Kaipara District Council

Water Supply
Strategic Activity Management Plan
2021-2031

Summarising the Scheme Plans

June 2021

Status: Final

This document has been prepared by Kaipara District Council.

QUALITY STATEMENT

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F	June 2021	Final Draft for Long Term Plan 2021-2031	D Mugutso	R Harvey	D Miller	J Sephton

Contents

Tables

Figures

1 INTRODUCTION

1.1 PURPOSE OF PLAN

The purpose of this Strategic Activity Management Plan (SAMP) is to summarise Council's strategic and long-term management approach for the provision and maintenance of water supply assets.

The SAMP provides discussion of the key elements affecting management of Council's water supply assets.

This document should be read in conjunction with scheme plans for each scheme area, and the Kaipara District Council (KDC) Activity Management Overview, which provides the background for asset management activities.

1.2 WATER SUPPLY ACTIVITY

A constant, adequate, sustainable, and high-quality water supply to Kaipara district's reticulated areas is essential for communities, growth, and local economic development. Public water supplies ensure communities receive water at the cost of production. Our water supply activities also protect and enhance our natural assets and open spaces. Territorial authorities have numerous responsibilities relating to the supply of water. One such responsibility is the duty under the Health Act 1956 to improve, promote and protect public health within the districts. This implies that, in the case of the provision of potable water, councils have the obligation to identify where such a service is required and to either provide it directly themselves or to maintain an overview of the supply if it is provided by others, this has been contrary to councils view on growth in the district.

1.3 WHAT WE DO

We operate five community water supply schemes for Dargaville (including Baylys), Glinks Gully, Ruawai, Maungaturoto and Mangawhai (mostly supplying the Mangawhai Heads Holiday Park and the Woods Street commercial precinct) giving them a sustainable drinking water supply.

We own and maintain the whole water supply network for the five schemes. We treat raw water to produce quality and quantities of drinking water to drinking water standards (potable); and distribute treated water to the point of supply to customers to meet specific flow, pressure, and quality standards. This includes water for emergency firefighting services for Dargaville's urban area.

We also undertake:

- customer services
- water billing
- asset management
- planning
- treatment plant operations and maintenance
- network operations and maintenance
- capital and refurbishment programme; and
- consent monitoring and compliance.

A snapshot of the number of connections for each of Council's Water Supply schemes is provided in **Table 1** below.

Table 1: Connections per Council Water Supply scheme

Water Supply scheme	Number of connections
Dargaville/Baylys	2,782
Maungaturoto	410 (Township) 37 (Railway)
Ruawai	251
Glinks Gully	85
Mangawhai	18

1.4 BENEFITS TO THE COMMUNITY

Water supply is crucial to our economic and social well-being. Along with supplying to the domestic consumers, we also support industries such as Silver Fern Farms (SFF) in Dargaville and Fonterra in Maungaturoto. Outside of the reticulated supply, households provide their own water supply through tank water.

- We will continue providing water as is currently supplied within Kaipara district
- We will provide water to Drinking Water Standards for New Zealand 2005 (Revised 2018) (DWSNZ 2005 (2018)) except for raw water connections where we will provide non-potable raw water as an extraordinary supply
- Where applicable we will extend water reticulation to new residential areas as climate change affects more of our communities
- Where there are proposals for new commercial and industrial areas, we will consider supporting that economic development through the water supply as part of a rezoning proposal, on a cost recovery basis
- We will comply with resource consents in respect of water takes, ensuring they do not adversely affect the environment

The Community Outcomes that the water supply delivers are:

- Climate smart: Consider water conservation and water security when future planning
- Healthy environment: Providing clean water supply to our communities.

1.5 POTENTIAL NEGATIVE EFFECTS

The potential significant negative effects on the community of undertaking the Water Supply activity are detailed in **Table 2** below. This SAMP describes Council's water assets and details the practices used to manage those assets which helps to reduce possible negative effects and risks. Council mitigates these potential negative effects by a mix of asset management planning activities including:

- asset development work
- monitoring and testing
- demand management initiatives and
- public education, including water conservation programmes.

Table 2: Potential Negative Effects

Activity	Effect on community well-being	Current controls
Malfunction of water assets	• Social - Can cause disruption to supply. This can pose a public health risk and is frustrating to the local community. • Economic - If the businesses rely on a Water Supply and has no built-in storage, then loss of water is a major inconvenience.	• Council relies on the operation and maintenance contractor responding quickly to any malfunction.
Water sources	• Social - Water is abstracted from surface water and groundwater sources. The removal of water from the natural environment results in the water being unavailable for other uses such as irrigation or recreational. • Economic - Water is abstracted from surface water and groundwater sources. The removal of water from the natural environment results in the water being unavailable for other uses such as irrigation or recreational. • Environmental - Water abstracted from surface water, may add strain on a river system which is already very low. • Cultural – the NZ government has a responsibility to ensure that it meets the responsibilities as set out in the treaty of Waitangi, Maori have a spiritual connection and relationship to the Awa, this symbiotic relationship is sometimes not agreeable with the consenting process, and although it may be the best body of water from a business point of view, it may have alternative factors that make it culturally significant through Treaty Partnerships and responsibilities.	• Council has Drought Management Plans in place to guide water management during times of drought. • Investigating new water sources and educating the public on water usage. • Council applies to the regional authority for a consent as it is their responsibility to ensure that water sources are not over allocated, it is Council's responsibility to take all practicable steps to keep within the limits set by the Regional Authority. • Relationship with Iwi/Hapu/Marae need to be strengthened, and knowledge shared where possible to ensure that best possible outcomes are achieved for Social, Economic, Cultural and Environmental benefits. Consultation and discussions followed by transparent procedures, are vital to the true meaning of partnership. Moving forward acknowledging and recognising the concept of 'kaitiakitanga' through the connections, links, and stories both spiritual and physical that iwi/hapū/marae and even whanau have to the Kaipara rivers, streams, lakes, moana and other water bodies.
The cost of providing the services	• Economic - The cost of providing services is resulting in increases in rates.	• Council uses competitive tendering processes to achieve best value for money for works it undertakes. • Water supply is currently a user pays system where costs are recovered through water meters within targeted rate schemes.

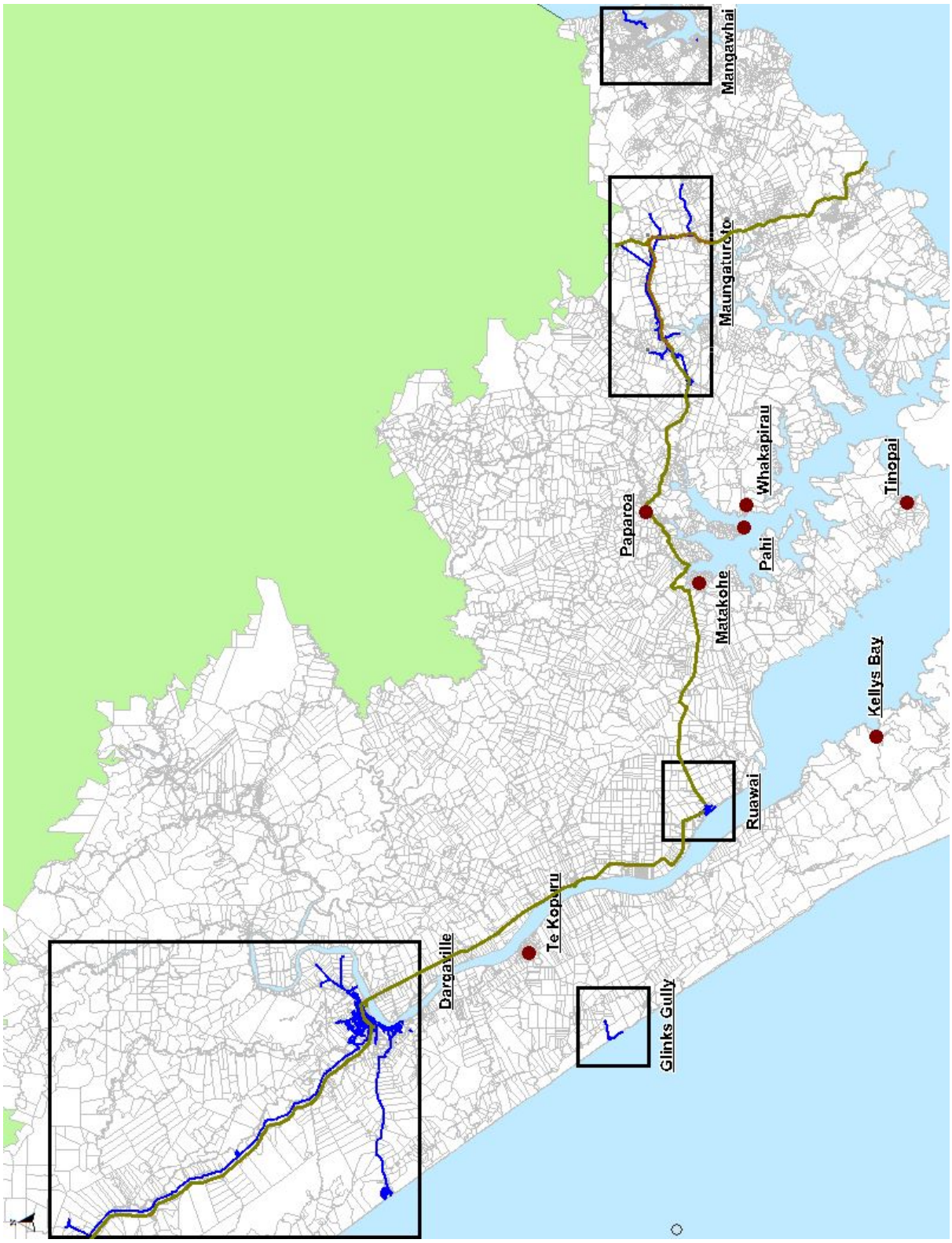
Activity	Effect on community well-being	Current controls
Spillage of chemicals stored at water treatment plants	• Social - The ratepayer expects Council to handle all chemicals in the correct manner. • Economic - Businesses which rely on nearby watercourses may not be able to operate until any chemical spill is resolved. • Environmental - Northland region is an environmentally sensitive area; any chemical spill will have a notable effect on the environment.	• Appropriately trained staff and contractors. All chemicals are stored in the correct prescribed manner.
Climate change effects on water supply activity reduced rainfall, extreme rainfall events and increased temperature	• Social - Reduced security of supply (depending on water source). • Environmental - Contamination of Water Supply.	• Climate smart behaviour throughout Council is promoted.

2 THE ASSETS

2.1 WATER SCHEMES

The location of each of the water supply scheme within Kaipara district is illustrated in the figure below. Dargaville has three water sources namely Waiparataniwha, Rotu and Waiatua Dam; the sources at Rotu and Waiatua are only used as pressures come on from lack of supply at Waiparataniwha during dry periods as part of current consent conditions.

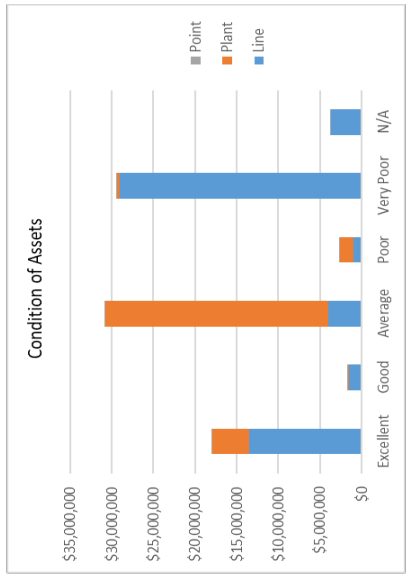
Figure 1: Location of communities with water supply schemes

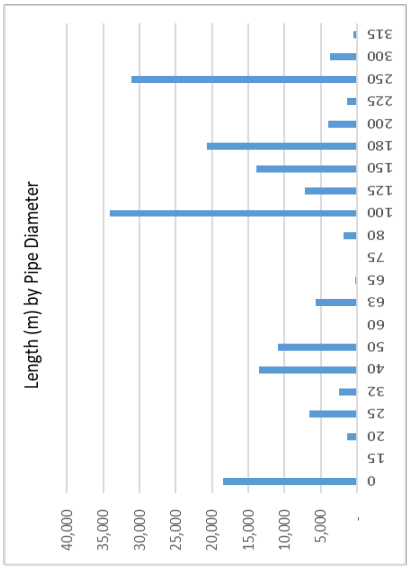


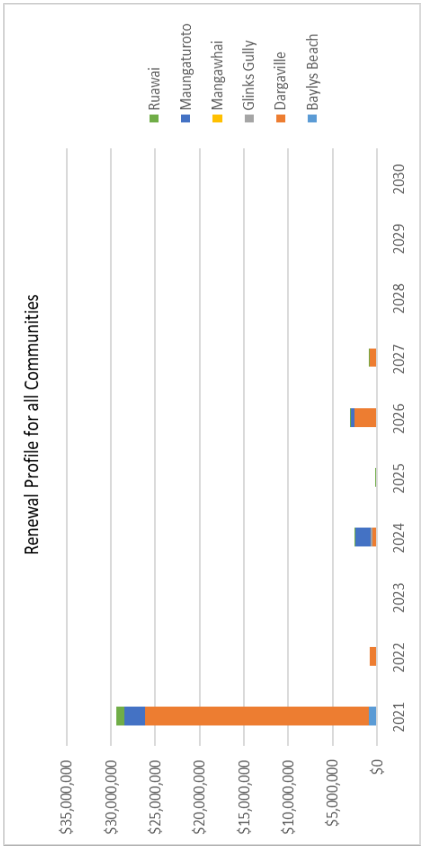
An overview of the Water Supply assets and their values are provided in the graphs below. Asset details for these schemes are described in the Scheme Plans.

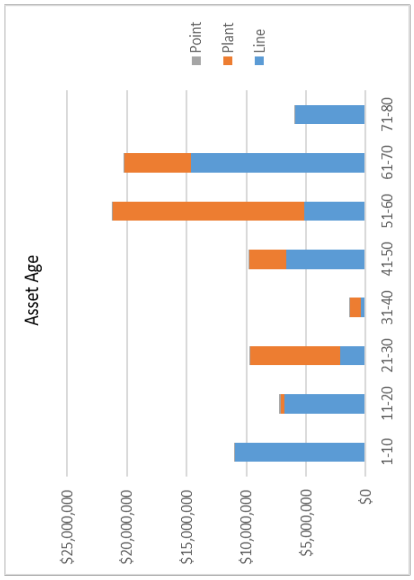
2.2 ASSET PROFILE

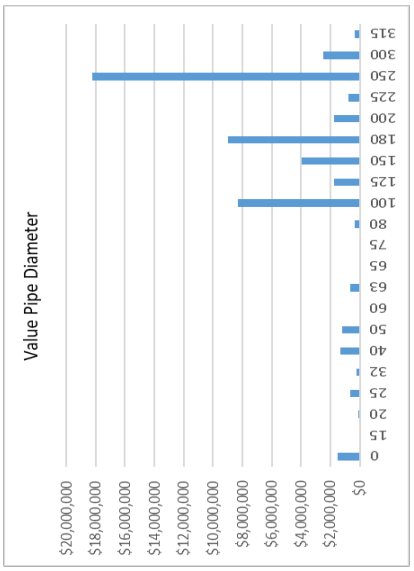
Table 3: Asset Profile Graphs

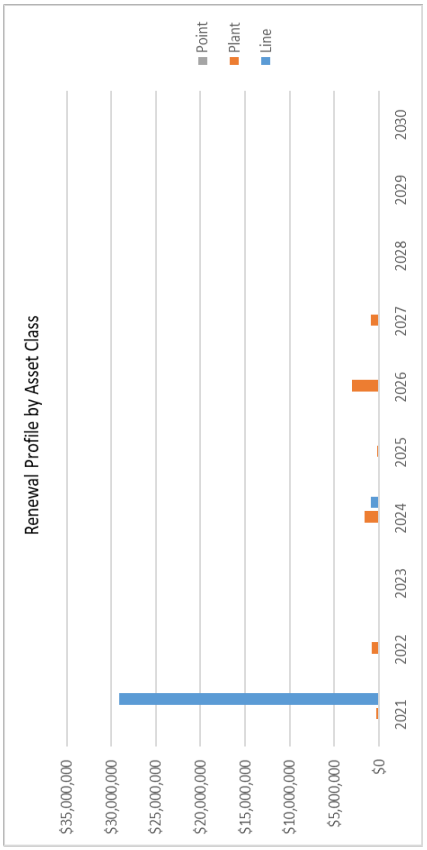


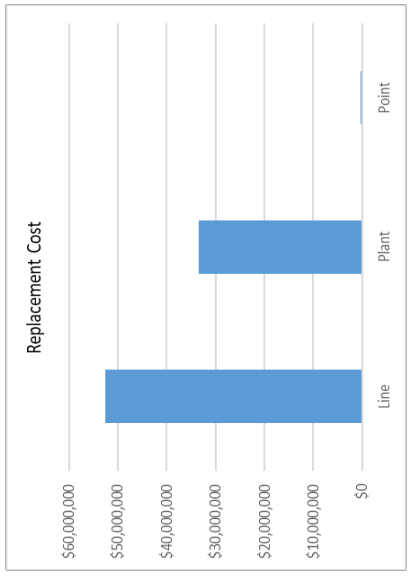


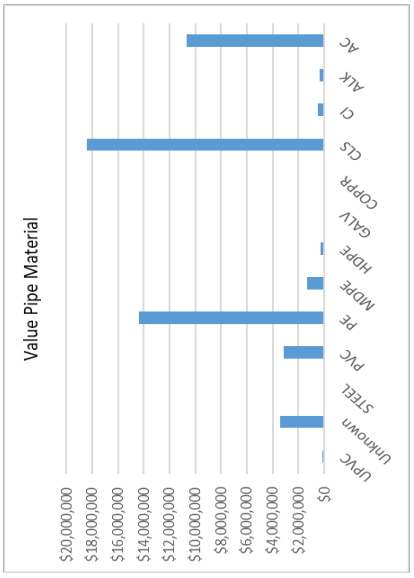












The changes in assets from 2017 to the current period, 2020, are shown below:

Table 4: Water main asset lengths

Water Main size (mm)	Dargaville		Baylys Beach		Maungaturoto		Ruawai		Glinks Gully		Mangawhai	
	2017	2020	2017	2020	2017	2020	2017	2020	2017	2020	2017	2020
0-50	22.8km	23.8km	3.1km	3.1km	2.6km	2.5km	2.2km	2.2km	0.9km	0.9km	1.1km	1.1km
51-100	27.5km	27.7km	11.3km	3km	6.0km	5.6km	1.3km	1.3km	0.5km	0.5km	2.4km	2.4km
101-150	7.9km	9km	1km	5.9km	3.5km	3.6km	3.5km	3.4km				
151-200	5.1km	11km			1.8km	2.4km	0km	0.6km				
201-250	4.4km	4.2km										
251-300	3.7km	3.7km										
301-350	0km	0.5km										
Total	**71.4km**	**79.9km**	**15.4km**	**12km**	**13km**	**14km**	**6.5km**	**7.1km**	**1.4km**	**1.4km**	**3.5km**	**3.5km**

Table 5: Number of other water assets

Asset Type	Dargaville/Baylys		Maungaturoto		Ruawai		Glinks Gully		Mangawhai	
	2017	2020	2017	2020	2017	2020	2017	2020	2017	2020
Water Meters	2,145	2,910	368	505	48	252	N/A	78	2	23
Fire Hydrants	367	443	56	74	32	38	1	2	2	2
Valves	603	734	72	124	49	55	8	9	10	17
Raw Water Line Length	25km	25km	8km	17km	N/A	0.6km	N/A	1.2km	N/A	N/A

2.3 VALUATION

Table 6: Asset Valuation (2019) Water Supply points

Description	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Baylys Beach	$167,260	$92,891	$3,616
Dargaville	$2,608,462	$1,138,818	$66,889
Glinks Gully	$12,300	$7,107	$196
Mangawhai	$56,717	$41,490	$1,041
Maungaturoto	$452,447	$257,811	$11,634
Ruawai	$208,100	$120,741	$5,898
Total 2019	**$3,505,286**	**$1,658,857**	**$89,274**
Total 2016	**$6,504,849**	**$2,644,056**	**$129,392**
% Change	-46.1%	-37.3%	-31.0%

Water Supply Plant

Description	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Dargaville	$10,603,414	$4,705,465	$209,748
Glinks Gully	$103,647	$34,792	$4,133
Mangawhai	$145,796	$58,134	$5,703
Maungaturoto	$3,790,590	$1,664,192	$95,300
Ruawai	$1,548,596	$693,340	$58,046
Total 2019	**$16,192,043**	**$7,155,923**	**$372,931**

Water Supply Line

Description	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Baylys Beach	$2,782,138	$1,889,559	$38,811
Dargaville	$37,709,222	$13,411,501	$502,321
Glinks Gully	$398,976	$278,459	$5,149
Mangawhai	$488,005	$389,074	$7,470
Maungaturoto	$12,050,633	$6,717,086	$170,797
Ruawai	$1,860,860	$755,446	$27,985
Total 2019	**$55,289,834**	**$23,441,126**	**$752,533**

In 2019 the district assets were valued at $74.987 million comprising 15 water source points with aboveground assets consisting of 5 water treatment plants (WTPS), 7 pump stations and 17 storage reservoirs. Below ground assets comprise 148.8 km of reticulation, 3,583 connections and 3,763 points which include, among others; valves, hydrants, and meters. This marks an increase from the 2016 valuation of $62 million, a large part of this was the identification of more 180mmØ PE pipeline and the asset data gathering project which has identified more of our networks.

2.3.1 Asset condition

The condition of pressure mains is difficult to assess and a combination of a limited planned and opportunistic assessment for those assets exposed during repair is used. Treatment plants and other aboveground assets have elevated criticalities and structured inspection programmes are undertaken.

Due to the high value of overdue pipelines that need to be replaced, it is going to require robust condition information to properly prioritise the Council's renewal profile, this may require Council to adopt a position of "fix on failure" until this can be completed.

2.3.2 Asset performance

The current performance of our water assets has been mixed as evidenced by the performance metrics included in the Annual Report 2019/2020. In section 6 the performance measures for average consumption of drinking water were all achieved except for Dargaville, Mangawhai and Glinks Gully.

Water quality

Bacteria and protozoa compliance were achieved for all schemes which means that all our schemes are compliant with the Drinking Water Standards for New Zealand 2005 (Revised 2018).

Water losses

Water losses in all major schemes was greater than the target level. While significant individual leaks impacted on several of the results and have subsequently been located and repaired the targets and the actual results are still considered to be quite high.

Table 7: Water losses

Scheme	Target	Actual
Dargaville	25%	27%
Maungaturoto	30%	41%
Ruawai	30%	41%
Mangawhai	30%	35%

2.4 CRITICAL ASSETS

The criticality framework is documented in the KDC Activity Management Overview. The key assets and their criticality are presented below.

Table 8: Key assets in network

Asset group	Specific asset group	Criticality
Raw water source	Glinks Gully: Maungaturoto – Alternate (not Cattlemount) supplies	Low
Raw water transmission and storage	Glinks Gully: Mangawhai: Maungaturoto: Individual transmission from smaller (non-Cattlemount) sources Ruawai	Low
Treated water storage	Glinks Gully	Low
Bulk treated water transmission	Glinks Gully: Mangawhai: Maungaturoto: Ruawai	Low
Boost pumping	Dargaville: Hokianga Road system Maungaturoto: Ruawai	Low
Reticulation	Baylys: Dargaville: < 200mm Glinks Gully: Maungaturoto: Ruawai	Low
Major customers	Silver Fern Farms Abattoir takes 25% of Dargaville supply and is at opposite end of town to the WTP. Ring-mains largely provide some redundancy through the western/central parts of Dargaville although there may be a loss of pressure at the abattoir if a failure occurred in these areas	Low
Business and community customers	CBD - Day Care Centres - Schools	Low
Raw water source	Mangawhai: Maungaturoto: Cattlemount supply Ruawai	Moderate
Raw water transmission and storage	Maungaturoto: Cattlemount and combined system	Moderate
Treated water storage	Dargaville: Mangawhai: Maungaturoto: 2 at end of system	Moderate
Bulk treated water transmission	Dargaville / Baylys	Moderate
Boost pumping	Baylys: Until standby pump installed	Moderate
Reticulation	Dargaville: ≥ 200mm Mangawhai: In response to summer peak usage	Moderate
Business and community customers	Commercial / Industrial	Moderate

Asset group	Specific asset group	Criticality
Raw water source	Dargaville / Baylys	High (Major)
Treatment	Dargaville / Baylys: Glinks Gully: Mangawhai: Maungaturoto: Ruawai	High (Major)
Treated water storage	Baylys: Maungaturoto: 1 x treated water reservoir at WTP Ruawai	High (Major)
Pipes running under buildings	There is a major pipeline that appears to be running under Dargaville High School buildings	High (Major)
Major customers	Maungaturoto Dairy Factory takes raw water from 7km system upstream of township. Believed to have approximately 1 day of storage onsite	High (Major)
Business and community customers	Hospital / clinics	High (Major)
SCADA		High (Major)
Back flow prevention	Currently going through an upgrade programme	High (Extreme)
Treatment	All plants - Equipment whose failure could lead to production of water not complying with Priority 1 Determinants of DWSNZ 2005 (Revised 2018)	High (Extreme)
Treated water storage	All reservoirs - Equipment whose failure could lead to the contamination of treated water to the extent of not complying with Priority 1 Determinants of DWSNZ 2005 (Revised 2018)	High (Extreme)

3 THE CHALLENGES AND ISSUES

Kaipara District is a beautiful area that spans both coasts. It has the benefits of enjoying several long-established water sources that provide high quality water and is a diverse district that has enjoyed the benefits provided through the forethought of previous generations.

Over the last 60 years little has been progressed to advance or replace the original assets of the water networks in our townships and this has resulted in a bow wave of renewals that are required across the district. Our water sources are coming under increasing pressure from growth and the changing environment and in dry conditions, when demand is high, alternative supply points with poorer raw water quality are used which puts pressure on the treatment system. Seasonal peaks are experienced in Mangawhai and Glinks Gully during the Christmas period, and in some dry periods, water carting has been necessary to augment the supply for these areas.

KDC has had to enforce restrictions (in Dargaville, Maungaturoto and Ruawai) on water use, to ensure enough water is available for residential and commercial use and to protect public health. With the environment, especially in the North, currently identified to get drier with shorter periods of more intense rainfall water security is going to be one of the biggest issues facing Kaipara and all of the people in the North. This will require planning and implementation where possible though without assistance from external funding sources it could be a high financial burden for the Kaipara communities.

Our townships are growing, and the communities are increasingly focused on economic opportunities. In the past Council has taken a “no growth” stance to the district which has allowed unplanned growth to occur without the subsequent upgrades to the system. Council needs to reconnect with these communities and forge stronger ties with our partners, Iwi/Hapu/Marae, regional council and other government agencies and local groups focused on the well-being of their community, here are areas of high growth within the district where there has been no identification of likely water supply sources to cater for the growth, this is a significant issue especially in the face of climate change and the infrastructure reform currently on-going within the country.

Key issues requiring attention for the Water Supply activity are summarised in table below.

Table 9: Key Issues Overall

Security of water supply sources	Security of water supply is a big issue for Kaipara for a raft of reasons: • Climate Change - we need to ensure that we have adequate water supplies to safeguard from the effects of climate change, we will need to do in depth investigations and optioneering on our existing water supplies and how they are going to be affected as Northland is looking to get drier overall with some periods of heavier rainfall. Kaipara is currently dependant on stream flows for water supply, and these will be no longer be sufficient to support the current townships moving forward and there will need to be a significant change to ensure security of water for the future, Kaipara will need to look at more water harvesting infrastructure now and into the future across the district. • Public Health - there are initiatives coming from central government that are paying attention to the health of waterways in terms of the National Policy Statement (NPS) for fresh water and others, the revised standards for drinking water and the new requirements for preparation of Water Safety Plans.

	• Growth - we need to ensure we have security of supply to support growth within our townships identified in our spatial plans, where possible council will be looking to access any opportunities raised by developers and other entities with access to external funding. • Economic development - we need to ensure that there is security of supply to support the current economic base within our townships and to allow for growth in our economic sectors, support for post-harvest infrastructure within Kaipara (Dargaville, Ruawai especially).
Resilience of water distribution assets	Our current infrastructure is aged and in quite a few cases it has neared or bypassed its current useful life, especially in Dargaville. There is over $24m of pipe assets that are in very poor condition and need replacing. We have constant issues with our water networks and a lot of our current infrastructure breaks and leaks. This causes issues in the loss of potable water and greater stress on our supply chain and treatment plant.
Water quality	Water quality is especially important to the community not just for water to be potable but to be drinkable as well. It helps with the feeling in the community that it is a good place to be and it is good for public health and growth-related infrastructure. It is also hard to keep up to standard when treatment and supply systems come under pressure.
Water pressure	This issue is a big one for growth, economic development, and public health. It facilitates all three and links in with security of supply and resilience of distribution assets. There is a minimum pressure requirement at each property and a needed minimum of water pressure and supply at the hydrants within a township. It allows for and facilitates growth whilst also protecting public health and providing security through firefighting supply.
Responding to issues	Responding to issues in a timely manner is important because it helps with customer focus and satisfaction, the fact that someone raises an issue and then it is dealt with helps with the public view that not only are they being listened to, but that we are taking issues within our network seriously, it also helps with security of supply and other things as it ensures that leaks are fixed as soon as possible so that water is not lost from the system or a greater issue is caused by the leak.

4 DEMAND MANAGEMENT

4.1 COUNCIL'S APPROACH TO DEMAND MANAGEMENT

Council has historically undertaken water demand management planning so that it's water use is efficient and cost effective. Council will be contributing to LoS that relate to the "sustainable economy" and "strong communities" community outcomes.

The recent climatic conditions affecting Kaipara are highlighting the need for Council to identify more appropriate proactive demand management strategies to be developed and implemented.

The following sections provide an analysis of factors affecting demand including population growth, social and technology changes, and environmental considerations. The impact of these trends is examined, and demand management strategies are recommended as a technique to modify demand without compromising customer expectations.

Water demand management options can be categorised into two key areas, measures, and instruments. Although there are other factors as outlined below.

Measures	'What to do' to achieve a reduction in water use (e.g. conversion of inefficient showers to efficient star rated showerheads).
Instruments	'How to do it' (how to ensure that the chosen 'measures' are put into place or taken up), which include the following types.
Economic	Incentives such as rebates and retrofits for efficient fixtures and fittings or cost reflective pricing which makes customers consider how they can reduce their water use to reduce their water bills. Uneconomic public water supplies are returned to private ownership or converted to a non-potable water source.
Regulatory	The use of local development consent conditions to ensure all new properties sold achieve a specified level of water efficiency and minimum water efficiency performance standards at a national level that require all products sold to achieve a specified level of water efficiency.
Communicative	Education and advertising/marketing to promote a water efficiency consciousness and promote behavioural changes.

In addition, the Water Services Association of Australia (WSAA) recommends identification of "foundation options" as they have often been critical elements to the success of a demand management programme. It may be difficult to analyse the costs and attribute savings to these options; however, they should be considered in the full programme.

WSAA also recommends designing both structural and behavioural changes into a demand management programme and using more than one instrument. A combination of at least two instruments is generally most effective. For example, an economic incentive for an indoor retrofit, plus communicative and educative material about water saving tips around the home, have the potential to tap into both structural and behavioural conservation.

Similarly, whenever considering changing a single measure such as a washing machine, at least two instruments are recommended to maximise effectiveness. For example, an economic incentive and communication/education that recognises both structural and behavioural changes can take place (e.g. a more efficient machine and the participant being informed that they can save both water and energy if they wait to use a full load when washing clothes, which will save them money).

4.2 INCREASE IN DEMAND FOR WATER SUPPLY SERVICES

As development occurs and communities expand, the need for water supply services may increase, to provide certainty in supply (of potable water) and to manage risk (firefighting protection). The demand for such services is generally governed by the communities need and ability to pay. Two communities may require additional water supply servicing in the future. Droughts are becoming a frequent occurrence in Northland and during these times, there is an increase in demand from self-supplied residents served by roof water tanks.

Mangawhai – this community continues to grow steadily but is largely un-serviced in relation to water supply. As many of the houses are used as holiday accommodation this can result in water shortages over summer and there is no reticulated fire capacity. Through the drought period of 2019/2020 there has been a growing demand from Council on what the position is for water supply and what we are doing to future proof this community against climate change and drought. As such there is the need to conduct an investigation and possible implementation of a water supply scheme for the whole community within the next 30 years, council will also look to partner with any entities that propose water supply options in the area to be able to provide economical solutions for the community.

Maungaturoto and Kaiwaka – the cost of home ownership in Auckland is driving people to look at locations outside Auckland that either provide for an extended commute or for lower cost retirement within range of city amenities and family ties. Government initiatives to extend the Northern Motorway to Wellsford is a specific driver for this increased level of demand and this has heavily influencing growth in Warkworth and Wellsford. It is expected that this will start to influence Maungaturoto and Kaiwaka and as such Council has created a spatial plan with these communities to be able to manage and direct this growth in a sustainable way. Kaiwaka currently has no community water supply and this is not an insurmountable barrier to growth occurring given the viability of tank supplies and the availability of tanker top-ups from Wellsford or Maungaturoto. However, through the spatial planning exercises to facilitate different types of residential densities and also commercial growth, the need to secure an acceptable water supply has become very apparent. Kaiwaka also has a private scheme servicing some of the residential area. There is increasing focus from central government to ensure that water supplies are managed and treated effectively, and this will need to be investigated properly and a decision reached as to how this will be managed.

4.3 TECHNOLOGICAL CHANGE

Changes in technology have a significant potential to alter the demand placed on the utility services and has the potential to provide techniques and processes for the more efficient provision of water supply services. Whilst the DWSNZ drive and monitor potable water quality compliance, developments in water treatment processes and technology potentially offset the cost of increased quality compliance requirements. As such there is a need to monitor the technology aspect of water supply treatment, to potentially identify opportunities that may be developed and implemented to reduce the cost of treating water.

4.4 CULTURAL PARTNERSHIPS

Cultural considerations are an increasing focus for Kaipara District Council. There are significant responsibilities which Council, as a government agency, has under the Treaty of Waitangi to create partnerships with our local Iwi/Hapu/Marae around the rights and use of water in our district. Council has identified that it wishes to increase these partnerships and as such consultation and engagement with Iwi/Hapu/Marae needs to happen in a timely and thoughtful manner that provides benefit to both parties.

4.5 LEGISLATIVE CHANGES

The 3 Waters Review identified the requirement to reform the regulation, delivery, and management of drinking water. This has culminated in the setting up of a Drinking Water Regulator Taumata Arowai, under the Water Services Regulator Act whose role and objectives are:

- administering and enforcing a new drinking water regulatory system (including the management of risks to sources of drinking water); and
- a small number of complementary functions relating to improving the environmental performance of wastewater and stormwater networks.

In addition, the government updated the Drinking Water Standards for New Zealand in 2018 to the current version which has seen changes in the way testing of certain pathogens is carried out and reported. The government also reviewed the guidelines and framework for preparation of Water Safety Plans to ensure among others that internal and external stakeholders are involved in the formulation of the strategy of achieving robust and effective water safety planning for the supplier. Example stakeholders are elected members and the regional council.

Another bill, the Water Services Bill will give effect to decisions to implement system-wide reforms to the regulation of drinking water and source water, and targeted reforms to improve the regulation and performance of wastewater and stormwater networks. The Regulator's detailed functions and powers are in that Bill.

4.6 CUSTOMER EXPECTATIONS

Our customers are becoming more aware of the cost and implications of providing and maintaining potable water supplies. Whilst seen as a necessity, the increased costs of providing a reticulated potable water system can be prohibitive. Community expectations such as in Mangawhai are clear that an extensive public water supply system to service the community is not required, and as such are unlikely to be willing to pay for a scheme to be implemented. The motivation behind such sentiment could be attributed to the funding issues associated with the Mangawhai wastewater system or seen to stifle development in the area. Regardless, such sentiment indicates that in this area, rainwater tanks will remain the preferred source of water for many years to come. It is our intention to monitor areas where potable water supply schemes are not available and to consult with the respective communities to gauge the future level of interest in the installation of potable water supply schemes.

4.7 ENVIRONMENTAL CONSIDERATIONS

The taking of water for subsequent treatment and use in a potable water supply scheme has until recently not been subject to much resistance. These days, with increasing demands for river and groundwater sources, unless well managed, the demand for that water may be greater than the ability of the source to supply. Recognising this, changes to the way in which river and groundwater takes are managed and the volume of water available to be taken, are likely to be more stringently controlled, with strict consent conditions around monitoring and reporting.

An important aspect of the water supply activity is ensuring the responsible management of water takes, whether from surface waters (such as streams, rivers, or dams) or from groundwater. While the extraction and supply of water for domestic and stock drinking water needs is essential to the social and economic well-being of the community, there is an important need to protect the natural environment and function of the water resource.

The key objective, as identified in the Proposed Region Plan for Northland is to:

- Manage the use, development, and protection of Northland's natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while:
    - sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations
    - safeguarding the life-supporting capacity of air, water, soil, and ecosystems, and
    - avoiding, remedying, or mitigating any adverse effects of activities on the environment.

It is recognised in the regional plan that these potential adverse effects are dependent on the size of the resource, the significance of the aquatic habitats it supports, other existing authorised users and the existing quality of the water resources. For example, larger rivers are better buffered from potentially adverse flow related habitat and water quality effects than are smaller rivers.

Where the existing water source is inadequate to meet demand, alternative water sources such as dams and reservoirs may have to be developed. More effective ways of utilising existing water sources will need to be considered, including strategies to harvest water at high river flows for use during periods of high demand and low availability. Avoiding wastage will also be an important consideration.

The controls for surface water and groundwater use are provided under Section 14 of the Resource Management Act (RMA) 1991 and through the regional plan. The RMA requires resource consents for all activities relating to water (other than taking water for an individual's reasonable domestic or stock drinking water needs). Other resource consents may also be required for the installation and operation of water supply infrastructure (e.g. pipelines across rivers and streams). Council holds several resource consents for its water take activities. A summary of current water take consents held by Council is presented in the Water Supply Scheme Plans.

On the other hand, the water treatment process can also impact on the environment as a result of backwash water discharge. The control of discharge of contaminants to the environment (land, air, and water) is also controlled under Section 70 of the RMA and through the regional plan.

4.8 CLIMATE CHANGE

The changing climatic conditions are explained in the KDC Activity Management Overview. The effects of this on water supply are that high intensity rainfalls create an increased flooding frequency and may contribute to poorer raw water quality and increased treatment requirements and costs.

The impact of long-term changes in weather patterns on the existing systems have not been built into this SAMP given the lack of detailed information available. Some items around security of water supply have been factored into this and the Infrastructure Strategy, work is ongoing to better identify these issues and what Council's response should be.

Certainly, Dargaville has experienced two dry years in a row with 2012 river levels of the source water dropping to 20-year lows. In 2014 the base flows appeared lower than the previous year indicating the catchment was still suffering the effects from the previous dry year. And again, in the summer of 2019/2020 which lasted for an extended period with Northland only receiving 47% of its usual rainfall throughout the 2019/2020 financial year. These compounding effects require consideration in developing appropriate mitigation strategies for the future.

Inclusion of possible risks imposed by global warming to the water supply assets will need to be included as appropriate as the SAMP is continuously developed now and into the future.

4.9 IMPACT OF TRENDS ON INFRASTRUCTURE ASSETS

The main impact of the above trends is the potential future restrictions on river and groundwater sources, the volumes of water able to be extracted, and the additional costs to source additional supplies to meet demand.

4.9.1 Asset capacity

The water supply system has enough capacity in the treatment system for the design population at Dargaville, Maungaturoto, Ruawai, Glinks Gully and Mangawhai. The issues as identified above are more focused on security of water sources especially during dry conditions when water restrictions are invoked in accordance with the approved Drought Management Plan. For the coastal areas of Glinks Gully, Baylys and Mangawhai, the increase in demand during peak holiday periods have put pressure in the supply system resulting in Glinks Gully and Baylys occasionally getting supplementary carted water. For Baylys, the reservoir needs upgrading to meet the peak demand over holiday periods although this is still fed from the Dargaville water supply source.

Council is currently investigating alternative options for water security in line with other government initiatives such as the Northland Water Storage Project etc.

4.9.2 Design parameters

Design parameters for all new Council water supply assets are set out in Council's Engineering Standards 2011. In summary these requirements include the following:

- that full supply is available during a 20-year drought
- be adequate for firefighting purposes
- normal residential demand shall be taken as 300 litres per person per day
- peak flow shall be taken to be 2.5 times the average daily demand
- fire hydrant specifications.
- service connection requirements, including compliance with the New Zealand Building Code requirements for backflow prevention
- requirements for pipe size, material, and depth of construction; and
- pipe installation, disinfection, and testing requirements for new water assets.

Currently there are sections of the networks under Council's ownership that do not meet the minimum requirements for pressure delivery, this is due to many factors, one of which is that the network has grown to support more properties without the necessary work being completed to upgrade the original network to cater for this.

5 PROPOSED LoS AND PERFORMANCE MEASURES

The LoS reported in **Table 10** are customer focused and are included in the Long-Term Plan (LTP). An extension of the LoS and performance measures to include the more technical measures associated with the management of the activity has commenced with the inclusion of the non-financial performance measures. The following Service and Performance Measures are the same as the targets for the LTP 2018-2028 and there is no change intended over the term of the LTP commencing in 2021.

Table 10: LoS and performance measures

What we measure	LTP Year 1 Target 2021/2022	LTP Year 2 Target 2022/2023	LTP Year 3 Target 2023/2024	LTP Years 4-10 Target 2024/2031
The extent to which Council's drinking water supply complies with part 4 of the NZDWS (bacteria compliance criteria) – mandatory.	Dargaville, Maungaturoto, Ruawai, Glinks Gully and Mangawhai All schemes must be compliant	Dargaville, Maungaturoto, Ruawai, Glinks Gully and Mangawhai All schemes must be compliant	Dargaville, Maungaturoto, Ruawai, Glinks Gully and Mangawhai All schemes must be compliant	Dargaville, Maungaturoto, Ruawai, Glinks Gully and Mangawhai All schemes must be compliant
The extent to which Council's drinking water supply complies with part 5 of the NZDWS (protozoal compliance criteria) – mandatory.	Dargaville, Maungaturoto, Ruawai, Glinks Gully and Mangawhai All schemes must be compliant	Dargaville, Maungaturoto, Ruawai, Glinks Gully and Mangawhai All schemes must be compliant	Dargaville, Maungaturoto, Ruawai, Glinks Gully and Mangawhai All schemes must be compliant	Dargaville, Maungaturoto, Ruawai, Glinks Gully and Mangawhai All schemes must be compliant
The percentage of real water loss from our networked reticulation system (average for total network of all schemes)	≤28%	≤28%	≤27%	≤26%
Median response time for attendance for urgent callouts; from the time the local authority receives notification to the time that service personnel reach the site.	≤2 hours	≤2 hours	≤2 hours	≤2 hours
Median response time for resolution of urgent callouts; from the time the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.	≤48 hours	≤48 hours	≤48 hours	≤48 hours
Median response time for attendance for nonurgent callouts; from the time the local authority receives notification to the time that service personnel reach the site.	≤3 hours	≤3 hours	≤3 hours	≤3 hours

What we measure	LTP Year 1 Target 2021/2022	LTP Year 2 Target 2022/2023	LTP Year 3 Target 2023/2024	LTP Years 4-10 Target 2024/2031
Median response time for resolution of non-urgent callouts; from the time the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.	≤3 days	≤3 days	≤3 days	≤3 days
Total number of complaints about drinking water quality e.g. clarity, odour, taste, pressure or flow and continuity of supply. Expressed per 1,000 water connections.	≤40	≤39	≤38	≤37
Total number of complaints received by Council about Council's response to any of these issues. Expressed per 1,000 water connections.	≤40	≤39	≤38	≤37
Water take consents:	100% compliance with Northland Regional Council consents.	100% compliance with Northland Regional Council consents.	100% compliance with Northland Regional Council consents.	100% compliance with Northland Regional Council consents.
The average consumption of drinking water per day per resident within Kaipara district. Average calculated by the billed metered consumption (m^3) x 1,000 divided by the number of connections x 365 x 2.5 (occupancy rate).	Dargaville 275 Maungaturoto 340 Ruawai 130 Glinks Gully 52 Mangawhai* 230 *Mangawhai calculation to consider the campground	Dargaville 275 Maungaturoto 340 Ruawai 130 Glinks Gully 52 Mangawhai* 230 *Mangawhai calculation to consider the campground	Dargaville 275 Maungaturoto 340 Ruawai 130 Glinks Gully 52 Mangawhai* 230 *Mangawhai calculation to consider the campground	Dargaville 275 Maungaturoto 340 Ruawai 130 Glinks Gully 52 Mangawhai* 230 *Mangawhai calculation to consider the campground
Major capital projects are completed within budget.	Achieved	Achieved	Achieved	Achieved

6 MAINTENANCE AND OPERATING STRATEGY

6.1 MAINTENANCE AND OPERATIONS

Current operation and maintenance activities undertaken across the Water Supply activity include:

- preparation and use of Water Safety Plans
- normal routine maintenance to ensure that natural water sources are kept functioning
- maintaining the raw water pipelines which convey raw water to the local WTPs
- inspection of the raw water pipelines annually
- maintaining and operating the local WTPS
- maintaining and repairing the water storage reservoirs and pump systems
- repairing any broken pipes or other related equipment
- recording faults and maintenance undertaken (a future improvement has been identified to begin recording maintenance history and costs at asset component level in AssetFinda)

Table 11 shows Council's maintenance and operating strategies to ensure that the defined LoS are provided. The table shows the key service criteria affected and mode and impact of failure if the action is not carried out.

Table 3: Maintenance and operating strategies

Activity	Strategy	Service criteria	Impact
General maintenance	Council will maintain assets in a manner that minimises the long term overall total cost while ensuring efficient day-to-day management.	Maintaining existing LoS. Cost/affordability	Low – Medium Increased costs and risk of failure.
Unplanned maintenance – all assets, disaster	Council will maintain a suitable level of preparedness for prompt and effective response to civil emergencies and system failures by ensuring the availability of suitably trained and equipped staff and service delivery contractors. Council will provide a 24-hour repair service and respond to and repair or overcome broken or leaking pipes, power outages and equipment or system failures.	Responsiveness (Response time for unplanned priority works is 1 hour for system malfunction or rupture and 2 hours for all other unplanned priority works, apart from service restoration).	Medium No water to parts of schemes. Potential flooding of private property and damage to public roads and utilities.
Unplanned maintenance – pump stations, treatment plants – mechanical or electrical failure	Provide a 24-hour repair service and respond to and repair or overcome broken or leaking pipes, power outages, and equipment or system failures.	Responsiveness (Response time for unplanned priority works is 1 hour for all scheme areas).	Medium No water to parts of schemes. Flooding, low water pressure.

Activity	Strategy	Service criteria	Impact
Unplanned maintenance – pipelines break	Enough spares to be stocked (by contractor) to address regular failures.	Responsiveness (Response time for unplanned priority works is1 hour for all scheme areas)	Medium No water to parts of schemes. Flooding, low pressure.
Planned inspections pump stations, treatment plant and pipelines	Council will undertake scheduled inspections in accordance with good industry practice and as justified by the consequences of failure on LoS, costs, public health, safety, or corporate image. Council will modify the inspection programme as appropriate in response to unplanned maintenance trends.	Maintaining existing LoS.	Medium Potential lowering of water pressure.
Planned inspections monitoring equipment calibration	Council will undertake annual inspection of monitoring equipment.	Maintaining existing LoS.	Medium
Planned – preventative maintenance pump stations, treatment plants, pipelines	Council will undertake a programme of planned asset maintenance to minimise the risk of critical equipment failure or where justified economically.	Maintaining existing LoS. Cost/affordability	Medium No water to parts of schemes. Flooding, low pressure.

7 EXPENDITURE FORECASTS

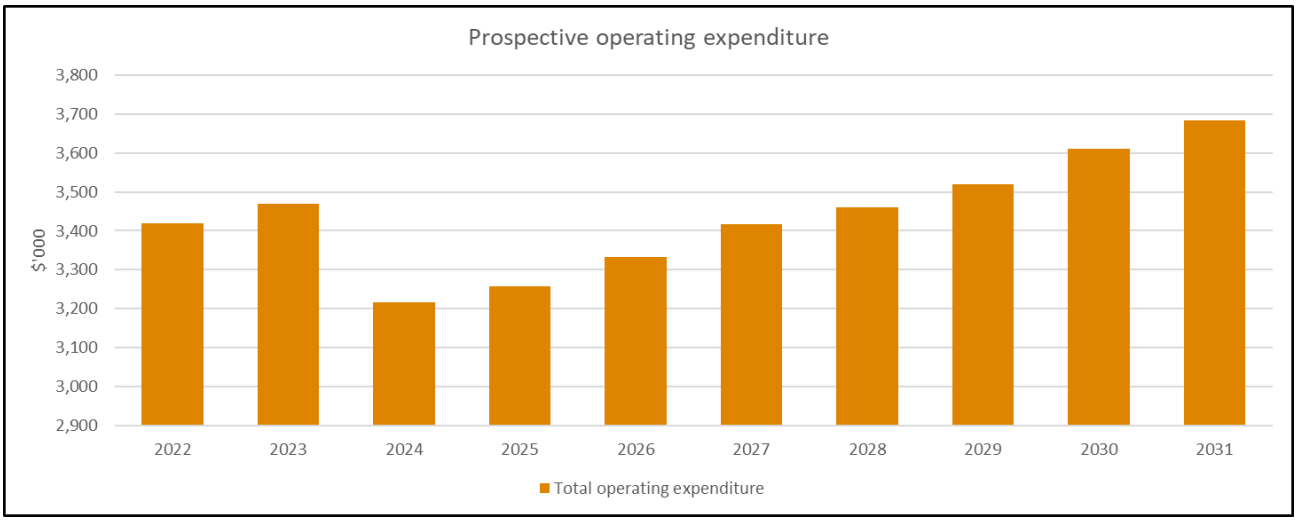
7.1 OPERATIONS AND MAINTENANCE EXPENDITURE

The 10-year forecast for operations and maintenance expenditure for the water activity are shown in the table below. The forecast expenditure information is based on the LTP 2021-2031 financial forecast, which provides a relative degree of confidence in the values reported, for more detailed information view the specific scheme plan.

Table 4: OPEX forecasts Water Supply

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000	2028-2029 $'000	2029-2030 $'000	2030-2031 $'000
Prospective Funding Impact Statement											
Activity selection: Water Supply, All, All											
Operating funding											
Sources of operating funding											
General rates, uniform annual general charges, rate penalties	0	381	366	0	0	0	0	0	0	0	0
Targeted rates	3,145	4,194	4,444	4,623	4,648	4,759	4,913	4,975	5,042	5,444	5,518
Subsidies and grants for operating purposes	0	0	0	0	0	0	0	0	0	0	0
Fees and charges	491	550	566	579	589	634	656	675	698	520	537
Internal charges and overheads recovered	0	0	0	0	0	0	0	0	0	0	0
Interest and dividends from investments	0	0	0	0	0	0	0	0	0	0	0
Local authorities fuel tax, fines, infringement fees and other receipts	0	0	0	0	0	0	0	0	0	0	0
Total operating funding	**3,636**	**5,125**	**5,377**	**5,202**	**5,236**	**5,393**	**5,569**	**5,650**	**5,740**	**5,964**	**6,055**
Application of operating funding											
Payments to staff and suppliers	1,281	1,981	2,013	1,806	1,862	1,921	1,984	2,035	2,099	2,166	2,234
Finance costs	277	208	202	163	117	109	91	79	70	55	44
Internal charges and overheads recovered	742	1,230	1,254	1,246	1,279	1,302	1,343	1,347	1,350	1,390	1,407
Other operating funding applications	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**2,300**	**3,419**	**3,469**	**3,216**	**3,258**	**3,332**	**3,417**	**3,461**	**3,519**	**3,610**	**3,685**
Surplus (deficit) of operating funding	**1,337**	**1,706**	**1,907**	**1,986**	**1,978**	**2,061**	**2,152**	**2,190**	**2,221**	**2,354**	**2,371**

Figure 2: Prospective OPEX



7.2 CAPITAL EXPENDITURE

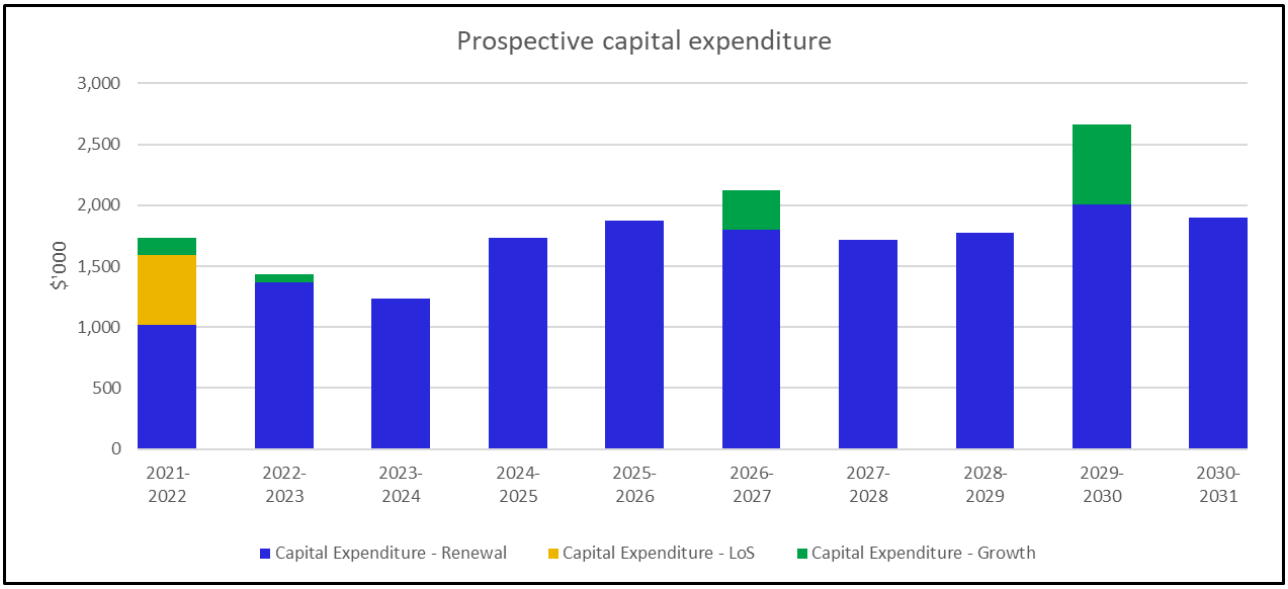
The 10-year forecast for capital expenditure is shown in the table below:

Table 5 CAPEX LTP forecast Water Supply

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000	2028-2029 $'000	2029-2030 $'000	2030-2031 $'000
Prospective Funding Impact Statement											
Activity selection: Water Supply, All, All											
Capital funding											
Sources of capital funding											
Subsidies and grants for capital expenditure	0	916	0	0	0	0	0	0	0	0	0
Development and financial contributions	0	33	57	57	49	44	40	38	37	23	23
Increase (decrease) in debt	248	-352	-365	-330	-448	-468	-508	-498	-471	-499	-480
Gross proceeds from sale of assets	0	0	0	0	0	0	0	0	0	0	0
Lump sum contributions	0	0	0	0	0	0	0	0	0	0	0
Other dedicated capital funding	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**248**	**597**	**-308**	**-273**	**-400**	**-424**	**-468**	**-460**	**-434**	**-476**	**-457**
Applications of capital funding											
Capital expenditure - to meet additional demand	0	139	67	0	0	0	322	0	0	662	0
Capital expenditure - to improve the level of service	13	579	0	0	0	0	0	0	0	0	0
Capital expenditure - to replace existing assets	1,383	1,017	1,370	1,232	1,736	1,872	1,800	1,719	1,778	2,004	1,901
Increase (decrease) in reserves	189	570	163	480	-157	-235	-439	11	9	-787	13
Increase (decrease) of investments	0	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**1,584**	**2,304**	**1,599**	**1,713**	**1,579**	**1,637**	**1,684**	**1,730**	**1,786**	**1,878**	**1,913**
Surplus (deficit) of capital funding	**-1,337**	**-1,706**	**-1,907**	**-1,986**	**-1,978**	**-2,061**	**-2,152**	**-2,190**	**-2,221**	**-2,354**	**-2,371**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

This was based on an initial projection of assets needs below:

Figure 3: CAPEX requirements by type:



The graph above includes the following capital projects.

Table 14: 10-year Water Supply capital projects

Primary driver	Community	LTP Project name	Expected timing	Total
Growth	Dargaville	Dargaville water treatment upgrades - investigation, design and construction	2022/23	$80,000
		Dargaville watermain upgrade – Hokianga Road to outer Dargaville plateau 1.4km	2029/30	$630,000
		Dargaville watermain upgrade to Awakino Plant 2km	2021/22	$80,000
	Maungaturoto	Maungaturoto Bickerstaffe Road to Judd Road watermain - 1.2km	2026/27	$270,000
		Maungaturoto south, south valley, Bickerstaffe Road 670m watermain connection renewal and growth	2021/22	$75,000
	Dargaville	Kaihu Water Treatment Plant and Tank Filler	2021/22	$500,000
	Maungaturoto	Maungaturoto Hurndall Street truck filler and main upgrade	2021/22	$157,000
	Mangawhai	Water security investigations	2021/22	$100,000
Renewals	Dargaville	Water Treatment Plant	2021/22	$240,000
		Dargaville raw watermain crossing stage 1 of 2	2021/22	$70,000
		Dargaville raw watermain crossing stage 2 of 2	2021/22	$60,000
		Dargaville watermain renewals	2022/23 - 2030/31	$8,000,000
	Ruawai	Water treatment plant and reservoir	2021/22	$275,568
		Ruawai water renewals	2022/23 - 2026/27	$770,000
	Glinks Gully	Glinks Gully water renewals	2022/23 - 2026/27	$255,000
	Mangawhai	Mangawhai water renewals	2021/22 - 2025/26	$133,000
	Maungaturoto	Maungaturoto water reservoir replacement	2021/22	$120,000
		Maungaturoto Water Reservoirs on Griffin Road specifically to be renewed	2022/23	$250,000
		Maungaturoto Hurndall Street watermain renewal	2021/22	$138,500
		Maungaturoto watermain renewals	2022/23 - 2030/31	$3,350,000
			Total	**$15,454,068**

Renewal Expenditure

Figure 4: Predicted renewals for district

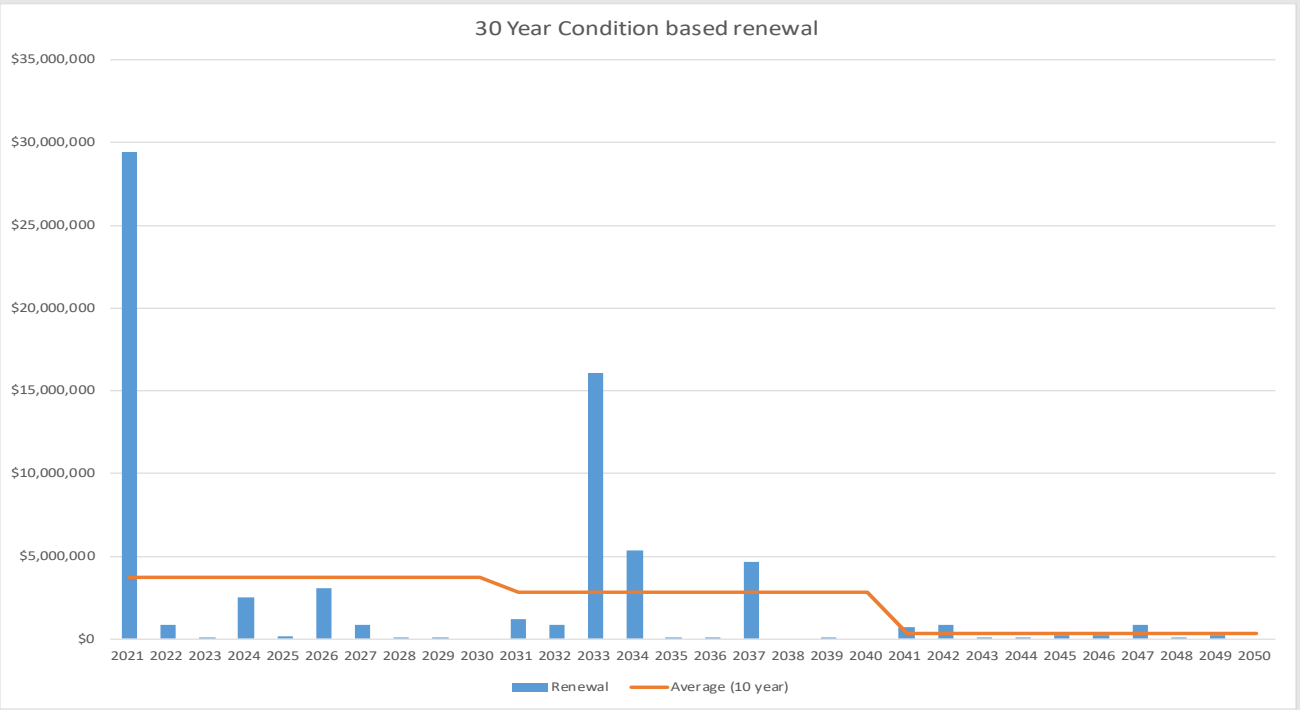


Table 15: Renewal costs for 2021-2051

Year	Line	Plant	Point	Total
2021	$29,086,939	$320,639	$2,111	**$29,409,689**
2022	$0	$868,320	$0	**$868,320**
2023	$0	$123,930	$0	**$123,930**
2024	$942,966	$1,607,335	$6,822	**$2,557,123**
2025	$0	$171,798	$8,208	**$180,006**
2026	$0	$3,074,926	$111	**$3,075,037**
2027	$0	$880,568	$0	**$880,568**
2028	$0	$0	$2,800	**$2,800**
2029	$6,915	$0	$2,111	**$9,026**
2030	$0	$0	$0	**$0**
2031	$0	$1,153,084	$81,471	**$1,234,555**
2032	$0	$868,320	$0	**$868,320**
2033	$1,514,670	$14,575,812	$0	**$16,090,482**
2034	$0	$5,368,000	$0	**$5,368,000**
2035	$0	$0	$74,385	**$74,385**
2036	$0	$61,236	$600	**$61,836**
2037	$2,428,516	$2,236,290	$111	**$4,664,917**
2038	$0	$0	$0	**$0**
2039	$0	$12,248	$2,600	**$14,848**
2040	$0	$0	$0	**$0**
2041	$15,915	$601,280	$84,208	**$701,403**
2042	$0	$868,320	$0	**$868,320**
2043	$0	$123,930	$2,800	**$126,730**
2044	$0	$10,800	$0	**$10,800**
2045	$263	$220,518	$8,208	**$228,989**
2046	$0	$240,559	$0	**$240,559**
2047	$0	$868,320	$0	**$868,320**
2048	$0	$0	$111	**$111**
2049	$0	$206,735	$0	**$206,735**
2050	$0	$0	$0	$0

As discussed above the starting point for renewals planning is the asset management information system combined with the asset valuation. Collectively these databases contain the extent and attributes of the asset, the date the asset was installed, the expected life for that type of asset and the expected renewal cost for that asset (in current equivalent materials).

From this information a future forecast of renewals expenditure can be calculated.

Pipelines

The forecast shows a significant level of overdue renewals required in Dargaville and then period renewals over the next 10 years. This largely relates to the AC pipe in the network with an expected life of 60 years.

For the other systems that are somewhat newer there are defined spikes in the future for both the Maungaturoto and Ruawai systems with the former falling into the 10-year plan.

While the Dargaville 'overdues' are past their theoretical life expectancy the backlog is not apparent in actual performance of the assets, particularly in relation to main breaks. This is not altogether surprising as the prediction of asset life is not a precise science. Even if the 'average life' could be accurately predicted there would still be a significant scatter of earlier and later failures occurring around this point.

The prediction of a 60-year life for AC pipes is prudent and supported by widespread views within the industry. It is therefore prudent for Council to manage its finances on the basis that this expenditure could be required in the relatively near future. The actual renewal works should however only be undertaken if justified by risk (in relation to critical mains) and considerations such as LoS and cost/benefit for low criticality mains. The analysis provides for the overdue renewal to occur by predicting that these works would be undertaken over the next 30 years at a uniform rate. This will almost certainly be wrong in relation to the timing and profile, to provide a more accurate renewals profile based on criticality and condition, then more extensive investigation and testing would need to be undertaken to smooth out Kaipara's expected renewals profile.

Plant renewals (treatment plant and reservoirs, pump stations)

A similar approach was applied to Water Supply plant i.e. using installation date, predicted lives and renewal cost from the valuation database.

While buildings and reservoirs tend to have quite long lives this group of assets also includes pumps, switchboards and treatment processes that are typically allocated quite short lives e.g. 15 years, in the valuation database. This is typical across the industry for such assets but any extension of the lives of these assets beyond the expected life expectancy quickly shows up as "overdue renewals.

The analysis shows that there is still a significant amount of overdue renewals and, as with the pipelines, there is not this amount of work showing up as needing to be undertaken at this time. The list of overdue renewals is included in a table in the appendix, as with the pipelines the overdue renewals are predicted to be undertaken over the next 15 years.

The analysis of renewals gathered the predicted future renewals into five-year blocks, and these are distributed uniformly over the five years when assembling the overall renewal prediction.

To date the development of Water Supply assets has largely been undertaken on a community by community basis. The reported growth figures (see Strategic Activity Plan for Growth information) five community-based Water Supply schemes -will have some form of growth over the next IS period, with a significant amount of growth in Eastern parts of Kaipara. Even in areas that are not experiencing significant amounts of growth

Council must undertake investigation projects to identify growth related projects to ensure that there is a consistent and adaptable plan in place to manage any growth that may happen in the next 3 to 30 years

Growth Expenditure

Due to previous growth in the district that council did not identify nor plan for, there are significant projects identified to secure water supplies for the future in response to the changing climate and also the recent spatial planning exercise has identified further requirements for Council to undertake focused investigations to provide alternative water supply options and also the creation of new water supply networks.

Level of Service Expenditure

LoS -related projects are to maintain treatment plants and reticulation to comply with DWSNZ, there is a significant back log of overdue renewals to the networks and investigations need to be undertaken on all of our plants to be able to ensure that council maintains the current levels of service and provides resilience to our communities.

8 RISK MANAGEMENT (INCLUDING HEALTH AND SAFETY)

The table below identifies Council high and extreme risks, together with potential impact, current controls, and an action plan to mitigate, minimise or manage the risk.

Table 6: Water Supply high risks

Description		Potential impact	Current controls	Action Plan
Asset group	**Risk**			
Events				
Reticulation	Earthquake causes extensive damage to reticulation	Loss of stored, treated water due to large diameter pipe failure	Nil	Fit emergency shut off valves to reservoirs
Dargaville water sources	Drought causes insufficient water at intakes	Water restrictions to loss of supply	Waiatua Dam Rotu Intake	Investigate alternative, more secure source Apply to vary consent to draw water at lower levels from Rotu
Dargaville raw water pipeline	Flooding causes erosion or debris build-up at inlets	Damage to intakes or pumping facilities rendering them inoperative	Routine inspections	Undertake inspections immediately after event
	Flooding causes extensive damage at multiple bridge crossings	Long term loss of water, very high cost to repair in reactive manner	Nil	Budgeted for replacement and renewal of river crossings with alternative like inverted syphons
Glinks Gully raw water pipeline	Landslide damages raw water pipeline	Loss of Water Supply to scheme for long period, high cost of reactive repairs	Secondary intake	Investigate alternative route for pipeline
Treatment and booster stations	External power failure causes shutdown of plant	Reduction in plant/station output, temporary loss of supply	Stored water	Provide alternative power supply (generator and external plug etcetera) at key locations
Infrastructure				
Dargaville raw water pipeline	Pipe failure over significant length of pipe	Loss of Water Supply to scheme for long period, high cost of reactive repairs	Annual inspection of pipeline	Continue investing in renewals
	Damage from external influences (farmers, stock etcetera) or singular pipe bridge failure	Localised pipe failure, causes loss for supply for short period		Investigate alternative, more secure source, provide extra cover to pipe where insufficient
Maungaturoto headworks	Failure of Cattlemount intakes	Loss of supply.	Can use Baldrock Dam supply	Renewal of infrastructure in poor condition
Dargaville headworks	Embankment failure at Waiatua Dam	Loss of security of supply, environmental and financial impacts	Five yearly inspection programmes	Monitor pore water pressures in the embankment, ensure drawdown of water levels is possible

Description		Potential impact	Current controls	Action Plan
Asset group	Risk			
All reticulation	Damage caused by contractors (related or unrelated)	Premature failure of assets results in unplanned maintenance and renewal costs		Register for contractors working in area
All reticulation	Poor quality of construction reduces life of network	Increased renewal expenditure and lack of funding	Designs are checked for compliance with Council's Engineering Quality Standards	Assess cost and benefits of Quality Audit and acceptance testing of new assets prior to final acceptance
All reservoirs	Leakage or failure due to deterioration	Excessive water loss, loss of pressure or supply	Periodic inspections	Monitor water loss levels, proactive restorative maintenance
Operational	Operator sustains injury onsite, not able to call for help	Serious injury occurs but no-one aware of issue to respond	Contractor Health and Safety Plan	Assess need to develop radio check in procedures
Product				
Water sources	Contamination of source water from land use activities.	Degrading of water quality, increased treatment requirements, illness possible		Investigate alternative, more secure source
Raw or treated water	Malicious contamination of Water Supply	Numerous cases of serious illness, medium term loss of supply	Locked gates to treatment plant, only access by authorised personnel	Review security of potential contamination points, improve where possible
Treated water	Contamination resulting from repair or incorrect commissioning of new works	Localised illness	Operator procedures and training	Assess costs and benefits of audit and enforcement of procedures
Treatment chemicals	Accidental release of chemicals (especially chlorine)	Environmental effects and health issues for operators and residents	Some consents in place	Assess chemical storage and handling procedures

9 CONTINUOUS IMPROVEMENT

9.1 OVERVIEW

The AMPs have been developed as a tool to help Council manage their assets, deliver LoS and identify the expenditure and funding requirements of the activity.

Continuous improvements are necessary to ensure Council achieves the appropriate (and desired) level of AM practice; delivering services in the most sustainable way while meeting the community's needs.

9.2 ASSET MANAGEMENT IMPROVEMENTS

Council has several systems and processes in place which are described in the KDC Activity Management Overview. The key AM improvements over the next 10 years are as follows:

Table 7: Improvement plan

Description	When
• Feasibility study for connection to Dargaville water storage • Application for new consent at Ahikiwi water take • Water rates equalisation will see a correction of water charges across the district • Kaihu Water Treatment Plant and Truck Filler will be delivered subject to the success of external funding application • Investigate a water security solution for Mangawhai • Business Case for connection to Tai Tokerau Water Storage • Kaipara District Council SCADA (Supervisory Control and Data Acquisition) Upgrade • Continue planning and collaboration on 3 Waters Reform	2021/2022