Failure: Catchment (current/future) flow monitoring, low flow/pressure records.
- Performance Failure: System performance, dirty water/low flow/low pressure incidents.
- Operations and Maintenance Failure: Repair records, maintenance records and costs.

Currently the ORDM for water reticulation failure probability assessment include the following factors:

- Structural consideration (number and major/nature of faults, etc.)
- Capacity considerations (current observation, future subdivision potential)
- Performance considerations (dirty water, low pressure/flow etc.)
- Maintenance considerations (leak/breakage etc.)

The above probability rating is then multiplied by the consequence of failure rating to obtain the overall risk score. The utility service department maintains and updates a database on the reticulation network. Each year the highest ranked sites are considered for renewal/replacement.

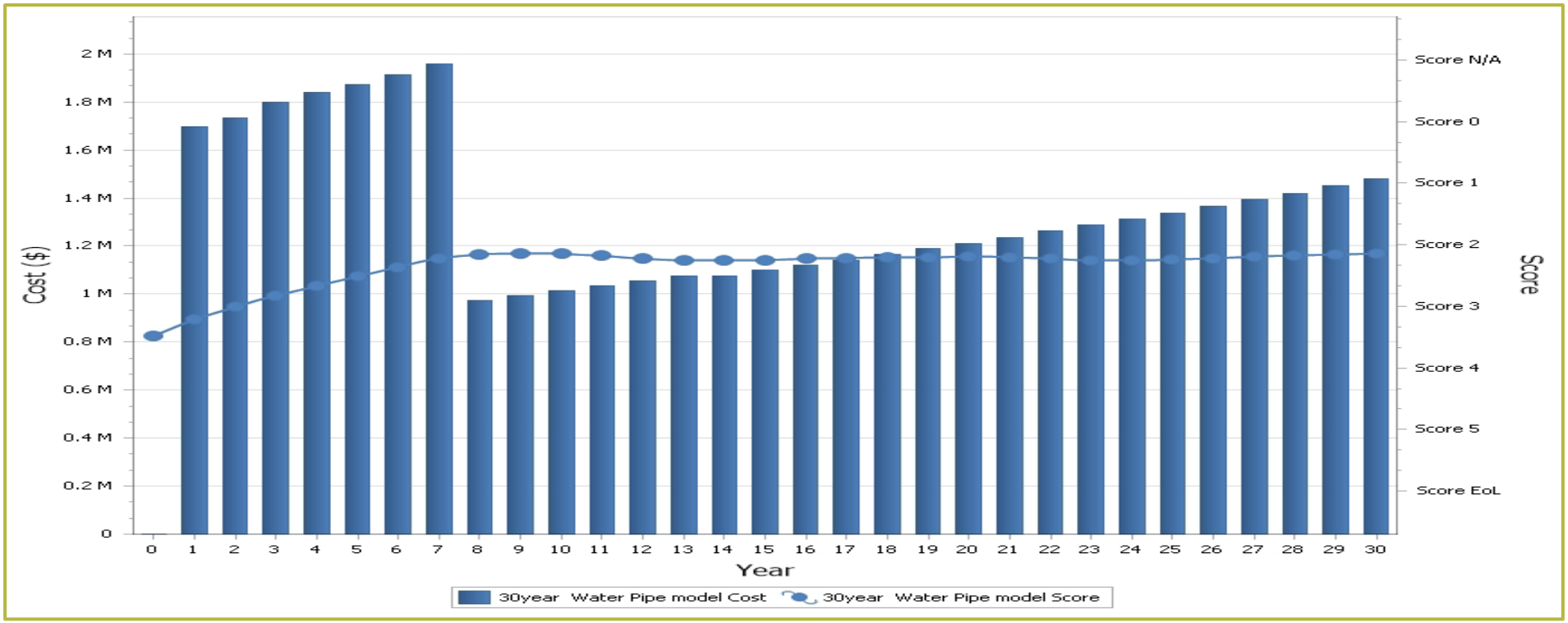
Predictor models and data

In 2017, Council have started to implement and provide Life Cycle models using Assetic Predictor.

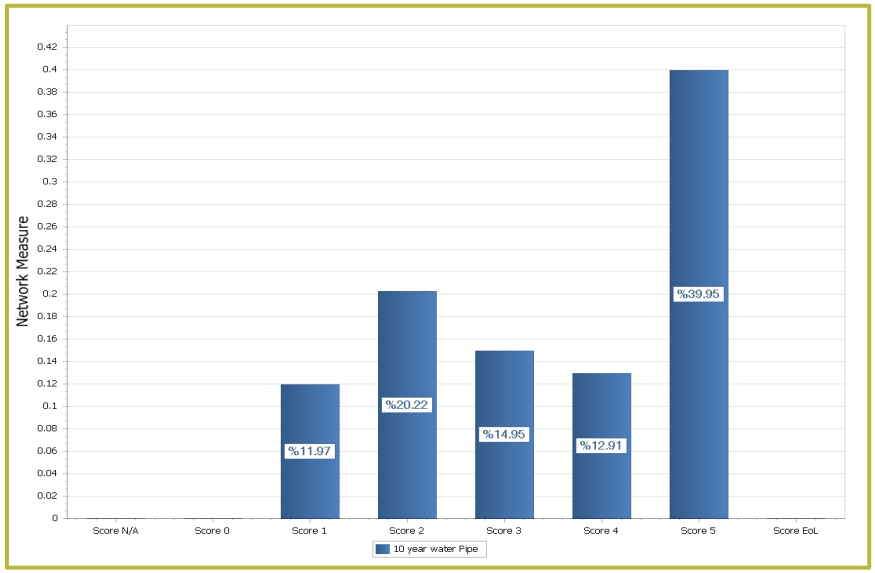
The objective of this prediction modelling analysis is to model the deterioration of Council's Water reticulation pipe network assets by developing a simulation model using Assetic Predictor. The model does not include main truck renewals.

The graph below demonstrates Renewal Cost vs Overall Condition Index (OCI). Using the LTP forecast for Water Supply (Main pipes and laterals) renewal spends of $1,600,000 2020 dollars per annum.

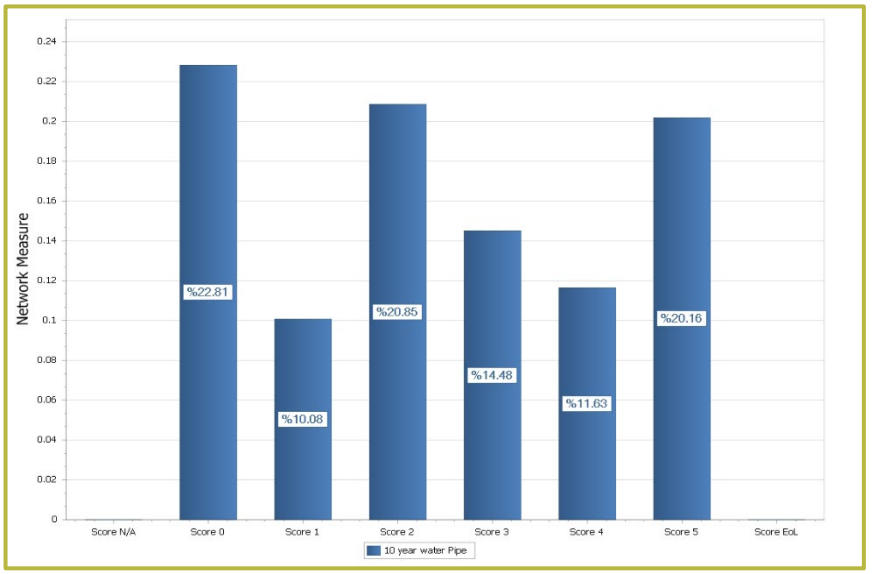
– 10 and 30-year scenario modelling for Water Supply reticulation pipes. Condition score and spend 2021 – 2031 & 20



– Water pipes predicted distribution of condition in 0 years. (2021)



Water pipes predicted distribution of condition in 10 years. (2031)



The model shows us that over the 10-year forecast strategy the Water Pipe condition will continue to improve throughout the 10-year life cycle.

Water Main Trunk Renewals Plan

The renewal plan is to undertake staged water main trunk renewals, and council have set aside financial provision throughout this LTP year 2021 - 2051 to undertake this work.

This Renewal spend begins in year 2 (2023) of the LTP at $1,300,000 and increases to $1,450,000 for years 3 & 4 (2024 & 2025) This expenditure will be used to upgrade part of the Main trunk pipe network from our Kaituna Water Supply treatment plant to the Masterton Urban Water reticulation network.

Development of the urban water scheme is largely through the private subdivision process.

Council has planned for the eventual requirement to increase supply up to 35,000 m3 per day. The ability to supply this increase would be provided in stages. The first stage would be to duplicate the 450 mm diameter main from the manifold down to the Fernridge School interlink. This option also allows the old 250 mm and 300 mm diameter mains to be decommissioned as they are amongst the oldest in the supply system. The second stage would be to provide boost pumping on the supply mains during peak demand.

An investigation into using bores at Te Ore Ore was carried out, augmenting supply and/or an emergency supply (TC Consultants et al, 1991). However, no physical work has been undertaken to treat the water which is high in iron and manganese, and no pumping or pipework is planned at this stage. Leak Detection Studies commenced in 2008 - 2020 and a Network Condition Assessment commenced in 2009. Work is ongoing. The WSP was revised in 2009 and reviewed in 2016 (due next in 2022). The combined results of this work assist with planning renewal and replacement works.

Financial forecast

Council has made a strategic decision to maintain the current levels of service for this activity. Maintenance, renewal and capital costs scheduled to enable this are outlined in the following table.

WATER SUPPLY MAINTENANCE, RENEWAL & CAPITAL COSTS IDENTIFIED (2021 $)

ACTION/WORK	DRIVER FOR ACTION	ESTIMATED COST	SCHEDULED FOR	HOW THIS WILL BE FUNDED
Water mains and trunk mains renewals	Renewals are required to address actual and potential leak issues, and to maintain current levels of service.	$2,200,000 year 1 $1,600, 000pa year 2 & 3 then $1,100,000 after 2024/25 -2032	2021/22 – 2024/25	Depreciation Fund plus external fund in year 1
Water connection replacements	Repairs are required to address actual and potential leak issues, and to maintain current levels of service.	$200,000pa	2021/22 – 2031/32	Depreciation Fund
450mm Main trunk replacement stage 1, 1.3 Km	Renewal is required to address actual and potential leak issues, and to maintain current levels of service.	$1,500,000	2023/24	Loan and Depreciation Funds

WATER SUPPLY MAINTENANCE, RENEWAL & CAPITAL COSTS IDENTIFIED (2021 $)				
ACTION/WORK	DRIVER FOR ACTION	ESTIMATED COST	SCHEDULED FOR	HOW THIS WILL BE FUNDED
450mm Main trunk replacement stage 2, 6 km	Renewal is required to address actual and potential leak issues, and to maintain current levels of service.	$1,650,000 p/a indicated	2024/25 – 2026/27	Loan and Depreciation Funds
Main trunk replacement (general)	Renewal is required to address actual and potential leak issues, and to maintain current levels of service.	$1,000,000	2029 then ever 3 years to 2051	Loan and Depreciation Funds
Water treatment plant	Floc tanks and fluoride tanks. Generator set install. Chlorinator bypass and reservoir valves SCADA upgrade Lime feeder Syphon pumps Backwash pump set Clarifier drive Diesel pumps Generator sets (2) Flow meters	$150,000 $30,000 $60,000 $15,000 $12,000 $30,000 $80,000 $80,000 $80,000 $60,000 $160,000	2021/22 2021/22 2023/24 2021/22 2025/26 2021 & 2022 2024 2025 2027 2023 & 2025 2021 (90k) & 2023 (70k)	Depreciation Fund plus external funding year 1

WATER SUPPLY MAINTENANCE, RENEWAL & CAPITAL COSTS IDENTIFIED (2021 $)				
ACTION/WORK	DRIVER FOR ACTION	ESTIMATED COST	SCHEDULED FOR	HOW THIS WILL BE FUNDED
Water treatment plant equipment & infrastructure renewals	Renewals are required to achieve compliance and to maintain current levels of service.	$95,000pa	2021/22 – 2031/32	Depreciation Fund
Water treatment plant buildings etc. upgrades	Asset condition. Upgrade is required to maintain current levels of service and prevent deterioration of the asset.	$20,000 $50,000	2021/22 2025/26	Depreciation Fund
WTP consent renewals Water takes	Construct new MDC raw water storage dams or contribute to the Wairarapa Water Ltd (WWL) project.	$7,400,000 –MDC $TBA – WWL project	2023 start	Loan
WELA (Lifelines)	Support and investigation for the 3 Wairarapa council to improve resilience in the networks	$60,000	2021-2022	External funding
Solar storage power supply	Lower climate emissions – Battery power to operate WTP functions (Back-wash pumps)	TBC	TBC	TBC
Network Upgrades *(Planned or in Progress)*	Lansdowne (water capacity) New Subdivisions and upgrades associated	$1,800,000	2021 - 2025	Capital contributions
Treated water storage	Improve resilience to urban supply (extra 1,000m3)	$800,000	2021-2022	External funding

WATER SUPPLY MAINTENANCE, RENEWAL & CAPITAL COSTS IDENTIFIED (2021 $)				
ACTION/WORK	DRIVER FOR ACTION	ESTIMATED COST	SCHEDULED FOR	HOW THIS WILL BE FUNDED
Point of use treatment for rural water supply	To provide adequate water treatment to achieve DWSNZ for Wainuioru scheme, Mauriceville and rural hall users	$780,000 Wain $120,000 Rural H $400,000 M'ville	2021-2022	External funding
Data investigation	3 Water reform data collection and analysis	$30,000	2021-2022	External funding

Disposal plan

Water supply assets will be considered for disposal when a more cost-effective alternative is available and/or there is a community consensus that the asset can be disposed of.

Tinui water supply

Introduction

Tinui Water Supply Key Features			
Parameter	Unit	Quantity	Comments
Status			Potable
Properties Connected	Number	19	+ schools etc.
Est. Population Served	Capita	120	
Catchment area	km^2	N/A	Groundwater – Whareama catchment
Intakes	Number	1	Concrete box collection from two springs
Storage Volume	m^3	85	
Storage	Days	1	
Treatment		Chlorination	Sodium hypochlorite
Pressure Zones		Single	
Pumped/Gravity		Gravity	
Estimated Daily Demand	m^3/day	60	Approximate

This AMP covers the water supply in Tinui (township), which is summarised in the table below.

Maximum Take	m^3/day	90	
Resource Consent #			WAR 010244
Consent Expiry			21 September 2036
Water Grading (source & treatment distribution)		u	Ungraded

Source and Abstraction

The water supply for the Tinui Township is sourced from two springs, covered by concrete collection boxes. These are located in the Tinui Taipo's area of the district, north of the community.

Treatment, Delivery and Storage

The flow from the springs is collected by a 2.7 m^3 holding tank, 20 m from the intake.

The water is a relatively small gravity fed pressure zone (pressure ranging from 27m to 34m), containing approximately 1.7 km of pressurised pipe. Pipe sizes range from approximately 20mm to 100mm in diameter. Pipe materials include PVC for the reticulation system in the township and polyethylene from the springs to the collection and storage points. The reticulation system for Tinui is currently ungraded (u).

The water leaving the treatment plant is currently ungraded (u). There is monthly testing of water with the sample point being the Tinui Store.

No provision is made for treatment processes capable of protozoa removal or inactivation.

Asset Capacity / Performance

The Tinui water supply daily capacity is 60 cubic meters per day.

Asset Condition

The condition of the Tinui water supply will be investigated in 2021.

Asset Valuation

The Tinui Water Supply asset components were valued as follows, as of 30th June 2020. Data was sourced from the MDC Annual Report 2020.

Tinui Water Supply Asset Valuation

Item	Optimised Replacement Cost ($)	Optimised Depreciated Replacement Cost ($)	Annual Depreciation ($)
Tinui Supply	531,997	359,265	15,951

Historical Expenditure

Council's annual reports provide historical information in the financial costs for water supply along with commentary on the performance of the asset. The annual operational and capital expenditures over the last eight years is summarised in the following table.

Tinui Rural Water Supply Historical Expenditure

Year	Renewal Expenditure ($)	Costs of Maintenance ($)	Total Expenditure ($)
2009-10		7,200	7,200
2010-11		11,557	11,557
2011-12		15,441	15,441
2012-13		9,362	9,362
2013-14	20,160	19,366	39,526
2014-15	97,750	17,080	114,380
2015-16	9,397	24,319	33,716
2016-17		36,167	36,167
2017-18	11,940	33,746	45,686
2018-19		47,468	47,468
2019-20		43,090	43,090

Critical Assets

Council's critical Tinui water supply assets are identified as being.

- The reservoir
- Treatment plant

Significant Negative Effects

The significant negative effects of the Tinui water supply are considered similar to those for the Masterton urban supply.

Resource Consents

The follow table summarises the resource consents Council currently holds that pertain to the Tinui water supply. Further information can be found in Council's Resource Consent Database, which is updated regularly.

Tinui Rural Water Supply Resource Consents

Location	Consent No.	Purpose	Date Granted	Date of Expiry
Whareama River Catchment Tinui	WAR 010244	To take up to 90m^3 of water/day, 7 days per week from a spring for public water supply.	21 September 2001	21 September 2036

Data Confidence Levels

The data confidence levels for this asset are shown in Table 6.18. Where, A = Highly Reliable, B = Reliable, C = Uncertain, D = Very uncertain

TINUI WATER SUPPLY DATA CONFIDENCE LEVELS

Attribute	D	C	B	A
Physical Parameters				
Asset Capacity				
Asset Condition				
Valuations				
Historical Expenditures				
Design Standards				

Design Standards

All water supply infrastructure installed in areas of new development must meet the requirements outlined in NZS4404: 2004 Land Development and Subdivision Engineering.

The policy for reticulation network design, endeavours to provide a grid network – and where "dead end" streets are unavoidable, rider mains are installed to minimise circulation problems (approximately 49% of installed water main lengths are rider mains).

The current policy for backflow prevention is to install appropriate backflow devices on commercial premises according to the assessed level of risk.

Maintenance Plan

The Tinui water supply plant is attended bi-weekly by Environmental Health Officers. The solution tank is topped up and a general operation check completed. Service is provided as problems arise.

Renewal/Replacement Plan

The Tinui bore will require circa $15,000 to refurbish in 2021/22. No other renewals are currently planned.

Asset Creation Plan

There is no current requirement for a Tinui asset creation plan.

Financial Forecast

Council has made a strategic decision to maintain the current levels of service for this activity. Council has no capital or renewal plans for this asset register.

Disposal Plan

There is no current disposal planned for Tinui assets.

FINANCIAL SUMMARY

Financial summary

This section summarises the forecast level of expenditure required to enable the proposed level of service and action the proposed projects set out in this Asset Management Plan. Here we also discuss historical expenditure, funding sources (past & future) and the implications of these for Council's financial sustainability.

Estimates of future costs and revenues have been developed using best available information and expected flow on effects calculated using established financial assumptions and policies in the Long-Term Plan 2021 - 31

The intended approach to service delivery for the activities of Water Supply (urban and rural) have been selected taking into account resource availability and cost efficiency and effectiveness. A predominantly more in-house approach has been taken to looking after and developing these important assets which include our water treatment operations, reticulation, urban and rural water connections, and services. Our in-house management is supported by consultants and contractors where appropriate.

As a Council we try to strike the optimal balance between maintenance and renewals. We have a number of big commitments in this area which will have significant impacts on our District. These include ongoing reticulation and supply renewals, bore investigations, reservoir upgrades, urban water meters and raw water storage dams. Water supply is essential to the health and longevity of life for our District therefore we have a programme of maintenance to ensure that these assets do not get worn down and incur expensive replacement costs.

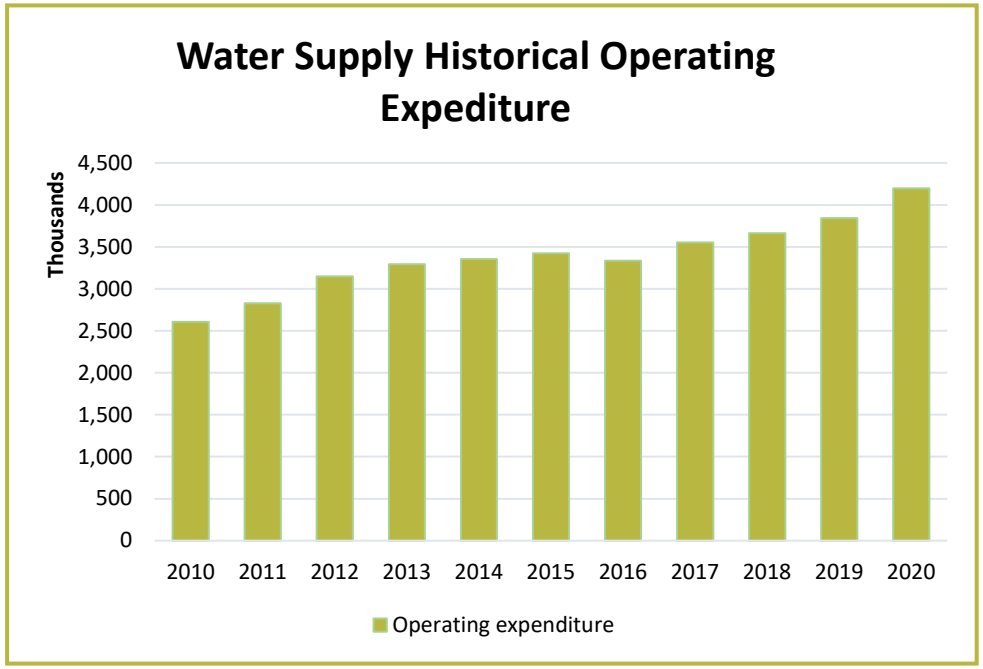
Historical Financial Performance

We summarise in the table and graphs below historical financial expenditure of Water Supply to place in context our current 10-year projections.

Past spending must be considered when we make our forecasts as it impacts our current financials through interest, depreciation and maintenance costs that arise when we make capital asset purchases, and the appropriateness of past operational spending influences the required maintenance programme going forward and available reserve funding.

The graphs and table below set out the operating expenditure including depreciation for the water supply activity for the past ten years.

Historical Water Supply Expenditure.



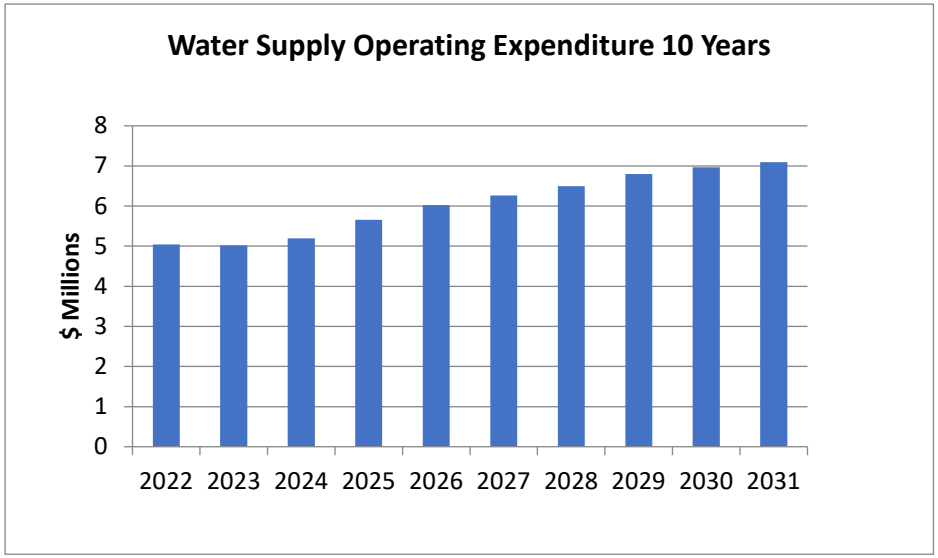
Historical Operating Expenditure

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Water Supply											
Operating Expenditure	2,608,460	2,829,740	3,148,251	3,294,363	3,356,160	3,423,534	3,336,401	3,551,545	3,663,947	3,843,074	4,198,513

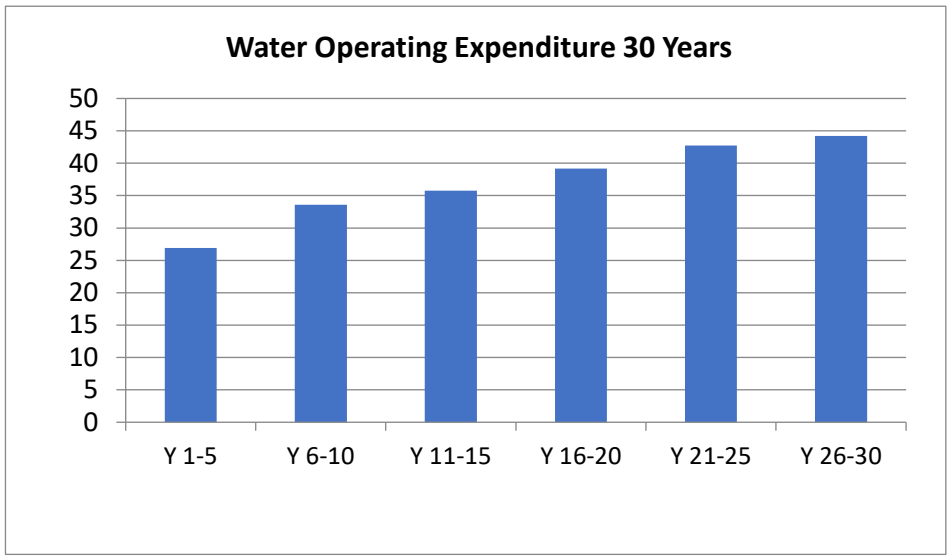
Forecast Operating Expenditure

Water Supply	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Operating expenditure	3,354,044	2,983,972	3,103,516	3,434,216	3,550,710	3,728,050	3,914,044	4,000,605	4,109,881	4,161,326
Depreciation	1,685,514	2,036,297	2,090,996	2,222,228	2,472,713	2,535,912	2,583,984	2,794,406	2,852,004	2,928,441
Total Operating expenditure	**5,039,558**	**5,020,269**	**5,194,512**	**5,656,444**	**6,023,422**	**6,263,962**	**6,498,028**	**6,795,011**	**6,961,885**	**7,089,766**

Forecast Water Operating Expenditure 2021 – 2031



Forecast Water Operating Expenditure 2021 – 2031

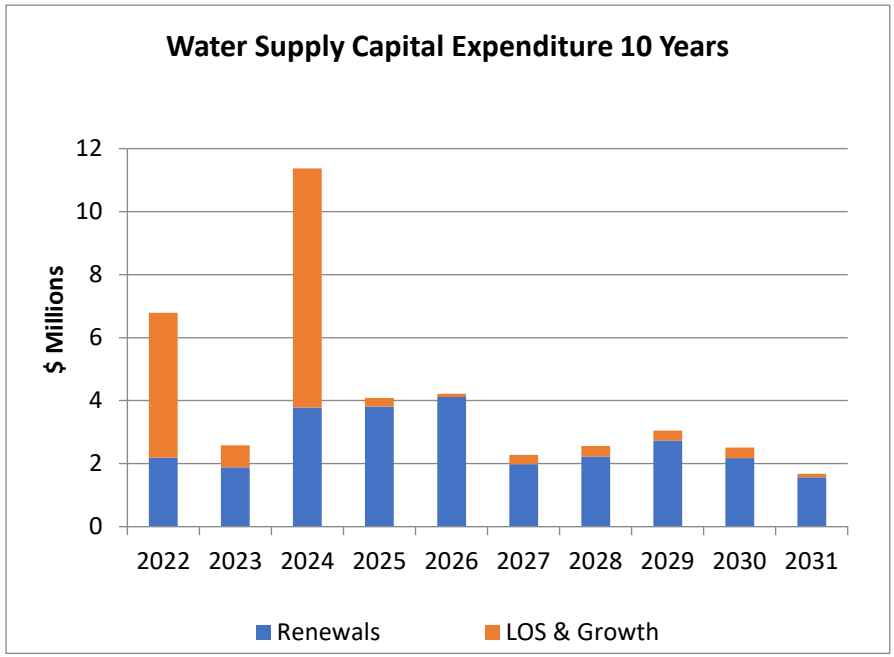


Capital Expenditure

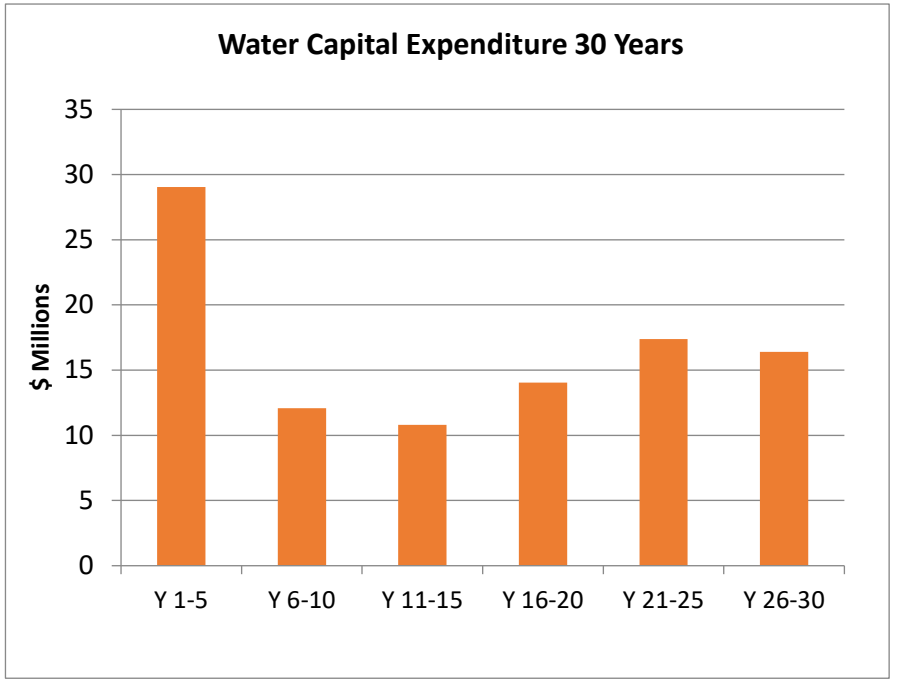
Investment in long life assets is essential to our Water Supply activities and responsibilities as it stands as a core component of our overall infrastructure. Indeed, as has recently been shown by national events water services are of utmost importance to the health and wellbeing of our community.

Over the current LTP 2021-31 timeframe we are projecting to invest $50.5M into our Water Supply assets.

Forecast Water Capital Expenditure 2021 – 2031



Forecast Water Capital Expenditure 2021 – 2051



Forecast Water Capital Expenditure Summary

WATER SUPPLIES												
Annual Plan 2020/21	Capital Expenditure Summary	Source of Funds	LTP Year 1 2021/22	LTP Year 2 2022/23	LTP Year 3 2023/24	LTP Year 4 2024/25	LTP Year 5 2025/26	LTP Year 6 2026/27	LTP Year 7 2027/28	LTP Year 8 2028/29	LTP Year 9 2029/30	LTP Year 10 2030/31
	Capital Projects		$	$	$	$	$	$	$	$	$	$
$	**Urban water treatment**											
-	WTP Consent Renewal - take	Depn Reserve	50,000	102,200	-	-	-	59,250	-	-	-	-
200,000	WTP sludge handling upgrade	Loan	800,000	-	-	-	-	-	-	-	-	-
40,000	WTP - plant & equipment renewals	Depn Reserve	150,000	97,090	165,075	104,785	108,585	112,575	116,565	120,935	125,590	130,340
	WTP - plant & equipment upgrades	Depn Reserve	120,000	81,760	74,550	88,240	105,156	94,800	98,160	101,840	105,760	109,760
20,000	WTP - building renewals	Depn Reserve	20,000	20,440	21,300	55,150	22,860	23,700	24,540	25,460	26,440	27,440
-	Raw water storage dams	Loan	-	-	7,455,000	-	-	-	-	-	-	-
-	Filter Refurbishment	Depn Reserve	-	-	-	-	-	-	-	-	661,000	-
-	Reseal Access Road WTP	Depn Reserve	-	-	-	-	-	-	18,405	-	-	-
-	Treated water storage - Nikau Heights Lansd	External Funds	796,500	-	-	-	-	-	-	-	-	-
-	WTP SCADA and electrical upgrades - stimul	External Funds	60,000	-	-	-	-	-	-	-	-	-
-	Fish Inlet - Stimulus project	External Funds	70,000	-	-	-	-	-	-	-	-	-
	Generator load bank - Stimulus project	External Funds	45,000	-	-	-	-	-	-	-	-	-
-	bulk tanker water supply terminal constructi	External Funds	82,000	-	-	-	-	-	-	-	-	-
260,000	**Total Urban water treatment**		**2,193,500**	**301,490**	**7,715,925**	**248,175**	**236,601**	**290,325**	**257,670**	**248,235**	**918,790**	**267,540**
	Urban water reticulation											
1,800,000	Water mains renewals (reticulation)	Loan/Depn Reserve	1,700,000	1,533,000	3,514,500	3,562,789	3,886,200	1,694,657	1,963,200	2,482,350	1,255,900	1,303,400
50,000	Water connections replacements	Depn Reserve	200,000	102,200	106,500	55,150	57,150	59,250	61,350	63,650	66,100	68,600
1,800,000	Water meters project completion	Loan	1,350,000	-	-	-	-	-	-	-	-	-
20,000	Urbanisation of Millard Ave	Subdiv contrib	-	613,200	-	-	-	-	-	-	-	-
	Reservoir upgrades	Depn Reserve	-	-	-	-	-	-	24,540	-	-	-
	Water main renewal - stimulus package	External Funds	600,000	-	-	-	-	-	-	-	-	-
20,480	Water main - CBD	Depn Reserve	-	-	-	187,411	-	201,343	208,480	216,295	224,621	-
3,690,480	**Total Urban water reticulation**		**3,850,000**	**2,248,400**	**3,621,000**	**3,805,350**	**3,943,350**	**1,955,250**	**2,257,570**	**2,762,295**	**1,546,621**	**1,372,000**
	Rural water supply											
50,000	Wainuioru water supply renewals	Depn Reserve	30,000	30,660	31,950	33,090	34,290	35,550	36,810	38,190	39,660	41,160
	Wainuioru Water supply - UV system and filte	External Funds	680,000	-	-	-	-	-	-	-	-	-
100,000	Water - emergency package plant	Loan	-	-	-	-	-	-	-	-	-	-
-	Tinui water supply upgrades	Depn Reserve	5,000	-	5,325	-	5,715	-	6,135	-	6,610	-
50,000	Opaki water race consent renewal	Loan	30,000	-	-	-	-	-	-	-	-	-
200,000	**Total Rural water supply**		**745,000**	**30,660**	**37,275**	**33,090**	**40,005**	**35,550**	**42,945**	**38,190**	**46,270**	**41,160**
4,150,480	**Total**		**6,788,500**	**2,580,550**	**11,374,200**	**4,086,615**	**4,219,956**	**2,281,125**	**2,558,185**	**3,048,720**	**2,511,681**	**1,680,700**
	Capital Funding											
(2,000,480)	Transfers from reserves		(1,795,000)	(2,120,650)	(1,522,950)	(1,627,998)	(1,796,796)	(1,942,194)	(2,165,545)	(1,775,720)	(2,511,681)	(1,680,700)
-	External funds		(2,333,500)	-	-	-	-	-	-	-	-	-
(2,150,000)	Loan funds		(2,660,000)	(459,900)	(9,851,250)	(2,458,617)	(2,423,160)	(338,931)	(392,640)	(1,273,000)	-	-
(4,150,480)	**Total capital funding**		**($6,788,500)**	**($2,580,550)**	**($11,374,200)**	**($4,086,615)**	**($4,219,956)**	**($2,281,125)**	**($2,558,185)**	**($3,048,720)**	**($2,511,681)**	**($1,680,700)**
$0	**Rates requirement**		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Key Projects by Activity

Over the next 10 years we are planning to invest in renewing out water reticulation and renewing and upgrading our reservoirs and treatment plant facilities. We set out here key projects by activity and show in graphical form the past, current budget and future forecast total spend by year.

- WTP Plant, equipment and building upgrades, YEAR 1-10, $3.5M
- Raw water storage dam, 2023/4, $7.4M
- Water mains reticulation renewals, YEARS 1-10, $22M
- Water connection replacements, YEARS 1-10, $840K
- Water Meter Installation Year 1 $1.3M

New borrowings are proposed to fund future capital projects. Details of the proposed new borrowings are shown on the Capital Expenditure Summary.

Insurance Coverage

The Council insures its buildings and structures under a comprehensive material damage policy. All parks' buildings are included under this policy. Some other structures and built items such as playgrounds and park furniture are identified on the insurance schedules, while others are included under a category called 'other improvements.

Estimated Future Loan Repayment and Loan Interest Cost

Future borrowing requirements are shown under the capital funding section in the Forecast Water Capital Expenditure Summary table above. Loan repayments costs on any existing borrowings are included within the activity budgets.

Financial Forecast

Forecast Operating Expenditure and Forecast Water Capital Expenditure Summary show the financial forecasts for operational and capital expenditure for the next 10 years.

Future Depreciation Projections

Future depreciation will be based on existing depreciation that flows out of infrastructural valuations, plus the additional depreciation that is generated by new capital expenditure and revaluations.

Financial Summary

All capital expenditure in Forecast Water Capital Expenditure Summary is funded by a mixture of loans, reserves, and external funding.

Changes in Service Potential

Council maintains the assets so as to retain their condition and overall value at nationally accepted levels. A programme of routine maintenance where and when required is used to achieve this.

Assumptions and Confidence Levels

– Basis of Preparation

The financial information in this plan has been prepared following the provisions of Public Benefit Entity (PBE) Standard - Financial Reporting Standard 42 'Prospective Financial Statements' (PBE FRS 42). The purpose of the financial forecasts in this long-term plan is to provide "best endeavour's" costing of Masterton District Council's plans to enable it to achieve its Community Outcomes, in collaboration with other stakeholders, over the 10-year period 2021-2031.

– Basis of Assumption

Prospective information is based on a number of assumptions. Risks and uncertainties surround these assumptions. The basis of the assumptions surrounding the information is found in Planning Assumptions in the LTP. The information should therefore be used carefully, with this best endeavour's purpose in mind. The Local Government Act 2002 Schedule 10 (1)(e) requires that information relating to levels of service, estimated expenses and revenue be provided in detail for three financial years, and indicative for the subsequent seven financial years. Over time, information becomes increasingly indicative from the time it was first prepared.

The approach taken to budget development has been that of preparing 'forecasts' on a best estimate basis. In this case, a forecast refers to financial information based on assumptions on future events the Council expects to occur and on the basis of Council's expected response to these events. The Council has not taken an approach where hypothetical ("what-if") projections are used.

The figures presented are budgeted. However, the opening balance of the 2020/21 year is based on the estimated actual result, with this estimation having been made in March 2021.

The major limitation of the forecasting approach, as with any approach, is that events may change over time and undermine the accuracy of assumptions made. The actual financial results achieved for the period are likely to vary from the information presented and the variations may be material.

The review of assumptions underlying the financial information was undertaken in preparation of the Long-Term Plan (LTP). However, the assumptions themselves were adopted by Council resolution to approve the Draft LTP for public consultation in April 2021.

– Assumptions and Risk Assessments

A number of assumptions were made in preparing the Draft 2021-2031 Long Term Plan (LTP). These assumptions are necessary as the planning term is for 10 years and the stating of assumptions ensures that all estimates and forecasts are made on the same basis. There are four categories of planning assumptions in this document:

Demand Assumptions

- Resident population
- District growth

Political Environment

- Policies
- Governance

Operating Environment

- Resource consents
- Natural disasters
- External factors
- Human resources

Financial Assumptions

(Please see the full LTP document for the assumptions detail.)

Funding Mechanism

Operating costs are to be funded by rates and user charges as per the Council's Revenue & Financing Policy. Capital renewals should be funded from depreciation reserves (to the extent that the reserve funds can sustain the renewals programme). Upgrade projects should be loan funded to ensure intergenerational equity (i.e., those receiving benefits should pay).

PLAN IMPROVEMENT AND MONITORING

Introduction

In preparing this Plan there remain a number of areas where improvement to the level of detail is needed. This improvement will be phased reflecting a process of continuous enhancement of the management confidence provided by the Plan. This further work will have the effect of:

- Enhancing analysis for planning purposes.
- Improving operational efficiency.

An overall utilities improvement plan (covering water supply, wastewater, stormwater and solid waste services) will be developed following completion and review of the risk assessment processes (section 5). Overall priorities will then be assigned, and resources allowed to deliver the outcomes.

Current amp improvement programme

Recommendations for improvement were made throughout this Plan. These are summarised in table below. It is recommended that this table be updated to match the current Plan and again after an overall utilities' improvement plan is established.

Water Supply Asset Management Plan Improvement Plan

No.	Item	Report Section	Year	By Whom
1.	Review current level of service every 3 years	LOS	From 2021	MDC
2.	Incorporate the findings of the WSP and Leak Detection Study & Network Assessment	LOS Growth and Demand	As Completed – check again after installation of water meters	USM
3.	Update any service level gaps identified, and their impact on Growth & Demand.	LOS Growth and Demand	2021 and each year	MAO
4.	Monitor trends identified in the Growth & Demand section and update this Plan accordingly.	Growth and Demand	2021 and ongoing	Asset Officer
5.	Undertake further monitoring & analysis work to better understand the	Growth and Demand	On-going	Asset Officer

Water Supply Asset Management Plan Improvement Plan				
No.	Item	Report Section	Year	By Whom
	effect of climate changes on demand			
6.	Strategic Review of risk management for all services/ activities.	Risk	On-going	SMT
7.	Following the review, undertake further work, training and assessment re risk management.	Risk	2021/22	Asset Manager
8.	Review valuation replacement costs for assets.	Lifecycle	Each valuation report	FM

Water Supply Asset Management Plan Improvement Plan				
No.	Item	Report Section	Year	By Whom
9.	Show assessed grades for sewer pipes on Asset system to assist with maintenance and renewal planning.	Lifecycle	2022	Asset Officer – as part of new AM system
10.	Include schedule of when assessments are next due for urban reservoirs located in Manuka St, Titoki St and Upper Plain	Lifecycle	2022	USM

The above 'Improvement Plans' should be monitored and reviewed once in every 12 months. Appropriate actions then can be taken for further improvement. This Plan will be reviewed every three years.

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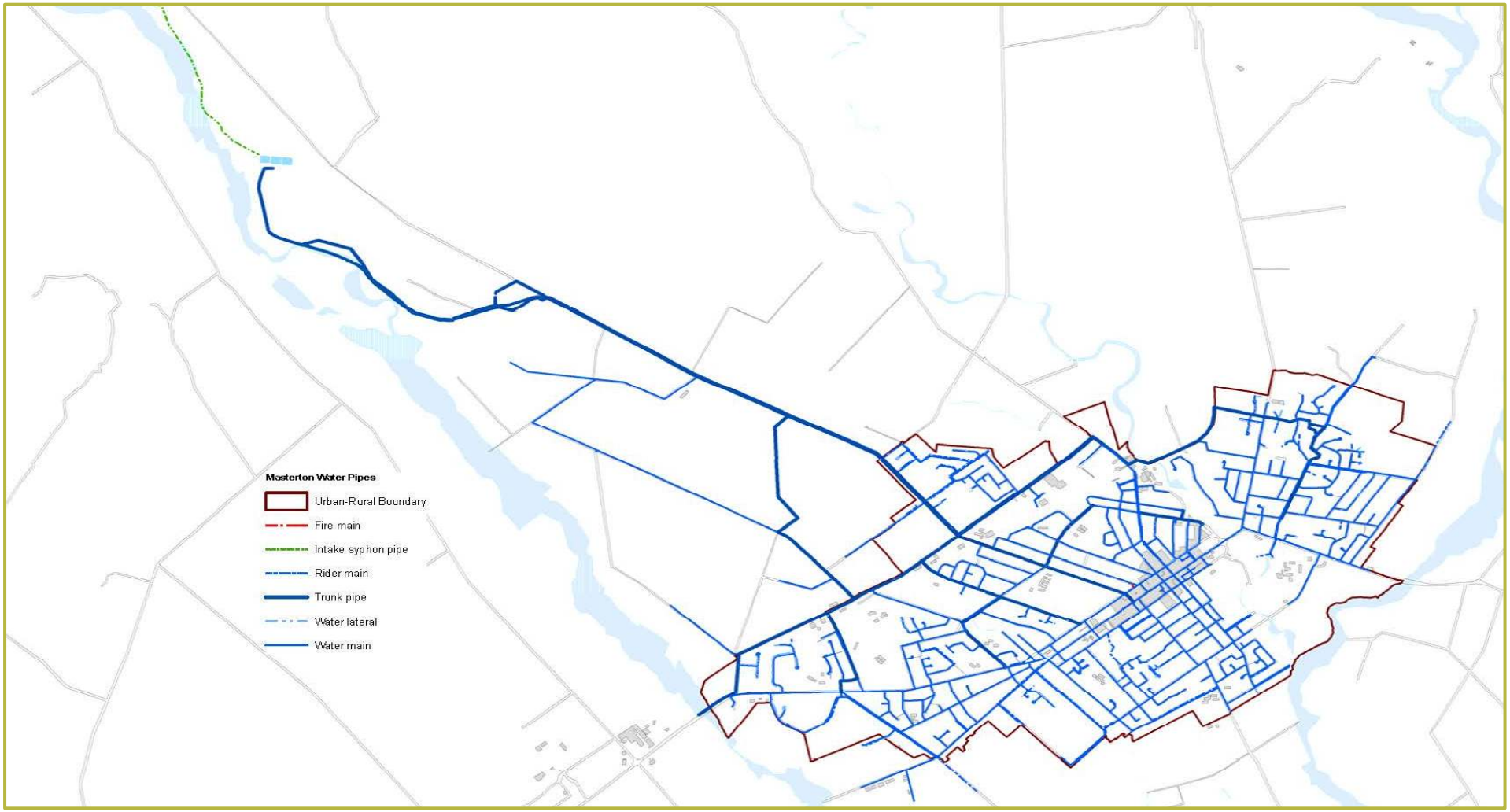
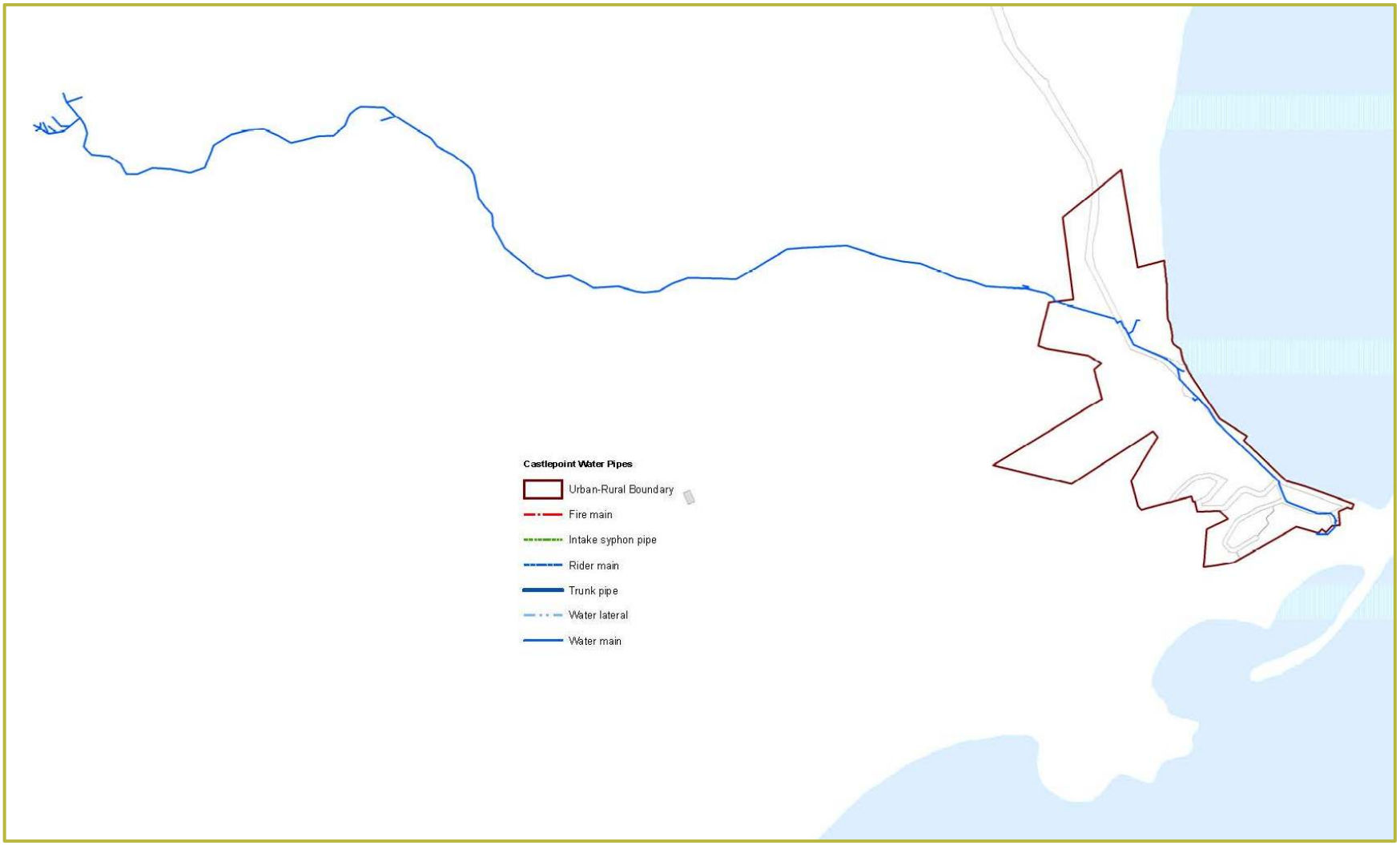
APPENDIX & MAPS

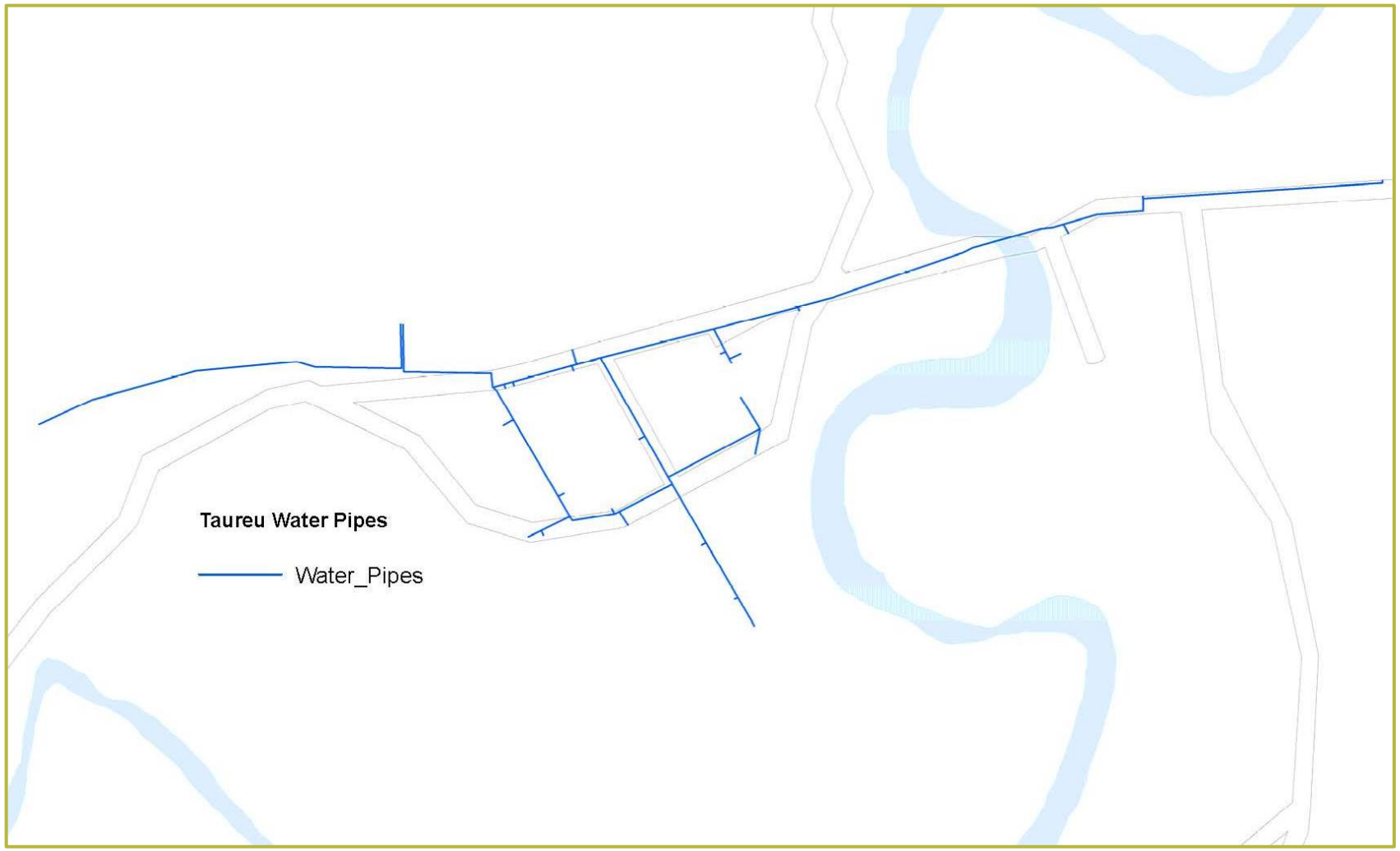
Appendix A – Masterton network



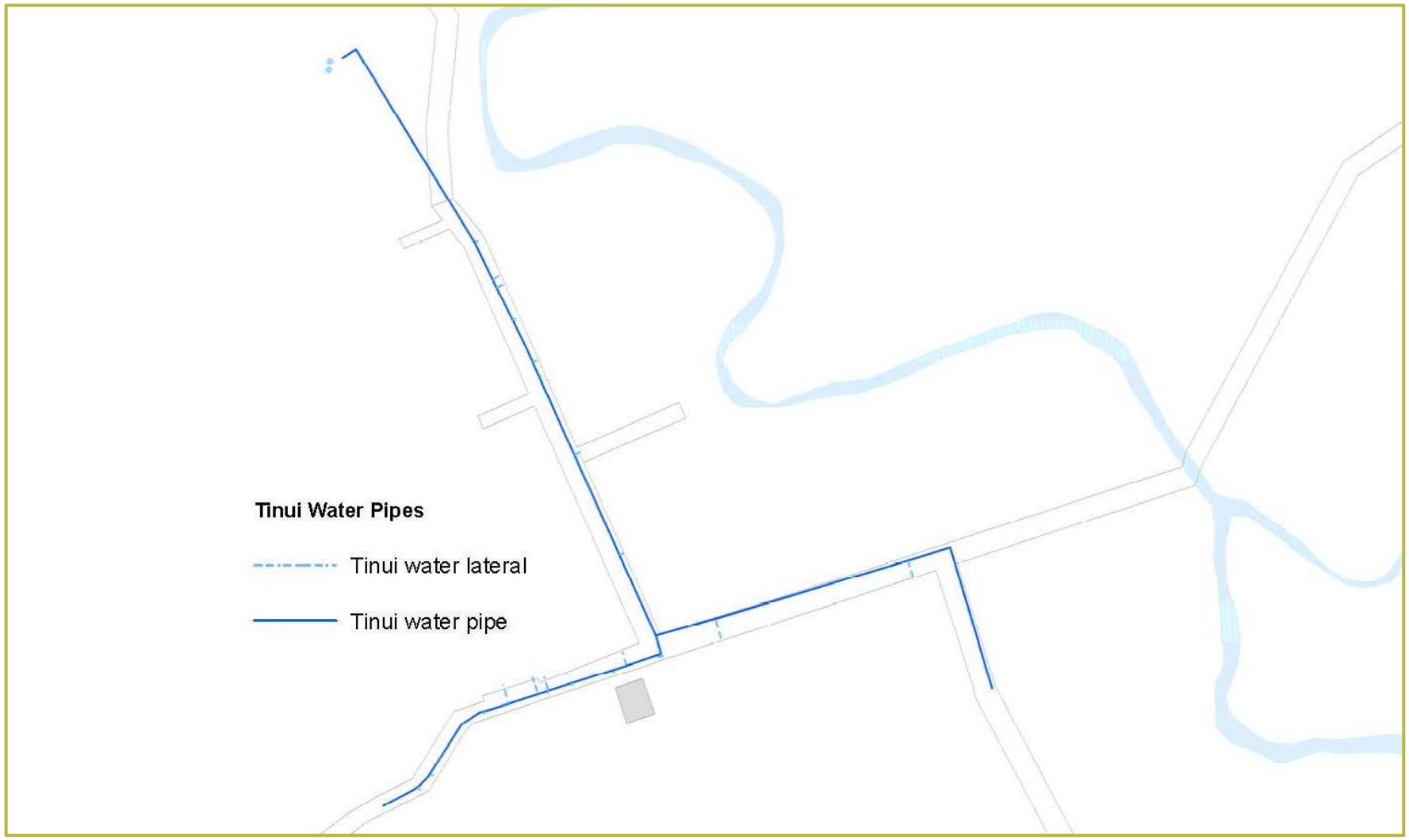
Appendix B – Castlepoint network



Appendix C – Taueru network



Appendix D – Tinui network



Appendix E – Masterton Urban - Pipes by Material