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Water Supply
Asset Management Plan

1 July 2021 – 30 June 2031

20 SEPTEMBER 2022

South Waikato District Council

PLAN

Water Supply Asset Management Plan 2021 - 2031

Plan management – review and update records:

Draft	17 December 2021
Final	23 December 2021
Update (New Works - July 2022)	30 August 2022
Update (New Works - July 2022 LTP Amendments – 2022)	22 September 2022
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Executive Summary

The purpose of this asset management plan is to describe how Water Supply assets in the South Waikato District will be managed so that acceptable levels of service are provided in the most cost-effective manner and contribute to the achievement of the 2021 – 2031 Long Term Plan (LTP).

This plan details information about:

- The strategic outcomes that Council is seeking to achieve related to Water Supply infrastructure.
- The level of service to be provided.
- The infrastructure that needs to be maintained, renewed, and developed to meet the demands placed on it over the next 30 years.
- How these services are to be provided.
- What funding is required to meet these demands.
- The associated risks.

The AMP covers the period 1 July 2021 to 30 June 2031 with a particular focus on work programs over the next five years. It informs the Councils 2021/31 10-Year plan and the 30-year Infrastructure Strategy and contributes to meeting Councils identified strategic outcomes.

What we do

The South Waikato District Council (SWDC) is in the business of owning, operating and maintaining water treatment plants and distribution networks in Arapuni, Tīrau, Putāruru, and Tokoroa urban communities and the Athol and Lichfield rural communities.

Assets	
Watermains, km	293
Bores & water supply springs	9
Treatment Plants	6
Reservoirs	11
Valves	1,738
Hydrants	1,138
Assets total replacement value, $M	68.7

We collect water from various water sources, treat the water to be safe for drinking and distribute water to homes and businesses via water supply pipes either by gravity or pumping. We treat drinking water to a quality mandated by the current drinking water standards.

Why we do it

A reliable supply of clean drinking water is essential for the health of our residents and also supports community safety through provision of adequate water supply to meet a minimum level of firefighting capability. A stable supply of water is essential in supporting our existing businesses and encouraging new businesses to our district. Council ensures that residents who are serviced by Council's Water Supply have high quality water that meets all statutory and environmental standards.

Our Goals and Outcomes

The Water Supply activity contributes to the Council's Vision, Outcomes and Strategies linking to the Levels of service and driving performance objectives. Asset management planning is undertaken within both an

internal and external strategic environment. The assumptions around which this AMP has been framed are outlined further into this document and include:

- The assets will remain in Council ownership, subject to the future impacts of the Government-led water reform and legislations arising from the Water Services Act.
- Inflation factors have been applied to budgets over the next 30 years based on BERL indices.
- Assumed asset lives are reasonable.
- Growth in Demand will be minor – potential changes in demand due to growth have been factored into our renewals as new assets programs.

Council's strategy presents what we are going to do for the next ten years to make our district a better place to live and work. At the core of our strategy is our vision, our outcomes and our strategies. The link between the vision, outcomes and strategies is explained in the table below:

The external strategic environment is also of relevance in that the performance of the Water Supply network is governed by legislative obligations such as, Local Government Act, Resource Management Act, Health Act (Drinking Water) Amendment Act and Drinking Water Standards for New Zealand.

Three Waters Reforms and Water Services Act 2021

In addition to the above, the proposed Three Waters Reforms currently proposed are likely to significantly impact on the delivery of the Water Supply services in the District. With the creation of a new water regulator Taumata Arowai the performance of our Water Supply treatment plants will be under additional scrutiny.

There is currently strong policy direction from national and local government to improve the state of our waterbodies as reflected in the Vision and Strategy, the National Policy Statement for Freshwater Management, the National Environmental Standard for Freshwater, the Waikato Regional Policy Statement, and Plan Change 1 of the Waikato Regional Plan.

These policies expect improvements in water quality nationally and their implementation can be expected to require a shift in Water Supply, Wastewater and Stormwater management. This will require TAs across the region to continue to seek funding through Long Term Planning processes to resource further upgrades. Recently, TAs in the region including the SWDC have taken advantage of funding made available by the Government as part of the Three Waters Review which has enabled some upgrade programmes to be brought forward.

The Water Services Act 2021 will significantly impact upon 3-waters management in New Zealand. The new water regulator, Taumata Arowai, will regulate drinking water suppliers and oversee Water Supply and stormwater utility providers and regulators (including Regional Council regulatory responsibilities). The Water Services Act will mean additional monitoring and reporting requirements for the management of water supply, stormwater, and wastewater activities as well as new water safety plans, specifically, as detailed below:

- Ensuring the drinking water we supply is safe
- Ensuring the drinking water we supply complies with the current Drinking Water Standards for New Zealand
- Annually updating our registration details
- Proving a sufficient quantity of drinking water to meet the ordinary drinking water needs of consumers who use our supply
- Drinking water safety planning
- Taking action to resolve any risks to drinking water safety or quantity. This includes keeping consumers informed
- Notifying Taumata Arowai in specified circumstances. This includes when we have, or may have, supplied drinking water that is unsafe or that doesn't comply with the current Drinking water Standards for New Zealand.

Contribution to the Council Strategy

Council's Water Supply services are provided for the benefit of the community to ensure that the Vision of 'Healthy people thriving in a safe, vibrant and sustainable community', as expressed in the Long-Term Plan, is achieved.

The Water Supply Activity contributes towards the implementation of Council's Vision, through achieving the Outcomes and Strategies.

Outcomes	Strategies
Growth: Council aims to increase population and jobs, reduce unemployment, increase average earnings, and improve the deprivation index.	Service provision: Water supply is an essential contribution to economic growth and increased quality of life. Infrastructure: It is imperative that our Water Supply plant is fit for purpose in terms of a growing population and the associated demand. Growth: An inevitable consequence of urban growth is an increased demand for water supply. Council will continue to assess the need for service extensions to areas of growth.
Resilience: We all, Council and community, need to anticipate, resist, respond to and recover from significant change or events.	Financial sustainability: Council will ensure adequate revenue is available to provide the required capacity or service level improvements in advance of development demand. Significant purchases will maintain a level that is viable for the current economic and population climate.

Outcomes	Strategies
Relationships: We will build stronger relationships with Iwi and Māori along with community and business groups to ensure that by working together we can achieve growth and a resilient community.	Engagement: Council will maintain relationships with Iwi regarding water supply activities, such as Te Waihou.

The National Infrastructure Plan (NIP)

The NIP details the Government's view of the challenges and priorities for infrastructure. The 2015 NIP describes the view to 2045. A Vision for New Zealand's Infrastructure in the NIP is:

New Zealand's infrastructure is resilient and coordinated and contributes to economic growth and increased quality of life.

More specifically the vision for the Water Sector is:

Water infrastructure will contribute to healthy and safe communities, promote the social, economic and cultural well-being of those communities, and will provide a competitive advantage for New Zealand's primary producers and industry.

National Policy Statement – Freshwater Management 2020

National policy statements are issued by central government to provide direction to local government about how to carry out their responsibilities under the Resource Management Act 1991 when it comes to matters of national significance.

This Freshwater NPS applies to the management of fresh water through a framework that considers and recognises Te Mana o te Wai as an integral part of freshwater management. It directs the content that regional councils, in consultation with their communities, must include in their regional plans. Regional plans tell resource users what is allowed in terms of things like water takes and discharges, and what will require a resource consent.

AMP Response to the Strategic Context

The approach taken in this AMP is to ensure that safe and reliable collection, treatment, and supply of water to protect community health and the environment. Specific issues focussed on for the 2021 – 31 period and addressed in the plan are:

- Replacement of the existing telemetry network to improve reliability and resilience of the data used to demonstrate compliance with drinking water standards
- Staged upgrades of the existing water network to meet projected growth.
- Completion of necessary upgrades to the water treatment plants to meet enhanced Drinking water requirements resource consent requirements.

The benefits of addressing these problems and the consequences of not addressing them are outlined in this AMP.

Key achievements over the last 3 years:

The key achievements for the Water Supply activity from the previous AMP update are:

- Installation of new chlorination system on the Te Waihou blue spring water supply
- Installation of new high flow filters onto the Te Waihou supply resulting from changes in water quality following the Kaikoura earthquake.
- Upgrade to the Glenshea park water supply to meet expected demand due to growth in Putāruru

Key Focus Areas 2021-2031

The key focus areas for the Water Supply activity for the next 10 years are:

- Water loss management - Assess water losses in the distribution system and develop an effective water loss strategy.
- Delivery of growth-related programmes particularly in Putāruru

- Delivery of a four-year watermain renewal programme to address deteriorating and/or under sized pipes

Network modelling

There was a need to undertake further Network Modelling to identify under sized infrastructure of the water reticulation system the requires upgrading and to meet future growth as well as to provide input to future asset management planning.

The pipe network is generally in good condition, like most networks there is significant AC (Asbestos Cement) pipework which is coming to the end of its useful life. Renewal expenditure is primarily targeted to replace these pipes based on pipe burst frequency. A four-year water renewal programme that addresses current renewal needs and addresses the projected growth has been awarded.

pH Management

- Council is investigating the options for pH correction for the water supplies which have naturally low pH.
- pH correction has health benefits and helps to prevent excess corrosion of pipework and other fittings in older houses. The mean average value of pH in the Drinking Water Standards is between 7-8 PPM. Water within the South Waikato District is typically below 7 PPM, pH correction is applied in the Tokoroa water supply.

Growth Programs

- Due to anticipated growth in the north of the district an increased focus will be required in supplying infrastructure to meet that growth, specific programs include:
- Upgrade 250 m of water main on Arapuni St from Reservoir St to Grey St to 180 mm diameter, required in 2029
- Upgrade 380 m of water main on Sholson St to 180 mm diameter proposed for 2025.
- Upgrade 600 m of gravity main along Reservoir Street from Glenshea PS to Arapuni St to 355 mm diameter proposed in 2025.

AMP Updates

The New Works scope, also identified as Projects-2022 below in this AMP reflect the following changes:

- - the addition of the network growth projects required for the new zoning areas in Tokoroa and Putāruru,
- - the addition of the Capital improvements in Putaruru as per the LTP Amendments[1] in August 2022.

The Assets covered in this AMP

Council staff manage four urban and two rural water supplies, Tokoroa, Putāruru, Tīrau, Arapuni, Lichfield and Athol. This includes 11 reservoirs, 9 bore water pumps, and 293 km of reticulation.

The total replacement value of the Water Supply assets is estimated $68.7 million as per the AssetFinda database. The total replacement value estimate was calculated based on the datasets for Line, Plant and Point assets, respectively, ww_line, ww_plant and ww_point, as shown following.

Total Replacement Value = UnitCost * QuantityLength

It is noted that ‘UnitCost’ and ‘QuantityLength’ are corresponding fields in the AssetFinda dataset.

Asset Condition

Overall water supply assets, based on the Condition data, 40% by value, are in Poor or Very Poor Condition. This represents a condition-based backlog of approximately $27 M.

[1] ECM_598789_v6_Long Term Plan Amendment update.docs

Water line assets, based on the Condition data, 36% by value, are in Poor or Very Poor Condition. This represents a condition-based backlog of approximately $24 M.

Water plant assets, based on the Condition data, virtually none are in Poor or Very Poor Condition. This indicates a low condition-based backlog ($178,000).

Water point assets, based on the Condition data, 4% by value, are in Poor or Very Poor Condition. This represents a condition-based backlog of approximately $3 M.

Other points to note:

- Overall water supply 38% by value of assets are in Excellent and Good condition versus 36% in Very Poor condition.
- Almost all plant assets (95%) are in Good or Excellent condition.
- 29% of the points assets are in Excellent condition, while 52% of the points' Replacement Cost corresponds to Average condition.
- 59% of the reticulation pipe network, which is 60% of the water reticulation assets' replacement cost, are in Poor and Very Poor condition.

Highest Asset Risks

Assessment of the Risk of water supply service failure due to asset failure shows the following highest risk assets (based on data in AssetFinda). This assessment also represents the assets' renewals backlog.

- Highest risk water supply assets overall: 5% ($3.4 M value) of all water supply assets are High or Very High Criticality and are in Poor or Very Poor Condition. Of which:
- Highest risk Toby assets: 4% (number 4,000, or $2.7 M) of Toby assets are Very High Criticality and are in Very Poor Condition
- Highest risk Pipeline assets: 1.1% (length 2,820 m, or $710,000) of water pipeline assets are High Criticality and are in Very Poor Condition

Further details on the asset condition, criticality and risk are as follows.

Asset Type and Condition	Quantity/ Length, metres	Replacement Cost	Replacement value as percentage of the total Water Assets Replacement Value	Replacement value as percentage of the Asset Type
Water line assets, m	292,923	$40,703,354		
Excellent	8,355	$1,108,602	2%	3%
Good	64,679	$7,245,563	11%	18%
Average	58,882	$8,153,905	12%	20%
Poor	29,761	$2,436,891	4%	6%
Very Poor	131,247	$21,758,393	32%	53%
Water plant assets	889	$13,346,511		
Excellent	821	$4,790,355	7%	36%
Good	57	$7,914,424	12%	59%
Average	9	$463,924	1%	3%
Poor	1	$1,080	0%	0%
Very Poor	1	$176,729	0%	1%
Water point assets	13,707	$14,631,623		
Excellent	4,601	$4,296,948	6%	29%
Good	2	$1,360	0%	0%
Average	5,112	$7,614,362	11%	52%
Very Poor	3,992	$2,718,953	4%	19%
Grand Total	-	$68,681,488	100%	

One third of the assets, by Replacement Value, is allocated High or Very High Criticality with majority of critical assets being in Average Condition.

Criticality	Asset Class	Asset Condition per Asset Type	Quantity, ea / Length, metres	Replacement Value
Very High	Lines (ws_line)	Average	8,320	1,541,252
		Excellent	2,610	280,594
		Good	1,647	230,514
		Poor	2	72
		Very Poor	31	10,366
	Plant (ws_plant)	Excellent	117	174,061
	Points (ws_point)	Average	5,087	7,594,740
		Excellent	4,148	3,912,166
		Good	1	680
		Very Poor	3,989	2,716,913
Very High Total				**16,461,359**
High	Lines (ws_line)	Average	7,950	2,647,370
		Good	1,239	386,300
		Poor	139	24,140
		Very Poor	2,790	699,817
	Plant (ws_plant)	Excellent	108	375,767
	Points (ws_point)	Excellent	6	17,496
High Criticality Total				**4,150,890**
Medium Criticality Total				2,920,963
Low Criticality Total				4,305,737
No Criticality data				12,740,678
Very Low Criticality Total				28,101,861
Grand Total				**68,681,488**

Levels of Service for Water Supply Customers

Customers' expectations of the service have been identified and subsequently defined in terms of Levels of Service and Performance Indicators that can be monitored, measured, and reported.

Council has adopted a series of measures which are intended to indicate how well the Water Supply infrastructure contributes to community outcomes and levels of service, as well as responsiveness, consent compliance, fault and complaint occurrence and planning. Both Customer Service Levels and Technical Standards are used.

The key LOS relate to water quality and continuity of service which are reported on in the SWDC Annual Report.

Customers' expectations of the service have been identified and subsequently defined in terms of Levels of Service and Performance Indicators that can be monitored, measured, and reported.

Council has adopted a series of measures which are intended to indicate how well the water infrastructure contributes to community outcomes and levels of service. Both Customer Service Levels and Technical Standards are used.

This plan supports Council providing:

- Safe and reliable drinking water and adequate supplies for firefighting to residential, commercial and industrial properties in the district
- Water infrastructure that meets the expected growth requirements
- Water services which comply with regulatory and consenting requirements
- Management of the water activity in a financially sustainable way.

The key LOS relate to water quality, system performance, continuity of service and responding to faults. LOS measures for the above services are contained within the Councils 10-year plan and include a number of regulatory and DIA mandatory performance measures. Key performance indicators include environmental compliance for treatment performance and ensuring wastewater is contained in the network and does not contaminate water supplies.

It is expected that the current levels of service will change in the next 30 years in the following areas:

- Mandatory compliance with the drinking water standards including meeting minimum residual chlorine levels for all water sources
- Increased reporting requirements by the new drinking water regulator Taumata Arowai.

The table below shows the changes in customer satisfaction levels over the past three years for all of the three water activities (Water, Wastewater & Stormwater). The satisfaction figures discount those who answered “don’t know” when they were asked for their opinion of the service. There has been a change in methodology between 2019 and 2020 when online or free post returns were allowed, and this may have impacted on the satisfaction percentages shown.

Council Activity	2018 Satisfaction Level	2019 Satisfaction Level	2020 Satisfaction Level	2020 Sample Size
Overall satisfaction with Council’s Water Management	85%	84%	80%	361
How well the stormwater network is maintained	75%	73%	72%	331
Ability of stormwater network to keep roads and footpaths free from flooding	71%	71%	68%	377
Ability of stormwater network to protect your property from flooding	82%	83%	79%	350
Water Supply system reliability	95%	97%	98%	275
How Council treats and disposes of Water Supply	94%	96%	94%	186
Odour of the water	84%	88%	86%	314
Reliability of the water supply	98%	95%	96%	324
Taste of the water	83%	84%	81%	318
Clarity of the water	84%	88%	86%	314
Pressure of the water	90%	90%	87%	321

Planning for Future Growth and Demand

The following key issues have been identified for the ten-year planning period:

- Compliance with revised national drinking water standards.
- Renewal of ageing pipes.
- Water demand management.
- Compliance with resource consent conditions.
- Planning for growth in the district

The following legislative requirements apply to Water Supply management:

- Water Services Act 2021
- Local Government Act 2002 (and amendments)
- Health Act 1956
- Health and Safety at Work Act 2015 (and amendments)
- Resource Management Act 1991 (and amendments)
- Civil Defence Emergency Management Act 2002

The latest 2018 Census data has revealed the District having an estimated population of 24,800 in 2018 and 25,100 in 2019 which is just over a 1% increase from 2018. The majority of the growth occurred in the north of the district focused on Tīrau and Putāruru.

Demand

Council expects that the demand from existing sources of Water Supply will generally not exceed capacity within the 10-year planning horizon of this AMP.

The impacts of proposed developments in Putāruru have been modelled to measure the impacts on both treatment/source capacity and reticulation. From this modelling a number of upgrades are proposed to both the reticulation and treatment plant to enable the water infrastructure to cope with increased demands.

Increased water demands can be expected from developments of recent industrial subdivisions in Tokoroa, Putāruru, and Tīrau communities during the planning period, including infill developments in Tīrau and Putāruru growth areas.

The demand for services is to be met through a combination of managing existing assets, upgrading existing assets and through providing new assets and demand management.

Demand management is to be delivered through implementing the Water Conservation Plan which outlines how council will achieve water use efficiencies to ensure compliance with resource consent conditions.

Lifecycle Management

Council manages six separate water supply schemes using its professional engineering staff and as required, external resources.

The major water supply assets include:

- Water source bore wells and associated pumps and controls.
- Treatment systems (small pumps and storage tanks) which inject chlorine disinfectant into the water.
- Treated water storage reservoirs.
- Large diameter trunk mains (conveying water to reservoirs).
- Water Mains – the backbone pipes of the reticulation network, of 100 mm diameter or larger.
- Fire Hydrants – connected to the fire mains as supply points for the Fire Service.
- Valves – permit parts of the network to be turned off in case of pipe breaks or other service requirements.
- Rider mains – smaller pipes, usually 40 mm or 50 mm diameter, used to supply properties on the opposite side of the street to fire mains.

- Service Connections and Meters – which convey water from the mains to individual buildings.
- Backflow prevention devices at certain properties - ensure that contaminants do not enter the reticulation network.

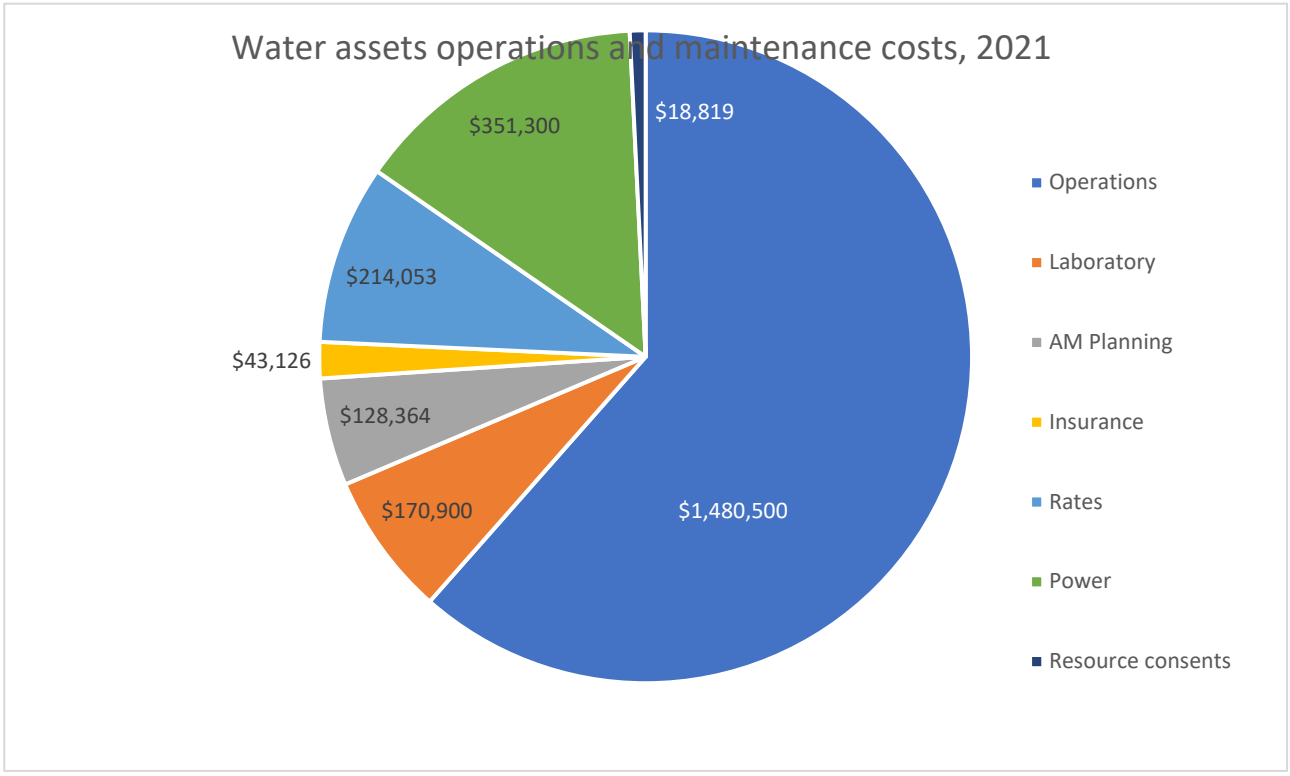
Details of these assets are recorded in a management system (AssetFinda). This enables the individual components to be tracked including size, age, depreciated and replacement value, and reports can be produced to predict replacement requirements.

Maintenance and Operations

The operation and maintenance of the water supply systems is carried out using a combination of Council Asset Management staff, Council staff (Water Services) and external contractors:

- Three Waters Manager and staff for management, administration, design, and supervision.
- Water Services for all operations and most maintenance work.
- External contractors for specialist activities such as laboratory testing, detailed investigations some equipment and major overhauls of mechanical equipment.

Asset operations are organised to meet the fluctuating demands placed on the assets and maintain service to the consumer. Proactive maintenance is aimed at maintaining asset performance and condition at optimal levels and is generally applied to critical assets where the consequences of failure are unacceptable. Reactive maintenance is carried in response to failure of an asset, a balanced approach is required with critical assets being proactively maintained while less critical assts are allowed to run to failure.



Capital Renewals

Asset renewal is significant work which restores, rehabilitates, replaces, or renews an existing asset to extend its economic life and/or restore its service potential. Work over and above restoring an asset to its original capacity is classed as development work.

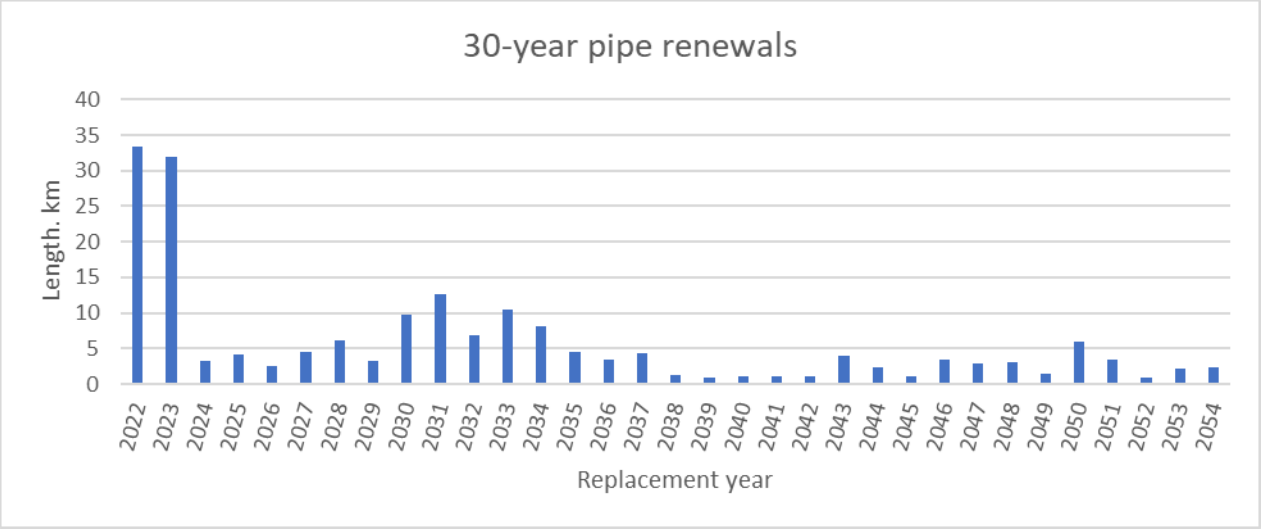
Pumping and treatment plant assets have shorter lives than the pipe reticulation system and more frequent re-investment is required. The AC–E type pipe assets are now in their renewal phase and increased annual renewals funding is required over the next 30 years.

Network hydraulic models have been developed or are in the process of being developed to analyse the water supply network capacity, firefighting capacity and pressure as well as optimise operations of the network to meet current and future demands on the network.

Council has a programme of testing pipes to determine their remaining life, this information will be used to reassess pipe lives and further refine the renewal programme. Council also continues to monitor pipe breakages and disruption to consumers. Water pipe replacement is planned to increase over the period of this AMP.

Length of Renewals

The length of water supply pipe renewals requirements over the next 30 years is shown below.

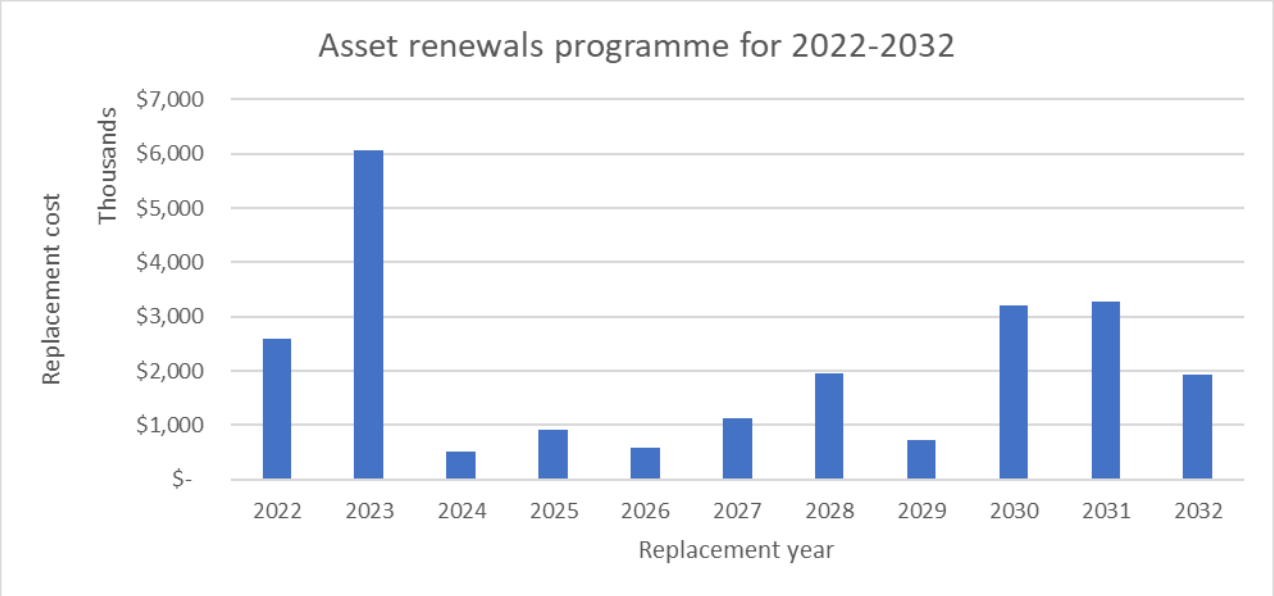


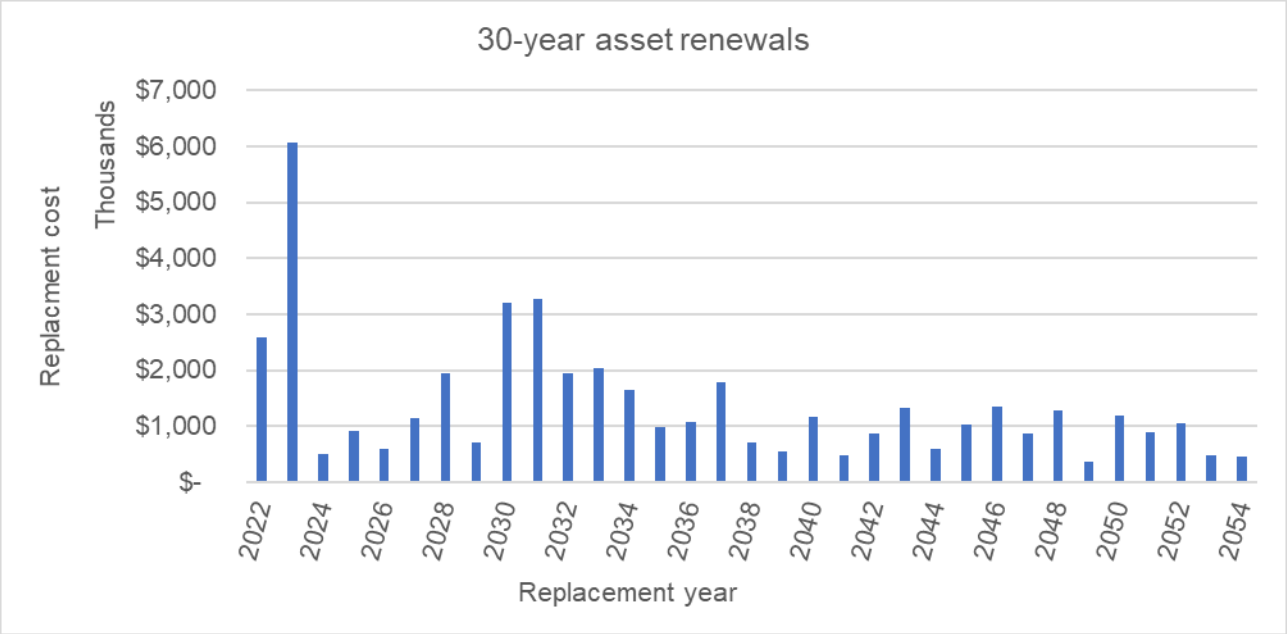
Cost of Renewals

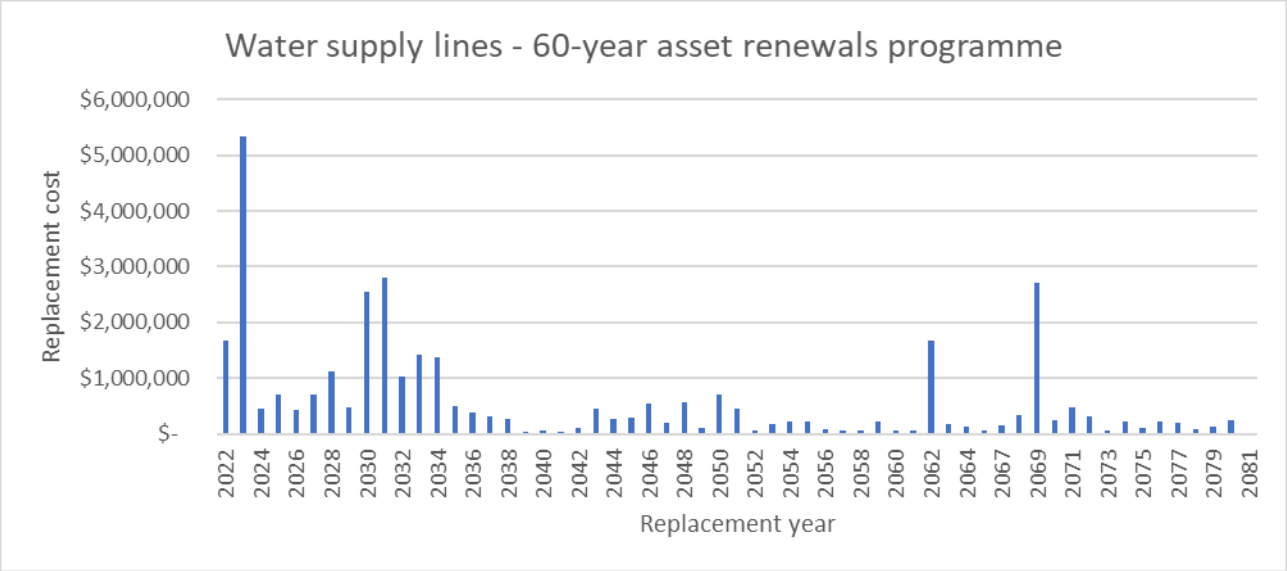
The cost of water supply pipe renewals requirements over the next 30 years is shown below.

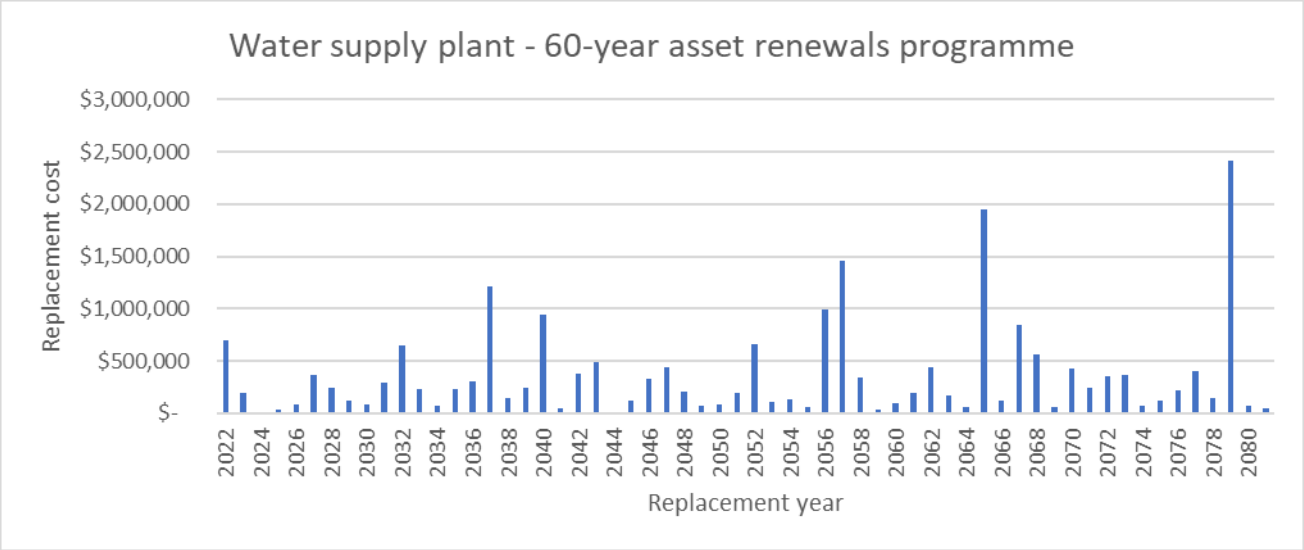
Capital Renewals needs for the next ten years are projected to be $**22.9 million**.

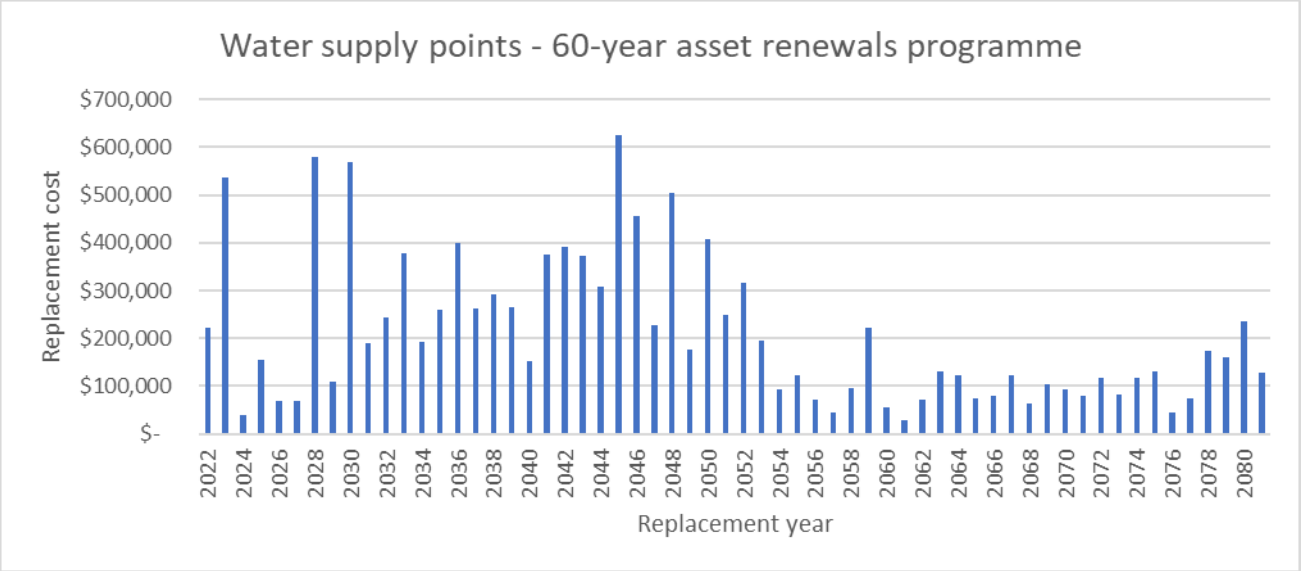
The costs renewal requirements for the water supply infrastructure over the next 60 years is detailed below.

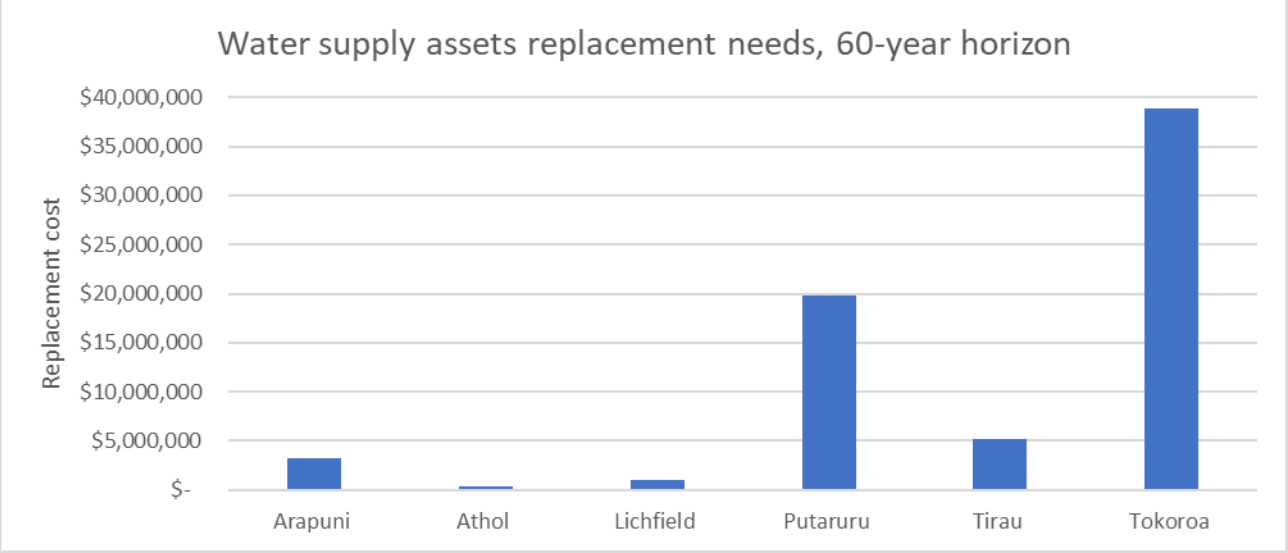












Capital Improvements/ New Works

Additional new components are sometimes required to meet regulatory requirements or national standards; to service additional consumers, or to manage risk exposure by duplicating the existing network. New Works projects planned for the next ten years include:

- Bore replacement in Arapuni
- New pH equipment for Putāruru
- Renewal of Tīrau water take resource consent

Network extensions to service additional outlying properties are funded by the users.

Managing Risk

Sustainable and reliable delivery of the Water Supply service requires careful consideration of the various types of risk associated with the service.

The major risks addressed in this Asset Management Plan include:

Business Risk

The Corporate Risk Management Policy addresses community outcomes, vision statement and strategic themes. Full details can be found in the South Waikato Risk Register and Risk Profile, which ranks the risks and includes control measures, where they exist.

Asset Risk

An Asset Criticality and risk Assessment report in 2007 addressed the consequences of infrastructure failure and identified the critical assets that required further investigation in order to ensure that they would continue to perform reliably delivering the agreed levels of service. Subsequent to that review our understanding of criticality and risk has evolved further, and additional work is underway to further refine our critical assets.

Critical assets are those assets which have the highest consequences in terms of disruption in services and financial, environmental and social cost should they fail. For the Water Supply activity, the assets in this category are:

- Large diameter Water Supply pipes
- Water Supply treatment plants
- Assets with critical customers

Mitigation measures to address these risks are covered in this plan, Resilient infrastructure is able to deal with significant disruption and changing circumstances as a result of the occurrence of natural hazards such as seismic and volcanic events.

Business Continuity Risk

Council has developed Business Continuity Plans that address the continuation of service delivery in the event of a disaster or failure of critical infrastructure. This is also linked to the regional lifelines program involving all territorial authorities in the greater Waikato and other utility providers.

Financial Forecasts LTP 2021

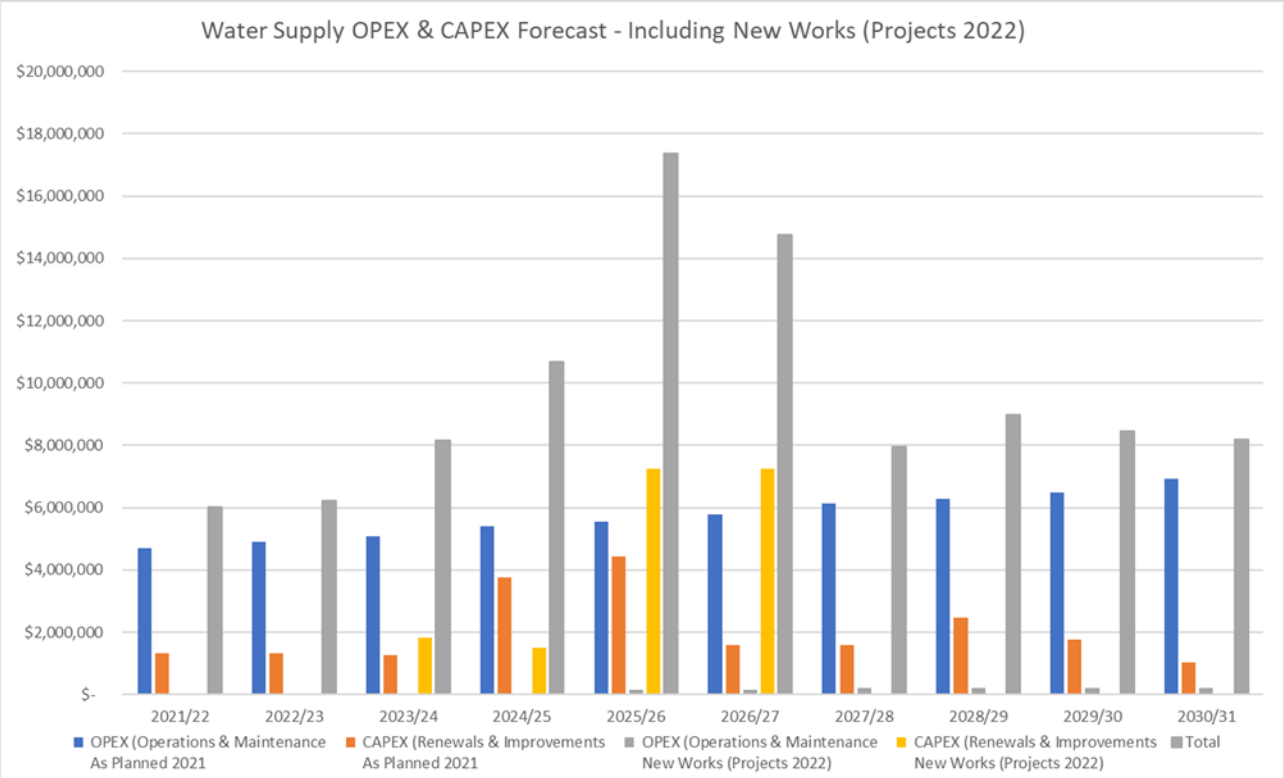
Maintenance and operating costs are expensed in the year they are accrued. The capitalisation threshold for water supply assets has been set at $1,000. Repairs to pipe failures will however only be capitalised if the length of new replacement pipe installed exceeds 12 metres (typically two pipe lengths). This is because a shorter repair would be abandoned along with the old assets in a future pipeline replacement. It therefore does not extend the overall life expectancy of the original pipe.

The graphs below detail the actual funding program over the 2021-2031 planning period. A condition assessment will be carried out on the water supply AC pipes in conjunction with wastewater AC pipes during the term of this AMP to ensure SWDC have allowed correct estimations of remaining lives for funding purposes and replacement timing.

Expenditure components are as follows:

- **Operating Costs**: It covers costs of operating and maintaining the water supply network, including fault repairs. See graph below for cost components.
- **Depreciation**: both renewal of existing assets and investment in new ones drive a gradual increase in depreciation charge over the plan period. The contribution of the older pipe assets to depreciation charges decreases as their value diminishes toward the end of their lives. Depreciation is based on the useful lives of assets, tabulated in AMP Chapter 7. Useful lives vary depending on many factors:
- Mechanical and electrical plant depreciate faster than reticulation pipes.
- Different pipe materials have different life expectancies.
- Different historical installation standards and service conditions also affect lives.
- **Interest and Principal**: New works are funded by borrowing. There is currently no loan balance for water supply works.
- **Support**: This item covers the share of corporate support costs apportioned to Water Supply.
- **New works**: Capital investment is required to service additional consumers, to manage risk or for a change in level of service to meet residents' expectations or changes in legislative / consent requirements.
- **Renewals**: This capital cost is for replacing old pipes and treatment plant/intake equipment to maintain service to existing consumers at the agreed levels of service. It is funded by drawing from the depreciation reserve.

The table below summarises financial projections for the planning period. These are expressed in 2020/21 dollars and have not been indexed for inflation. The chart below includes the latest Growth, Improvements and Renewals' amendments made in 2022.



OPEX & CAPEX EXPENDITURE	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
CAPEX (Renewals & Improvements As Planned 2021	$ 1,318,500	$ 1,328,500	$ 1,275,500	$ 3,749,500	$ 4,421,670	$ 1,583,500	$ 1,598,500	$ 2,480,308	$ 1,752,797	$ 1,033,500	$ 20,542,275
OPEX (Operations & Maintenance As Planned 2021	$ 4,705,837	$ 4,897,154	$ 5,079,045	$ 5,407,310	$ 5,557,790	$ 5,777,089	$ 6,120,170	$ 6,287,937	$ 6,482,979	$ 6,925,970	$ 57,241,281
CAPEX (Renewals & Improvements New Works (Projects 2022)			$ 1,812,058	$ 1,511,058	$ 7,239,065	$ 7,239,065					$ 17,801,245
OPEX (Operations & Maintenance New Works (Projects 2022)				$ 1,505	$ 150,447	$ 150,447	$ 222,838	$ 222,838	$ 222,838	$ 222,838	$ 1,193,751
Total	**$ 6,024,337**	**$ 6,225,654**	**$ 8,166,603**	**$ 10,669,373**	**$ 17,368,972**	**$ 14,750,101**	**$ 7,941,508**	**$ 8,991,083**	**$ 8,458,614**	**$ 8,182,308**	**$ 96,778,552**

Processes and Practices

The management activities referred to or implied in the preceding paragraphs include decisions about water quality, service responsiveness, reliability, pressure and flow, demand management, renewal and new works requirements, funding, staffing, an overall consideration of risk and other factors.

Decisions are made based on data that is mostly stored in electronic form. They are made on a rational basis which includes economics, engineering and pragmatic considerations. Chapter 9 of the AMP provides a more complete explanation of the supporting systems and the decision processes.

Improvement Plan

Council's asset management target is to achieve the "intermediate" level, which is considered to be appropriate for an organisation of its size. Following guidance from the Office of the Auditor General and the NAMS manual, a number of Improvement Plans have been developed and implemented historically, while others are ongoing.

Further improvement proposals are based on a review of the current status of compliance with the requirements of "Intermediate" level.

Conclusion

This AMP sets out programs for operating, maintaining, renewal and development of the Water Supply Activity over the next 30 years that will ensure that the required level of service is delivered to the community, the service potential of the assets is maintained for future generations, and that the growth of the District is provided for.

1 Introduction

1.1 Background

This Asset Management Plan (AMP) for Water Supply describes in detail how the activity will be managed to support the Council's Vision, Outcomes and Strategies for the South Waikato District, particularly over the next 10 years as encapsulated in the Long-Term Plan 2021-2031

This AMP covers:

1. Why the Council manages Water Supply
2. How Water Supply management contributes to Council's Strategy
3. What level of service we will provide
4. Planning for the future
5. How we deliver our services
6. Quantifying and managing the issues and risks
7. Lifecycle management plans of Water Supply's assets
8. Projected costs of the service for the next 10 years
9. Planned improvements to asset information and management
10. To comply with the requirements of relevant legislation

Forward planning for the 3-waters is based around communities of interest which then feeds into an integrated management regime for the District, resulting in efficiencies across the District's in its water supply management.

1.2 Purpose

The purpose of this Asset Management Plan is to ensure that assets are planned, provided, operated, and maintained in a sustainable and cost-effective manner, so that they provide the required level of service for the present and future customers.

The Water Supply AMP supports the purpose by:

- Demonstrating responsible management and operation of Water Supply assets which represent a significant, strategic, and valuable asset belonging to the South Waikato District Council
- Justifying funding requirements
- Demonstrating regulatory compliance, of note is section 94(1) of the LGA 2002 which in summary requires the Long-Term Plan (LTP) to be supported by:
  - Quality information and assumptions underlying forecast information
  - A framework for forecast information and performance measures that are appropriate to assessing meaningful levels of service
- Demonstrating clear linkage to community agreed outcomes with stated levels of service

1.3 Objectives

The objectives of this Water Supply AMP are to demonstrate that Council:

- Delivers the required level of service to existing and future customers in the most cost-effective way
- Understands how the outcomes delivered by the assets link to the wider community outcomes
- Understands what asset capacity will be required in the future, and what issues drive this capacity requirement
- Has an ever-improving knowledge of its asset locations, ages, and service conditions

- Has robust and transparent processes in place for managing, operating, maintaining, renewing, and extending assets
- Has adequately considered the classes of risk its activities face, and has systematic processes in place to mitigate identified risks
- Provides adequate funding for asset provision, operations, maintenance, renewals, extensions, and depreciation
- Delivers outcomes that are aligned to the community's wishes and to other internally and externally imposed levels.

What Council has achieved over last 3 years:

- Permanent flow meter at Colson's Hill
- Implementation of Infrastructure Data systems (for compliance)
- WSPs (Water Safety Plans) approved and audited by the Drinking Water Assessor
- Pinedale Reservoirs upgrade (baffles and new liners on the roof, tension bands)
- Permanent chlorine disinfection of the Waihou water supply.

1.4 Asset Management Development Focus

The focus previously has been the implementation and development of asset management practices associated with:

- Improved knowledge of the assets
- Ensuring the asset register was at the appropriate standard
- Continuity of the three waters asset knowledge within Council
- Consultation framework and implementation
- Compliance with resource consent conditions

The AMPs are reviewed and updated triennially to provide support to, and align with, Council's Long-Term Plans, which are required by legislation. This revision supersedes the 2018-2028 Water Supply AMP. That document was the fourth plan produced for the assets. Improvements to Water Supply asset management processes have been identified and over the next three years will focus on the areas of:

Asset Management

- Is the practice of managing infrastructure capital assets to minimise the total cost of owning and operating these assets while delivering the desired service levels?
- Process that can be used to make sure that planned maintenance can be conducted and capital assets ((pumps, pies, motors etc.) can be repaired, replaced, or upgraded on time and there are sufficient funds to pay for it.
- Improving the sustainability of asset management to enable long term options to be considered
- Undertaking condition assessments of critical assets

Water Supply Network

- Network Renewals - Continuation of the reticulation renewals programme with increased emphasis on critical main condition assessments and increased intervention as the AC - E type mains are nearing the end of their useful lives
- Upgrading of water mains that are undersized and require upgrading to meet recommended fire flow requirements
- Legislative compliance - Upgrading of water supplies for compliance with Health (Drinking Water Amendment Act)

- Continue to promote water efficiency and to work towards reducing demand as per the Water Management Plan and Drought Management Plan

Risk Management Practices and Procedures

- Undertaking contingency planning
- Critical assets - integrate criticality into the on-going operation, renewals, and capital programme for Water Supply service

1.5 Asset Management Policy

1.5.1 Asset Management Policy Objective

The objective of Council's Asset Management Policy is to ensure that Council's service delivery is optimised to deliver agreed community outcomes and levels of service, manage related risks, and optimise expenditure over the entire lifecycle of the service delivery, using appropriate assets as required. The Asset Management Policy requires that the management of assets be in a systematic process to guide planning, acquisition, operation and maintenance, renewal, and disposal of the required assets. Delivery of service is required to be sustainable in the long term and deliver on Council's objectives. This Asset Management Policy sets the appropriate level of asset management practice for Council's Water Supply Activity.

1.5.2 Asset Management Policy Principles

The following principles will be used by Council to guide asset management planning and decision making:

1. Effective consultation to determine appropriate Levels of Service
2. Ensuring service delivery needs form the basis of asset management
3. Integration of asset management within and across Council utilising corporate, financial, business, and budgetary planning in activity management plans and Council's LTP to demonstrate this
4. Integration of asset management within Council's strategic, tactical, and operational planning frameworks
5. Informed decision making taking a lifecycle management and intergenerational approach to asset planning
6. Transparent and accountable asset management decision making
7. Sustainable management providing for present needs whilst sustaining resources for future generations.

1.5.3 Structured Assessment of Asset Management Practice

In 2014, Council undertook a structured assessment of the appropriate level of asset management practice for the water, Water Supply and Stormwater assets. This structured assessment follows the guidance provided in Section 2.1.2 of the IIMM 2015. The results of this assessment are shown in Table 1.1 below.

Table 1.1 Asset Management Practice Assessment Results

Criteria	Assessment	Commentary
Population	Population	Intermediate (Core Plus)
District Wide Risks	District wide risks	Intermediate (Core Plus)

Criteria	Assessment	Commentary
Costs and Benefits	$4.7 million (annual expenditure)	The Water Supply asset budgets represent a significant portion of Council expenditure and therefore higher risks if AM practice is not at an appropriate level. These budgets also allow more scope to develop asset management practice as appropriate
Legislative Requirements	Level of service focus	Level of service driven approach, this may exceed or comply with legislative requirements
Size, Condition, Complexity of Assets	Average	Water Supply assets are generally in average condition and meet Customer needs. Creating new assets or changes to existing assets occurs after extensive community consultation
Risks Associated with Failures	Average	Generally physical risks have been assessed to be low. Work is on-going in investigating management, renewal and service level delivery risks. A criticality study has been undertaken and physical risks are understood
Organisational Skills and Resources	Average	SWDC is a mid-sized local authority with competent management and services in place. Attracting and retaining staff is an ongoing issue, and partnerships with consultants are integral to achieving a range of functions. Further analysis of appropriate resource levels for water asset management is required
Customer Expectations	Average	The District Water Supply assets are of a high standard, the community has high expectations of their ongoing development and maintenance Comprehensive Levels of Service consultation undertaken in 2015 so services and affordability issues are understood
Sustainability	A corporate sustainability policy will be developed as required by legislation or community demand	South Waikato District Council is still in the process of developing its corporate sustainability policies. This will include incorporating legislative changes and any national or regional policies or plans and will also be focussed on economic sustainability and affordability
Final AM Level	Intermediate (Core Plus)	Analysis of factors suggests that asset management practice should be more sophisticated than Core, with an emphasis on sustainable delivery of agreed service levels and ensuring there is provision for adequate funding to meet quality and performance standards

1.5.4 Implementation and Review of Policy

The Asset Management Policy (adopted in 2008) set the appropriate level of asset management practice for SWDC infrastructure assets at "core plus" which was described in IIMM 2006 as lying between "core" and "advanced". The updated IIMM 2011 relabelled "core plus" as "intermediate" for the same level of asset management practice.

This Asset Management Policy is implemented through the AMPs and the LTP. The next full review of this policy shall be completed as part of the AMP's review and update as part of the 2021 LTP.

AMPs are reviewed triennially to identify the status of compliance with the target level of asset management. The reviews identify any gaps and improvements that are to be implemented in subsequent AMPs' improvement plans.

1.5.5 Asset Management Implementation Strategy

Council staff have carried out a detailed analysis of the current level of asset management with reference to the appropriate level as outlined in this Policy. The review has examined asset description, levels of service, managing growth, risk management, asset lifecycle decision making, financial forecasts, planning assumptions and confidence levels, improvement programmes use of qualified persons, and Council commitment to asset management planning.

From this detailed analysis Council's level of achievement has been assessed. Any gaps in appropriate asset management practice were identified and have been shown on the AMP improvement plan.

1.6 Linkages to other Plans

The AMP provides input into the LTP which following community consultation provides the basis of the Water Supply activity levels of service. The AMP provides linkages to the Annual Plan, LTP and other key documents. The AMP sits at a tactical level between the LTP (a strategic document) and a myriad of activity and process plans (operational documents).

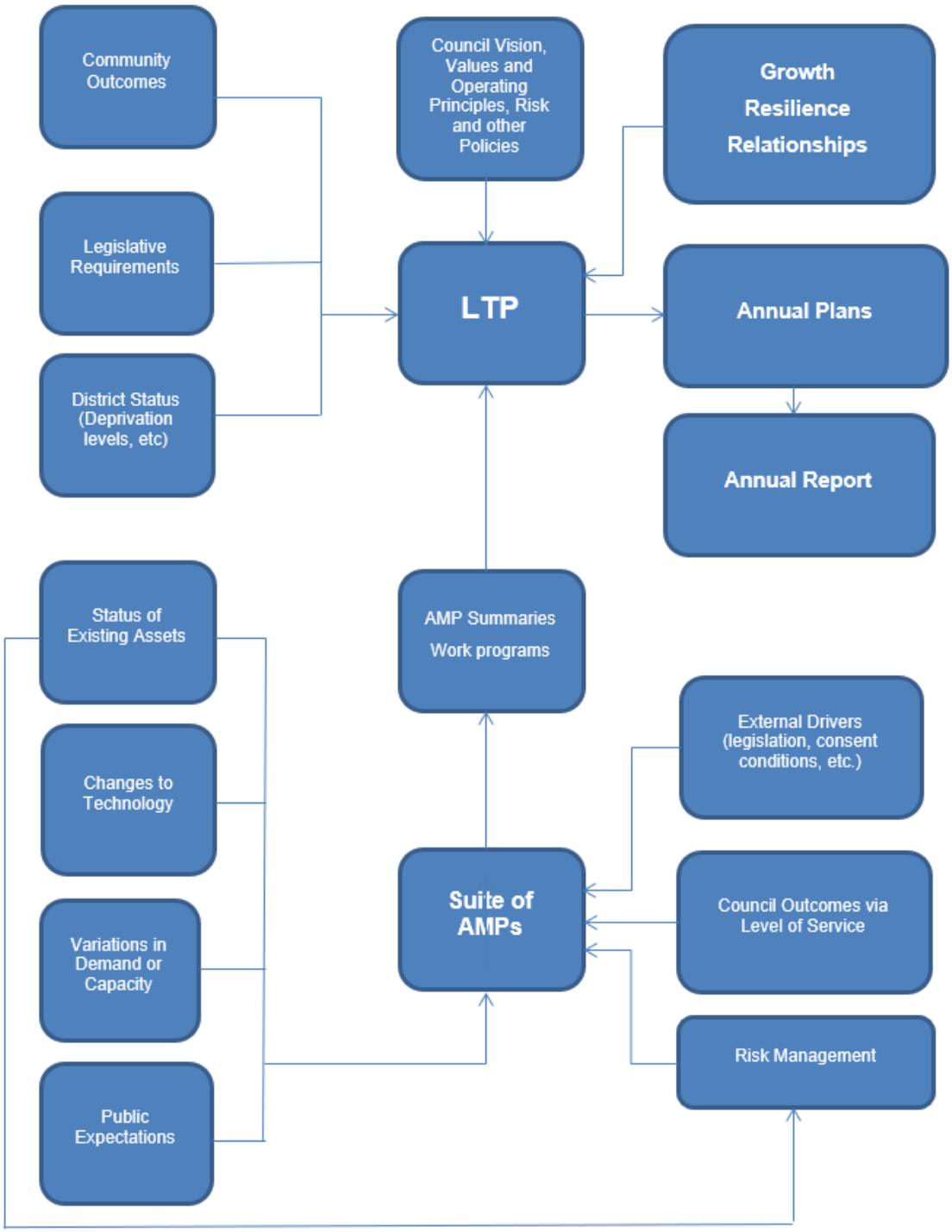


Figure 1.1 Linkages between AMP, LTP, Policy and Planning Documents, Key Council Processes and Drivers

1.7 Description of the Water Supply Activity

Council supplies potable water to residential and commercial properties within its district at Tokoroa, Putāruru, Tirau, Lichfield, Athol, and Arapuni. The water is also available for firefighting purposes, via hydrants, except in Athol and Lichfield.

Table 1.2 Description of Community Water Supply Schemes

Community	System Information	Quantity	Comments
Tokoroa	Population	14,498	NZ Statistics, 2019
	Properties Connected	5,570	Eff. 2020
	Water Source	Bore 1 – 61 m Bore 3 -75 m	
	Water Treatment	Chlorine, Aeration, Lime, Ultraviolet & Fluoride	
	Reservoirs	3	
	Capacity	Billah 4,500 m^3 Colson Hill 6,500 & 9,000 m^3	Average daily consumption equivalent of 4.1 days
	Average Demand (m^3/day)	4,931	Jan 2012- June 2020
	Peak Demand (m^3/day)	13,730	Jan 2012- June 2020
	Storage as a % of average demand	320%	
	Reticulation - Length of Mains, m	184,610	
	Replacement Cost - Total Scheme	$38,824,681	
	Water Age	9 yrs.	
Putāruru	Population	6,687	NZ Statistics, 2019
	Properties Connected	1,820	Eff. 2020
	Water Source	Glenshea Park Bore 2 – 120 m; Glenshea Park Bore 3 – 150 m; Waihou Spring	
	Water Treatment	Glenshea Park - Chlorination, UV & filtration Waihou Spring - UV & Filtration	
	Reservoirs	3	
	Capacity	Pinedale 2x 1,250 m^3 Glenshea 2,125 m^3	Average daily consumption equivalent of 2 days
	Average Demand (m^3/day)	2,288	Jan 2012- June 2020
	Peak Demand (m^3/day)	6,212	Jan 2012- June 2020
	Storage as a % of average demand	202%	
	Reticulation - Length of Mains, m	70,176	
	Replacement Cost - Total Scheme	$19,788,542	
	Water Age	Glenshea Bore 2 – 55 yrs.	
		Glenshea Bore 3 – 125 yrs.	
		Blue Spring – 56 yrs.	
Tīrau	Population	700	
	Properties Connected	448	
	Water Source	Oraka Spring	
	Water Treatment	Chlorine disinfection/UV/ Cartridge Filter	
	Reservoirs	2	
	Capacity	Reservoirs 500 & 400 m^3	Average daily consumption equivalent of 1.1 days
	Average Demand (m^3/day)	805	Jan 2012- June 2020
	Peak Demand (m^3/day)	1,728	Jan 2012- June 2020
	Storage as a % of average demand	118%	
	Reticulation - Length of Mains, m	22,225	

Community	System Information	Quantity	Comments
	Replacement Cost - Total Scheme	$5,158,370	
Arapuni	Population	300	Estimate
	Properties Connected	160	Eff. 2020
	Water Source	4 bores, 100 m deep	
	Water Treatment	Chlorine disinfection/UV/sand Filter	
	Reservoirs	2	
	Capacity	Reservoirs 225 m^3 & 150 m^3	Average daily consumption equivalent of 2.8 days
	Average Demand (m^3/day)	133	Jan 2012- June 2020
	Peak Demand (m^3/day)	1,068	Jan 2012- June 2020
	Storage as a % of average demand	283%	
	Reticulation - Length of Mains, m	10,355	
	Replacement Cost - Total Scheme	$3,194,773	
Lichfield	Population	50	Estimate
	Properties Connected	16	Eff. 2020
	Water Source	1 bore, 160 m	
	Water Treatment	Chlorine & UV/Cartridge filter	
	Reservoirs	1	
	Capacity	Reservoir 25 m^3	Average daily consumption equivalent of 2.3 days
	Average Demand (m^3/day)	11	Jan 2012- June 2020
	Peak Demand (m^3/day)	1,240 (limit)	Jan 2012- June 2020
	Storage as a % of average demand	n/a	
	Reticulation - Length of Mains, m	955	
	Replacement Cost - Total Scheme	$435,124	
	Water Age	+- 60 yrs.	
Athol	Population	tbc	Water supplied by Oji
	Properties Connected	38	Eff. 2020
	Water Source		
	Water Treatment		
	Capacity		
	Average Demand (m^3/day)	30	Jan 2012- June 2020
	Peak Demand (m^3/day)	n/a	
	Storage as a % of average demand	75%	
	Reticulation - Length of Mains, m	4,646	
	Replacement Cost - Total Scheme	$447,964	
	Water Age		

All ground water sources are no longer considered as secure as per the Water Services Act 2021.

Supply is achieved by pumping water from springs or various depth bores and adding a small quantity of chlorine for disinfection in all supplies.

In response to the Public Health (Drinking Water) Amendment Act, Council has prepared Public Health Risk Management Plans (which are now called Water Safety Plans) for the towns' supplies. The Water Safety Plans have been approved by the Ministry of Health Assessors and are being implemented progressively by:

- Recent installation of ultra-violet treatment at Lichfield, Arapuni, and Glenshea to protect against protozoa.
- Protecting against contamination from backflow into the pipe network from connected properties. Backflow prevention devices are installed at the connections to properties that present a potential risk of contaminants associated with the activities on those properties.

Treated water is stored in reservoirs in most cases, and distributed to properties through pipe systems, which are generally buried under the road verge area. Athol is an exception in that the bulk supply is privately-owned by OJI and provided to a Council connection which supplies the public via its distribution system.

The water is controlled by pumps and valves enabling flow to be boosted, diverted, or stopped when required for operational and maintenance reasons. The larger pipes are referred to as 'fire mains'. These have fire hydrants installed on them at regular intervals.

Consumers receive their supply from the pipe systems through small pipes referred to as service connections, which serve each property within the reticulated area. Consumer connections are metered when their anticipated annual usage is expected to exceed the volume allowed for in Council's uniform charge for the property (320 m^3/year).

The Water Supply Activity requires the infrastructure to be provided, operated, maintained, renewed, upgraded, extended, and in rare cases, dismantled or abandoned.

In addition to these physical activities, administrative activities include:

- Responding to requests from consumers or other residents
- Obtaining and complying with resource consents
- Recording and costing of expenditure
- Billing consumers for water or for new connections installed
- Complying with accepted standards through:
    - Testing the water
    - Supervising the design and carrying out of physical work
    - Managing the asset inventory
    - Maintaining database of backflow devices and ensuring they are maintained

This Asset Management Plan records these activities, providing a reference to policies, management decisions and programmes. At the same time, it is intended to demonstrate that the activity is being conducted in a responsible and cost-effective way that is sustainable over the long term. Table 1.2 details the description of water supply schemes.

The replacement cost of each the schemes is summarised in the following table.

Table 1.3 Summary of historical Water Supply assets replacement costs

Town	Replacement Cost 30/06/2013	Replacement Cost 30/06/2016	Replacement Cost 30/06/2019	Replacement Cost 30/06/2021	Replacement Cost 30/06/2022
Tokoroa	$31,841,724	$26,189,134	$34,770,217	$41,865,276	54,293,163
Putāruru	$13,762,846	$11,772,594	$14,797,624	$18,115,982	23,970,516
Tīrau	$4,092,865	$2,960,919	$4,305,561	$5,163,189	6,490,876
Arapuni	$1,704,436	$1,360,548	$2,167,159	$2,653,954	3,380,419
Lichfield	$206,188	$163,765	$236,477	$435,124	563,977
Athol	$326,434	$197,244	$357,312	$447,964	824,324
Total	**$51,934,493**	**$42,644,204**	**$56,634,350**	**$68,681,489**	**$89,523,275**

Unit rate increase (typically 7-20%) and a change in valuation methodology for pipelines to a banding technique from individual costing (average 212% increase) were an additional source of the observed increase in valuation. Asset quantity increases, base lives reviews, and remaining life adjustments have also impacted the reported valuation.

The following other minor water supplies that are operated by Council, and are not covered in this AMP:

- Jones Landing Reserve
- Rural Hall supplies

These do not serve permanent populations and have minimal associated infrastructure. A number of these small supplies are fed from adjacent properties under agreements with the owners. They may be included in future AMPs in recognition of Council's duty of care to residents.

The supply schemes above and other small water supplies that are neither owned nor operated by Council are described and reported in the "Assessment of Water and Sanitary Services 2011 Review", a separate document that is complementary to this plan.

Reference

Assessments of Water and Sanitary Services (ECM 215869) - refer Appendix D for a summary.

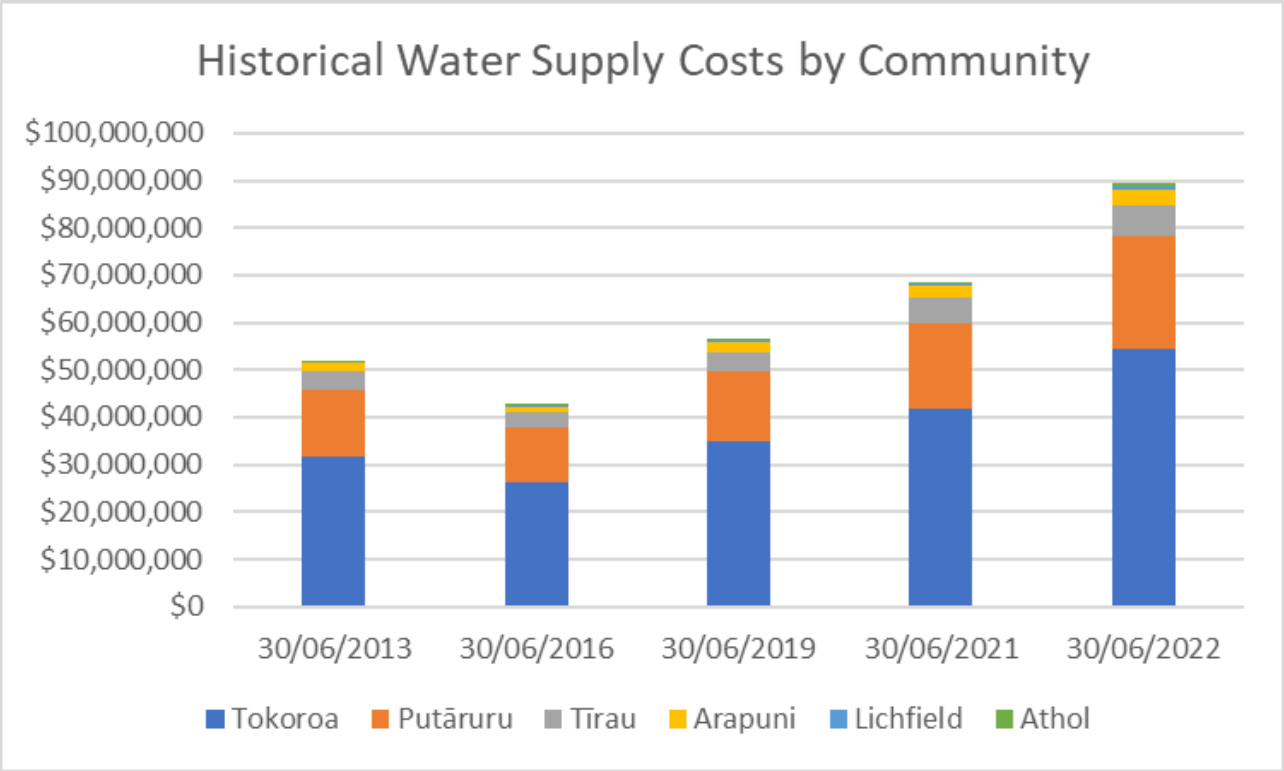


Figure 1.2 Historical Water Supply asset replacement costs by community

The above replacement cost figures up to 2019 are based on Beca valuation reports and previous AMPs. The 2021 replacement cost figure is based on the AssetFinda data as of July 2021.

1.8 Issues Arising

1.8.1 Issues Arising Within the Ten-Year Planning Horizon

The following describes the future issues that are expected to arise the current 10-year planning horizon period.

Table 1.4 Issues Arising Within the Ten-Year Planning Horizon

Description	Will/May Arise	Resolution/Comments
Water demand, increased pressure from WRC and National Policy Statement for Fresh Water Management.	Will Arise	The District's Water Demand and Drought Management Plans will be implemented in response to supply and demand pressure.
Increase in pipe replacement programme over the next ten years as the AC pipe reaches the end of it assessed life	Will Arise	Pipe samples throughout the district are being tested to ensure that pipes will be replaced at the correct time.
Global warming	Will Arise	Drier summers will place more pressure on communities to manage their water use.
Universal water metering	May Arise	The new water entities proposed by the Governments Three Waters Reform may opt for universal water metering as their preferred method of charging.
Water Allocation	Will Arise	Water catchments becoming over-allocated will place pressure on business/industry that requires water to set up or expand. Council will work closely with WRC.
Water Reform	Will Arise	The Government intends to legislate the formation of 4 mega entities to manage the Three Waters activity to take effect from 1 July 2024

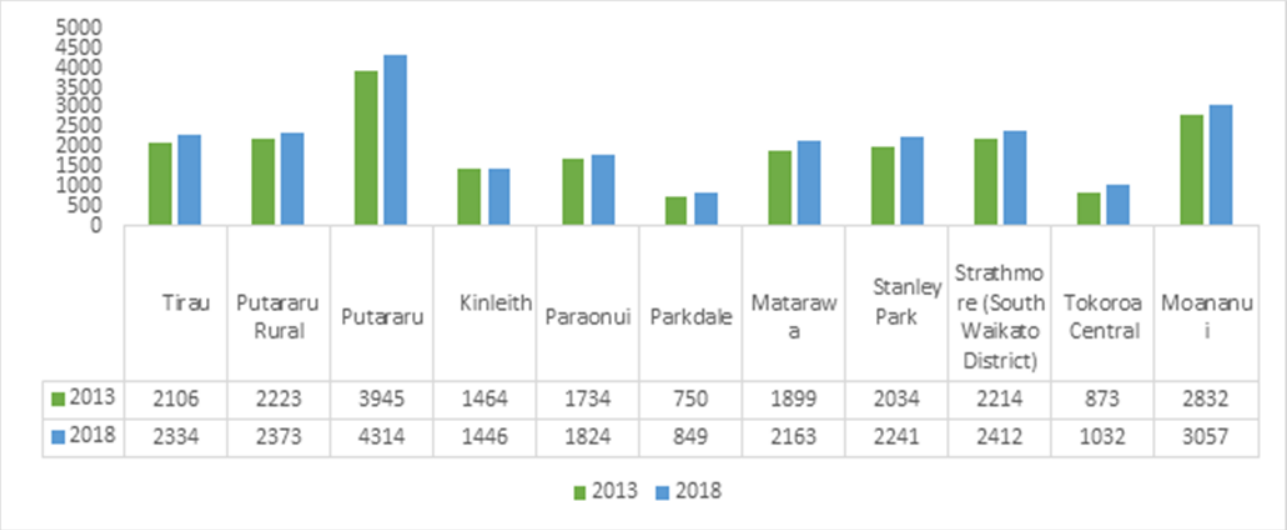
1.8.2 Issues Arising Beyond the Ten-Year Planning Horizon

The following issues may arise beyond the 10-year planning horizon:

Aging population

Population projections released by Statistics New Zealand show that the proportion of people aged 65 years or older in the district's population is predicted to increase. As of Census night in 2013 there were 3,600 people aged 65 years or older living in the District. Statistics New Zealand predict that by 2043 we can expect that there will be 6,400 people aged 65 years or older living in the district.

In keeping with trends elsewhere in New Zealand, the projections indicate significant structural ageing of the population under all projection variants, with the proportion aged 65+ years increasing from 16.8 per cent in 2018 to 20.7, 22.6, and 24.2 per cent in 2053 under the high, medium and low variants respectively. This compares with 22.5, 24.3 and 26.6 per cent respectively (in 2053) at national level, making the population of South Waikato District slightly younger and ageing slightly more slowly than is the case nationally, as a result of the projection assumptions.



	Tirau	Putararu Rural	Putararu	Kinleith	Paraonui	Parkdale	Mataraw a	Stanley Park	Strathmo re (South Waikato District)	Tokoroa Central	Moananu i
2013	2106	2223	3945	1464	1734	750	1899	2034	2214	873	2832
2018	2334	2373	4314	1446	1824	849	2163	2241	2412	1032	3057

Figure 1.3 SWDC population growth 2013-2018 by ward (Census data)

The main risk associated with ageing population is that if there is a higher proportion of older people in the district and therefore fixed income, rates may become unaffordable.

Long Term Renewals Programme and Funding

The funding for the water services renewal programme detailed in the financial section adequately services the SWDC water services renewals for the period of this plan. There is a significant increase in the period 2023 and 2030-31.

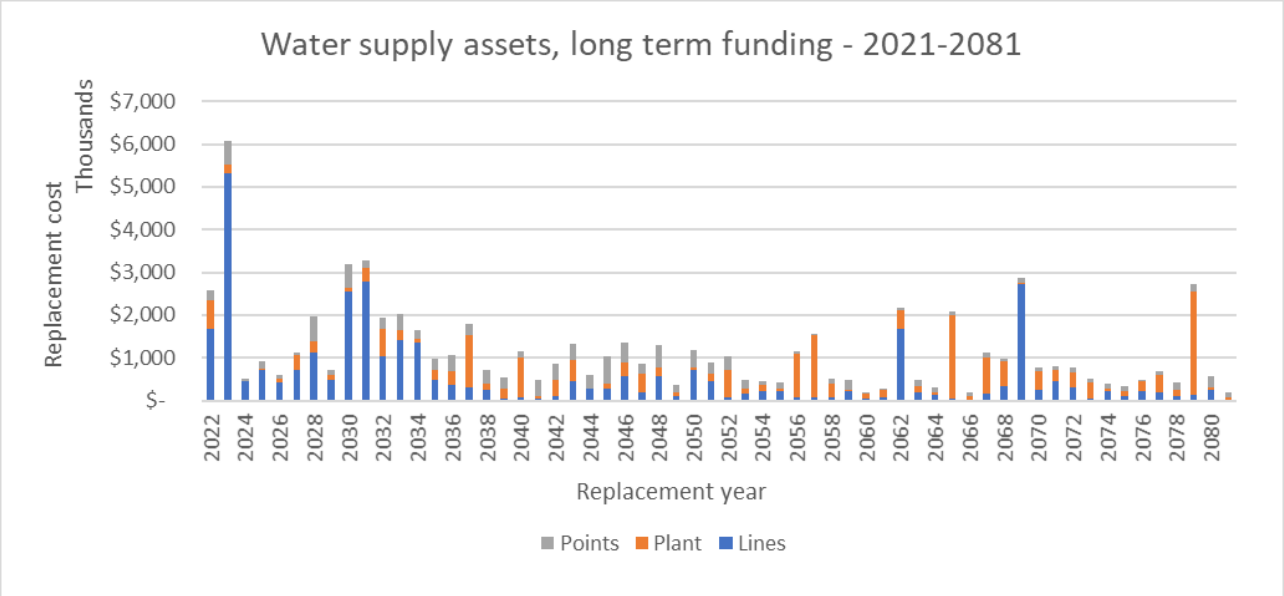


Figure 1.4 Long term funding

Climate change

Climate change is likely to result in more extreme storm and drought events brought about by changes in rainfall, wind, and temperature. This will require Council to assess the effects of key climate influence on wastewater, water supply, and stormwater infrastructure.

Natural Hazards

Natural Hazards such as earthquakes and volcanic eruptions have the potential to cause damage to our infrastructure.

Economic Activity trends

There are number of economic activity trends that have been recognised as having the potential to impose high and or seasonal demands on the infrastructure.

1.9 Significant Negative Effects of the Activity

Potential negative effects associated with the Water Activity include:

- The effect on public health should the water supply not meet water quality standards.
- Health and Safety risks associated with the construction, maintenance, or operation of the water supply infrastructure.
- Property damage resulting from mains failures.
- The effect on the environment of water from ground water bores and springs.
- The effects on the environment of discharges of chlorinated water from maintenance activities or pipeline failures.
- The effect on the environment of disposal of water supply treatment by-products (such as treatment sludge and backwash water).
- Risks from natural events such as large earthquakes and significant floods.

All of these potential negative effects are managed as part of the day-to-day operation of the Water Activity.

2 Strategic Planning Structure

2.1 The Strategic Plan and policy process

The strategic plan and process work as integrated whole to achieve the vision agreed by Council, this is represented in Figure 2.1 below. The top section of the pyramid (vision, community outcomes and strategy) describes what the public sees, and the bottom dark blue section describes the work carried by Council that forms the solid base to the public documents.

Figure 2.1 Strategic pyramid of Council

Source: http://www.southwaikato.govt.nz/our-council/strategies-plans-policies-bylaws/Pages/The-Strategic,-Plan-and-Policy-Process.aspx

2.2 Linkage to Long Term Plan

Over the years we have prepared and adopted a number of strategies, policies and bylaws. As the Council Strategy provides the overarching direction, every strategy, plan, policy, and bylaw that Council adopts should directly link to the Council Strategy. At the core of our strategy is our vision, our outcomes, and our strategies. Figure 2.2 below shows how Council's documents fit together.

Figure 2.2: How Council's documents fit together

The goal of the Water Supply activity is to provide assets that facilitate the health and wellbeing of the community through appropriate collection, treatment, and disposal of Water Supply. Linkage between the Council's Vision, Outcomes, related Strategies, and Levels of Service applicable to the Waters Activity are shown in the figure below.

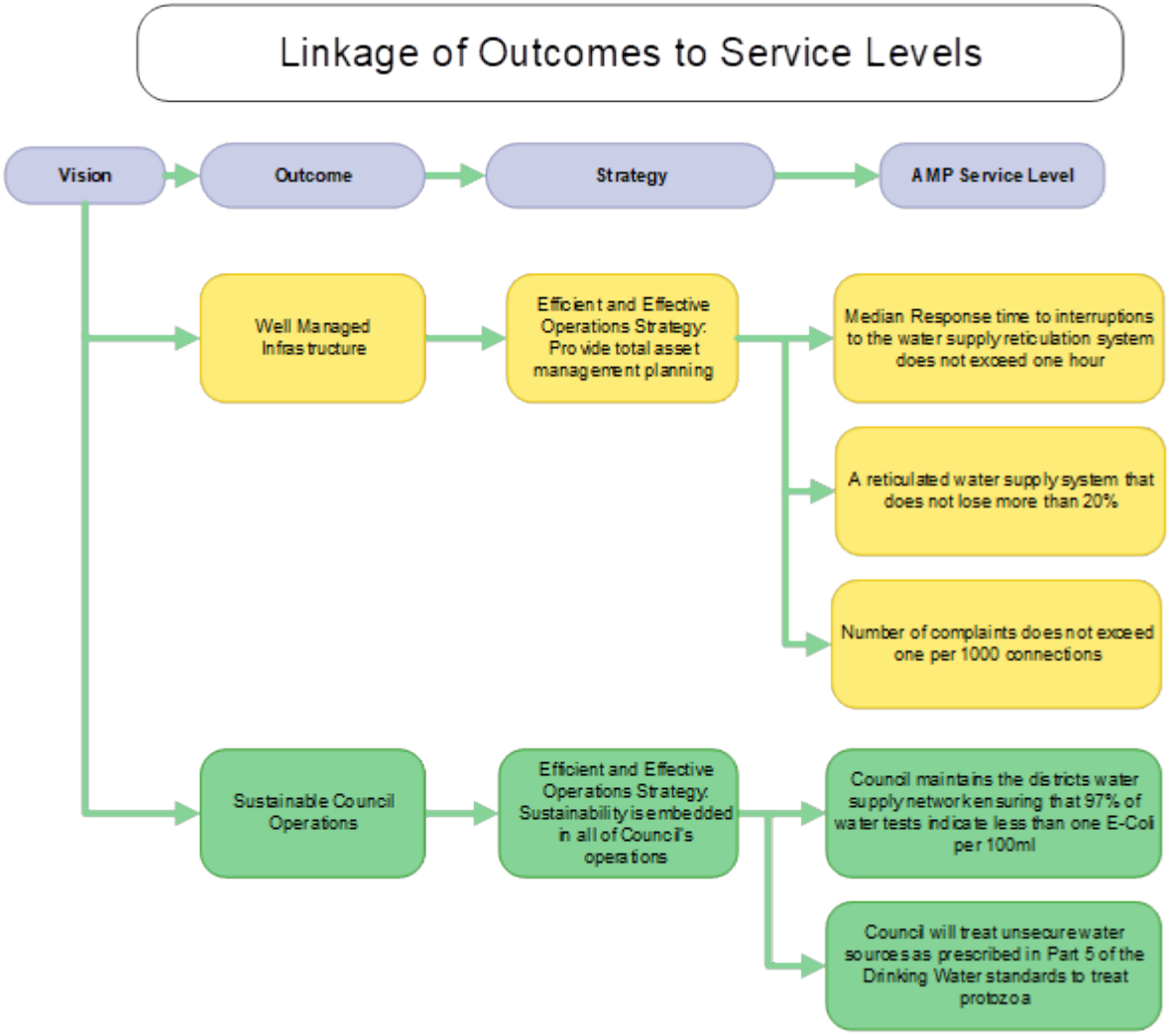


Figure 2.3 Linkage of Vision to Water Supply Service Levels

2.2.1 Water Supply Contribution

The Water Supply Activity contributes primarily to the following Council Outcomes and Strategies:

Outcomes	Strategies
Growth: Council aims to increase population and jobs, reduce unemployment, increase average earnings, and improve the deprivation index.	Infrastructure: It is imperative that our Water Supply plant is fit for purpose in terms of a growing population and the associated demand
Resilience: We all, Council and community, need to anticipate, resist, respond to, and recover from significant change or events.	Environmental resilience: In alignment with the proposed Healthy Rivers Plan changes, Council is obliged to undertake Water Supply management that has reduced impact on waterways such as the Waikato River
Relationships: We will build stronger relationships with Iwi and Māori along with community and business groups to ensure that by working together we can achieve growth and a resilient community.	Engagement: Council and Raukawa have undergone a significant engagement process regarding options for the new Water Supply plant.

2.2.2 Rationale

A supply of good quality water on-demand is the very first pre-requisite to sustain life and protect health. Council provides water as a public service, where economies of scale make it efficient and affordable for the people of the District. This contribution aims to enhance and safeguard health by providing sufficient water and avoiding the effects of water-borne disease which are more prevalent in unregulated, private supplies.

The Water Supply Activity contributes towards Council's Vision for "Healthy people thriving in a safe, vibrant and sustainable community". This contribution aims to provide water to residents and also to social services such as health care and education as well as servicing venues where people may gather in groups for entertainment or cultural activities. In addition to the provision of potable water, the infrastructure provides important support for the NZ Fire Service.

Water is a finite resource that must be used efficiently to avoid waste and reduce the energy demand that is necessary for its abstraction, treatment, and distribution. Competing demands from residential and commercial users must be managed to ensure that the supply is sustainable in terms of continuity of service and that is economic and affordable for all, while minimising the environmental impact of the methods used to develop, operate, and maintain the service.

In addition to urban centres, which accommodate commercial premises of all kinds, Council also provides water to industries such as timber processors and water bottling businesses. This contribution aims to facilitate employment and the provision of services by privately-owned entities. A sustainable and equitable economic environment requires the sharing of natural resources between competing demands so that all may benefit from them.

Taking water from the environment is carried out in a manner that respects Māori cultural beliefs. Council provides and operates modern water abstraction and treatment systems and holds consents for these systems in accordance with current New Zealand law. Procurement of these consents required wide consultation and community involvement, including with Raukawa.

2.2.3 Justifying Council Involvement and Ownership

Council's current ownership stems from a legacy ownership role that, except in particular circumstances, is now prohibited from passing to the private sector by the Local Government Act 2002 Part 7 S.130. The water supply assets are considered to be strategic assets in terms of section 90 (2) of the LGA and are identified as such in Council's Significance Policy. Therefore, Council has a statutory obligation to continue owning all water supply assets owned by Council.

Because of its effect on a large proportion of the district's residents and the natural water resources, the Water Supply Activity is best administered by Council, with uniform and equitable controls and education to ensure:

- Consistent and sustainable quality and quantity available
- Good standards of private water supply connections and building systems
- A public firefighting water supply

Historically, Council has provided this service. Under the Health Act 1956 Council is required to monitor the quality of drinking water, hence Council must be involved in a legislative sense.

Facilities maintenance is provided by Council's Water Services Business Unit. This has proved to be a cost-effective option. Capital works are undertaken by Water Services or contracted out to external providers.

3 State of the Assets (what assets we have)

3.1 Network Overview

Council staff manage six separate water supply schemes: four urban water supplies at Tokoroa, Putāruru, Tīrau, and Arapuni, as well as two rural water supplies at Lichfield and Athol.

These schemes include 11 reservoirs, 9 bore water pumps, 6 treatment plants, and 293 km of reticulation.

Three-quarters of the assets are buried, and hold water under pressure, making details of their location, material, internal and external condition largely dependent on the original paper records because of the prohibitive cost of investigation and testing.

The key assets that contribute to providing these services are summarized in the table 1.3 below.

Table 3.1 Water Supply assets - key components

Asset Component	Quantity
Watermains	293
Bores & water supply springs	9
Treatment Plants	6
Reservoirs	11
Valves	1,738
Hydrants	1,138
Assets total replacement value, $M	68.7

Council manages the water supply schemes using its professional engineering staff, and as required, external resources.

The major water supply assets include:

- Water source bore wells and associated pumps and controls.
- Treatment systems (small pumps and storage tanks) that inject chlorine disinfectant into the water.
- Treated water storage reservoirs.
- Large diameter trunk mains (conveying water to reservoirs).
- Water Mains – the backbone pipes of the reticulation network, of 100 mm diameter or larger.
- Fire Hydrants – connected to the fire mains as supply points for the Fire Service.
- Valves – permit parts of the network to be turned off in case of pipe breaks or other service requirements.
- Rider mains – smaller pipes, usually 40 mm or 50 mm diameter, used to supply properties on the opposite side of the street to fire mains.
- Service Connections and Meters – which convey water from the mains to individual buildings.
- Backflow prevention devices at certain properties - ensure that contaminants do not enter the reticulation network.

Details of these assets are recorded in a management software system (AssetFinda). This enables the individual components to be tracked including size, age, depreciated, and replacement value, and reports can be produced to predict replacement requirements.

3.1.1 District Map

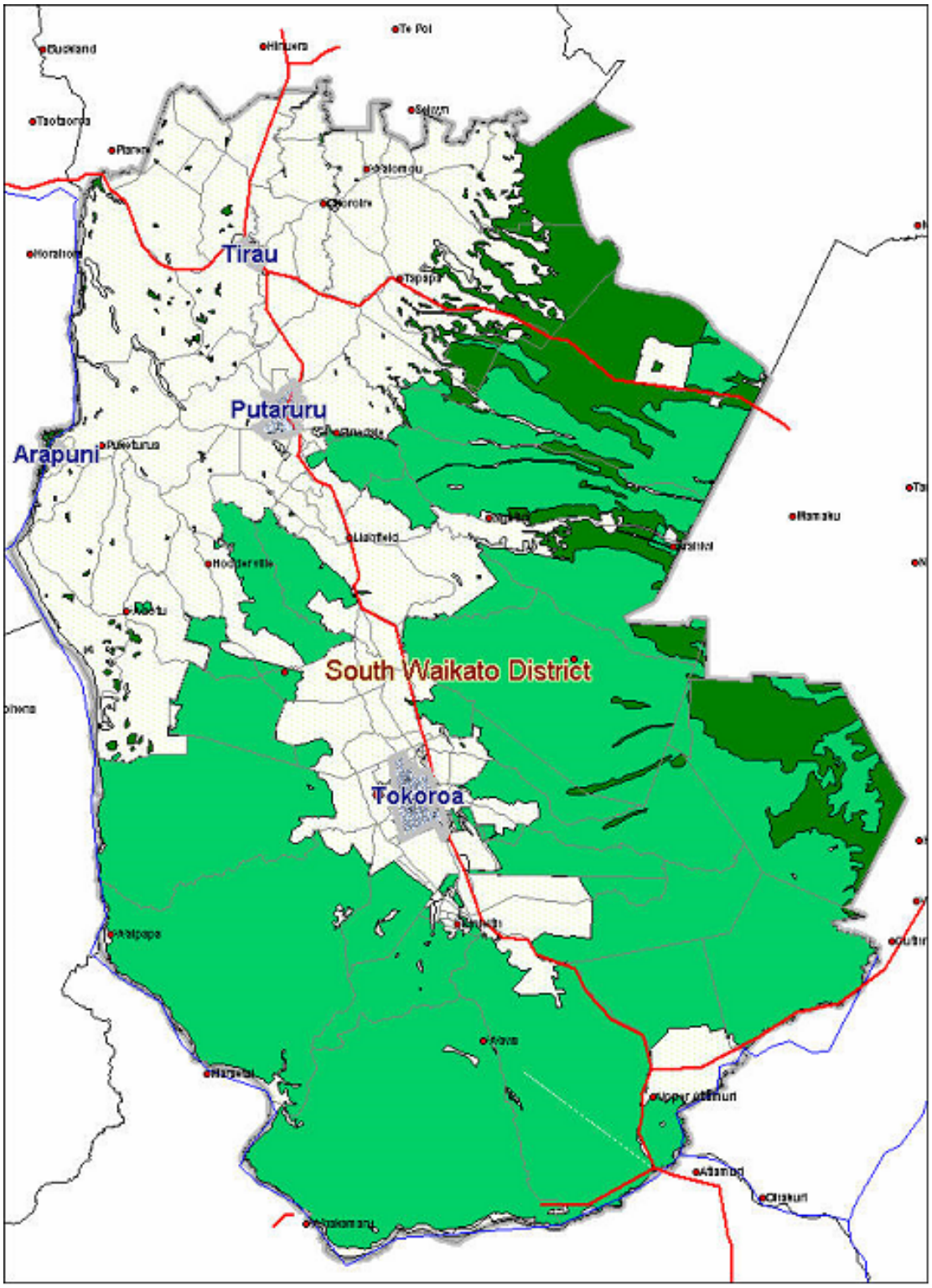


Figure 3.1 District Map of South Waikato

The Water Supply assets are distributed in the six scheme areas as follows:

Table 3.2 Water Supply assets by community

Water Supply Assets	Tokoroa	Putāruru	Tīrau	Arapuni	Lichfield	Athol	Total
Properties connected	5,570	1,820	448	160	16	38	**8,052**
Reticulation pipes, km	184,604	70,176	22,188	10,355	955	4,646	**292,923**
Reservoirs	1	3	1	1	0	0	**6**
Replacement cost	**$41,865,276**	**$18,115,982**	**$5,163,189**	**$2,653,954**	**$435,124**	**$447,964**	**$68,681,488**

3.1.2 Tokoroa

General Overview

Tokoroa has two operational bores with dedicated submersible pumps, three individual dosing pumps, and two large reservoirs fed by a single rising main. Treatment of the raw water from Elizabeth Park comprises of pH correction, chlorine disinfection, fluoridation, ultraviolet treatment, and a contact tank at Billah Street Pumping Station (as shown in photo) before transfer to the reservoirs at Colson's Hill.

Table 3.3 Tokoroa Scheme Overview

System Information – Tokoroa		Comments
Population	14,498	NZ Statistics, 2019
Properties Connected	5,570	Eff. 2020
Water Source	Bore 1 – 61 m; Bore 3 – 75 m	
Water Treatment	Chlorine, Aeration, Lime, Ultraviolet & Fluoride	
Reservoirs	3	
Capacity	Billah - 4,500 m^3 Colson Hill - 6,500 & 9,000 m^3	
Average Demand (m^3/day)	4,931	Jan 2012- June 2020
Peak Demand (m^3/day)	13,730	Jan 2012- June 2020
Storage as a % of average demand	320%	
Reticulation - Length of Mains, m	184,610	
Replacement Cost - Total Scheme	$38,824,681	
Water Age	9 yrs.	

Growth

Future growth in Tokoroa has been estimated as a per annum growth rate of 0.3%, with no specific growth areas or new developments identified at the time of modelling. Applying a uniform growth rate will provide an indication of areas where development could be more readily serviced by the water infrastructure.

The analysis indicates there are very few new issues within the Tokoroa water supply network with the uniform growth applied. The network has a good volume of reservoir storage available in the event of an emergency. Once specific development areas are identified within the town, it is recommended further hydraulic analysis be undertaken.

Upgrade Options

The following upgrades for water supply network have been identified to allow for the community growth due to the new development zoning in Tirau and Tokoroa, and to allow for stormwater capacity increase requirements as identified by Te Miro Water Stormwater Modelling for a 100-year ARI flood event.

It is noted that Tokoroa new development is seen as the first priority growth project for the District and constitutes 76% of the total water network growth scope. The table below also contains a reference to the districtwide SCADA improvement. Other water growth projects are allocated as SWDC low priority upgrades.

Table 3.4 Tokoroa water network growth projects.

Community	Project	Capital expenditure
SWDC	Districtwide Water and Wastewater Telemetry and SCADA upgrades	$ 750,000
Tokoroa	Maraetai Road Intermodal Business Park (MRIPB) Watermain	$ 950,000
	Strathmore Park Water	$ 200,000
	Tokoroa water and wastewater growth projects	*$3,630,000*
Grand Total		**$5,530,000**

3.1.3 Putāruru

General Overview

The town has two independent sources, Glenshea Park and Te Waihou, each with duplicate pump sets. Glenshea Park well replaced an old well called Alexandra No 3 due to the shallow depth and poor water quality.

The Glenshea Park source feeds direct to a single reservoir. The pressure is boosted by a newly upgraded booster pump set consisting of 3 primary pumps and a small “Jockey” pump to handle lower night-time flows, after water leaves the reservoir to feed the northern half of Putāruru. Treatment comprises of chlorine injection and UV treatment at the Glenshea Park site

Te Waihou Spring (as shown in photo above) has duplicate pumps feeding from the Spring, through a single rising main to serve twin reservoirs located off Pinedale Rd which feeds the southern half of the town through a separate supply line. Water is passed through cartridge filters before it is treated with ultraviolet and chlorine.

Demand in Putāruru includes a significant number of extra-ordinary supplies, among them is a timber processor and three water bottling companies. The Putāruru water bottling industry markets its product on the basis of the purity of the water source.

Table 3.5 Putāruru Scheme Overview

System Information – Putāruru		Comments
Population	6,687	NZ Statistics, 2019
Properties Connected	1,820	Eff. 2020
Water Source	Glenshea Park Bore 2 – 120 m; Glenshea Park Bore 3 – 150 m; Waihou Spring	
Water Treatment	Glenshea Park - Chlorination, UV & filtration Waihou Spring - UV & Filtration	
Reservoirs	3	
Capacity	Pinedale - 2x 1,250 m^3 Glenshea - 2,125 m^3	
Average Demand (m^3/day)	2,288	Jan 2012- June 2020
Peak Demand (m^3/day)	6,212	Jan 2012- June 2020
Storage as a % of average demand	202%	
Reticulation - Length of Mains, m	70,176	
Replacement Cost - Total Scheme	$19,788,542	
Water Age	Glenshea Bore 2 – 55 yrs.	
	Glenshea Bore 3 – 125 yrs.	
	Blue Spring – 56 yrs.	

3.1.4 Tirau

General Overview

Tirau water is pumped from the Oraka Spring source by duplicate pumps to two reservoirs. Treatment of the raw water comprises of chlorine injection into the rising main adjacent to the source pump house. The water passes through cartridge filters before it is treated with ultraviolet.

An agreement was made in the late 1990's with the Fonterra dairy factory to provide an emergency backup supply, providing the additional water needed for Tirau in emergencies.

Demand on Tirau Water Supply has changed since September 2005 due to one consumer, PPCS, representing forty percent of the total demand in 2005, closing their Tirau factory.

Table 3.6 Tirau Scheme

System Information – Tirau		Comments
Population	700	Estimate
Properties Connected	448	Eff. 2020
Water Source	Oraka Spring	Subject to flooding from Oraka
Water Treatment	Chlorine disinfection/UV/Cartridge Filter	Subject to flooding from Oraka
Reservoirs	2	
Capacity	500 & 400 m^3	
Average Demand (m^3/day)	805	Jan 2012- June 2020
Peak Demand (m^3/day)	1,728	Jan 2012- June 2020
Storage as a % of average demand	118%	
Reticulation - Length of Mains, m	22,225	
Replacement Cost - Total Scheme	$5,158,370	

Overview

Growth

For future growth in Tirau for the next 30 years, a uniform growth rate 1.0% per annum was applied to provide an indication of areas where development could be more readily serviced by the water infrastructure in the future. No specific development areas were identified prior to the modelling exercise. No minimum pressure (below 200 kPa) or maximum pressure issues are identified in Tirau, and although there is some slight degradation of pressure with growth, they still remain above minimum levels.

Upgrade Options

Options for Tirau are based around providing additional reservoir storage, and meeting fire flows for commercial and industrial areas

- Reservoir storage – provide additional 1000 m^3. The recommended further investigations of base flows will improve the assessment of when additional storage will be required.
- Oraka Spring pumpstation – upgrade existing pump stations to cope with additional demand. Relocation of the treatment headworks and construction of a new water source will be part of those investigations.
- Fire flow options – there are several pipe upgrade options available, which are documented in the report. The selected options will be dependent on the outcome of the recommended fire flow demand classification review.
- Tirau new development water supply upgrade project is forecast at $2,600,000 capital expenditure.

3.1.5 Arapuni

General Overview

Arapuni Water Supply consists of two bores each with a submersible pump, lifting water through a single pipe to two reservoirs about 1 km distant. Water is then pumped via a single variable speed pump into the township. This pump has firefighting capacity. The scheme is treated with UV, Filters, and Chlorination.

Table 3.7 Arapuni Scheme Overview

System Information – Arapuni		Comments
Population	300	Estimate
Properties Connected	160	Eff. 2020
Water Source	2 bores, 100 m deep	New bore commissioned in 2023
Water Treatment	Chlorine disinfection/UV/Greensand Filter	
Reservoirs	2	
Capacity	225 m^3 & 150 m^3	
Average Demand (m^3/day)	133	Jan 2012- June 2020
Peak Demand (m^3/day)	1,068	Jan 2012- June 2020
Storage as a % of average demand	283%	
Reticulation - Length of Mains, m	10,355	
Replacement Cost - Total Scheme	$3,194,773	

3.1.6 Lichfield

General Overview

The Town is supplied from a single bore well and submersible pump to a small reservoir. Much of the Lichfield networks have been renewed with modern materials over the last 15 years, making them of adequate capacity for the foreseeable future. The networks also include consumer meters for each property connection, with backflow included.

Lichfield's Water Supply serves only small lifestyle properties. Fonterra's Lichfield Cheese Factory, the largest in the southern hemisphere, has an independent supply.

Lichfield water is treated by Cartridge filter followed by Ultraviolet disinfection, and Chlorine dosing.

Table 3.8 Lichfield Scheme Overview

System Information – Lichfield		Comments
Population	50	Estimate
Properties Connected	16	Eff. 2020
Water Source	1 bore, 160 m	
Water Treatment	Chlorine & UV/Cartridge filter	
Reservoirs/ Contact Tank	1	
Capacity	25 m^3	
Average Demand (m^3/day)	11	Jan 2012- June 2020
Peak Demand (m^3/day)	1,240 (limit)	Jan 2012- June 2020
Storage as a % of average demand	N/A	
Reticulation - Length of Mains, m	955	
Replacement Cost - Total Scheme	$435,124	
Water Age	+- 60 yrs.	

3.1.7 Athol – WaWa

General Overview

Athol-WaWa is currently supplied by Carter Holt Harvey from the Kinleith pulp and paper mill. The demand is made up of residential houses, lifestyle blocks, farms, and some light industry.

Much of the Athol-WaWa networks have been renewed with modern materials over the last 15 years, making them of adequate capacity for years to come. The networks also include consumer meters for each property connection with backflow preventers.

Individual properties on the supply are required to provide their own emergency storage in case there is a failure in the Kinleith supply. Chlorinated water is supplied by Carter Holt Harvey. There are no Council treatment assets.

Table 3.9 Athol - WaWa Scheme Overview

System Information – Athol-WaWa		Comments
Population	tbc	Estimate
Properties Connected	38	Eff. 2020
Water Source	Oji Mill	
Water Treatment	N/A	
Reservoirs	None	
Capacity	N/A	
Average Demand (m^3/day)	30	Jan 2012- June 2020
Peak Demand (m^3/day)	N/A	
Storage as a % of average demand	75%	
Reticulation - Length of Mains, m	4,646	
Replacement Cost - Total Scheme	$447,964	

3.1.8 Headwork's Asset Group (including all pumps)

Bores/Bore Liners

The chart below shows the number and depth of water source bores and spring extraction assets, and the depth from which water is pumped. The deeper the bore, the more secure it is likely to be against contamination by surface-water-borne contamination; however, there are some issues which affect this statement.

- Where bore liners are in poor condition, surface water contamination can occur
- At Arapuni, deep wells will collect water with undesirable concentrations of iron and manganese. The first several cubic metres after each pump start are pumped to waste to remove the build-up of irons. A Greensand filter capable of removing Iron and Manganese has now been installed.

Table 3.10 Bore Depth and Pump Lift, m

Bore	Depth
Elizabeth 1	67
Elizabeth 3	75
Glenshea 2	120
Glenshea 3	150
~~**Arapuni 4**~~	~~100~~
Arapuni 5	100
Arapuni 101	
Lichfield	160

Bore Pumps

Except for the Putāruru Te Waihou Spring and Tirau spring sources, water is lifted to the surface by deep submersible bore pumps situated at the levels indicated in the above table. Deep bore pumps require considerable energy due to the height difference over which water must be lifted.

Reticulation/Booster Pumps

Pumps are used to transfer water from sources to reservoirs for most supplies. In addition, the Putāruru reticulation includes booster pumps for low pressure areas and to equalize pressures from the two separate sources, these pumps turn on and off depending on pressure in the system. Variable speed drives have now been added to the system in place of the previous pressure tank. Arapuni has a variable speed booster pump available to increase reticulation pressure particularly for firefighting.

3.1.9 Telemetry /SCADA Asset Group

In order to provide operations visibility and remote control of key water supply treatment and pumping assets, Council utilises a telemetry system, whereby information from a range of inputs at each site, is transmitting via dedicated radio frequencies to Council's Whakaruru WWTP where the servers are located. The system relies on a number of repeater stations to see all the asset sites and re-transmit the data to the WWTP. Operations and assets staff use the telemetry system to monitor the status of the facilities and in some cases remotely control some functions e.g., pump pressure set points etc.

Council currently operates DATRAN Telemetry System supplied by QTEC. The system is capable of providing real-time monitoring, alarming and recording (at the central site) of digital statuses, analogue measurements, and pulse counts. The system is also capable of sending control and analogue outputs to remote sites for action. These can be generated manually or by programs within the master unit (currently located in the main Council office computer room). While the system has served Council well, it is clear there are problems. Key issues include:

- Communication drop out problems between the Waihou Water Treatment Plant and the WWTP associated with weather and trees blocking the signals
- The vulnerability of the system to the condition and reliable functioning of the individual telemetry units

- Capacity constraints in respect of the number of channels in the analogue frequency and low bandwidth
- The current high cost of radio licences

The current and future telemetry network can be found in Appendix A.

In the light of the above issues the Council has resolved to replace the existing telemetry system with a new modern digital network and the proposed architecture can be seen in Appendix A.

A programme to upgrade the telemetry system to serve all three water activities in the future has been developed and will be implemented during the first 3 years of this AMP.

At the Whakaruru WWTP a SCADA system is employed to monitor and collect data from.

The various equipment and processes at all the various water and wastewater treatment sites in the district the previous system was replaced with a new system called Wonderware Archestra. The Archestra SCADA software was purchased and installed in 2020 and this includes an Historian back-up server located at the Tokoroa WWTP. This server records all the data collected from the WTP making it available for reporting purposes. The new system provides enhanced functionality, as well as significant additional capacity to accommodate additional inputs from the treatment plants, likely to be required as operations become ever more complex, and more data needs to be recorded for effective operation and compliance with every more demand compliance requirements. In addition, Archestra integrates seamlessly with the LUTRA Infrastructure Data system thereby enabling simplified compliance reporting.

Critical operational performance data also continues to be transmitted back via the Telemetry system to Tokoroa WWTP. The SCADA system includes its own independent alarm paging systems to notify the treatment plant operators and supervisors of any issues. The Water Treatment Plants can be monitored and managed remotely to some extent as the SCADA computer can be accessed via the Council network.

3.1.10 Water Treatment Asset Group

The following table details the existing and future water treatment for the six Council water supplies.

Table 3.11 Existing and Future Water Treatment.

Community	Water Source	Secure	Existing Treatment	Proposed Treatment	Treatment Costs	Additional Infrastructure Required
Tokoroa	60m bore 75m bore	No	Chlorination Aeration Lime Fluoride Ultraviolet	Same	Nil	Both well heads to be lifted above GL & backflow/air valves and new isolation valves installed
Putāruru	120 m bores 150 m bores Waihou Spring	No No No	Chlorination Ultraviolet Cartridge Filtration Ultraviolet Filtration Chlorination	Same Coarse Filtration Chlorination	Nil Nil Nil $105,000 Capital Cost and $1250 Operating expenditure $700,000 Capital Cost	Nil Nil Nil
Tirau	Oraka Spring	No	Chlorination Ultraviolet Filtration	Same	Nil	Investigations into relocation required

Community	Water Source	Secure	Existing Treatment	Proposed Treatment	Treatment Costs	Additional Infrastructure Required
Arapuni	2 bores 1 x 100m (A5) 1 x 220m (A101)	No	Chlorination Ultraviolet Cartridge Filtration Greensand Filtration	Same	Nil	Nil
Lichfield	160m bores	No	Chlorination Ultraviolet Cartridge Filtration	Same	Nil	Nil
Athol - WaWa	Oji Limited	No	Chlorination Ultraviolet			Nil

3.1.11 Reservoirs, Surge and Contact Tanks Asset Group

- Contact Tanks - due to similar construction and lifecycles, these tanks of various sizes have been grouped together.
- Surge Tanks - their primary purpose is to permit bore pumps to be stopped and started without affecting the operation of downstream pumps which lift water to reservoirs.
- Small reservoirs where water is held while the chlorine disinfectant is injected, ensuring adequate mixing and reaction time on organisms that are required to be neutralised by the disinfectant.
- Reservoirs - these have a twofold purpose; to hold water at an elevation which allows it to be steadily fed using gravity to respond to varying demand in the network; and to store enough water that changes or faults in source or pumping operations do not result in interruption to supply to the network and for firefighting reserves.

Reservoir assets are shown below. Athol does not have an operational reservoir.

Table 3.12 Reservoir Assets

Town	Location	Size (m^3)	Chlorine Contact
Tokoroa	Billah Colson Hill x 2	4500 9000 6500	Yes No No
Putāruru	Glenshea Pinedale x 2	2125 1250 1250	Yes Yes
Tīrau	Fairview Street x 2	500 400	Yes Yes
Arapuni	Pioneer Crescent x 2	225 150	Yes Yes
Lichfield	Ngatira Road	23	Yes

3.1.12 Pipes Asset Group

Classification

Pipes are grouped into:

- Trunk mains - those that form the 'skeleton' of the distribution system or serve as large capacity feeders to reservoirs.

- Fire mains (Watermains) - those fitted with fire hydrants and also providing sub-distribution functions; and
- Ridermains - those which only serve domestic demand ('rider mains').

Certain policies have been attached to these groups; for example, it is not normal to make service connections to trunk mains.

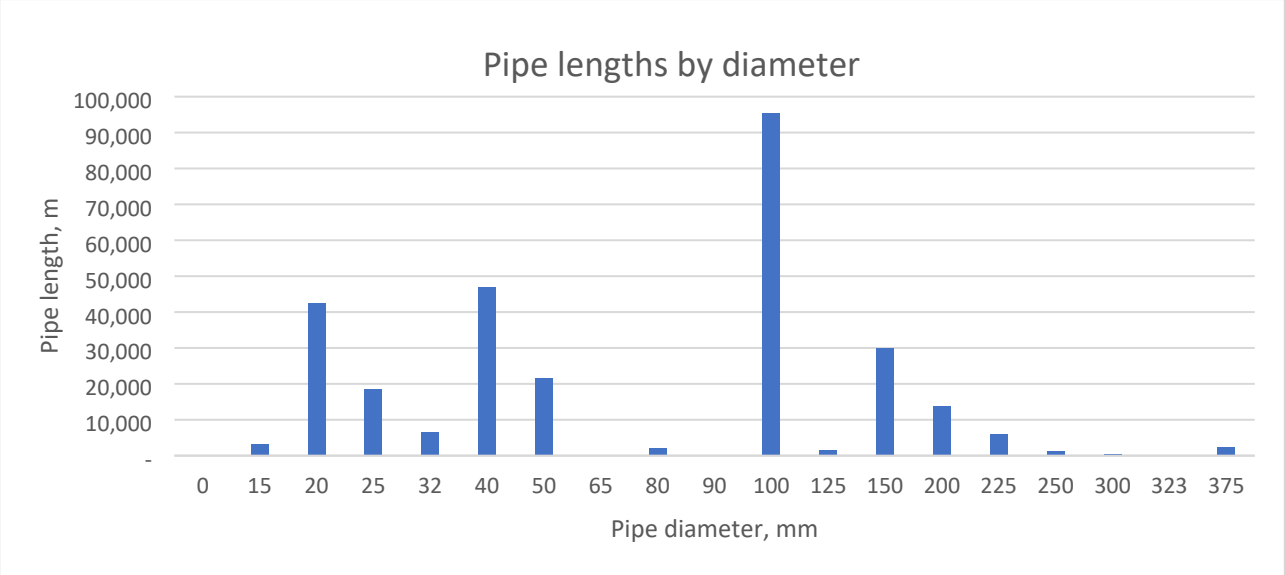


Figure 3.2 Pipe Size Distribution

Materials

Pipes are also grouped into material types as shown below, since these offer the potential to consider attributes, such as base life and performance, in groups.

Table 3.13 Pipe Material by Scheme (in metres)

	Arapuni	Athol	Lichfield	Putāruru	Tirau	Tokoroa	Grand Total
ALK	668			1,198	422	1,921	**4,209**
ARA-AC-E	255						**255**
ARA-AC-F	1,732						**1,732**
CONC				113			**113**
GI	290			6,413	1,394	22,017	**30,114**
HDPE						168	**168**
HISTROIC-AC-E				1,116	303	2,914	**4,333**
HISTROIC-AC-F	69			75	746	257	**1,147**
MDPE	1,320	2,735	955	7,606	4,891	28,083	**45,590**
MPVC	711			725	2,279	10,297	**14,012**
PUT-AC				12			**12**
PUT-AC-E				20,340			**20,340**
PUT-AC-F				5,417			**5,417**
PVC	1,175	1,910		15,805	2,707	29,594	**51,192**
RC				77			**77**
STEEL	10			140	14	403	**566**

	Arapuni	Athol	Lichfield	Putāruru	Tirau	Tokoroa	Grand Total
TIR-AC-E					3,213		**3,213**
TIR-AC-F					3,343		**3,343**
TOK-AC						31	**31**
TOK-AC-E						46,708	**46,708**
TOK-AC-F						24,304	**24,304**
UPVC	2,005			11,127	2,875	17,899	**33,906**
VICTAULIC	2,120			12		9	**2,141**
Grand Total	**10,355**	**4,646**	**955**	**70,176**	**22,188**	**184,604**	**292,923**

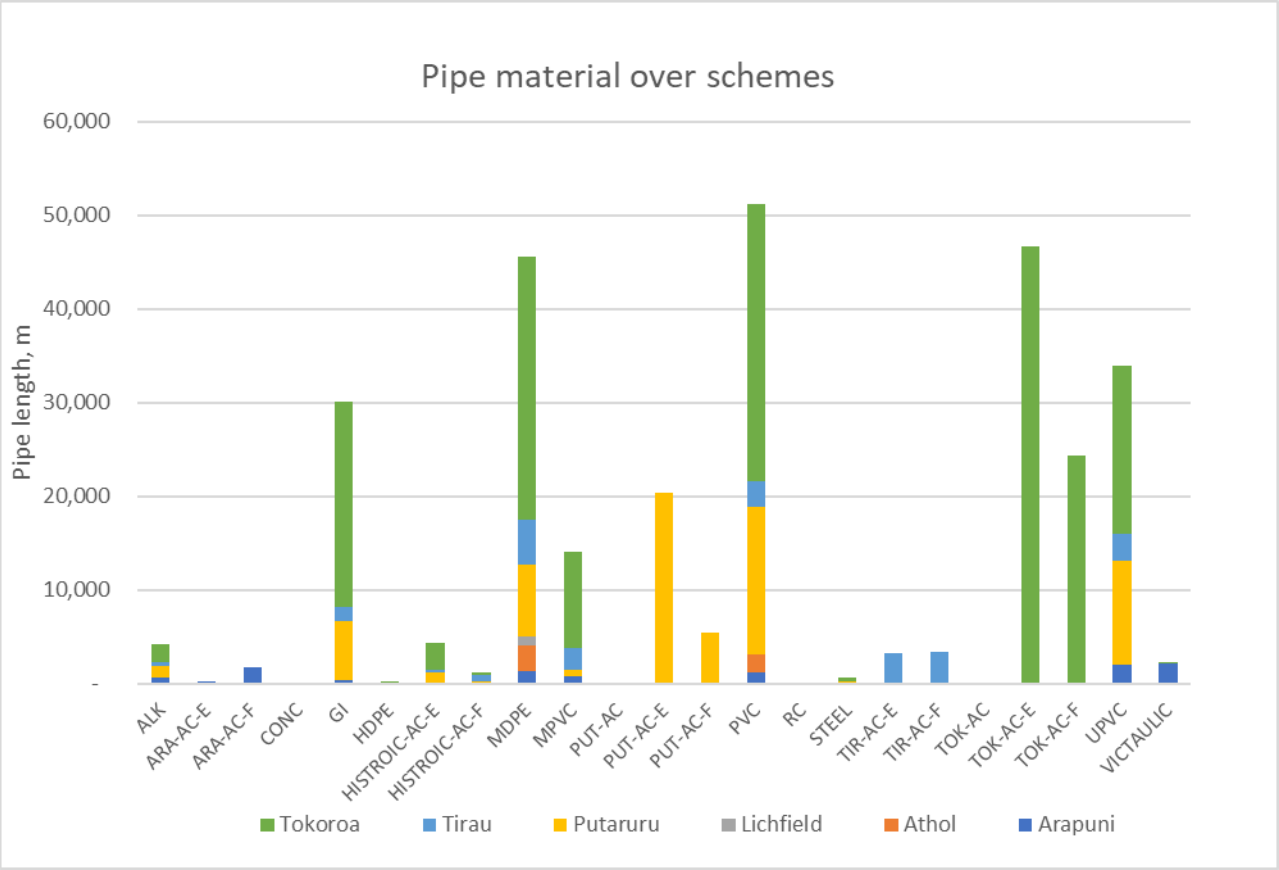


Figure 3.3 Pipe Material over all Schemes

A range of materials have been used in the reticulation systems, generally being the most popular, cost-effective type at the time of installation.

In common with many other authorities, SWDC has a high proportion of fibre cement pipes. During and after the world wars, metal was scarce and cement-based materials reinforced by fibres of various types including asbestos were developed. This coincided with the 'baby boom' when significant lengths of network were constructed to serve the growing population, and in the South Waikato region hydro power schemes were also constructed to meet the demands of the same population increase. Fibre cement pipe was imported from various sources overseas under brand names such as "Eternit", "Italit" and "Everite". These pipes have generally exhibited variable quality and life expectancy. After 1960 it was manufactured in NZ as "Fibrolite" and then Asbestos-Cement "AC".

Apart from the assumption that all fibre-cement pipes used after 1960 were NZ made, it is virtually impossible to differentiate between the different types of inspection. All types are subject to weakening with

age when used to convey water of relatively low pH as is found in the District. This is caused by leaching of alkaline cement compounds from the pipe material.

In the Arapuni reticulation there are significant lengths of steel "Victaulic" pipe in 100 mm diameter - 150 mm diameter mains. This material appears to have an excellent life expectancy, although fittings for any repair work can prove difficult because it is not a commonly used material.

uPVC pipe is the most commonly used material for normal reticulation work today and has been in use since the late 1950's. In smaller diameters galvanised iron pipe was a commonly used material until uPVC, alkathene, and latterly medium and high-density polyethylene (MDPE and HDPE) have and are being used.

Age Distribution

The majority of pipes were installed in the 1950-1980 period as indicated in Figure 3.4 below (pipe install age). The AC - E type of pipe with an estimated renewal life of 60-80 years will be the main type of pipe requiring replacement over the next 20 years. The AC - F type of pipe has an estimated renewal life of 60-105 years, and this will not require replacement until approximately 2045-2055.

The total length of pipe requiring replacement over the next 20 years will be approximately 70 km, of these AC-E accounts for 60 km. The timing of this replacement will be dependent on the criticality of the individual pipes (as detailed in Section 6.1.1) and the condition i.e., increased intervention will be required.

A condition assessment has been carried out on the water supply AC pipes to ensure correct estimates of remaining lives have been allowed for funding purposes and replacement timing.

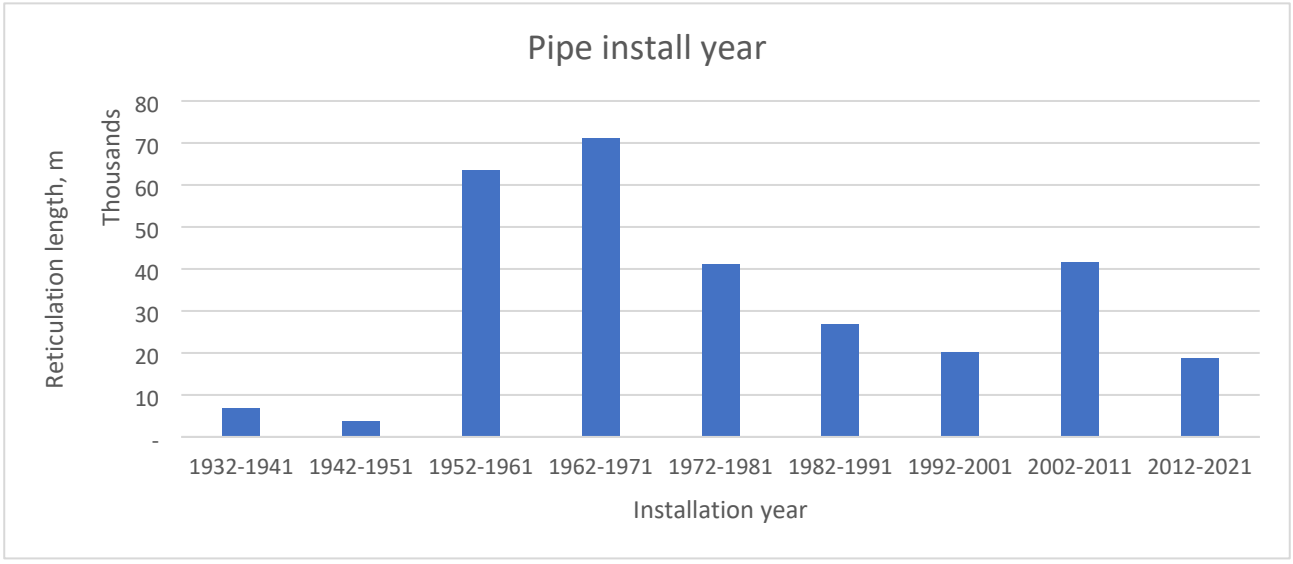


Figure 3.4 Pipe Install Year

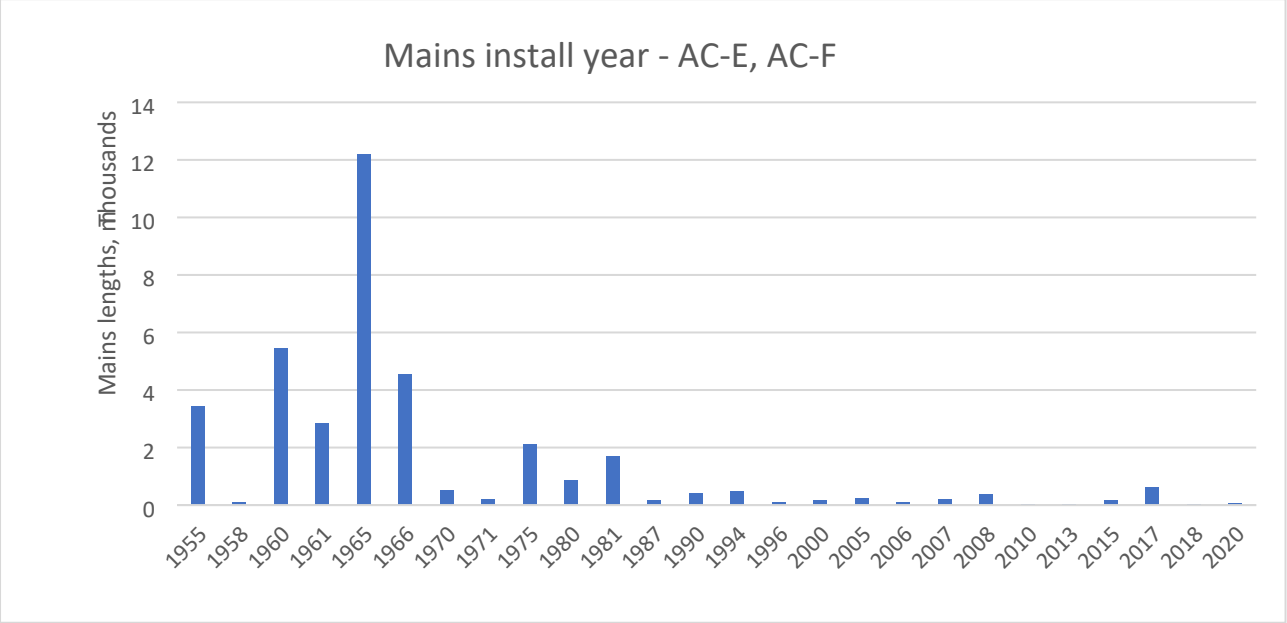


Figure 3.5 AC - E and F Pipe Install Year

3.1.13 Valves Asset Group

Valves have been installed throughout each of the reticulated supply areas to enable sections of pipe to be isolated for maintenance purposes. The valves are all standard patterns approved for use in town reticulation, installed in service boxes with lids at ground or road surface level, and are readily replaceable.

Note 52% of the valves have interpolated install dates (estimated install date is shown in the asset register).

3.1.14 Fire Hydrants Asset Group

Fire Hydrants are provided for firefighting purposes in the four main supplies generally in accordance with the New Zealand Fire Service Fire Fighting Water Supplies Code of Practice 2008. This provides standards for hydrant spacing and water delivery and sets firefighting flows that vary from 7.5 L/s to 200 L/s depending on the fire class risk.

The asset register records 1,120 fire hydrants. None have a theoretical life expiry date before 2015, and all have base lives set at 80 years, longer than those of the pipes. In practice, when it is time to replace the pipes, the hydrants are unlikely to be in a condition economical to re-furbish and re-fit and are replaced at the same time.

3.1.15 Service Connections Asset Group

Each property connected to the water supply is provided with one connection point to the Council reticulation. Only in exceptional circumstances are multiple connections allowed. Each connection is provided with a shut-off valve (toby valves for domestic use) manifold valves that incorporate a single check valve are now used for most residential replacements.

The numbers of property connections in each supply area are as follows:

- Tokoroa 5,570
- Putāruru 1,820
- Tīrau 448
- Arapuni 160
- Lichfield 50

- Athol 38

3.1.16 Water Meters Asset Group

Meters are installed in the water reticulation for monitoring demand and flows, and for billing extraordinary water consumers. Universal metering has not been contemplated in the foreseeable future by this Council.

Consumer Meters

Meters are installed on water connections to premises where consumption may exceed 320 m^3 per year (extraordinary users as defined in the current bylaw). This is the volume that is made available for each ordinary connection for the basic water charge set annually. The property owner with a metered connection is required to pay for water used in excess of 320 m^3/annum. A backflow preventer may also be required on a property if activities on the property create a significant risk of contamination to the supply in the event of a failure. The level of risk is outlined in the Backflow Prevention Management Plan. Water meters that require replacement are being replaced with new “Smart” meters that allow for remote reading, this enables quicker readings at a lower cost.

Bulk Supply Meters

All supplies have bulk meters that record the total volume of water produced and fed into the reticulation. An additional flow meter was installed on the rising/falling main from Colson Hill in 2019 to further assist in future water modelling. This also provides the operators with knowledge of peak flows and average demand figures for analysis purposes. These figures are recorded and can be used to identify changes in demand, major leakage etc. An additional bulk flow meter was installed on the Colsons Hill Reservoirs delivery main in 2019 and further bulk meters are planned throughout the network to enable better estimations of water consumption and to assist in water leak detection.

All watertake meters have an accuracy of ±5% and are calibrated independently every 5 years.

Drinking Water Standards

To comply with Drinking water Standards, each individual supply needs to meet the bacterial, protozoal, viral, Cyanotoxin, Chemical and Radiological criteria, as well as the monitoring and record requirements. These requirements apply to all sources, including raw water supply, bore water sources, the treatment plant, and the reticulation network.

Council and the WLASS certified laboratory, which is contracted by the Council work to collaboratively develop a sampling calendar and clear responsibilities, and to ensure samples are collected, analysed and the test results are registered in a new online tool Hinekorako (previously called Drinking Water Online) at Taumata Arowai, with the exception of Athol. The results are also used for operational purposes to adjust settings and optimise the treatment process.

Data is maintained and uploaded to the web based online application for compliance assessment. Council utilises an external software solution namely ‘Infrastructure Data’ to record and report on the bacterial and protozoal record keeping criteria for water treatment plants. This system extracts data from the SCADA and telemetry systems and issues reports directly to the Drinking Water Assessor.

3.2 Asset Condition

Overall water supply assets, based on the Condition data, 40% by value, are in Poor or Very Poor Condition. This represents a condition-based backlog of approximately $27 M.

Water line assets, based on the Condition data, 36% by value, are in Poor or Very Poor Condition. This represents a condition-based backlog of approximately $24 M.

Water plant assets, based on the Condition data, virtually none are in Poor or Very Poor Condition. This indicates a low condition-based backlog ($178,000).

Water point assets, based on the Condition data, 4% by value, are in Poor or Very Poor Condition. This represents a condition-based backlog of approximately $3 M.

Other points to note:

- Overall water supply 38% by value of assets are in Excellent and Good condition versus 36% in Very Poor condition.
- Almost all plant assets (95%) are in Good or Excellent condition.
- 29% of the points assets are in Excellent condition, while 52% of the points' Replacement Cost corresponds to Average condition (ref. **Error! Reference source not found.**).
- 59% of the reticulation pipe network, which is 60% of the water reticulation assets' replacement cost, are in Poor and Very Poor condition.

Table 3.14 Asset condition versus Replacement Value

Asset Type and Condition	Quantity/ Length, metres	Replacement Cost	Replacement value as percentage of the total Water Assets Replacement Value	Replacement value as percentage of the Asset Type
Water line assets, m	292,923	$40,703,354		
Excellent	8,355	$1,108,602	2%	3%
Good	64,679	$7,245,563	11%	18%
Average	58,882	$8,153,905	12%	20%
Poor	29,761	$2,436,891	4%	6%
Very Poor	131,247	$21,758,393	32%	53%
Water plant assets	889	$13,346,511		
Excellent	821	$4,790,355	7%	36%
Good	57	$7,914,424	12%	59%
Average	9	$463,924	1%	3%
Poor	1	$1,080	0%	0%
Very Poor	1	$176,729	0%	1%
Water point assets	13,707	$14,631,623		
Excellent	4,601	$4,296,948	6%	29%
Good	2	$1,360	0%	0%
Average	5,112	$7,614,362	11%	52%
Very Poor	3,992	$2,718,953	4%	19%
Grand Total	-	$68,681,488	100%	

3.2.1 Condition assessment methodology

In the case of water pipelines the condition of the pipe is taken as being directly related to its age unless better information is available. The different types of pipes have been attributed various average life expectancies and then a normal distribution has been applied for 20 years either side of the failure year to try to model what generally happens in practice.

This method of describing condition of underground assets will be used until such time as a better one is available. The Council's continuing programme of pipe sampling and testing during repairs provides additional information on pipes that are approaching the end of their useful life, but it would be incorrect to extrapolate the observed condition of failing assets to all assets. While physical inspection would provide a more direct assessment of condition, the cost of such a programme is prohibitively high. It is considered to outweigh the twin risks of accumulating excessive or insufficient depreciation reserve funding, where this is based on a conservative asset life. The emphasis for physical condition inspections will be placed on critical assets. The adopted age/condition relationship should ensure that Council adequately provides for minimising decline in service potential in any one year and proactively manages the risks associated with the failure of critical assets.

3.3 Asset Information (data quality/ completeness)

Data confidence for the assets covered under Section 8.7 of this AMP.

4 Levels of Service

4.1 Summary of Levels of Service

Following on from the definition of Council's Vision, Outcomes and Strategies the relevant Council units responsible for delivering services to the community have defined specific **Levels of Service** (LOS) that describe what the customer will receive from a particular activity.

The LOS are associated with **Performance Measures** that are expressed in both customer and technical terms.

Key Performance Indicators have been developed for the purpose of monitoring and reporting by the service provider, to ensure that the service is being delivered to the defined performance level.

In addition to the above, the Department of Internal Affairs has gazetted in November 2013 a series of Mandatory Non-Financial Performance Measures that have been addressed in the LTP and supporting AMPs. The measures address the five core services areas of Water Supply, Water Supply, Stormwater, Roads, and Flood Control. SWDC has no flood control schemes.

The Performance Management process ensures that all activities are coordinated and aligned with the global objectives of the LTP and are described in detail both there and in the individual AMPs.

A "Service Level Gap" exists when the reported results of service level monitoring are lower than the service level "target". Customer service level gaps may arise from a difference between perception and expectation, particularly if a service level is expressed in terms of public satisfaction. From this point, improvements can be developed that may involve altering the parameters of fixed assets or altering process features.

The results of Council's regular customer surveys, which include "public satisfaction", can be influenced by factors unrelated to actual measured service, such as 'how well council communicated its achievements', and the general attitude of respondents to the Council.

To deal objectively with shortfalls requires a clear distinction to be made between perceived and technical levels of service. The service levels adopted in the AMPs generally avoid use of "customer satisfaction", reflecting the advice of the Auditor-General.

Levels of service for the Water Activity are based on:

- Strategic Goals These provide guidelines for the scope of current and future services offered, the manner of service delivery and defines specific levels of service which the organisation wishes to achieve.
- Statutory Requirements/Environmental Standards (Regulations, Acts and
- Council By-Laws that impact on the way assets are managed (i.e., resource consents, building regulations, health and safety legislation). These requirements set the minimum level of service that must be provided.
- Community Engagement and Feedback Information gained over the last 3 years on LoS from specific consultation, customer service requests, Annual Budget submissions, and community surveys.
- The Department of Internal Affairs (DIA) mandatory measures were introduced in 2013 and attempt to establish a set of baseline data to enable performance to be measured comparatively amongst all Councils in the country. These performance measures have been a reporting obligation since July 2014.

Prior to 2017 there were no satisfaction measures for Water supply. The Council now conducts four times per year a community perception survey to provide the community a platform to engage and provide their thoughts on various Council activities.

Table 4.1 Identification of Stakeholders and Interests

Customer Driver	Satisfaction 2017	Satisfaction 2018
The reliability of the water supply	96%	94%
The taste of the water	84%	82%
The clarity of water	89%	87%
The odour of water	90%	85%
The pressure of water	86%	91%

4.2 Stakeholders' Wishes & Expectations

4.2.1 Identification of Stakeholders

The following table lists those who have significant specific involvement with the assets (and/or the service facilitated by the assets) and describes their particular main interests. The table is limited to the main issues for key stakeholder groups. 'Public Service providers' include schools, dentists, doctors, hospitals, and other government organisations. 'Asset Managers' are those District Council staff (Engineers and others) whose responsibility it is to manage the services made possible by the assets covered in this AMP.

Table 4.2 Identification of Stakeholders and Interests

External Stakeholders	Main Interests
Central Government	Ensure that Local Government Act is complied with (via Auditor-General)
Resident population	Reliable, healthy water supply at an affordable cost
Local Businesses/Industries	Water supply to suit commercial needs and expansion, at affordable cost
Oji Ltd.	Supplier of water to Athol and WaWa communities via Council, at fair value
***Public Service providers**	Reliable, healthy water supply at an affordable cost
Taumata Arowai	Water quality is suitable, consistently assured, does not spread diseases
NZ Fire Service	Sufficient flow and pressure via reliable system, to extinguish fires
Tangata Whenua	Respect for spiritual/cultural significance of water and land affected
Council's Service Providers	On-going work: processes and systems to facilitate efficient operations
Regional Council	Water volume taken is within allocation, is not wasted, and is sustainable
Local Authority Shared Services Ltd (LASS)	Provide the local authorities of the Waikato region with a vehicle to develop shared services. Jointly owned by 13 local authorities. Beneficial to the community through enhanced services and/or reduced costs

Internal Stakeholders	Main Interests
Elected Officials	Owner of assets, responsible for sustainable service levels under the LGA 2000
Executive	Compliance with regulations, service reliability, quality, and economy
Asset Managers	As above plus policy development, planning and implementation of infrastructure and service management activities (e.g., operations, demand management, maintenance, construction), safety, effective corporate support for decision-making, service management, procurement, finance, communications, I.T., staff, and other resources
Planners	AMP support for Long-term. Infrastructure support for current/future district activities (housing, business, recreation)
Finance	Proper accounting for assets and for services consumed by asset management activities. Reliable, justified projections of future costs
Internal Business Units	On-going work: processes and systems to facilitate efficient operations
Customer Services	Systems which minimise and resolve complaints/enquiries about service
Information Services	Clarity of technical and budget requirements for systems and support

*Public service providers include schools, dentists, doctors, hospitals, and other government organisations.

4.2.2 External Mandated Standards

The Drinking Water Standards are mandatory under the Government's 3-Waters reform legislation, the Water Services Act 2021.

4.2.3 National Strategies and Plans

National Infrastructure Plan

The National Infrastructure Plan (NIP) details the Government's view of the challenges and priorities for infrastructure. The 2015 NIP describes the view to 2045.

A Vision for New Zealand's Infrastructure in the NIP is:

- By 2045 New Zealand's infrastructure is resilient and coordinated and contributes to a strong economy and high living standards.

More specifically the vision for the Water Sector is:

- Water infrastructure will contribute to healthy and safe communities, promote the social, economic, and cultural well-being of those communities, and will provide a competitive advantage for New Zealand's primary producers and industry.
- Consumers have an appreciation for water conservation and environmental protection.
- Effective allocation models ensuring water is allocated to its highest value use.

National Policy Statement Freshwater Management

The National Policy Statement for Freshwater Management 2020 sets out the objectives and policies for freshwater management under the Resource Management Act 1991. It came into effect on 3 September 2020 and replaces the National Policy Statement for Freshwater Management 2014 (amended 2017).

The National Policy Statement - Freshwater Management took effect from August 2017. Government has noted this is Part 1, to be followed by:

- Water limit setting - includes non-point source discharges such as those from agricultural practices
- New regulatory tools - designed to properly manage limits

Key and Regulation– Implications for Asset Management

Legislation is established by Central Government and must be complied with at Local Government Level. Significant legislation and regulations affecting the water activities are provided in the table below. Council must comply with any relevant legislation enacted by Parliament. Commentary related to some of the key legislation is provided below.

Table 4.3 Legislation and Regulation Affecting the Water Supply Activity

Legislation & Regulation	Asset Group Impacted	*Impact Range
Building Act 2004 (and amendments)	All	*
Central North Island Forests Land Collective Settlement Act 2008	All	*
Civil Defence Emergency Management Act 2002	All	***
Climate Change (Emissions Trading and Renewable Preference) Act 2008	All	*
Climate Change Response Act 2002 (and amendments)	All	**
Energy Efficiency and Conservation Act 2000	All	*
Environmental Protection Authority Act 2011	All	*
Epidemic Preparedness Amendment Act 2010	All	*
Health Act 1956	Water, Water Supply, Landfill	***
Health and Safety at Work Act 2015 (and amendments)	All	***
Historic Places Act 1993 (and amendments)	All	*
Infrastructure (Amendments Relating to Utilities Access) Act 2010	All	**
Local Government Act 2002 (and amendments)	All	***
Local Government Act 1974 (and amendments)	All	**
Local Government (Financial Reporting) Regulations 2011	All	*
Local Government Rating Act 2002 (and amendments)	All	**
Local Government Rating Act 1979	All	*
Ngati Tuwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2011	All	*
Public Works Act 1981 (and amendments)	All	*
Railways Act 2005	Transport Utilities	*

Legislation & Regulation	Asset Group Impacted	*Impact Range
Railway and Corridor Management and Safety Act 1992	Transport Utilities	*
Reserves Act 1977 (and amendments)	Community All	** *
Resource Management Act 1991 (and amendments)	All	***
Transit New Zealand Act 1989	Transport	*
Utilities Access Act 2010	All	***
Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010	All	*

***Impact Range:** Different legislation has differing levels of impact on the groups of activities; this is indicated under Impact Range (Broad ***, Moderate **, Limited *).

Major Legislation Details

The legislation that has or will have the most effect on the Water Supply Activity is expanded in the following section.

Civil Defence Emergency Management Act 2002

The expectations under the CDEM Act 2002 are that Council's services will function at the fullest possible extent during and after an emergency, even though this may be at a reduced level. In addition, Council has established planning and operational relationships with regional CDEM groups to deliver emergency management within our boundaries.

Water supply and Wastewater are regarded as critical services and are given special consideration within Council emergency management procedures. Every effort will be given to restore services immediately after an event to at least provide adequate water for sanitation and health albeit supply quantity may be limited.

Health Act 1956

The Health Act 1956 places an obligation on Council to improve, promote and protect public health within the District. The provision of water and Water Supply services conserves public health and helps to protect land and waterways from contamination.

The Health Act requires Council to furnish from time to time to the Medical Office of Health such reports as may be required as to diseases, drinking water and sanitary conditions within the District.

Local Government Act 2002

Council's 30-year Strategy must address the "core activities" of water supply; Water Supply; stormwater; flood protection and control; roads and footpaths; as well as any other assets that the local authority wishes to include. It is prepared separately from the AMPs but aligned with them and is included in the LTP.

In addition to the general requirements of the Local Government Act there are some specific clauses that apply to Water Supply services.

S125 places a requirement to assess water and other sanitary services from time to time

S130 imposes an obligation to maintain water services and places limitations on the transfer or selling of assets

S136 empowers Councils to enter into Contracts relating to provision of water services for periods not exceeding 35 years whilst maintaining control over the pricing of the service, retain legal responsibility for the service and being responsible for the development of policy related to the water services

S137 empowers Councils to enter joint local government arrangements and joint arrangements with other entities for the provision of water services, with the same constraints as S136

Resource Management Act 1991

The RMA 1991 provides an environmentally conscious framework for Local and

Authorities to administer powers with regard to development and the management of natural resources. The RMA 1991 focuses on the effects of activities rather than on the activities themselves. SWDC's District Plan provides the rules that apply to subdivision, land use consent and development in conjunction (where necessary) with Waikato Regional Council's regional plans – (see above) that also provide for the abstraction of water and discharges to the environment.

Ngati Tuwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2011

The legislation provides for improving the health and well-being of the Waikato River through a partnership arrangement between iwi and the Crown. Part of the legislation covers co-management arrangements for the Waikato River from Te Toka a Tia near Taupō through to Karāpiro and the first agreement was signed with Raukawa on 10 May 2012 at Pikitu Marae, south-west of Putāruru,

The Waikato River Authority is a statutory body formed under the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010 and is the sole Trustee of the Waikato River Clean-up Trust whose role is to fund projects that meet the purpose of the Authority.

Waikato Regional Plan and Regional Policy Statement

The Waikato Regional Plan is fully operative and implements the Regional Policy Statement. The Plan provides direction regarding the use, development, and protection of natural and physical resources in the Waikato region. The Plan contains modules covering Matters of Significance to Māori, Water, River and Lake Beds, Land and Soil, Air, and Geothermal Resources.

Effects on asset management include:

- Waikato River Authority requirements regarding taking water and discharging treated effluent
- Allocation and use of fresh water
- Adapting to climate change
- Integration of transportation and land use

Proposed Plan Change 1 (Healthy Rivers) will have an impact long term on water usage takes and discharges in the Waikato Region. The effects on Water Supply disposal long term are unknown at this time.

4.2.4 Standards, Codes of Practice and Guidelines

National Environmental Standard for Sources of Human Drinking Water (2008)

The National Environmental Standard for Sources of Human Drinking Water is intended to reduce the risk of contaminating drinking water sources such as rivers and groundwater. It does this by requiring regional councils to consider the effects of activities on drinking water sources in their decision making - resource consents and regional plans. Specifically, councils will be required to:

- Decline discharge or water permits that are likely to result in community drinking water becoming unsafe for human consumption following existing treatment
- Be satisfied that permitted activities in regional plans will not result in community drinking water supplies being unsafe for human consumption following existing treatment
- Place conditions on relevant resource consents requiring notification of drinking water suppliers if significant unintended events occur (e.g., spills) that may adversely affect sources of human drinking water

Drinking Water Standards of New Zealand

The Drinking Water Standards (DWSNZ) are now overseen by a new drinking water regulator Taumata Arowai after enactment of the water services Act 2021. Taumata Arowai became fully operational as the drinking-water regulator when the Water Services Act 2021 came into effect on 15 November 2021. Part 2A (Drinking Water) of the Health Act 1956 was repealed from this date.

Drinking-water Standards for New Zealand 2005 (Revised 2018) (DWSNZ) replaced Drinking-water Standards for New Zealand 2005 (revised 2008). It details how to assess the quality and safety of drinking-

water using the revised water quality standards and compliance criteria that came into effect from 31 December 2005. The Drinking-water Standards apply to drinking-water that is intended to be used for human consumption, food preparation, utensil washing, oral hygiene or personal hygiene. The criteria are applicable to all drinking-water except bottled water, which must comply with the Food Act 1981.

Taumata Arowai has been developing new drinking water standards for water suppliers, which will replace the current Drinking Water Standards for New Zealand (DWSNZ) and come into effect on 1 July 2022

Design Standards

The "Regional Infrastructure Technical Standard" prepared by the Waikato Local Authority Shared Services group is the principal document defining design requirements.

The Regional Infrastructure Technical Specification (RITS) is a document that sets out how to design and construct transportation, water supply, wastewater, stormwater, and landscaping infrastructure in the participating councils' areas. Prior to developing RITS, each council had its own Infrastructure Technical Specifications, which resulted in different standards having to be met across the Waikato region. The purpose of RITS is to provide a single regional guide and specifications for building public infrastructure.

Developers are required to provide infrastructure in subdivisions/developments and can use the RITS as a means of complying with the conditions set by councils as part of the resource consenting process. If developers, and their consultants and contractors, use the RITS, the process to meet resource consent conditions will usually be quicker and therefore less costly.

Water Supply Bylaw

The following Council Bylaws are relevant to the management of Water Activity assets.

South Waikato District Council Water Supply Bylaw 2020 sets out the terms and conditions of water supply, measures to protect the water supply and the breaches and infringement of offences.

Other References

- NZWWA The New Zealand Infrastructural Asset Grading Guidelines
- NES Sources of Human Drinking water
- National Guidelines for Health and Safety in the New Zealand Water Industry.
- Water NZ National Guidelines for Occupational Health and Safety in the NZ Water Industry.
- NZS 6101 'Classification of Hazardous Areas'.

NZ Fire Service Fire Fighting Water Supplies Code of Practice SNZ PAS 4509:2008

Firefighting application, both from street fire mains and hydrants and within industrial premises, including fire sprinkler systems, are also covered in the bylaw. It refers to the publicly available specification SNZ PAS 4509:2008 NZ Fire Service Fire Fighting Water Supplies Code of Practice, which is used as a guideline for the flows and pressures provided through hydrants for firefighting purposes. The Council aims to meet the minimum standards set out in the Code.

Zoning and Easements

Water Supply Infrastructure is installed in council road reserves as of right, but these are shared with other designated utility operators. Council controls the location of infrastructure and also the programming, quality and timeliness of reinstatement. More information is available in the Land Transport Asset Management Plan.

Council assets on private land are protected from interference, and access to them for maintenance is ensured, by legal easement, provision of the Local Government Act, or under by-laws. This includes reservoirs, which must be sited on elevated land sometimes owned by private entities such as the forestry companies.

Infrastructure situated on or under state highways is protected by utility operator legislation/regulation which gives Waka Kotahi (NZTA) the right to control the location and standard of construction and gives the Council the right to enter, construct, maintain and protect the assets.

Other Standards

Council has established standard operating procedures (SOP) for supply, handling, and use of water treatment chemicals such as lime, hypochlorite and hydroflurosilicic acid. These are an integral part of the Water Safety Plan and incorporated into the requirements of the maintenance contract.

4.3 Assets Constraints to Levels of Service

This section lists constraints imposed by the existing assets, which may affect current or future levels of service, and explains why each is relevant.

4.3.1 Capacity

Sources

Resource Consent Volume - if additional water was required and abstraction was at the maximum average, or at maximum flow rate, specified in the consent, new consents would be required for existing or new additional bores.

Bore size and Bore pump output - There are no issues for current projected demand for the majority of SWDC's water sources., the exception being the Tirau water source for which indications are that it may be declining and further investigation work is required.

Treatment

Chemical storage (where installed) - if additional water was required, this would require additional storage or more frequent delivery schedules. There are no issues for current projected demand.

Dosing pumps (where installed) - if additional water was required, this would require additional volume of chemical dosing which might exceed the capacity of the dosing pumps. There are no issues for current projected demand.

Ultraviolet disinfection, there are two reactors at Tokoroa, each able to disinfect 160 l/sec which is more than adequate. Ultraviolet disinfection and cartridge filtration has also been installed at Tirau Te Waihou, Lichfield, and Arapuni.

The greensand filters installed at Arapuni have been identified as under capacity, they are currently only capable of treating 3L/s versus the required 6L/s delivery from the nearly constructed water bore. Costs have been sort from Filtec the suppliers of the existing unit which has been estimated at $110,000 to $135,000.

Rising Mains

Rising Main Size - if pipes feeding to and from the reservoirs are not large enough to meet demand the flow rates and reticulation pressure will fall during peak periods. Reservoirs may be filled by increasing pump size, but this could increase pressures in a rising main and accelerate its failure. There are no issues for current projected demand.

Booster pump capacity (where installed) - if demand increases in a part of a network where pressure is low (for example, if additional development is permitted on elevated parts of the land) then existing booster pumps may not be powerful enough to sustain the standard specified in the levels of service. There are no issues for current projected demand, but this needs to be monitored carefully.

Reservoirs at major communities are twin tanks, Lichfield has a single tank installed. The failure of one tank would typically halve the time for which water can be supplied in event of a simultaneous upstream plant failure.

Reticulation

Normal demand - the efficient distribution of water depends on a network of larger main pipes feeding smaller ones. As demand increases, if the main pipes are not large enough, the pressure is reduced in the extremes of the network at high demand time and may be less than the standard specified in the levels of service. This problem is apparent in some areas and may be exacerbated by high industrial demand. Resolution may require additional larger pipes, unless resolved by agreement with the industries concerned such as installation of private holding tanks to cater for the peak requirements. Properties on the fringe of the

reticulation that are fed by one ended rider mains need to install holding tanks to ensure they have adequate supply.

Fire-fighting Demand - since this is an extreme case of the point above, the same comments apply. Rural residential properties that are not connected to the Council's water supply are required under New Zealand Fire Service Firefighting Water Supplies Code of Practice SNZ PAS 4509:2008 to supply a holding tank for firefighting.

Reservoirs

Reservoirs - The recognised minimum for Reservoir capacity is equivalent of 24 hours supply at peak demand rates. This is not mandatory and therefore storage becomes a risk management issue. Firefighting storage requirements are met in all cases. The only identified shortfall is with respect to the Tirau water reservoirs which is short of storage on the forecast peak day demand, additional storage has been recommended.

4.3.2 Reliability and Security of Supply

The following comments relate to reliability and security of the installed assets and are not intended to cove major disruptions such as seismic activity. Response planning both for typical plant failures and or major events is the subject of an Emergency Response Plan 'Risk Management Water Supply Back up Plan' document No.18778. This has been prepared under the guidelines of the Risk Assessment.

There is currently no specific plan for distribution of alternative for drinking water - for example by road tanker - and this will be addressed in the Improvement Plan.

Sources

The water sources are typically multiple bores with twin pumps, providing a level of redundancy except for peak demand times when both pumps may be needed to provide the required flow. In case of Council asset failure, water could still be provided but pressures would be lower, and consumers could be asked to conserve water for the duration of a problem. In case of power outage, the reservoirs have storage sufficient for several hours during which back-up generators would be provided if power could not be restored. The Tirau water source (Spring) is located within the flood zone of the adjacent Oraka Stream and has been flooded several times most recently in January 2023, investigations are required to identify options for a new location.

Treatment Plant

There is little redundancy in the water treatment systems, prior to the reservoir sites. Chlorine supplies are monitored to ensure sufficient stock, but power failure to, or breakdown of a dosing pump would result in the bore water being supplied (generally, direct to reservoirs) untreated until the fault was repaired. To avoid this the SCADA control systems have been modified to automatically shut down the site until an operator can attend and rectify the fault. The dosing pumps are linked to alarms, which notify staff when there is a problem.

The Tokoroa, Tīrau, Putāruru, Litchfield, and Waihou UV reactors can be run with a generator if there is a power failure, the reactors are set up so that water cannot be pumped if they are not working.

The Tirau spring and headworks are located within the flood zone of the Oraka Stream and they have been impacted by inundation several times in the past. In order to improve the resiliency of the water supply investigations are required to locate an alternative water source and identify appropriate locations to relocate the headworks clear of potential flooding.

Rising Mains and Reservoirs

The failure of a rising main (between source pumps and the reservoir tank into which it discharges) presents two problems. First, unless both the rising main and the inlet pipework to the tanks are duplicated, the failure means that no further water can be supplied to either tank.

Second, in Tokoroa the rising main also serves as the gravity supply pipe to the network. Therefore, unless the source pumps can discharge direct into the distribution system, a failure could result in an immediate supply outage. In Tokoroa there is a pump at Billah on a VSD that can pump water directly into the

reticulation. Reservoirs at major communities are twin tanks, Lichfield has a single tank installed. The failure of one tank would typically halve the time for which water can be supplied in event of a simultaneous upstream plant failure, which is unlikely except in serious seismic events. The existing Timber tanks at Putāruru and Arapuni have been identified as a risk to quality and security and require replacement.

Reticulation

The water network is typically a grid arrangement following the street layout, and therefore most consumer connections can be fed from two directions. Watermains are sized to deliver the appropriate water pressure and to meet firefighting demand.

Consents.

The Resource Consents issued by Waikato Regional Council impose strict water extraction limits on the volume of water that can be extracted from any water source. Extensive monitoring arrangements are in place to ensure that consent conditions are met and complied with at all times. Council also needs to ensure that all water supplies meet the Drinking Standards. Any transgressions are reported to Taumata Arowai (the new DW Regulator).

4.3.3 Environmental Performance

Assets such as bore well pumps are sized and managed to avoid breaching consent conditions. There are no other significant issues arising from operation of SWDC's Water Supply system assets, which are likely to impact on the environment. Risks such as catastrophic failure of reservoirs and rising mains are not level of service issues, and are covered in Section 6.0, Quantifying and Managing Risk.

4.3.4 Other Constraints

Sources

All water supply bores have bore liners installed to ensure the water extracted is not potentially contaminated by surface water. Liners in poor condition will affect raw water quality, which in turn affects treated water quality (where treatment exists) and/or delivered water quality where no treatment is carried out.

Treatment

Dosing pumps (where treatment exists) are critical to the addition of the correct quantity of treatment chemicals. A pump malfunction will affect the water quality by either failing to dose, or over-dosing and these are all monitored and alarmed to ensure a prompt response in case of failure

Rising Mains and Reservoirs

Reservoir condition and size in relation to demand both affect water quality. Reservoirs that are much larger than required for the demand will deliver 'stale' water with inadequate disinfectant level, but may be managed and/or retrofitted with suitable valves and baffles to ensure the water 'turns over' rather than allowing part of the volume to remain static. None of the existing water supply reservoirs have been fitted with seismic isolation valves, this needs further investigation to determine if they are required.

Reticulation

Unlined cast iron, or galvanised iron pipes, are likely to affect water quality by adding rust by-products.

Concrete, lined cast iron, and fibre-cement pipes may increase the alkalinity of the water. In SWDC this is not a problem since the pH of the water is lower than the optimum level. The naturally occurring acidic water tends to weaken fibre cement pipes over time by leaching cement from the pipe wall. Lime is added to the Tokoroa supply to increase pH to address this situation and also to improve the effect of chlorine disinfection.

4.3.5 Service Level Gaps

The AMP has been prepared on the basis of water supply provision to the water supply area as defined by the water supply bylaw.

Currently network modelling for Tīrau indicates there is a shortage of storage in the event of an emergency, and the storage volumes should be more than doubled within the next 20 years, in addition several areas have been assessed as being unable to meet firefighting flows based on land use classification.

The Glenshea Park water supply had previously been assessed as undersized and would be unable to meet future demands, as a result a significant upgrade to the water booster station was undertaken in 2020/21 to enable it to supply 55 l/s at 350 kPa, further work is required on the water supply bore to confirm its current capacity and determine any future upgrades[2]

The Council is expecting to receive a formal direction from the Ministry of Health to begin fluoridating the water supplies in Putāruru and Tirau, estimate have been supplied to implement this in both towns at $350,000 per township with additional annual operating expenses of $15,000 per year per site.

No service level gaps have been identified in Tokoroa.

4.4 Council's Service Level Goals

Council has adopted a series of measures which are intended to indicate how well Council's services contribute to the community's desired outcomes. Both Customer Service Levels and Technical Standards are used.

4.4.1 Service Levels

The following table lists the current Levels of Service and performance measures.

Table 4.4 Water Supply Levels of Service

Universal Definitions

	Definition
Respond	is the first action taken in regard to a Service Request and/or complaint. The response can be in the form of a phone call, email, or physical attendance to an issue.
Resolved	means the Service Request and/or complaint has been completed, repaired, or addressed and the resolution communicated back to the initiator.
Urgent	relates to issues that involve actual or potential harm to health or significant disruption to a level of service or issues of sensitivity.
Non-urgent	relates to general enquiries or passing on of information that does not fit the urgent criteria or does not disrupt the level of service.

Table 4.5 Water Supply Levels of Service

Activity	Level of Service statement	Strategy	Previous KPI	Proposed LTP KPIs 2021/31		Baseline	Evidence updates
				What	Method		
Water Supply							

[2] Putāruru WS Model Calibration & Infrastructure Assessment ECM493898

Tīrau WS Model Calibration & Infrastructure Assessment ECM553261

Tokoroa WS Model Calibration & Infrastructure Assessment ECM557292

Activity	Level of Service statement	Strategy	Previous KPI	Proposed LTP KPIs 2021/31		Baseline	Evidence updates
				What	Method		
Drinking water and treatment distribution	Council operates and maintains four urban and two rural water supplies. Council ensures that residents who are serviced by Council's water supply, have high-quality water available at all times for drinking and to meet other household and business needs. Council is responsible for looking after the network and making sure all statutory requirements and environmental standards are met.	Durable infrastructure	All unsecure water sources, will have their water treated as prescribed in part 5 of the drinking water standards to treat protozoa.	**PROPOSED WORDING:** All unsecure water sources, will have water treated as prescribed in Part 5 of the drinking water standards to treat protozoa.	Infrastructure Database	100%	Monthly
		Healthy, proud and connected community	n/a	**NEW/PROPOSED**: Community satisfaction with South Waikato water supply reliability is at 95% or above annually.	Community Perception Survey	95%	Quarterly
		Durable infrastructure	At least 97% of tests for E-coli (bacteria compliance) carried out on treated reticulated water will indicate a level of E-Coli in the reticulated Council systems of less than one per 100ml.	At least 97% of tests for E-coli (bacteria compliance) carried out on treated reticulated water will indicate a level of E-Coli in the reticulated Council systems of less than one per 100ml.	Infrastructure Database	97%	Monthly
		Durable infrastructure	The median response times for callouts in response to a fault or interruption to the water reticulation system does not exceed one hour of notice.	**PROPOSED WORDNG:** Where Council attends to water supply issues resulting from a fault or interruption in the Council's water supply system, the median response times measured: **Respond* to urgent* callouts - 95% within one hour**	MAGIQ Excel Spreadsheet	95%	Monthly
				PROPOSED WORDNG: Where Council attends to water supply issues resulting from a fault or interruption in the Council's water supply system, the median resolution times measured: **RESOLVE * URGENT* CALLOUTS– 95% WITHIN 24 HOURS**	MAGIQ Excel Spreadsheet	95%	Monthly

Activity	Level of Service statement	Strategy	Previous KPI	Proposed LTP KPIs 2021/31		Baseline	Evidence updates
				What	Method		
		Durable infrastructure	The total number of complaints received by Council about water supply issues (including clarity, taste, odour, water pressure/flow and continuity of supply) does not exceed one complaint per 1000 connections to Council's water supply system.	**PROPOSED WORDNG:** The total number of complaints about any of the following water supply issues: • **CLARITY** • **TAST** • **ODOUR** • **WATER** • **PRESSURE/ FLOW** • **CONTINUITY OF SUPPLY** does not exceed one complaint per 1,000 connections to Council's water supply system.	MAGIQ Excel Spreadsheet	Does not exceed one complaint per 1,000 connections to Council's water supply system.	Monthly
		Durable infrastructure	The water loss from Council's reticulation network will be no more than 20%.	The water loss from Council's reticulation network will be no more than 20%.	Spreadsheet information received from rates department, compliance team.	No more than 20%	
		Durable infrastructure	The average amount of water consumed per resident per day is 500 litres.	**PROPOSED WORDING:** The average amount of water consumed per resident per day is less than 500 litres.	Spreadsheet	Less than 500 litres	

Water Reticulation Incidents

The number of reticulation incidents handled, and location is shown in the Figure below. The level of incidents over the three years is relatively consistent in both overall numbers and the individual types. The types of incidents are water reticulation leaks 82%, Toby location 9%, fire main repair 4%, fire hydrant repair 3%, and head works repair 2%.

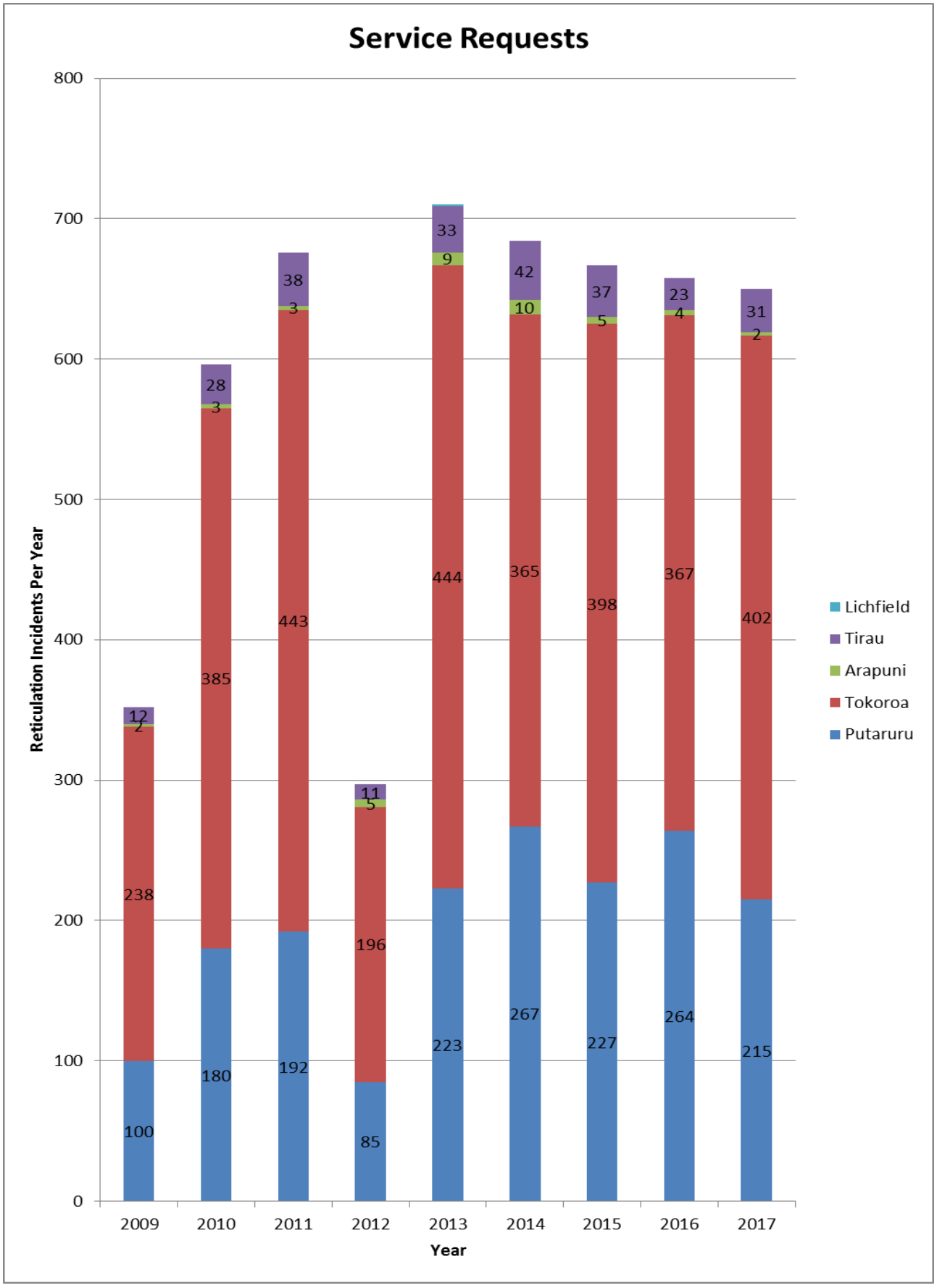


Figure 4.1 Water Reticulation Incidents

Service Level Gaps

Service level gaps arise where actual service levels “fall short” of customer expectations. To deal objectively with short falls requires a clear distinction to be made between perceived and technical levels of service.

Technical service level gaps require actual levels of service to be compared with desired levels. From this point changes can be made in contract agreements to “close the gap” between actual and expected levels of service.

Activities Affecting Service Levels

The overall level of service that a customer receives will depend on three broad classes of “experiences” with Council:

- Fixed asset functions such as pipes, treatment plants, buildings, and roads. These assets provide service attributes such as capacity and reliability through their inherent physical characteristics such as internal diameter, wall thickness and, durability
- “Front office functions” such as answering enquiries, repairing network defects, arranging new connections, or receipting cash sales. These are generally done on-demand (while the customer waits) and require a high level of customer contact
- “Back-office functions” such as preventative maintenance, compiling invoices, and receipting credit sales. These are generally done with minimal customer contact

The homogeneous nature of Fixed Asset Service Levels

Service levels such as capacity and reliability that are derived from fixed asset characteristics tend to be homogeneous or “common standard”.

Due to the homogeneous nature of fixed asset service levels Council will usually derive service levels from Customer needs, or technical standards that reflect established Customer needs.

Funding Levels of Service

The customer usually pays for utility services on an average charge basis, Average charging inevitably means that some customers will be subsidising others. Typically, customers in high density areas will be subsidising those in low density areas. Combining this with the “common good” nature of service levels means customers are unlikely to ever receive and pay for exactly what they want. This ideal situation is when the service is charged for on a metered or measured “user pays” basis, i.e., each customer pays a fixed connection charge based on the maximum capacity available to them, plus a variable charge based on the quantity used.

4.4.2 Customer Levels of Service

These service levels may include qualitative statements.

The challenge for Council is three-fold:

- To accurately translate perceived service levels into scientifically repeatable and measurable technical levels
- To implement those technical levels through robust asset management processes
- To report over time the measurable service levels that have in fact been achieved

Furthermore, Council must do these three activities within an acceptable funding envelope.

Quantitative service levels that may be expressed in terms of the customers’ requirements can include:

- Reliability - When people connected to Council’s Water Supply system, they expect drinkable water that has no taste or odour and is at sufficient pressure
- Cost - All users currently pay a fixed annual charge of $438.05 incl. GST (2021/22).

4.4.3 Technical Measures

These measures are almost always quantitative. For example, the quality of water downstream of a sewage treatment plant may be measured by testing for a range of organisms and chemicals and checking in-stream biological impacts.

4.4.4 Regulatory Levels of Service

Most Council service delivery is also subject to standards imposed by external (government) agencies such as the NZ Transport Agency, Ministry of Health, Taumata Arowai, Regional Council, and Council itself through its District Plan requirements.

The Resource Consents issued by Waikato Regional Council impose strict water extraction limits on volume of water that can be extracted from any water source. Extensive monitoring arrangements are in place to ensure that consent conditions are always complied with. Any transgressions are reported to Waikato Regional Council and DHB.

4.4.5 Fire Fighting Capacity

District wide Firefighting capacity was reviewed as part of the recent hydraulic network work completed by Watershed Engineering.

The Tokoroa water supply network operates well with no current minimum or maximum pressure issues, and typical fire firefighting flows based on land use classifications can generally be met. The network has a good amount of storage available in the event of an emergency.

The Putāruru water supply network operates well with no current minimum or maximum pressure issues, and typical fire firefighting flows based on land use classifications can be met. The network has a good amount of storage available in the event of an emergency, although half of the storage is reliant on pumping for delivery to the network.

The Tirau water supply network operates well; however, it does experience areas where typical fire firefighting flows base on land use classifications are not able be met. The network is short on storage available in the event of an emergency. It was recommended that we consider producing a fire risk classification map in conjunction with the local fire service, which considers key sites within the town.

The village of Arapuni was not included in any Watershed reports as it is not intended that any planned growth will be allowed and as such the performance of the firefighting capacity is currently unknown.

4.4.6 Service Response Times

Response times are set through the LTP process and are recorded through the service request system and reported monthly.

4.4.7 Balancing Competing Needs

Residential and Extra-ordinary Supplies

The Council installs water meters to monitor the consumption of customer who may exceed an annual allowance of 320 cubic metres - typically, industrial users and lifestyle properties. Water in excess of this allowance, which should be adequate for typical residential use, is charged on a volume basis this ensures that those consuming a greater share of the resource pay for it. Consumers that use over 200 m^3/day pay an extra rate currently set at $0.20 above the standard rate.

Supply to Water Bottlers

The Putāruru water bottling industry markets its product on the basis of the purity of the water source. Previously the Te Waihou water supply was unchlorinated partly to satisfy their requirements, following recent water transgressions the Te Waihou supply is chlorinated along with the rest of the water supply.

4.4.8 Key AMP Improvement Projects Relating to Level of Service

For the key AMP improvement projects relating to Growth and demand refer to section 5 for further detail, some key projects include:

- Arapuni water supply bore replacement
- Tokoroa Water Supply – Manfield Street Ridermain installation
- Putāruru water supply pH correction

4.5 Sustainability Issues

Source Water

Through the Resource Management functions of the Regional Council, several of the above demands or needs are also balanced against requirements for a sustainable natural environment. Council's river and ground water abstraction activities are controlled under the Resource Consents which limit the quantities to be abstracted.

Demand projections are covered in the following section. In summary, at present and for the foreseeable future, Council should not require additional water abstraction consents; however, it may be necessary to abandon bore wells as their liners deteriorate, admitting excessive ground water, and to drill new bore. On the basis that the same volume of water will be drawn from the same aquifers by different bores, no difficulties are expected in obtaining variations to, or new consents for this purpose.

Having stated this, it is possible that the demand arising from a new large industrial customer, or rapid growth in demand from an existing one, could require a review of the Council's position.

4.5.1 Key Sustainability Issues

- Managing water use to reduce energy consumption for water treatment and distribution
- Managing water use to reduce or delay the need for abstracting more groundwater and further infrastructure upgrades due to inadequate capacity of assets.
- Minimising the inputs required by the operator, particularly electricity and chemicals, by optimising the operations.
- Manage water abstraction in such a manner as to minimise electricity usage while ensuring demand is met.
- Identify and explore water sharing initiatives with other large bore owners in order to preserve the overall water resource.

4.5.2 Reliability and Quality of Supply

The on-going reliability of supply downstream of the source bores depends upon the proper management of all water supply assets. Documenting this activity is the purpose of this document. It can be seen from the demand projections and service level discussion that there are some key issues.

4.6 Role of Private Assets

In some locations, private infrastructure is integrated with the Council's water supply systems. These are listed below with the issues that relate to each of them.

Fonterra - Tīrau

Agreement has been obtained with Fonterra to provide a back-up to the public supply in case of emergency. Without this independent dairy factory source, the security of supply to Tīrau residents would be low, due to the reliance on one spring source.

Oji Limited - Athol

Oji - Kinleith supplies bulk water for some 17 Athol residents by agreement with Council. The cost of providing a public supply has been deemed both prohibitive and uneconomic.

Fonterra Co-Operative Group Ltd - Putāruru

The Pinedale reservoirs are sited on a 1.3-hectare area leased from Fonterra Co-Operative Group Ltd, access is covered by an easement.

4.7 Key AMP Improvement Projects Relating to Level of Service

For the key AMP improvement projects relating to growth and demand refer to Section 5 for further detail, some key projects include:

- Arapuni bore replacement.
- SH1 – SH27 Water supply upgrade
- Tokoroa water supply – Manfield Street ridermain installation
- Putāruru water supply pH correction

5 Growth And Demand

This section sets out the factors impacting on the management and development of the assets to meet the requirements of growth and other demands place on the Water Supply assets as follows:

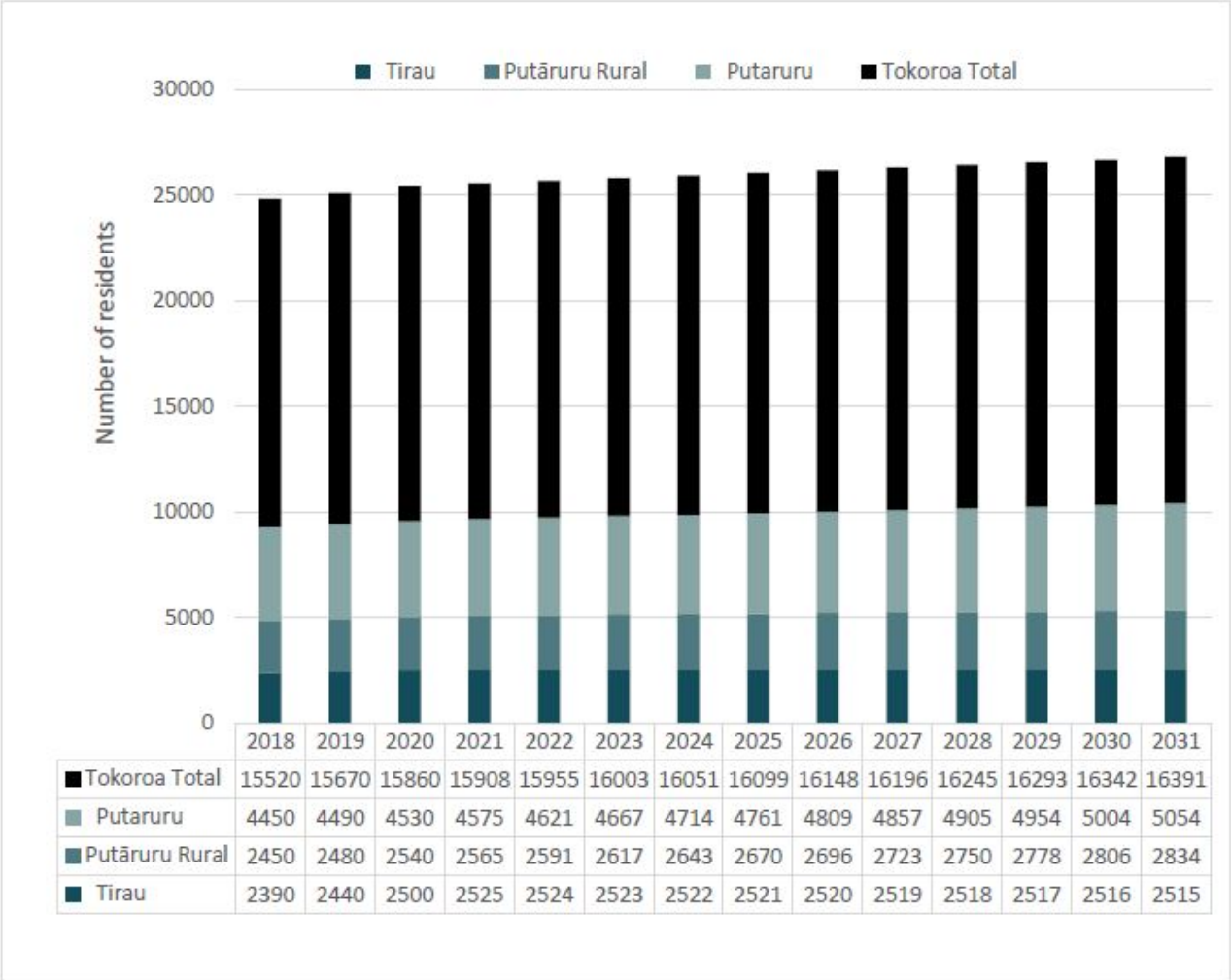
- Growth trends, increasing industrial and residential growth in the District
- Land-use strategies (residential, industrial, retail and rural-residential);
- Changes in Regional policies i.e., Healthy Rivers;
- Consumption and use patterns;
- Future demand for treatment of Water Supply driven by technological changes;
- Demand management strategies; and
- Climate change impacts on demand.

The latest 2018 Census data has revealed the District having an estimated population of 24,800 in 2018 and 25,100 in 2019 which is just over a 1% increase from 2018. The majority of the growth is anticipated to be in the north of the District focused on Tīrau and Putāruru. The individual results by ward are tabled below:

Table 5.1 Demand Census data by ward

Age	Total people, age				Total Population			
Sex	Male		Female					
Year on 30 June 2020	2018	2019	2018	2019	2018	2019	Difference	%
South Waikato District	12,400	12,500	12,500	12,600	24,900	25,100	200	+1%
Tirau ward	1,200	1,230	1,190	1,210	2,390	2,440	50	+2%
Putāruru ward	3,370	3,380	3,530	3,580	6,900	6,960	60	+1%
Tokoroa ward	7,800	7,850	7,750	7,800	15,550	15,650	100	+1%

The District as of May 2020 is home to a resident population of 25,400 people and it is predicted that more people will choose our district to become their new home with more young families making Tīrau, Putāruru and Tokoroa their home, where previously Putāruru has mainly attracted those 55 years and older. In 2031 our overall population is predicted to increase to 27,000 as can be seen in the figure below:



	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Tokoroa Total	15520	15670	15860	15908	15955	16003	16051	16099	16148	16196	16245	16293	16342	16391
Putaruru	4450	4490	4530	4575	4621	4667	4714	4761	4809	4857	4905	4954	5004	5054
Putāruru Rural	2450	2480	2540	2565	2591	2617	2643	2670	2696	2723	2750	2778	2806	2834
Tirau	2390	2440	2500	2525	2524	2523	2522	2521	2520	2519	2518	2517	2516	2515

Figure 5.1 South Waikato demographics forecast

5.1 Future Demand Drivers

Asset planning necessarily involves a long-term approach that takes account of many factors and must also align with Council's Long Term Plan projections.

In addition to the Asset Management Plans, the Local Government Amendment Act requires Council to develop a 30-Year Infrastructure Strategy that addresses key issues and identifies necessary investment in new or upgraded infrastructure; replacement of ageing infrastructure and related operations and maintenance expenditure.

Future demand drivers for reticulated Water Supply services in the South Waikato District are outlined below:

- Climate change projections – declining source water
- Healthy waterways
- Demographic projections, including population growth/decline, age distribution and location
- Economic development projections
- Demand projections, including customer expectations and ability to pay. Conversely, demand management may help to reduce or delay expenditure on extensions and upgrades to infrastructure, extend useful service lives and also to reduce operation and maintenance costs
- Changes to land use (e.g., conversion from forestry to dairy production)

- Compliance with existing and projected legislation (e.g., drinking water standards, public health and safety), national strategies (e.g., transportation and related funding provided) and regional strategies (e.g., higher standards regarding environmental effects)
- Agreed Levels of Service and projected changes thereto
- Replacement of ageing infrastructure prior to assumed failure, which would interrupt service delivery and incur related consequences and costs
- Ensuring sufficient capacity to cope with total demand and the variability of demand (e.g., peak usage for short periods)
- Managing demand appropriately to control costs and contribute to sustainable management of natural resources
- Efficient and effective service delivery mechanisms (e.g., contracting, shared services)
- Introduction of new technology, where appropriate, with higher performance and more cost effective
- Affordability for the community and the mechanisms for creating revenue
- Lifecycle management, which aims to optimise expenditure throughout the operating life of the infrastructure, including provision, operation, maintenance, and disposal of assets (see Chapter 4)
- The concept of sustainability and cultural considerations (including Tangata Whenua)
- Resilience or the ability to maintain service delivery by alternative means following a major disruptive event, such as power failure, earthquake, volcanic eruption, or flooding and to restore normal services as quickly as possible thereafter (see Chapter 5)
- National policy statements are issued by central government to provide direction to local government about how to carry out their responsibilities under the Resource Management Act 1991 when it comes to matters of national significance.
- Consideration of "non-asset based" alternatives (e.g., charging regimes that incentivise desired behaviour)
- Consideration of the impacts of COVID on the demand for Water Supply services, as business and household usages change

In addition to the above, infrastructure planning should allow a degree of flexibility to allow adaptation to changing and unforeseen circumstances.

5.1.1 National Policy Statement – Urban Development 2020

Under The National Policy Statement – Urban Development (NPS-UD) Council is considered a ‘Tier 3’ District and therefore must implement the majority of the matters within the NPS UD, this has some implications regarding our obligations to provide for growth in residential and business development. Apart from removing our ability to have rules for car parking, the following are the key requirements from the NPS UD that now apply to SWDC:

- Provide sufficient development capacity to meet demand for short, medium, and long term.

Sufficient means ‘plan enabled’, ‘infrastructure ready’, and feasible and reasonably expected to be realised for both residential and business land.

‘Plan enabled’ means:

- Short term (0-3 yrs.) – zoned in an operative plan
- Medium term – (3-10 yrs.) – zoned in an operative plan or proposed plan (plan change)
- Long term (10-30 yrs.) – zoned in an operative or proposed plan or identified in a formal council strategy.

‘Infrastructure ready’ means:

- Short term (0-3 yrs.) – adequate existing development capacity to support development

- Medium term (3-10 yrs.) – adequate existing development capacity or funding for adequate infrastructure in 10-year plan.
- Long term (10-30 yrs.) - existing or funded capacity in 10-year plan or development of the infrastructure to support required development capacity is identified in infrastructure strategy.

5.1.2 National Policy Statement – Freshwater Management 2020

The Freshwater NPS applies to the management of fresh water through a framework that considers and recognises Te Mana o te Wai as an integral part of freshwater management. It directs the content that regional councils, in consultation with their communities, must include in their regional plans. Regional plans tell resource users what is allowed in terms of things like water takes and discharges, and what will require a resource consent.

The implementation of this National Policy Statement will result in heightened expectation that Council achieves meaningful improvements in Water Supply discharge quality.

National Environmental Standards for Freshwater

The National Environmental Standards for Freshwater 2020 (Freshwater NES) will set requirements for carrying out certain activities that pose risks to freshwater and freshwater ecosystems. Anyone carrying out these activities will need to comply with the standards.

The standards are designed to:

- Protect existing inland and coastal wetlands
- Protect urban and rural streams from in-filling
- Ensure connectivity of fish habitat (fish passage)
- Set minimum requirements for feedlots and other stockholding areas (to take effect in winter of 2021)
- Improve poor practice intensive winter grazing of forage crops (to take effect in winter of 2021)
- Restrict further agricultural intensification until the end of 2024
- Limit the discharge of synthetic nitrogen fertiliser to land and require reporting of fertiliser use (to take effect in winter of 2021).

5.1.3 National Environmental Standard for Water Supply

The Ministry for the Environment is continuing its work to support improvements to regulatory arrangements for Three Waters infrastructure. This includes progressing the development of a proposed new National Environmental Standard for Water Supply discharges and overflows, as signalled in the Action for Healthy Waterways discussion document of 2019.

5.2 Summary of Current Capacity

5.2.1 Sources

The current demands are within the supply capacities of the sources. Abstraction from some sources is limited to a daily volume and a maximum flow rate. This may produce a constraint during seasonal demand fluctuations. Resource consents have a limited duration, which requires extension of the consent or the procurement of an alternative one in due course.

Table 5.2 Summary of Resource Consents for Water Supply

Consent Name	WRC Reference	Consent Limit m^3/day	Maximum Flow Rate	Consent Conditions - Comments	Expires
Tokoroa: Elizabeth Park Bores	AUTH130334.01.01	15,000	Not specified		31/12/2031
Putāruru: Glenshea Bores	122363	3,800	Not specified		31/12/2031
Putāruru: Blue Spring	131427.01.01	4,000	45 litres/sec	This consent is in the renewal process	31/03/48
Tīrau: Oraka Spring	103937	2,000	25 litres/sec	Possibly declining investigations required	20/09/2022
Arapuni: Bores	125251	355	Not specified	Shall not exceed 129,575 m^3/year	31/03/2031
Arapuni Discharge	125252	20	Not specified	Flushing at pump starts to reduce iron and manganese	31/03/2031
Lichfield	940284	40	Not specified		1/09/2029

The bores at Arapuni have been assessed as at the end of their useful lives and replacement is scheduled for the 2020/21 year.

5.2.2 Reservoirs

Reservoir storage is typically expressed as number of days' supply at average or peak demand. Where demand is sufficiently high to require additional water during the day, the pumps are operated during the day, and help to feed the network while the water level in the reservoir controls the network pressure until it is filled, and the pumps can be turned off.

Reservoir levels are managed to optimise pump power charges, storage levels against emergency supply requirements, and water quality.

Table 5.3 Summary of Scheme Storage, January 2012 - June 2020

	Tokoroa	Putāruru	Tirau	Arapuni	Lichfield	Athol
Average Demand (m^3/day)	4,931	2,288	805	133	11	30
Peak Demand (m^3/day)	13,730	7,747	1,728	1,068	-	-
Treated Water Storage (m^3)	20,000	4,625	900	375	25	-
Storage as a % of Peak Demand	115%	69%	55%	35%	-	-
Storage as a % of Average Demand	320%	202%	118%	283%	75%	-

Tokoroa

Tokoroa two reservoirs at Colson Hill provide 15,800 cubic metres of storage, which equates to 3 days' supply at current average demand (this does not include the Billah Treated Water Storage). This may give rise to water quality issues since the volume will not turn over frequently if the tanks are kept nearly full.

Putāruru

The Putāruru reservoirs (one at Reservoir Street and two at Pinedale) total 4,625 cubic metres, but not all of this capacity is available for the whole town due to the elevation of some properties. Reservoir Street supply

relies on boosted pressure provided by pumps at the reservoir site, and to maintain the flows that would be required for firefighting. The timber tanks at Pinedale have been identified as a risk to security and need replacing.

Tīrau

Tirau has two small reservoirs of 450 and 500 cubic metres. ~~The emergency supply from the Fonterra dairy factory can also be relied on~~. The supply has been assessed as deficient and new storage of an additional 2,000 m^3 is required to meet future demand requirements.

Lichfield

Lichfield's reservoir has a capacity of 25 cubic metres, which can supply one day's domestic demand at summertime peak flows. A fire supply meeting the national standard is not a component of the Level of Service for Lichfield. Properties are expected to provide on-site storage for firefighting. This is a timber tank ad should be replaced to improve water security.

Arapuni

Arapuni has two small reservoirs with a capacity of 225 and 150 cubic meters capable of providing the peak domestic demand for the community. One tank is an old concrete tank and the other is a timber tank, both have been assessed as a risk to our water supply security and require replacement.

Athol

Athol is supplied from OJI plant, and its original two tanks have been de-commissioned. Individual properties on the supply are required to provide their own emergency storage in case there is a failure in the Kinleith supply.

5.2.3 Reticulation

Earlier network modelling work undertaken in 2003 by consultants Harrison Grierson has now been superseded by more recent work completed by Watershed Engineering Consultants in 2020 and 2021. This later modelling incorporated both the existing scenarios and various growth forecasts into their models to provide a more accurate picture of the water supply networks. This work was focused on Tokoroa, Putāruru, and Tīrau as this is where the future growth is anticipated to occur. The new network model replicates the network performance very well and is suitable for use as a planning tool with a degree of confidence not previously held.

Tokoroa

The Tokoroa water supply network operates well with no current minimum or maximum pressure issues, and typical fire firefighting flows based on land use classifications can generally be met. The network has a good amount of storage available in the event of an emergency. A number of recommendations were made including:

- Review watermain diameters, closed valves, and cross connections in a number of locations in the town.
- Consider producing a fire risk classification map in conjunction with the local fire service which considers key sites within the town.
- Undertaken future hydraulic analysis using the network model once specific development areas have been identified.

Putāruru

The demands and peaking factors used to assess the development are based on assumptions and the actual final water demands may vary. The peak day demand has been increased to 3,200 m^3/day based on data from the 2018/2019 summer period. The peak hour demand factor has been reduced slightly (from the previous uncalibrated model) given lower peaks were observed in the field data; however, it still remains higher than the model calibration as this was undertaken based on April 2020 consumption data.

The resulting current peak day system performance provides similar results to the previous analysis. The Putāruru water supply network operates well with no current minimum or maximum pressure issues, and typical fire firefighting flows based on land use classifications can be met. The network has a good amount of storage available in the event of an emergency, although half of the storage is reliant on pumping for delivery to the network.

Full development of the proposed growth areas degrades pressures within the network. The Glenshea booster pump station was identified as likely at capacity for operation in a duty/standby arrangement and would probably need to be upgraded to service any growth. These upgrades have now been completed.

Tīrau

The Tirau water supply network operates well however does experience areas where typical fire firefighting flows base on land use classifications are not able be met. The network is short on storage available in the event of an emergency.

Future growth in Tirau has been estimated as a per annum growth rate of 1.0%, with no specific growth areas or new developments identified at this time. Applying a uniform growth rate provides an indication of areas where development could be more readily serviced by the water infrastructure. Three future Horizons have been assessed, 10-yr, 20-yr and 50-yr.

The analysis indicates the Oraka Spring pump capacity reaches its limit for the current duty/standby arrangement, operating 19 hrs per day in the 20-yr scenario, and unable to maintain the level in the Tīrau Reservoirs in the 50-Year scenario. As identified in the current peak day system performance assessment reservoir storage is limited, the required storage increases with increasing demands, and the shortfall becoming more apparent. The volume of storage should be more than doubled within the next 20 years based on the growth rate.

The Tirau water supply network operates well; however, it does experience areas where typical fire firefighting flows base on land use classifications are not able be met. These are primarily identified in the current peak day scenario with areas broadening in the future.

Options have been developed to address both the supply and storage and for meeting fire flow classifications.

Arapuni, Athol and Lichfield

Although the level of service for these communities does not include firefighting, Arapuni has a firefighting capability. Much of the Athol and Lichfield networks have been renewed with modern materials over the last 15 years, making them of adequate capacity for years to come. These two networks also include consumer meters for each property connection, with backflow preventers.

5.2.4 Security of Supply

This section covers the relative likelihood that a community runs out of water given the current asset capacity and condition.

The District's water sources, although some are subject to groundwater infiltration, which affects security in the sense of water quality, are unlikely to experience water shortages.

Pumping installations in general have duplicate pumps, enabling pressure and flow to be maintained during a breakdown or servicing of one pump, as long as there is a power supply to them.

It is in scenarios such as power outage that reservoir storage becomes important. Storage is typically expressed as number of day's supply at average or peak demand. This gives a measure of the security of supply which may be considered along with the extent of duplication of the facilities to estimate the effect of a problem with water source. The accepted standard of storage is 24 hours' supply at normal average demand.

Reticulation security can be expressed as the condition of, and level of redundancy in the network. In general, there are no problems in this part of the infrastructure.

Tokoroa

Tokoroa has two operational bores with dedicated submersible pumps, duplicate dosing pumps, and two large reservoirs fed by a single rising main.

Operational testing has shown that supply can be supported from the Billah Street Reservoir and direct pumping by pump number 2.

Putāruru

The town has two independent sources, each with duplicate pump sets. The water from Glenshea has the pressure boosted by a multi pump booster station after water leaves the reservoir to feed half of Putāruru; this was upgraded in 2021. Duplicate pumps feeding from the Waihou spring serve twin reservoirs through a single uPVC rising main and these feed the other half of the town through a separate uPVC pipe. Both these pipes are each over 3 km long and cross streams and/or private properties and forest land. The Putāruru reservoirs total storage is currently sufficient for one days' demand.

Tīrau

Tirau water is pumped from the Oraka Spring source by duplicate pumps just under one kilometre over farmland through a single pipe to double reservoirs.

The Tirau water supply network operates well however does experience areas where typical fire firefighting flows base on land use classifications are not able be met. The network is short on storage available in the event of an emergency.[3]

High base flows were identified within Tirau, and these will be investigated to determine whether this is leakage or legitimate consumption. If leakage is substantial and able to be reduced, then this will reduce the overall demand. Equally, if a single large consumer is identified, their consumption may be able to be reduced. The current peak day demand has been assessed as 1,250 m^3/day based on historical data.

The two small reservoirs only provide one day's demand for the residents and various non-residential consumers. An agreement made in the late 1990's with the Fonterra dairy factory for a backup supply provides the additional water needed in emergencies.

Following the development of a new 25 lot subdivision at the end of Fairview Street in 2021, a new 2 pump set booster station along with a new 200 mm diameter delivery main has been constructed to create a separate boosted pressure zone to supply the area.

Arapuni

Arapuni residents on town supply receive water from two bores each with a submersible pump, lifting water through a single pipe to two reservoirs about 1 km distant. The average demand could be met by one of the larger pumps and the reservoirs can supply over 48 hour's requirement.

Lichfield

The town, with reticulated population of about 50, is supplied from a single bore well and submersible pump to a reservoir which holds over three quarters of a day's supply at average demand.

Athol

Athol's 30 residents are served directly from the Oji Mill. This supply is a minor portion of Oji water supply.

5.2.5 Water Consumption

The tables below show the peak daily water consumption for Tokoroa, Putāruru, Tīrau, and Arapuni for each year.

[3] Watershed Report ECM 553261 Tīrau WS Model Calibration & Infrastructure Assessment

The number of connections has been broken down into domestic or non-domestic. The non-domestic includes the following:

- Commercial
- Industrial
- Lifestyle Blocks
- Agriculture
- Council
- Schools
- Churches
- Marae
- Other

Water Consumption data

Table 5.4 Peak Water Consumption

Peak Water Consumption (yearly)					
Year	**Tokoroa, m^3**	**Waihou, m^3**	**Glenshea, m^3**	**Tīrau, m^3**	**Arapuni, m^3**
Consent Limits, m^3	**15,000**	**4000**	**3800**	**2000**	**355**
2010	7813	2458	2448	1300	276
2011	11129	3019	2218	985	269
2012	9632	3317	2338	1284	201
2013	7432	3745	2180	1392	347
2014	8884	2887	2131	1194	277
2015	7490	3197	2490	1114	245
2016	7935	2451	1957	1294	224
2017	13730	1752	2232	1609	333
2018	8172	2355	2242	1420	1068
2019	10723	3511	2701	1728	395
2020	11906	2814	3002	1687	472
2021 (Jan-Oct)	7998	2916	2,839	1546	350

Customer Profiles		
Town	**Residential**	**Non-Residential**
Tokoroa	5392	365
Putāruru	1824	92
Tirau	364	57
Arapuni	112	28

Lichfield and Athol

Peak daily consumption is not recorded at Lichfield and Athol due to the size of these communities. The average yearly water consumption has been shown below as an indication of consumption:

Average Water Consumption (m^3, yearly)		
Year	**Athol**	**Lichfield**
Consent Limits, m^3	40	Water purchased from Oji Fibre Solutions
2010	12	35
2011	12	35
2012	12	9
2013	15	9
2014	17	10
2015	29	13
2016	16	10
2017	12	9
2018	22	12
2019	28	15
2020	34	13
2021 (Jan-Oct)	20	13

Customer Profiles		
Town	**Residential**	**Non-Residential**
Lichfield	17	0
Athol	24	7

5.3 Ensuring there is Sufficient Capacity

The program shows the various demand components and potential for demand management activities that can influence them, as shown in the figure following.

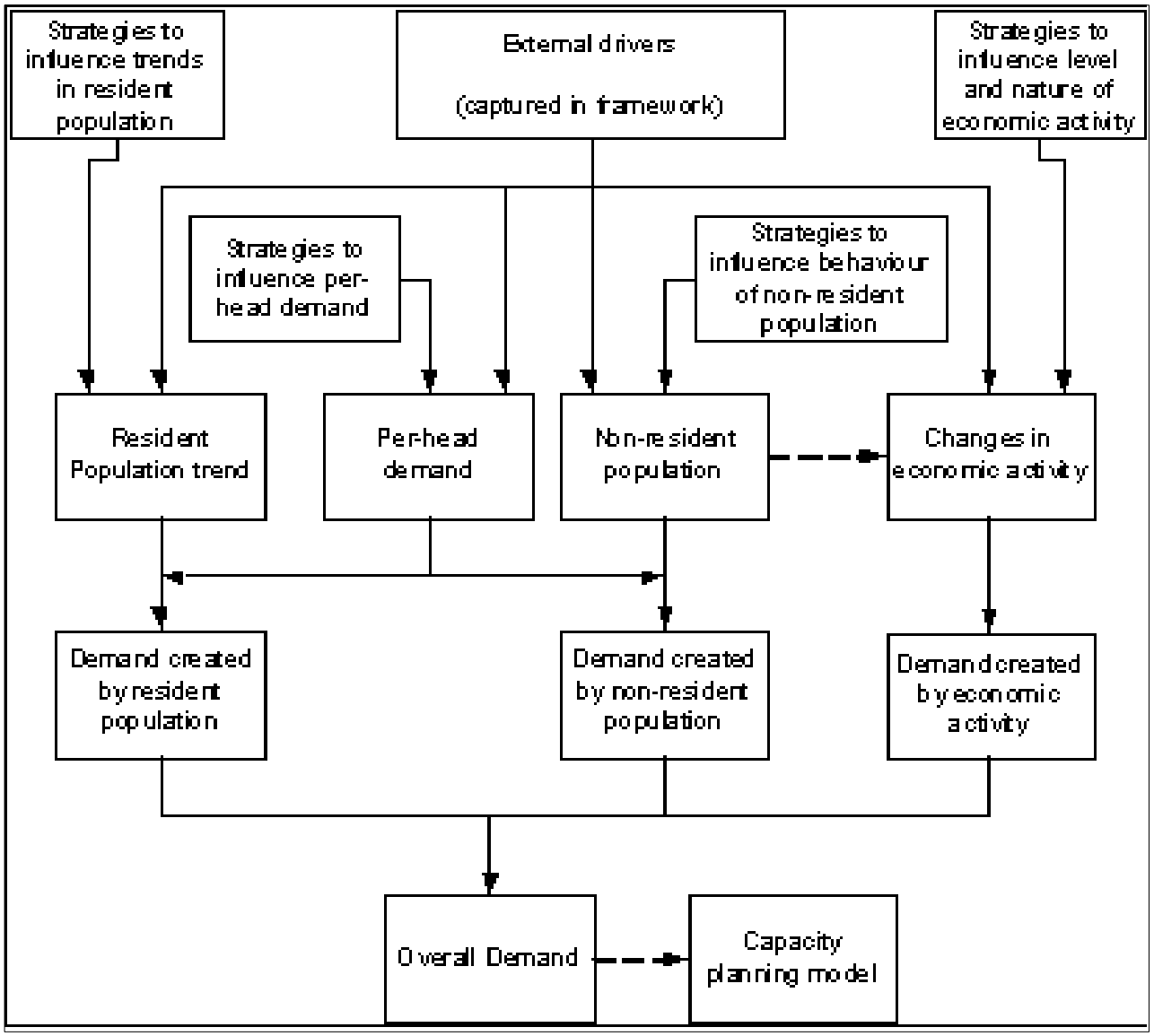


Figure 5.2 Demand Management Framework

5.3.1 Current Demand

The "Water Demand Management and Drought Management Plan" revised 2021 covers current demand and the procedures in place to manage this. ECM 284038.

5.3.2 Projecting Future Demand

This is covered in the Water Demand Management Plan: however, Council expects that existing sources will not generally exceed demand within the next 10-year planning horizon.

The smaller supplies of Lichfield and Arapuni could be rendered inadequate by a relatively small increase in demand. While the water source for each is sufficient for several years, the reticulation of both towns, which along with Athol are designated 'rural' is not intended as a firefighting supply and consists of small diameter pipes.

Capital improvements for these supplies will always be difficult to justify due to the small consumer base. A conservation approach, including effective consultation with residents, is therefore indicated.

Population Projections

Demographic analysis and projections assist future planning by identifying likely trends in numbers and distribution of population.

The District's population for the period of the 2018-2028 LTP and AMPs is projected to increase by approx. 0.275% per annum, with an increase in the average age.

Key issues include

- The post war "baby boom" is projected to result in an increase from 15% to 30% of the population aged 65 plus, many on fixed incomes.
- Migration into and out of the district is expected to be driven by educational, economic development and employment opportunities as well as the availability of cheaper housing in the district.
- Improved transport links via the Waikato expressway and State Highway enhancements may encourage more commuting for work and study opportunities both within and without the district.

Demand Analysis by Community

Table 5.5 Demand forecast by community

Year	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30
Tokoroa Water	13,771	13,813	13,854	13,896	13,937	13,979	14,021	14,063	14,105	14,148	14,190	14,233
Putāruru Water	5984	6044	6105	6123	6184	6246	6308	6371	6435	6500	6565	6630
Tīrau Water	1625	1641	1658	1663	1679	1696	1713	1730	1748	1765	1783	1800
Arapuni Water	350	354	358	359	362	366	369	373	377	381	384	388
Lichfield Water	13	13	13	13	13	13	13	13	13	13	13	13
Athol Water	35	36	36	36	36	36	37	37	37	37	37	37

Each community is discussed in the following paragraphs. It is assumed that pumping and treatment plant capacity can be increased as required to utilise the resource consent for the source if demand increases to approach the current capacity of the plant. Discussion is limited to explanations of the demand and yield for each geographical area, as currently understood.

Tokoroa

Tokoroa water supply services about 13,770 residents (2019 Data), plus metered consumers accounting for about 14% of the water supplied. The District Council, including the public swimming pool, the schools, and two supermarkets are the other main consumers. This suggests that the demand of the remaining large consumers is to come extent population-dependent, which may be the dominant factor and would simplify demand projections for the area.

The existing Tokoroa water supply network operates well and provides a good level of service to customers. The impacts of the proposed growth cells on the network are minimal, with the only issue identified being for growth cells 14 & 15[4] where the FW2 fire classification would be unable to be achieved without network improvements. Two options were presented with the preferred option to be based around cost and constructability.

[4] Tokoroa 3 Waters Growth Cells Assessment Report May 2021

Athol is currently supplied by Oji from the Kinleith Timber Mill. The demand is made up of residential houses, lifestyle block, farms, and some light industry. Council does not require resource consent under this supply arrangement. The previous Council source would still be available if it should be needed in the future. However, the consent for this emergency/contingency source, which would provide an annual volume well in excess of any demand, has expired. Servicing from Tokoroa in the future is the most likely outcome.

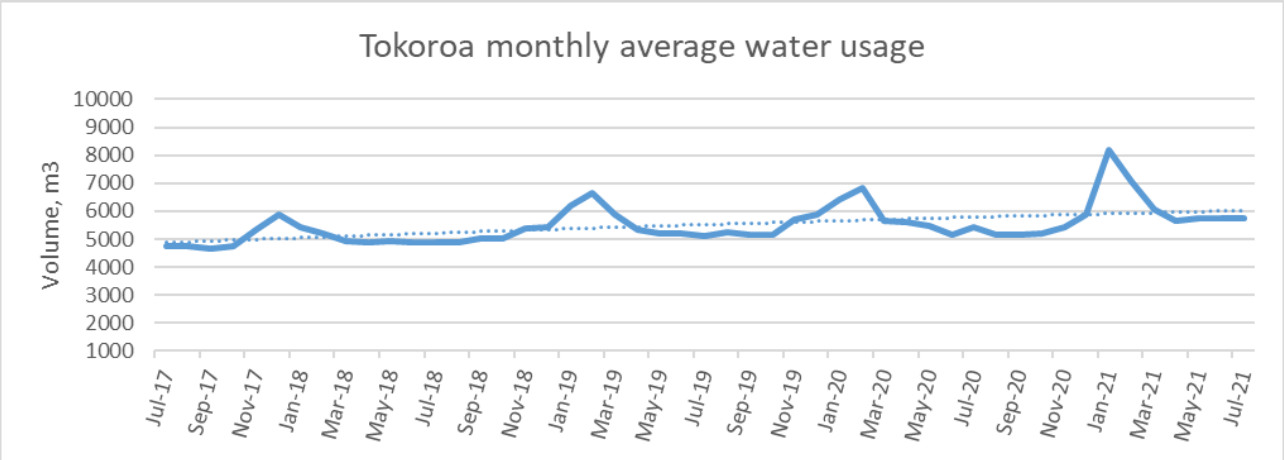


Figure 5.3 Tokoroa monthly average water usage

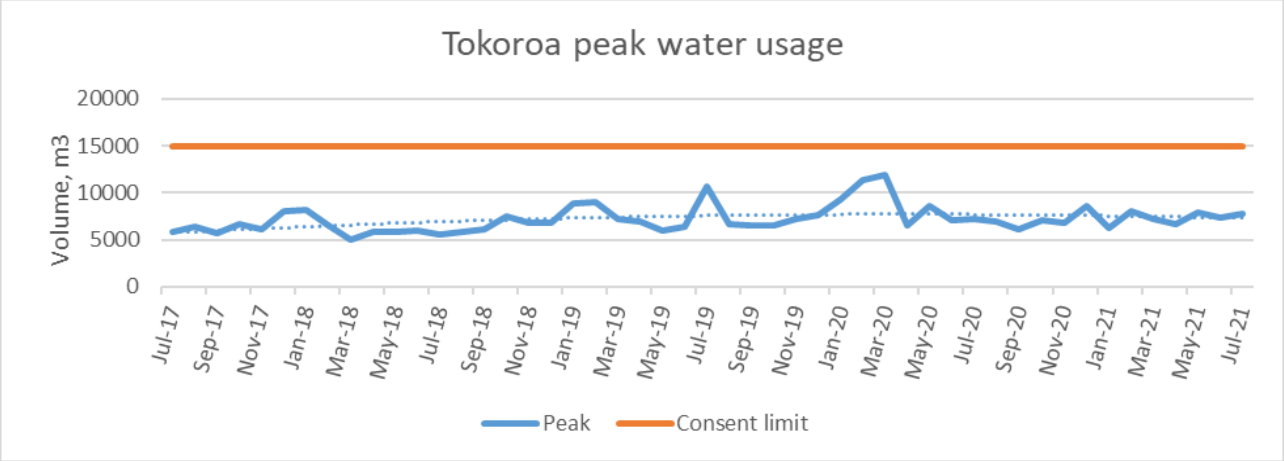


Figure 5.4 Tokora peak water usage

Putāruru

Demand in Putāruru includes a significant number of extra-ordinary supplies, among them a timber processor and three water bottling companies. Council has been approached by a number of bottling plants wanting to set up in Putāruru. 20% of the water is used by metered consumers. The potential for growth of the water bottling industry and its preference for non-chlorinated water from the Waihou Spring source make this a special case, which has received further analysis. Current demand from water bottlers makes up about 3% of the total.

The resource consent for the Waihou Spring is set at 4,000 m^3/day and a maximum rate of 45 litre/sec.

Previously there were issues created by the mixing of these two source waters in the distribution system, due to Waihou being unchlorinated previously. This is no longer the case, following the installation of chlorination

at Waihou.

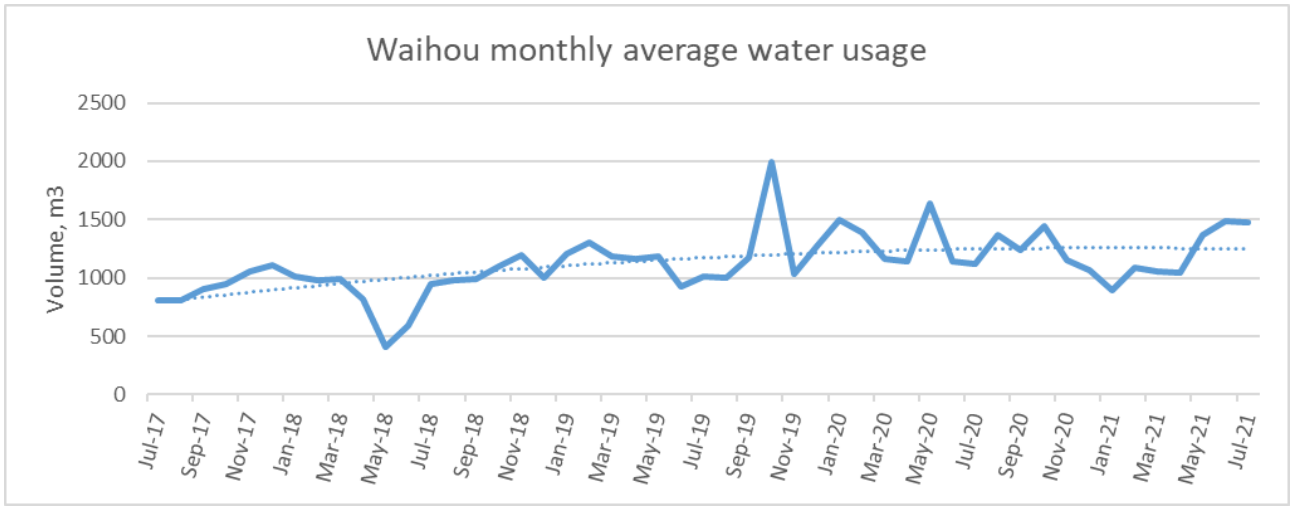


Figure 5.5 Waihou monthly average water usage

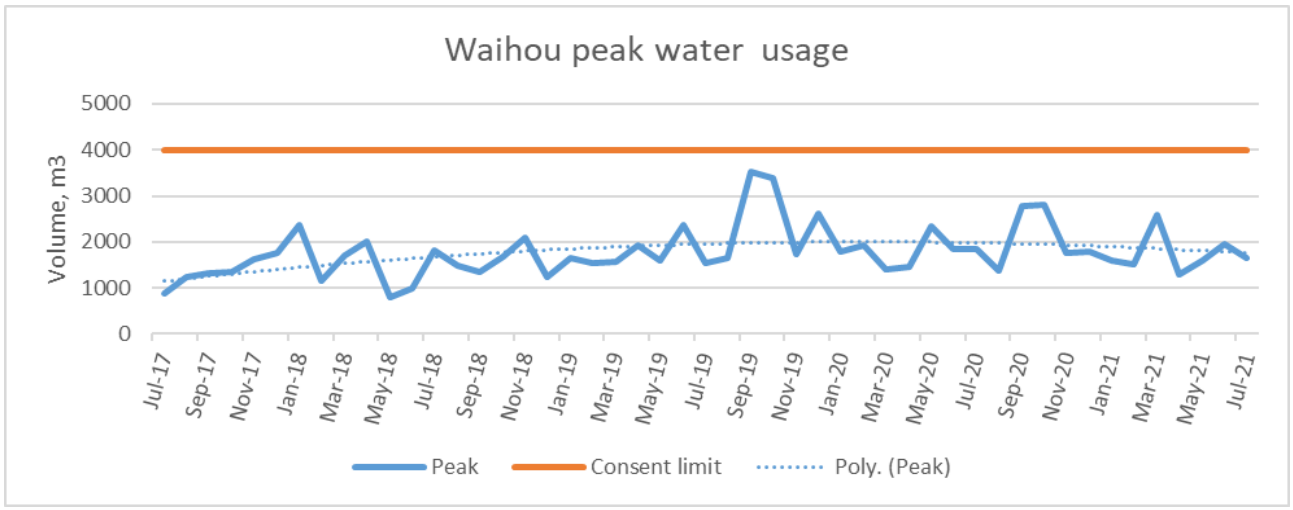


Figure 5.6 Waihou peak water usage

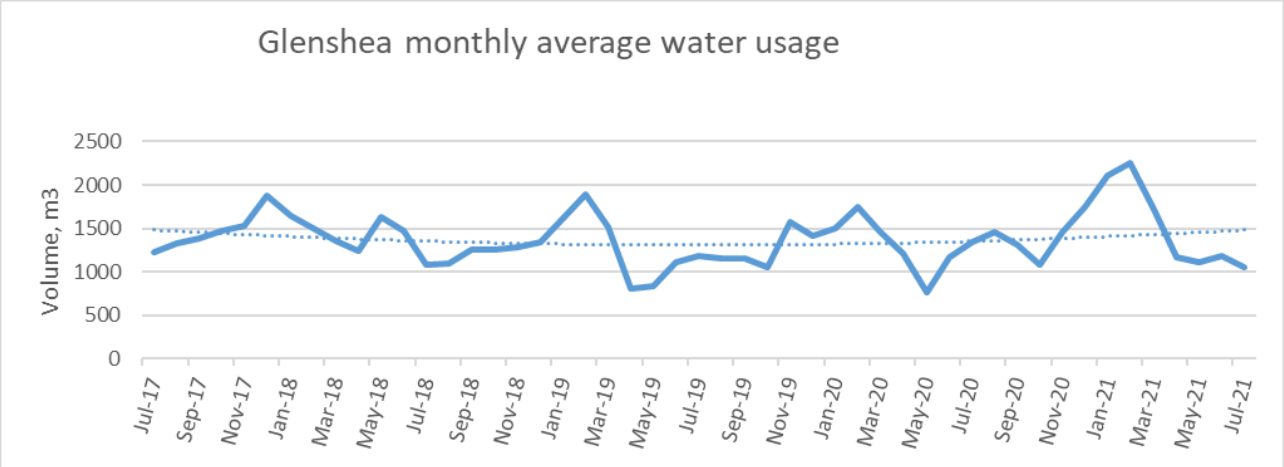


Figure 5.7 Glenshea monthly water usage

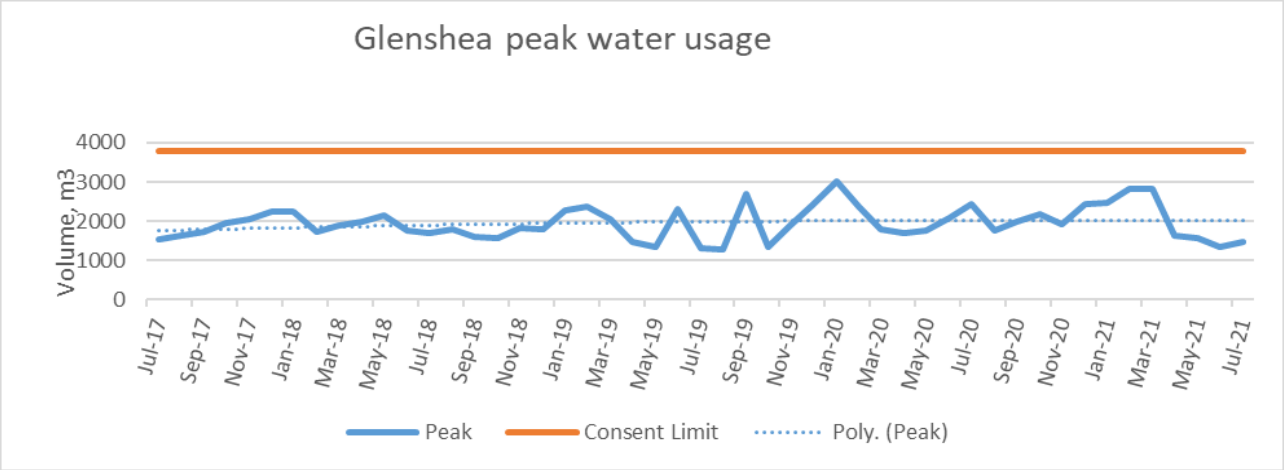


Figure 5.8 Glenshea peak water usage

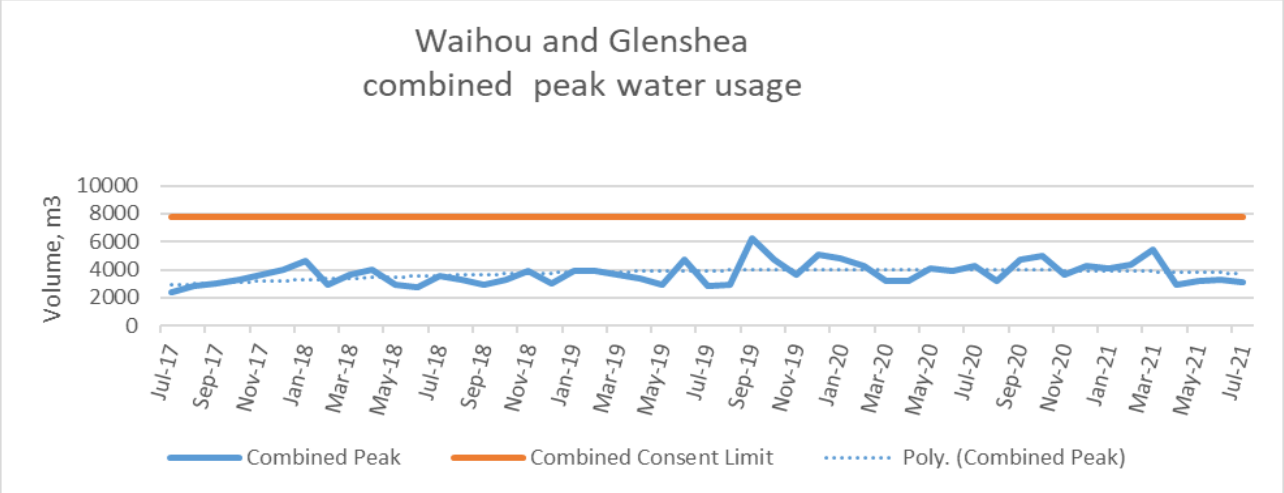


Figure 5.9 Waihou and Glenshea combined peak water usage

Tīrau

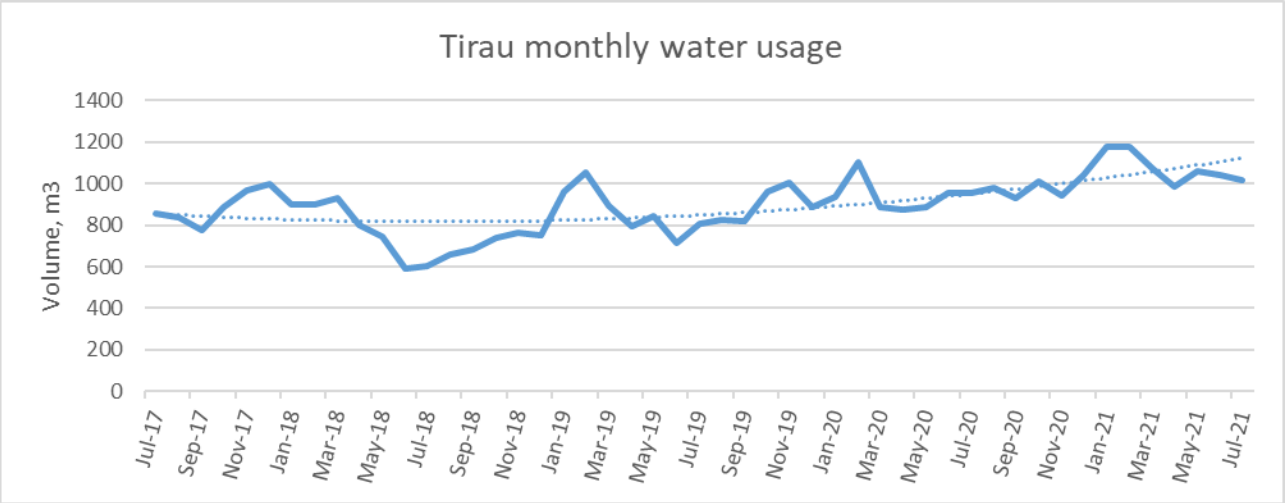


Figure 5.10 Tirau monthly water usage

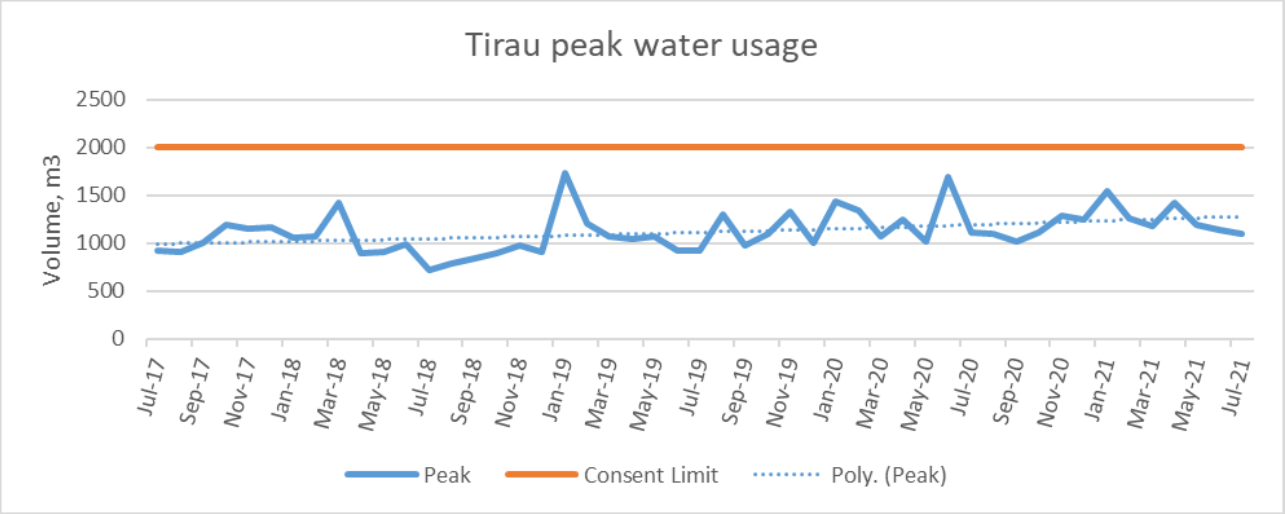


Figure 5.11 Tirau peak water usage

Arapuni

The Arapuni reticulated population of approximately 300 appears to be stable. The current consent was renewed in 2013 and expires in 2031.

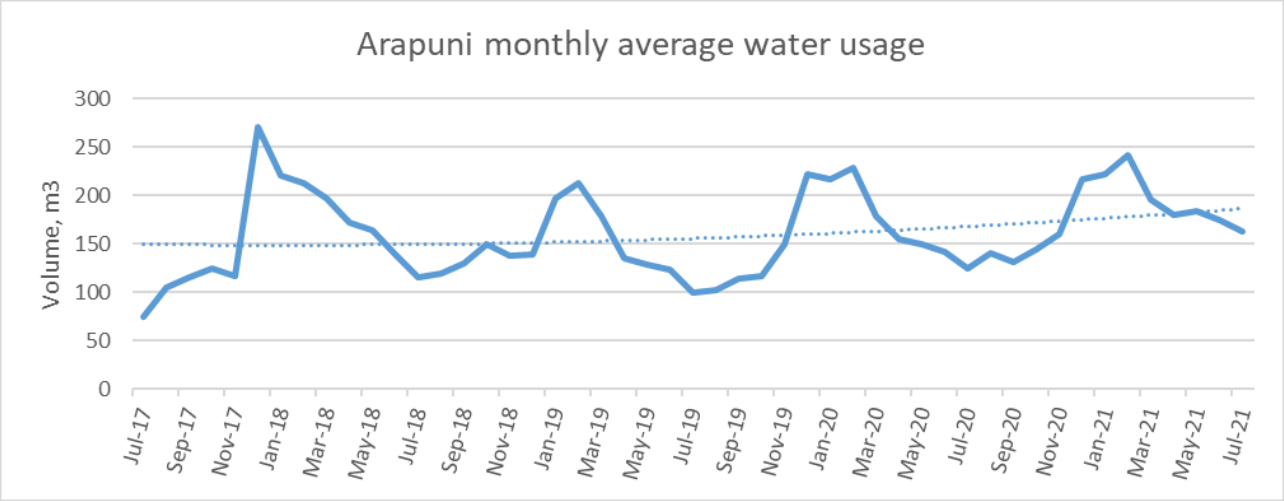


Figure 5.12 Arapuni monthly average water usage

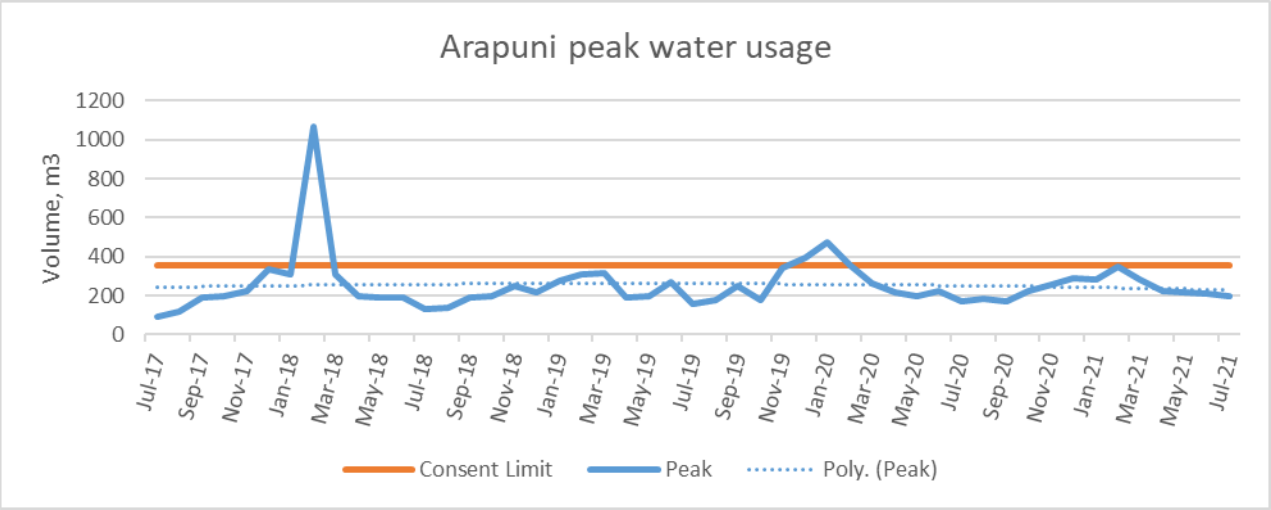


Figure 5.13 Arapuni peak water usage

Lichfield

Lichfield's water supply serves only small lifestyle properties. Fonterra's Lichfield factory, the largest in the southern hemisphere, has an independent supply. Increased demand in Lichfield may also require additional reservoir capacity to be provided. The existing reservoir can supply one day's demand at summertime peak flows. Currently most properties connected to this supply utilise on site storage. Litchfield was planned around on site storage and not as an on demand water supply hence LOS standards do not apply. Unfortunately, a number of properties do not currently have on site storage which causes issues during power outages and ensuring continuous supply.

The current consent for the Lichfield bore source expires in 2029 and would support at least double the current population.

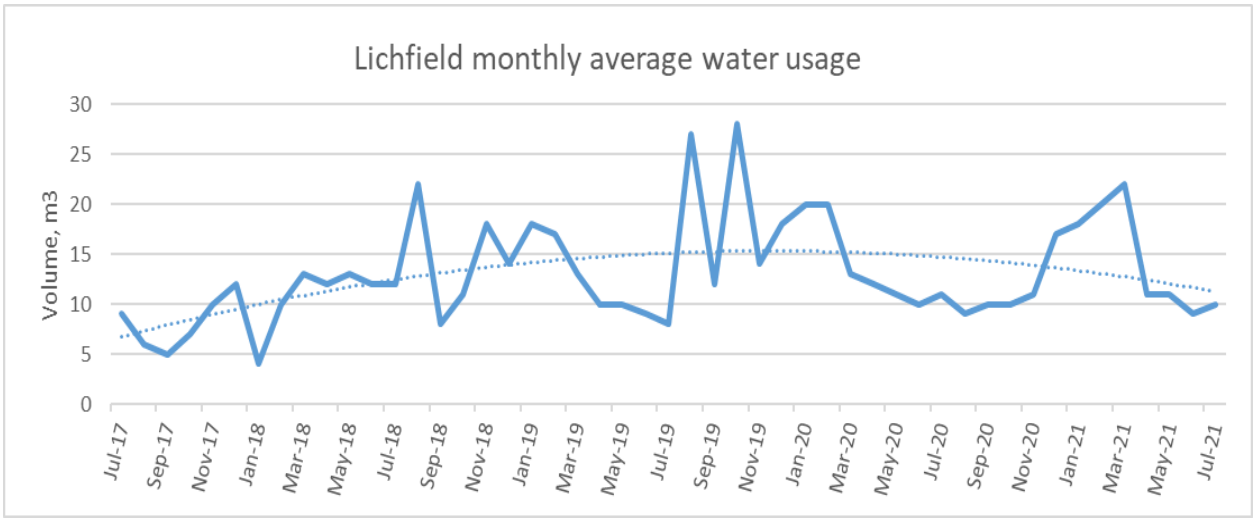


Figure 5.14 Lichfield monthly average water usage

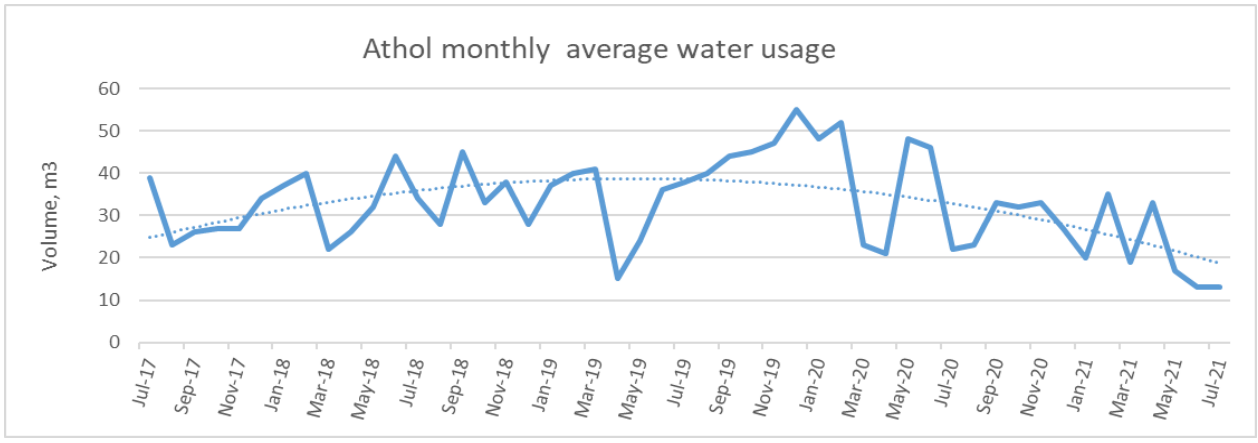


Figure 5.15 Athol monthly average water usage

5.3.3 Residential Growth

To match the anticipated demand for new housing to the future supply of available housing in Putāruru, costed and serviced land, Council focused on selecting only some of the nine areas originally identified by the initial Growth Concept Plan and Putāruru Moving Forward workshops as seen in the plan below.

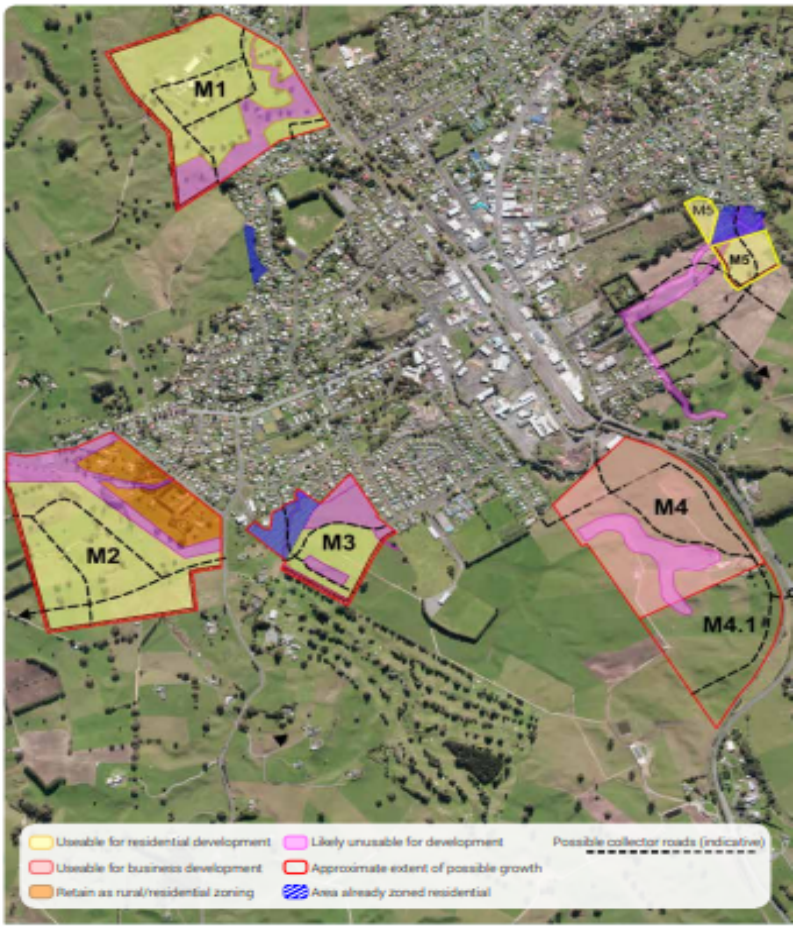
These areas have been selected to provide growth opportunities for the next ten years. Any development of these areas will also need to consider the possibility of future expansion beyond these extents.

Existing Land Supply

Putāruru, as shown highlighted in the adjacent aerial photograph, already has vacant, residential zoned land for possibly 45 new lots in the vicinity of Maple Drive and Ruru Crescent (greenfield sites) and approximately 150 sites capable of subdivision for smaller sections within the built-up residential areas (brownfield sites). However, there are a variety of constraints to some of these areas being developed for homes.

The growth scenario adopted for the town expects there to be about 20 new dwellings a year established over the foreseeable ten-year period. Once subdivided, Council anticipates that there will be a choice for homeowners when selecting an area of town to build in, so the land supply should exceed the expected demand for this reason.

Growth in Tokoroa is anticipated to be all within the currently zoned areas for the duration of this AMP period, the land zoned around Strathmore Park is currently being investigated as the next development area to include affordable homes and low-income homes.



Future growth areas and the corresponding new growth projects are covered in Section 6.6.4.

In 2018, the Waikato Housing Initiative identified there was a shortfall currently in SW of 739 dwellings, increasing to 851 dwellings by 2043. SWDC borders the Futureproof sub-region (Ham, Waipa and Waikato) which has seen rapid growth over the last three decades, pushing people into the South Waikato to find affordable housing.

A medium growth scenario has been adopted for the district; this anticipates moderate but sustained growth over the next 30 years with an additional 9,929 population from 2023 to 2053.

Tokoroa has a population greater than 10,000 people which means we have to proactively plan for growth under the NPS-UD.

Council is undertaking a Housing & Business Assessment to identify what land is required for additional housing and business (Town Centre, Business zone, Industrial zone) within the short term (1-3 years), medium term (3-10 years) and long term (10-30 years. District Plan changes will be necessary as a result of the assessment and a high-level concept for the plan changes required will be coming to Council for approval in late June 2022.

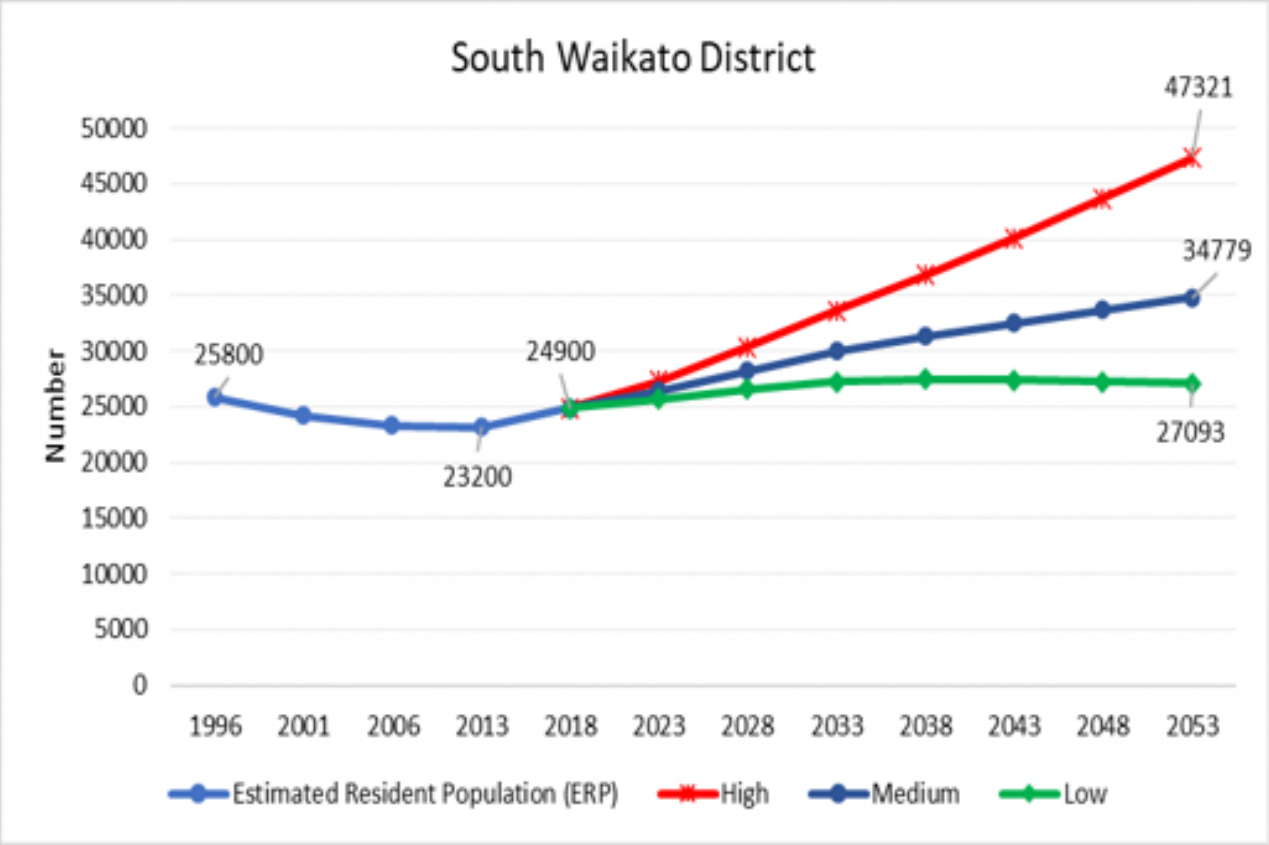


Figure 5.16 South Waikato district Estimated Resident Population

5.3.4 Industrial growth

Industrial growth is currently forecast to occur within the presently zoned areas of Tokoroa in particular the Maraetai Industrial estate and in Browning Street/Hutloc Place. Industrial growth in Putāruru is currently planned in the growth cell M4 and only minimal industrial growth is forecast in Tirau in the Patetere Street Industrial Park.

5.3.5 Technology Trends

The following section identifies changes which may affect the level of service or provide solutions for maintaining and improving it.

Trends Affecting Demand and Capacity

Changes in technology which could affect the water demand of the main industrial consumers are still to be investigated.

Universal water metering would affect demand. At this stage it is not cost effective for Council but may become an option in the future.

Trends Affecting Water Quality Treatment

Ultra-violet reactors have been installed at Billah headwork to disinfect the water supply in Tokoroa as well as Tīrau and the Te Waihou with micro filtration. Glenshea, Lichfield, and Arapuni water treatment process has been upgraded to Ultra-Violet Disinfection and Cartridge filtration as well as the addition of a green sand filter to address the high iron and manganese. No further upgrades are anticipated at our water treatment sites.

Trends Affecting Management

Improvements in performance and management of chemical dosing equipment and telemetry may assist in overcoming water quality issues, subject to sufficient funding for installation and operation.

Efficient maintenance despatch and field computing equipment (tablets and smart metering) may be of use in streamlining response times and capturing asset data to improve knowledge of the inventory.

5.3.6 Demand Management Plan

Demand Management

Demand typically fluctuates over time, for example as a result of seasonal weather conditions or diurnal variations caused by residential and commercial activities. As a result, the infrastructure and other resources employed to deliver the services are sized and operated to achieve the LOS when operating under peak demand.

Examples and their solutions include the following:

- Residential water usage is higher in the early morning and early evening or when gardens are watered during summer. A solution is to have storage reservoirs that provide water during peak periods, thereby satisfying customer expectations while "smoothing" the load variation on the sources, treatment works and pumping systems and allowing them to be filled during off peak periods, when electricity charges are lower. Reservoirs also provide backup supply during emergencies, such as power failures.
- Excessive demand peaks can be reduced by various methods, including restricting the supply or imposing user charges that encourage or reward desired behaviour (as is the case with energy charges).

Benefits of demand management:

- Increase confidence in the required capacity of infrastructure by reducing the need to "oversize" to meet short term peak requirements
- Operate the asset at its optimum performance efficiency
- Extend the operating life of the asset
- Optimise operational expenditure and effectiveness

Demand management is required in terms of resource consent conditions issued by the Waikato Regional Council, particularly to protect the allocation of physical resources.

A Water Demand and conservation Management Plan has been produced for the district, (ECM 284038) this document addressed the following:

- Water losses (water supply leakage, theft etc.)
- Condition of networks
- Data integrity (control of data collection, recording and updating)
- Accuracy of metering equipment
- Leak detection programme

5.4 New Growth Projects 2022

In 2022, the new development zones were approved for Tokoroa and Tirau (ref. Appendix F):

- Residential growth zones (Areas A, B, C, D) for 1124 residential units total, Tokoroa,
- Mixed business and residential growth Area E for 118 residential units with 35% yield on the total area of 16.2 ha, Tokoroa,
- Industrial Growth Area, 46.07 ha, Tokoroa,
- Residential growth zones (Areas A, B) for 229 residential units total, Tirau,

- Industrial Growth Areas A, B, C, total 42.85 ha, Tirau

The corresponding water network capital improvements are rated as High Priority projects and are aimed to support growth and development by providing reticulation up to boundary of developable lands.

Tīrau Water Supply was identified as a Medium Priority capital project to provide a Variation to existing Watermain contract could be done immediately to facilitate starting this work by Nov 2022 and to be completed by 30 June 2024 for reticulation work. However, the pumpstation and reservoirs would need to be done as a design and build over the same time.

Tokoroa Strathmore Park Water is a Low Priority project added to watermain renewal contract in October 2022, to be completed by 30 June 2024. The project will support growth and development by providing reticulation up to boundary of developable lands.

The water component of Maraetai Road Intermodal Business Park (MRIPB) Stormwater and Watermain Improvements have been planned as a low priority project within financial years 2022/23 and 2023/24.

The Wastewater component of Districtwide Water and Wastewater Telemetry and SCADA Upgrades was identified as a Low Priority capital growth project to ensure compliance with wastewater Resource Consents and drinking water standards.

The above projects are proposed to be carried out in financial years 2022/23 and 2023/24 (ref. Section 8.1, 8.2, 8.3, 8.4, Appendices D2, G4).

5.5 Ensuring Future Service Levels are Adequate

5.5.1 Fire Fighting Capacity

Network modelling has indicated that parts of the urban networks may not deliver the fire flows specified in the NZ Fire Service 'Fire Fighting Code of Practice for Water Supplies' due to limitation in network capacity during periods of high demand. Further work is required and is included in the improvement plan under demand management. Section 6.8 shows the proposed upgrades to fire mains to improve fire flows.

5.5.2 Backflow Prevention

All new connections are assessed to determine if they require a backflow prevention device, if they do then a backflow device is installed.

With the recent population growth and the new industries in the district, necessity for backflow prevention devices is more crucial.

5.6 Future Service Level Requirements

5.6.1 Externally Mandated Changes

The current Drinking Water Standard for New Zealand (DWSNZ) has become mandatory with the enacting of the Water Services Act 2021.

Taumata Arowai took over from NZ Ministry of Health as a Regulator of Drinking Water Quality in NZ as of 15 November 2021. They have imposed new requirements for reporting and monitoring our water supplies.

5.6.2 Key sustainability issues

Sustainability is the capacity to endure. In the context of asset management, it is about meeting the needs of the future by balancing Council outcomes or needs when making decisions today.

Sustainable Management is at the core of the Resource Management Act, which governs virtually all aspects of resource use in New Zealand.

Sustainable Development meets the needs of the present without compromising the ability of future generations to meet their own needs.

The concepts of Sustainability drive the Life Cycle Management of infrastructure, as described in the various AMPs.

Non-asset-based options are also considered, where appropriate.

5.6.3 Climate Change

There has been considerable work undertaken at a national level on the possible effects of climate change and sea level rise. The New Zealand Government has published projections of climate change to 2080. The general projected trend in the published projections for the District is of winters being wetter and the other seasons being drier. More frequent and more intense rainfall events have been predicted. By 2090's the published projections show that in the Waikato region the typical temperature rise is expected to be up to +2.3 degrees Celsius and the region wetter by 20%.

The projected key climate influences on the Council's Water Supply Activity are detailed in the following table.

Table 5.6 Key Climate Influences on Council's Activities

Activity	Influences	Effects
Water Services	**Changing weather patterns - Longer dry spells and higher temperatures will lead to more hot days during summer**	**Change in water usage patterns – higher water demands in summer**
Wastewater Services	Higher intensity rainfall events	More water inflow and infiltration into the wastewater system, with potential subsequent increases the risk of wet weather overflow events
Stormwater	Higher intensity rainfall events	Increase Stormwater inflow to the wastewater system Increased infrastructure capacity to cope with the increased rainfall intensity Increased risk of flooding
Emergency response/ Rural Fire	Seasonal swings in moisture availability or excess	Increased exposure to fire and other weather-related matters has potential to increase costs to the community

Over time additional analysis is required to ascertain long term effects (if any) of climate change effects on Council's assets and service provision. To do this, more information will be required from Central and Regional Government. It is expected that the results of analysis will affect Council's policies relating to asset management and the AMPs. It is considered that improved design and design loading of new and replacement facilities will be an important part of Council's response.

In addition to planning a response to climate change effects, Council's Sustainability initiatives are intended to minimise the actions that are likely to contribute to further warming.

6 Lifecycle Management Plan

6.1 Overview of Lifecycle Management

Lifecycle Asset Management aims to minimise the lifecycle cost in all AM strategies and practices associated with an asset or group of assets.

The Lifecycle Cost is the total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation, and disposal costs.

Typically, the greatest opportunity to influence the lifecycle costs and impacts of a project occurs before the assets are created. Once in place it can be costly to make substantial changes to the way it is managed. It is important to state the problem as broadly as possible, in order to encourage consideration of as many options as possible.

Decision techniques include Benefit/Cost Analysis; Multi-Criteria Analysis, and Risk-based evaluations or combinations of them.

6.2 Lifecycle Management Requirements

Council's strategic goals, customer requirements and external environment influences decisions about which activities are carried out and how they are best delivered.

The Asset Management Policy framework guides the priorities and sets out responsibilities, objectives, targets and plans for AM development.

Levels of Service have been defined and a Council-wide performance management framework has been developed to ensure that the agreed stakeholder expectations are delivered. The framework is described in Doc Set 267385.

6.3 Asset Development Planning

The development of asset infrastructure becomes necessary when a service deficiency has been identified. The solution may require the creation of a new asset or the replacement or renewal of existing assets, particularly if a "non-asset based' solution is not appropriate. In each case a project assessment is required to determine the amount of capital investment required.

In accounting terms, the capital expenditure assets are grouped into three categories, according to whether they satisfy (i) growth, or (ii) increased level of service, or (iii) renewal requirements. In some cases, the expenditure may address a combination of those requirements, particularly where there is an opportunity to introduce new technology or materials or processes.

The decisions on new asset projects will influence the long-term operating and maintenance costs and therefore the lifecycle costs of the infrastructure.

Determining the scope of the project includes considering the purpose of the project, estimated lifecycle costs, expected benefits, likely risks, funding arrangements, and physical delivery. A range of options should be compared before selecting the preferred solution.

For some projects a Business Case may be required, in order to consider procurement strategies, commercial markets and funding mechanisms.

Where a number of projects is being considered, it is necessary to consider the timeframes and funding requirements, so that an implementation programme can be developed in an affordable manner, thereby avoiding peaks and troughs in expenditure and associated pressure on funds required.

New Works: Capital investment is required to service additional consumers, to manage risk or for a change in level of service to meet residents' expectations or changes in legislative/consent requirements.

Renewals: This capital cost is for replacing reticulation system component and treatment plant equipment to maintain the agreed environmental (plant discharge quality) levels of service. Renewal or restoration of assets is required to ensure that the service potential of the assets is maintained and that the level of service can continue to be delivered. It is funded by drawing from the depreciation reserve.

6.4 Operations and Maintenance Planning

6.4.1 Introduction to Operations and Maintenance

All water supply operations and maintenance activities are currently carried out by the Water Services Section. This includes provision of water quality sampling, with laboratory testing under subcontract. All water supply activities are currently carried out by the Water Services Section. The general operations requirements of the maintenance agreement are:

- To produce and supply potable water to the required standard in each reticulated area and monitor water quality as specified
- To undertake promptly all inspections, scheduling and programming requirements described in the agreement

Water Supply Operations and Maintenance strategies set out how the water supply activity will be operated and maintained on a day-to-day basis to consistently achieve the optimum use of assets.

Operations and Maintenance activities fall into the following categories, each having distinct objectives and triggering mechanisms.

Operations

The assets are operated to deliver the agreed Levels of Service in an efficient and cost-effective manner. Good operational management ensures that customers retain a high level of confidence in the service provided.

Activities designed to ensure efficient utilisation of the assets, and therefore that the assets achieve their service potential. Operational strategies cover activities such as energy usage, control of mechanical and electrical plant, inspections, and service management.

Support Services

Activity management has no direct effect on asset condition but provides functions required to support the maintenance, renewal, and development plans. These functions include:

- Asset systems planning and monitoring,
- Asset systems record management; and
- Asset management planning and policy.

Internal staff resources are mainly utilised in carrying out the functions as outlined above. Specialist external resources are employed for backflow inspection of pipelines, strategic water flow monitoring and more sophisticated technical investigations and legal advice.

Maintenance

Maintenance strategies are designed to enable existing assets to operate to their service potential over their useful life. This is necessary to meet service standards, achieve target standards, and prevent premature asset failure or deterioration. There are three types of maintenance:

- Programmed maintenance - A base level of maintenance carried out to a predetermined schedule. Its objective is to maintain the service potential of the asset system
- Condition maintenance - Maintenance actioned as a result of condition or performance evaluations of components of the system. Its objective is to avoid primary system failure
- Reactive maintenance - Maintenance carried out in response to reported problems or system defects. Its objective is to maintain day-to-day levels of service

Asset operations are organised to meet the fluctuating demands placed on the assets. For example, controls are set up to enable additional pumping capacity to be activated quickly as demand for water rises. Backup systems are designed to continue operations when there are power cuts or other asset failures. Asset design allows for redundancy to enable service continuity when a particular pump or important piece of equipment fails or is being serviced.

Proactive maintenance is aimed at maintaining asset performance and condition at optimal levels and is generally applied to critical assets where failure cannot be allowed to occur. Reactive maintenance is carried out on all other assets in response to failure of the asset. A balance is required where critical assets are proactively maintained while others can be allowed to run to failure.

Method of Service Delivery

The operation and maintenance of the water supply systems is carried out using a combination of Council Asset Management staff and external contractors. Following a restructuring exercise, the previous internal business unit “Watermark” was disestablished, and the staff re-absorbed in the general Council business. The Water Services Staff currently consists of a Water Team Leader, Supervisor, three Treatment Plant Technicians, and four reticulation servicemen.

A new unit part of the Assets Group called Assets & Compliance are responsible for collection of all monitoring data and report on compliance to Taumata Arowai the new drinking water regulator.

The Council has a well-established communications and fault reporting system (MAGIQ) to ensure that complaints and request for services are passed to the operators for responding to and resolution within agreed timeframes.

Expenditure components and capitalisation thresholds

Maintenance and operating costs are expensed in the year they are accrued. The capitalisation threshold for water supply assets has been set at **$5,000**. The cost of an asset must be greater than $5,000 to be capitalised. A lower threshold for assets can be used where determined by the budget manager in consultation with the Finance team, and where the value of an individual item is less than the threshold, but the item is part of a group of similar items, these may either be expensed or be capitalised at an aggregated amount.

Repairs to pipe failures will however only be capitalised if the length of new replacement pipe installed exceeds 12 meters (typically two pipe lengths). This is because a shorter repair would be abandoned along with the old assets in a future pipeline replacement. It therefore does not extend the overall life expectancy of the original pipe.

Operating Costs: It covers costs of operating and maintaining the water treatment plants and reticulation, including fault repairs.

Support Costs: This item covers the share of Council support costs incl. overheads apportioned to Water Supply.

Depreciation: Both renewal of existing assets and investment in new assets drive a gradual increase in depreciation charge over the plan period. The contribution of the older pipe assets to depreciation charges decreases as their value diminishes toward the end of their lives. Depreciation is based on the useful lives of assets, tabulated in AMP Chapter 6. Useful lives vary depending on many factors:

- Mechanical and electrical plant depreciate faster than reticulation pipes.
- Different pipe materials have different life expectancies.
- Different historical installation standards and service conditions also affect lives.

Interest and Principal: New works are generally funded by borrowing. Interest payments and repayment of principal are an operating expense.

The distribution of costs for O&M is shown below based on historical average financial year budgets. Maintenance of the treatment plants is included in the ‘operations’ sector of the chart. Treatment operations accounts for over half of the Opex budget and are further described in the following section.

Water Operations Activities as a percentage of annual expenditure (include Water Services costs) are summarised as in the Diagram below.

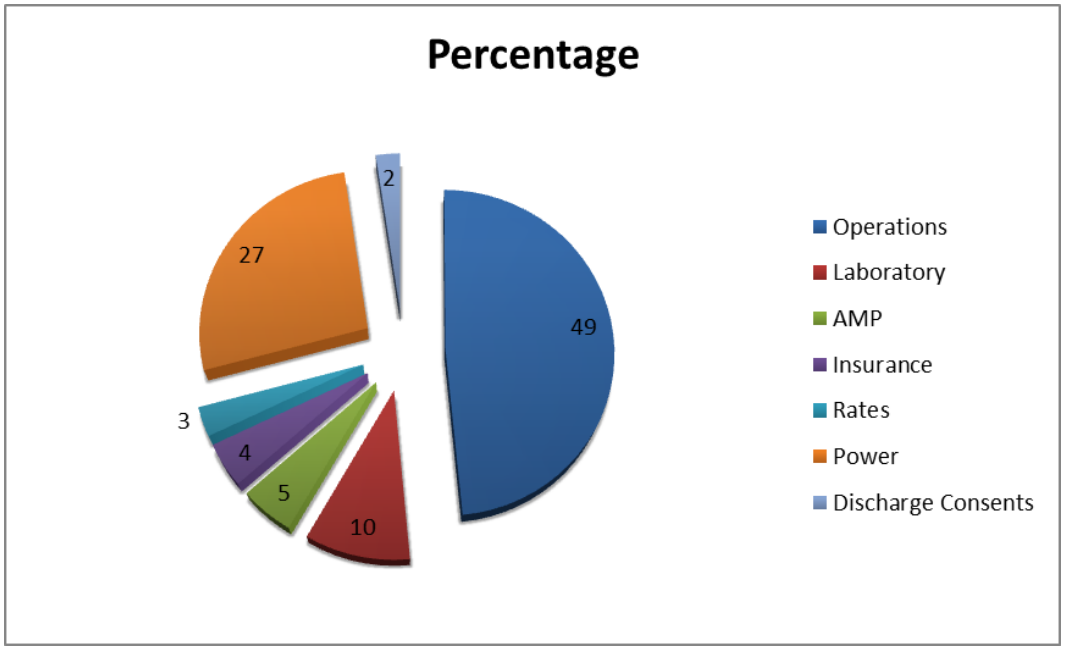


Figure 6.1 Distribution of Operations Costs

Note: Staff and Professional Services costs; finance, loans, and depreciation charges are not included above.

Power costs for pumping source water to reservoirs are subject to changes in tariffs from the supplier and are carefully managed by using off-peak power whenever possible. The Arapuni bores are very deep and the high lift up to the reservoir creates high pumping costs for this relatively small settlement. Changes proposed with the new bore upgrade to install separate smaller surface boost pumps will help lower overall power consumption at this site.

Water quality sampling and testing costs are driven by requirements for demonstrating to Taumata Arowai that the supplies meet the Drinking-Water Standards for NZ.

Professional services, which include maintaining and developing asset inventories, standard specifications and drawings, project design, supervision, and management are generally provided by Council's in-house staff. When necessary, assistance with Asset Planning, Network Modelling, and Water Quality management is sought from external consultants.

6.4.2 Operation and Maintenance Activities

All water supply maintenance activities for physical works and repairs are currently carried out by the Water Services Section. The general maintenance requirements of the maintenance agreement are:

- To provide dedicated labour, plant and material resources to effect prompt and efficient routine maintenance of Council water supplies both within and outside normal working hours
- To produce and supply potable water to the required standard in each reticulated area and monitor water quality as specified
- To undertake promptly all inspections, scheduling and programming requirements described in the agreement
- To execute the works to specification requirements in a safe, efficient, and timely manner that will enhance the Council's assets while minimising any inconvenience to asset users
- To maintain a close working relationship with the Asset Manager to enhance the liaison process and ensure a good understanding of what is required

Water Services continues to deliver the level of service required and a low level of public complaint is a measure of the effectiveness of Water Services.

The agreement includes operating to a Quality Plan assuring that the work is properly carried out. Scheduled monthly meetings and reports are used to advise problems, plan future activities, and identify future works for longer term planning. Water Services given authority to act on unforeseen emergency maintenance to a point where the service is stabilised and can be referred to the Infrastructure Manager for direction. At this point service may not have been fully restored but no ongoing cost is being incurred, e.g., Water wastage. Water Services and Services will then agree on the appropriate course of action required and costs prior to final repairs being implemented.

Water Services is required to maintain knowledge of new products and maintenance methods in order to provide the most cost-effective service for Council.

The standards and specifications for work done are set out in the Agreement. Should the Unit wish to carry out work to a different standard it must present a case to the Infrastructure Manager identifying any advantages or risks and obtain approval prior to proceeding.

Water Services has developed a schedule of duties to be performed at a daily, weekly, monthly, or “as required” basis at each headwork. The duties include measurements to be taken and recorded, sampling, testing, dosing, routine housekeeping, and preventative maintenance.

6.4.3 Headworks

Bores/Bore Liners

The Water Services unit monitors bore groundwater table depths and reports total, peak day, and average water consumption. In addition, hydrostatic level sensors have been installed in the bores in Tokoroa and Putāruru (Glenshea) and these are logged by the telemetry system.

The maintenance contractor monitors bore groundwater table depths and reports total, peak day, and average water consumption.

Pumping equipment is maintained in good operating condition. At the Te Waihou headwork it is necessary to regularly check the spring-fed intake is clear of built-up of pumice, additional coarse filters were installed in 2020 to enhance pumice removal due to an increase in the volume of pumice being experienced. If this is not cleared it can be drawn into the supply and cause abrasion on the pump impellors and blockages in filters at points of supply.

Following investigations into the condition of the bore heads at the Elizabeth Park Bores in Tokoroa it was determined that they do not meet the requirements of a sanitary bore. The bore heads need to be raised above ground level and backflow installed in accordance with a report prepared in 2022 by PDP Consultants.[5]

Bore Pumps

The Water Service unit monitors and reports pump input (power requirement) and output (water flow) to optimise pumping programmes and pump efficiency. This also provides an indication of when overhauls are required. Backflow prevention at Te Waihou is checked six-monthly. The bore head pipe work at Elizabeth Park in Tokoroa has been identified as a risk and it has been recommended that these be raised above ground in line with current best practice.

6.4.4 Controls/Telemetry

An independent contractor is proposed to undertake regular maintenance of the Telemetry and SCADA systems and to provide a reactive service whenever there are failures of other issues in the telemetry and SCADA systems. It was resolved that the Councils current telemetry hardware supplied by QTech is no longer fit for purpose and will be replaced with a modern system, after investigation Schneider SCADAPack was selected.

[5] Tokoroa Borehead Review ECM614248

The current Telemetry network is being replaced with a modern system supplied by Schneider (SACADPack) this includes installation of 4 new base stations and implementation of a new primary communication backbone utilising Sparks fibre network.

6.4.5 Water Treatment

The Water Services unit manages the chemical usage and orders and operates the treatment systems, where installed, to comply with the drinking water standards. Equipment is inspected regularly and maintained or replaced as required, with routine inspection and maintenance of other electrical equipment occurring six-monthly.

The Water Services unit also conducts water quality sampling to specified frequencies as required by the drinking water standards and reports non-compliances to the Asset and Compliance Manager.

6.4.6 Reservoirs, Surge and Contact Tanks

Arapuni reservoir is scoured clean annually, and the rising main feeding it six-monthly, to minimise accumulation of manganese and iron from the source aquifer. A structural check is carried out on reservoirs every five years on average. The latest inspections undertaken in 2020 by Calibre[6] Consultants indicated that essential strengthening repairs were required to the base connections with the sides at both the Glenshea Reservoir and Pinedale reservoirs. This work was scheduled to be completed in 2022. In addition there is insufficient storage in Tirau and studies have recommended that this is increased to 2000m³.

6.4.7 Reticulation

Pipes Asset Group

No preventative maintenance is carried out for most network pipes. Faults are repaired as reported, and asset information returned as part of the operation. At Arapuni, the source rising main, and reservoir are cleaned regularly to prevent iron and manganese deposits building up in the network pipes.

In Putāruru, due to taste and odour complaints originating from the zone where the non-chlorinated Waihou Spring and chlorinated Glenshea-sourced supplies mix, an effective pipe sluicing programme has been implemented

Booster Pumps (Reticulation)

The Water Services unit inspects and maintains pumps six-monthly in November and May, ensuring it is reliable for the summer peak demand.

Fire Hydrants Asset Group

Hydrants are inspected and flow-tested on a three-yearly cycle, at which time the markings are repainted, and work done reported to the Asset Manager.

Service Connections Asset Group

No preventative maintenance is carried out for service connections. Faults are repaired as reported, and asset information returned as part of the operation. Service connections are replaced when the main is replaced.

Water Meters Asset Group

No preventative maintenance is carried out for water meters. Faults are repaired as reported each quarter and asset information returned as part of the operation.

[6] Pinedale Report ECM555162 & Glenshea Report ECM574298

Council is in the process of replacing water meters with smart meters, which saves time in reading the meters as they can be read remotely by driving by. The meter readings are also more accurate.

6.5 Renewal Planning

6.5.1 Overview

Infrastructure assets all have their particular useful lives, during which they are fit for the purpose of providing the required service reliably and effectively. When they are no longer capable of providing that service, a decision is required regarding continued operation of the service. The decision process addresses the following options for arriving at the optimal solution (i.e., the lowest lifecycle cost):

- Simple replacement of the asset (like for like)
- Providing additional capacity or performance (e.g., for growth)
- Refurbishment (e.g., relining the interior of a pipe)
- Introduction of new technology to replace old (e.g., solid state controls instead of mechanical/electrical)
- Disposal of the existing asset

In some cases, replacement is required before the useful life has ended, for example to cope with additional demand or to improve performance to ensure compliance with more stringent resource consent requirements or increased industry standards.

Renewal and replacement expenditure is a part of the overall capital expenditure process and should be considered whenever new assets are created or purchased, with a view to minimising lifecycle cost.

Renewal applies to works that replace existing assets or facilities with assets or facilities of equivalent capacity or performance capability. There are two options for a renewal project:

- Rehabilitate or refurbish the asset; or
- Replace the asset like for like.

Replacement applies to complete replacement of assets that have reached the end of their useful life, so as to provide a similar, or agreed alternative, level of service.

Asset renewal is major work which restores, rehabilitates, replaces, or renews an existing asset to extend its economic life and/or restore its service potential. Work over and above restoring an asset to its original capacity is classed as development work. Renewals may be carried out for two primary reasons:

- Maintain the asset service potential – this may be either the quality of service or reliability of service.
- Minimise the whole lifecycle cost of the asset.

The decision to renew an asset will be based on:

- Criticality (consequence of failure)
- Condition (and therefore remaining useful life)
- Performance; and
- Value.

Renewal literature often refers to renewals options to upgrade/downgrade or alter the asset to meet other service requirements. For the purpose of this AMP, this is considered development work.

The potential is recognised for extending the investment period of the depreciation reserves, so that cost to the community can be reduced in the long term due to growth in funds.

6.5.2 Funding and Depreciation

The Depreciation account is based on the expected remaining useful life (which is determined and reviewed by condition and performance assessments and maintenance history) as well as the replacement cost (determined by triennial revaluations).

The account is funded from Council's rates, which are subject to review and acceptance at the political level, therefore the renewals and replacements programme must be carefully prepared to ensure that the agreed levels of service are maintained at an acceptable cost and risk from one year to the next.

Depreciation accounting was not introduced when the older assets were originally created, therefore the account does not adequately address the full cost of renewals and replacements, but it will significantly reduce the demand from other sources of funding, such as loans.

6.5.3 Renewals Programme Needs

A theoretical programme of asset renewal needs would be based on asset installation dates and standard asset useful lives. However, this does not mean that assets are automatically replaced when their life should be over, because condition, reliability, contribution to water quality, maintenance cost, and other factors are monitored and used to determine which assets are actually replaced.

Indicative water supply capital renewal needs from historical trends are as follows:

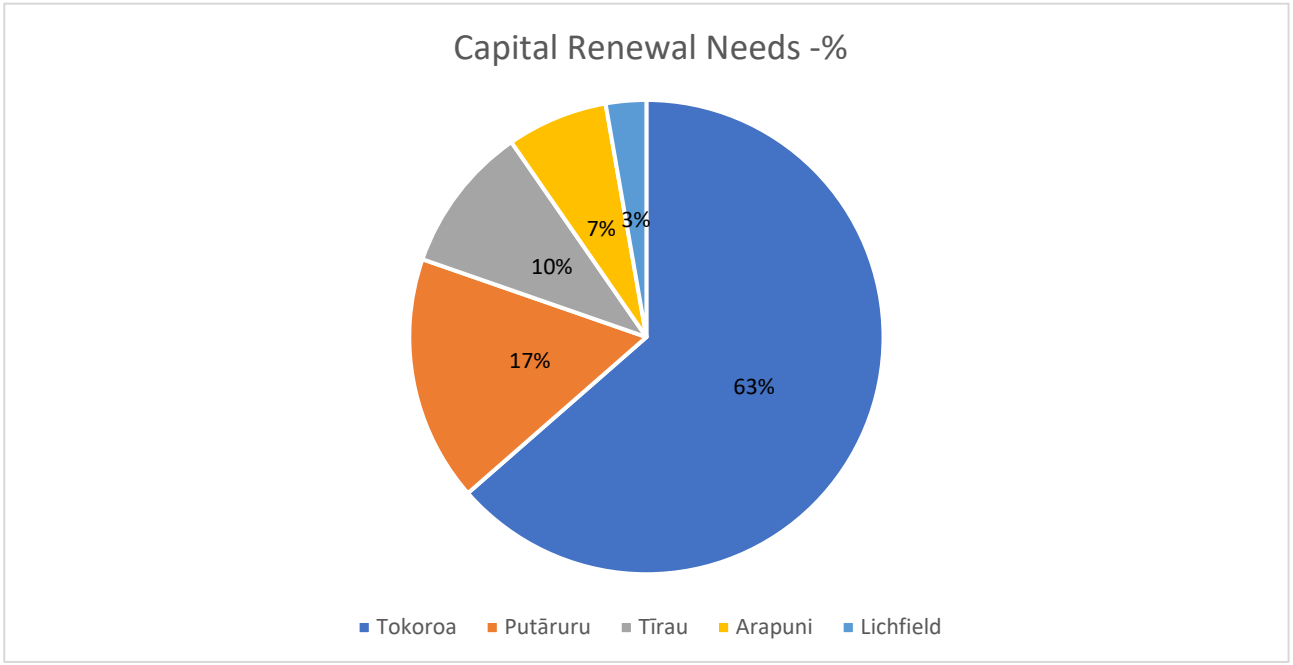


Figure 6.2 Indicative Capital Renewal Needs by Community

6.5.4 Plant Asset Group (including all pumps)

The renewal programme for the headwork assets is carried out on a replace as required basis. These assets are regularly inspected and monitored, and this normally allows for replacement prior to failure. Details of the individual scheme renewals for the Headwork asset group are shown in Appendix H.

Bores/Bore Liners

No separate base life has been nominated for pipe used as bore liner. This results in the adoption of a standard life of 60 years.

Bore liners must be in good condition to prevent potentially contaminated surface water from infiltrating the bore and causing water quality problems.

Pumps

The Pumps asset group includes bore and reticulation/ booster pumps. Renewal strategy is typically a total replacement at the end of their useful life.

Controls/Telemetry

The expected base life of control equipment is 15 years. Electronic equipment may also fail due to technological redundancy. However, this is unlikely to be an issue for the water supply assets during this planning period. Renewal budgets are included as required over the planning period.

Water Treatment

To ensure compliance with new Drinking Water Standards are achieved, some optimisation or early disposal of assets is possible during the planning period. The headworks and treatment plant assets are regularly inspected, calibrated, and maintained to ensure compliance with the DWS is not compromised.

The small dosing pumps and corrosive liquids handled by water treatment plant make base lives of some equipment shorter in some cases. Chlorine metering pumps are considered to have a base life of 3-4years these are replaced as part of standard operations and are not considered renewals.

Reservoirs, Surge and Contact Tanks

The expected base life of tanks is 80 years for concrete and 50 years for wood. Condition surveys of Council's reservoirs indicate that they are generally in good condition and can be expected to outlive these periods. The Glenshea Park reservoir required minor renewals of handrails and ladders in 2020. Timber reservoir liners require more frequent replacement, with a useful life of 20 years.

Re-tensioning of the circumferential cables for the timber tanks is carried out on a regular basis.

6.5.5 Pipes Asset Group

Age Profile

The theoretical end-of-life of all pipe assets is shown in Figure 9 and Figure 10 below. Those affected in the period of this plan and for the following ten years are shown in Figure 9. These profiles are based on the asset lives given in Section 7.

When the renewal programme for water pipes is planned, Asbestos Cement pipes are given high priority with following criteria.

- Areas of higher pressure or areas of pressure fluctuations
- Criticality of the individual lines
- The assessment of the remaining lives for pipe diameter groupings (in the individual schemes) using MRI scanning of wall thickness (this allows an assessment of the extent of deterioration of the wall and estimation of remaining life)
- Different lives for pipes of the same material but smaller sizes
- Modified lives reflecting local service conditions
- Experience of other local authorities

To predict the pipe failures in water network, condition assessment process has been adopted by the Council. The condition assessment process will reduce the maintenance costs, prioritised capital expenditure and minimise disruption to water supplies and the community.

In the South Waikato District, the pH of the water is lower than the optimum level. The naturally occurring acidic water tends to weaken fibre cement pipes over time by leaching cement from them. Lime is added to the Tokoroa supply to reduce this situation, and this is an issue which has been taken into consideration in predicting the useful life of fibre cement pipes.

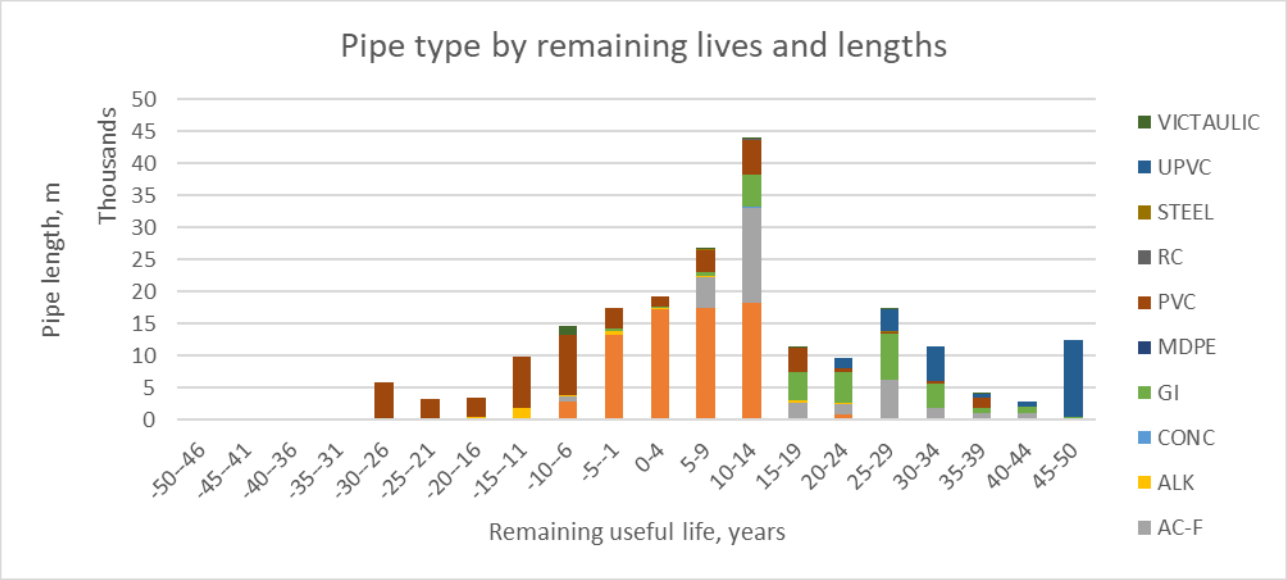


Figure 6.3 Pipe type by remaining lives and lengths

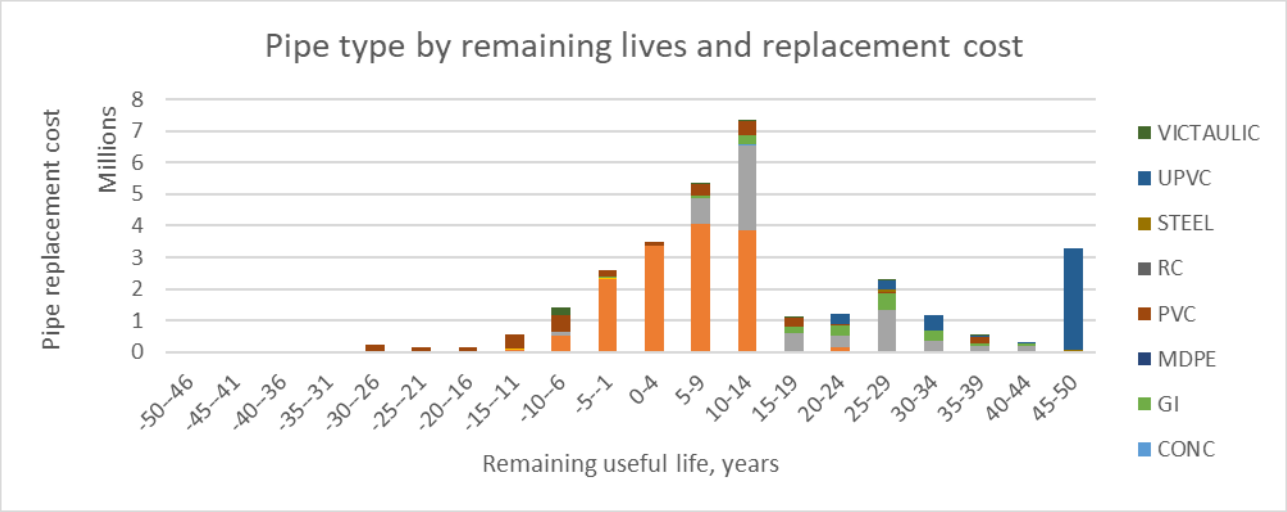


Figure 6.4 Pipe type by remaining lives and replacement costs

AssetFinda indicates that there are 42 km of water pipe that are due for replacement in the next 10 years. These pipes condition will be reviewed and pipes in good condition will have their lives extended. The actual renewal program carried out over the next 3 years will be based on results of testing, risk assessment, and criticality assessments on each specific pipe.

However, criticality, reliability, contribution to water quality, maintenance cost, and other factors are monitored and used to determine which pipes are actually replaced.

Pipe sizes are also reconsidered during renewal design. Network modelling provides information on which size is required so that it addresses any existing problems and is adequate for known future demands over the life of the new asset. Economies of scale are achieved by deferring or bringing forward elements of the renewal programme where possible, so that a more viable quantity of pipe can be scheduled in one project.

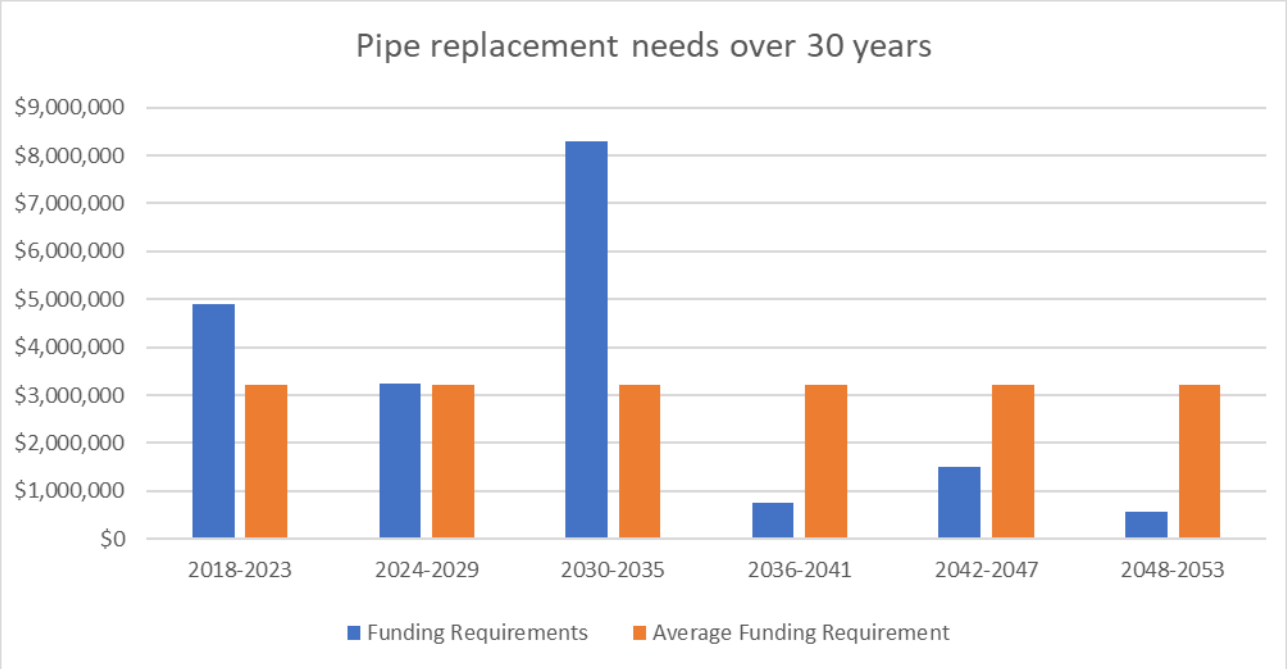


Figure 6.5 30-Year Pipe Replacement Requirements

Pipe Replacement Methodology

When pipes require replacement, it is most economical to replace the associated assets at the same time. Valves, fire hydrants, service connections, and toby valves are therefore replaced as part of the project in most cases. Valve and hydrant surface boxes may be re-used if in good condition.

Observations on individual communities' networks

- The Athol reticulation over the full length of the supply is in good condition having been replaced in 1996.
- The Lichfield reticulation over the full length of the supply is in new condition having been replaced at the residents' cost in 2005 and then taken over by the Council
- A large proportion of the Arapuni reticulation was replaced in 1990 - 92 with PVC pressure pipe
- A continued replacement programme is in place in Tirau as some pipework dates from the mid – 1930's and the asbestos-cement pipes have deteriorated gradually. The target over the last few years has been the replacement of critical mains under State Highway and the railway.
- A pipe renewal programme in Putāruru through the late 1970's - early 1980's removed old concrete mains from the reticulation. Since then, there has been limited need for more renewals, however it has been noted that galvanised rider mains now need replacing. The profile indicates the need for a programme of $190,200 over the 2018-2028 planning period
- The replacement profile for Tokoroa shows two peaks in activity as a result of the way Tokoroa has developed
- A selection of old rider mains located on private properties also need attention. Work has started in moving these to the road reserve.

See the proposed fire main upgrade plans for Tokoroa, Putāruru and Tirau in Appendix A.

6.5.6 Points Asset Group

Point assets (Valves, hydrants, air valves) are normal replaced when the water pipe is replaced, except for water meters which are replaced when they become faulty.

Water Meters

Based on the installation dates and a service life of 30 years, minimal meter replacement is required in the period of this Plan, but 80% of these assets would require renewing, or a review of the need for them, circa 2020.

6.6 New Works

6.6.1 New Works Introduction

Capital investment is required to service additional consumers, to manage risk or for a change in level of service to meet residents' expectations or changes in legislative/consent requirements.

This section sets out the factors impacting on the management and development of the assets to meet the requirements of growth and other demands place on the Water Supply assets as follows:

- Future demand drivers
- Growth projections
- Growth trends
- Land-use strategies (residential, industrial, retail and rural-residential)
- Consumption and use patterns
- Demand management strategies; and
- Climate change impacts on demand.

The future demand for reticulated Water Supply services in the South Waikato District will be driven by:

- Government Regulations and water reform (Water Services Act 2021)
- Residential and industrial growth in the District particularly in Putāruru.
- Changes in water consumption and usage patterns.
- Future demand for treatment of Water Supply driven by technology changes.
- Regional Council Standards
- Climate change.

The planned LTP forward capital improvement programme is summarised in Section 8 Financial Forecasts and detailed in Appendix G.

6.6.2 Network Hydraulic Modelling

In order to analyse the water supply network Council utilises a computer based hydraulic model. The model can be used to assist the analysis of:

- Capacity of the system to accommodate additional water connections, from a single connection to a multi lot sub-division.
- Optimisation of the network to improve operational efficiency.
- Fire supply capability.
- Opportunity to improve network layout prompted by the need for water pipe renewals.
- Requirements for pipe upgrades to cater for population growth and new large developments.
- Excessive flow velocities that may cause water discolouration.
- Design aid for pressure zoning and district meter areas.

The hydraulic modelling prepared by Watershed Engineering (WSE) for the water supply was used by the Council throughout 2020-2022. There are comprehensive models for Tokoroa, Putāruru, and Tīrau which were built by Watershed on data from GIS and flow data collected from the telemetry system. Limited model

calibrations have been carried out using flow and pressure data from the telemetry and on-site pressure loggers.

Additionally, SWDC undertook further Network Modelling using Te Miro Water (TMW) model in 2022, to identify undersized infrastructure of the stormwater reticulation system, and to potentially identify upgrade requirements to meet future growth and provide input to future asset management planning. The findings of the consecutive Watershed Engineering and Te Miro Engineering modelling in 2022 reflected in the updated Water Network Growth (ref. Section 5.4 New Growth Projects 2022).

6.6.3 Additional Proposed Capital Growth Projects

Earlier network modelling work undertaken in 2003 by consultants Harrison Grierson has now been superseded by more recent work completed by Watershed Engineering Consultants in 2020 and 2021. This later modelling incorporated both the existing scenarios and various growth forecasts into their models to provide a more accurate picture of the water supply networks. This work was focused on Tokoroa, Putāruru, and Tīrau as this is where the future growth is anticipated to occur. The new network model replicates the network performance very well and is suitable for use as a planning tool with a degree of confidence not previously held.

The following future growth projects were identified post the current LTP, based on the Watershed Engineers recommendations. They are not funded under the current LTP period, but it is expected that funding will be sought for construction after 2024. The project summary is as follows:

Tirau Water Supply projects[7]:

Fire Flow Pipe Upgrade - Option 1A	$300,000
Fire Flow Pipe Upgrade - Option 3	$1,135,000
Oraka Spring Pump Station Upgrade	$320,000
New 2,000 m^3 Reservoir	$1,175,000
TOTAL:	$2,930,000

The project scope was identified based on the Watershed Engineers recommendations on significant further investigations to be undertaken. The cost estimates are based on very limited scope from Watershed or an understanding of the existing infrastructure and what condition this is in. The estimates are hence high level.

The options for Tokoroa are presented below, these relate solely to the growth cells rather than the 0.3% per annum growth rate relating to infill housing.

Option	Description	Item	Upgrade Type	Size	Length	Est. Cost
1	Upgrade to service Strathmore Park	Pipe	New pipe from Benalder Crescent to subdivision boundary	100 mm	90 m	$300,000
Growth cells 14 & 15	Option 1 Newell Rd/SH1/Carson Street Or Option 2 Inman Ave to Carson Street	Pipe	New Pipe across SH1 at Newell Rd Or New pipe from Inman Ave to Carson Street	100 mm 100 mm	295 m 100-220 m	$50,000

Some additional key new work identified in these reports include:

Town	Description	Item	Upgrade Type	Size	Length	Est. Cost
Tirau	Network Upgrades	Pipes	Up sizing watermains to meet growth	Varies	Varies	$110.000 annually

[7] Tirau Water Supply Hydraulic Model Calibration and Infrastructure Assessment Report, March 2021, Watershed Engineers Ltd., ECM553261.

Putāruru	Reservoir St Trunk main- Glenshea to Arapuni St	Pipes	Additional pipes to meet growth	355 mm	305 m	$125,000
Putāruru	Arapuni St – Reservoir to Grey St	Pipes	Additional pipes to meet growth	355 mm	265 m	$110,000
Putāruru	Sholson St	Pipes	Additional main to meet growth	200 mm	400 m	$150,000

6.6.4 New Growth Projects 2022

In 2022, new development zones were approved for Tokoroa and Tirau (ref. Appendix D):

- Residential growth zones (Areas A, B, C, D) for 1124 residential units total, Tokoroa,
- Mixed business and residential growth Area E for 118 residential units with 35% yield on the total area of 16.2 ha, Tokoroa,
- Industrial Growth Area, 46.07 ha, Tokoroa,
- Residential growth zones (Areas A, B) for 229 residential units total, Tirau,
- Industrial Growth Areas A, B, C, total 42.85 ha, Tirau

The corresponding Water network capital improvements are rated as first priority projects and proposed to be carried out in financial years 2022/23 and 2023/24.

The water supply component of Maraetai Road Intermodal Business Park (MRIPB) Stormwater and Watermain Improvements have been planned as a low priority project within financial years 2022/23 and 2023/24.

New Improvements/ Growth Projects 2022 for water network (additional to LTP 2021 scope), projects were identified to meet the new development zoning and stormwater capacity increase for the modelled 100-year ARI flood event modelling. The forecast CAPEX projects breakdown is shown below.

Table 6-1 New Growth Projects 2022 CAPEX summary

Community	Project	CAPEX Project Priority	2022/23	2023/24	Project total
Tokoroa	Maraetai Road Intermodal Business Park (MRIPB) Stormwater and Watermain	Low	$750,000	$-	**$750,000**
	Strathmore Park Water	Low	$222,857	$2,377,143	**$2,600,000**
	Tokoroa water and wastewater growth projects	High	$81,429	$868,571	**$950,000**
Tirau	Tīrau Water Supply	Medium	$80,000	$120,000	**$200,000**
SWDC	Districtwide Water and Wastewater Telemetry and SCADA upgrades	Low	$544,500	$3,085,500	**$3,630,000**
Total			**$1,678,786**	**$6,451,214**	**$8,130,000**

6.6.5 Future Levels of Service

Water Quality

Additional monitoring and control equipment may be required to assure compliance with the Drinking Water Standards resulting from the change in water regulator to Taumata Arowai, the impact of the new regulator on water quality and compliance has not been assessed at the time of writing this AMP. It had been

determined that pH adjustment was required in Putāruru due to the low pH in both water sources and an item has been included in the LTP for this to be implimenteed.

6.6.6 Headworks (including all pumps)

Bores/Bore Liners

A new water production bore is planned for Arapuni following investigation and condition assessments of the existing bores. This new bore will be drilled at the existing location and is intended to be a 200 mm diameter partially lined bore, to assist in ensuring the sustainable operation of the new bore a new break tank and surface mounted booster pumps will be installed at the site of the existing treatment headworks.

6.6.7 Water Treatment

See section 4.3.5 above:

6.6.8 Pipes Asset Group

The results from the recently completed network modelling undertaken by Watershed Engineering has indicated that the existing networks in Tokoroa and Putāruru are generally operating satisfactorily with no current minimum or maximum pressure issues and can supply typical firefighting flows based on land use classifications.

Tirau Firefighting

The Tirau water supply network operates well however does experience areas where typical fire firefighting flows base on land use classifications are not able be met. The network is short on storage available in the event of an emergency. These are primarily identified in the current peak day scenario with areas broadening in the future.

As a result, a 10-year programme has been included in the 2021/31 LTP for networks upgrades ($100,000/yr.) The first area identified for improvements is the installation of a new 150 mm diameter link between SH1 from the BP service station to Patetere Street on SH27, this work is programmed for 2022.

6.6.9 Fire Hydrants Group

No expenditure on additional new assets is contemplated in the plan period. The replacement of existing hydrants as part of pipe upgrades should improve the fire flows sufficiently without installing additional ones.

6.6.10 Service Connections Asset Group

Expenditure generally relates only to additional new houses, which are self-funding due to the age of the network there has been a small increase in the number of existing service connections requiring replacement. Supplies to major industries are generally adequate. Additional unmetered private fire system service connections have been installed in the past to ensure adequacy of these systems while retaining a suitably sized meter and dedicated service connection for normal demand.

6.6.11 Water Meters Asset Group

Expenditure relates only to additional new houses, which are self-funding.

6.7 Disposal Planning

Disposal is a necessary part of the "whole of life" costing of assets and should be included in the planning of capital expenditure.

Assets may be disposed of for various reasons, including

- No longer fit for purpose due to poor condition or not suitably sized for the required performance as a result of increased demand or changed level of service
- No longer required because the intended purpose has changed (service discontinued)
- No longer able to be serviced due to lack of availability of spare parts

- No longer suitable as a result of decisions to standardise on brands or types of equipment
- No longer suitable as a result of changed manufacturing or performance standards or legislation

Options for managing disposal depend on the type of asset, for example

- A buried pipe may be abandoned in the ground or may provide a duct for inserting a replacement pipe
- A mechanical item may be taken into storage for use as spare parts or possible future use elsewhere (in which case it is no longer strictly a disposal item)
- An item may be suitable for use in a recycling programme, but may need to be disassembled into the various material components, e.g., metals and plastics
- An item may be sold at market value or given away
- An item may be taken to a solid waste landfill, if suitable for acceptance, in which case a disposal fee is incurred

Levels of Service have been defined and a Council-wide performance management framework has been developed to ensure that the agreed stakeholder expectations are delivered. The framework is described in Doc Set .267385

7 Quantifying and Managing Risk

Risk in its various forms is managed for all of Council's activities, not just the asset infrastructure. This chapter of the AMP identifies how risk is managed corporately and then how asset risk is managed.

Risks are events that may compromise the delivery of council's strategic objectives.

The risk management context:

- Risk management is a core business driver that influences all decision making and is not an isolated process.
- The corporate risk framework is applied across the organisation and identifies the criteria for risk evaluation and the responsibilities for managing risk.

7.1 Risk Management Strategy

This section outlines the processes set up by SWDC for assessing and managing risk.

Risk management is used as a strategic decision-making tool to assist with developing and prioritising strategies and work programmes.

SWDC currently manages its risks as Business Risk, Asset Risk, Emergency Management and Public Health Risks separately, based on the following risk documents:

- Corporate Risk Management Policy (Doc Set 200515. Adopted 2005. Revised March 2006)
- Asset Criticality and Risk Process Report (Waugh, May 2009)
- SWDC Water Supplies Public Health Risk Management Plan (April 2010). These have been renamed as Water Safety Plans.
- Waikato Civil Defence Emergency Management Group Plan 2016-2021.

The following flow chart indicates the Risk Management Process in terms of business risk and asset risks.

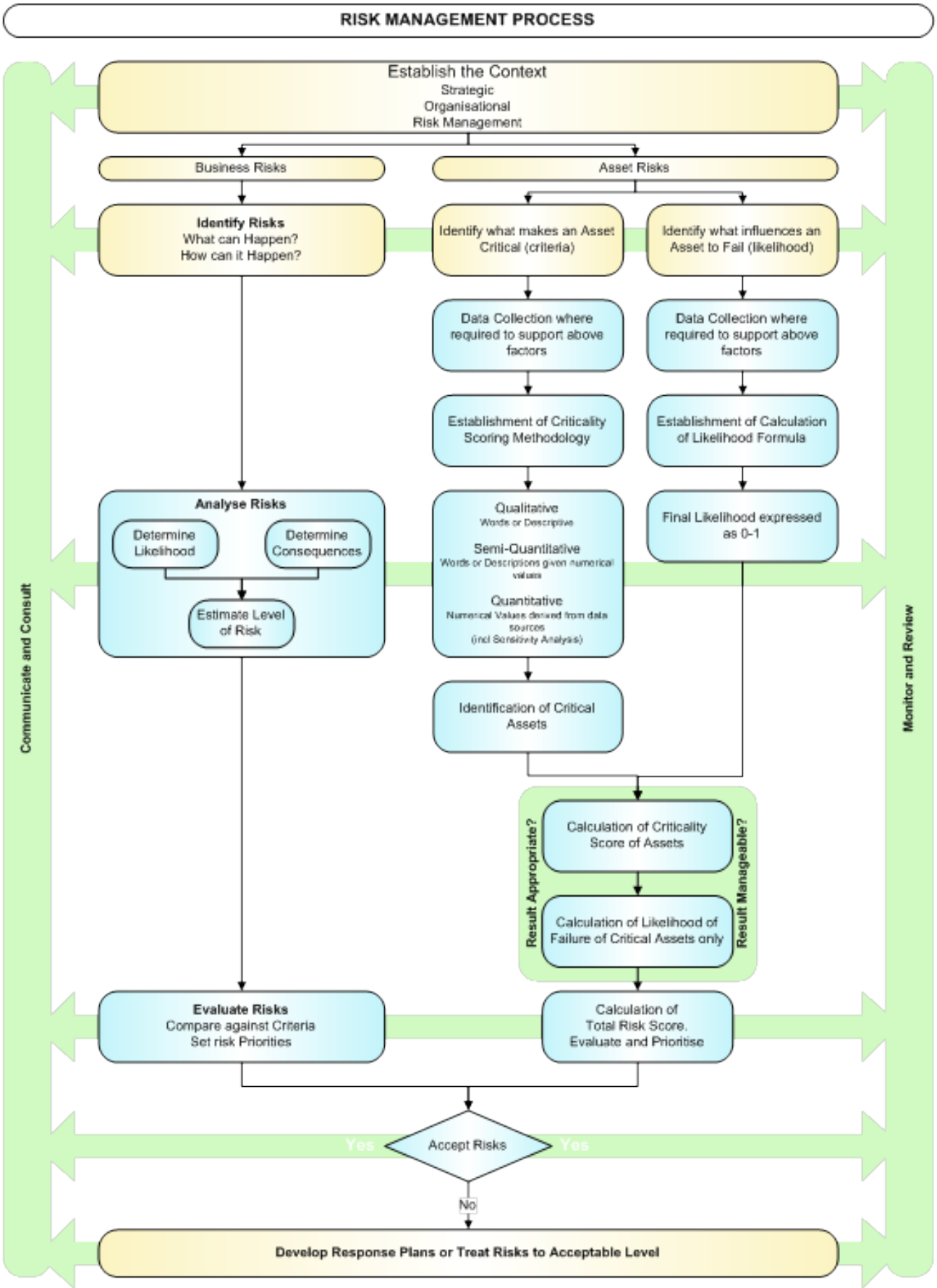


Figure 7.1 Risk Management Process

The Water Supplies Public Health Risk Management Plan (PHRMP) identified the risks to public health, ranked the relative importance of those risks and stated how those risks should be managed.

The Waikato Civil Defence and Emergency Management (CDEM) Group Plan provides a regionally based approach to risk management, using the 4 R's (Reduction, Readiness, Response and Recovery) and contains references to the Waikato Engineering Lifelines Group (since renamed as the Waikato Lifelines Utilities Group), which includes all major utility service providers.

For the purposes of the Water Supply AMP, risks are grouped and classified, and the principal risks are further described, in the following classes.

Table 7-1 Identifying Classes of Risks

Risk	Discussion	Management of Risk
Public Health Risks	Ensuring public health and providing clean drinking water is highly important to Council. Public Health Risk Management Plans (PHRMP's) have been developed for each of the six community Water Supplies. Public Health Risks associated with the Water Supply network are managed via the resource consent and compliance monitoring process. Council holds relevant consents for all Water Supply sources and services.	Public Health Risk Management Plan Resource Consent and Monitoring
Physical Risks	Physical risks to the infrastructure are generally: Risks from natural processes whether gradual or acting over a short period Risks created by the actions of other parties working in the vicinity of the assets Council has adopted construction and maintenance standards which are formulated to encourage appropriate planning prior to working on infrastructure; selection of durable materials; good workmanship, and appropriate processes. These will not always be sufficient to prevent physical damage by external forces or natural events. For example, failure to check before excavating near a water main can result in damage and loss of supply. Earthquakes and erosion due to flood or breaks in large diameter pipes create potentially high losses. Smaller faults may still create problems such as loss of supply to critical consumers (home dialysis patients, emergency services, major industry, etc).	Critical Assets
Business/Commercial Risks	Business or Commercial risks are those which result in decreased cash flow and/or inability to afford or implement (e.g., not enough resources) the works that are required. They include loss of large consumers (requiring the fixed cost burden to be absorbed by the remaining customers), poor timing of work causing less than optimal life-cycle cost, and failure to take advantage of any available subsidies. Council is considering of the impacts of COVID on the risks associated with Water Supply services, as business and household usages change, and financial impacts affect users' ability to pay for services.	Corporate Risk Plan
Health & Safety Risks	These are risks posed to people and property, consequential to the physical actions or omissions of Council staff or contractors, or failure of equipment. For Water Supply, they include failure to supply firefighting water to hydrants, since, where they are installed, the Fire Service has an expectation that sufficient flow will be provided. Council has sufficiently comprehensive health & safety policies in place including the requirement for Business Units and external contractors to have such policies to minimise health & safety risks associated with operating heavy machinery and handling hazardous materials.	Corporate Risk Plan Contractor Health and Safety Quality Plan South Waikato Health and Safety Quality Plan

Risk	Discussion	Management of Risk
Environmental Risks	Risks of environmental damage arising from the operation of assets and/or physical actions or omissions of Council staff or contractors are generally managed in accordance with resource consent conditions, where applicable.	Consenting and Performance Monitoring/ Reporting
Regulatory Risks	Risks of prosecution due to failure to comply with laws and resource consent conditions. The Health (Drinking Water) Amendment Act 2007 represents a regulatory risk that Council manages. A decrease in the grading of supplies, and continuing or increased water quality problems, may also result in loss of public confidence in the management. The power of Waikato Regional Council to review and amend resource consent conditions during the duration of the consents represents a regulatory risk exposure to Council. The consequence of this risk might be inability to supply water to consumers, which is in itself of sufficient magnitude that dialogue would occur with WRC prior to actually amending conditions and well before ceasing supply.	Consenting and Performance Monitoring/ Reporting Waikato Regional Council Ministry of Health

7.2 Corporate Risk Management

Risk management at the council wide level is focused on business continuity planning.

The Business Continuity Plan (Site Management Plan) is coordinated by the Emergency Management Manager/Principal Rural Fire Officer and has the objective of ensuring that essential business operations are restored promptly and efficiently following any physical disaster at Council's premises. *(The BCP is currently stored in S/Environment/Emergency Mgt/dm-exceptions/Business Continuity/BCP Plans).*

The asset infrastructure related business functions include the following that are identified as Critical to water supply (requiring full recovery within 48 hours or partial recovery within 24 hours):

- Water Supply pumping (raw water from sources, treated water to reservoirs) and sampling at supply points

7.2.1 Insurance

South Waikato District Council has engaged Aon New Zealand insurance brokers to handle all its insurance needs, and forms part of our commitment to the Local Authority Shared Services (LASS) scheme.

Public Liability Insurance

Council currently holds public liability insurance to the value of $50 M for each and every claim with certain limitations. A copy of this is located in Council’s corporate support section.

Material Damage - Infrastructure Insurance

While insurance was previously held with the Local Authority Protection Programme Disaster Fund (LAPP), SWDC moved away from LAPP after the Christchurch earthquakes made a significant impact to existing LAPP funds.

Infrastructure insurance is now handled by Aon New Zealand through London based insurers. This covers all assets as previously provided by LAPP and includes:

- Water reticulation, treatment, and storage
- Water Supply reticulation and treatment
- Stormwater drainage
- Dams and canals

- Flood protection schemes including stop banks (not applicable to SWDC)
- Flood gates, seawalls, and harbour risks such as buoys, beacons, and uninsurable foreshore lighthouses (not applicable to SWDC).

Professional Indemnity Insurance

Professional indemnity insurance covers SWDC for professional liability protection to the value of $50 M and covers claims from actual or alleged acts, errors or omissions or conduct omitted or committed in connection with the business.

7.3 Civil Defence, Lifelines Utilities and Emergency Response Plans

Civil Defence Emergency Management

The Civil Defence Emergency Management (CDEM) Act 2002 requires Local Authorities to coordinate Plans, Programmes and Activities related to CDEM across the areas of Risk Reduction, Readiness, Response and Recovery. It also encourages cooperation and joint action within regional groups.

Council recognises its obligations under the CDEM Act and participates in a Waikato Region-wide Civil Defence Emergency Management Group (EMG). The Waikato CDEMG is responsible for all matters involving staff training, general Civil Defence public awareness and maintaining contact lists for schools, pre-schools, rest homes and the like. Each Local Authority maintains its own contacts for local resources.

The District is generally sheltered from most natural disasters, although there are risks associated with high wind, flooding and wind-blown ash from volcanic eruption from Mount Ruapehu.

The following documents are available for guidance in Civil Defence and Emergency Management:

(The Emergency Management Manager will update these to align with the Waikato CDEM processes)

- SWDC Emergency Response Plan Emergency Operating Procedures 2016/2017
- Civil Defence Emergency Management Plan Southern Emergency Operations Area of South Waikato and Taupō Districts.
- Waikato Civil Defence Emergency Management Group Plan 2011-2015.
- The National Civil Defence Emergency Management Plan

Waikato Lifelines Utilities Group (WLUG)

Lifelines are the essential 'utility' services that support the life of a community. These services include Water, Water Supply, Power, Gas, Telecommunications and Transportation networks.

SWDC is a member of the WLUG, which is comprised of representatives from the Waikato region's territorial authorities and major energy, telecommunications, and transportation sector organisations. The WLUG provides support to the Emergency Operations Centres that may be required during a major service failure or civil defence emergency.

Current projects include:

- The Group Vulnerability Project - Assessing the Waikato's utilities infrastructure vulnerability to natural and man-made hazards and developing measures to reduce the effects.
- The Group Priority and Alternative Route Plan - Identifying the routes that may be used during an event, in order to ensure that access is available for emergency services, access to critical utilities and evacuation purposes.
- The Critical Fuel Supply Plan - Planning for fuel to be available to both the Lifelines utilities and the public during an emergency event.
- The Coordination Protocols - To assist Lifelines utilities to coordinate, communicate and share information during the Response and Recovery phases of an emergency. An associated Contact Details List is maintained for reference.
- The Group Lifeline Utilities Coordinator and Supporting Staff - Role Descriptions - Ensuring that coordinators are appointed and trained to manage activities during an emergency.

SWDC continues to co-operate within the framework of the WLUG to implement the guidelines outlined in Working Together Lifeline Utilities and Emergency Management.

Based on the District's geographical location, the most significant hazard SWDC faces is the spread of volcanic ash from an eruption. Emergency Management plans are in place for this scenario.

SWDC is committed to monitoring and reviewing its policies around climate change to ensure alignment with national legislation.

Continual development of contingency planning requires revising and improving these plans through emergency response exercises or scenarios.

7.3.1 Business Continuity Plan and Emergency Management Plan

As distinct from naturally occurring events impacting directly on the network, Council recognises that naturally occurring and other classes of events (such as a fire at the Council's Water Services Operations Room) may disrupt wider process aspects of service delivery. Council is currently undertaking an update of its BCP and EMP to address continuity issues.

The South Waikato District Council Water Supply Back-up Plan (ECM 187778) has been prepared to provide a guide for emergency response in situations identified in the risk management assessment, where for one reason or another, water cannot be supplied by conventional means to Council's reticulated users in the District.

The objective of this Plan is to ensure that conventional means of quality water supply is maintained or resumed as soon as practical. The Emergency Services Plan for the District has specific contact details that are kept up to date.

The plan outlines what should be carried out in the event of:

- Pipe Breakages
- Telemetry System Failure
- Pump failure
- Power failure
- Reservoir failure

7.4 Significant Business Risks

There is the potential for the community to experience negative effects which are generated by the Water Supply activity.

Table 7-2 Potential Business Risk/ Negative Impacts generated by water supply activity for community

Negative Impacts / Business Risk	What does Council do to help minimise the negative impacts?
If treatment systems fail, then it may cause illness	Water is regularly tested for micro-organisms, chemical imbalances, or contamination to ensure that it meets Council and the New Zealand Drinking Water Standards.
Some users may waste water	High users of water (such as some industrial users) are charged for the volume of water that they take which is an incentive to reduce unnecessary use. When water use across the district's water supply networks is higher than normal, Council introduces water restrictions.
Negative environmental impact from water extraction activities	Council will analyse potential environmental impacts and consider options that are economically viable and environmentally prudent.
Competing values and priorities can create tension between Council and stakeholders. Treaty partnerships are important and a legislative requirement	Relationships with Iwi are a key priority for Council. Councillors and staff will endeavour to maintain successful co-management and co-governance partnerships with Iwi.

7.4.1 New Business Risks Since the Last AMP

New risks since the last AMP to the Water Supply services activities of Council include the following:

- The impacts of the Government-led water reform, including the final outcomes of the Water Services Act and establishment of Taumata Arowai. These may impact the financial, operational and asset ownership of Water Supply services in the District.
- The impacts of COVID on the risks associated with Water Supply services, as business and household usages change, and financial impacts affect users' ability to pay for services.

7.4.2 Significant Negative Effects

The operation of community Water Supply network and associated assets generate effects on the community, other infrastructure, and the environment. These effects are managed within legislative and consulting frameworks.

The Negative Effects associated with the Water Supply Activity are listed in the table below, along with Council's approach and/or future actions to mitigate or avoid the effects where practical.

These Negative Effects must be balanced against the positive contribution the activity makes to achieving Council's Vision, Outcomes and Strategies.

Table 7-3 Negative Effects – Water Supply Activity

Effect	Status of Effect		Effect (Existing situation)		Impact on Outcomes (existing situation)		Existing Approach or Proposed Action to Address
	Existing	Potential	Negative	Significantly Negative	Well - managed infrastructure Social	Sustainable operations	
Competition for Water	⇧	⇧		✓	Minor	High	Maintain a current consent Implement a water conservation strategy Participate in Community discussion on water allocation
Excessive demand and waste of water	⇧	⇧	✓		Minor	Mod	Emphasis social responsibility (sustainable resource) Temporary Water restrictions
System failure causing illness	⇔	⇧		✓	High	Minor	Comply with Drinking Water Standards
Water Extraction	⇔	⇔	✓		Minor	Mod	Comply with WRC consent conditions

7.4.3 Water Safety Plan

The Water Safety Plans ensure that, as public water suppliers, Council has developed operational practices which will reduce the likelihood of contamination and respond to and mitigate contamination events. Therefore, the Water Safety Plan identifies the risks associated with the public water supply and provides a plan to manage those risks.

The Water Safety Plan have been developed for the South Waikato Water Supply District as a whole and also for the six individual water supply communities. Refer to South Waikato District Council Water Supplies Public Health Risk Management Plan 2010 for the detailed plan with improvement items.

The Water Safety Plans were developed within the compliance framework to ensure people have clean water to drink and the water is monitored to comply with the Health (Drinking Water) Amendment Act (2007) and Drinking Water Standards for New Zealand (DWSNZ 2008-Revised 2018).

The following table outlines the high and significant risk events that were identified in the Water Safety Plan, together with related mitigation and updated standard operating procedures.

Table 7-4 Public Health Risk Events

Event	Risk Level	Water Supply	Mitigation/ Comment
No Backflow prevention device on at-risk connections	Significant	All	IP 12, Proposed 2009 onwards
Contamination gets into Waihou spring	High	Putāruru	Chlorination
Incomplete removal of manganese	Significant	Arapuni	
Fonterra Emergency Pump - Source water unknown	High	Tirau	
Fonterra Emergency Pump- Treatment procedures and monitoring unknown	High	Tirau	
Source Water mill	High	Athol	
UV Treatment procedures and chlorine	low	Athol	
Operation and management of supply main unknown	High	Athol	
Contamination gets into the trunk mains	High	Athol	
Too much free available chlorine	Significant	Athol	

The South Waikato Water Safety Plan has implemented an improvement programme for the Water Safety Plan to be successful. Some of the major improvements items in progress are:

- Continue Implementation Backflow Prevention
- Continue Update and Implement new Standard Operating Procedures

7.5 Network Asset-related Risks

7.5.1 Highest Asset Risks

Asset related risk assessment

Asset-related risk can be assessed as:

Asset Risk is a function of **Consequence of Failure** (Criticality) and **Probability of Failure** (Condition/ Age)

Highest Asset Risks

Assessment of the Risk of water supply service failure due to asset failure shows the following highest risk assets (based on data in AssetFinda). This assessment also represents the assets' renewals backlog estimated at different levels dependent on the criteria used.

- **Highest risk water supply overall:** 5% ($3.4 M value) of all water supply assets are High or Very High Criticality and are in Poor or Very Poor Condition. Of which:
- **Highest risk Toby assets:** 4% ($2.7 M or number 3,984 out of 9,379) of Toby 'point' assets are Very High Criticality and are in Very Poor Condition. Table 7.5 following shows the diameters of these assets. This raises a concern in overall reliability of the Criticality criteria: potential failure of each individual Toby is not critical for the functionality of the network
- **Highest risk Pipeline assets:** 1.1% (length 2,820 m, or $710,000) of water pipeline assets are High Criticality and are in Very Poor Condition. Table 7.5 following shows the diameters of these pipes.
- Condition-based backlog, i.e., assets in Poor and Very Poor Condition, are associated with 41% of all assets and correspond to $27.1 M replacement cost.
- Age-based backlog, i.e., Assets with an overdue renewal date between 1971 and 2021, based on the Remaining life, are estimated as 7.4% and $5.1 M respectively.
- 8% of the reticulation pipes by length are identified as High or Very High Criticality assets

Further details on the above items are as follows.

Table 7-5 A breakdown for High and Very High Criticality assets with Poor and Very Poor Condition

Asset Class	Condition	Diameter	Criticality	Count of Asset Type	Sum of Quantity/ Length		Replacement Cost
					Quantity/ Length	Unit of measure	
Lines	**Poor**	20	Very High	1	2	m	$72
		100	High	1	138	m	$23,110
		375	High	1	2	m	$1,030
	Poor Total			**3**	**141**	**m**	**$24,212**
	Very Poor	100	High	10	579	m	$97,262
		150	High	21	1,122	m	$226,549
		200	High	6	793	m	$264,012
			Very High	1	31	m	$10,366
		225	High	5	235	m	$88,345
		250	High	2	59	m	$22,150
		375	High	2	3	m	$1,499
	Very Poor Total			**47**	**2,821**	**m**	**$710,183**

Asset Class	Condition	Diameter	Criticality	Count of Asset Type	Sum of Quantity/ Length		Replacement Cost
					Quantity/ Length	Unit of measure	
Points	**Very Poor**	15	Very High	80	80	ea	$50,960
		20	Very High	3,834	3,834	ea	$2,606,040
		25	Very High	46	46	ea	$31,280
		32	Very High	3	3	ea	$2,115
		40	Very High	14	14	ea	$13,486
		50	Very High	6	6	ea	$5,988
		100	Very High	6	6	ea	$7,044
	Very Poor Total			**3,989**	**3,989**	ea	**$2,716,913**
Grand Total				**4,039**			**$ 3,451,308**

Table below represents a summary of the backlog estimates based on Age, Condition and Criticality criteria. A significant discrepancy between different backlog estimates illustrates poor data consistency and proves low confidence in risk evaluations and forecasting mechanisms that rely on low quality data.

Table 7-6 - Water Supply Assets Backlog and Criticality and Risk summary

Category	Criterion	Backlog, % of Total Assets	Backlog, Replacement cost	Reference
Condition	Poor and Very Poor	41%	$27.1 M	**Error! Reference source not found.**
Age	Renewal date overdue	7.4%	$5.1 M	Figure 6.4
Criticality	High and Very High Criticality	8.0%	$24.7 M	**Error! Reference source not found.**
Highest Risk	Criticality High or Very High & Condition Poor or Very Poor	5.0%	$3.4 M	**Error! Reference source not found.**

7.5.2 Confidence in Risk Assessment

Confidence in risk and financial forecasting can be no higher than the asset data confidence. However, the water asset data appears to be mostly Uncertain or Very Uncertain (refer section 8, table 8.6). Therefore, the confidence in the assessment of asset-related risks is also assumed to be mostly Uncertain or Very Uncertain. However, in spite of the uncertainty in asset data, asset related risks can be assessed.

Data confidence risk reduction can be achieved via improvement of the assets' Age, Condition and Criticality data quality. The need for improving the quality and confidence of asset data is shown as high priority in the Improvement Plan in Section 10.4.

7.5.3 Asset Criticality (consequence of failure)

Asset Risks are traditionally managed in a less formal, practical way, e.g., two pumps installed at a pump station in-case one fails. The 'Asset Criticality and Risk Process Report', Waugh Infrastructure Management, September 2007, aimed to assess Asset Risks in a formal approach by prioritising the risks into a matrix.

A list of critical assets has been identified for further analysis as shown below.

Table 7-7 Criticality Matrix

Weighting	Criticality Scoring				
Criteria	Total Score = Weighting x Level	Highest Individual Weighted Point Score	Criticality Assessed from Total Score	Criticality Assessed from Highest Point	Overall Criticality
Backflow preventer (4 found in AMS)	310	80	High	Medium	High
Facilities- SCADA, Repeaters, Bores/Pumps, Disinfection Plant. ('High' criticality, manage separately)	305	80	High	Medium	High
Trunk Mains and Facilities	240	80	High	Medium	High
Public Health Service (Hospital, Maternity, A&E Clinic) Rest Homes	235	80	High	Medium	High
WS Adjacent to Sensitive Infrastructure	235	80	High	Medium	High
Fire Hydrants and Valves associated with critical mains	230	80	High	Medium	High
Pressure Reducing Valves (none identified in AMS)	225	60	Medium	Medium	Medium
Water Aerial Pipes (self-supported/on dedicated structure)	205	60	Medium	Medium	Medium
Single feeds to public facilities	200	60	Medium	Medium	Medium
Single feeds (valve arrangement means that a shutdown will affect) significant Industrial/Commercial customer	200	60	Medium	Medium	Medium
Ground Conditions require extra stabilisation Gravels, high water table, etc	200	60	Medium	Medium	Medium
WS serves main shopping streets, CBD	160	60	Medium	Medium	Medium
Asset Under Railway	155	60	Medium	Medium	Medium
Asset Under Water Body	150	60	Medium	Medium	Medium
Under State Highway (SH1)	150	60	Medium	Medium	Medium
Under State Highway (other)	150	60	Medium	Medium	Medium
Unusual Pipe/Valve sizes	150	60	Medium	Medium	Medium
WS Adjacent to historic area	140	40	Low	Low	Low
Located close to Burial Grounds	135	40	Low	Low	Low
Difficult to Access (located on private property)	135	40	Low	Low	Low
Air Relief Valves (none identified in AMS)	105	60	Low	Medium	Low

As a result of the criticality criteria above, the following Table was created to illustrate the percentage of critical assets within the network. Total of approximately 8% of the reticulation pipes length is identified as critical assets. Asset criticality should be used for prioritising the asset condition assessment and maintenance planning. Additionally, the criticality designation process, as well as the existing criticality data should be audited to ensure the important assets information is up to date and meets the original criticality criteria as per Table.

The percentages of critical assets identified fall within industry accepted standard ranges for this type of analysis, and this was used as a check for the validity of the methodology.

Table 7-8 Critical assets summary

Pipe Diameter	High Criticality assets	Very High Criticality assets	Total Very High & High Criticality assets	
mm	Length, m	Length, m	Length, m	Percentage of the total assets' length of 293 km
0		22	22	0.0%
15	-	215	215	0.1%
20	-	417	417	0.1%
25	-	553	553	0.2%
32	-	505	505	0.2%
40	-	866	866	0.3%
50	177	1,760	1,937	0.7%
65	-	110	110	0.0%
80	-	100	100	0.0%
90	-	-	-	0.0%
100	717	3,872	4,589	1.6%
125	-	444	444	0.2%
150	1,726	1,886	3,613	1.2%
200	5,302	881	6,183	2.1%
225	3,886	476	4,362	1.5%
250	133	133	266	0.1%
300	172	-	172	0.1%
323	-	-	-	0.0%
375	4	406	410	0.1%
TOTAL:	**12,118**	**12,646**	**24,765**	**8%**

7.5.4 Asset Probability of Failure (Condition/Age)

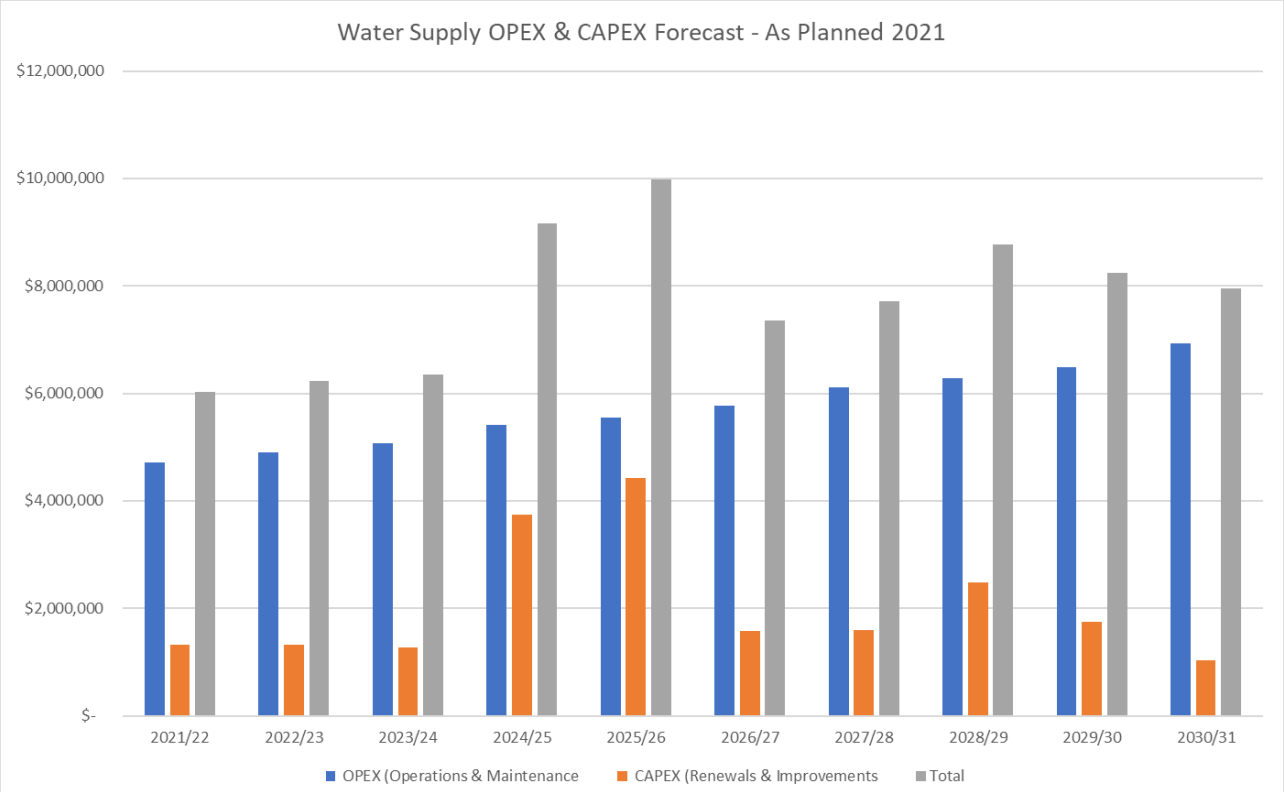
The probability of failure of assets is related to the age and condition of the assets, as well as the events that can lead to asset failure. However, the asset data relating to age and condition appears to be mostly Uncertain or Very Uncertain (refer Section 8, Table 8.6). This is an improvement item identified in Section 10 and is particularly important for higher Criticality assets.

A programme of asset condition assessments is in progress and the results of the assessment of condition-based failure probability and completed asset risk assessment will be included in the next update of this plan.

8 Financial Forecasts

8.1 Summary of LTP Expenditure Forecast

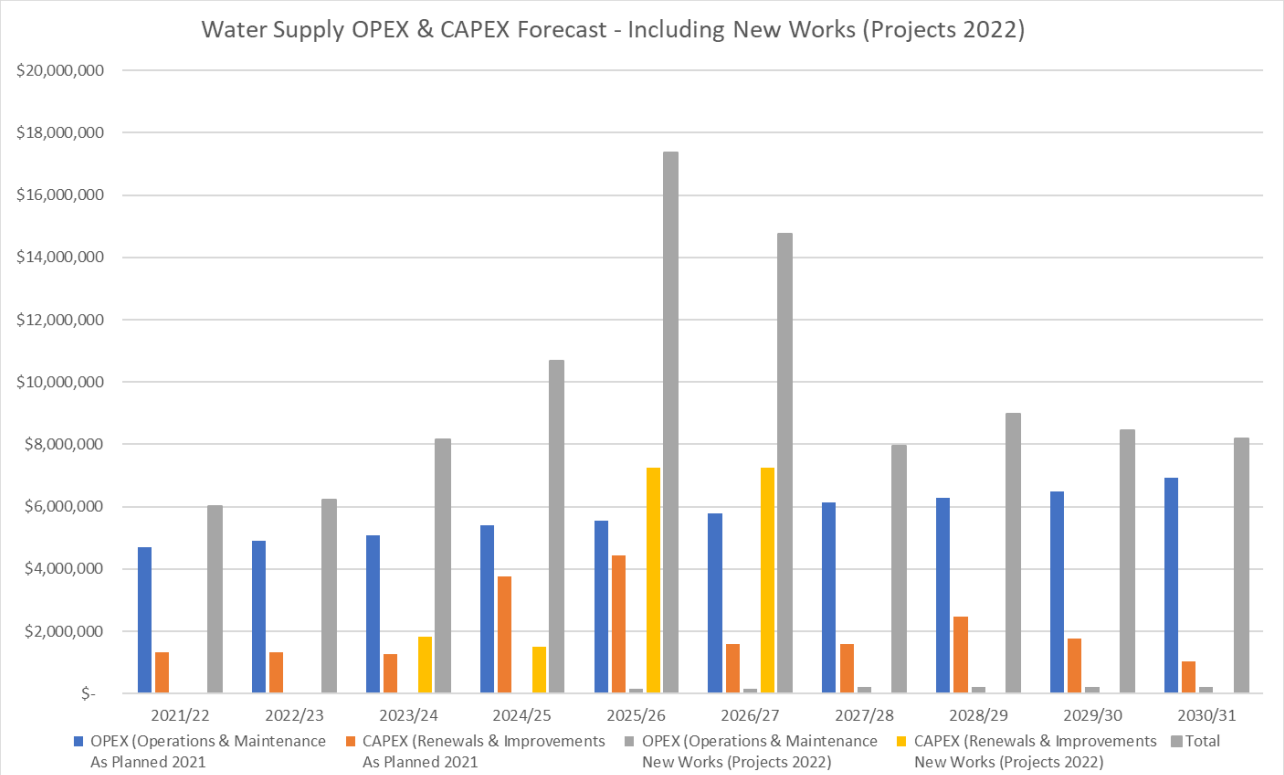
The overall OPEX and CAPEX budget projections are shown below. The table below summarises financial projections for the planning period. These are expressed in 2020/21 dollars and have not been indexed for inflation.



OPEX & CAPEX EXPENDITURE	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
CAPEX (Renewals & Improvements	$ 1,318,500	$ 1,328,500	$ 1,275,500	$ 3,749,500	$ 4,421,670	$ 1,583,500	$ 1,598,500	$ 2,480,308	$ 1,752,797	$ 1,033,500	$ 20,542,275
OPEX (Operations & Maintenance	$ 4,705,837	$ 4,897,153	$ 5,079,044	$ 5,407,310	$ 5,557,790	$ 5,777,091	$ 6,120,170	$ 6,287,936	$ 6,482,979	$ 6,925,970	$ 57,241,280
Total	**$ 6,024,337**	**$ 6,225,653**	**$ 6,354,544**	**$ 9,156,810**	**$ 9,979,460**	**$ 7,360,591**	**$ 7,718,670**	**$ 8,768,244**	**$ 8,235,776**	**$ 7,959,470**	**$ 77,783,555**

Figure 8.1 Financial Forecasts LTP 2021

Additional to LTP 2021 scope, New Water Network Projects were identified in 2022 to meet the new development zoning and stormwater capacity increase based on 100-year ARI flood event modelling. A graphical representation of the forecast OPEX and CAPEX increase is shown in Figure 8.2 below.

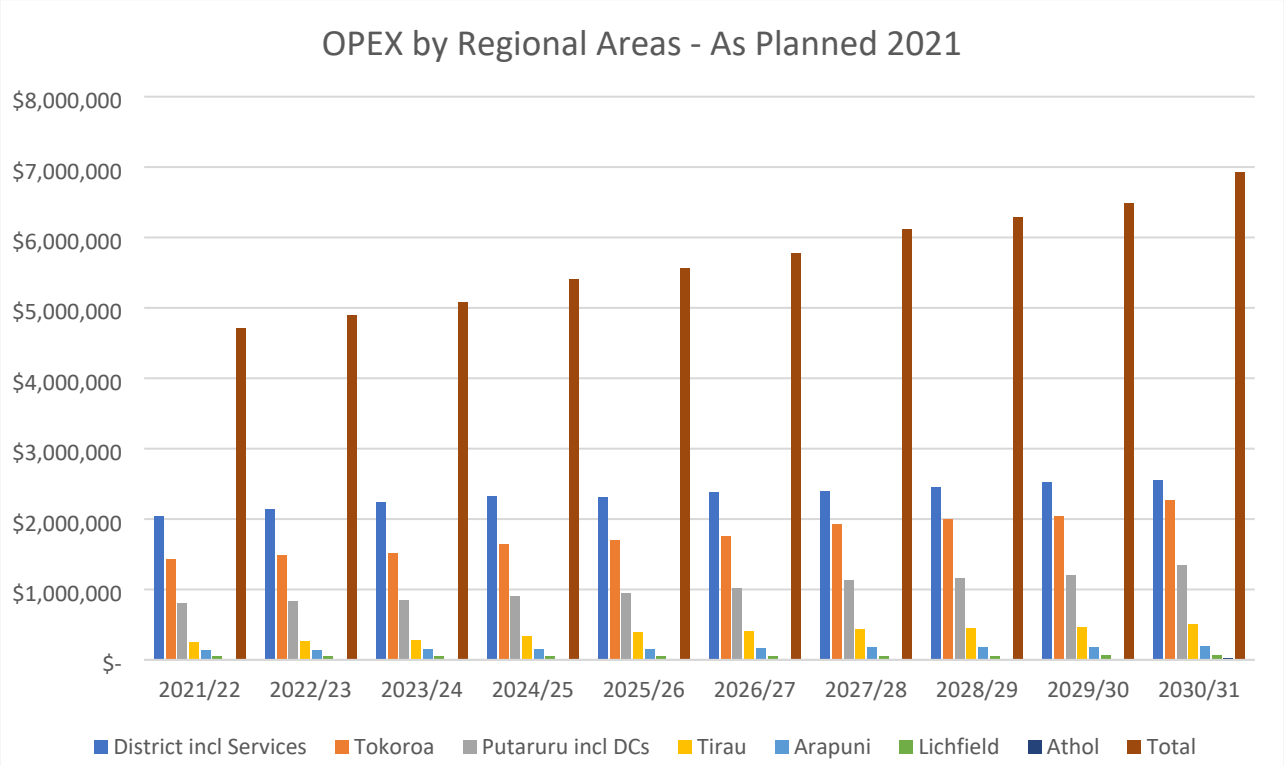


OPEX & CAPEX EXPENDITURE	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
CAPEX (Renewals & Improvements As Planned 2021	$ 1,318,500	$ 1,328,500	$ 1,275,500	$ 3,749,500	$ 4,421,670	$ 1,583,500	$ 1,598,500	$ 2,480,308	$ 1,752,797	$ 1,033,500	$ 20,542,275
OPEX (Operations & Maintenance As Planned 2021	$ 4,705,837	$ 4,897,154	$ 5,079,045	$ 5,407,310	$ 5,557,790	$ 5,777,089	$ 6,120,170	$ 6,287,937	$ 6,482,979	$ 6,925,970	$ 57,241,281
CAPEX (Renewals & Improvements New Works (Projects 2022)			$ 1,812,058	$ 1,511,058	$ 7,239,065	$ 7,239,065					$ 17,801,245
OPEX (Operations & Maintenance New Works (Projects 2022)				$ 1,505	$ 150,447	$ 150,447	$ 222,838	$ 222,838	$ 222,838	$ 222,838	$ 1,193,751
Total	**$ 6,024,337**	**$ 6,225,654**	**$ 8,166,603**	**$ 10,669,373**	**$ 17,368,972**	**$ 14,750,101**	**$ 7,941,508**	**$ 8,991,083**	**$ 8,458,614**	**$ 8,182,308**	**$ 96,778,552**

Figure 8.2 Water New Projects 2022 additional to LTP 2021

8.2 OPEX (Operations and Maintenance) LTP Expenditure Forecast

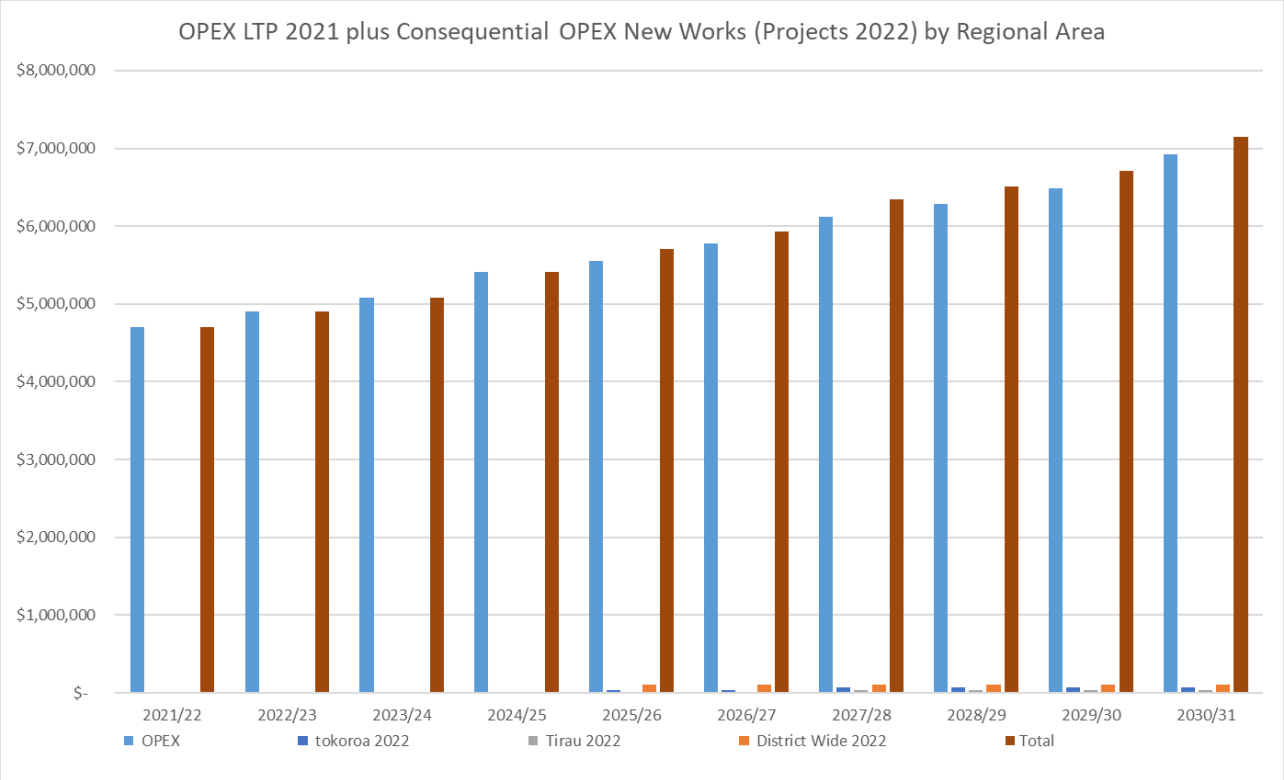
The LTP 2021 OPEX budget projections are shown below. The table below summarises financial projections for the planning period. These are expressed in 2020/21 dollars and have not been indexed for inflation.



OPEX	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
District incl Services	$ 2,036,669	$ 2,131,942	$ 2,243,448	$ 2,318,806	$ 2,301,631	$ 2,376,726	$ 2,390,561	$ 2,443,551	$ 2,522,266	$ 2,547,462	$ 23,313,062
Tokoroa	$ 1,434,612	$ 1,477,331	$ 1,510,988	$ 1,634,047	$ 1,695,765	$ 1,755,300	$ 1,926,495	$ 1,991,241	$ 2,043,097	$ 2,267,653	$ 17,736,529
Putaruru incl DCs	$ 796,893	$ 829,795	$ 845,568	$ 903,599	$ 950,996	$ 1,016,675	$ 1,128,062	$ 1,159,438	$ 1,204,634	$ 1,336,286	$ 10,171,946
Tirau	$ 243,817	$ 257,698	$ 274,220	$ 336,349	$ 389,913	$ 403,489	$ 433,277	$ 446,856	$ 460,750	$ 497,456	$ 3,743,825
Arapuni	$ 135,861	$ 141,415	$ 144,940	$ 151,812	$ 155,614	$ 160,080	$ 172,410	$ 176,498	$ 180,585	$ 198,063	$ 1,617,278
Lichfield	$ 46,618	$ 47,418	$ 48,154	$ 50,445	$ 51,439	$ 52,207	$ 55,827	$ 56,627	$ 57,734	$ 63,687	$ 530,156
Athol	$ 11,367	$ 11,555	$ 11,727	$ 12,252	$ 12,432	$ 12,612	$ 13,538	$ 13,726	$ 13,913	$ 15,363	$ 128,485
Total	**$ 4,705,837**	**$ 4,897,154**	**$ 5,079,045**	**$ 5,407,310**	**$ 5,557,790**	**$ 5,777,089**	**$ 6,120,170**	**$ 6,287,937**	**$ 6,482,979**	**$ 6,925,970**	**$ 57,241,281**

Figure 8.3 OPEX Expenditure by Area

The New Projects 2022 Consequential OPEX impact the overall OPEX budget as follows.



OPEX	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
OPEX	$ 4,705,837	$ 4,897,154	$ 5,079,045	$ 5,407,310	$ 5,557,790	$ 5,777,089	$ 6,120,170	$ 6,287,937	$ 6,482,979	$ 6,925,970	$ 57,241,281
tokoroa 2022				$ 1,505	$ 39,822	$ 39,822	$ 75,927	$ 75,927	$ 75,927	$ 75,927	$ 384,857
Tirau 2022							$ 36,286	$ 36,286	$ 36,286	$ 36,286	$ 145,144
District Wide 2022					$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 663,750
Total	**$ 4,705,837**	**$ 4,897,154**	**$ 5,079,045**	**$ 5,408,815**	**$ 5,708,237**	**$ 5,927,536**	**$ 6,343,008**	**$ 6,510,775**	**$ 6,705,817**	**$ 7,148,808**	**$ 58,435,032**

Figure 8.4 Consequential OPEX for New Projects 2022 addition to OPEX LTP 2021

8.3 New Projects 2022 Consequential OPEX

Included in the LTP 2021 OPEX forecast above is Consequential OPEX which will be required to operate and maintain the Water Supply network as a result of capital works requirements in the LTP period. These are summarised as follows.

Table 8.1 Consequential OPEX for New Works (Projects 2022)

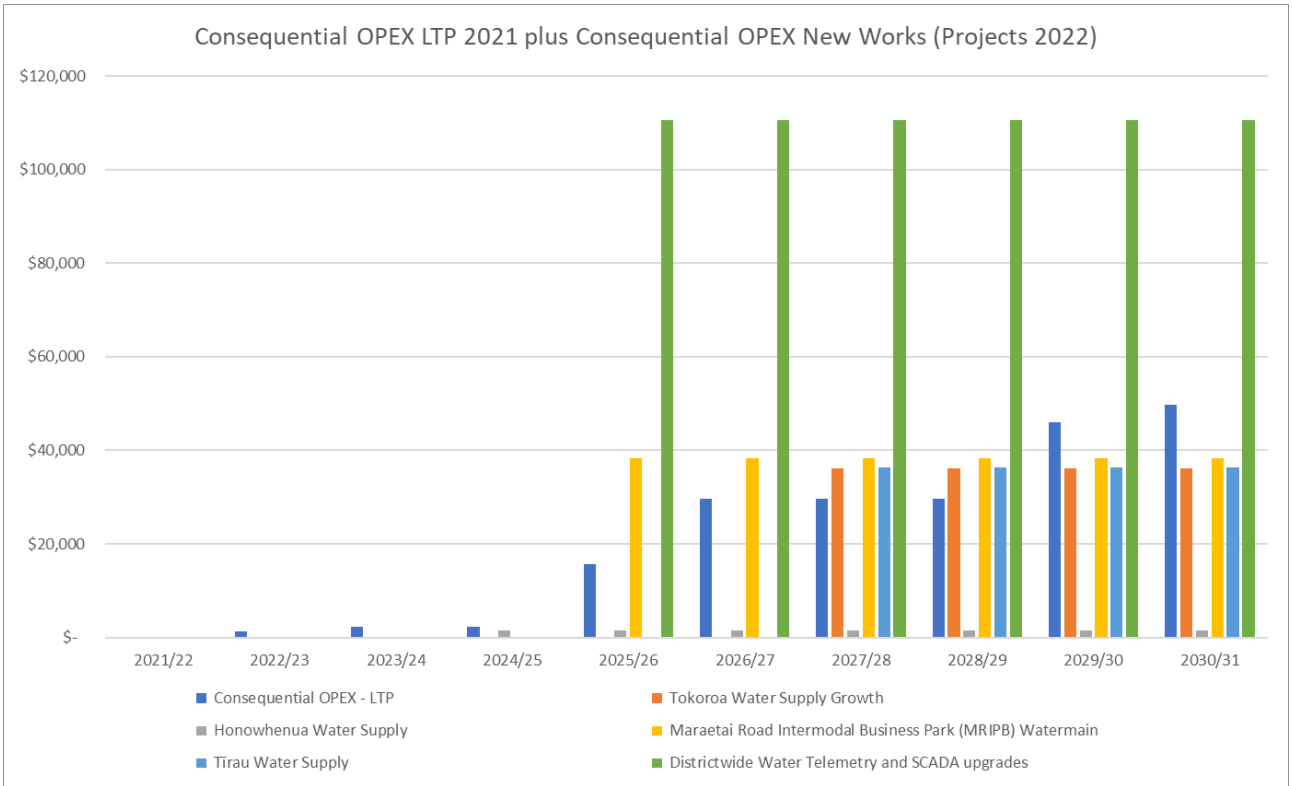
Consequential OPEX	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Tokoroa Water Supply Growth							$ 36,105	$ 36,105	$ 36,105	$ 36,105	$ 144,418
Honowhenua Water Supply			$ -	$ 1,505	$ 1,505	$ 1,505	$ 1,505	$ 1,505	$ 1,505	$ 1,505	$ 10,535
Maraetai Road Intermodal Business Park (MRIPB) Watermain					$ 38,317	$ 38,317	$ 38,317	$ 38,317	$ 38,317	$ 38,317	$ 229,904
Tirau Water Supply							$ 36,286	$ 36,286	$ 36,286	$ 36,286	$ 145,144
Districtwide Water Telemetry and SCADA upgrades					$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 663,750
Total	**$ -**	**$ -**	**$ -**	**$ 1,505**	**$ 150,447**	**$ 150,447**	**$ 222,838**	**$ 222,838**	**$ 222,838**	**$ 222,838**	**$ 1,193,751**

The operation and maintenance requirements consequential to the water network New Projects 2022 are summarised in Table 8.2.

Table 8.2 Consequential OPEX summary for New Projects 2022

Community	Expenditure type	Investment category	Project	CAPEX Project Priority	OPEX factor, annually
Tokoroa	Improvements	Growth	Tokoroa water growth projects	Low	0.5%
	Improvements	Growth	Maraetai Road Intermodal Business Park (MRIPB) Watermain	High	0.5%
	Improvements	Growth	Honowhenua Water Supply	High	0.5%
Tirau	Improvements	Growth	Tīrau Water Supply	Low	0.5%
SWDC	Renewal	Renewal	Districtwide Water Telemetry and SCADA upgrades	High	10%

The impact of New Projects 2022 Consequential OPEX at the overall LTP 2021 Consequential OPEX by project, cost type and area are shown below.



Consequential OPEX	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Consequential OPEX - LTP		$ 1,400	$ 2,225	$ 2,225	$ 15,740	$ 29,746	$ 29,746	$ 29,746	$ 46,065	$ 49,786	$ 206,679
Tokoroa Water Supply Growth							$ 36,105	$ 36,105	$ 36,105	$ 36,105	$ 144,418
Honowhenua Water Supply				$ 1,505	$ 1,505	$ 1,505	$ 1,505	$ 1,505	$ 1,505	$ 1,505	$ 10,535
Maraetai Road Intermodal Business Park (MRIPB) Watermain					$ 38,317	$ 38,317	$ 38,317	$ 38,317	$ 38,317	$ 38,317	$ 229,904
Tirau Water Supply							$ 36,286	$ 36,286	$ 36,286	$ 36,286	$ 145,144
Districtwide Water Telemetry and SCADA upgrades					$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 663,750
Total	**$ -**	**$ 1,400**	**$ 2,225**	**$ 3,730**	**$ 166,187**	**$ 180,193**	**$ 252,584**	**$ 252,584**	**$ 268,903**	**$ 272,624**	**$ 1,400,430**

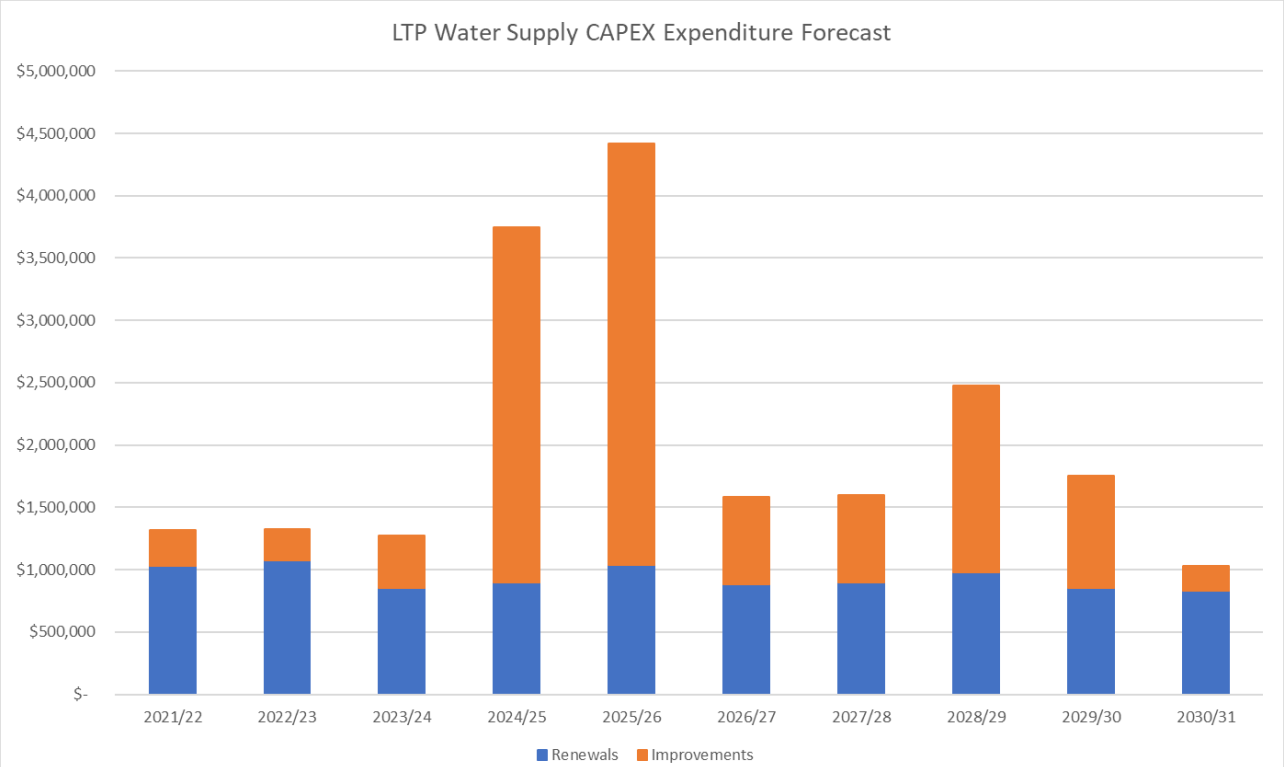
Figure 8.5 Consequential OPEX for LTP 2021 and New Works (Projects 2022) 2021

8.4 CAPEX (Renewals and Improvements) LTP Expenditure Forecast

The overall budget projections are shown below. The table below summarises financial projections for the planning period. These are expressed in 2020/21 dollars and have not been indexed for inflation.

8.4.1 Total LTP Capital Expenditure Forecast

The total LTP Capital Expenditure by Renewals and Improvements expenditure types are as follows.



CAPEX	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Renewals	$ 1,031,500	$ 1,071,500	$ 853,500	$ 894,500	$ 1,038,500	$ 881,500	$ 896,500	$ 978,500	$ 856,500	$ 831,500	**$ 9,334,000**
Improvements	$ 287,000	$ 257,000	$ 422,000	$ 2,855,000	$ 3,383,170	$ 702,000	$ 702,000	$ 1,501,808	$ 896,297	$ 202,000	**$ 11,208,275**
Total Capex	**$ 1,318,500**	**$ 1,328,500**	**$ 1,275,500**	**$ 3,749,500**	**$ 4,421,670**	**$ 1,583,500**	**$ 1,598,500**	**$ 2,480,308**	**$ 1,752,797**	**$ 1,033,500**	**$ 20,542,275**

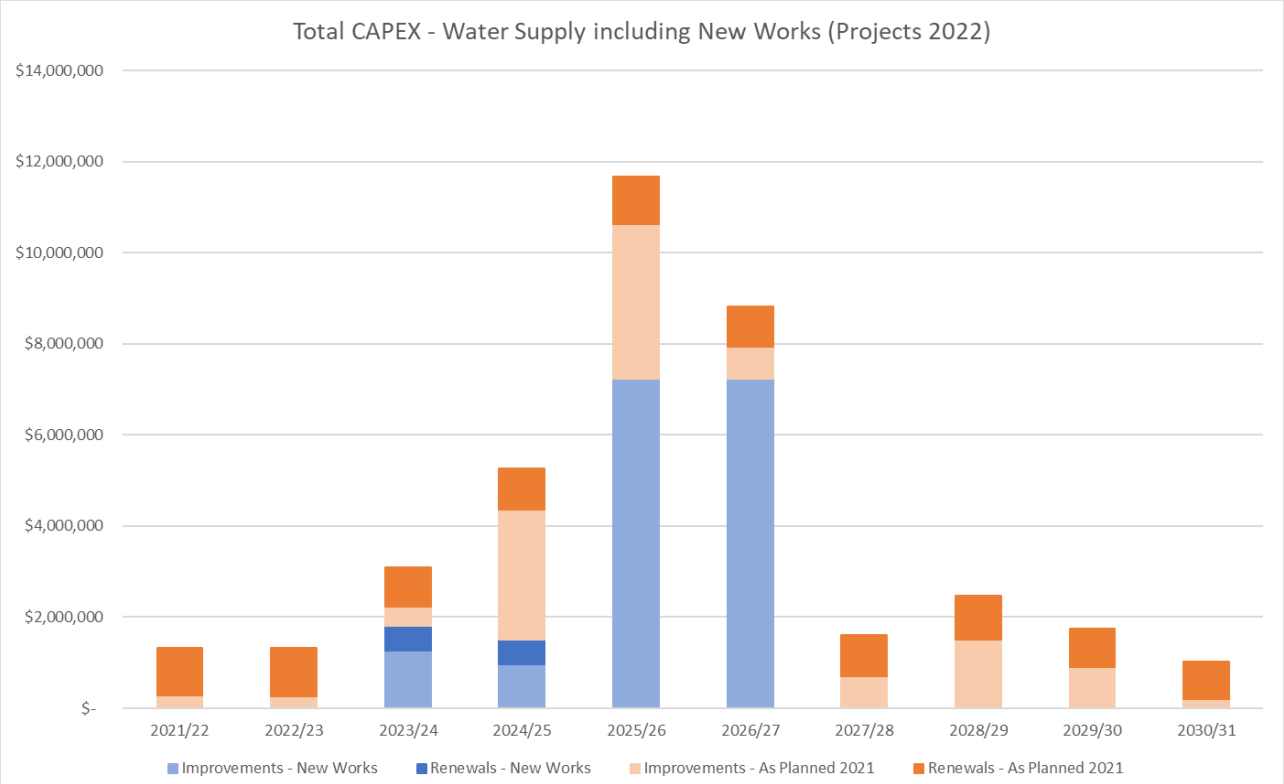
Figure 8.6 Capital expenditure by expenditure type

Additional to LTP 2021 scope, new water network projects were identified to meet the new development zoning and stormwater capacity increase requirements. All water network forecast projects are categorised as Growth (Improvement) CAPEX projects as follows (Table 8-3, Figure 8.7).

Table 8-3 CAPEX Summary - water network New Projects 2022.

	CAPEX Water Network Growth Projects
Year 2023/24	$1,258,933
Year 2024/25	$957,933
Year 2025/26	$7,239,065
Year 2026/27	$7,239,065
Total	**$16,694,995**

The first priority rated Tokoroa Water and Wastewater Growth Projects represent 32% of the overall New Projects-2022 Improvements budget for Financial Year 2022/23 and 48% for Financial Year 2023/24, which increases the overall CAPEX by 18% and 40% correspondingly for Financial Years 2022/23 and 2023/24.

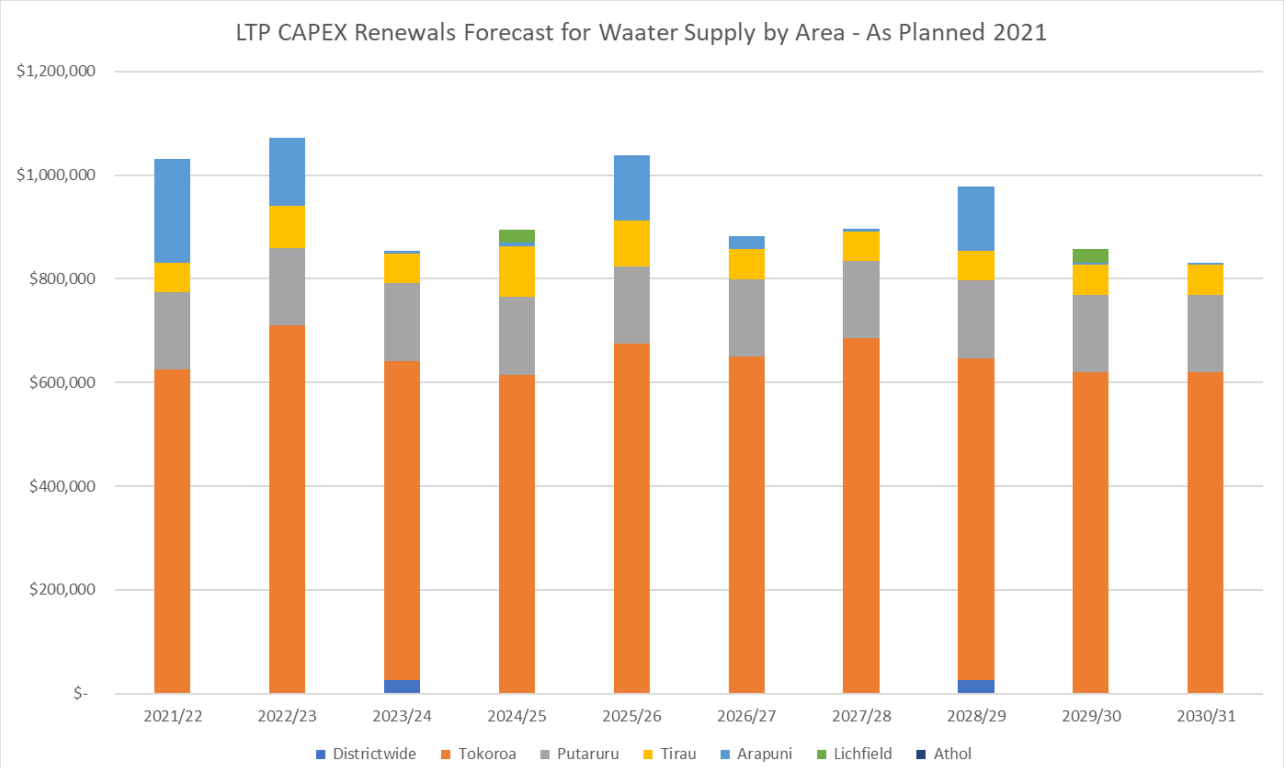


CAPEX	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Renewals - New Works			$ 553,125	$ 553,125							$ 1,106,250
Improvements - New Works			$ 1,258,933	$ 957,933	$ 7,239,065	$ 7,239,065					$ 16,694,995
Total New Works (Projects 2022)			**$ 1,812,058**	**$ 1,511,058**	**$ 7,239,065**	**$ 7,239,065**					**$ 17,801,245**
Renewals - As Planned 2021	$ 1,031,500	$ 1,071,500	$ 853,500	$ 894,500	$ 1,038,500	$ 881,500	$ 896,500	$ 978,500	$ 856,500	$ 831,500	$ 9,334,000
Improvements - As Planned 2021	$ 287,000	$ 257,000	$ 422,000	$ 2,855,000	$ 3,383,170	$ 702,000	$ 702,000	$ 1,501,808	$ 896,297	$ 202,000	$ 11,208,275
Total As Planned 2021	**$ 1,318,500**	**$ 1,328,500**	**$ 1,275,500**	**$ 3,749,500**	**$ 4,421,670**	**$ 1,583,500**	**$ 1,598,500**	**$ 2,480,308**	**$ 1,752,797**	**$ 1,033,500**	**$ 20,542,275**
Total Capex	**$ 1,318,500**	**$ 1,328,500**	**$ 3,087,558**	**$ 5,260,558**	**$ 11,660,735**	**$ 8,822,565**	**$ 1,598,500**	**$ 2,480,308**	**$ 1,752,797**	**$ 1,033,500**	**$ 38,343,520**

Figure 8.7 LTP 2021 plus 2022 Water Supply Upgrades CAPEX Forecast

8.4.2 Capital Renewals Expenditure Forecast

The breakdown of LTP Capital Renewals Expenditure by regional area is as follows.

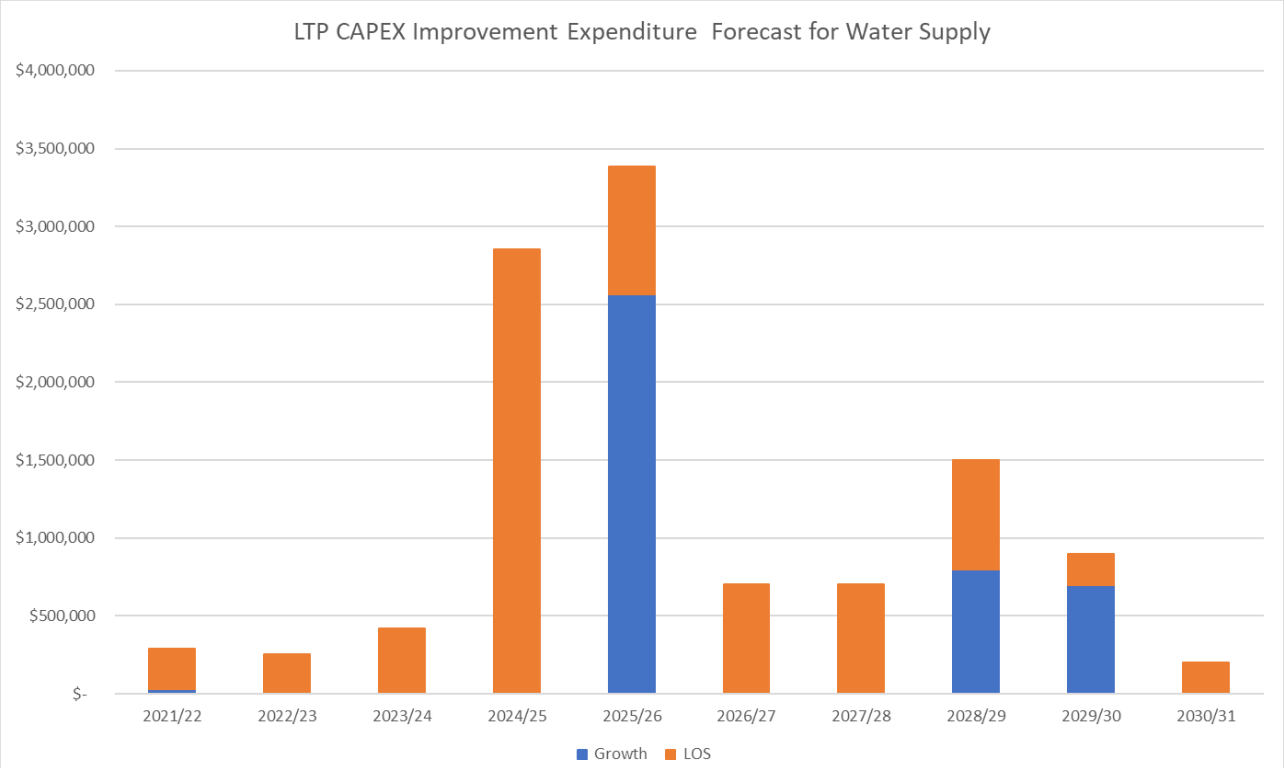


Capital Renewals Expenditure	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Districtwide			$ 27,000					$ 27,000			$ 54,000
Tokoroa	$ 625,000	$ 710,000	$ 615,000	$ 615,000	$ 675,000	$ 650,000	$ 685,000	$ 620,000	$ 620,000	$ 620,000	$ 6,435,000
Putaruru	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 1,495,000
Tirau	$ 57,000	$ 82,000	$ 57,000	$ 99,000	$ 87,000	$ 57,000	$ 57,000	$ 57,000	$ 57,000	$ 57,000	$ 667,000
Arapuni	$ 200,000	$ 130,000	$ 5,000	$ 6,000	$ 127,000	$ 25,000	$ 5,000	$ 125,000	$ 5,000	$ 5,000	$ 633,000
Lichfield				$ 25,000					$ 25,000		$ 50,000
Athol											$ -
Total	**$ 1,031,500**	**$ 1,071,500**	**$ 853,500**	**$ 894,500**	**$ 1,038,500**	**$ 881,500**	**$ 896,500**	**$ 978,500**	**$ 856,500**	**$ 831,500**	**$ 9,334,000**

Figure 8.8 Capital Renewals Expenditure by Area

8.4.3 Capital Improvements Expenditure Forecast

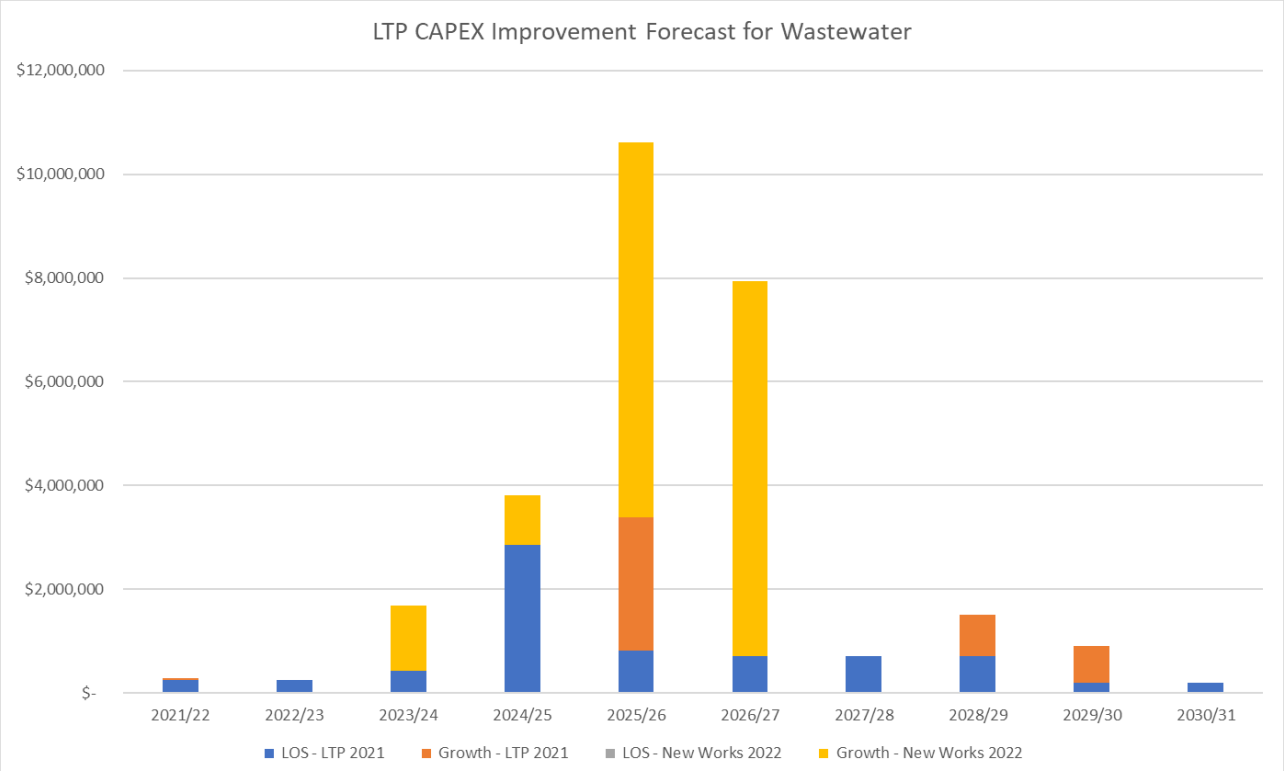
The total LTP Capital Improvements Expenditure by expenditure type is as follows.



CAPEX Impovements Expenditure	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
LOS	$ 257,000	$ 257,000	$ 422,000	$ 2,855,000	$ 822,000	$ 702,000	$ 702,000	$ 702,000	$ 202,000	$ 202,000	$ 7,123,000
Growth	$ 30,000	$ -	$ -	$ -	$ 2,561,170	$ -	$ -	$ 799,808	$ 694,297	$ -	$ 4,085,275
Total LTP plus New Works	**$ 287,000**	**$ 257,000**	**$ 422,000**	**$ 2,855,000**	**$ 3,383,170**	**$ 702,000**	**$ 702,000**	**$ 1,501,808**	**$ 896,297**	**$ 202,000**	**$ 11,208,275**

Figure 8.9 LTP Capital Improvements by Expenditure Type

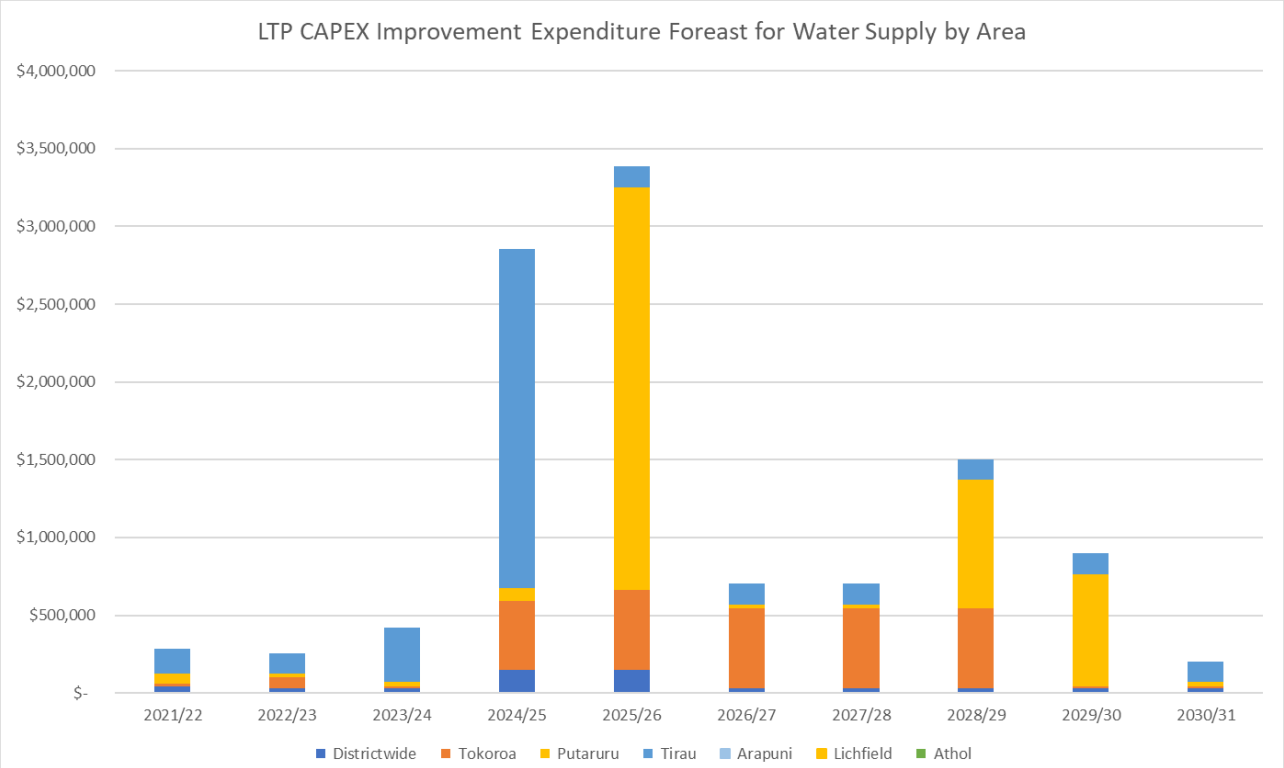
New Water Projects 2022 contribute 75%, 25%, 68%, and 91% to the 2023/24, 2024/25, 2025/26, and 2026/27 Financial Years budgets respectively. Moreover, for the same Financial Years the High priority Honowhenua Water Supply and Maraetai Riad Intermodal Business Park (MRIPB) Watermain projects contribute 75%, 25%, 34%, and 45% to the budget.



CAPEX Improvements	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
LOS - LTP 2021	$ 257,000	$ 257,000	$ 422,000	$ 2,855,000	$ 822,000	$ 702,000	$ 702,000	$ 702,000	$ 202,000	$ 202,000	$ 7,123,000
Growth - LTP 2021	$ 30,000	$ -	$ -	$ -	$ 2,561,170	$ -	$ -	$ 799,808	$ 694,297	$ -	$ 4,085,275
LOS - New Works 2022											$ -
Growth - New Works 2022			$ 1,258,933	$ 957,933	$ 7,239,065	$ 7,239,065					$ 16,694,995
Total	**$ 287,000**	**$ 257,000**	**$ 1,680,933**	**$ 3,812,933**	**$ 10,622,235**	**$ 7,941,065**	**$ 702,000**	**$ 1,501,808**	**$ 896,297**	**$ 202,000**	**$ 27,903,270**

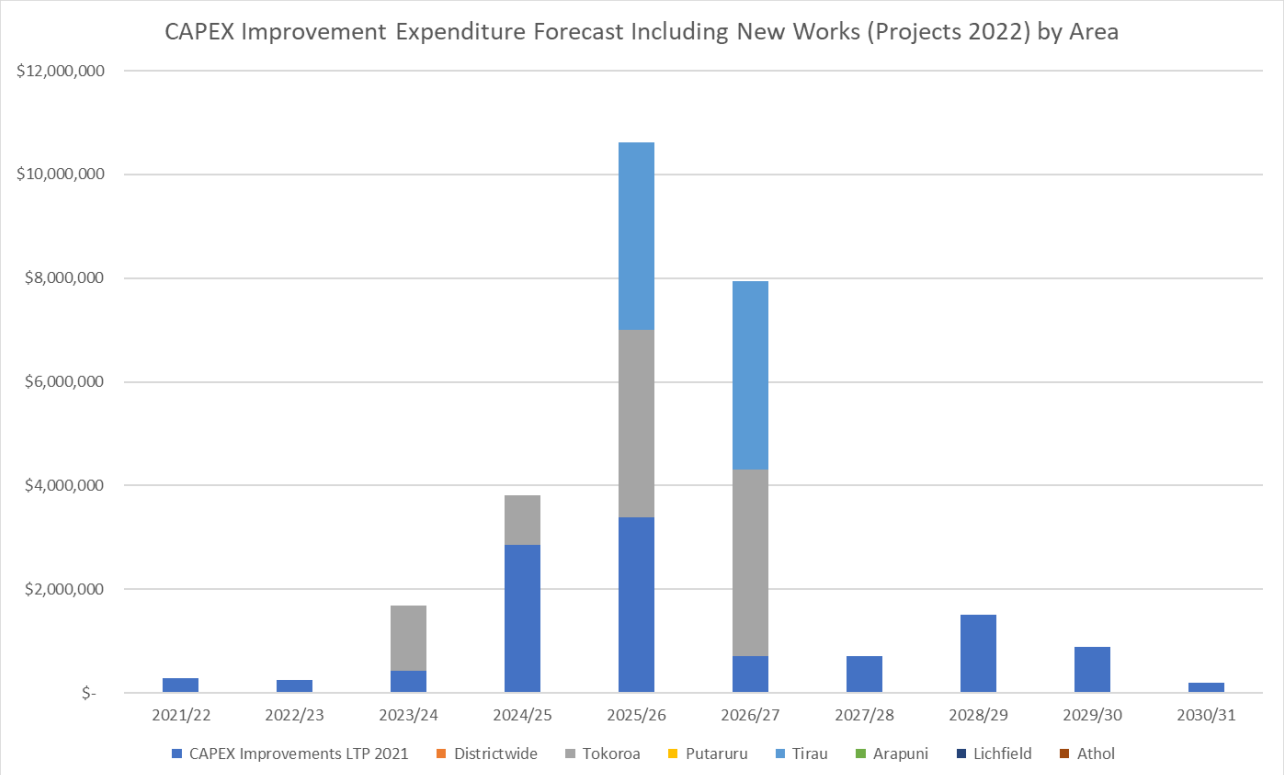
Figure 8.10 Capital Improvements by Expenditure Type plus New Projects 2022

The breakdown of LTP Capital Improvements Expenditure by regional area is as follows.



CAPEX Improvements	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Districtwide	$ 45,000	$ 30,000	$ 30,000	$ 150,000	$ 150,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 555,000
Tokoroa	$ 15,000	$ 70,000	$ 15,000	$ 443,000	$ 515,000	$ 515,000	$ 515,000	$ 515,000	$ 15,000	$ 15,000	$ 2,633,000
Putaruru	$ 65,000	$ 25,000	$ 25,000	$ 80,000	$ 2,586,170	$ 25,000	$ 25,000	$ 824,808	$ 719,297	$ 25,000	$ 3,188,000
Tirau	$ 162,000	$ 132,000	$ 352,000	$ 2,182,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 5,821,000
Arapuni	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,009,000
Lichfield	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 14,830,000
Athol	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 23,839,000
Total	**$ 287,000**	**$ 257,000**	**$ 422,000**	**$ 2,855,000**	**$ 3,383,170**	**$ 702,000**	**$ 702,000**	**$ 1,501,808**	**$ 896,297**	**$ 202,000**	**$ 59,875,000**

Figure 8.11 Capital Improvements by Area



Capital Improvements Expenditure	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
CAPEX Improvements LTP 2021	$ 287,000	$ 257,000	$ 422,000	$ 2,855,000	$ 3,383,170	$ 702,000	$ 702,000	$ 1,501,808	$ 896,297	$ 202,000	$ 11,208,275
Districtwide											$ -
Tokoroa			$ 1,258,933	$ 957,933	$ 3,610,457	$ 3,610,457					$ 9,437,780
Putaruru											$ -
Tirau					$ 3,628,608	$ 3,628,608					$ 7,257,215
Arapuni											$ -
Lichfield											$ -
Athol											$ -
Total	**$ 287,000**	**$ 257,000**	**$ 1,680,933**	**$ 3,812,933**	**$ 10,622,235**	**$ 7,941,065**	**$ 702,000**	**$ 1,501,808**	**$ 896,297**	**$ 202,000**	**$ 27,903,270**

Figure 8.12 Capital Improvements by Area Including New Works (Projects 2022)

8.5 Financial Management Processes and Practices

The Council Strategy is detailed in the 2021 LTP integrating Councils Vision, Outcomes and Strategies.

8.5.1 Financial Strategy

The Council Strategy is detailed in the 2021 LTP integrating Councils Vision, Outcomes and Strategies.

The LTP includes Council's Revenue and Financing Policy, which states the Objectives, Principles and Definitions together with policy statements on Rating and Charging methods and other sources of funding. That was followed by a detailed description of each activity and their associated reasons for involvement; methods of service delivery; principal indicators; distribution of benefits; capital expenditure; costs/benefits and funding conclusions.

The implementation of Council's Financial Strategy is detailed in each individual AMP. The AMPs include statements about Funding Policies; Valuation Policies; Expenses; Changes in Asset Valuation; Capitalisation Threshold and Sensitivity Analysis.

8.5.2 Financial Expenditure Forecasting

The chart below shows the process SWDC use to finalise expenditure.

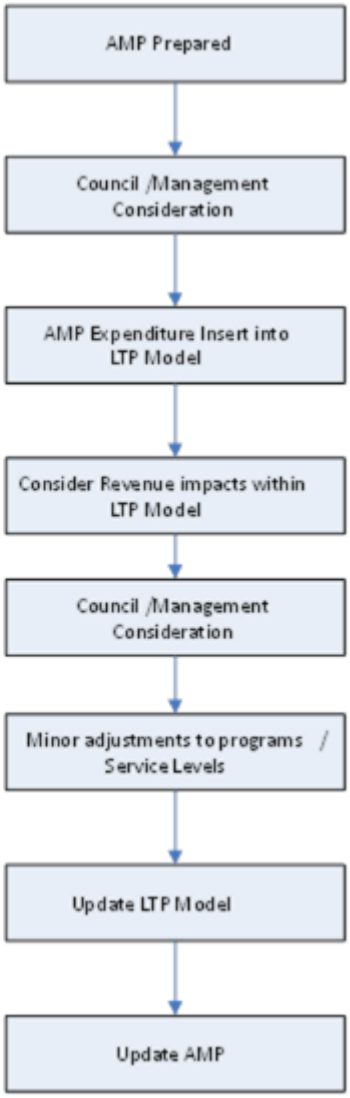


Figure 8.13 Process Used to Finalise Expenditure

8.5.3 Financial Planning, Valuations and Depreciation

AMP budgets were prepared by senior and experienced asset managers. Given the team approach used by SWDC in AMP budget preparations the budgets have been reviewed during workshop and internal review processes by senior managers. The budget setting and review process has been extensive, rigorous, and robust.

Budgeting for renewals of ageing infrastructure is analysed using a spreadsheet that takes account of all relevant data (including the age, remaining useful life, material, quantity, capacity, replacement cost), to calculate the depreciation funding required over a period of decades. The model allows the criteria to be amended to determine the sensitivity of the assumptions and assists long term planning to "smooth" the peaks in the work programme and associated funds required.

Infrastructure asset valuations are reviewed and updated every three years to take account of changes in the quantity, age, condition, remaining useful life and replacement cost. The process includes independent review of the accuracy of the data held in the asset management systems (AssetFinda and RAMM) and includes comparison of replacement costs with those used by similar councils.

8.5.4 Changes in Asset Valuation

The costs associated with renewing assets and providing new or improved asset infrastructure are capitalised and depreciated in accordance with the assessed economic life of each asset. This applies also

where a developer provides infrastructure to be taken over as public assets by Council. Costs of growth are currently met by developers, with any cost effect on Council assessed as not material. Growth costs therefore may be identified by the Vested Assets projections given and are self-balancing.

8.5.5 Capitalisation Threshold

The capitalisation threshold for water supply assets has been set at $5,000. The cost of an asset must be greater than $5,000 to be capitalised. A lower threshold for assets can be used where determined by the budget manager in consultation with the Finance team, and where the value of an individual item is less than the threshold. However, if the item is part of a group of similar items, these may either be expensed or be capitalised at an aggregated amount.

Maintenance is work done that is of an operational nature that neither increases the value nor extends the remaining life of any asset.

Renewal is improvement work done, (including plant, labour, materials, and professional services used), on an existing asset that increases its depreciated replacement value by more than $5000 and extends its remaining life. The cost of renewal is a capital expenditure that must be recognised by an appropriate adjustment in the Asset Register. The renewed value in the AssetFinda Register cannot exceed the optimised replacement value of the asset.

Replacement is work done (including plant, labour, materials, and professional services used), to replace an existing asset that is recorded in the Asset Register. The cost of replacement must be greater than $5,000, unless where the value of an individual item is less than the threshold, but the item is part of a group of similar items, these may either be expensed or be capitalised at an aggregated amount. The corresponding capital expenditure is recorded in the Asset Register as a new asset and is uniquely identified. If the asset replaced is discarded or sold it must be removed from the Asset Register and any residual value must be formally written off.

An addition to the Asset Register is required when a new asset is created with a value (including plant, labour, materials and professional services used) that exceeds $5,000. A new asset must be uniquely identified, and the record in the Asset Register requires an assessment of the asset's remaining life expectancy or straight-line depreciation rate.

Where the asset register recognises an individual component worth less than $5,000, or where a length of pipe greater than 12 metres is replaced, the threshold does not apply, and the additional value is capitalised.

8.6 Current Valuation

The following table summarises the latest valuation, to June 2019. The optimised replacement cost and base life assigned to each asset were determined by Council staff and was initially peer reviewed by Opus International Consultants. The resulting figures have been applied to Council's AssetFinda database to derive the valuation and depreciation. Valuations will be updated every three years.

The notations "lines", "points", and "plants" refer to the broad classification of asset types within the AssetFinda database. In the water supply activity:

- "Lines" mean water pipes and mains
- "Points" mean the end point of each section of pipe, normally manholes
- "Plants" mean all the other structural, mechanical, electrical asset components

Table 8.4 Summary of Water Supply Assets Replacement Costs

Town	Replacement cost, 30/06/13	Replacement cost, 30/06/16	Replacement cost, 30/06/19	Replacement cost, 30/06/21	Replacement cost 30/06/22
Tokoroa	$31,841,724	$26,189,134	$34,770,217	$41,865,276	$54,293,163
Putāruru	$13,762,846	$11,772,594	$14,797,624	$18,115,982	$23,970,516
Tīrau	$4,092,865	$2,960,919	$4,305,561	$5,163,189	$6,490,876

Town	Replacement cost, 30/06/13	Replacement cost, 30/06/16	Replacement cost, 30/06/19	Replacement cost, 30/06/21	Replacement cost 30/06/22
Arapuni	$1,704,436	$1,360,548	$2,167,159	$2,653,954	$3,380,419
Lichfield	$206,188	$163,765	$236,477	$435,124	$563,977
Athol	$326,434	$197,244	$357,312	$447,964	$824,324
Total	**$51,934,493**	**$42,644,204**	**$56,634,350**	**$68,681,488**	**89,523,275**

There has been increase in Replacement Cost since the 2019 valuation, largely due the new Anaerobic Digester and associated equipment at the Tokoroa Water Supply Treatment Plant.

8.7 Assumptions

8.7.1 Base Assumptions

- The current valuation and renewal profiles are based on the best Engineering of the current assets value, condition, and performance.
- The Asset Register is currently the AssetFinda database. Summary data from AssetFinda is supplied to the Fixed Asset Database (NCS) managed by Corporate Support.
- All expenditure is stated in 2020/21 dollars, with no allowance for inflation over the planning period
- All costs and financial projections are GST exclusive
- Operational costs are generally shown to increase in proportion to total demand and anticipated real energy price increases
- Renewal costs are based on the plans outlined in Chapter 5
- New assets requirements have been derived from analysis of service level changes, growth and risk
- The costs of insurance and risk mitigation are included in the forecasts, however the potential costs that could arise through exposure to risk are not
- Climatic and other environmental trends are expected to largely continue as they have in the past
- Population and Households growth is assumed to be growing by 0.3% in Tokoroa and 1% in Putāruru, Tīrau and Arapuni.
- This Plan assumes no growth in commercial/industrial demand
- Asset values and lives have been taken from the 30 June 2019 valuation.

8.7.2 Asset Condition

In the case of water pipelines the condition of the pipe is taken as being directly related to its age unless better information is available. The different types of pipes have been attributed various average life expectancies and then a normal distribution has been applied for 20 years either side of the failure year to try to model what generally happens in practice. In a given area of reticulation installed at the same time, some parts will fail earlier than expected and some later.

This method of describing condition of underground assets will be used until such time as a better one is available. The Council's continuing programme of pipe sampling and testing during repairs provides additional information on pipes that are approaching the end of their useful life, but it would be incorrect to extrapolate the observed condition of failing assets to all assets. While physical inspection would provide a more direct assessment of condition, the cost of such a programme is prohibitively high. It is considered to outweigh the twin risks of accumulating excessive or insufficient depreciation reserve funding, where this is based on a conservative asset life. The emphasis for physical condition inspections will be placed on critical assets. The adopted age/condition relationship should ensure that Council adequately provides for minimising decline in service potential in any one year and proactively manages the risks associated with the failure of critical assets.

8.7.3 Improved Level of Services

At present there are a number of Water Supply plants that are not connected to Councils Telemetry system, we have budgeted to connect these pump stations, so we have improved control of these pump stations.

8.7.4 Above Ground "Plant" assets

Plant assets have a large variety of useful lives and operating conditions, so most of the annual renewal programmes are centred on the prudent replacement of assets that demonstrate declining performance and reliability.

In assembling the plant replacement programme, and checking data for the revaluation, it has been necessary to re-check the inventory for useful lives and cost. There also have been extensions of individual assets to sub-component level so that significant asset items are recognised separately.

8.7.5 Replacement Needs Cost

The Capital Renewals shown in the following figure have been derived from the Council's Assets register in 2021. The cost of renewals over the plan period can be seen in the chart. The figures for reticulation and plant have been derived directly from the asset register and are not inflation adjusted.

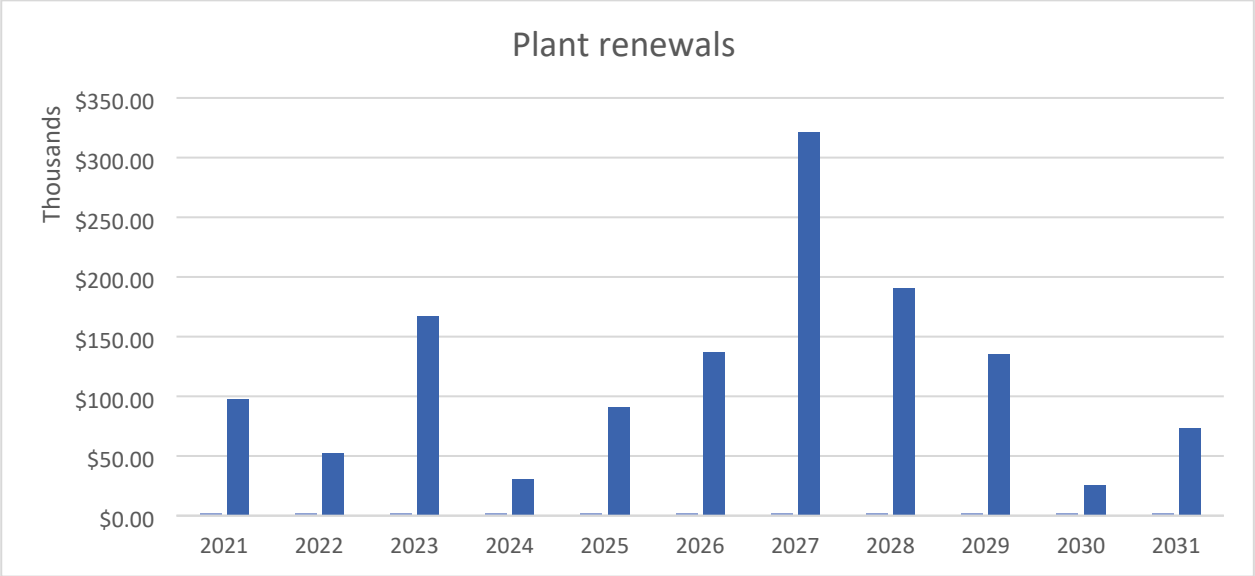


Figure 8.14 Capital Renewals Needs

The assumption that has been made regarding renewals following analysis of the asset register data, operational experience, national trends, and debate amongst the senior asset managers involved in the project is that the asset life figures, and subsequent projected renewals are conservative. There is no doubt that the AC pipes in particular are nearing the end of their life, however it is expected that the bulk of replacements will occur in the period 2027-2028. This assumption has been adopted in the financials. Depreciated Value and Life Expectancy Policy Straight-line depreciation has been adopted for all above-ground water supply assets and optimised depreciated replacement costs (ODRC) have been calculated. The remaining life over which assets are depreciated are shown for each asset in the asset register and have been assessed by taking account of the various factors that have affected the particular asset's base life expectancy, in accordance with the IIMM.

The following life expectancies were used for the June 2019 Valuation.

Table 8.5 Comparison of Base Lives 2010 and 2013

Pipe Type	Base Life 2010, years	Base Life 2013, years	Base Life, 2016,years	Remarks
AC-E	60	60	Tokoroa 60 yrs. Putāruru 65 yrs. Tīrau 75 yrs.	"Everite"
AC-F	75	75	75	"Fibrolite"
LDPE	35	45	45	"Alkathene"
RC	90	90	90	Reinforced conc.
GI	80	80	80	Galv. Iron
MDPE	90	90	90	
HDPE	100	100	100	
PVC	75	75	75	Obsolete
uPVC	80	80	80	
mPVC	90	90	90	
Steel	80	80	80	"Victaulic in Arapuni"

These values were derived from published data from other Councils and the International Infrastructure Management Manual, modified by deterioration failure records and observations by Council employees. Values for pumps, electrical and telemetry assets will be ascertained during replacement work.

8.7.6 Depreciated Value and Life Expectancy Policy

Straight-line depreciation has been adopted for all Water Supply assets and optimised depreciated replacement costs (ODRC) have been calculated. The remaining lives over which assets are depreciated are shown for each asset and have been assessed by taking account of the various factors that have affected the particular asset's base life expectancy, in accordance with the IIMM.

The following life expectancies were used to calculate depreciated values for water pipes:

Table 8.6 Typical Pipe ("Line") Material Base Lives

Pipe Material	Base Life
RCRRJ	85
Glazed Earthware	80
mPVC	90
Steel	80
uPVC	80
mDPE	90

The following life expectancies were used to calculate depreciated values for 'point' fittings. Changes from previous valuation are shown against each type. These indicate a more conservative approach based on experience with repairs and replacement of the fittings.

Table 8.7 "Plant" Base Lives

Asset Type	Base Life
Air valve	**50**
Electrical	**25**
Manholes	**80**
Pumps	**20-30**
Control Equipment	**25**

These useful lives were derived from published data from other Councils, the International Infrastructure Management Manual modified by deterioration failure records, and observations by Council employees. Other values for pumps, treatment plant components, electrical and telemetry assets were checked and adjusted, as necessary, during the 2013 valuation.

Base life values were deemed to be accurate enough for the 2019 asset valuation.

8.8 Confidence Levels and Financial Forecasting Risks

The degree of reliability of the data affects confidence and margin of error in the projected renewal programmes and financial forecast estimates.

Table 8.8 Confidence Grading Table

Confidence Grade	General Meaning
A	Highly Reliable Data based on sound records, procedure, investigations, and analysis, documented properly and recognised as the best method of assessment
B	Reliable Data based on sound records, procedures, investigations, and analysis, documented properly but has minor shortcomings, for example the data is old, some documentation is missing, and reliance is placed on unconfirmed reports or some
C	Uncertain Data based on sound records, procedures investigations, and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data is available
D	Very Uncertain Data based on unconfirmed verbal reports and/or cursory inspection and analysis

The Confidence Level of different categories of Asset Information based on asset data quality, completeness and currency varies from Very Uncertain to Reliable as shown in the following table. The data for the assets' Age (6 - Date of Installation) and Condition (2b – Condition/Remaining Life of Buried Components) is graded as Uncertain and Very Uncertain. Financial forecasting confidence is limited by the low confidence asset data. Low data confidence for assets' Criticality, Age and Condition, and the low confidence risk assessments contribute to the uncertainty of financial forecasting and increase the forecasting risks.

Table 8.9 Assessment of Confidence in Key Inputs to Programmes

Assessment of Confidence in Key Inputs to Programmes					
	Attribute	**D Very Uncertain**	**C Uncertain**	**B Reliable**	**A Highly Reliable**
1	Unit cost for Replacement				
2	Condition/Remaining Life:				
2a	*Above-ground Civil, Mechanical & Electrical*				
2b	*Buried Components*				
3	Asset Size				
4	*This field is not applicable*				
5	Material				
6	Date of Installation				
7	Asset Type				
8	Location				
9	Length (pipelines)				
10	Quantity (other assets)				
11	Deterioration Rates:				
11a	*Above-ground Civil, Mechanical & Electrical*				
11b	*Buried Components*				
12	Asset Performance				
13	Demand Information				

Notes

- 2, 6, 11b: While condition, remaining life, material, and installation date and deterioration rates are not as accurate as desired, fault frequency generally demonstrates that within this ten-year plan period, buried components are very unlikely to require significant renewal. Depreciation rates have been conservatively set, so that in future plan periods there should be adequate funding to sustain a renewal programme based on better data.
- Accuracy of Depreciation cost is medium due to some uncertainty of asset life, but has been set conservatively to compensate in the medium term
- Confidence in renewal costs over the plan period is higher than that in the depreciation figures because of observed reliability performance of buried assets.

9 Processes and Practices

This section describes how SWDC manages its asset infrastructure in an integrated manner.

9.1 Summary of Expenditure

The following organisational structure outlines the responsibilities and linkages between the Group Managers.

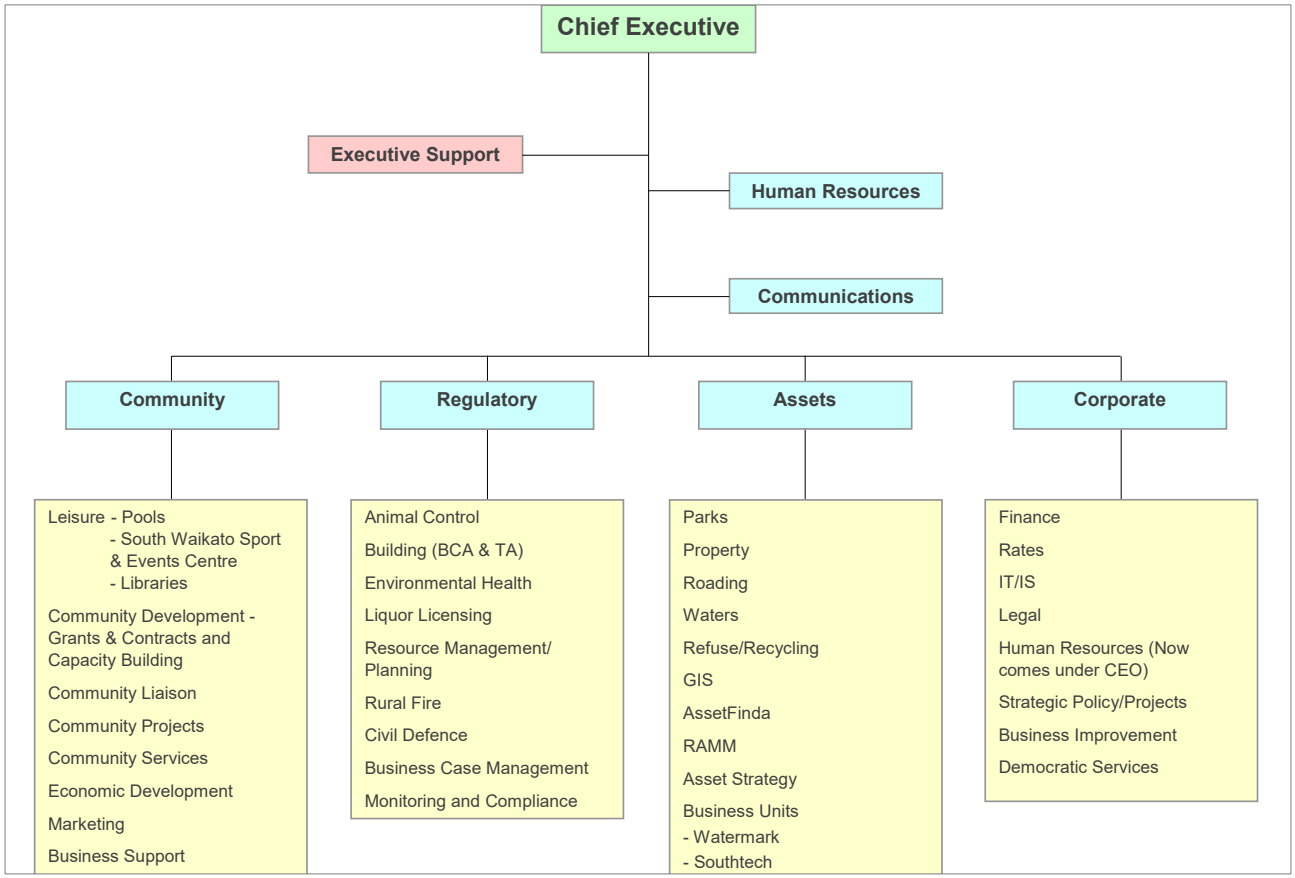


Figure 9.1 Organisational Structure

9.2 Responsibilities for Asset Management Outcomes

Council's infrastructure assets are managed by the Assets Group.

The Group Manager, Assets is responsible for managing the infrastructural assets that provide the services of Land Transport, Water Supply, Water Supply, Stormwater, Refuse Landfills and Community Facilities and Property. This responsibility includes:

- Ensuring that infrastructure is provided and maintained in a manner that it is capable of delivering the agreed Levels of Service and complies with resource consent conditions
- Planning and long-term budgeting of capital, operating and maintenance requirements
- Monitoring Levels of Service provided by the assets
- Identifying and managing asset and service-related risk
- Reporting of Level of Service, Key performance indicators and Risks at asset level
- Achieving Asset Management practice defined in the Asset Management Policy
- Asset Strategy - Coordination of asset management plans and improvements

9.3 Business Processes

9.3.1 Asset Management Systems (AMS)

SWDC operates two separate asset management systems for maintaining an up-to-date inventory of assets, expected useful lives, age, condition and performance assessment, renewal timeframes, installed cost, replacement cost and maintenance history.

- AssetFinda is used for the 3 Waters, Landfill, Parks and Property assets
- RAMM (Road Assessment and Maintenance Management) is used for Land Transport assets.

AssetFinda is a cost-effective solution for a number of smaller councils in NZ. AssetFinda is used to manage and produce asset inventory reports. It is integrated with the MapInfo data tables to permit input, querying, reporting, and financial modelling using the asset register data. Reports can be produced for high level asset groups (“lines, points and plant”), monthly depreciation for additions and deletions as well as summaries since the last revaluation. Asset Group data can be filtered from the standard report by output to, and manipulation in, a spreadsheet.

The default valuation process used by AssetFinda is capable of recognising asset condition, extending the life of the asset if appropriate, and recalculating revised depreciated value and annual depreciation.

AssetFinda is reviewed, upgraded, and extended from time by the vendors, to meet the requirements of the users.

Financial Management

SWDC operates the NCS (Napier Computer Systems) corporate financial management software, which has been developed specifically for local government planning, operational, and reporting purposes. NCS does not store or compute asset management information but could be used to determine the number of properties billed for rates for checks against connections to the infrastructure shown in GIS.

NCS currently holds the Fixed Asset Register and Property related data. The Fixed Asset Register, which is part of the NCS Accounting software, holds the valuation information for buildings and depreciation of buildings is calculated using NCS. Depreciation for the 3 waters assets is calculated using AssetFinda.

Each of the asset infrastructure groups has its own cost centre in Council’s accounts. The income from fees and charges and the costs of maintenance, operation and capital improvements are accrued to the group to which they apply.

Document Management

SWDC operates the ECM electronic document software for storing documents.

Historical paper drawing records are stored in secure filing cabinets with an electronic catalogue, while more recent CAD drawings are stored electronically in a network drive.

Resource Consent Management

CSVue is used to record resource consent information issued by the Waikato Regional Council and to manage the relevant consent compliance monitoring and reporting requirements. The software also provides alerts for actions that are required. Relevant consent documents are stored in ECM.

Geographical Information System (GIS)

The Assets Group operates a GIS to display and manage core infrastructural asset data held in the Asset Management System.

The GIS provides the following functionality:

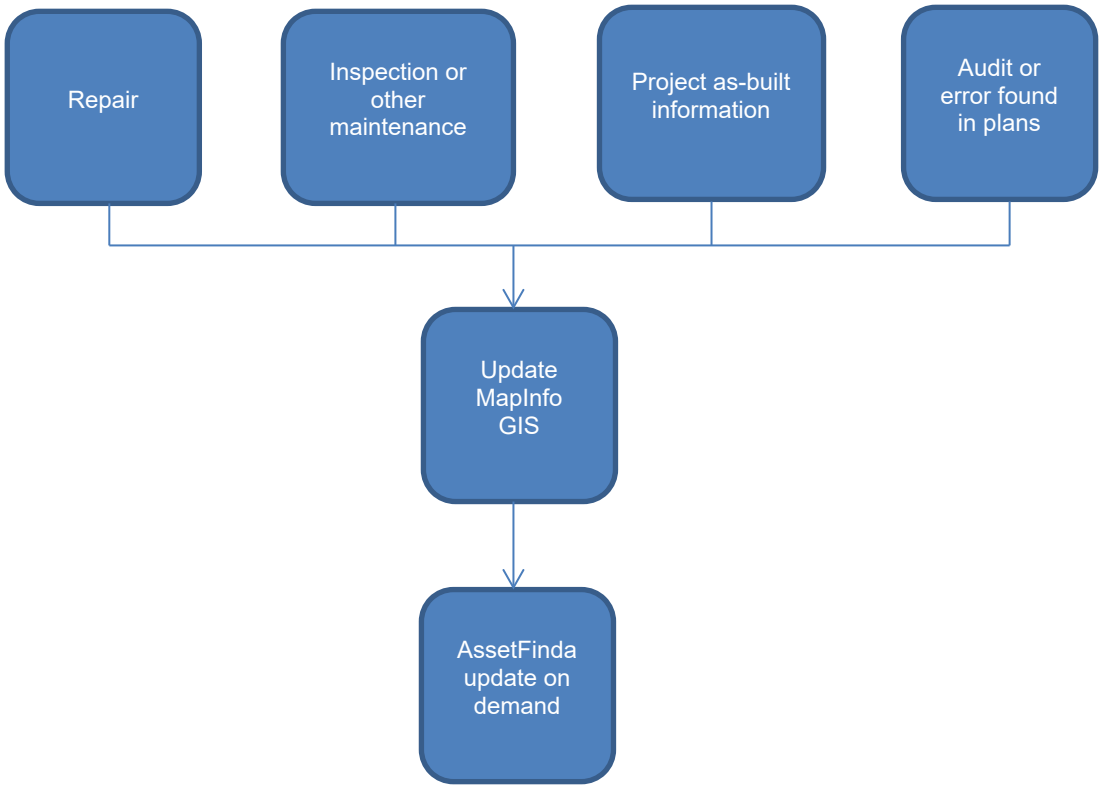
- The spatial component (geometry) of AMS data is be created, deleted, or edited.
- Displays asset data as map feature layers for internal and external users.
- Map features can be queried to retrieve feature attributes, and spatial relationships between layers can be analysed.

- Non-asset data layers such as property parcels, road centrelines (CRS), building outlines and aerial photography is available.
- Property layers linked to Council's rates and valuation systems can return owner and land information
- Provides a link between Map features, as-built drawings and other documents held in Council's document management system

There are standard operating procedures to ensure that the GIS database is maintained up to date, and to ensure that correct information is given out to users of the database.

GIS data is updated as shown in the following process chart.

Figure 9.2 GIS Update Process



9.3.2 Key Information flows and processes

Key information flows and process linkages include:

- Developing the LTP including the Public Consultation phase (from which the Council Outcomes are derived)
- Translating the Council Outcomes into detailed levels of service and performance measures that can be embodied in fixed assets, processes and contracts for service
- Identifying future demand and then planning appropriate capacity increases
- Identifying and planning upgrades to comply with legal requirements or to improve performance
- Preparation of long term and annual budgets, and associated on-going reporting
- Establishing service level agreements with Southtech and Council’s Water Services department
- Developing contract specifications and standards, and then engaging external contractors through prescribed procurement processes

- On-going management of those contracts and service level agreements
- On-going compliance monitoring and reporting of environmental performance
- Responding to customer requests for service and complaints

These key information flows and process linkages are shown diagrammatically below in Performance Management System Hierarchy. Refer also to the Corporate Performance Management Framework (DocSet 289107).

Figure 9.3 Performance Management System Hierarchy

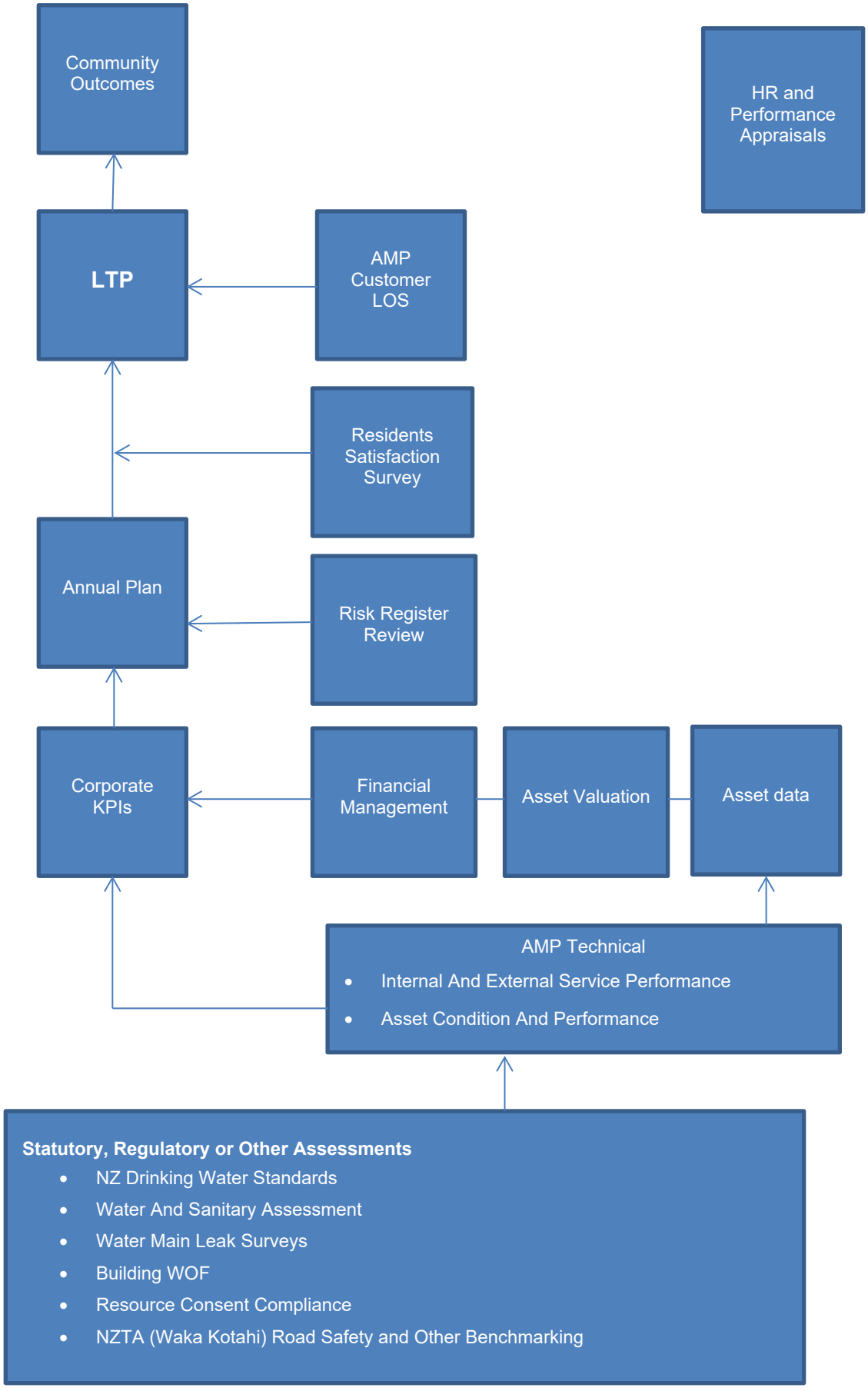


Table 9-1 Key Asset Processes

Process	Utilities
Procurement	• Professional Services are obtained from Council's Services Business Unit • Water and Water Supply maintenance activities are carried out by Council's Water Services department, via annual Services agreements • Stormwater maintenance activities are carried out by an external contractor, arranged through competitively tendered contracts.
Expenditure Decision-making	• Formal processes have still to be developed. This will require the development of guidelines and indicators which trigger the desired response, and rank projects according to risk, financial capability, and optimised lifecycle costing. These processes will include: • Trigger Point for Renewal • Trigger Point for Extension or New Capacity • Evaluating/Prioritising Projects • Evaluating/Prioritising Renewal Projects • Evaluating/Prioritising New Works Projects
Asset Operation & Maintenance	• The following processes are used for maintaining and operating water assets: • Standards as described in the Levels of Service, Maintenance Contract Specification and Service Agreements • Operating Standards as defined in the operating procedures (SOPs) • Maintenance Standards and policies defined in Council's Water Services procedures are established by reviewing the performance and cost of maintenance work • Routine (programmed) maintenance check inspections are carried out for critical assets
Asset Renewals	• The following processes/practices are used for renewing assets: • Rehabilitating existing assets were economic • Condition assessment • Asset criticality Matrix criteria • Financial treatment of renewal-projects • Most plant renewal is reliability-driven • Current criterion for renewal of network pipes is a failure rate greater than or equal to two breaks per year for two consecutives in any individual residential block
Constructing/ Vesting of New Assets	• Procedures are used for: • Constructing New Assets, particularly where demand for additional capacity may arise from commercial customers and where upgrades are driven by consent conditions • Vesting assets to Council, most likely to occur in the case of subdivision • Existing Assets to be bought by Council, however this is not expected to happen
Disposal of Assets	• Procedures are used for the following: • Trigger point for decommissioning • Issues to be considered for disposal as outlined in the LGA 2002

Process	Utilities
As-Built Records	• The AssetFinda inventory largely relies on information from Council's maintenance contractors, as-built records of new works and results of monitoring and testing activities. Fieldwork recording sheets and processes to ensure the records are updated in the asset register and GIS, have been put in place. The sheets identify any existing asset that is being renewed or replaced and record the details necessary to fully update the asset register or the GIS system as appropriate
Quality Management	• Management is guided by the requirements of the following: • Drinking Water Standards of New Zealand • Health (Drinking Water) Amendment Act • Generally accepted accounting practice - NZ IAS 16 • The International Infrastructure Management Manual • Council Asset Management Policy • Resource Consent Conditions • Council Health and Safety Plan • Council Quality Assurance Documents • Standard Operating Procedures and Operations Manuals • Requirements include: • Water Supply Testing and Monitoring, A programme of source, treatment point and distribution system water sampling and testing is operated • Treatment Management, the source water is pre-treated • Storage and Reticulation Management for Water Quality • Council's Stormwater Management Plan (SMP) is a key document and a companion reference to this Asset Management Plan. It identifies the issues, values and opportunities associated with urban stormwater. Planning tools that provide the basis for management, and details of the legal framework are discussed in the SMP • Water Supply sourcing and treatment is in accordance with consent conditions
Performance Management Process	• Monitoring and reporting of service levels • Monitoring and reporting of consent compliance • Public Health monitoring QA system via Standard Operating Procedures • Monthly and quarterly Management Reporting

9.4 Monitoring and Reporting Performance

Monitoring of performance and service delivery is achieved by various means, including:

- Service delivery, service requests, projects, performance measures and KPIs are reported six-weekly to Council.
- Resource consent compliance reports are submitted to the regulatory authority (Waikato Regional Council)
- Drinking water quality test results are submitted to the District Health Board
- Roading reports are submitted to the funding authority (NZTA) - including condition rating, traffic data and the annual Achievement Report
- Financial performance is reported monthly to Council

Further details are provided in the respective activity AMPs.

9.5 Quality Management/Confidence

Data quality in AssetFinda is audited randomly to verify the existence and location of particular assets, as well as the condition, where the items are visible.

Samples are taken from the ageing asbestos cement water pipe samples and analysed to determine their condition and assessed remaining useful lives then recorded in AssetFinda to improve confidence in planning the replacement programme.

More detailed verification is required and independently reviewed for the triennial asset revaluations, at which time the remaining useful lives and replacement costs are updated.

New construction and renewal/replacement items are recorded in AssetFinda, following the capitalisation process, which includes all related project costs such as investigation, reporting, consenting, design, procurement, installation, and supervision. As-built information is provided by the contractor.

10 Asset Management Improvement Plan

10.1 Asset Management Plan Improvement Process

Council has been actively committed to effective asset management since the mid 1990's. This commitment has included in-house production of asset management plans since 1998, implementation of asset management systems and associated data collection.

During the period 2004-2006 Council's AMPs were updated to meet requirements of the Local Government Act 2002 and progress with asset management practice was incorporated into the plans. Resulting from the analysis in the 2008 AMPs an asset management improvement programme was implemented.

South Waikato District Council completed a formal assessment of appropriate asset management practice in 2008. The report "South Waikato District Council - Selecting the Appropriate AM Level" was prepared by Waugh Infrastructure Management. The report used a structured process to determine the appropriate level of asset management, using guidelines provide in the IIMM.

The report recommended that the "core plus" level of asset, management was appropriate for all of the activities. Based on the value of our assets and the maturity of our asset management practice, and the reports recommendation, Council adopted in the Asset Management Policy 2008 a target level of "Core plus". Since this time the International Infrastructure Management Manual 2015 (IIMM 2015) has renamed "Core plus" as "Intermediate". Every 3 years in synchronicity with the LTP process we reassess progress towards the goal of "intermediate" level.

10.2 Review of asset management practice

Draft versions of the Council's AMPs were sent to Waugh Infrastructure Ltd for independent external review. The results of their review as reported in draft form as "Water Supply, Water Supply, Facilities & Community AMPs, AMP Compliance Reassessment - December 2014".

The assessment reviewed the AMP's progress toward the target level in terms of the 12 areas defined in IIMM. Overall Waugh's assessment indicated the AMPs require some additional work to meet the target compliance level and compliance with local government legislation (LGA 2002).

The review highlighted areas where the AMP's need more work and identified gaps in our documentation of what we do to manage the assets. A series of improvements to be undertaken to rectify omissions and gaps in our documentation have been consolidated into the 8 areas as set out in the improvement plan outline.

10.3 Current and target asset maturity

The New Zealand Treasury has created an asset management maturity assessment tool to allow organisations to measure the extent of the maturity of their asset's management practice to meet the current and future needs of the organisation.

The asset maturity tool is based on the requirements of the IIMM 2015. The tool is provided in Asset Management Plan Improvement Plan

Council has developed the following AM practice improvement programme. AM Improvements in the table below will be in the context of the following issues

- The impacts on operations and management, asset ownership, risks, and financial requirements of the Government-led water reform, including the impacts of the Water Services Act and establishment of Taumata Arowai. These may impact the financial, operational and asset ownership of Water Supply services in the District.

The impacts on operations and management, risks, and financial requirements relating to COVID and associated with Water Supply services. This includes changes to business and household usages, financial impacts affect users' ability to pay for services, and COVID restrictions on Council and contractor's operational capabilities on the following pages and shows the improvement projects planned for the next 5 and links to the IIMM 2015. This should be updated to the use of the latest IIMM 2020 Online version.

The table also shows the timing and resources required for each task. These tasks will be implemented and monitored over the next 3 years.

10.4 Asset Management Plan Improvement Plan

Council has developed the following AM practice improvement programme. AM Improvements in the table below will be in the context of the following issues

- The impacts on operations and management, asset ownership, risks, and financial requirements of the Government-led water reform, including the impacts of the Water Services Act and establishment of Taumata Arowai. These may impact the financial, operational and asset ownership of Water Supply services in the District.
- The impacts on operations and management, risks, and financial requirements relating to COVID and associated with Water Supply services. This includes changes to business and household usages, financial impacts affect users' ability to pay for services, and COVID restrictions on Council and contractor's operational capabilities.

Table 10.1 Asset Management Improvement Plan

IIMM Reference	AM Maturity Area	Improvement Task 2022	Priority	Resources Required	Comments
2.0	**Understanding and Defining Requirements**				
2.1	AM Policy and Strategy	Update Asset Management Policy (last update was in 2008)		TBC	To be completed for next AMP/LTP update 2021. Practices to be aligned to the use of the latest updated IIMM 2020 Online version of best industry practice guidelines
		Sustainability policy development		TBC	Strategic Policy Team to develop
2.2	Levels of Service and Performance Management	Improve customer knowledge and understanding of demand for Water Supply services		TBC	Council needs to collect updated information and data for each of the regional areas on population, number of properties connected. This can be achieved through implementing customer measures i.e., surveys, track counters and recording requests for service. Improve understanding of asset performance through implementing technical performance measures.
		Level of service review and consultation, and knowledge of customer service expectations and performance. Collect information on incidents, failures and callouts by each of the four community areas		Estimate 6 to 8 person-weeks	Understand Council's performance with respect to customer service, including incidents past and current call out statistics and failures from reported customer incidents. Consultation on the LOS should occur at the same time as the LTP consultation. This will be internally resourced and will involve asset, GIS services, and asset managers.
2.3	Demand Forecasting	Update Population demographics analysis before the next AMP update		TBC	To be completed before the next AMP and LTP update for infrastructure activities (2021)
		Develop a non-resident demand trend for the district		TBC	
		Investigate economy driven demand trends		TBC	
		Update demand forecast for the activity		TBC	

IIMM Reference	AM Maturity Area	Improvement Task 2022	Priority	Resources Required	Comments
2.4	Asset Register Data	Ongoing review of asset age, condition, useful lives and unit rates to ensure correct renewal programmes and asset replacement values. Revise asset types.	Very High	TBC	Implement improvements identified in the 2018 revaluation.
2.5	Asset Performance and Condition Assessment	Develop and document an asset performance assessment programme	High	TBC	Using IIMM framework. Align with LOS and performance measures
		Record assets condition data.	High	TBC	
		Undertake condition assessment on a 3 yearly cycle.	High	TBC	Currently undertaken.
		Determine the minimum condition grade for each asset component		TBC	
		Asset data quality confidence.	Very High	TBC	The assets' location and other physical data are audited randomly to determine the accuracy of the information stored in AssetFinda. Triennial revaluations of the infrastructure are independently reviewed. The reviews include comparison of replacement costs with other Councils to improve confidence in our financial estimates for renewal and replacement.
		Electronic recording of asset condition and assessment		TBC	Hand-held tablets to maintenance staff, which will facilitate recording and transfer of information to the asset management system (AssetFinda). Mobile technology linked to AssetFinda database is expected to be completed in the first quarter of 2022.
3.1	Lifecycle Decision Making				
3.1	Decision Making	Develop a spreadsheet model that is intended to produce long term (>50) estimates of renewal expenditure cycles, based on consideration of different assumptions regarding useful lives, replacement costs and timing.		TBC	Asset Managers have been working with the Finance team and a consultant to develop this model. The model will assist in identifying and avoiding significant peaks and troughs in the replacement programme and will indicate the level of depreciation funds that will need to be accumulated to allow the work to continue. Completed but not utilised in AMIS, only finance use this analysis

IIMM Reference	AM Maturity Area	Improvement Task 2022	Priority	Resources Required	Comments
	Risk Management	Update risk management policy and procedures in alignment with latest NZ standard. Document risk management strategies and processes for critical assets	High	TBC	
		Develop an emergency response procedure Development of a business continuity plan		TBC	
		Extend risk management to include assessment of failure probability in Waters assets, to enable completion of risk profile	High	TBC	
		Update risk assessment for all assets within the activity	High	TBC	Extend risk management to include assessment of failure probability in Waters assets, to enable completion of risk profile
3.3	Operational Planning	Services staff are working with the vendor to develop the maintenance tracking module in AssetFinda		TBC	
		Optimise the reactive versus planned maintenance schedules and budgets for building assets		TBC	
3.4	Capital Works Planning	Develop systems to promote good decisions based on "whole of life" asset management		TBC	
		Improve valuation processes		TBC	
3.5	Financial and Funding Strategies	Develop project plans prior to financial year start		TBC	
4.0	Asset Management Enablers				
4.1	Asset Management Teams	Undertake an asset maturity assessment (Source: http://www.treasury.govt.nz/statesector/investmentmanagement/review/icr/information/assetmgmt)	High	TBC	An asset maturity assessment is required to be carried by staff. This will allow the Waters asset managers to understand the current rating against the anticipated target to be achieved within the activity.

IIMM Reference	AM Maturity Area	Improvement Task 2022	Priority	Resources Required	Comments
4.2	Asset Management Plans	Update AMPs according to the IIMM guidelines		TBC	
4.3	Management Systems	Document asset management procedures		TBC	This will be done corporately
4.4	Information Systems	Develop Waters Layer for GIS and plot all Waters assets		TBC	To be completed before the next AMP and LTP update (2021)
		Develop GIS capabilities to support Asset management systems (AssetFinda)		TBC	Develop and use GIS capabilities to support to deliver proposals above
4.6	Audits and Improvement Planning	Monitor and report on this improvement plan	High	TBC	

10.5 Achievements and future improvement programme

10.5.1 Quality of asset information and confidence

Further work is planned to develop the "Condition" and "Performance" characteristics in AssetFinda to improve confidence in assessing remaining life. This is particularly useful for underground assets that cannot easily be examined. Not yet completed.

The assets' location and other physical data are audited randomly to determine the accuracy of the information stored in AssetFinda. Not yet completed.

Details of new assets are provided by the contractors installing them, as part of their contractual responsibilities. Not yet completed.

Details of the individual components in ancillary buildings are scheduled separately in AssetFinda, indicating the description, assessed useful life, installed cost, and replacement cost. These are to be reviewed and updated.

10.5.2 Planning Assumptions

Documented in all AMP's. Completed.

10.5.3 Demand management

Council will implement a flow gauging and hydraulic modelling of Water Supply network to assess the hydraulic capacity and how much of the capacity is being used by the total demand from return of portable water from leakages, ground water infiltration and ingress of rainwater during heavy rainfall event. The calibrated hydraulic model will enable the Council to identify the potential future capacity issues of the Water Supply network.

10.5.4 Water Supply volumes

Following a desktop evaluation to identify any correlation between rainfall events and Water Supply volumes, areas were identified for further inspection. Staff have commenced a programme of visiting properties and issuing notices to redirect surface water away from the Water Supply system.

10.5.5 Sensitivity analysis

Asset Managers have worked with the Finance team and a consultant to develop a spreadsheet model that produces a long term (>50) estimates of renewal expenditure cycles, based on consideration of different assumptions regarding useful lives, replacement costs and timing. The model assists in identifying and avoiding significant peaks and troughs in the replacement programme and indicates the level of depreciation funds that will need to be accumulated to allow the work to continue.

10.5.6 Resilience

Resilience is incorporated into the council's outcomes and strategies.

The following is a summary of improvements that have been achieved or are currently being implemented for the Waters activity.

Table 10.2 Summary of improvement tasks

Improvement plan	Outline and description
Quality of asset information and confidence therein	Further work is planned to revise the "Condition" and "Performance" characteristics in AssetFinda to improve confidence in assessing remaining life. This is particularly useful for underground assets that cannot easily be examined. *Not yet completed*. Age and Condition data revision carried out in conjunction with the Criticality revision should be useful for improvement of the asset data reliability*. To be initiated.* The assets' location and other physical data are audited randomly to determine the accuracy of the information stored in AssetFinda. *Not yet completed.* Details of new assets are provided by the contractors installing them, as part of their contractual responsibilities. *Not yet completed*. Details of the individual components in ancillary buildings are scheduled separately in AssetFinda, indicating the description, assessed useful life, installed cost and replacement cost and later reviewed during the revaluation process, which is carried out triennially and independently reviewed.
Maintenance recording	Services staff are working with the vendor to develop the maintenance tracking module in AssetFinda. Up to Version 4 – not yet completed.
Electronic recording of maintenance activities	The budget includes providing hand-held tablets to maintenance staff, which will facilitate recording and transfer of information to the asset management system (AssetFinda). This will be more efficient and effective than the existing paper-based system. – *Underway and expected to be completed first quarter 2022.*
Sensitivity analysis	Asset Managers have been working with the Finance team and a consultant to develop a spreadsheet model that is intended to produce long term (>50) estimates of renewal expenditure cycles, based on consideration of different assumptions regarding useful lives, replacement costs and timing. The model will assist in identifying and avoiding significant peaks and troughs in the replacement programme and will indicate the level of depreciation funds that will need to be accumulated to allow the work to continue. Completed but not utilised in AMIS, only finance use this analysis.

10.6 Improvement plan methodology

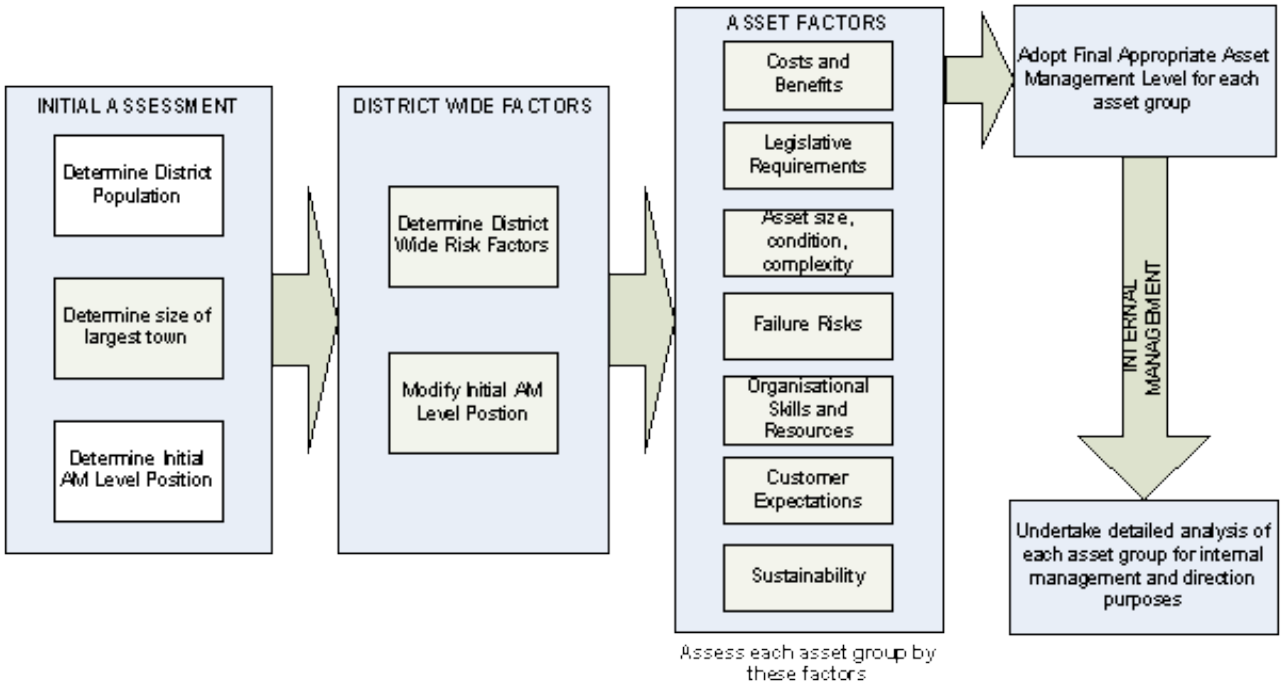


Figure 10.1 Methodology for determining Appropriate Asset Management Level)

Asset management planning, programmes and practice are now embedded into Councils Asset Group Practice. The following diagram outlines the integration between Council structures to support the ongoing implementation of improvement of Council's asset management practices.

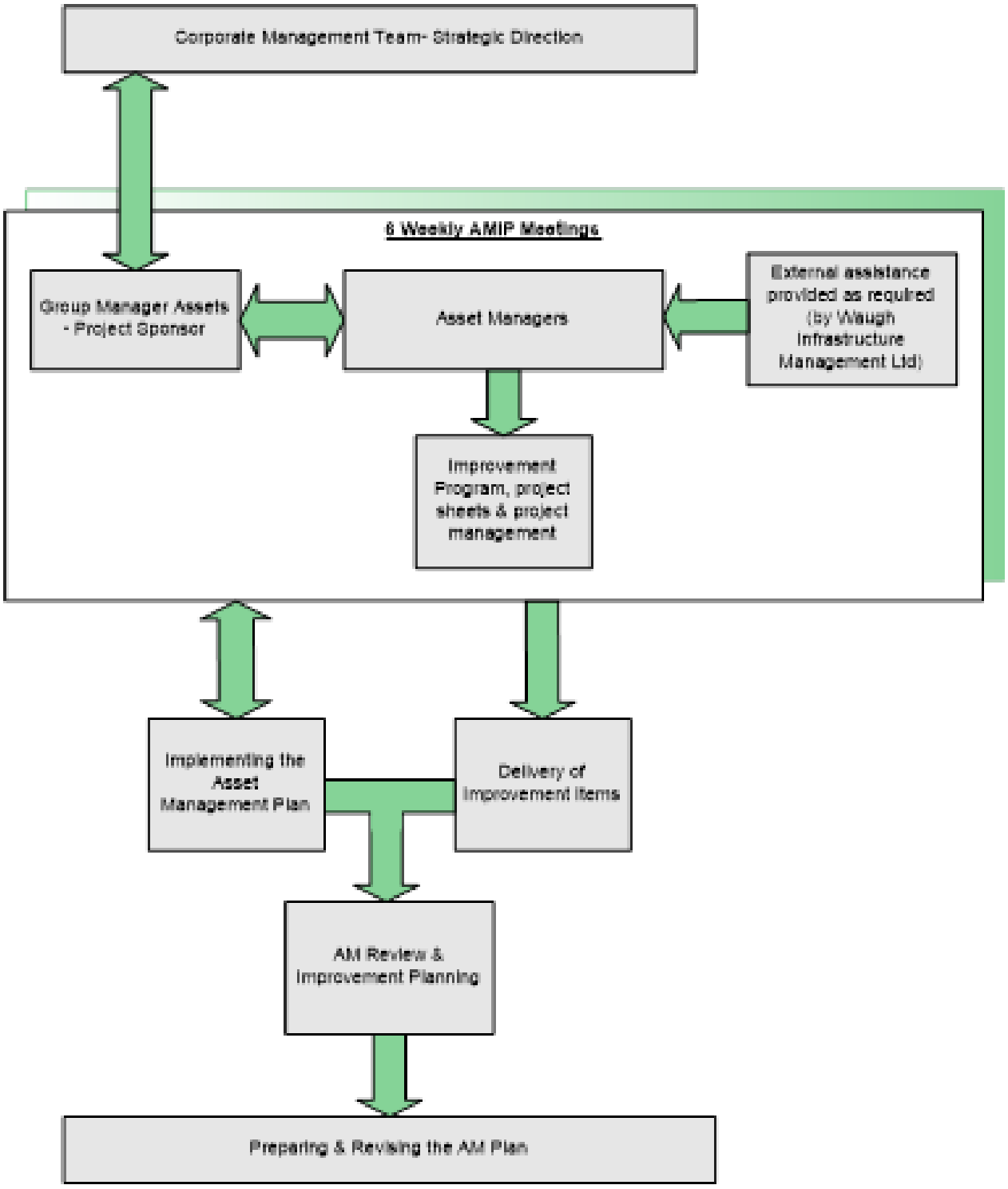


Figure 10.2 Improvement Programme Process

10.7 Monitoring and review procedure

10.7.1 Monitoring approach

South Waikato District Council has developed the AMPs based on an integrated asset management planning approach that includes:

- Customer consultation and subsequent development of service levels

- The configuration of networks to meet customer requirements, now and in the future
- Current asset information
- Well-developed strategies to achieve customer requirements

Further development of Council's asset management approach, including supporting processes, systems and data, will be needed to meet the appropriate level of asset management practice as set out in Council's Asset Management Policy. This Policy will be reviewed periodically to take into account legislative and other national practice changes.

10.7.2 Timetable for audit and review

The programme for future AM reviews of this plan is shown in the table below.

Table 10.3 Timetable for audit and review

Activity	Target Date
Asset Management Improvement Programme 6 weekly meetings with Asset Managers	6 Weekly
Monthly reporting to Group Manager of Assets Monthly Improvement Plan reviewed annually by all staff directly involved and focusing on key business issues	30 June each year
Report on Improvement Plan	30 June each year
AMP updates involving members of staff involved in preparing specific aspect of the AMP	30 June each year
Compliance Status review prior to start of LTP process (to identify and budget for new improvements)	30 August every 3
Identify new LOS based on preliminary consultation on LTP	Early in LTP process
Adoption of AMP by Council (linked to adoption of LTP)	30 June every 3
External benchmarking by internal staff	Annually
Audit NZ external audit	As required by Audit NZ
External Peer review of AMP	3 Yearly

APPENDIX A ADDITIONAL ASSET INFORMATION AND SYSTEMS OVERVIEW

A1 – TOKOROA

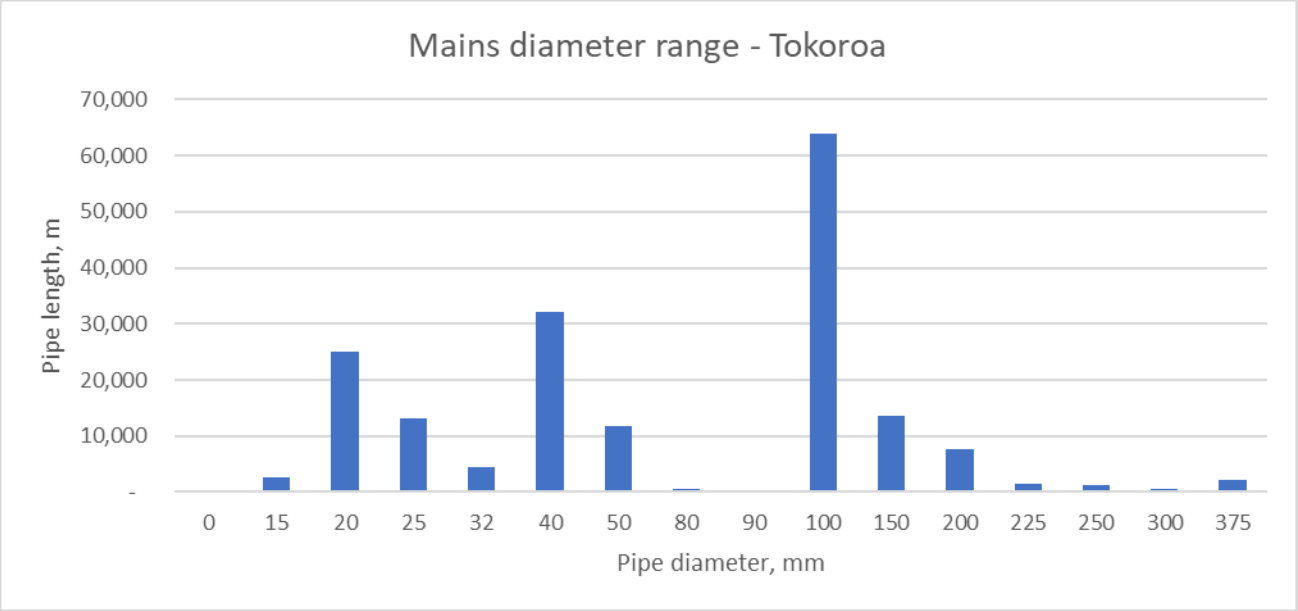


Figure A-10.3 Tokoroa Mains Diameter Range

Table 10-4 Tokoroa Reticulated Mains - Forecast Renewals (metres)

	<2021	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	Grand Total
AC	28								**28**
AC-E	12,544	5,968	11,850	16,300	34				**46,696**
AC-F			4,762	14,707	2,623	1,511	447		**24,050**
ALK	1,258	197	278			151	14	5	**1,903**
GI				2,589	2,971	4,031	7,003	1,693	**18,287**
MDPE						4		6	**10**
PVC	24,611	1,256	717	859	654	398	30	35	**28,560**
STEEL					56	52	214		**321**
UPVC					13	1,519	3,367	1,254	**6,153**
VICTAULIC							9		**9**
Grand Total	**38,440**	**7,420**	**17,607**	**34,455**	**6,351**	**7,667**	**11,085**	**2,992**	**126,017**

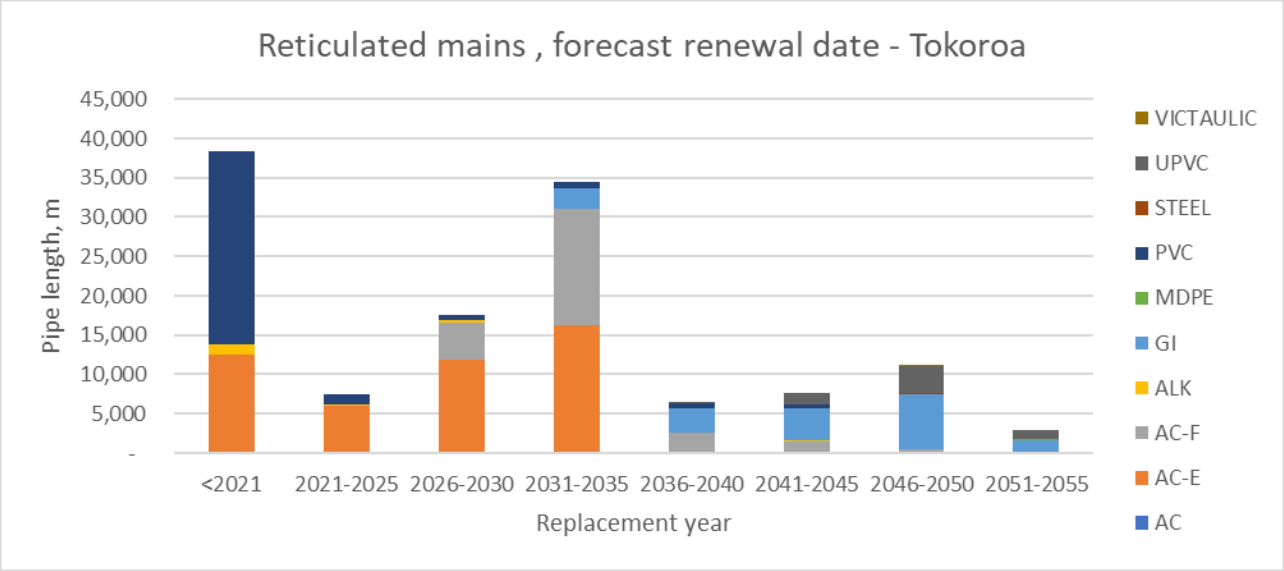


Figure A-10.4 Tokoroa Reticulated Mains - Forecast Renewals

Table 10-5 Tokoroa Assets Replacement Cost and Forecast Renewal Date

Renewal year	Lines	Plant	Points	Total
<2021	$3,468,965	$242,559	$77,887	$3,789,411
2021-2025	$1,384,163	$201,688	$178,538	$1,764,389
2026-2030	$3,949,445	$369,914	$754,264	$5,073,623
2031-2035	$6,433,980	$213,259	$735,018	$7,382,257
2036-2040	$751,847	$541,491	$1,126,520	$2,419,858
2041-2045	$965,916	$34,236	$1,887,107	$2,887,259
2046-2050	$1,012,786	$231,632	$1,504,928	$2,749,346
2051-2055	$284,672	$5,986	$270,218	$560,876
Grand total:	$18,251,773	$1,840,765	$6,534,480	$26,627,018

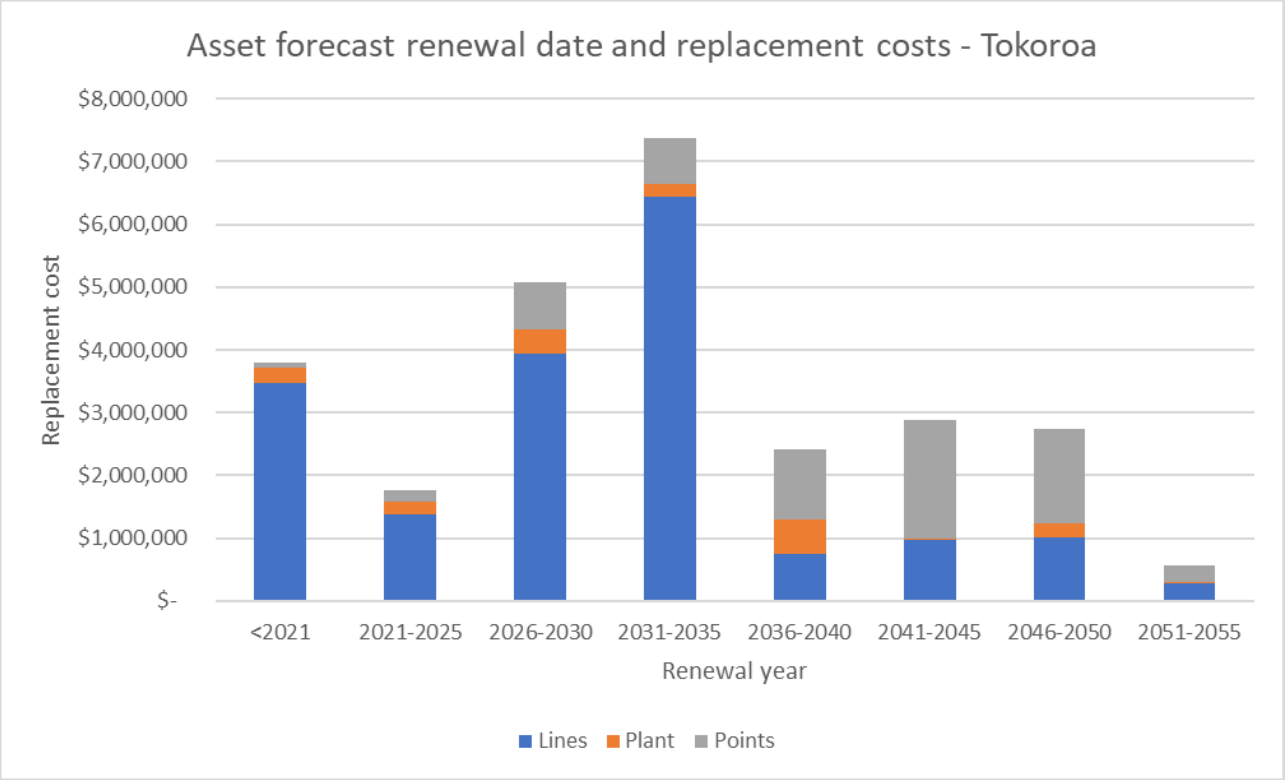


Figure A-10.5 Tokoroa Assets Replacement Cost and Forecast Renewal Date

A2 – PUTARURU

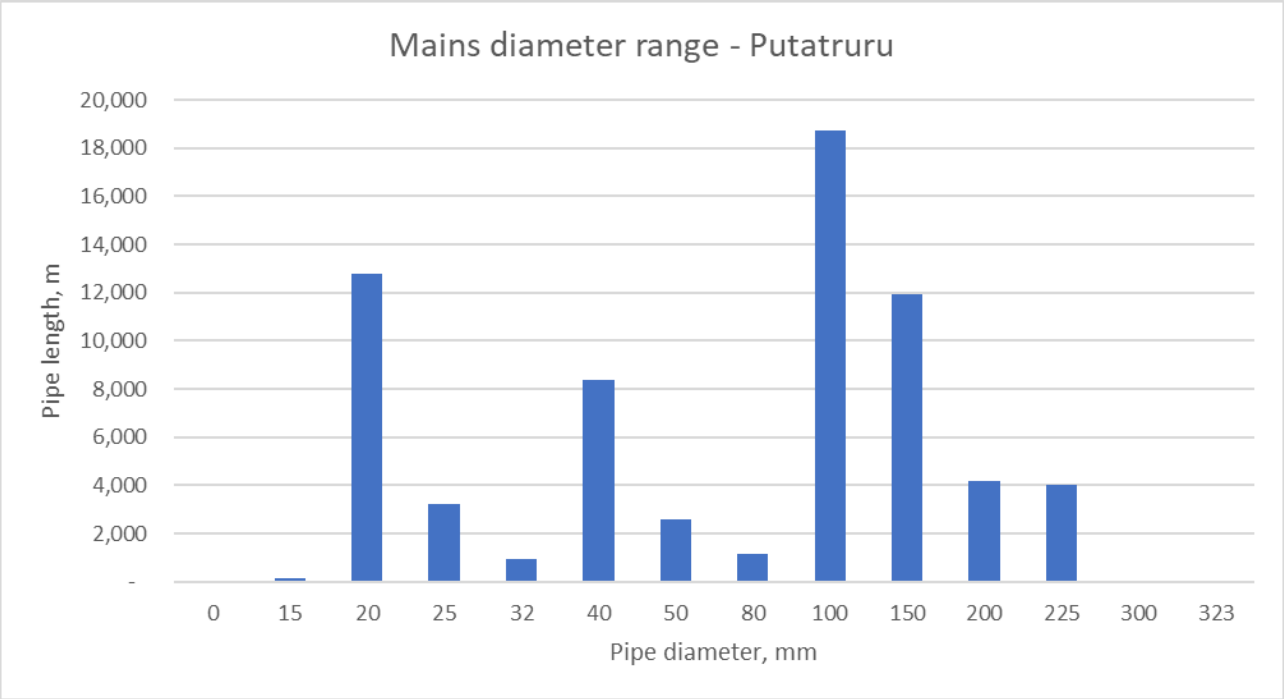


Figure A-10.6 Putāruru Mains Diameter Range

Table 10-6 Putāruru Reticulated Mains - Forecast Renewals (metres)

	<2021	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	Grand Total
AC		12							12
AC-E	1,787	10,903	5,604	2,020					20,314
AC-F							2,146	1,069	3,215
ALK	947	10		123	53	4	11		1,149
CONC				44		48			91
GI		247	485	2,401	1,465	686	0		5,284
MDPE						6	12	22	40
PVC	7,479	131	2,678	3,304	829	59	41	7	14,526
RC				76			0		77
STEEL			108		5				113
UPVC				2					2
VICTAULIC				5	3				8
Grand Total	**10,213**	**11,302**	**8,874**	**7,977**	**2,354**	**802**	**2,210**	**1,098**	**44,830**

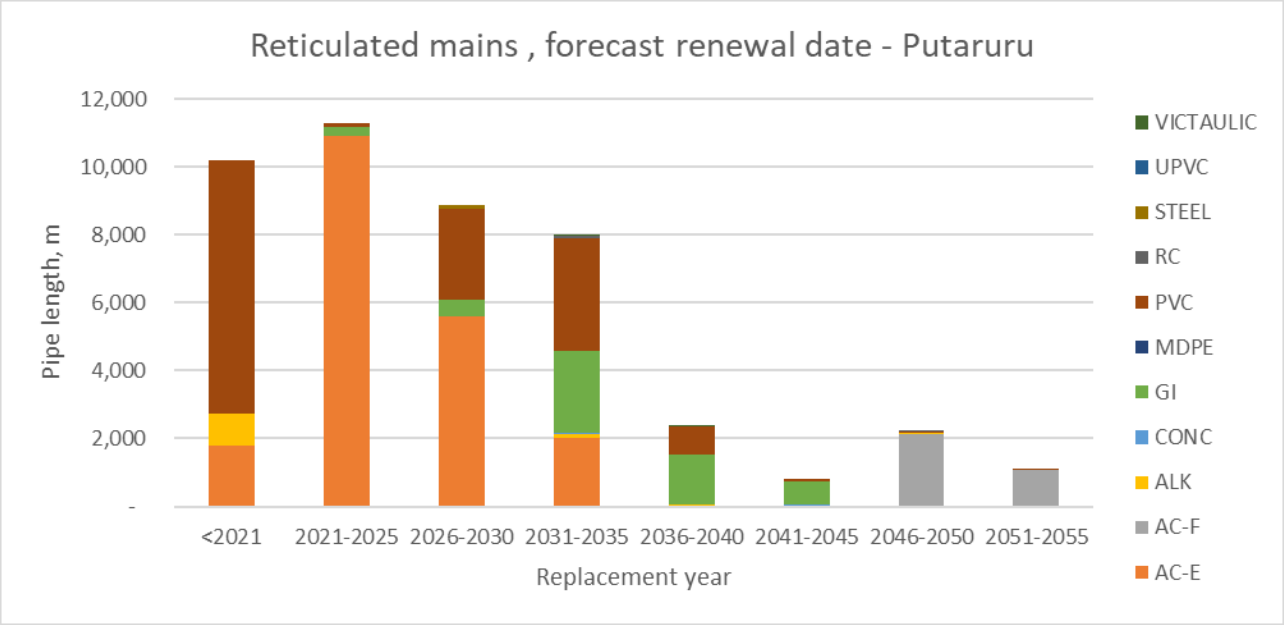
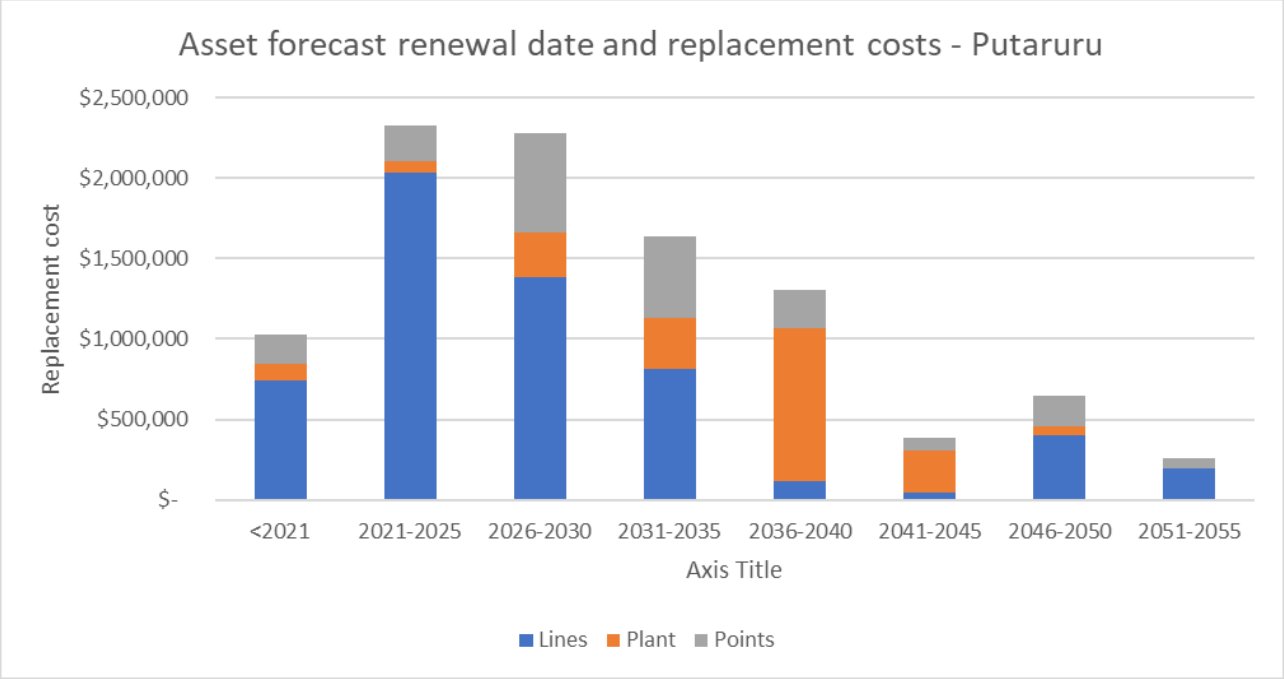


Figure A-10.7 Putāruru Reticulated Mains - Forecast Renewals

Table 10.7 Putāruru Assets Replacement Cost and Forecast Renewal Date

Renewal year	Lines	Plant	Points	Total
<2021	$745,309	$96,298	$182,184	$1,023,791
2021-2025	$2,034,169	$68,447	$226,000	$2,328,616
2026-2030	$1,383,113	$276,041	$624,412	$2,283,566
2031-2035	$815,420	$317,521	$508,845	$1,641,786
2036-2040	$112,517	$958,617	$230,762	$1,301,896
2041-2045	$44,505	$259,089	$81,473	$385,067
2046-2050	$397,694	$60,380	$192,997	$651,071
2051-2055	$198,808		$59,171	$257,979
Grand total:	$5,731,535	$2,036,393	$2,105,844	$9,873,772

Figure A-10.8 Putāruru Assets Replacement Cost and Forecast Renewal Date



A3 – TIRAU

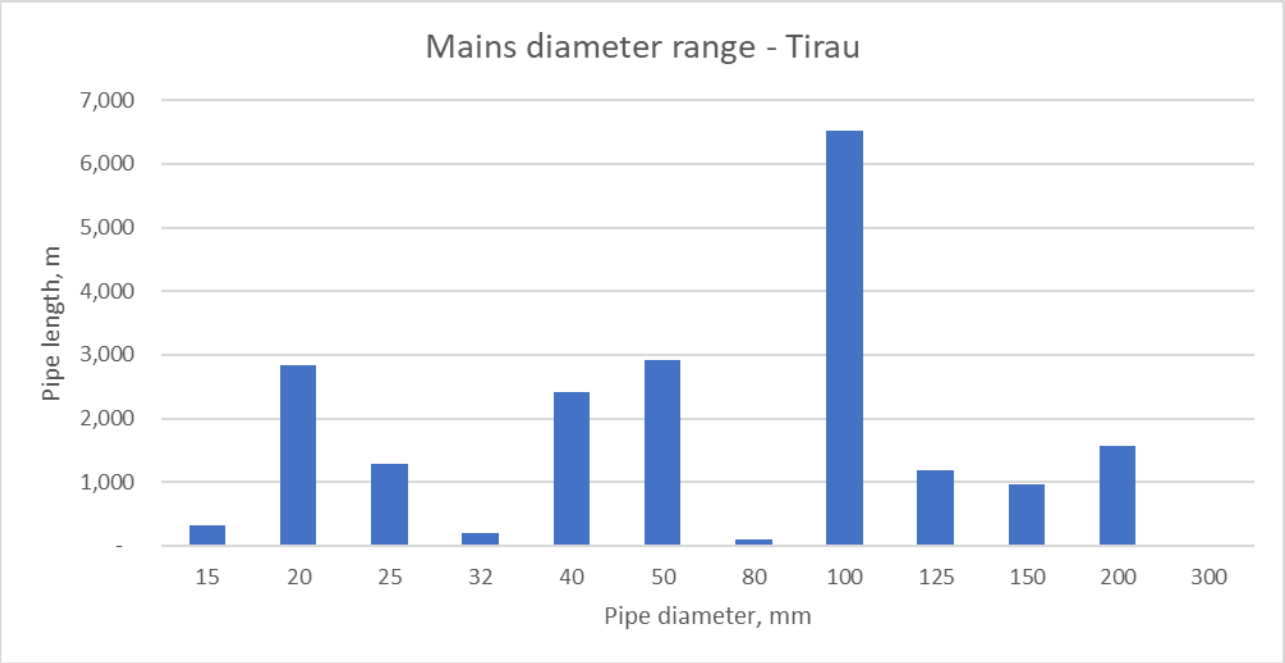


Figure A-10.9 Tirau Mains Diameter Range

Table 10.8 Tirau Reticulated Mains - Forecast Renewals (metres)

	<2021	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	Grand Total
AC-E	2,292	28			61	829			**3,210**
AC-F	669					197	1,885	63	**2,813**
ALK	282		20	5	109			6	**422**
GI	462			12		7	305		**786**
PVC	936	336	79	967	164	64	7		**2,552**
UPVC						15			**15**
Grand Total	**4,641**	**364**	**99**	**984**	**334**	**1,111**	**2,197**	**69**	**9,797**

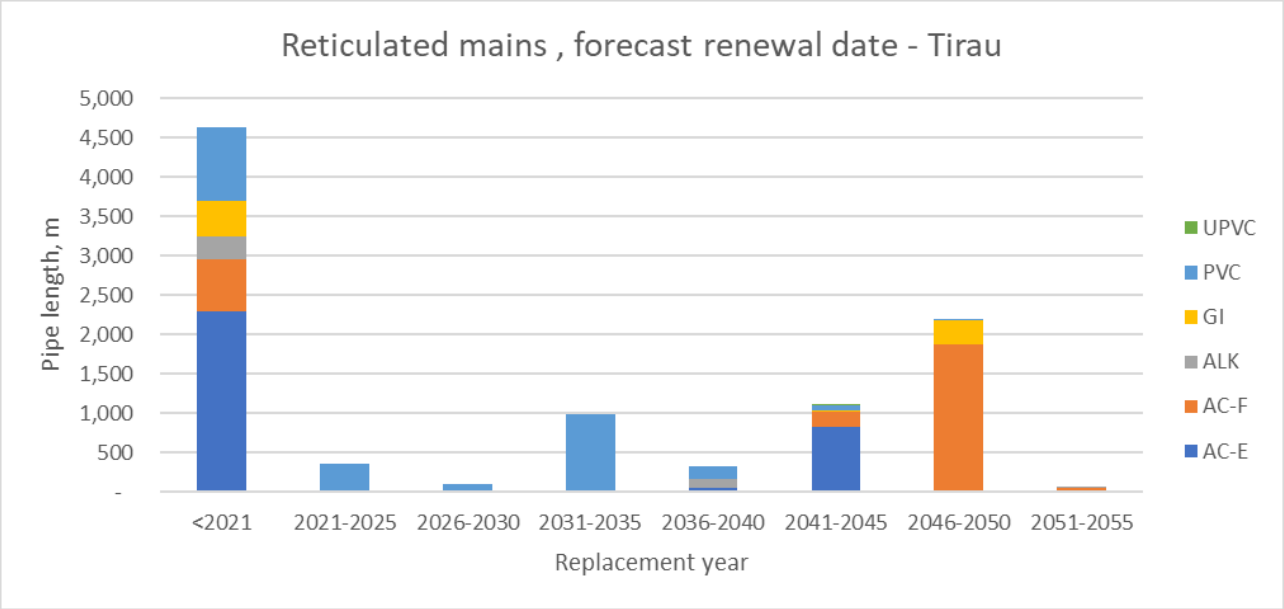


Figure A-10.10 Tirau Reticulated Mains - Forecast Renewals

Table 10.9 Tirau Assets Replacement Cost and Forecast Renewal Date

Renewal year	Lines	Plant	Points	Total
<2021	$591,713	$167,669	$184,929	$944,311
2021-2025	$16,760	$13,625	$9,279	$39,664
2026-2030	$3,896	$114,304	$7,162	$125,362
2031-2035	$57,349	$32,448	$8,456	$98,253
2036-2040	$24,303	$535,894	$13,863	$574,060
2041-2045	$176,385	$63,232	$87,474	$327,091
2046-2050	$487,954	$-	$67,620	$555,574
2051-2055	$10,822		$4,025	$14,847
Grand total:	$1,369,183	$927,172	$382,808	$2,679,163

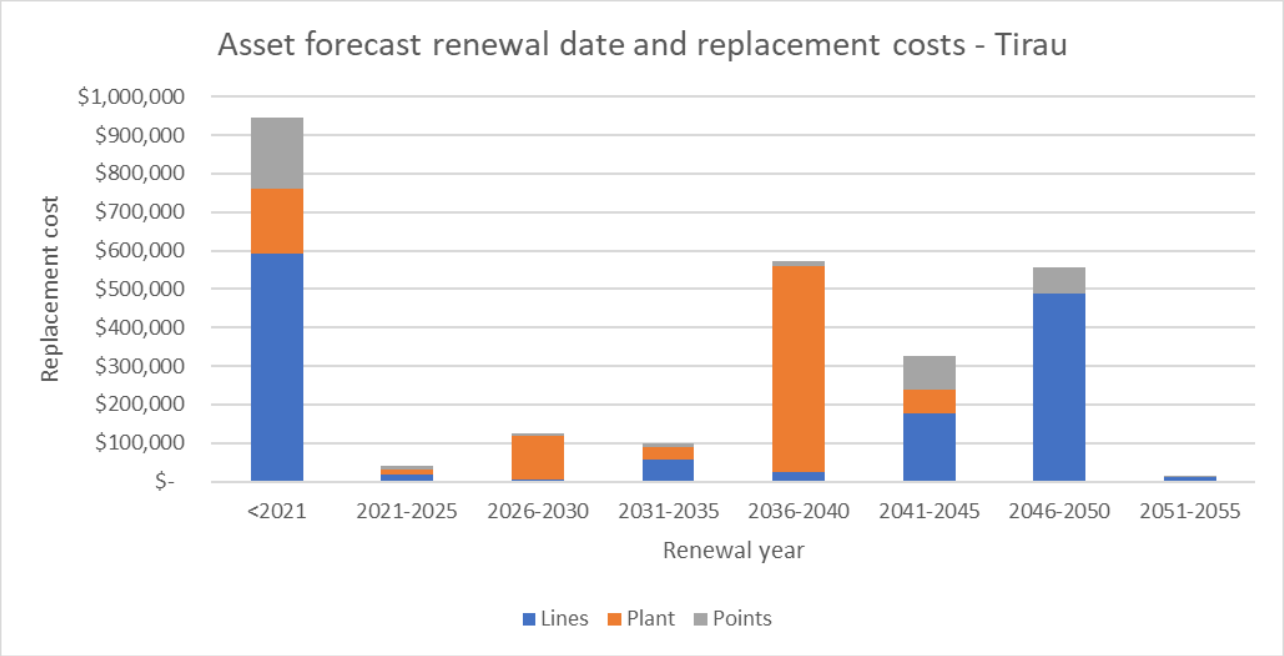


Figure A-10.11 Tirau Assets Replacement Cost and Forecast Renewal Date

A4 – ARAPUNI

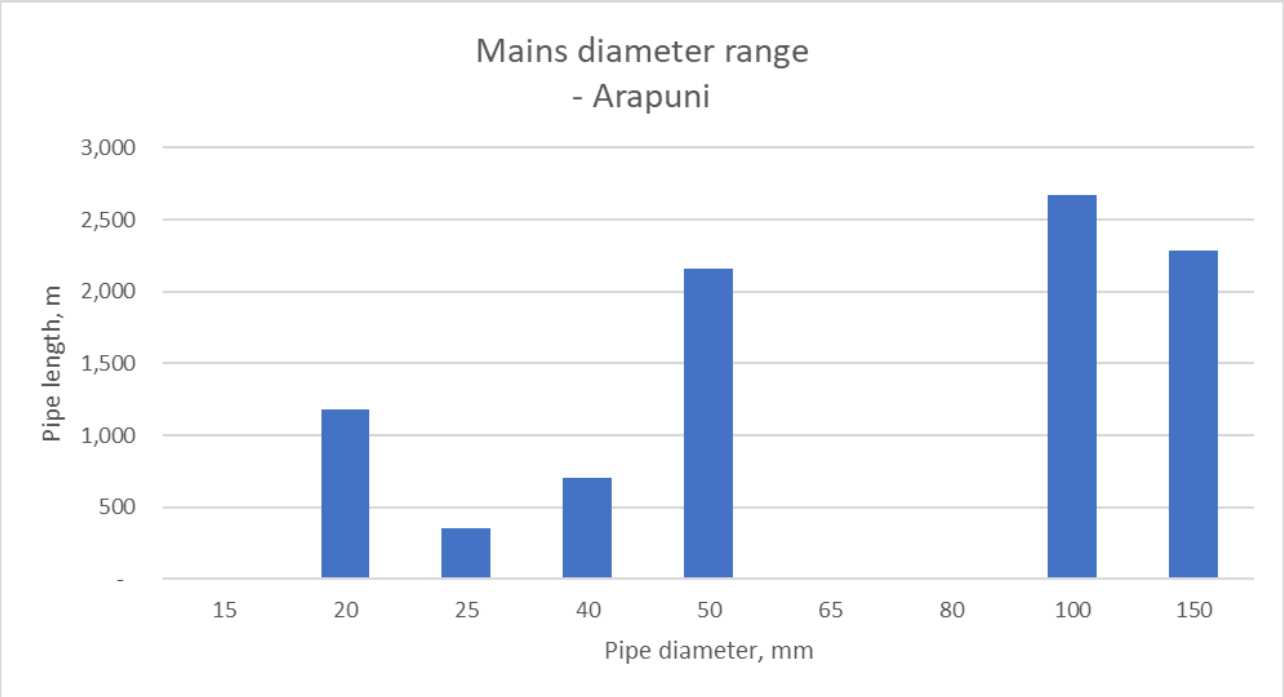


Figure A-10.12 Arapuni Mains Diameter Range

Table 10.10 Arapuni Reticulated Mains - Forecast Renewals (metres)

Replacement year	<2021	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	>2056	Grand Total
ALK	508				160					668
ARA-AC-E		255								255
ARA-AC-F							1,732			1,732
GI	6		2					138	43	189
MDPE									1,320	1,320
MPVC									642	642
PVC	577			379	182	8			29	1,175
STEEL									10	10
UPVC									1,909	1,909
VICTAULIC	1,435		20						24	1,478
Grand Total	2,525	255	22	379	342	8	1,732	138	3,976	9,378

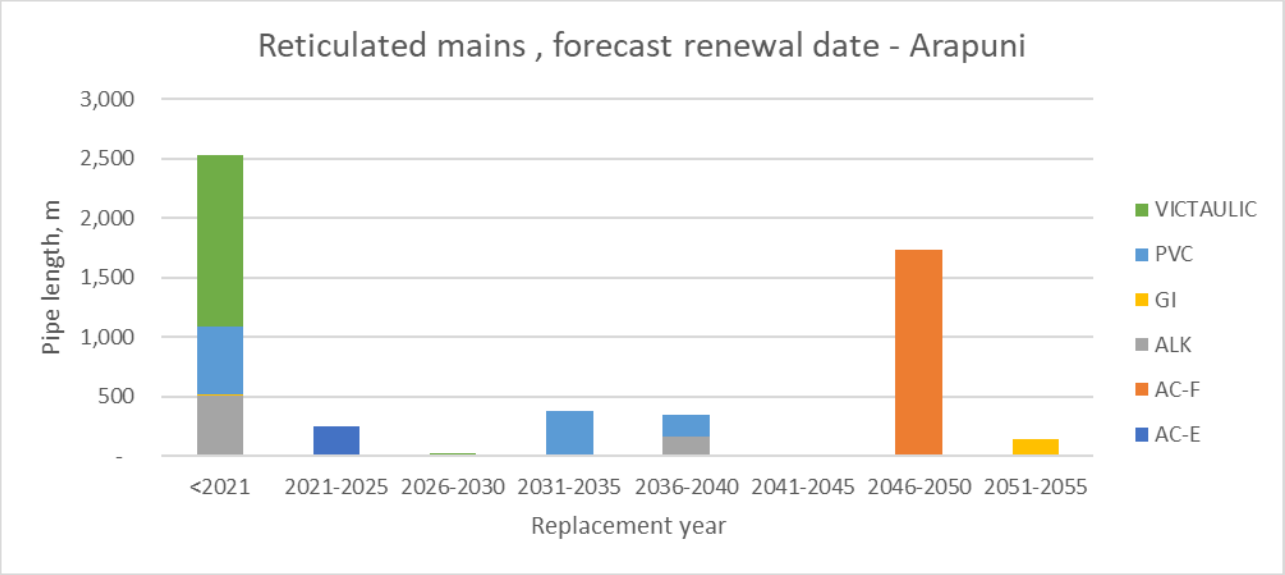


Figure A-10.13 Arapuni Reticulated Mains - Forecast Renewals

Figure 10.11 Arapuni Assets Replacement Cost and Forecast Renewal Date

Renewal year	Lines	Plant	Points	Total
<2021	$306,542	$76,740	$76,706	**$459,988**
2021-2025	$42,780	$21,229	$18,641	**$82,650**
2026-2030	$3,478	$83,213	$3,393	**$90,084**
2031-2035	$13,649	$379,494	$13,941	**$407,084**
2036-2040	$24,575	$26,576	$2,245	**$53,396**
2041-2045	$284	$15,429	$22,660	**$38,373**
2046-2050	$347,588	$38,942	$4,358	**$390,888**
2051-2055	$21,787	$19,314	$10,157	**$51,258**
Grand total:	**$760,682**	**$660,937**	**$152,101**	**$1,573,720**

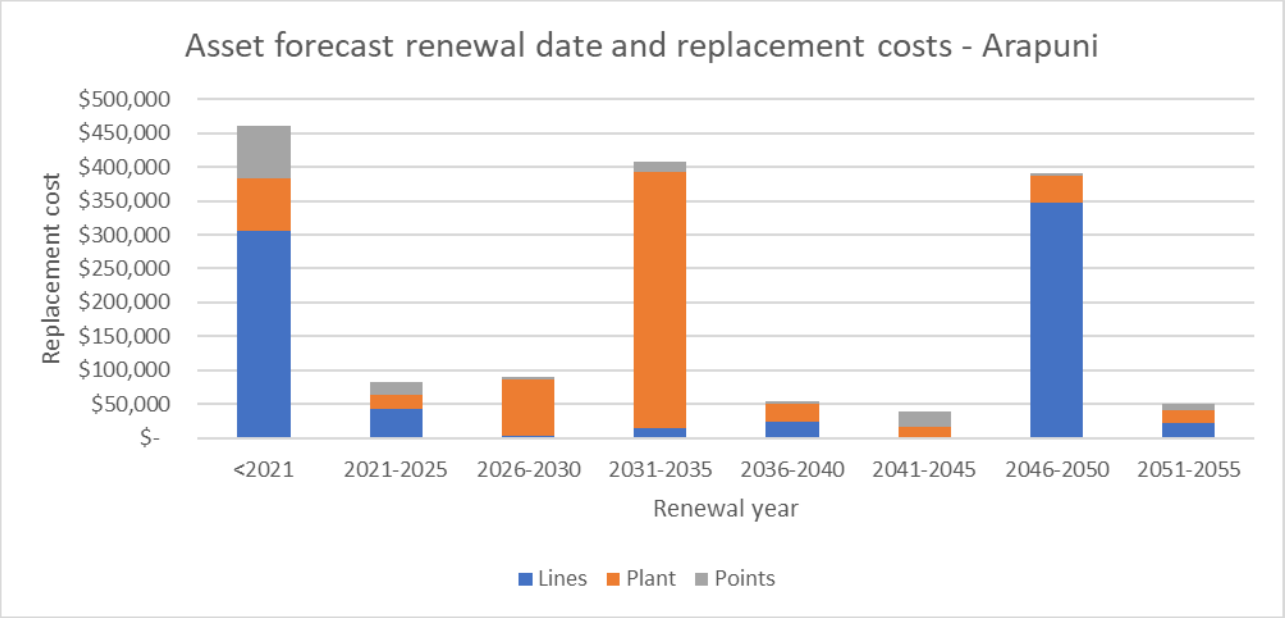


Figure A-10.14 Arapuni Assets Replacement Cost and Forecast Renewal Date

A5 – LICHFIELD

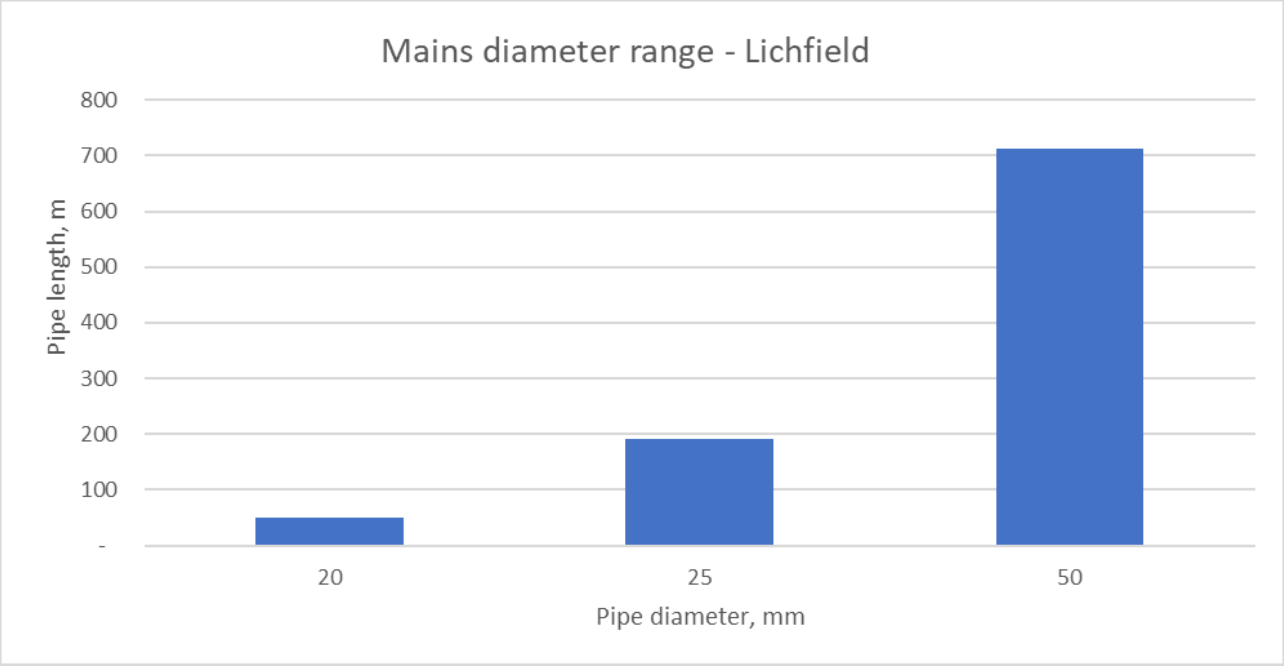


Figure A-10.15 Lichfield Mains Diameter Range

Table 10.12 Lichfield Assets Replacement Cost and Forecast Renewal Date

Renewal year	Lines	Plant	Points	Total
<2021		$34,041		$34,041
2021-2025		$24,779		$24,779
2026-2030		$48,435		$48,435
2031-2035		$20,412		$20,412
2036-2040		$1,350		$1,350
2041-2045		$95,411	$1,279	$96,690
2046-2050		$545	$6,960	$7,505
Grand total:		$224,973	$8,239	$233,212

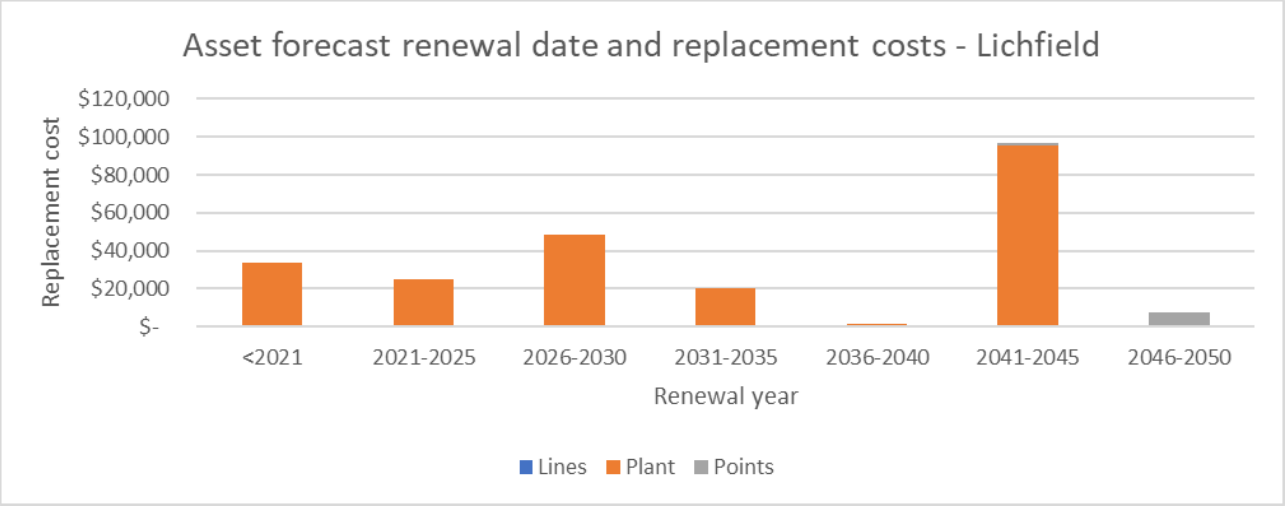


Figure A-10.16 Lichfield Assets Replacement Cost and Forecast Renewal Date

A6 – ATHOL

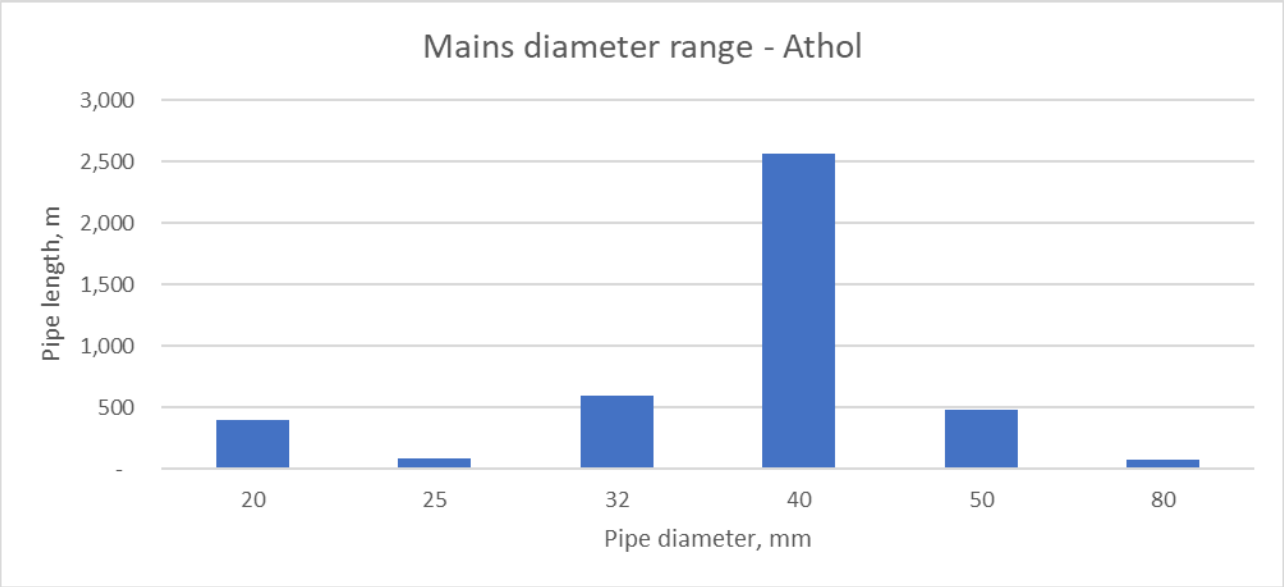


Figure A-10.17 Athol Mains Diameter Range

Table 10.13 Athol Assets Replacement Cost and Forecast Renewal Date

Renewal year	Lines	Plant	Points	Total
<2021			$1,452	**$1,452**
2021-2025			$928	**$928**
2026-2030			$5,949	**$5,949**
2031-2035			$5,455	**$5,455**
2036-2040	$169,350		$1,886	**$171,236**
2041-2045			$928	**$928**
2046-2050			$2,784	**$2,784**
2051-2055			$1,444	**$1,444**
Grand total:	**$355,100**	**$-**	**$55,414**	**$410,514**

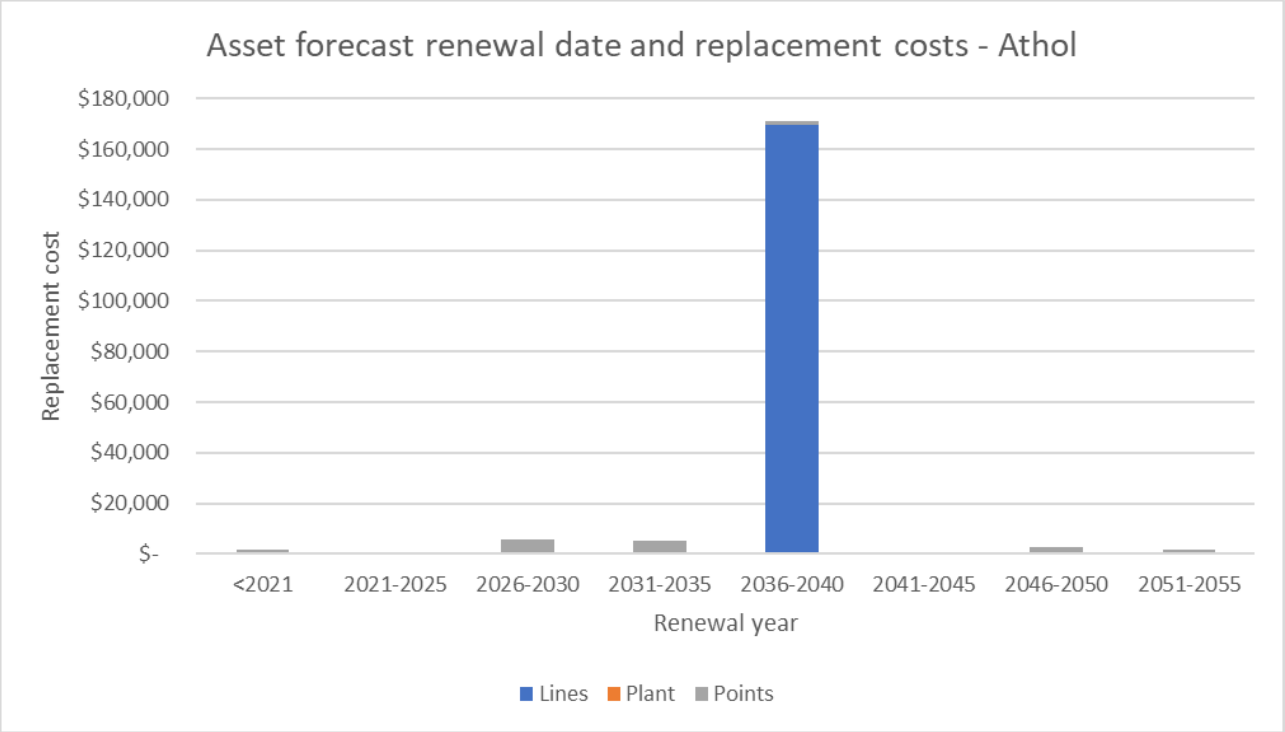


Figure A-10.18 Athol Assets Replacement Cost and Forecast Renewal Date

APPENDIX B SUMMARY OF WATER AND SANITARY ASSESSMENTS

B1 Water Supply Assessment

The LGA2002 Section 126 (d) requires an assessment of the health and environmental impacts of discharges of Water Supply from current and future demands.

This report was prepared for and adopted by Council in June 2005. All wording below is from the Water and Sanitary Assessment and reflects when it was written.

B1.1 The Communities

Descriptions of the seventeen community Water Supply services that were assessed within South Waikato District are detailed in Assessment of Water and Sanitary Services 2006, reviewed 2011 by Waugh Infrastructure Management Ltd below. The full details of the individual communities' Water Supply services are shown in the Supplementary Information Section.

Note: Population figures are from the Assessment of Water and Sanitary Services, 2019.

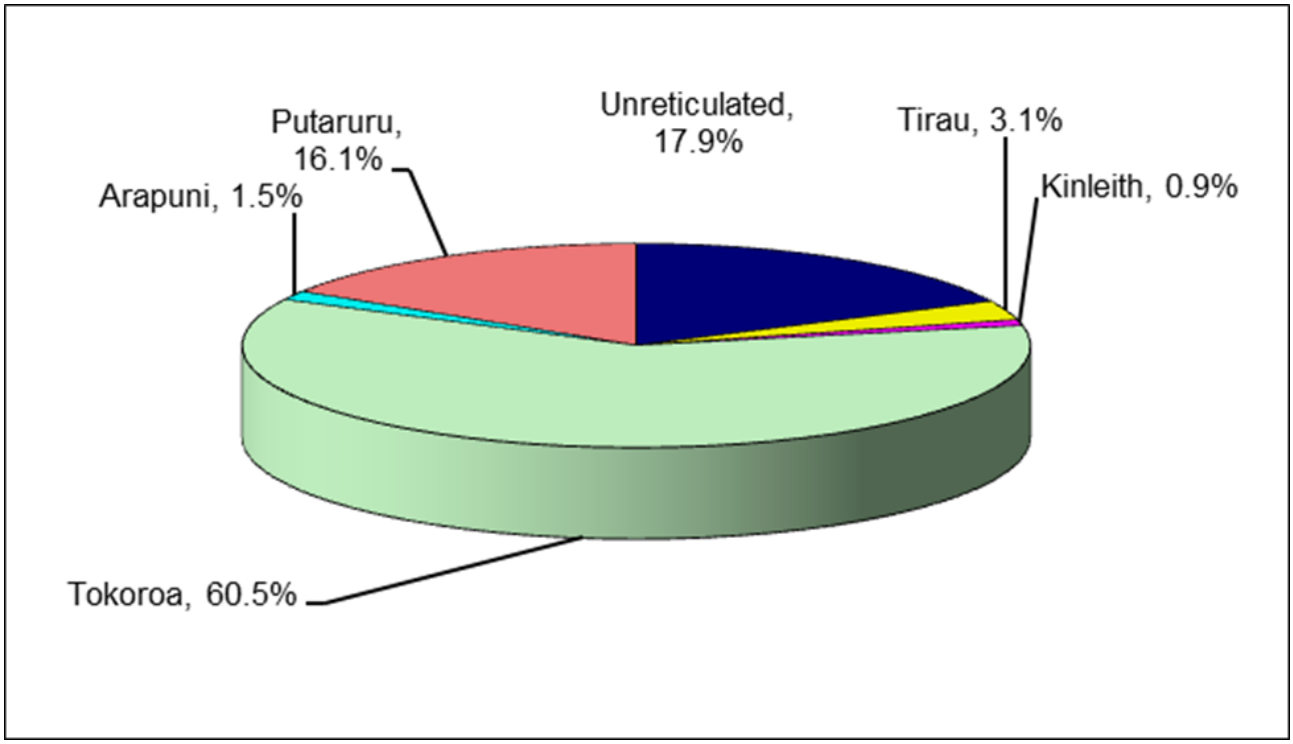


Figure B-10.19 Percentage of Populations Served by Community Water Supply Systems

B2 Issues for Community Schemes

B2.1 The Risks for Non-Reticulated Communities

An assessment of the risks to the communities relating to the absence of a reticulated Water Supply service was carried out. The levels of risks and mitigation for the non-reticulated communities are detailed in Table below. Section 12.1 of the complete Assessment report details the explanation of risk criteria, risk consequence, risk probability and the gross risk scales.

Table 10.14 Risks (Water Supply) for non-reticulated Communities

Community	Risk Description	Consequence	Probability	Risk	Mitigation Options
Kuranui School	Increased levels of nitrogen and phosphate entering water ways	Moderate	Unlikely	M	Ongoing monitoring by Environment Waikato will detect any increase and act accordingly
	Contamination of shallow domestic wells by septic tank discharges	Moderate	Unlikely	M	Enforcement of discharge consents by Environment Waikato
	Pollution of ground water	Minor	Unlikely	L	Monitoring by Environmental Waikato will detect any increase and act accordingly
	Increased levels of nitrogen and phosphate entering water ways	Moderate	Unlikely	M	Ongoing monitoring by Environment Waikato will detect any increase and act accordingly
Lichfield School	Contamination of shallow domestic wells by septic tank discharges	Moderate	Unlikely	M	Enforcement of discharge consents by Environment Waikato
	Pollution of ground water	Minor	Unlikely	L	Monitoring by Environmental Waikato will detect any increase and act accordingly
	Increased levels of nitrogen and phosphate entering water ways	Moderate	Unlikely	M	Ongoing monitoring by Environment Waikato will detect any increase and act accordingly
	Contamination of shallow domestic wells by septic tank discharges	Moderate	Unlikely	M	Enforcement of discharge consents by Environment Waikato
Te Waotu School	Pollution of ground water	Minor	Unlikely	L	Monitoring by Environmental Waikato will detect any increase and act accordingly
	Increased levels of nitrogen and phosphate entering water ways	Moderate	Unlikely	M	Ongoing monitoring by Environment Waikato will detect any increase and act accordingly
	Contamination of shallow domestic wells by septic tank discharges	Moderate	Unlikely	M	Enforcement of discharge consents by Environment Waikato
	Pollution of ground water	Minor	Unlikely	L	Monitoring by Environmental Waikato will detect any increase and act accordingly

Ngatira, Ongaroto, Pikitu, Mangakaretu and Ruapeka Marae	Contamination of surface water which has been linked to an increased risk of disease in human	Moderate	Moderate	S	Enforcement of discharge consents by Environment Waikato
	Increased levels of nitrogen and phosphate entering water ways	Moderate	Unlikely	M	Monitoring by Environmental Waikato will detect any increase and act accordingly
	Contamination of shallow domestic wells by septic tank discharges	Moderate	Unlikely	M	Enforcement of discharge consents by Environment Waikato
	Septic tanks are poorly maintained and operated	Minor	Moderate	M	Community education in conjunction with Environment Waikato, neighbouring Councils and Federated Farmers
Whakaaratamaiti Marae	Pollution of ground water	Minor	Unlikely	L	Monitoring by Environmental Waikato will detect any increase and act accordingly
	Increased levels of nitrogen and phosphate entering water ways	Moderate	Unlikely	M	Monitoring by Environmental Waikato will detect any increase and act accordingly
	Contamination of shallow domestic wells by septic tank discharges	Moderate	Unlikely	M	Enforcement of discharge consents by Environment Waikato
	Pollution of ground water	Minor	Unlikely	L	Monitoring by Environmental Waikato will detect any increase and act accordingly
	Contamination of surface water which has been linked to an increased risk of disease in human	Moderate	Unlikely	M	Enforcement of discharge consents by Environment Waikato
Okoroire Hotel	Increased levels of nitrogen and phosphate entering water ways	Moderate	Unlikely	M	Ongoing monitoring by Environment Waikato will detect any increase and act accordingly
	Contamination of shallow domestic wells by septic tank discharges	Moderate	Moderate	S	Ensuring effluent disposal systems are located sufficient distances from water takes Testing of well water quality by property owners on a regular basis
	Pollution of ground water	Minor	Unlikely	L	Monitoring by Environmental Waikato will detect any increase and act accordingly
Northern and Southern Water Supply Area					

APPENDIX C RISK ASSESSMENT – SUPPORTING INFORMATION

C1 Water Supply Risk Assessment

Table 10.15 Risk Assessment

	No	Risk Description	Impact	Probability	Risk	Response
Common Issues						
	1	Cyclonic episode	4	D	S	Review exposure
	2	Volcanic disruption	3	E	M	Accept
	3	Earthquake	5	D	H	Apply correct design loadings to new structures and have an emergency back-up plan
	4	Material breakages	3	B	S	Apply asset management plan
	5	Reduced consumer base	2	B	S	Monitor
	6	Loss of income	3	C	S	Monitor
	7	Criminal misuse	4	E	S	Accept
	8	Affordability	2	D	L	Accept
	9	Technology change	2	B	S	Monitor
	10	Limited contractor resources	3	C	S	Monitor
	11	Plan changes	2	A	S	Monitor
	12	Iwi issues	4	A	H	Monitor
	13	Vandalism	3	D	M	Monitor
	14	Delayed maintenance	3	C	S	Apply asset management plan
	15	Inadequate design	3	D	M	Select qualified and experienced designers
	16	Commercial risk	3	C	S	Apply asset management plan
	17	Business continuity	3	C	S	Apply asset management plan
	18	Occupational risk	2	D	L	Comply with legislative requirements
	19	Operator strike action	3	D	M	Accept
	20	Sabotage	5	E	H	Undertake security review
	21	Consumer expectations quality	3	D	M	Customer satisfaction surveys
	22	Asset condition knowledge	2	C	S	Apply asset management plan
Reticulation						
	23	Power failure	3	C	S	Backup plan in event of failure
	24	Pump failure	3	C	S	Backup plan in event of failure
	25	Telemetry control system failure	2	D	L	Backup plan in event of failure
	26	Landowner issues	2	C	M	Accept
	27	Pipe failures	3	B	S	Apply asset management plan

	No	Risk Description	Impact	Probability	Risk	Response
	28	Excavation breakages	3	C	S	Monitor
	29	Stormwater infiltration	2	A	S	Monitor in relation to consent compliance and treatment plant and pump station performance
	30	Water Supply exfiltration	2	C	M	Accept
	31	Water supply failure	4	D	S	Accept
	32	Reticulation security	4	D	S	Monitor
	33	Asset location knowledge	2	C	M	Apply asset management plan
	34	Easements	3	B	S	Accept

Water Supplies Assessments

C1.1 The Assessments in Summary

The assessment off adequacy for capacity and quality for now and the future for each community is detailed below.

Table 10.16 Adequate for Capacity

Community	Adequate for Capacity			
	For Now		For future	
	Yes/No	Reason	Yes/No	Reason
Athol	Yes	No supply concerns	Yes	Static Population
Arapuni	Yes	Spare capacity and no supply concerns	Yes	Static Population
Lichfield	Yes	Spare capacity and no supply concerns	Yes	Static Population
Putāruru	Yes	Spare capacity and no supply concerns	Yes	Static Population
Tirau	Yes	Spare capacity and no supply concerns	Yes	Static Population
Tokoroa	Yes	Spare capacity and no supply concerns	Yes	Static Population

Table 10.17 Adequate for Quality

Community	Adequate for Quality			
	For now		For future	
	Yes/No	Reason	Yes/No	Reason
Athol	Yes	Water is supplied by Carter Holt Harvey	Yes	
Arapuni	Yes	Water is chlorinated.	No	Upgrading of water treatment and/or water quality testing may be required to comply with the proposed amendments to the Proposed Health (Drinking Water) Amendment Bill
Lichfield	Yes	Water is chlorinated	Yes	Upgrading of water treatment and/or water quality testing may be required to comply with the proposed amendments to the Proposed Health (Drinking Water) Amendment Bill
Putāruru	No	Water has regular occurrences of contamination over the last 4 years	Yes	Upgrading of water treatment and/or water quality testing may be required to comply with the proposed amendments to the Proposed Health (Drinking Water) Amendment Bill
Tirau	Yes		No	Upgrading of water treatment and water quality testing will be required to comply with the proposed amendments to the Health (Drinking Water) Amendment Act 2007
Tokoroa	Yes	Duplicate of the Colson's Hill rising main will result in significant increase in security of supply (quality and quantity)	Yes	Subject to compliance with DWSNZ2005

APPENDIX D DEMAND INFORMATION

Council has developed a comprehensive model identifying the drivers of demand for services.

D1 Demand Drivers

The drivers of demand for the Water Supply Activity are as follows:

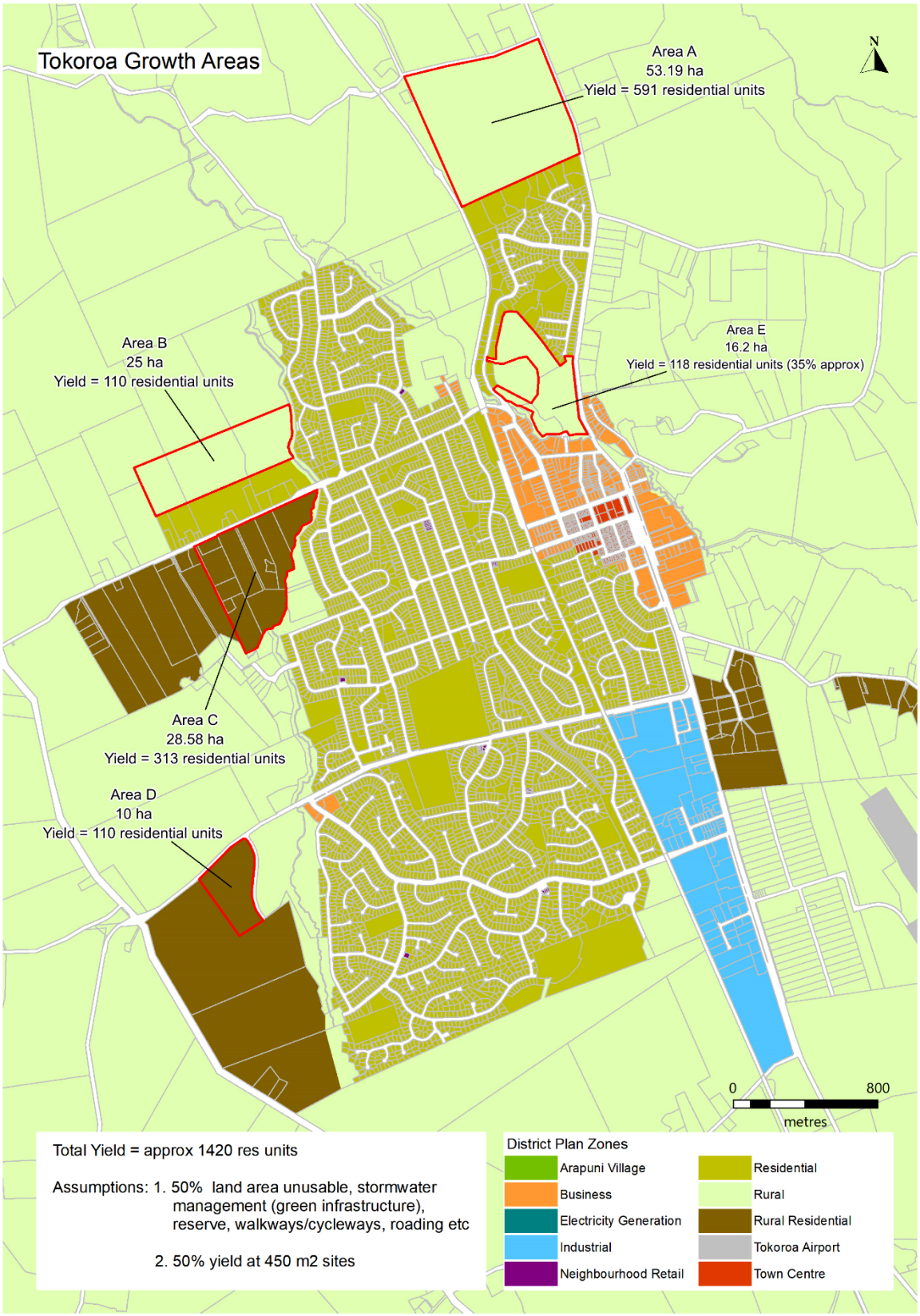
Table 10.18 Demand Matrix

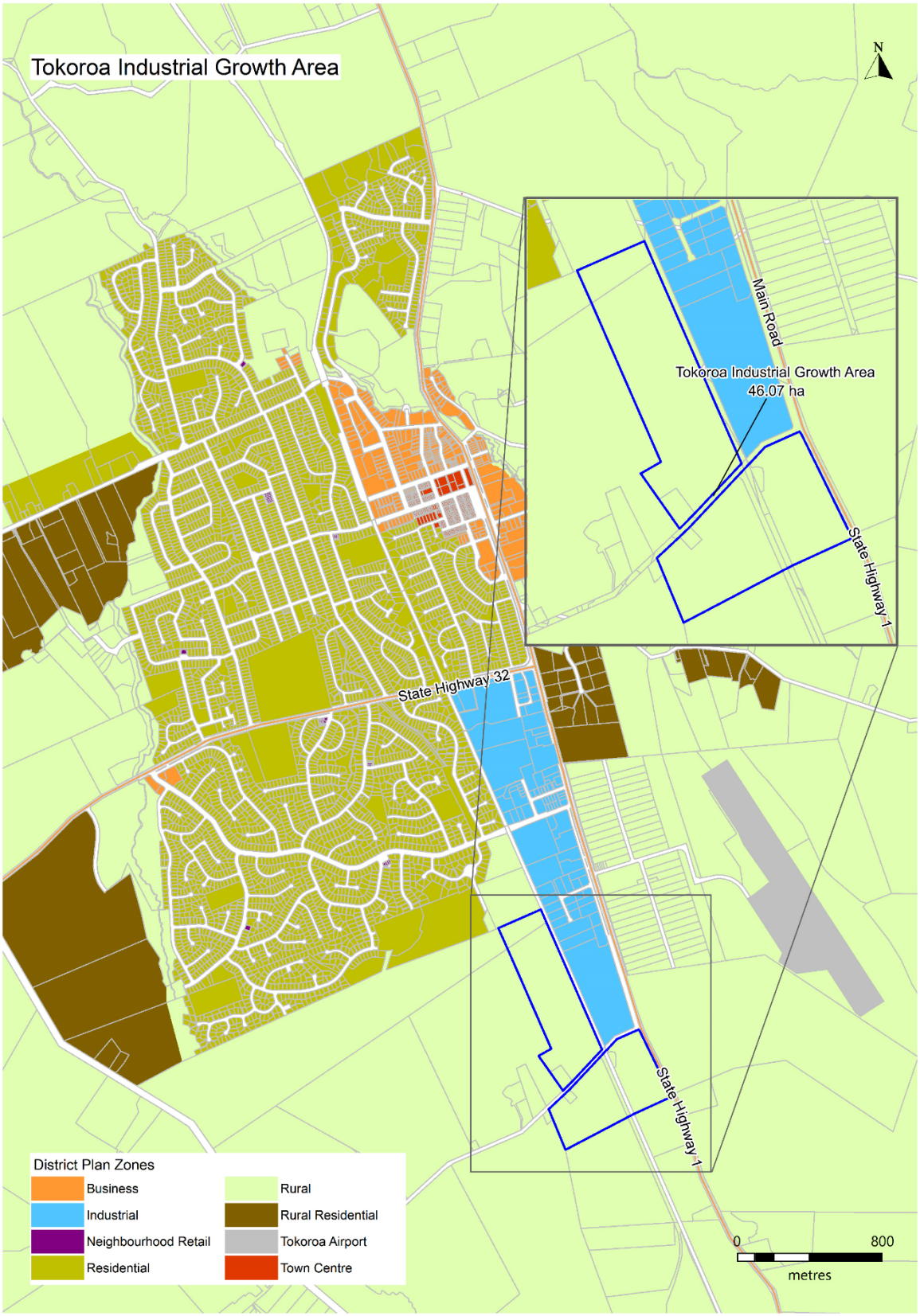
	Sector Creating the Demand			Basis of the Driver			
	Domestic	Commercial	Community	Industrial	Resident Population Growth	Per-head Demand Growth	Unrelated to Resident Population
Growth in resident population	✓	✓	✓	✓	✓		
Shifting patterns of farming, forestry & industry				✓			✓
Housing trends that include multiple bathrooms and toilets	✓					✓	
Increasing use of in-sink garbage disposals	✓					✓	
Demand for trade waste disposal		✓		✓			✓

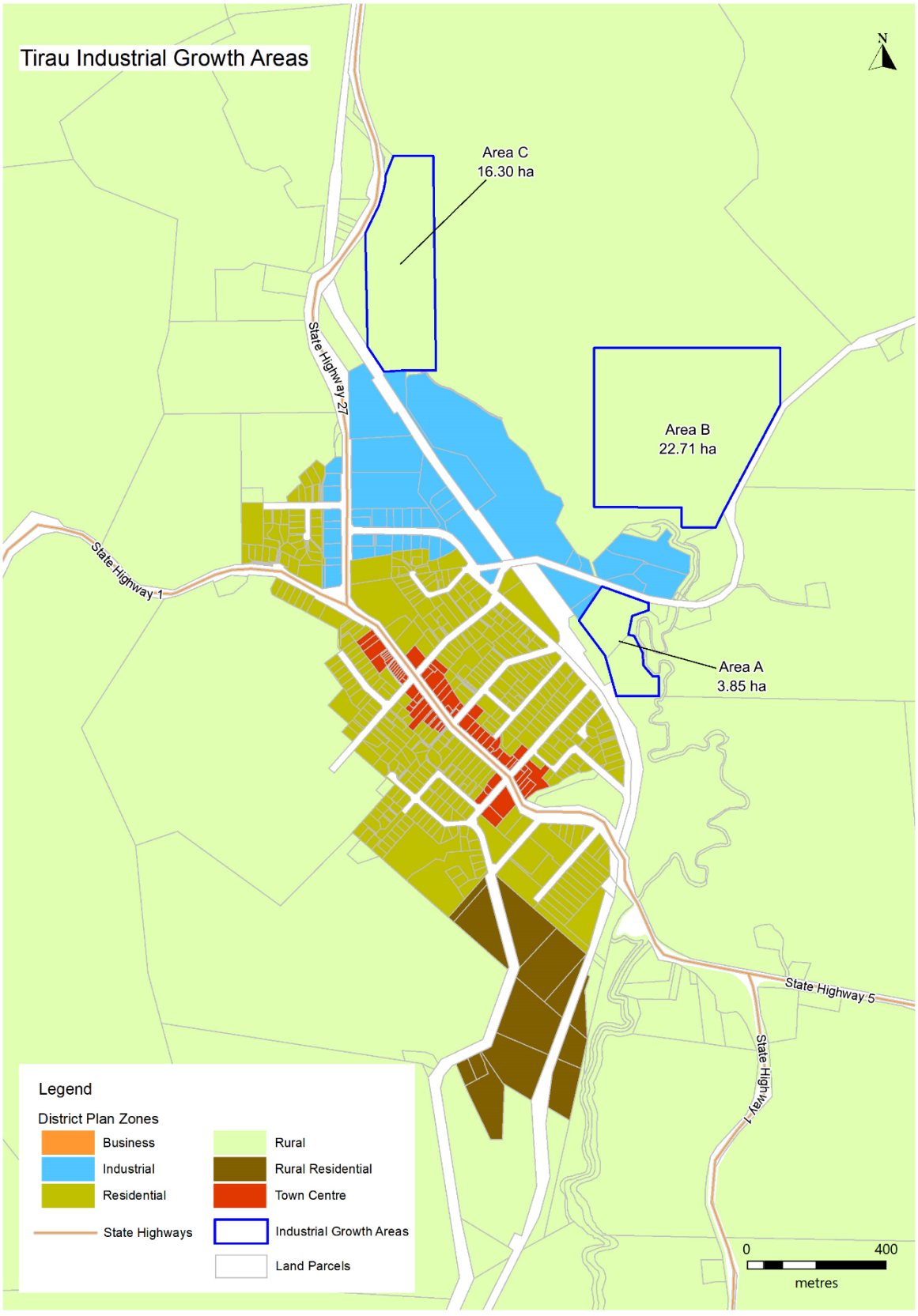
These individual drivers influence overall demand as indicated in the model below. Key numerical parameters in this model are:

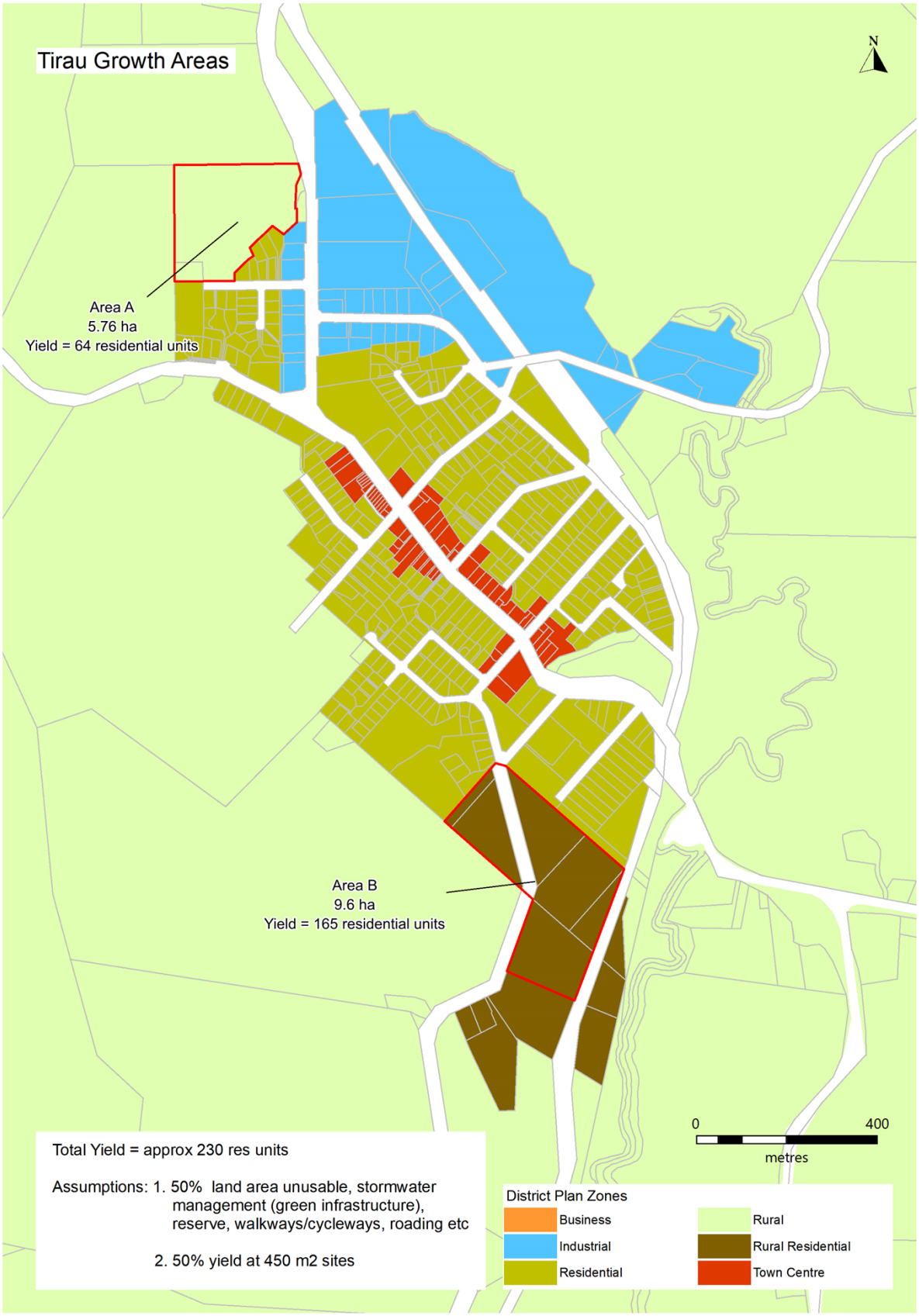
- Resident population trends of reticulated areas - stable at about the levels identified in Section 4.2.3
- Per-head demand – this is increasing as implied from increasing water use
- Non-resident population – this has been implicitly accounted for in that the network also serves public toilets and toilets and washrooms in commercial and public buildings
- Changes in economic activity – forest land converted to dairy farms has brought between 30 and 50 new families into the District. These families are certainly be based outside of the reticulated areas which has not increased the demand

D2 New Growth Areas









APPENDIX E LEGISLATION, CONSENTS & PUBLIC HEALTH

E1 Resource Consents, Zonings and Easements

Council has the following resource consents for the Water Supply Activity:

Table 10.19 Waikato Regional Council Client ID: SO1553

Consent	Type	Subtype	Location	Purpose	Date Applied	Date Granted	Date Expires	Charge	Charge Step	Full Year Amount 2013/14
AUTH130334.01.01	Water Permit	Ground water (3 bores)	Elizabeth Drive Tokoroa	Tokoroa Municipal Water Supply 15,000 m^3/day	30/09/2013	4/12/2013	31/12/2031	Yes	Ground Water take Large	$600.00
122363	Water Permit	Ground water take	Glenshea Park Putāruru	Putāruru Municipal Water Supply 3,800 m^3/day	30/01/2011	10/01/2013	31/12/2031	Yes	Ground Water take Large	$600.00
101869	Water Permit	Surface water take	Waihou River Leslie Road Putāruru	Putāruru Municipal Water Supply 4,000 m^3/day	29/01/2014	5/05/2014	31/03/2048	Yes	Surface Water take Large	$529.00
103937	Water Permit	Surface Water take	Oraka Spring Tirau	Tīrau Municipal Water Supply 1750 m^3/day	12/07/2000	11/09/2001	30/09/2022	Yes	Surface Water take Large	$529.00
125251	Water Permit	Ground Water take	Arapuni Road Arapuni	Arapuni Municipal Water Supply 355 m^3/day	30/09/2012	1/04/2013	31/03/2031	Yes	Ground Water take Large	$600.00
125252	Discharge Permit	Discharge to Land	Arapuni Road Arapuni	Discharge from start-up at Arapuni Water Supply 20 m^3/day	30/09/2012	1/04/2013	31/03/2031	Yes	Discharge to Land	$405.00
940284	Water Permit	Ground Water take	Corner of State Highway 1 and Ngatira Road Lichfield	Lichfield Municipal Water Supply 40 m^3/day	8/06/1994	16/08/1994	1/08/2029	Yes	Ground Water take Small	$281.00

APPENDIX F OPEX AND CAPEX CAPITAL IMPROVEMENT & RENEWAL LTP 2021 PROGRAMMES

F1 OPEX LTP PROGRAMMES - July 2021

Summary – July 2021

OPEX SUMMARY	2021/31 LTP Budget 2021/22	2021/31 LTP Budget 2022/23	2021/31 LTP Budget 2023/24	2021/31 LTP Budget 2024/25	2021/31 LTP Budget 2025/26	2021/31 LTP Budget 2026/27	2021/31 LTP Budget 2027/28	2021/31 LTP Budget 2028/29	2021/31 LTP Budget 2029/30	2021/31 LTP Budget 2030/31
Water	**4,705,837**	**4,897,153**	**5,079,044**	**5,407,310**	**5,557,790**	**5,777,091**	**6,120,170**	**6,287,936**	**6,482,979**	**6,925,970**
52000- Water - District	1,279,669	1,356,017	1,450,112	1,508,816	1,473,473	1,530,400	1,526,824	1,560,889	1,620,679	1,625,436
52100- Water - Tokoroa	1,434,612	1,477,331	1,510,988	1,634,047	1,695,765	1,755,303	1,926,495	1,991,241	2,043,097	2,267,653
52200- Water - Putaruru	794,027	823,794	839,566	897,598	934,540	989,764	1,101,151	1,126,538	1,163,811	1,293,529
52201- Water - Putaruru - DCs	2,866	6,001	6,001	6,001	16,456	26,911	26,911	32,900	40,823	42,757
52300- Water - Tirau	243,817	257,698	274,220	336,349	389,913	403,489	433,277	446,856	460,750	497,456
52400- Water - Arapuni	135,861	141,415	144,940	151,812	155,614	160,080	172,410	176,498	180,585	198,063
52500- Water Supply - Lichfield	46,618	47,418	48,154	50,445	51,439	52,207	55,827	56,627	57,734	63,687
52600- Water Supply - Athol	11,367	11,555	11,727	12,252	12,432	12,612	13,538	13,726	13,913	15,363
93000- Water Services	757,000	775,925	793,336	809,990	828,158	846,326	863,737	882,662	901,587	922,026

Detailed – July 2021

Account	2021/31 LTP Budget 2021/22	2021/31 LTP Budget 2022/23	2021/31 LTP Budget 2023/24	2021/31 LTP Budget 2024/25	2021/31 LTP Budget 2025/26	2021/31 LTP Budget 2026/27	2021/31 LTP Budget 2027/28	2021/31 LTP Budget 2028/29	2021/31 LTP Budget 2029/30	2021/31 LTP Budget 2030/31
Water	**4,705,837**	**4,897,153**	**5,079,044**	**5,407,310**	**5,557,790**	**5,777,091**	**6,120,170**	**6,287,936**	**6,482,979**	**6,925,970**
52000- Water - District	1,279,669	1,356,017	1,450,112	1,508,816	1,473,473	1,530,400	1,526,824	1,560,889	1,620,679	1,625,436
5200000260129. OH - Tokoroa Depot	19,640	21,276	22,477	23,093	23,372	24,062	24,392	24,762	25,809	26,192
5200000265000. OH - Corporate Management	42,318	43,762	44,876	45,994	46,687	47,495	48,392	49,326	50,211	51,245
5200000266000. OH - Corporate Services	34,790	37,055	38,294	39,736	39,857	40,569	41,248	42,198	42,829	43,691
5200000270100. OH - Customer Services Tokoroa	22,485	23,356	24,352	24,971	24,742	25,157	25,555	26,120	26,559	27,091
5200000270200. OH - Customer Services Putaruru	12,238	12,555	12,842	13,187	13,329	13,597	13,827	14,107	13,432	14,037
5200000275000. OH - Finance Services	91,850	95,581	98,481	101,561	102,464	104,317	106,126	108,107	109,936	112,158
5200000275013. OH - Rates	77,013	79,922	82,994	86,870	85,721	87,611	90,248	90,541	91,968	95,270
5200000281000. OH - Strategic Policy	25,964	30,917	36,236	29,561	29,590	38,385	30,568	31,237	40,554	32,344
5200000284000. OH - Asset Management	113,364	117,444	120,800	124,485	125,778	128,180	130,492	133,134	135,430	138,198
5200000284001. OH - Assets Business Support	96,726	89,728	102,976	118,633	89,774	100,298	93,950	94,069	105,209	99,358
5200000285000. OH - Asset Management Services	109,683	115,573	119,689	124,240	124,563	126,726	128,801	131,516	133,726	136,413
5200000289000. OH - Programme Management	87,277	98,816	106,626	112,756	110,600	111,931	113,218	115,528	116,887	118,867
5200000293000. OH - Water Services	366,495	402,394	423,926	449,761	440,459	445,662	451,107	463,623	470,173	478,895
5200000296000. OH - Infrastructure & Maintenance	135,819	140,260	150,052	152,203	151,801	157,425	156,368	159,654	164,548	164,471
52000010. Depreciation	1,508	3,816	8,471	14,291	16,242	18,290	22,039	25,411	28,881	33,441
52000108. Asset Management Planning	15,000	15,375	28,200	18,050	18,410	29,950	19,115	19,490	31,775	20,270
52000243. Water Education	2,500	2,562	2,620	2,675	2,735	2,795	2,852	2,915	2,977	3,045
52000308. Water Loss Detection	25,000	25,625	26,200	26,750	27,350	27,950	28,525	29,150	29,775	30,450
52000423. Health & Safety	0	0	0	0	0	0	0	0	0	0

Detailed

52100- Water - Tokoroa	1,434,612	1,477,331	1,510,988	1,634,047	1,695,765	1,755,303	1,926,495	1,991,241	2,043,097	2,267,653
52100010. Depreciation	518,742	538,052	550,133	623,874	654,449	681,897	821,656	852,900	876,504	1,072,678
52100010004. Depreciation	0	0	0	0	0	0	0	0	0	0
52100101. Southtech	0	0	0	0	0	0	0	0	0	0
52100109. Laboratory	36,000	36,900	37,728	38,520	39,384	40,248	41,076	41,976	42,876	43,848
52100109650. Laboratory Internal WM	30,000	30,750	31,440	32,100	32,820	33,540	34,230	34,980	35,730	36,540
521001101. Operations - Headw ork	110,000	112,750	115,280	117,700	120,340	122,980	125,510	128,260	131,010	137,634
521001101650. Operations Headw ork Internal WM	105,000	107,625	110,040	112,350	114,870	117,390	119,805	122,430	125,055	127,890
521001102. Operations - Reticulation	80,000	82,000	83,840	110,600	112,520	114,440	116,280	118,280	120,280	122,440
521001102650. Operations Reticulation Internal WM	185,000	189,625	193,880	197,950	202,390	206,830	211,085	215,710	220,335	225,330
52100111. Resource consents	10,000	10,250	10,480	10,700	10,940	11,180	11,410	11,660	11,910	12,180
52100300. Chemicals	25,000	25,625	26,200	26,750	27,350	27,950	28,525	29,150	29,775	30,450
52100352. Pow er	200,000	205,000	209,600	214,000	218,800	223,600	228,200	233,200	238,200	243,600
52100453. Remissions	0	0	0	0	0	0	0	0	0	0
52100457. Interest On Loan	0	511	1,023	5,192	14,354	24,463	34,831	45,436	50,792	50,792
52100458. Insurance	25,016	25,641	26,217	26,767	27,368	27,968	28,543	29,169	29,794	30,469
52100463. Rates - WRC	13,357	13,691	13,998	14,292	14,613	14,933	15,240	15,574	15,908	16,269
52100463625. Council Rates - SWDC	96,497	98,909	101,129	103,252	105,568	107,884	110,103	112,516	114,928	117,533
52100464. Lapp	0	0	0	0	0	0	0	0	0	0
52100466. Write Offs - Rates	0	0	0	0	0	0	0	0	0	0
52200- Water - Putaruru	794,027	823,794	839,566	897,598	934,540	989,764	1,101,151	1,126,538	1,163,811	1,293,529
52200010. Depreciation	256,847	273,339	276,901	307,736	331,407	353,898	413,081	425,209	443,264	541,518
52200010004. Depreciation	0	0	0	0	0	0	0	0	0	0
52200108. Asset Management Plan	0	0	0	0	0	0	0	0	0	0
52200109. Laboratory	50,000	51,250	52,400	53,500	54,700	55,900	57,050	58,300	59,550	60,900
52200109650. Laboratory Internal WM	5,000	5,125	5,240	5,350	5,470	5,590	5,705	5,830	11,910	12,180
522001101. Operations - Headw ork	85,000	87,125	89,080	105,950	107,990	110,030	111,985	114,110	116,235	135,530
522001101650. Operations Headw ork Internal WM	77,000	78,925	80,696	82,390	84,238	86,086	87,857	89,782	91,707	93,786
522001102. Operations - Reticulation	45,000	46,125	47,160	48,150	49,230	70,310	111,345	112,470	113,595	114,810
522001102650. Operations Reticulation Internal WM	120,000	123,000	125,760	128,400	131,280	134,160	136,920	139,920	142,920	146,160
52200111. Resource consents	4,000	4,100	4,192	4,280	4,376	4,472	4,564	4,664	4,764	4,872
52200300. Chemicals	8,000	8,200	8,384	8,560	8,752	8,944	9,128	9,328	9,528	9,744
52200352. Pow er	110,000	112,750	115,280	117,700	120,340	122,980	125,510	128,260	131,010	133,980
52200359. R & M - Grounds	2,000	2,050	2,096	2,140	2,188	2,236	2,282	2,332	2,382	2,436
52200452. Doubtful Debts	0	0	0	0	0	0	0	0	0	0
52200453. Remissions	0	0	0	0	0	0	0	0	0	0
52200457. Interest On Loan	2,645	2,556	2,472	2,910	3,352	3,257	3,165	3,061	2,960	2,858
52200458. Insurance	11,057	11,333	11,588	11,831	12,096	12,362	12,616	12,892	13,169	13,467
52200463. Rates - WRC	1,444	1,480	1,513	1,545	1,580	1,614	1,648	1,684	1,720	1,759
52200463625. Council Rates - SWDC	16,034	16,435	16,804	17,156	17,541	17,926	18,295	18,696	19,096	19,529
52200464. Lapp	0	0	0	0	0	0	0	0	0	0
52201- Water - Putaruru - DCs	2,866	6,001	6,001	6,001	16,456	26,911	26,911	32,900	40,823	42,757
52201457. Interest Payable	2,866	6,001	6,001	6,001	16,456	26,911	26,911	32,900	40,823	42,757
52300- Water - Tirau	243,817	257,698	274,220	336,349	389,913	403,489	433,277	446,856	460,750	497,456
52300010. Depreciation	58,489	65,655	72,776	106,669	133,669	140,597	163,864	170,502	177,407	209,145
52300010004. Depreciation	0	0	0	0	0	0	0	0	0	0
52300109. Laboratory	25,000	25,625	26,200	26,750	27,350	27,950	28,525	29,150	29,775	30,450
52300109650. Laboratory Internal WM	5,000	5,125	5,240	5,350	5,470	5,590	5,705	5,830	5,955	6,090
523001101. Operations - Headw ork	35,000	35,875	37,680	38,450	39,290	40,130	40,935	41,810	42,685	43,630
523001101650. Operations Headw ork Internal WM	35,000	35,875	36,680	37,450	38,290	39,130	39,935	40,810	41,685	40,194
523001102. Operations - Reticulation	10,000	10,250	10,480	10,700	10,940	11,180	11,410	11,660	11,910	12,180
523001102650. Operations Reticulation Internal WM	30,000	30,750	31,440	32,100	32,820	33,540	34,230	34,980	35,730	36,540
52300111. Resource consents	2,500	2,563	2,620	2,675	2,735	2,795	2,853	2,915	2,978	3,045
52300300. Chemicals	4,000	4,100	4,192	4,280	4,376	4,472	4,564	4,664	4,764	4,872
52300352. Pow er	27,000	27,675	28,296	28,890	29,538	30,186	30,807	31,482	32,157	32,886
52300453. Remissions	140	144	147	150	153	157	160	163	167	171
52300457. Interest On Loan	990	3,096	7,258	31,439	53,578	55,802	58,083	60,416	62,796	65,223
52300458. Insurance	4,407	4,517	4,619	4,715	4,821	4,927	5,028	5,139	5,249	5,368
52300463. Rates - WRC	767	786	804	821	839	858	875	894	914	934
52300463625. Council Rates - SWDC	5,524	5,662	5,789	5,911	6,043	6,176	6,303	6,441	6,579	6,728
52300464. Lapp	0	0	0	0	0	0	0	0	0	0

52400- Water - Arapuni	135,861	141,415	144,940	151,812	155,614	160,080	172,410	176,498	180,585	198,063
52400010. Depreciation	44,048	47,307	48,720	53,572	55,170	57,433	67,651	69,444	71,235	86,235
52400010004. Depreciation	0	0	0	0	0	0	0	0	0	0
52400109. Laboratory	10,000	10,250	10,480	10,700	10,940	11,180	11,410	11,660	11,910	12,180
52400109650. Laboratory Internal WM	5,000	5,125	5,240	5,350	5,470	5,590	5,705	5,830	5,955	6,090
524001101. Operations - Headw ork	15,000	15,375	15,720	16,050	16,410	16,770	17,115	17,490	17,865	18,270
524001101650. Operations Headw ork Internal WM	35,000	35,875	36,680	37,450	38,290	39,130	39,935	40,810	41,685	42,630
524001102. Operations - Reticulation	3,500	3,588	3,668	3,745	3,829	3,913	3,994	4,081	4,169	4,263
524001102650. Operations Reticulation Internal WM	3,500	3,588	3,668	3,745	3,829	3,913	3,994	4,081	4,169	4,263
52400111. Resource consents	800	820	838	856	875	894	913	933	953	974
52400300. Chemicals	1,000	1,025	1,048	1,070	1,094	1,118	1,141	1,166	1,191	1,218
52400352. Pow er	12,500	12,813	13,100	13,375	13,675	13,975	14,263	14,575	14,888	15,225
52400458. Insurance	2,096	2,148	2,197	2,243	2,293	2,343	2,392	2,444	2,496	2,553
52400463. Rates - WRC	401	411	420	429	439	448	458	468	478	488
52400463625. Council Rates - SWDC	3,016	3,091	3,161	3,227	3,300	3,372	3,441	3,517	3,592	3,673
52400464. Lapp	0	0	0	0	0	0	0	0	0	0
52500- Water Supply - Lichfield	46,618	47,418	48,154	50,445	51,439	52,207	55,827	56,627	57,734	63,687
52500010. Depreciation	14,618	14,618	14,618	16,205	16,431	16,431	19,315	19,315	19,622	24,711
52500010004. Depreciation	0	0	0	0	0	0	0	0	0	0
52500109. Laboratory	1,900	1,947	1,991	2,033	2,079	2,124	2,168	2,215	2,263	2,314
52500109650. Laboratory Internal WM	3,000	3,075	3,144	3,210	3,282	3,354	3,423	3,498	3,573	3,654
52500111. Resource consents	750	769	786	803	821	839	856	875	893	914
52500303. Repairs & Maintenance	8,000	8,200	8,384	8,560	8,752	8,944	9,128	9,328	9,528	9,744
52500303650. R & M Reticulation Internal WM	16,000	16,400	16,768	17,120	17,504	17,888	18,256	18,656	19,056	19,488
52500352. Pow er	1,800	1,845	1,886	1,926	1,969	2,012	2,054	2,099	2,144	2,192
52500458. Insurance	550	564	576	589	602	615	628	641	655	670
52500464. Lapp	0	0	0	0	0	0	0	0	0	0
52600- Water Supply - Athol	11,367	11,555	11,727	12,252	12,432	12,612	13,538	13,726	13,913	15,363
52600010. Depreciation	3,867	3,867	3,867	4,227	4,227	4,227	4,981	4,981	4,981	6,228
52600010004. Depreciation	0	0	0	0	0	0	0	0	0	0
52600102. Water Purchases	5,000	5,125	5,240	5,350	5,470	5,590	5,705	5,830	5,955	6,090
52600109650. Laboratory Internal WM	0	0	0	0	0	0	0	0	0	0
52600303. Repairs & Maintenance	500	513	524	535	547	559	571	583	596	609
52600303650. R & M Reticulation Internal WM	2,000	2,050	2,096	2,140	2,188	2,236	2,282	2,332	2,382	2,436
93000- Water Services	757,000	775,925	793,336	809,990	828,158	846,326	863,737	882,662	901,587	922,026
9300000267000. OH - Human Resources	10,855	11,738	12,379	13,072	13,213	13,600	13,964	14,404	14,792	15,256
9300000267001. OH - Health & Safety	37,092	38,960	40,265	41,627	41,912	42,677	43,404	44,251	45,014	45,921
9300000268000. OH - Information Services	87,877	118,037	133,761	153,129	139,407	139,229	138,787	145,626	146,384	149,489
93000006. Internal Vehicle Charge	0	0	0	0	0	0	0	0	0	0
93000145. WM J Costs	898,000	920,450	941,104	960,860	982,412	1,003,964	1,024,618	1,047,068	1,069,518	1,093,764
93000308. Miscellaneous	0	0	0	0	0	0	0	0	0	0
93000312. Merchandise - Stock	0	0	0	0	0	0	0	0	0	0
93000405. Plant Cost - Job Cost	3,000	3,075	3,144	3,210	3,282	3,354	3,423	3,498	3,573	3,654
93000406. Plant Recovery - Job Cost	(60,000)	(61,500)	(62,880)	(64,200)	(65,640)	(67,080)	(68,460)	(69,960)	(71,460)	(73,080)
93000416. Training	0	0	0	0	0	0	0	0	0	0
93000419000. Salaries	138,751	141,526	144,357	147,244	150,189	153,193	156,256	159,382	162,569	165,821
93000445000. Wages - Job Cost	416,920	425,259	433,764	442,439	451,288	460,314	469,520	478,910	488,488	498,258
93000446. Wages Recovery - Job Cost	(409,000)	(419,225)	(428,632)	(437,630)	(447,446)	(457,262)	(466,669)	(476,894)	(487,119)	(498,162)
93000715. Overhead Recoveries	(366,495)	(402,394)	(423,926)	(449,761)	(440,459)	(445,662)	(451,107)	(463,623)	(470,173)	(478,895)

F2 CAPEX RENEWALS & IMPROVEMENTS LTP PROGRAMMES – July 2021

Water Supply Capital Renewals by Detail – July 2021

Expenditure Type	Project Names	Community	Total Cost	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Capital Renewals	Watermain Renewal Programme - Tokoroa	Tokoroa	**6,000,000**	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000
Capital Renewals	Watermain Renewal Programme - Arapuni	Arapuni	**360,000**		120,000			120,000			120,000		
Capital Renewals	Watermain Renewal Programme - Putāruru	Putāruru	**1,495,000**	149,500	149,500	149,500	149,500	149,500	149,500	149,500	149,500	149,500	149,500
Capital Renewals	Watermain Renewal Programme - Tīrau	Tīrau	**420,000**	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000
Capital Renewals	Watermain Renewal Programme - Lichfield	Lichfield	**50,000**				25,000					25,000	
Capital Renewals	Arapuni Water Supply Bore Replacment	Arapuni	**195,000**	195,000									
Capital Renewals	Tīrau Water Supply Plant & Equipment Replacement	Tīrau	**247,000**	15,000	40,000	15,000	57,000	45,000	15,000	15,000	15,000	15,000	15,000
Capital Renewals	Tokoroa Water Supply Plant & Equipment Replacement	Tokoroa	**325,000**	25,000		15,000	15,000	75,000	50,000	85,000	20,000	20,000	20,000
Capital Renewals	Tokoroa Water Supply Billah St Headworks Rising Main replacement	Tokoroa	**110,000**		110,000								
Capital Renewals	Arapuni Water Supply Plant & Equipment Replacement	Arapuni	**78,000**	5,000	10,000	5,000	6,000	7,000	25,000	5,000	5,000	5,000	5,000
Capital Renewals	Water Treatment Plant Telemetry Infrastructure - Server Replacement [P1]	District Wide	**54,000**			27,000					27,000		
Subtotal Capital Renewals - Districtwide			***54,000***	*0*	*0*	*27,000*	*0*	*0*	*0*	*0*	*27,000*	*0*	*0*
Subtotal Capital Renewals - Tokoroa			***6,435,000***	*625,000*	*710,000*	*615,000*	*615,000*	*675,000*	*650,000*	*685,000*	*620,000*	*620,000*	*620,000*
Subtotal Capital Renewals - Puataruru			***1,495,000***	*149,500*	*149,500*	*149,500*	*149,500*	*149,500*	*149,500*	*149,500*	*149,500*	*149,500*	*149,500*
Subtotal Capital Renewals - Tirau			***667,000***	*57,000*	*82,000*	*57,000*	*99,000*	*87,000*	*57,000*	*57,000*	*57,000*	*57,000*	*57,000*
Subtotal Capital Renewals - Arapuni			***633,000***	*200,000*	*130,000*	*5,000*	*6,000*	*127,000*	*25,000*	*5,000*	*125,000*	*5,000*	*5,000*
Subtotal Capital Renewals - Lichfield			***50,000***	*0*	*0*	*0*	*25,000*	*0*	*0*	*0*	*0*	*25,000*	*0*
Subtotal Capital Renewals - Athol			***0***	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Capital Renewals			**9,334,000**	**1,515,500**	**1,525,500**	**1,637,500**	**6,544,500**	**5,183,670**	**2,225,500**	**2,240,500**	**3,122,308**	**1,894,797**	**1,175,500**

Water Supply Capital Improvements by Detail – July 2021

Expenditure Type	Project Names	Community	Total Cost	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Capital Improvements Growth	Tirau Water Supply Resource Consent Renewal	Tirau	30,000	30,000									
Capital Improvements Growth	Arapuni Street Watermain Upgrade	Putāruru	694,297									694,297	
Capital Improvements Growth	Reservoir Street Watermain Upgrade	Putāruru	1,757,568					1,757,568					
Capital Improvements Growth	Sholson Street Watermain Upgrade	Putāruru	803,602					803,602					
Capital Improvements Growth	Glenshea Booster Pump	Putāruru	799,808								799,808		
Capital Improvements LOS	Water Supply District Wide Health & Safety Upgrade	District Wide	0										
Capital Improvements LOS	Seismic Assessments Water Supply Reservoirs	District Wide	240,000				120,000	120,000					
Capital Improvements LOS	Glenshea Water Supply Reservoir Repairs	Putāruru	40,000	40,000									
Capital Improvements LOS	Water Supply Putāruru - Capital Component of Maintenance	Putāruru	150,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Capital Improvements LOS	Water Supply Tirau - Capital Component of Maintenance	Tirau	120,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
Capital Improvements LOS	Water Supply Tokoroa - Capital Component of Maintenance	Tokoroa	150,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Capital Improvements LOS	Putāruru Water Supply - Reticulation Minor New Works	Putāruru	100,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Capital Improvements LOS	Tokoroa Water Supply - Mansfield Street Ridermain Installation	Tokoroa	55,000		55,000								
Capital Improvements LOS	Putāruru Water Supply - pH Correction Plant	Putāruru	55,000				55,000						
Capital Improvements LOS	Tirau Water Supply - Reticulation Minor New Works	Tirau	100,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Capital Improvements LOS	Billah Street Filtration	Tokoroa	378,000				378,000						
Capital Improvements LOS	Tirau Water Supply Storage	Tirau	2,270,000			220,000	2,050,000						
Capital Improvements LOS	Tirau Water Supply Reticulation	Tirau	1,100,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000
Capital Improvements LOS	Tokoroa Water Supply	Tokoroa	2,050,000				50,000	500,000	500,000	500,000	500,000		
Capital Improvements LOS	Infrastructure Unit - Technology Upgrades New Mobile Devices	Internal Project	15,000	15,000									
Subtotal Capital Improvements - Districtwide			***255,000***	***0***	***0***	***0***	***120,000***	***120,000***	***0***	***0***	***0***	***0***	***0***
Subtotal Capital Improvements - Tokoroa			***2,633,000***	***15,000***	***70,000***	***15,000***	***443,000***	***515,000***	***515,000***	***515,000***	***515,000***	***15,000***	***15,000***
Subtotal Capital Improvements - Putāruru			***4,400,275***	***65,000***	***25,000***	***25,000***	***80,000***	***2,586,170***	***25,000***	***25,000***	***824,808***	***719,297***	***25,000***
Subtotal Capital Improvements - Tirau			***3,620,000***	***162,000***	***132,000***	***352,000***	***2,182,000***	***132,000***	***132,000***	***132,000***	***132,000***	***132,000***	***132,000***
Subtotal Capital Improvements - Arapuni			***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Subtotal Capital Improvements - Lichfield			***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Subtotal Capital Improvements - Athol			***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Subtotal Capital Improvements Growth			***4,085,275***	***30,000***	***0***	***0***	***0***	***2,561,170***	***0***	***0***	***799,808***	***694,297***	***0***
Subtotal Capital Improvements LOS			***6,823,000***	***227,000***	***227,000***	***392,000***	***2,825,000***	***792,000***	***672,000***	***672,000***	***672,000***	***172,000***	***172,000***
Total Capital Improvements			**10,908,275**	**257,000**	**227,000**	**392,000**	**2,825,000**	**3,353,170**	**672,000**	**672,000**	**1,471,808**	**866,297**	**172,000**

** Water Supply District Wide Health & Safety Upgrade project transferred from Wastewater AMP*

F3 THREE WATERS SCOPE – LTP 2021 SCOPE INCLUDING LTP AMENDMENTS AND NEW WORKS

Scope			Capex Spend By Year										OPEX		Opex Spend By Year								
	Project	Total CAPEX (uninflated)	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Consequential	Total OPEX (Uninflated)	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
NW22	Baird Road Stormwater*	$ 2,704,354			$ 1,352,177	$ 1,352,177							2.0%					$ 54,087	$ 54,087	$ 54,087	$ 54,087	$ 54,087	$ 54,087
	- Inc. Baird Rd Channel Works																						
	- Inc. Baird Rd Culvert Upgrade																						
NW22	Dreghorn Place Stormwater*	$ 1,217,260			$ 608,630	$ 608,630							2.0%					$ 24,345	$ 24,345	$ 24,345	$ 24,345	$ 24,345	$ 24,345
NW22	St Andrews Drive Stormwater*	$ 1,048,044			$ 524,022	$ 524,022							2.0%					$ 20,961	$ 20,961	$ 20,961	$ 20,961	$ 20,961	$ 20,961
NW22	Giles Street and Pelikan Place Stormwater*	$ 7,547,575			$ 754,758	$ 754,758	$ 3,019,030	$ 3,019,030					2.0%							$ 150,952	$ 150,952	$ 150,952	$ 150,952
NW22	Strathmore Park Stormwater	$ 3,327,868			$ 1,663,934	$ 1,663,934	$ -	$ -					2.0%					$ 66,557	$ 66,557	$ 66,557	$ 66,557	$ 66,557	$ 66,557
NW22	Mereweti Road Intermodal Business Park (MRIPB) Stormwater and Water	$ 1,915,865			$ 957,933	$ 957,933	$ -	$ -					2.0%					$ 38,317	$ 38,317	$ 38,317	$ 38,317	$ 38,317	$ 38,317
NW22	Putaruru Stormwater	$ 6,983,378			$ 3,491,689	$ 3,491,689	$ -	$ -					2.0%					$ 139,668	$ 139,668	$ 139,668	$ 139,668	$ 139,668	$ 139,668
AMNDT22	Putaruru Improvements - Arapuni Rd culvert	$ 164,000		$ 160,000									2.0%	$ 26,240		$ 3,280	$ 3,280	$ 3,280	$ 3,280	$ 3,280	$ 3,280	$ 3,280	$ 3,280
AMNDT22	Putaruru Arapuni St open channel& culvert improvements	$ 1,082,000					$ 541,000	$ 541,000					2.0%	$ 86,560		$ -	$ -	$ -		$ 21,640	$ 21,640	$ 21,640	$ 21,640
NW22	Tirau Stormwater	$ 3,711,330			$ 1,855,665	$ 1,855,665	$ -	$ -					2.0%					$ 74,227	$ 74,227	$ 74,227	$ 74,227	$ 74,227	$ 74,227
NW22	Manfeld Street Culvert Replacement	$ 105,000				$ 35,000	$ 35,000	$ 35,000					2.0%										
NW22	Manfeld Street Culvert Replacement	$ 45,000				$ 15,000	$ 15,000	$ 15,000					2.0%										
LTP21	Treatment devices	$ 4,334,000					$ 722,333	$ 722,333	$ 722,333	$ 722,333	$ 722,333	$ 722,333	2.0%	$ -		$ -	$ -	$ -					
LTP21	Urban stormwater consent renewals	$ 102,000			$ 102,000								2.0%	$ 14,280		$ -	$ 2,040	$ 2,040	$ 2,040	$ 2,040	$ 2,040	$ 2,040	$ 2,040
LTP21	Buckland Street culvert replacement	$ 204,000				$ 204,000							2.0%	$ 24,480		$ -		$ 4,080	$ 4,080	$ 4,080	$ 4,080	$ 4,080	$ 4,080
LTP21	Philip Street improvements	$ 246,000							$ 246,000				2.0%	$ 14,760		$ -	$ -	$ -	$ -	$ -	$ 4,920	$ 4,920	$ 4,920
LTP21	SH /Countdown network improvements	$ 182,000					$ 182,000						2.0%	$ 18,200		$ -	$ -		$ 3,640	$ 3,640	$ 3,640	$ 3,640	$ 3,640
LTP21	Scott Glen to Golf Street - piping open drain	$ 930,000				$ 465,000	$ 465,000						2.0%	$ 93,000		$ -	$ -		$ 18,600	$ 18,600	$ 18,600	$ 18,600	$ 18,600
LTP21	Improvements - SH1/Harry Martin Drive	$ 103,000		$ 34,333					$ 34,333	$ 34,333			2.0%	$ 4,120								$ 2,060	$ 2,060
LTP21	Minor new works	$ 122,000		$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	2.0%	$ -									
LTP21	General upgrades	$ 314,000		$ 104,667		$ 104,667	$ 104,667						2.0%	$ 31,400					$ 6,280	$ 6,280	$ 6,280	$ 6,280	$ 6,280
LTP21	Minor new works	$ 122,000		$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	2.0%	$ -									
LTP21	General upgrades	$ 321,000		$ 107,000			$ 107,000	$ 107,000					2.0%	$ 25,680						$ 6,420	$ 6,420	$ 6,420	$ 6,420
LTP21	Rehabilitation	$ 640,000							$ 213,333	$ 213,333	$ 213,333		2.0%	$ 12,800		$ -	$ -	$ -	$ -				$ 12,800
IncLTP21	Stormwater Tirau - Minor New Works	$ 55,000	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	2.0%	$ -									
IncLTP21	Stormwater Arapuni - Minor New Works	$ 55,000	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	2.0%	$ -									
NW22	Tokoroa Wastewater Growth	$ 2,607,382	$ -				$ 1,303,691	$ 1,303,691					1.0%	$ 104,296						$ 26,074	$ 26,074	$ 26,074	$ 26,074
NW22	Districtwide Water and Wastewater Telemetry and SCADA upgrades	$ 1,106,250			$ 553,125	$ 553,125							10.0%	$ 663,750				$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625
NW22	Tirau Wastewater	$ 3,973,200			$ -	$ -	$ 1,986,600	$ 1,986,600					1.0%	$ 158,928						$ 39,732	$ 39,732	$ 39,732	$ 39,732
LTP21	Wastewater Development Contributions	$ 150,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	1.0%	$ -									
LTP21	Buckland Street Pump Station Capacity Upgrade	$ 386,372									$ 386,372		1.0%	$ 3,864									$ 3,864
LTP21	Wastewater District Wide Health & Safety	$ 300,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	1.0%	$ -									
LTP21	Putaruru WWTP Consent Upgrade	$ 6,755,000			$ 275,000	$ 3,240,000	$ 3,240,000						1.0%	$ 337,750					$ 67,550	$ 67,550	$ 67,550	$ 67,550	$ 67,550
LTP21	Galway Crescent WWPS - Flood Protection Work	$ 85,000					$ 85,000						1.0%	$ 4,250					$ 850	$ 850	$ 850	$ 850	$ 850
LTP21	Tirau - Depot St Pumpstation - Stage 1	$ 1,025,000		$ 100,000	$ 925,000								1.0%	$ 71,750			$ 10,250	$ 10,250	$ 10,250	$ 10,250	$ 10,250	$ 10,250	$ 10,250
LTP21	SCADA Telemetry Upgrade - Funded by 3 Waters Reform	$ 219,000	$ 219,000										1.0%	$ 19,710	$ 2,190	$ 2,190	$ 2,190	$ 2,190	$ 2,190	$ 2,190	$ 2,190	$ 2,190	$ 2,190
LTP21	De-Nitrification - Funder by 3 Waters Reform	$ 1,389,000	$ 1,389,000										1.0%	$ 125,010	$ 13,890	$ 13,890	$ 13,890	$ 13,890	$ 13,890	$ 13,890	$ 13,890	$ 13,890	$ 13,890
LTP21	Tokoroa Wastewater Pump Station	$ 1,500,000				$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000		1.0%	$ 15,000									$ 15,000
LTP21	Baird Rd & Tasman Drive WWPS Seismic Upgrade	$ 59,000				$ 35,000	$ 24,000						1.0%	$ 2,950					$ 590	$ 590	$ 590	$ 590	$ 590
LTP21	Tokoroa Wastewater Plant - Digester Refurbishment	$ 1,940,000	$ 1,070,000	$ 870,000									1.0%	$ 155,200		$ 19,400	$ 19,400	$ 19,400	$ 19,400	$ 19,400	$ 19,400	$ 19,400	$ 19,400
LTP21	Baird Rd WWPS - Inlet Screen	$ 90,000	$ 90,000										1.0%	$ 8,100	$ 900	$ 900	$ 900	$ 900	$ 900	$ 900	$ 900	$ 900	$ 900
LTP21	Tokoroa WWTP UV System Duplication	$ 250,000		$ 250,000									1.0%	$ 20,000		$ 2,500	$ 2,500	$ 2,500	$ 2,500	$ 2,500	$ 2,500	$ 2,500	$ 2,500
LTP21	Tokoroa WWTP Duplicate Drum Filter	$ 210,000			$ 210,000								1.0%	$ 14,700			$ 2,100	$ 2,100	$ 2,100	$ 2,100	$ 2,100	$ 2,100	$ 2,100
LTP21	Replacement Generator	$ 42,000	$ 42,000										1.0%	$ 3,780	$ 420	$ 420	$ 420	$ 420	$ 420	$ 420	$ 420	$ 420	$ 420
LTP21	Replacement Generator	$ 36,500		$ 36,500									1.0%	$ 2,920		$ 365	$ 365	$ 365	$ 365	$ 365	$ 365	$ 365	$ 365
LTP21	Replacement Generator	$ 36,500			$ 36,500								1.0%	$ 2,555			$ 365	$ 365	$ 365	$ 365	$ 365	$ 365	$ 365
LTP21	Tokoroa WWTP UV Lamp	$ 400,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	1.0%	$ -									
LTP21	Arapuni Wastewater Equipment	$ 12,500	$ 2,500					$ 10,000					1.0%	$ 500						$ 125	$ 125	$ 125	$ 125
LTP21	Tirau St - Putaruru Wastewater Main	$ 165,000		$ 165,000									1.0%	$ 13,200		$ 1,650	$ 1,650	$ 1,650	$ 1,650	$ 1,650	$ 1,650	$ 1,650	$ 1,650
LTP21	Putaruru WWTP UV Lamp	$ 80,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	1.0%	$ -									
LTP21	Putaruru Wastewater Plant &	$ 705,000	$ 87,500	$ 50,000	$ 52,500	$ 75,000	$ 90,000	$ 150,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	1.0%	$ -									
LTP21	Putaruru Wastewater Main Renewal	$ 708,000				$ 60,000	$ 108,000	$ 108,000	$ 108,000	$ 108,000	$ 108,000	$ 108,000	1.0%	$ -									
LTP21	Tirau WWTP -Membrane	$ 225,000	$ 45,000		$ 45,000		$ 45,000		$ 45,000		$ 45,000		1.0%	$ 2,250									$ 2,250
LTP21	Tirau WWTP - Inlet Screen Renewal	$ 85,000					$ 85,000						1.0%	$ 4,250					$ 850	$ 850	$ 850	$ 850	$ 850
LTP21	Tirau Wastewater Plant & Equipment	$ 445,000	$ 100,000	$ 55,000	$ 25,000	$ 55,000	$ 25,000	$ 65,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	1.0%	$ -									
LTP21	Tokoroa WWTP Plant & Equipment	$ 2,045,500	$ 115,000	$ 135,000	$ 315,000	$ 170,500	$ 140,000	$ 510,000	$ 180,000	$ 180,000	$ 150,000	$ 150,000	1.0%	$ -									
LTP21	Tokoroa WWTP - FAST Filter Media	$ 650,000			$ 650,000								1.0%	$ 45,500			$ 6,500	$ 6,500	$ 6,500	$ 6,500	$ 6,500	$ 6,500	$ 6,500
LTP21	Tokoroa Wastewater Main Renewal	$ 2,720,000			$ 115,000	$ 200,000	$ 215,000	$ 320,000	$ 430,000	$ 480,000	$ 480,000	$ 480,000	1.0%	$ -									
NW22	Arapuni Road WWPS	$ 350,000			$ 350,000								1.0%	$ 24,500			$ 3,500	$ 3,500	$ 3,500	$ 3,500	$ 3,500	$ 3,500	$ 3,500
NW22	Tokoroa Ferguson St Wastewater Main Renewal	$ 300,000			$ 300,000								1.0%	$ 21,000			$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000
NW22	Tokoroa Water Supply Growth	$ 7,220,915					$ 3,610,457	$ 3,610,457					0.5%							$ 36,105	$ 36,105	$ 36,105	$ 36,105
NW22	Horowhenua Water Supply	$ 301,000			$ 301,000	$ -	$ -	$ -					0.5%				$ 1,505	$ 1,505	$ 1,505	$ 1,505	$ 1,505	$ 1,505	$ 1,505
NW22	Mereweti Road Intermodal Business Park (MRIPB) Stormwater and Water	$ 1,915,865			$ 957,933	$ 957,933	$ -	$ -					2.0%					$ 38,317	$ 38,317	$ 38,317	$ 38,317	$ 38,317	$ 38,317
NW22	Tirau Water Supply	$ 7,257,215			$ -	$ -	$ 3,628,608	$ 3,628,608					0.5%							$ 36,286	$ 36,286	$ 36,286	$ 36,286
NW22	Districtwide Water and Wastewater Telemetry and SCADA upgrades	$ 1,106,250			$ 553,125	$ 553,125	$ -	$ -					10.0%					$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625
LTP21	Watermain Renewal Programme - Tokoroa	$ 6,000,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	0.5%	$ -									
LTP21	Watermain Renewal Programme - Arapuni	$ 360,000		$ 120,000			$ 120,000			$ 120,000			0.5%	$ 3,600								$ 1,800	$ 1,800
LTP21	Watermain Renewal Programme - Putaruru	$ 1,495,000	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	0.5%	$ -									
LTP21	Watermain Renewal Programme - Tirau	$ 420,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	0.5%	$ -									
LTP21	Watermain Renewal Programme - Lichfield	$ 50,000				$ 25,000					$ 25,000		0.5%	$ 250									$ 250
LTP21	Arapuni Water Supply Bore Replacement	$ 195,000	$ 195,000										0.5%	$ 8,775	$ 975	$ 975	$ 975	$ 975	$ 975	$ 975	$ 975	$ 975	$ 975
LTP21	Tirau Water Supply Plant & Equipment Replacement	$ 247,000	$ 15,000	$ 40,000	$ 15,000	$ 57,000	$ 45,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	0.5%	$ -									
LTP21	Tokoroa Water Supply Plant & Equipment Replacement	$ 325,000	$ 25,000		$ 15,000	$ 15,000	$ 75,000	$ 50,000	$ 85,000	$ 20,000	$ 20,000	$ 20,000	0.5%	$ -									
LTP21	Tokoroa Water Supply Billah St Headworks Rising Main Replacement	$ 110,000		$ 110,000									0.5%	$ 4,400		$ 550	$ 550	$ 550	$ 550	$ 550	$ 550	$ 550	$ 550
LTP21	Arapuni Water Supply Plant & Equipment Replacement	$ 78,000	$ 5,000	$ 10,000	$ 5,000	$ 6,000	$ 7,000	$ 25,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	0.5%	$ -									
LTP21	Water Treatment Plant Telemetry Infrastructure Server Replacment (P1)	$ 54,000			$ 27,000					$ 27,000			0.5%	$ 540								$ 270	$ 270
LTP21	Tirau Water Supply Resource Consent Renewal	$ 30,000	$ 30,000										0.5%	$ 1,350	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150
LTP21	Arapuni Street Watermain Upgrade	$ 694,297									$ 694,297		0.5%	$ 3,471									$ 3,471
LTP21	Reservoir Street Water Main Upgrade	$ 1,757,568					$ 1,757,568						0.5%	$ 43,939					$ 8,788	$ 8,788	$ 8,788	$ 8,788	$ 8,788
LTP21	Sholson Street Watermain Upgrade	$ 803,602					$ 803,602						0.5%	$ 20,090					$ 4,018	$ 4,018	$ 4,018	$ 4,018	$ 4,018
LTP21	Glenshea Booster Pump	$ 799,808								$ 799,808			0.5%	$ 7,998								$ 3,999	$ 3,999
LTP21	Seismic Assessments Water Supply Reservior	$ 240,000				$ 120,000	$ 120,000						0.5%	$ 6,000					$ 1,200	$ 1,200	$ 1,200	$ 1,200	$ 1,200
LTP21	Glenshea Water Supply Reservoir Repairs	$ 40,000	$ 40,000										0.5%	$ 1,800	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200
LTP21	Water Supply Putaruru - Capital Component of Maintenance	$ 150,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	0.5%	$ -									
LTP21	Water Supply Tirau - Capital Component of Maintenance	$ 120,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	0.5%	$ -									
LTP21	Water Supply Tokoroa - Capital Component of Maintenance	$ 150,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	0.5%	$ -									
LTP21	Putaruru Water Supply - Reticulation Minor New Works	$ 100,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	0.5%	$ -									
LTP21	Tokoroa Water Supply - Manfeld Street Ridermain Installation	$ 55,000		$ 55,000									0.5%	$ 2,200		$ 275	$ 275	$ 275	$ 275	$ 275	$ 275	$ 275	$ 275
LTP21	Putaruru Water Supply - pH Correction Plant	$ 55,000				$ 55,000							0.5%	$ 1,650				$ 275	$ 275	$ 275	$ 275	$ 275	$ 275
LTP21	Tirau Water Supply Reticulation Minor New Works	$ 100,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	0.5%	$ -									
LTP21	Billah Street Filtration	$ 378,000				$ 378,000							0.5%	$ 11,340				$ 1,890	$ 1,890	$ 1,890	$ 1,890	$ 1,890	$ 1,890
LTP21	Tirau Water Supply Storage	$ 2,270,000			$ 220,000	$ 2,050,000							0.5%	$ 68,100				$ 11,350	$ 11,350	$ 11,350	$ 11,350	$ 11,350	$ 11,350
LTP21	Tirau Water Supply Reticulation Minor New Works	$ 1,100,000	$ 110,000	$ 110,000	$ 110,000	$ 110,000	$ 110,000	$ 110,000	$ 110,000	$ 110,000	$ 110,000	$ 110,000	0.5%	$ -									
LTP21	Tokore Water Supply	$ 2,050,000				$ 50,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000			0.5%	$ 20,500								$ 10,250	$ 10,250
LTP21	Infrastructure Unit - Technology Upgrade New Mobile Devices (Internal Pr	$ 15,000	$ 15,000										0.5%	$ 675	$ 75	$ 75	$ 75	$ 75	$ 75	$ 75	$ 75	$ 75	$ 75
LTP21	Water District Wide Health & Safety Improvements	$ 300,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	0.5%	$ -									
		$ 106,976,399	Total CAPEX									$ 106,972,399			Total OPEX								$ 5,290,010