KAIPARA DISTRICT COUNCIL

Kaipara District Council

Asset Management Overview

June 2020

Status: Draft

Kaipara te Oranganui

KAIPARA DISTRICT

Two Oceans Two Harbours

This document has been prepared by Kaipara District Council

QUALITY STATEMENT

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CHECKED BY	…….. ……/……/……	
REVIEWED BY	…….. ……/……/……	
APPROVED FOR ISSUE BY	…….. ……/……/……	

42 Hokianga Road, Private Bag 1001
Dargaville 0340, New Zealand
TEL +64 9 439 3123, FAX +64 0 439 6756

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B						
C						
D						
E						

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1 INTRODUCTION

The purpose of this AMP is to outline and to summarise in one place, Council's strategic and management long term approach for the provision and maintenance of its infrastructure assets (water, wastewater, stormwater parks, solid waste and land drainage assets.

The AMP demonstrates responsible management of the district's assets on behalf of customers and stakeholders and assists with the achievement of strategic goals and statutory compliance. The AMP combines management, financial, engineering and technical practices to ensure that the LOS required by customers is provided at the lowest long term cost to the community and is delivered in a sustainable manner.

This AMP outlines and summarises Council's strategic and management long term approach for water, wastewater and stormwater. For reference, a list of defined acronyms used throughout this AMP is provided at the back of this document as Appendix E.

1.1 SERVICE DESCRIPTION AND SCOPE

Council undertakes the following with assistance from their Maintenance Contractor, and other service providers as required:

- Asset management (AM);
- Customer services;
- Treatment plant operation and maintenance;
- Network operations and maintenance;
- Capital and refurbishment programme;
- Consent monitoring and compliance.

The scope of this AMP is to determine asset standards, LOS and funding levels to maintain sustainable and affordable three water activities for Council. The AMP should be used to drive and manage the Three Waters business throughout the year, and this will require progressive updating to reflect the constantly changing situation.

1.2 ASSUMPTIONS

Council has made a number of assumptions in preparing the AMP, which are described in Table 1 below.

Table 1: Key assumptions

Assumption type	Assumption	Discussion
Financial assumptions	That all expenditure has been stated in 01 July 2019 New Zealand dollar values (GST exclusive) and no allowance has been made for inflation. Asset valuations are in 2018 dollar values.	The LTP will incorporate inflation factors. This could have a significant impact on the affordability of the plans if inflation is higher than allowed for, however Council is using the best information practicably available from Business and Economic Research Limited (BERL).
Levels of service	Asset management activity aims to maintain a consistent level of service across the district.	Although service levels may vary for a number of reasons, the aim is to maintain assets to the levels noted in the Activity Management Plans.
Growth forecasts	Kaipara District Council uses a set of Medium-High series population projections provided by Infometrics as an indication of future growth. These project growth will slow over 2020 and 2021 with softer net migration and a decline in employment as a consequence of COVID-19. Population growth is projected to pick up from 2022 onwards, with the district growing steadily to reach a population of 32,600 in 2051. Most growth is projected to be centred in the Mangawhai area (as it has been historically) with other south-eastern areas such as Kaiwaka also growing rapidly. Strong growth is also projected for the Northwest of the District though not to the same extent as the Southeast.	If the growth is significantly different it will have a significant impact. If higher, Council may need to advance capital projects. If it is lower, Council may have to defer planned works. Council plans its infrastructure (e.g. size of water pipes) to have sufficient capacity for the population it is anticipated to serve over its design life. If population exceeds the designed capacity, there will be additional costs. The amount of development is a key consideration for Council when planning how it will fund the required infrastructure. If growth falls short of that projected, it may result in a shortfall in income.

Assumption type	Assumption	Discussion
Population fluctuations	Population fluctuations: The populations of some coastal settlements in Kaipara fluctuate considerably throughout the year with regular influxes of holiday makers. Comparisons of the number of occupied dwellings and unoccupied dwellings as well as comparisons of wastewater volumes suggests the combined population of Mangawhai Village and Mangawhai Heads can more than double during holiday periods. Population fluctuations in are expected to continue to be a feature of Kaipara's coastal communities. However, the level to which they fluctuate is anticipated to decrease over time. A trend towards a greater proportion of occupied dwellings versus unoccupied dwellings is already evident in Mangawhai and this is anticipated to continue. This is partly driven by Mangawhai's improving commutability to Auckland and improving services. However, in Mangawhai and across the district this trend is being perpetuated by the aging population retiring to lifestyle destinations. In addition, some traditional batch communities are emerging as satellite suburbs of growing parent settlements, such as Baylys which is easily commutable to Dargaville.	The capacity of Council infrastructure needs to be capable of meeting the needs of the peak population not just the usually resident population. If the peak population increases to beyond the planned capacity of the infrastructure, there may be operational issues and unforeseen costs. A key downward driver on the proportion of holiday homes in Kaipara's settlements is New Zealand's aging population and their desire to retire by the sea. In addition, former holiday homes are increasingly being taken up by young families seeking more affordable housing. These drivers appears unlikely to change. The proportion of holiday homes in Kaipara's coastal settlements may be driven up if the level of disposable income available to the working age population in neighbouring Auckland and Whangarei increases. Substantial increases in disposable income could allow more people to purchase a holiday home in Kaipara. Similarly, rising house prices make developing and investing in property more attractive. However, Infometrics economic forecasts suggest that disposable income, house prices and consumer confidence are all likely to fall over the near term due to the COVID-19 recession. This suggests that a reversal in the trend towards lower population fluctuations is unlikely over the near planning horizon.
Network capacity	That Council's knowledge of network capacity is sufficient enough to accurately programme capital works.	If the network capacity is lower than assumed, Council may be required to advance capital works projects to address congestion. The risk of this occurring is low; however the impact on expenditure could be large. If the

Assumption type	Assumption	Discussion
		network capacity is higher than assumed, Council may be able to defer works. The risk of this occurring is low and is likely to have little impact. There is a degree of uncertainty regarding network capacity with increased severity of rainfall events and risk of freshwater flooding, increased frequency of coastal inundation and flooding, and increased drought.
Changes in legislation and policy	That there will be no major changes in legislation or policy.	The risk of major change is high due to the changing nature of the Government and politics. If significant changes occur it is likely to have a significant impact on the required expenditure. Council has not mitigated the effect of this. The Resource Management Act is undergoing a comprehensive review. The review includes the interface of the RMA with the Local Government Act 2002, the Land Transport Management Act 2003 and the Climate Change Response Amendment Act 2019.
Natural Hazards	Climate change will bring an increase in the frequency and severity of extreme weather events.	The network capacity may be lowered. There will be an increase in costs to maintain and repair exposed assets. Capital works projects may need to be altered or advanced to account for increased vulnerability.

1.3 RELATIONSHIP TO COMMUNITY OUTCOMES, COUNCIL POLICIES AND STRATEGIES

Council has adopted a new Mission and Community Outcomes that includes specific reference to managing (maintaining and improving) its infrastructure.

The Long Term Plan 2021/2031 (LTP) is still being generated. It is not expected that the role of asset related activities will significantly change from the LTP 2018/2028.

This overall Mission for the district provides a broad initial direction for the infrastructure related activity priorities and how those assets may be managed. This information, along with community consultation and discussion with other interested parties, contributes to the development of the community outcomes identified in the LTP.

Council Mission: Nurturing our people and place by inspiring a vibrant, healthy and caring community

Community Outcomes

1. Climate smart - Climate change and its impacts are reduced through community planning
   - Mitigation of climate change through community planning
   - Adaptation of our communities for climate change
   - Reducing Kaipara's carbon footprint
   - Encouraging and supporting alternative industries
   - Drought management

2. Celebrating diversity – our local heritage and culture are valued and reflected in the community
   - Embrace our bi-cultural values, principles and practices
   - Continue to build our Iwi and hapū relationships

- Support and develop Māori economic potential
- Support public galleries, libraries, archives and museums

3. Vibrant communities - Kaipara communities offer an attractive place to live and visit
    - Connect our towns and communities (?)
    - Promote Kaipara as an attractive place to live and visit
    - Create an accessible Kaipara (?)
    - Support key events
    - Provide sufficient sports and recreation areas
    - Continue to improve and upgrade Council public facilities
    - Celebrate our two harbours & two coasts
4. Healthy environment – Our natural environment is protected and open to the community
    - Protect and promote our natural ecosystems
    - Incentivise protection of natural areas
    - Advocate for the environment
    - Minimise volume and impact of waste on the environment
    - Maintain wastewater and stormwater infrastructure
    - Support green space - community gardens, subdivisions and zoning
5. Prosperous economy - Development is encouraged, supported and sustainable
    - Operate as a business entity, balancing income and debt
    - Use government funding opportunities to build the local economy

- Create a simple and enabling district plan
- Ensure utilities and roading have capacity to take growth
- Support growth through development and financial contributions
- Promote tourism initiatives

6. A Trusted Council - An open organisation working for our community

- Easy to do business with - clear processes
- Consistent service delivery
- Friendly and welcoming
- Transparency in decision making and reporting
- Fair to everyone

Infrastructure Strategy

As part of the LTP Council is required to produce a Long Term Financial Strategy and an Infrastructure Strategy for its major asset using activities. These documents are required to look out not less than 30 years to identify the issues and challenges that Council will face during that period, how Council would likely respond to them, what this will cost and where the funding will come from. This recognises the long lived nature of the infrastructure assets that Council utilised to provide services, the potential for technology and expectations to change considerably and the potential for expenditure to be quite 'lumpy' as assets enter their renewal cycles.

Strategic Activity Management Plan (this document)

There is no statutory requirement for Council to generate an AMP. However, it serves a valuable purpose in collecting relevant information about the assets and services at a level of detail that would not be appropriate for the various statutory documents described above.

1.4 STAKEHOLDERS AND CONSULTATION

There are many individuals and organisations that have an interest in how Council does management and/or operation of assets. The following key external and internal stakeholders are identified for this AMP:

Table 1: Stakeholders

External stakeholders	Interest
Kaipara district community	Ratepayers; Commercial businesses; Public safety; Public health; Protection of private property; Environmental protection; and Water quality of local harbours' and ephemeral waterways for commercial and recreational activities.
Government agencies (e.g. Department of Health, Ministry for the Environment (MfE), Audit NZ)	Adherence to Government policies and framework; Ensuring Council is transparent and accountable; Public safety; and Environmental health and protection.
New Zealand Fire Service	Council has a responsibility to provide a reticulated supply that meets current fire fighting supply standards.
Local Iwi	Protection of historical relationship of Maori and their culture and traditions with their ancestral lands, water, sites, wahi tapu and other taonga.
Civil defence and emergency management	Understanding stormwater control and measures to ensure public safety, and to better understand flood issues within the local area.
Northland Regional Council	Adherence to NRC policies and plans e.g. NRC – Regional Plan; Environmental impacts and protection; Protection and increase of water quality and water quality standards; and Planning for climate change and sea level rise.

External stakeholders	Interest
Maintenance contractor	Maintain existing services; Understand Council's LOS and their targets and requirements; and Understand the local network and the councils' direction for the AMP period.
Northland District Health Board;	Council provides reports to the NDHB on compliance with the current water drinking standards, we have a responsibility to ensure the water is safe for our communities to drink and the NDHB is the authority council reports to. Water Safety Plans are submitted to and reviewed by the NDHB.
Visitors to the district	Public safety; Environmental protection; Minimal flooding and flood protection of tourist areas within the surrounding district; and Quality of ephemeral waterways and harbours' for recreational activities.
Developers	Council works with developers in our district to provide better outcomes for our communities with on-going growth.

Internal stakeholders	Interest
Mayor and Councillors	Representing the publics' interests and those of the greater district; Protecting the ratepayers' interests and ensuring the transparency of Council's actions and projects; Planning of future works; Maintaining water quality; Allowing for future growth and the provision of services; and Maintaining and increasing LOS to the communities.

Internal stakeholders	Interest
Financial Services Manager	Understanding the financial implications of the AMP period and how this will affect rates and ratepayers of the district; Ensuring the completeness of asset data and how this affects current valuations and decision making; Ensuring that budgets are valid and able to be adhered to; and Protection of public interest in regards to spending on public assets.
Information Services Manager	Ensuring that all information is recorded correctly; Keeping track of assets and asset data; Vested interest in completeness of asset data and value; and Increasing the reliability of Council asset registers.
Records and Information Manager	Ensuring Council's transparency on identified works; and Retaining and cataloguing Council information for auditable purposes.
Northern Transportation Alliance (NTA)	Protection of road assets from stormwater; Planning flow of stormwater away from road assets; Protection of road users; and Identifying growth, renewal and LOS projects where stormwater and road asset projects coincide.

Council consults with the public to gain an understanding of customer expectations and preferences. This enables Council to provide a LOS that better meets the community needs. Council's knowledge of customer expectations and preferences is based on:

- Feedback from public surveys;
- Public meetings;
- Feedback from Elected Members;
- Analysis of customer service requests and complaints; and
- Consultation via the Annual Plan and LTP process.

Council undertakes customer surveys on a regular basis, using the National Research Bureau Ltd (NRB). These customer perception surveys assess levels of satisfaction with key services, including stormwater, and the willingness across communities to pay for service improvements.

1.5 LEGISLATIVE FRAMEWORK AND LINKAGES

The AMP is related to a range of national and local legislation, regulatory and policy documents as listed in through Table 2 below. The legislation and guidelines below are listed by their original title for simplicity, however all Amendment Acts shall be considered in conjunction with the original Act, these have not been detailed in this document. For the latest Act information refer to http://www.legislation.govt.nz/.

Table 2: Relevant Legislation

Acts
The Health Act 1956
The Health (Drinking Water) Amendment Act 2007 (an amendment of the Health Act 1956)
The Local Government Act 2002, especially: • Part 7; • Schedule 10; • The requirement to consider all options and to assess the benefits and costs of each option; and • The consultation requirements.
The Climate Change Response Act 2002 (and Climate Change Response Amendment Act 2019)
The Civil Defence Emergency Management Act 2002 (Lifelines)
The Resource Management Act 1991
The Local Government (Rating) Act 2002
The Land Drainage Act 1908
The Rivers Boards Act 1908
The Soil Conservation and Rivers Control Act 1941
The Health and Safety at Work Act 2015
The Utilities Access Act 2010
The Building Act 2004
The Consumer Guarantees Act 1993
The Sale of Goods Act 1908
The Fair Trading Act 1986
Public Records Act 2005

Table 3: Relevant regulatory requirements

National policies, regulation, standards and strategies
Drinking Water Standards for New Zealand 2005(08) (DWSNZ)

National policies, regulation, standards and strategies
The Government's Sustainable Development Action Plan
National Policy Statement on Urban Development Capacity 2016
The National Environmental Standard Sources of Human Drinking Water
Code of Practice for Urban Sub-division
The New Zealand Fire Service Fire Fighting Water Supplies Code of Practice: SNZ PAS 4509:2008
NAMS Manuals and Guidelines http://www.nams.org.nz
Office of the Auditor-General's publications http://www.oag.govt.nz
Standards New Zealand • AS/NZS ISO 31000:2009 Risk Management Principles and Guidelines; • NZS 4404:2010 Land Development and Subdivision Infrastructure; • AS/NZS ISO 9001:2008 Quality Management Systems; and • AS/NZS 4801:2001 Occupational Health and Safety Management Systems • AS/NZS 2032:2006 Installation of PVC Pipe Systems • AS/NZS 2280:2004 Ductile Iron Pressure Pipes and Fittings • AS/NZS 3725:2007 Design for Installation of Buried Concrete Pipes • AS/NZS 2566.1:1998 Buried Flexible Pipe Design • AS/NZS 2566.2:2002 Buried Flexible Pipe Installation • NZS 3101.1&2:2006 Concrete Structures Standard • NZS 3910:2003 Conditions of Contract for Building and Civil Engineering Construction • NZS 4404:2010 Land Development and Subdivision Infrastructure • SNZ HB 4360:2000 Risk Management for Local Government • NZWWA New Zealand Infrastructure Asset Grading Guidelines 1999 • ISO 20400:2017 Sustainable Procurement Standardisation National Guidelines • NZ Pipe Inspection Manual 2006 • QV Costbuilder Construction Handbook.

Table 4: Relevant Council planning and policy documents

Local policies, regulations, standards and strategies
Council District Plan
Northland Regional Plan
NRC Regional Policy Statement
NRC Regional Air Quality Plan
NRC Regional Coastal Plan
NRC Regional Water and Soil Plan
Council Engineering Standards and Policies 2011
Council Procurement Strategy and Policy Documents March 2012
Fonterra Water Supply Agreement 2009 (Maungaturoto)
Climate Change Strategy

Table 5: Relevant Council Bylaws

Council Bylaws
Water Supply Bylaw 2009
Wastewater Drainage Bylaw 2016

The preparation and implementation of this AMP and associated long term financial strategies is a means for Council to comply with these requirements.

Local Government Act 2002:

As per the LGA 2002:

1. The purpose of local government is –
    a. To enable democratic local decision making and action by, and on behalf of, communities; and
    b. To meet the current and future needs of communities for good-quality local infrastructure, local public services and performance of regulatory functions in a way that is most cost-effective for households and businesses.
2. In this Act, **good-quality**, in relation to local infrastructure, local public services, and performance of regulatory functions, means infrastructure, services, and

performance that are –

a. Efficient; and

b. Effective; and

c. Appropriate to present and anticipated future circumstances

This Act requires local authorities to:

- Prepare a range of policies, including significance, funding and financial policies.
- Prepare an LTP (formerly the Long Term Council Community Plan or LTCCP), at least every three years, which must identify:
  - Activities and assets;
  - How the asset management (AM) implications of changes to demand and service levels will be managed;
  - What and how additional capacity will be provided, and how the costs will be met;
  - How the maintenance, renewal and replacement of assets will be undertaken and how the costs will be met; and
  - Revenue levels and sources.

With respect to the Significance and Engagement Policy, all local councils must adopt a policy that sets out their approach to determining the significance of proposals or decisions relating to issues, asset or other matters, and any thresholds, criteria or procedures to be used by Council in assessing whether issues, proposals, decisions or other matters are significant.

Schedule 10 of the Act provides further detail for the LTP, which is relevant to this AMP. This Act supersedes the 1996 Local Government Amendment Act, which required the adaptation of a Long Term Financial Strategy, prudent asset management, and formal accounting for the "loss of service potential" of assets. In essence however, the intent of these requirements is still relevant as embodied in Audit New Zealand's expectations for AMPs through its requirement for councils to conduct an "assessment of water and wastewater services within its district".

The new legislation also puts a stronger emphasis than ever before on strategic planning (s121) that will describe:

- The systems for supply of water and disposal of wastewater and stormwater (cl.3 (a));
- The quality of drinking water and wastewater (including stormwater) (cl.3 (b));
- Current and future demands for water and wastewater (including stormwater) services and related effects on the quality of supply and the discharges to the environment (cl.3(c)); and
- Options for meeting current and future demands with associated assessments of suitability (cl.3 (d)).

Local Government (Rating) Act 2002, the funding companion to this proposed new LGA:

- Permits councils to strike a rate or charge for any activity they choose to get involved in (s16).

Resource Management Act 1991 and amendments:

The RMA 1991 is an established planning framework covering land designation processes and resource consents for activities that affect the environment. Northland Regional Council (NRC) is responsible for monitoring compliance with certain environmental provisions of this Act.

The RMA is key legislation influencing how stormwater is managed, in particular the effect of the stormwater discharges on the environment. Council is required to gain approval to discharge from the drainage networks under the RMA. Council is working with NRC to understand the Regional Plans for managing stormwater discharges in urban areas.

The RMA sets out the framework for freshwater management. Freshwater is managed by regional councils who are responsible for the water bodies within their boundaries through implementation of the RMA.

Council is also involved in the control of development and subdivisions under the RMA and the District Plan, to manage effects on the environment.

Amendment Bill 2020 will significantly change freshwater management and will add mitigation targets and national adaptation plan that territorial authorities must give reference to.

Building Act 2004:

The Building Act 2004 and its related provisions set standards for stormwater control as they relate to buildings. Under the Building Act, a territorial authority has a regulatory role in receiving and assessing building consent applications. Council is responsible for producing PIMs (Project Information Memoranda) and LIMs (Land Information Memoranda). Information on drainage plans, flood records, maintenance history, notices and correspondence should be included in these memoranda. Council may reject a building consent where there is a risk of flooding. The Building Act also stipulates the minimum level of flood protection for houses.

The Health (Drinking Water) Amendment Act 2007 amended the Health Act 1956, requiring all water suppliers with the duty to ensure their water is safe to drink. The amended Act introduced a statutory requirement that all drinking water suppliers providing drinking water to over 500 people must develop and implement a Water Safety Plan (WSP) to guide the safe management of their supply. The quality assurance is complemented by the DWSNZ**,** which specifies the maximum acceptable concentrations of harmful contaminants in the water.[1]

Health Act 1956 contains:

- Measures for the prevention or management of outbreaks of disease;
- A requirement (s25) for territorial authorities to provide "Sanitary works for villages, towns and cities" which amongst other things are defined as:
  - Drainage works, sewerage works, and works for the disposal of sewage;
  - Works for the collection and disposal of refuse, night soil and other offensive matter;
  - Sanitary conveniences for the use of the public;
  - Any other works declared by the Governor General by Order in Council to be sanitary works, and includes all lands, buildings, machinery, tanks, pipes, and appliances used in connection with any such sanitary works; and
  - Authority for the raising of loans to build such works (s27).

The Health Act requires Council to provide sanitary works, including drainage works for all lands, buildings and pipes used in connection with such works.

National Policy Statement for Freshwater Management 2011

- Reflects central government's policy and directions to local government regarding the management of the nation's freshwater resources. The freshwater objectives seek to safeguard the life -supporting capacity, ecosystem processes and indigenous species, including their associated ecosystems of fresh water. This is to be achieved quantitatively through the sustainable management of taking, damming or diverting fresh water, and qualitatively through the sustainable management of the use and development of land and the discharge of contaminants.

Northland Regional Council (NRC) regulates the water takes in the Kaipara district. Resource consents issued by NRC are a significant driver of the AM programme.

Health and Safety at Work Act 2015:

- The Act introduces a new term, "Person Conducting a Business or Undertaking" (PCBU), which captures employers, self-employed, principals to contracts, manufacturers, designers, etcetera who have the primary health and safety duties. Workers also have duties under the Act. Workers include employees and contractors, the PCBU must ensure that it's duties are carried out as per subpart 2 – Duties of PCBUs of the Act.

Civil Defence Emergency Management Act 2002:

- Requires utility lifelines (such as three waters) to function to the fullest possible extent during and after an emergency and to have plans for such functioning (business continuity plans).
- Crown Public Health has prepared a Response Manual for Accidental Wastewater Discharges, which is a basic set of procedures to prevent threats to public health

Public Records Act 2005

Council is required to create and maintain full and accurate records including all matters that are contracted out to an independent contractor. This includes records which relate to property or assets owned by and/or administered by the local authority such as contract documents, as-built of public utilities and services such as: roads, drainage, sewerage and stormwater, water supply, flood control, power generated and supply, refuse disposal and public transport.

National Environmental Standards (NES)

The RMA promotes the sustainable use of resources. The main method that the Act uses to control the use of resources including the discharge of effluent to the environment is through the Regional Water and Soil Plan at regional level and District Plans at district level. This has resulted in varying standards for each region and district.

One method of ensuring that environmental standards are applied consistently across the country is provided in sections 43 and 44 of the RMA. These sections allow the Minister for the Environment to promote regulations called National Environmental Standards (NES). When an NES is enacted it means that each regional, city or district council must enforce the same standard. In some circumstances councils can impose stricter standards.

NES not only protect people and the environment, they also secure a consistent approach and decision making process throughout the whole country. They create a level playing field.

The following standards are in force as regulations:

- Air quality standards;
- Sources of human drinking water standard;
- Telecommunications facilities;
- Electricity transmission; and
- Assessing and managing contaminants in soil to protect human health

The standards listed below are at various stages of development, ranging from initiating consultation to being legally drafted.

- Ecological flows and water levels;
- Future sea level rise; and
- Plantation forestry.

The proposed National Environmental Standard for onsite wastewater systems has been withdrawn. These would have developed a warrant of fitness regime for

onsite wastewater systems and had the potential to impose significant costs on ratepayers although it was argued that this would have benefited the environment.

This AMP has considered the impact of those relevant NES that are known to be in force at the time of the current update. Future AMP updates will need to consider future Standards as the MfE develops these.

Trade Waste Bylaw

Following public consultation under the special consultative procedures of the Local Government Act 2002, Council adopted a Policy for the Discharge and Acceptance of Wastewater and an associated Wastewater Drainage Bylaw in June 2016.

The Policy sets out the manner in which Council will address issues surrounding wastewater, including, but not limited to how applications for new connections are to be made, maintenance responsibilities and other general customer and Council roles and responsibilities. The bylaw sets out the specific conditions and quality parameters that must be met in order to discharge into the wastewater system. The bylaw standards are legally enforceable and breaches of these standards could lead to disconnection and/or prosecution.

Where a discharge into the wastewater system cannot meet the requirements of the bylaw, a separate trade waste agreement must be entered into. This agreement identifies the maximum allowable values that establish an acceptable quality of the wastewater being discharged into the system. These parameters are based on the existing schedule contained within the bylaw. In addition, specific conditions can be included to ensure the discharge can be more easily accommodated at Council's WWTP.

Links with other documents

This AMP is a key component in Council's strategic planning function. Among other things, this AMP supports and justifies the financial forecasts and the objectives laid out in the LTP. It also provides a guide for the preparation of each Annual Plan and other forward work programmes.

2 DEMAND MANAGEMENT

2.1 INTRODUCTION TO DEMAND MANAGEMENT

This section of the AMP analyses factors affecting demand including population growth, social and technology changes. The Activity Management Plans consider the impact of these trends is examined and demand management strategies are recommended to address demand and ensure:

- Existing assets' performance and utilisation are optimised
- The need for new assets is reduced or deferred
- Council's strategic objectives are met

- Provision of a more sustainable service
- Council is able to respond to customer needs

The process of demand management provides Council with a high level tool to identify where infrastructure growth is likely to occur over a period of time. It enables a natural structured growth of the public system to occur. Without this type of assessment ad hoc development of localised assets occurs and can leave a burdensome, somewhat redundant legacy for Council to operate and maintain.

Demand management strategies provide alternatives to the creation of new assets in order to meet demand and look at ways of modifying customer demands so that the utilisation of existing assets is maximised and the need for new assets is deferred or reduced.

Precise demand forecasting for the management of infrastructure is a difficult undertaking. This AMP has largely been based on historical data and growth predictions provided by Statistics New Zealand (and revised by Infometrics) in order to identify potential future demand for infrastructure.

There is uncertainty in forecasting demands. The key assumptions are:

- Growth is consistent with the low percentages forecast
- No major changes to industrial usage

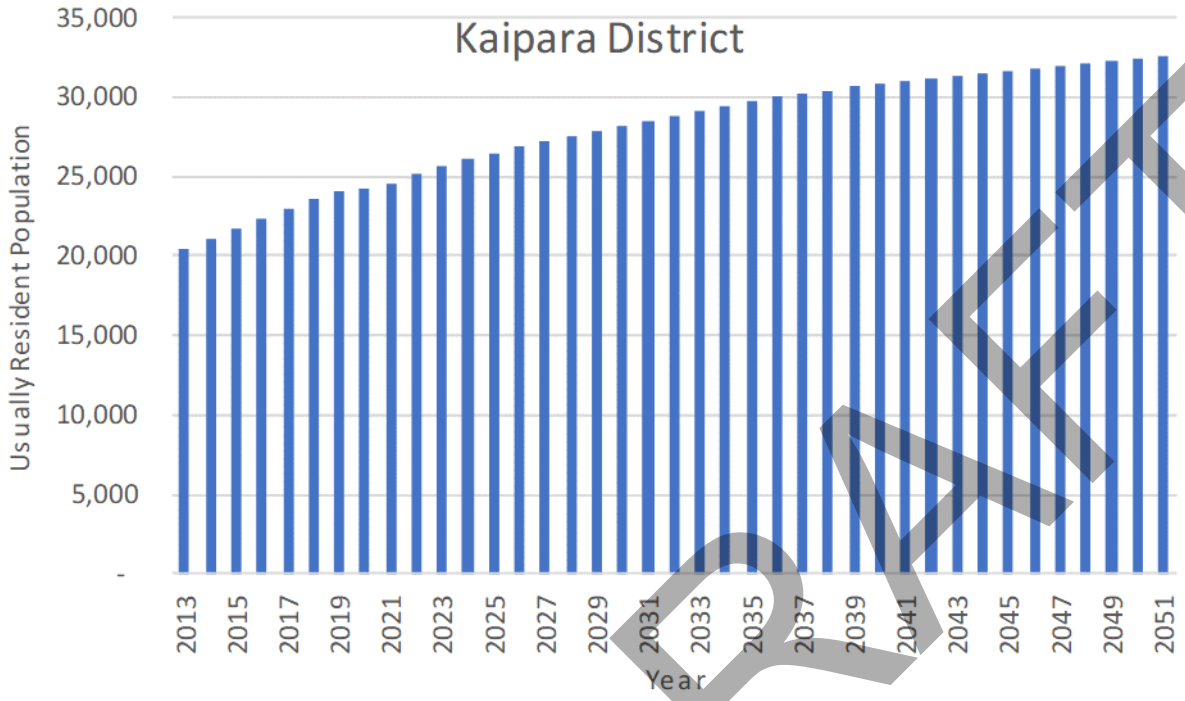
If the growth significantly exceeds expected levels then there is a risk that the capacity of the infrastructure will be exceeded sooner than anticipated. To minimise this risk Council will need to review capacity requirements based on actual demand growth as new assets are planned.

2.2 POPULATION GROWTH

The Kaipara District has been growing rapidly thanks to its proximity to Auckland, lifestyle opportunities and growing employment. According to the 2018 Census, Kaipara's population grew 20.6% from 18,963 in 2013 to 22,869 in 2018 making it the fastest growing district in Northland. The district's 2019 population is estimated at 24,100 and this is projected to grow to 26,839 in 2026, 28,523 in 2031 and 32,551 in 2051.

Kaipara District Council engaged Infometrics to prepare population and household projections for the district . This work by Infometrics finds the population of Kaipara District has grown strongly over the 15 years to 2019, reaching a population of 24,100 in 2019. As a consequence of COVID-19, population growth is projected to slow over 2020 and 2021 with softer net migration and a decline in employment. Population growth is projected to pick up from 2022 onwards, with the district growing steadily to reach a population of 32,600 in 2051. These projections are shown in Figure 2.

Figure 2 Infometrics population forecast for Kaipara



Most of Kaipara's growth has been focussed around Mangawhai and the southeast of the district; those parts which are closest to Auckland. This trend is projected to continue with Mangawhai's population projected to increase from 5,547 in 2019 to 7,661 in 2026, 9,088 in 2031 and 12,796 in 2051. The growth of Mangawhai and other areas of the Kaipara southeast have primarily been driven by migrants from Auckland.

Many of these migrants are those nearing retirement age and may be able to facilitate their move by selling their family home in Auckland for significantly more than the value of a new home in Kaipara, allowing them to enjoy an early retirement. More recently, these areas have begun to attract young families seeking the affordable housing and lifestyle opportunities Kaipara offers while still being able to commute back to Auckland part of the work week for employment. This later trend is anticipated to strengthen as roading improvements reduce travel times between Kaipara and Auckland and more services are developed particularly in Mangawhai, Kaiwaka and Maungaturoto. population aging rapidly over the next 30 years. The number of residents aged 65 years and over is projected to grow from 5,600 in 2019 to 12,200 in 2051. The population 15 to 64 years of age is projected to grow slightly, and the population under the age of 15 is projected remain

steady.

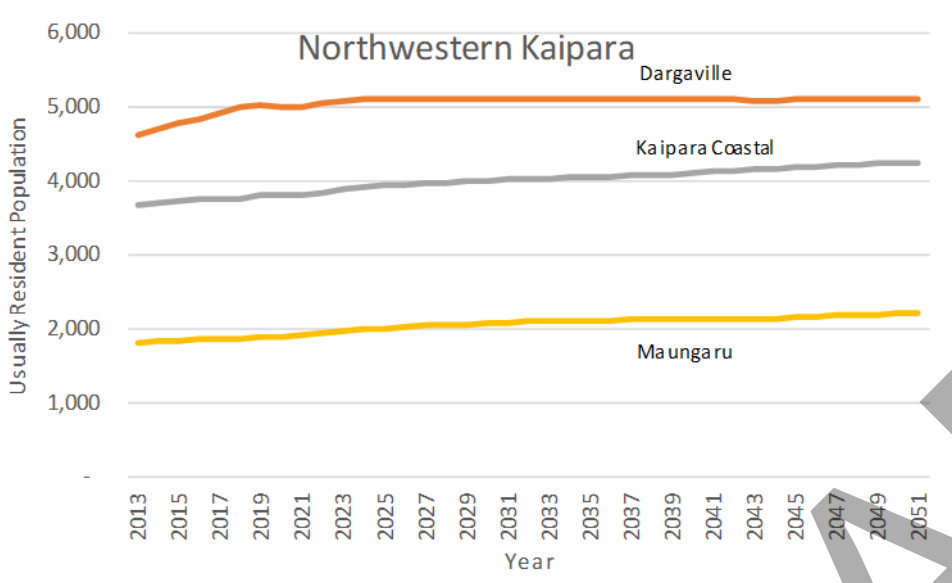
Table 6 Population projections by 5 year age group for Kaipara District from 2013 - 2051

Age Group	Year													
	2013	2019	2020	2021	2022	2023	2024	2025	2026	2031	2036	2041	2046	2051
Age 0-4	1,350	1,464	1,447	1,435	1,434	1,432	1,441	1,447	1,451	1,434	1,397	1,384	1,416	1,468
Age 5-9	1,380	1,619	1,609	1,606	1,616	1,624	1,625	1,622	1,615	1,614	1,601	1,557	1,541	1,574
Age 10-14	1,450	1,538	1,570	1,610	1,663	1,717	1,727	1,733	1,737	1,726	1,729	1,709	1,662	1,646
Age 15-19	1,310	1,295	1,277	1,263	1,258	1,253	1,302	1,348	1,394	1,500	1,495	1,496	1,477	1,430
Age 20-24	995	1,025	999	977	962	946	941	934	925	1,039	1,148	1,140	1,143	1,124
Age 25-29	810	1,150	1,112	1,078	1,052	1,024	1,010	994	976	912	1,031	1,134	1,123	1,124
Age 30-34	910	1,163	1,195	1,233	1,283	1,333	1,310	1,283	1,253	1,138	1,077	1,191	1,290	1,280
Age 35-39	1,010	1,169	1,187	1,210	1,243	1,277	1,323	1,367	1,410	1,414	1,303	1,235	1,346	1,446
Age 40-44	1,220	1,227	1,227	1,231	1,245	1,260	1,291	1,320	1,348	1,532	1,539	1,423	1,354	1,465
Age 45-49	1,360	1,424	1,397	1,375	1,363	1,350	1,364	1,376	1,385	1,487	1,675	1,674	1,556	1,489
Age 50-54	1,590	1,613	1,608	1,609	1,623	1,636	1,627	1,614	1,598	1,594	1,700	1,879	1,874	1,759
Age 55-59	1,570	1,865	1,853	1,848	1,857	1,866	1,881	1,892	1,900	1,873	1,875	1,971	2,145	2,143
Age 60-64	1,515	1,958	1,988	2,028	2,085	2,142	2,154	2,161	2,165	2,199	2,181	2,174	2,266	2,442
Age 65-69	1,455	1,899	1,933	1,975	2,034	2,094	2,148	2,199	2,247	2,363	2,411	2,388	2,383	2,479
Age 70-74	1,110	1,619	1,671	1,731	1,807	1,885	1,941	1,993	2,044	2,293	2,423	2,472	2,458	2,463
Age 75-79	605	1,073	1,152	1,238	1,337	1,439	1,507	1,573	1,638	1,925	2,185	2,317	2,375	2,373
Age 80-84	395	557	618	682	754	829	909	989	1,070	1,418	1,698	1,947	2,082	2,153
Age 85+	365	444	457	473	492	512	569	626	684	1,064	1,516	1,949	2,363	2,693
Grand Total	**20,400**	**24,100**	**24,300**	**24,600**	**25,110**	**25,619**	**26,070**	**26,473**	**26,839**	**28,524**	**29,983**	**31,039**	**31,852**	**32,552**

North-West Kaipara

In contrast to the southeast, population growth in northern and western parts of the district appears to be more closely aligned to employment growth, with more jobs attracting and retaining workers and their families. Employment in Kaipara District grew steadily over the past decade, at nearly 2% per annum. Employment growth is expected to turn negative in 2020 and 2021 because of COVID-19 and the resultant economic shock. Strong employment growth is expected for the remainder of the 2020's as the district recovers from the economic shock and returns to its prior growth path.

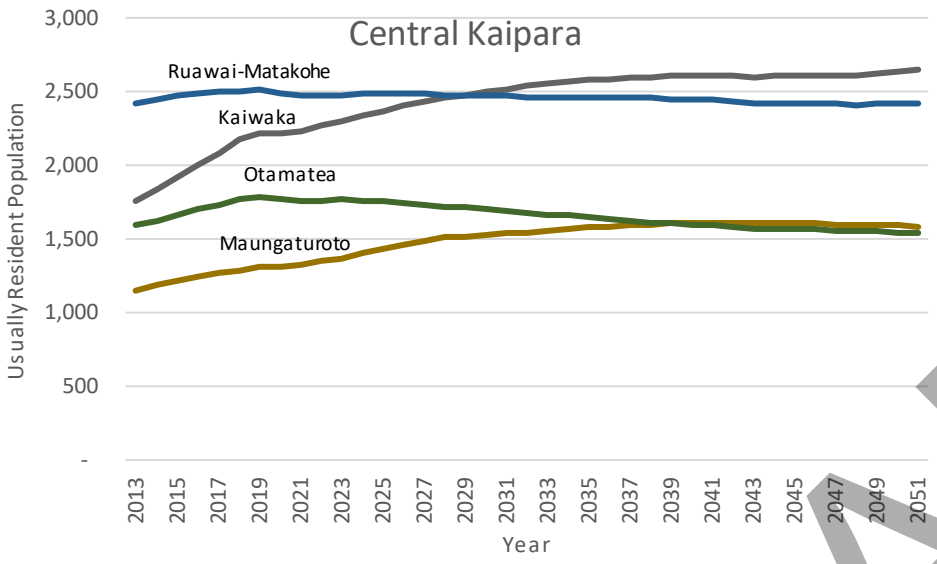
Figure 3 Projected population growth in the Northwest Kaipara area



Central Kaipara

The fortunes of Kaipara's central areas will be influenced by a mix of those factors driving growth in Mangawhai and those driving growth in Northwest Kaipara. Maungaturoto and Kaiwaka are projected to grow as a result of both local employment growth and their proximity to Auckland and improving transport linkages. By contrast, the population in the Ruawai-Matakohe area is projected to remain relatively stable while the Otamatea area is projected to experience population decline as a result of population aging and limited employment growth. Of note, both the Ruawai-Matakohe and Otamatea areas are projected to have more households in 2051 despite having smaller populations. This is because of a trend towards less people per household that is in part due to the aging population and in part due to a trend towards couples having fewer children. Population projections for areas in central Kaipara are shown in Figure 4.

Figure 4 Projected population growth in central Kaipara



South-East Kaipara

Further improvements to State Highway 1 will reduce travel times to and from Auckland, thus improving the attractiveness of Mangawhai for commuting workers. Infometrics are projecting the population in Kaiwaka and Maungaturoto to grow strongly as these towns are expected to gain from reduced travel times to Auckland, as well as local employment growth. The Dargaville area is projected to grow strongly, although much of this growth will happen on the fringes of the existing urban area (i.e. much of the growth will be reported as occurring in the Kaipara Coastal and Maungaru SA2s). Population in Ruawai-Matakohe and Otamatea areas is expected to ease slightly, however the number of households is still expected to increase in these areas due to decreasing household sizes (i.e. less people living in each house on average). Table 7 reports how the different areas of Kaipara are projected to grow.

Table 7 Population projections for Kaipara's communities 2013-2051

Statistical Area 2	Year													
	2013	2019	2020	2021	2022	2023	2024	2025	2026	2031	2036	2041	2046	2051
Dargaville	4,600	5,027	5,002	4,996	5,031	5,063	5,088	5,102	5,107	5,105	5,104	5,090	5,092	5,097
Kaipara Coastal	3,680	3,796	3,788	3,795	3,833	3,869	3,902	3,925	3,943	4,011	4,058	4,114	4,185	4,241
Maungaru	1,815	1,890	1,894	1,905	1,931	1,958	1,981	2,001	2,018	2,079	2,112	2,120	2,157	2,207
Mangawhai Village	535	1,062	1,146	1,236	1,339	1,446	1,529	1,611	1,692	2,073	2,392	2,636	2,778	2,851
Mangawhai Heads	1,320	2,186	2,283	2,392	2,524	2,659	2,774	2,887	2,998	3,553	4,060	4,442	4,628	4,704
Mangawhai Rural	1,505	2,300	2,379	2,469	2,583	2,699	2,793	2,883	2,971	3,461	3,965	4,377	4,799	5,242
Total Mangawhai	3,360	5,547	5,808	6,097	6,446	6,803	7,096	7,381	7,661	9,088	10,418	11,455	12,204	12,796
Kaiwaka	1,760	2,217	2,222	2,237	2,270	2,303	2,341	2,375	2,406	2,524	2,593	2,608	2,614	2,658
Maungaturoto	1,160	1,318	1,322	1,332	1,353	1,374	1,405	1,434	1,461	1,543	1,590	1,612	1,608	1,588
Ruawai-Matakohe	2,430	2,520	2,494	2,477	2,479	2,480	2,489	2,492	2,491	2,475	2,467	2,444	2,423	2,420
Otamatea	1,595	1,785	1,770	1,761	1,766	1,770	1,768	1,762	1,752	1,699	1,642	1,595	1,569	1,544
Kaipara District	20,400	24,100	24,300	24,600	25,110	25,619	26,070	26,473	26,839	28,524	29,983	31,039	31,852	32,552

Figure 3 further portrays the importance of Mangawhai to Kaipara's growth, with growth in the remainder of the district strong yet modest by comparison.

Figure 5 Mangawhai growth

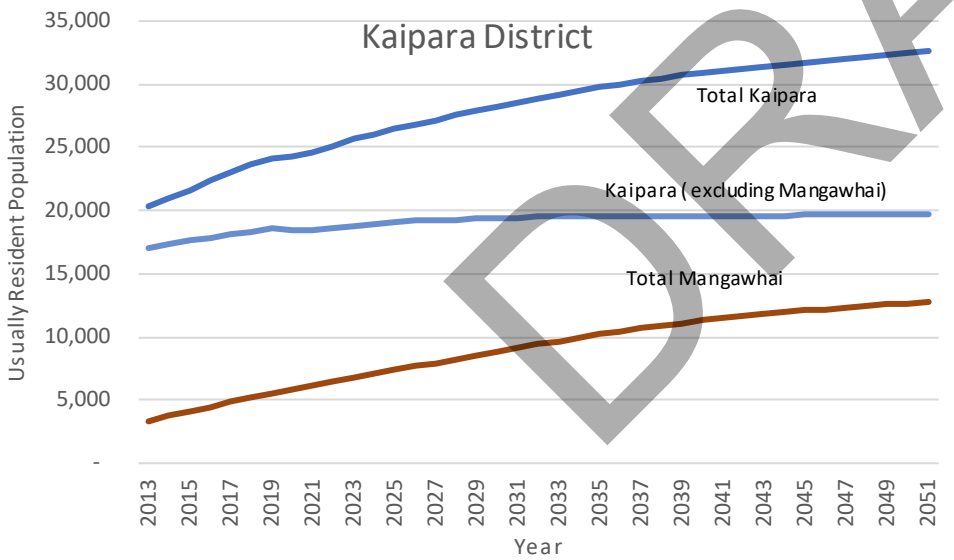
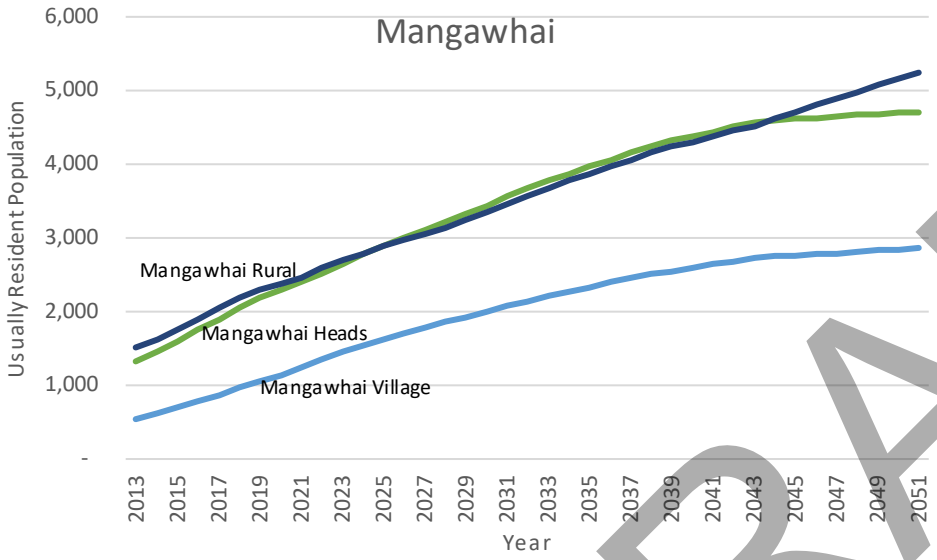


Figure 4 shows strong population growth for all three of the Statistical Area 2s that comprise the Mangawhai Area. These projections foresee Mangawhai emerging as the largest centre in the district with new shops and services attracting a large retirement population and improved connectivity with Auckland making it increasingly commutable to Auckland, attracting young families wanting to escape the Auckland housing market.

Figure 6 Projected population growth in the three areas of Mangawhai.



2.3 POPULATION FLUCTUATIONS

The population projections in the previous section refer only to Kaipara's "usually resident population". These are those people who usually live in an area and does not capture those who may be holidaying there or who may be resident for part of the year (e.g. weekends and public holidays or over summer) while primarily living at another address.

The popularity of some Kaipara settlements as holiday destinations means their populations can increase considerably at certain times of the year. This is an important planning consideration for Council whose infrastructure and services need to be able to meet peak demand.

Past analysis comparing the number of unoccupied dwellings to occupied dwellings and wastewater flows between peak and off-peak times suggests the combined population of Mangawhai Village and Mangawhai Heads more than doubles during holiday periods. Similar population fluctuations are anticipated to occur in other holiday settlements such as Whakapirau, Pahi, Tinopai, Glinks Gully and Baylys however no modelling has been done for these smaller settlements.

These population fluctuations are anticipated to continue into the future, however their severity is anticipated to ease as holiday homes are increasingly being taken up by new permanent residents. This is partly due to an influx of retirees into these lifestyle locations, some of whom may be retiring to their existing holiday home. In addition, some traditional batch communities may take on a more permanent nature as satellite suburbs of parent settlements e.g. Baylys with its commutability to Dargaville, Whakapirau with its commutability to Maungaturoto and increasingly, Mangawhai with its improving commutability to Auckland's North Shore.

Mangawhai is increasingly transitioning from a holiday settlement into a fully-fledged town, with more services and an increasing proportion of permanent residents. This transition is anticipated to continue into the future.

2.4 HOUSEHOLD GROWTH

The ageing population of the district, combined with trends of greater life expectancy and smaller families, means that the average household size of the district is projected to ease from 2.37 individuals per household in 2019 to 2.14 individuals per household in 2051. The effect of this is to spread the same population over a greater number of households. Accordingly, household numbers are projected to grow faster than the population, from 10,000 in 2019 to 14,600 in 2051 (refer to Table 8).

Household growth should not be taken as a proxy for dwelling growth. Dwelling growth pertains to the number of dwellings (houses and apartments) be they occupied or unoccupied, whereas household growth pertains to the number of "family units" or "households" who live in these dwellings. Households can thus include families, people living alone and people flatting together. Household projections therefore make no allowance for unoccupied dwellings (e.g. holiday homes).

Table 8 Household projections for Kaipara's communities.

Statistical Area 2	Year													
	2013	2019	2020	2021	2022	2023	2024	2025	2026	2031	2036	2041	2046	2051
Dargaville	1,817	2,034	2,029	2,031	2,049	2,067	2,078	2,085	2,088	2,090	2,091	2,096	2,115	2,138
Kaipara Coastal	1,460	1,538	1,543	1,554	1,578	1,602	1,622	1,640	1,654	1,720	1,770	1,812	1,849	1,871
Maungaru	712	758	765	776	793	810	824	837	849	898	933	955	989	1,025
Mangawhai Village	237	472	512	554	601	651	687	724	760	929	1,075	1,196	1,276	1,320
Mangawhai Heads	615	1,001	1,044	1,093	1,151	1,212	1,261	1,309	1,357	1,594	1,808	1,975	2,066	2,103
Mangawhai Rural	625	1,000	1,037	1,078	1,130	1,183	1,228	1,271	1,312	1,544	1,773	1,951	2,125	2,303
Total Mangawhai	1,477	2,473	2,592	2,725	2,883	3,046	3,176	3,304	3,429	4,067	4,656	5,122	5,467	5,727
Kaiwaka	690	875	883	896	916	935	958	978	997	1,080	1,137	1,165	1,181	1,205
Maungaturoto	426	502	509	518	532	546	562	578	593	646	691	731	759	774
Ruawai-Matakohe	940	1,049	1,045	1,045	1,054	1,062	1,071	1,077	1,082	1,101	1,120	1,126	1,123	1,122
Otamatea	641	732	731	732	740	747	751	753	754	756	754	751	753	752
Kaipara District	8,163	9,962	10,098	10,277	10,545	10,814	11,042	11,251	11,445	12,358	13,150	13,757	14,236	14,614

As with population growth, most new households in Dargaville are likely to be located in greenfields developments outside the existing Dargaville SA2 boundary. The Dargaville area itself is therefore projected to grow by 100 households, with a further 330 households in Kaipara Coastal, and 270 households in Maungaru.

Households in Mangawhai are projected to grow strongly, by 850 in Mangawhai Village, 1,100 in Mangawhai Heads, and 1,300 in Mangawhai Rural.

Infometrics projects the number of households in Maungaturoto and Kaiwaka to grow by 270 and 330 respectively, reflecting their growing populations. Interestingly, household growth is also projected for Ruawai-Matakohe and Otamatea despite a projected decrease in their populations. This is because decreasing average household sizes mean more houses are required to house the same population. Matakohe and Otamatea are therefore projected to experience growth of 70 and 20 households, respectively.

2.5 GROWTH AND DEMAND TRENDS

Future demand for services is driven by:

- Extent and location of urban growth
- Changing environmental expectations
- Community expectations
- Industrial/commercial demand
- Legislation

There are growth -driven capital projects of significance over the 10 year LTP and 30 year Infrastructure Strategy periods. There is a strong focus on ensuring resilience of assets now and in the future and adequately maintaining and renewing infrastructure. In general, the forecasts assume that any additional demand for services created by the increased growth levels will be absorbed by the rating base growth and by more efficient delivery of services.

Projections for growth in demand for services must take into account new developments and existing residents in areas not yet serviced. Additionally, community expectations vary geographically and over time. Council can track the future demand for future services through community consultation via the LTP and Annual Plan processes.

2.6 NPS ON URBAN DEVELOPMENT CAPACITY 2016

The NPS requires all councils to provide for growth to occur in their areas such that a lack of ‘development infrastructure’ (which includes water services) is not an impediment to that growth.

There are no communities in Kaipara larger than 30,000 population of experiencing high rates of growth and so compliance only with requirements PA1-4 is required. Broadly these can be summarised as:

- For expected growth in period from now to 3 years the land and development infrastructure has to be feasible, zoned and serviced (or able to be serviced if it is developer responsibility);
- For medium term growth (3-10 years) the land does not need to be serviced but plans to service must be included in the LTP; and
- For long term growth (10-30 years) the land does not need to be serviced but provision to do so needs to be included in the Infrastructure Strategy.

In practical terms it is difficult for Council to predict when a particular developer might decide to proceed and what the staging of that development might be. In the absence of a specific proposal it is not cost -effective for Council to pro-actively install capacity for developments that 'might' proceed.

The approach adopted by Council is therefore to engage with the development community and seek a co-ordinated approach that will provide for the development on a 'just in time' basis and with confidence that any works required are financially feasible for both the developer and Council.

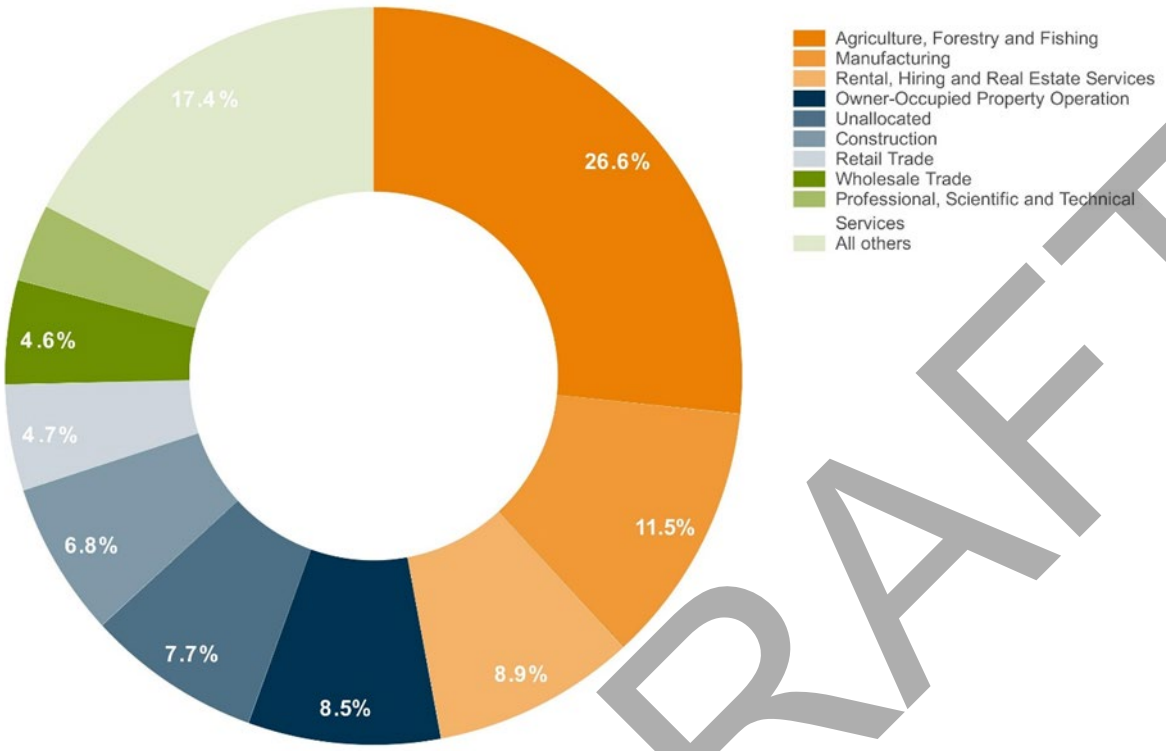
2.7 TECHNOLOGICAL CHANGE

A constant awareness of technology changes is necessary to most effectively predict future trends and their impact on the utility infrastructure assets.

2.8 ECONOMIC TRENDS

Kaipara's economy is founded on its primary industries (particularly dairy) supported by a strong manufacturing sector which itself is strongly tied to the primary sector e.g. processing of milk and meat and production of agricultural equipment and supplies. In 2019, the primary sector (agriculture, forestry and fishing) accounted for 26.6% of Kaipara's GDP while manufacturing contributed a further 11.5% as is shown in Figure #. Dairy cattle farming's contribution to the local economy alone was 12.1% of Kaipara's GDP compared to 2% in the national economy. The primary and manufacturing sectors were also the two biggest contributors to employment in Kaipara in 2019 accounting for 25.4% and 11.6% of filled jobs, respectively (Infometrics, 2020).

Figure 7 Contribution of different sectors to Kaipara's GDP in 2019 (Infometrics, 2020).



However, the structure of Kaipara's economy is not consistent across the district (Infometrics, 2020). The primary sector is even more important to the Northwest Kaipara area with agriculture, forestry and fishing accounting for 64.9% of GDP and 67.6% of filled jobs in 2019. Dairy farming alone accounted for 33.1% of Northwest Kaipara's 2019 GDP while sheep, beef and grain farming accounted for a further 13.3%, horticulture and fruit growing a further 11.7% and forestry a further 5% (Infometrics, 2020).

Southeast Kaipara was also highly dependent on the primary sector (32.8% of 2019 GDP) but was also well supported by the manufacturing sector (18.2% of 2019 GDP) (Infometrics, 2020). The greater importance of Manufacturing to Southeast Kaipara likely reflects the presence of Fonterra's Maungaturoto Dairy Factory. Collectively, the primary and manufacturing sectors accounted for almost half of all filled jobs in the Southeast Kaipara area (29.8% and 17.1% respectively) (Infometrics, 2020).

As the service centre for the wider rural area, Dargaville township had a more diversified economy with a stronger focus on manufacturing (14.4% of GDP and 12.3% of filled jobs in 2019) (Infometrics, 2020). This reflects the presence of Silver Fern Farms' meat works together with the many smaller fabricating, processing and manufacturing businesses present in the town.

By contrast, Mangawhai has little economy of its own with only 1,099 filled jobs for a usually resident population of 5,620 people (compared to Dargaville with 3,542 filled jobs for 4,930 residents) (Infometrics, 2020). This reflects the large number of retired people who have chosen to make Mangawhai their home, as well as the increasing number of working age residents who commute to Auckland for their employment. Unsurprisingly for a fast-growing seaside resort, what local economy Mangawhai does have is primarily focussed around facilitating residential development with the construction sector accounting for 11% of GDP and 16.4% of filled jobs, real-estate services accounting for 21.7% of GDP and 6% of filled jobs, professional, scientific and technical services accounting for 10% of GDP and 9.7% of filled jobs and administrative and support services accounting for 7.4% of GDP and 12% of filled jobs. Accommodation and food services were also important to Mangawhai's employment, accounting for 14.6% of filled jobs (Infometrics, 2019).

As a rural agricultural district, and with many of its retail and manufacturing businesses supporting the primary sector, Kaipara's fortunes are closely linked to its primary industries. This means Kaipara's economy is overly exposed to risks in the primary sector and shows more extreme shifts between good economic performance and poor economic performance compared to more diversified local economies. Years with strong returns for agricultural products and good growing condition can see Kaipara's economy flourish with GDP growth far exceeding that elsewhere. Conversely, drought years, low dairy pay-outs and poor returns for meat and forestry products can disproportionately impact Kaipara's economy. This over exposure to the primary sector is expected to continue into the future.

Similarly, Mangawhai's economy is over exposed to the housing market (particularly the Auckland housing market) with demand for new houses (either as holiday homes or as residences) driving the performance of its construction sector and the demand for real-estate services and professional, scientific and technical services (e.g. geotech assessments and resource consenting services). This means the performance of Mangawhai's economy, employment and population growth is heavily influenced by Auckland's housing market. Greater availability of houses and lower house prices in Auckland will make purchasing a house/developing a property in Mangawhai less attractive, particularly for those whose employment is in Auckland. Lower house prices in the Auckland market also influences the ability and willingness of those nearing retirement to sell out of the Auckland housing market and purchase a property in Mangawhai. In addition, the ability of people to afford a second home also impacts the demand for coastal holiday homes. This means Mangawhai's growth can be expected to slow or accelerate in response to the Auckland housing market as well as in response to roading improvements which make Mangawhai more commutable to Auckland. The development of more services in Mangawhai also helps to attract more residents.

Economic outlook

As planning was underway for the Long Term Plan 2021-2031 and associated 30 Year Infrastructure Strategy, Kaipara's economy was impacted by the effects of the Coronavirus disease 2019 (COVID-19) pandemic, made worse by the presence of the 2019/2020 drought. Originating in China in December 2019, COVID-19 quickly spread to other countries, fast becoming the worst global pandemic since the 1918-1920 Spanish flu. New Zealand's response included closing its boarder and placing the nation into a series of "Lockdowns" at different levels of restrictiveness. Similar measures were taken by other nations around the globe in an effort to contain the virus. While necessary to contain COVID-19, these measures pushed the world's economy into a global recession.

For Kaipara, and Northland, the COVID-19 Lockdowns came towards the end of persistent drought conditions and severe water restrictions. This effectively resulted in a double hit to the economy. The drought impacted most on the primary sector (including associated manufacturing) which in turn had flow on effects for the district's retailers and service centres as less export earnings resulted in less wealth to flow through the wider economy. While the status of food producers, manufacturers and associated supply chain as "essential services" throughout the COVID-19 Lockdowns protected a large part of Kaipara's economy, it meant those sectors of the economy not already affected by the drought were then caught by Lockdown restrictions. This included retail, tourism, cafés/restaurants, hospitality, construction and forestry, with the forestry industry being further impacted by low log prices followed by reduced demand for wood products internationally.

The first few years of the Long Term Plan 2021-2031 and associated 30 year Infrastructure Strategy will therefore be characterised by economic recession and recovery following the COVID-19 pandemic.

In the five years prior to the outbreak of COVID-19, Kaipara's economy had been enjoying a period of sustained economic growth (see Figure 8) with average GDP growth of 2.7% per annum over the five years from 2014 to 2019, slightly below the national average rate of 3.4% (Infometrics, 2019). This expansion of the economy had resulted in employment growth (an average of 2.2% per annum over the same period compared to 2.6% nationally) and, consequently, population growth (an average of 3.1% per annum over the same period compared to 1.8% nationally) as people moved to all areas of the district to take up jobs. In addition, high housing costs in Auckland also drove migration to the Mangawhai area despite limited job opportunities in that area. By December 2019, when COVID-19 first broke out in China, Kaipara's unemployment rate had fallen to 3.9%, lower than the national average 4.1% and its lowest rate since 2008 (just prior to the onset of the Global Financial Crisis) (see Figure 9) (Infometrics, 2019).

Figure 8 Growth in Kaipara's economy over the past decade as demonstrated by annual GDP ($m) (Infometrics, 2020).

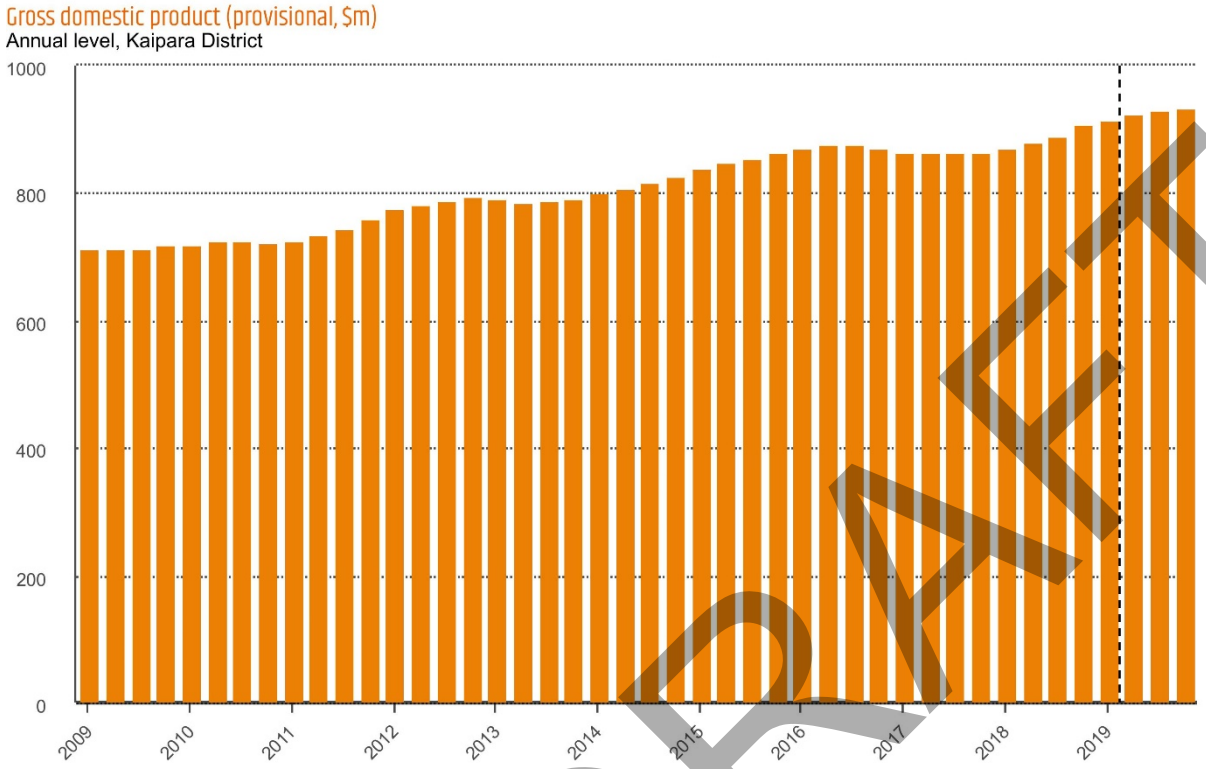
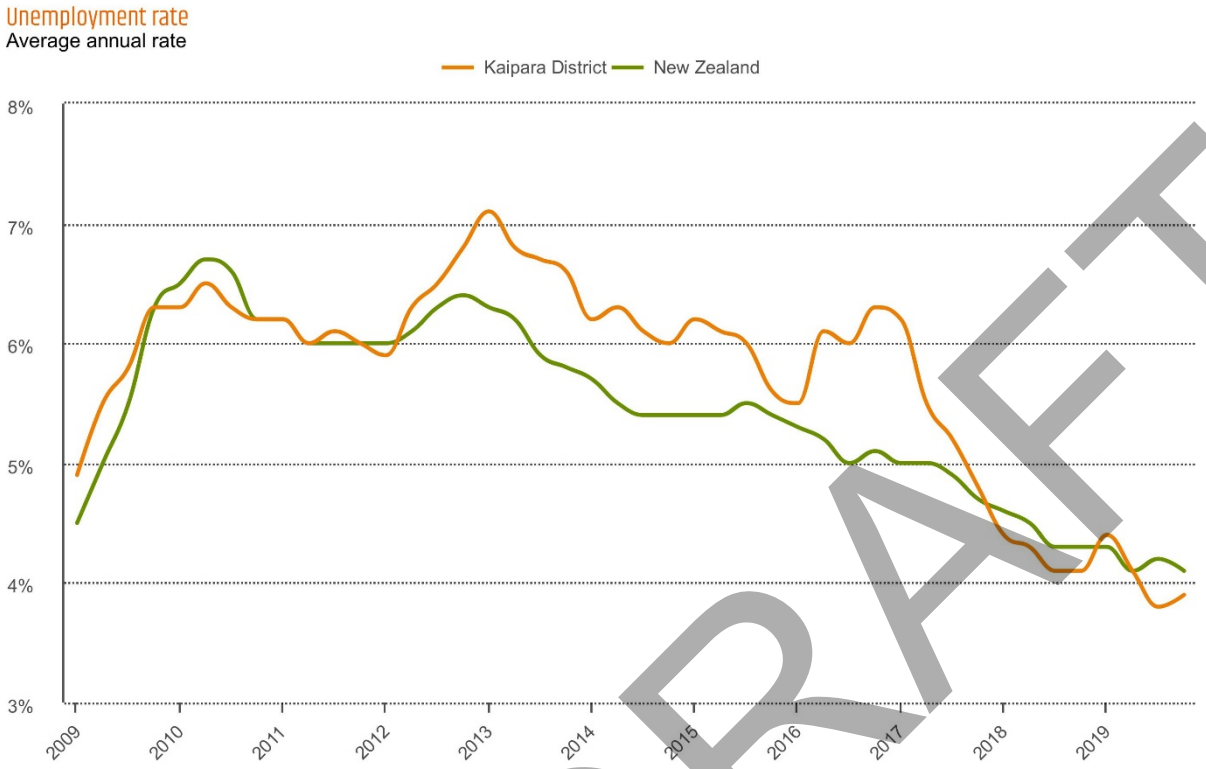


Figure 9 Changes in Kaipara's average annual unemployment rate compared to that in the national economy (Infometrics, 2020).



Infometrics estimate that 23.2% of Kaipara's workforce were able to work from home during the COVID-19 Lockdowns (Infometrics, 2019). When combined with the number of "essential services" workers it is estimated that 57.6% of Kaipara's workforce were able to continue working even during the most restrictive parts of the Lockdown. This compares to 28.6% and 53% respectively in the national economy. The fact that 1.5 million workers (57% of the country's workforce) came to be supported by the government's wage subsidy scheme, highlights the pressure placed on businesses throughout the Lockdowns. Unemployment is therefore expected to average over 9% during 2021. Infometrics expect more than 250,000 jobs to be lost nationwide between March 2020 and March 2021, with tourism-related sectors set to be the worst-hit (Infometrics, 2020).

The sudden loss of key sectors, along with lower spending by firms and households, will have a devastating effect on businesses (Infometrics, 2019). The rapid deterioration in economic conditions across New Zealand, and expectations for a long, slow, recovery, signal a tough few years' for the economy. Economic activity is anticipated to contract 8% in the year to March 2021, house prices are expected to fall 11% by the end of 2021 and economic growth is not expected to

exceed 3%pa until late 2022 (Infometrics, 2019).

The COVID-19 economic disruption is therefore continuing at a scale not experienced since the 1930s Great Depression (Infometrics, 2019). The economy is not considered likely to recover to greater than pre-COVID-19 levels until the second half of 2023 at the earliest (Infometrics, 2020).

That said, New Zealand's strong primary sector, and position as a food exporter, is likely to provide a solid foundation for regional New Zealand (Infometrics, 2019). The ability of Kaipara's economy to recover is therefore better than most due to its focus on food production. The sector has been largely unaffected by Lockdown restrictions and export prices for food commodities (particularly dairy and meat) are holding up well. Kaipara's economy is also fortunate to have limited exposure to the tourism sector (Infometrics, 2019).

Once international trade and travel begins to return to normal (or reach a new normal), the factors that contributed to Kaipara's economic success prior to 2019 are likely to once again stimulate economic growth (Infometrics, 2019). Demand for Kaipara's produce and interest from tourists in exploring the Kauri Coast are therefore likely to lead to further expansion of Kaipara's economy over the remainder of the 2021-2051 planning horizon, once the COVID-19 economic recovery is overcome.

2.9 LEGISLATIVE CHANGE

Legislative change can significantly affect Council's ability to meet minimum LOS and may require improvements to infrastructure assets. Changes in the NRC Proposed Plan for Northland, environmental standards and the RMA 1991, may affect services.

In addition, changes in legislation can influence the ease at which new consents are obtained or existing consents are renewed. Experience demonstrates that consent conditions are becoming more stringent with increased monitoring requirements being commonplace and the likelihood of better management and possible reduced volumes in water take consents.

The Ministry for the Environment (MfE) is promoting a series of NES that can be enforced as regulations under the RMA. One such standard is the proposed standard for Ecological Flows and Water Levels, the objective of which is to facilitate the sustainable management of New Zealand's water resource. It intends to promote consistency in the way decisions are made to ensure sufficient variability and quantity of water flowing in rivers, groundwater systems, lakes, and wetlands. Whilst the Onsite Wastewater Systems National Environmental Standard has been withdrawn, other standards have the potential to impose costs on ratepayers including those not connected to a Council wastewater system

During the 2030s, more stringent environmental regulation is expected to result in higher carbon prices and greater regulation related to freshwater quality. Coupled with greater uptake of automation technology across the economy, this is expected to reduce the rate of employment growth, particularly in agriculture, though growth will remain positive.

2.10 CHANGES IN WEATHER PATTERN

According to NIWA projections (2016; 2019), Northland and Kaipara District will see an increase in temperature of 0.5-1.5°C by 2040, and 1.0-3.5°C by 2090. This compares to a temperature increase in New Zealand during last century of about 0.7°C. Kaipara will see an increase in the number of hot days and heatwave days and an increase in the number of dry days. The increase in accumulated potential evapotranspiration deficit (PED) will lead to an increase in drought potential. NIWA projects slight variations in annual rainfall changes (around 2%), with increases projected in Autumn and decreases for Winter and Spring. Potential increases in the intensity of ex-tropical cyclones and severe storms (i.e. wind speeds & rainfall) are anticipated. Frequency of cyclones are projected to decrease or stay the same. There is a projected increase in the severity of rainfall events (more intense short duration rainfall events). By 2090, the depth of a current 1-in-100-year, 1-hour duration rainfall event is projected to increase by approximately 35%. With the increase in intense, short duration rainfall events there is increased potential of flooding.

3 LEVELS OF SERVICE AND PERFORMANCE MEASURES

Levels of Service (LOS) are attributes that Council expects of its assets to deliver the required services to stakeholders. A key objective of an AMP is to match LOS provided by the activity with agreed expectations of customers and their willingness to pay for that LOS.

The LOS provide the basis for the lifecycle management strategies and works programmes identified in the AMP. With assets, there are often higher levels of maintenance and renewal requirements proposed (increased LOS) than the resources allow for. Trade-offs then have to be made as to what impacts on the ability of an asset to provide a service against the nice to have aspects.

LOS can be strategic, tactical, operational and implementation should reflect the current industry standards and be based on:

- **Customer Research and Expectation** Information gained from stakeholders on expected types and quality of service provided.
- **Statutory Requirements** Legislation, regulations, environmental standards and Council bylaws that impact the way assets are managed. These requirements set the minimum LOS to be provided.
- **Strategic and Corporate Goals** Guidelines for the scope of current and future services offered and manner of service delivery, and define specific LOS that Council wishes to achieve.
- **Best Practices and Standards** Specify the design and construction requirements to meet the LOS and needs of stakeholders.

The LOS have been developed to contribute to the achievement of the stated Community Outcomes that were developed in consultation with the community (s1.4) and taking into account:

- Council's statutory and legal obligations;

- Council's policies and objectives; and
- Council's understanding of what the community is able to fund.

The LOS included in this AMP are the LOS prepared, consulted on and adopted as part of the LTP consultation process. The Strategic Activity Management Plans for each activity details the LOS and associated performance measures. These now include non-financial performance measures in accordance with s261B of the LGA which came into force on 30 July 2014, and DIA mandatory performance measures.

The LTP performance measures are reported on through the annual reporting process. Council's current actual performance will be reported in the Annual Report.

The Asset Management Improvement Plan (AMIP) includes an action for Council to review its LOS to identify if there is further opportunity for improved efficiencies and/or best practice that can be incorporated into the service framework. Currently the LOS reported in the activity management plans are customer focused and those that are included in the 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.

4 CRITICAL ASSETS

Critical assets have been defined as being assets with a high consequence of failure[2]. They are often found as part of a network, in which, for example, their failure would compromise the performance of the entire network.

In March 2016, the Water Services Team developed a criticality framework with respect to consequence of failure with the help of a Consultant. It is anticipated that actions would be put into place to reduce the consequences of failure to High (Major) e.g. by duplication or elimination of an asset, or it is accepted that the very high cost of lowering the consequence is not justifiable given the very low likelihood of occurrence associated with the particular hazard. In the latter case some consideration would be given to contingency planning, but the nature and scale of the potential occurrence is likely to be difficult to predict and require the implementation of emergency management procedures at the time.

Criticality classes - management approach

Table 7 shows the lower three of five categories of criticality derived from the criticality framework. The High (Extreme) category would be managed in the Council's Risk Matrix and Council would not tolerate a situation where the consequence was considered to be Extreme and the Likelihood any higher than Rare.

In order to reduce the consequence to High (Major), a cost benefit analysis will have to be carried out to see if the (high) cost duplication or elimination of an asset would be justifiable when compared to the acceptance of the risk considering that the likelihood of occurrence is low. Contingency planning can be implemented as well as emergency management approaches because the nature and scale of the occurrence is unpredictable.

Table 7: Criticality classes – management approach

Consideration		Insignificant / Minor	Moderate	High (Major)
1	Primary description	Assets with low consequence of failure and largely managed reactively by contractor without direct Council input (other than Call Centre referral).	Assets with tolerable consequence of failure but not on a reoccurring basis. Response will typically require additional resources and generate widespread and/or lengthy disruption.	Assets that ideally do not fail and are managed pro-actively to prevent this. If failure does occur it is a major event requiring significant resourcing and management input.

[2] National Asset Management Steering Group, Association of Local Government Engineering NZ Inc. (2006) 3rd edition (Version 3.0), *International Infrastructure Management Manual*, National Asset Management Steering Group, Association of Local Government Engineering NZ Inc. (INGENIUM)

Consideration		Insignificant / Minor	Moderate	High (Major)
2	Consequences of failure	Limited in both extent and time (typically less than 3-4 hours maximum) and covered by adopted LOS targets. Extent of disruption also likely to be limited. Some customers may be unaware of situation.	Impact on customers (key and residential) is more significant in relation to extent and/or duration. May generate impacts on health, safety, damage and environment. Contingency servicing may be required and some management of demand.	Major impact on residential and/or key customers. Services are disrupted for lengthy period and inconvenient alternatives put in place. Significant and/or lasting adverse impacts occur in any, or several, of service delivery, health, safety, damage, environment.
3	Impact during remediation	Some alternative servicing may be required for some customers in extra-ordinary circumstances. Otherwise customers expected to cope with loss of service. Some discomfort and inconvenience for some affected customers.	Likely to require demand management and provision of alternative servicing for duration. Discomfort and inconvenience for large group of customers. Individual evacuations may be required.	Significant demand management required. Alternative servicing barely adequate. Widespread evacuations may be required.
4	Maintenance response	Routine maintenance response typically within capacity and authorisation of maintenance contractor.	The response to the incident will require resources beyond the normal capacity of the contractor such as multiple tankers or sucker trucks, additional manpower or specialist skills, additional equipment such as generators etcetera brought in. Urgency with obtaining equipment not held in stock. Note that it is still anticipated that the contractor would have contingency plans in place to undertake the lower end of this	Contractor fully committed to response and additional resourcing utilised. 'Fix at any cost' approach may be required in relation to obtaining required equipment and materials. Overall response is managed by Council management in consultation with the contractor and any external resources engaged. It is not anticipated that the Declaration of a Local Emergency would be required in

Consideration		Insignificant / Minor	Moderate	High (Major)
			escalation as part of their 'normal' response and without the involvement, or approval, of Council management.	these circumstances but this could occur in unusual circumstances.
5	Escalation and communication	Largely dealt with at normal operational level. Call Centre would be advised. Council Water Services management advised in monthly reporting and on an informal/courtesy basis.	Escalation to management of Water Services for input into solution. Senior management and Mayor/local Councillor advised of situation and remedial measures underway. Communication staff briefed as required. Some 'public service' announcements required and co-operation of community sought.	Major event for Council. Primary focus of Council activity until resolved. Communication staff updated regularly and managing media and Mayor/Councillor enquiries. Regular briefing of senior management and CE. Potential to escalate to emergency management status if required to manage impacts or acquire resources.
6	Planned maintenance and inspections regime	Prescribed maintenance undertaken as required for specific electro/mechanical equipment. Maintenance of other assets likely to be irregular and budget constrained. Standby equipment routinely checked for serviceability where this provides full, or substantially, the same capacity as duty equipment. Service alternated to manage wear on duty/standby configurations. Many readily accessible assets are subject to regular inspections even though	Valves and controls exercised routinely to check operability. Equipment that is easily accessible (not requiring excavation) is subject to regular inspections; includes electrical, mechanical and hydraulic equipment that does not have an installed or easily implemented bypass. In some circumstances consideration should be given to exposing assets (e.g. in pits and chambers) to allow regular inspections to be undertaken.	As for Moderate plus prescribed maintenance linked to contractual reporting and KPIs. Consideration given to duplication of equipment to ensure ongoing functionality even in event of asset failure (some loss of capacity may be acceptable).

Consideration		Insignificant / Minor	Moderate	High (Major)
		they have a relatively low criticality. The inspection is relatively low cost, typically undertaken as part of a circuit and serves to minimise the likelihood of minor issues leading to failure, and associated costs, or a situation arising that would reflect adversely on Council if noted by the public but not 'Called in' e,g, graffiti. Such inspections reduce the likelihood of avoidable failures but might not be justifiable if subjected to strict cost/benefit analysis.		
7	Contingency planning and Critical Spares	Generic contingency planning appropriate for wide group of assets and circumstances. Notwithstanding availability of stand-by equipment the time required for sourcing replacement should be assessed and this may require holding of Critical Spares if time running without back-up is considered to be unacceptable.	Planning would reflect the upper end of generic contingency planning. Consideration would be given to the more significant impacts of asset failure and the nature of the resources required to manage the situation and affect a recovery. This may result in the holding of increased inventory and more robust assessment of the compatibility of existing spares versus the installed assets.	Specific contingency planning for identified hazards arising from failure of specific asset. Assumptions (e.g. availability of repair or replacement equipment) checked on a regular basis. Critical spares held and periodically checked for condition and serviceability.
8	Asset Information and location	Attributes of asset may be incomplete or not verified. Updating occurs when opportunity arises.	All attributes of asset are known and verified. Specific repair spares and equipment identified.	All attributes of asset are known and verified. Specific repair spares and equipment identified.

Consideration		Insignificant / Minor	Moderate	High (Major)
		Location generally plotted from asbuilts or 'best fit'. Servicing and repair may require some time to locate asset.	Location of asset will be generally known with consideration given to how difficult it would be to find if required. Connectivity of valves and lines known and verified by testing.	Location of asset will be known and piloted if required to ensure rapid ability to respond. Connectivity of valves and lines known and verified by testing.
9	Performance monitoring	Monitoring by exception i.e. if issue/complaint arises an investigation is undertaken.	Some form of regular inspection/measurement should be in place to detect any decline in performance that would indicate imminent failure.	Regular monitoring of performance as appropriate. Likely to be SCADA connected. Targets and response limits defined using approaches such as Hazard Analysis Critical Control Point (HACCP).
10	Condition monitoring	Assets are inspected as the opportunity arises either from asset modification (e.g. adding a connection) or repair of asset failure.	Periodic inspections are undertaken on the asset, or very similar assets, to determine if deterioration is occurring. Industry knowledge about the likely decline of similar assets may be utilised if it can be established they are in comparable situations. Any asset failure is carefully investigated to determine if asset deterioration was the primary driver.	Techniques are identified that allow the condition of the specific asset to be monitored in relation to likely failure modes. Inspections are scheduled and likely to become more frequent as the asset ages or as deterioration is noted. Analysis is undertaken using the measured deterioration to predict likely asset life.
11	Renewal Planning	These assets are operated on a 'Fix When Fail' basis. Renewal is only considered when there is clear evidence that the failure was generated by the deterioration of the condition of the asset and that this is likely to extend beyond the point of	The key characteristic is that the impacts are considered to be tolerable but not on a regular basis. A single asset failure considered to be directly attributable to condition deterioration, and considered to be indicative of overall asset condition, would	These are assets for which failure Is considered to be unacceptable and to be avoided if it is practical and possible to do so. In the absence of actual failure records for the specific asset it will be necessary

Consideration		Insignificant / Minor	Moderate	High (Major)
		failure to the extent that renewal of the entire asset can be justified rather than a localised repair/renewal. Renewal would also require consideration of the cost benefit of repair versus renewal and whether acceptable LOS have been breached. Multiple failures over several years may be an acceptable outcome albeit this would result in the pipe being closely monitored and included in potential renewal within the near term.	trigger a response to minimise the likelihood of a repeat occurrence within the short to medium term.	to assemble as much information as is relevant to the renewal decision. This will include information on failure of other assets considered to be similar, general industry knowledge, specific testing undertaken on the asset and a rigorous review of the consequences and likelihood of failure. It is unlikely that age by itself will be sufficient unless this is all that is available and there is consensus that failure is not an option.
12	Prioritisation	In the event that budget provisions are constrained these are the assets that would be given the lowest priority for investigations, preventative maintenance and renewals. If resources are constrained these are the projects that should be deferred. Care should however be exercised to ensure that any increasing maintenance costs arising do not exceed the cost associated with renewal. There is also the risk that Council will be perceived to be running its assets down by not progressing routine renewals in	These sit between the Low and High Criticality projects. They would have status above the Low but would be subservient to the High.	These are the highest priority projects to progress both in terms of funding the necessary works in the operational or CAPEX budgets but also in terms of ensuring that works actually progress during the intended planning period. In the event that any asset is identified as having Extreme (High) consequences of failure then a remedial plan to reduce that consequence would have the highest consequence unless it is considered that the associated likelihood of occurrence does not justify such an investment.

Consideration		Insignificant / Minor	Moderate	High (Major)
		response to failures and it is therefore still desirable to be able to maintain an ongoing programme of renewals of assets that have obviously deteriorated to the point where this is required.		

5 ASSET VALUES

5.1 OVERVIEW

The valuation was based on substantially complete asset registers, appropriate replacement costs and useful lives, providing a relative degree of confidence in the valuation data

Asset values are presented in the Activity Management Plans in terms of current replacement value and depreciated replacement value. Depreciated replacement value is the current replacement cost less allowance for physical deterioration and optimisation for obsolescence and relevant surplus capacity.

Depreciation

Depreciation of assets must be charged over their useful life.

- *Depreciated Replacement Cost* is the current replacement cost less allowance for physical deterioration and optimisation for obsolescence and relevant surplus capacity. The *Depreciated Replacement Cost* has been calculated as:

$$\frac{\text{Remaining useful life}}{\text{Total useful life}} \times \text{replacement cost}$$

- *Depreciation* is a measure of the consumption of the economic benefits embodied in an asset. It distributes the cost or value of an asset over its estimated useful life. Straight-line depreciation is used in this valuation;
- *Total Depreciation to Date* is the total amount of the asset's economic benefits consumed since the asset was constructed or installed;
- The *Annual Depreciation* is the amount the asset depreciates in a year. It is defined as the replacement cost minus the residual value divided by the estimated

total useful life for the asset; and

- The *Minimum Remaining Useful Life* is applied to assets which are older than their useful life. It recognises that although an asset is older than its useful life it may still be in service and therefore have some value. Where an asset is older than its standard useful life, the minimum remaining useful life is added to the standard useful life and used in the calculation of the depreciated replacement value.
-

6 ASSET DATA CONFIDENCE

Confidence in asset data is improving at Kaipara District Council with better use of AssetFinda. Confidence ratings are assigned to asset quantities, replacement costs and life expectancy using the following ratings:

Table 8: Asset data confidence ratings

Grade	Label	Description	Accuracy
A	Accurate	Data based on reliable documents	5%
B	Minor inaccuracies	Data based on some supporting documentation	15%
C	Significant data estimated	Data based on local knowledge	30%
D	All data estimated	Data based on best guess of experienced person	40%

7 FINANCIAL AND LIFECYCLE STRATEGY AND MANAGEMENT

7.1 INTRODUCTION

This section identifies Council's strategy and programme for managing, maintaining and renewing assets within its water scheme. The programmes described within this section have been developed to achieve the LOS identified in the Activity Management Plans.

Management of the lifecycle of each asset should optimise performance whilst minimising the total lifecycle costs of both the reticulation and treatment systems. The management process balances the various competing demands and investigates the capacity and performance constraints of each component to establish a regime to achieve the overall objectives.

The objectives of each Lifecycle Management Plan are to:

- Optimise performance
- Minimise total lifecycle costs

Whilst this section notes the generic strategies used by Council, it is supplemented by specific strategies for each scheme detailed in the Activity Management Plans and related scheme or Lifecycle Plans. The lifecycle strategies for each asset component incorporates the following:

- Operations and maintenance strategies to keep the assets operational
- Renewal strategies to replace assets as they reach the end of their useful life
- Development strategies to address growth and demand
- Disposal strategies for when the asset is no longer required
- Work programmes and the associated financial forecasts

7.2 WORK CATEGORIES

Council's lifecycle asset management strategies are divided into the following five work categories:

Asset operations: The active process of utilising an asset which will consume resources such as manpower, energy, chemicals and materials. The Operations category also incorporates funding to address the AMIP actions and the provision of professional services. The AMIP is generally focused on a three year timeframe (covering the lifespan of this AMP) with a nominal allowance for years 4 to 10. As the actions in the programme are addressed, and the AMP reviewed, new initiatives will be identified and added to the programme and budgets will be revised accordingly.

Asset maintenance: The ongoing day-to-day-- work activity required to keep assets serviceable and prevent premature deterioration or failure. Three categories of maintenance are carried out:

- **Unplanned maintenance** – work carried out in response to reported problems or defects;
- **Preventative maintenance** – work additional to scheduled inspections and maintenance identified during inspections as essential to continued operation; and
- **Planned maintenance** – work carried out to a predetermined schedule or programmed as a result of identified needs.

Asset Renewal: Major work that restores an asset to its original capacity or the required condition. This includes both planned and reactive renewals.

New Capital: Creation of new assets (including those created through subdivision and other development) or works which upgrade or improve an existing asset beyond its existing capability or performance in response to changes in supply needs or customer expectations.

Development works falls into two separate categories:

- Council funded
- Developer funded as part of subdivision development or by way of contributions

Asset decommissioning / disposal: Any of the activities associated with the disposal of a decommissioned asset. Assets may become surplus to requirements for any of the following reasons:

- Under-utilisation;
- Obsolescence;
- Provision exceeds required LOS;
- Uneconomic to upgrade or operate;
- Policy change;
- Service provided by other means (e.g. private sector involvement); and
- Potential risk of ownership (financial, environmental, legal, social, vandalism).

The day-to-day operation work categories include:

- Routine work;
- Ordered work;
- Priority work; and
- Emergency work

The relationship of each of these categories to the lifecycle management strategies together with a description of the work involved is shown in Table 4-1.

Table 9: Contract work group relationship with lifecycle management strategies

Contract work category	Description of works	Planned maintenance	Preventative maintenance	Responsive maintenance	Asset renewals reactive
Routine work	Work carried out on cyclical basis.	x			
Ordered work	Specific order issued by Engineer.		x	x	x
Priority work	Urgent routine or ordered work to address operational issues.	x	x	x	x
Emergency work	System malfunction, service disrupted.			x	x

7.3 RENEWALS STRATEGY AND EXPENDITURE FORECAST

Renewal expenditure is major work that does not increase asset design capacity but restores, rehabilitates, replaces or renews an existing asset to its original capacity. Work over and above restoring an asset to original capacity is 'new works' expenditure.

Council reviewed its renewal strategy during 2019 and is moving towards a "just in time" approach; to rehabilitate or replace assets when justified by condition and where there is a significant reduction in performance.

The current state of our asset data affects Council's ability to accurately forecast necessary renewals. The water and wastewater renewal strategies are based on a combination of age and condition where it is known. Other asset renewals are broadly based on asset lives, further modified through local knowledge and experience gained from the maintenance contract staff and local resources on asset performance. Council's current renewal strategy is presented below.

Assets are considered for renewal as they near the end of their effective working life or where the cost of maintenance becomes uneconomical and when the risk of failure of critical assets is sufficiently high.

Council's renewal programme has been developed by:

- Taking asset age, condition and remaining life predictions from the asset database, calculating when the remaining life expires and converting that into a programme of replacements based on replacement costs; and
- Reviewing and justifying the renewals forecasts using the accumulated knowledge and experience of asset operations and AM staff. This incorporates the knowledge gained from tracking asset failures through the customer services system, known location of asset issues, and contractor knowledge.

When justifying renewals the following factors are considered:

- **Asset performance**: Renewal of an asset when it fails to meet the required LOS. The monitoring of asset reliability, capacity and efficiency during planned maintenance inspections and operational activity identifies non-performing assets. Indicators of non-performing assets include repeated and/or premature asset failure, inefficient energy consumption and inappropriate or obsolete components.
- **Risk:** The risk of failure and associated financial and social impact justifies action (e.g. probable extent of damage, safety risk, community disruption).
- **Economics**: It is no longer economic to continue repairing the asset (i.e., the annual cost of repairs exceeds the annualised cost of renewal). An economic consideration is the co-ordination of renewal works with other planned works such as road reconstruction.
- **Efficiency:** New technology and management practices relating to increased efficiencies and savings will be actively researched evaluated and, where applicable, implemented.
- **Levels of service:** Consideration of the adaptative pathways planning outcomes and whether the levels of service are still required by communities.

The renewal programme is reviewed in detail at each Activity Management Plan update (three yearly) and every year the annual renewal programme is reviewed and planned with the input of the maintenance contractor.

If work is deferred for any reason, this work will be re-prioritised alongside the next year's renewal projects and a revised programme established.

Renewal works identified by way of the above renewal strategies may be deferred if the cost is beyond the community's ability to fund it. This situation may arise if higher priority works are required on other infrastructure assets; short term peaks occur in expenditure or if an inadequate rating base exists.

When renewal works are deferred, the impact of the deferral on economic inefficiencies and the scheme's ability to achieve the defined service standards will be assessed. Although the deferral of some renewal works may not impact significantly on the short term operation of assets, repeated deferral will create a liability in the longer term.

7.4 NEW CAPITAL (ASSET CREATION, ACQUISITION, ENHANCEMENT) STRATEGY AND EXPENDITURE FORECAST

New Capital works are planned in response to identified service gaps, growth and demand issues, risk issues and economic considerations.

When evaluating significant new capital proposals, the following issues will be considered:

- The contribution the new or improved assets will make to the current and anticipated future LOS and community outcomes;
- The risks and benefits anticipated to be made from the investment;

- The risks faced by not proceeding with the development works. These could include safety risks, social risks and political risks, as well as sea level rise and natural hazards
- Ability and willingness of the community to fund the works
- Future operating and maintenance cost implications
- The adaptive capacity of the asset and its significance in the long-term resilience of the community. Whether increased capacity of the asset is required to adapt to increased natural hazards and meet required LOS

Significant new capital works will be prioritised and programmed with contributions from:

- Targeted user groups (e.g. special interest groups, industry groups, adjacent residents)
- The general community (through public consultation)
- Council staff and consultants that may be engaged to provide advice to Council
- The LTP/Annual Plan process
- The elected Council (significant proposals are subject to Council decision and available funding)
- Dynamic adaptive pathways planning community decisions

Growth related capital works are undertaken to extend the provision of infrastructure to new properties or to provide additional capacity that is required to service those properties. Growth related works also include moving the location and/or changing the design of the asset to allow for managed retreat and community relocation. It is important to separate out these costs as a portion of them may be recoverable as development contributions and it is also desirable that there is a degree of transparency in relation to what is being contributed by new residents versus existing residents.

LOS capital works are undertaken when the current asset is not able to provide/perform the desired LOS. This may relate to capacity, capability, safety, appearance etcetera. This may be driven by legislation change, resource consent requirements or customer aspiration. Continuing with the existing asset will generate a LOS gap.

7.5 ASSET DECOMMISSIONING AND/OR DISPOSAL STRATEGY AND FINANCIAL FORECAST

Council does not have formal strategy documents relating to asset disposals. When disposal of an asset needs to be considered, Council will address this case by case--.

There are no areas of operation that Council plans to abandon therefore asset disposal is a by-product of renewal or upgrade decisions that involve the replacement of assets, adaptive pathways planning and/or other climate change adaptation responses.

Assets may also become surplus to requirements for any of the following reasons:

- under-utilisation
- obsolescence
- provision exceeds required LOS
- uneconomic to upgrade or operate
- policy change
- service provided by another means (e.g. private sector involvement)
- potential risk of ownership (financial, environmental, legal, social, vandalism)

Depending on the nature and value of the assets they are either:

- made safe and left in place
- removed and disposed to landfill
- removed and sold
- reinstituted and/or repurposed

Council follows a practice of obtaining the best available return from disposal or sale of assets within an infrastructural activity. Any net income is credited to that activity.

7.6 DEPRECIATION (LOSS OF SERVICE POTENTIAL)

Service potential is defined as the economic benefit embodied in assets that over time declines as the assets age and deteriorate. Depreciation is charged annually to recover from the users of services the equivalent annual decline in service potential and renewals are undertaken to restore it. The loss (or gain) in service potential over time can therefore be described as the difference between the annual renewal and depreciation provisions.

If this figure is negative, the renewals undertaken in that year are lower than the financial depreciation. This would be expected when assets are young, but over the life of all assets the accumulated figure would be expected to be close to zero if the assets were being sustained indefinitely. Service potential is restored through renewals and is effectively funded through the annual depreciation charge.

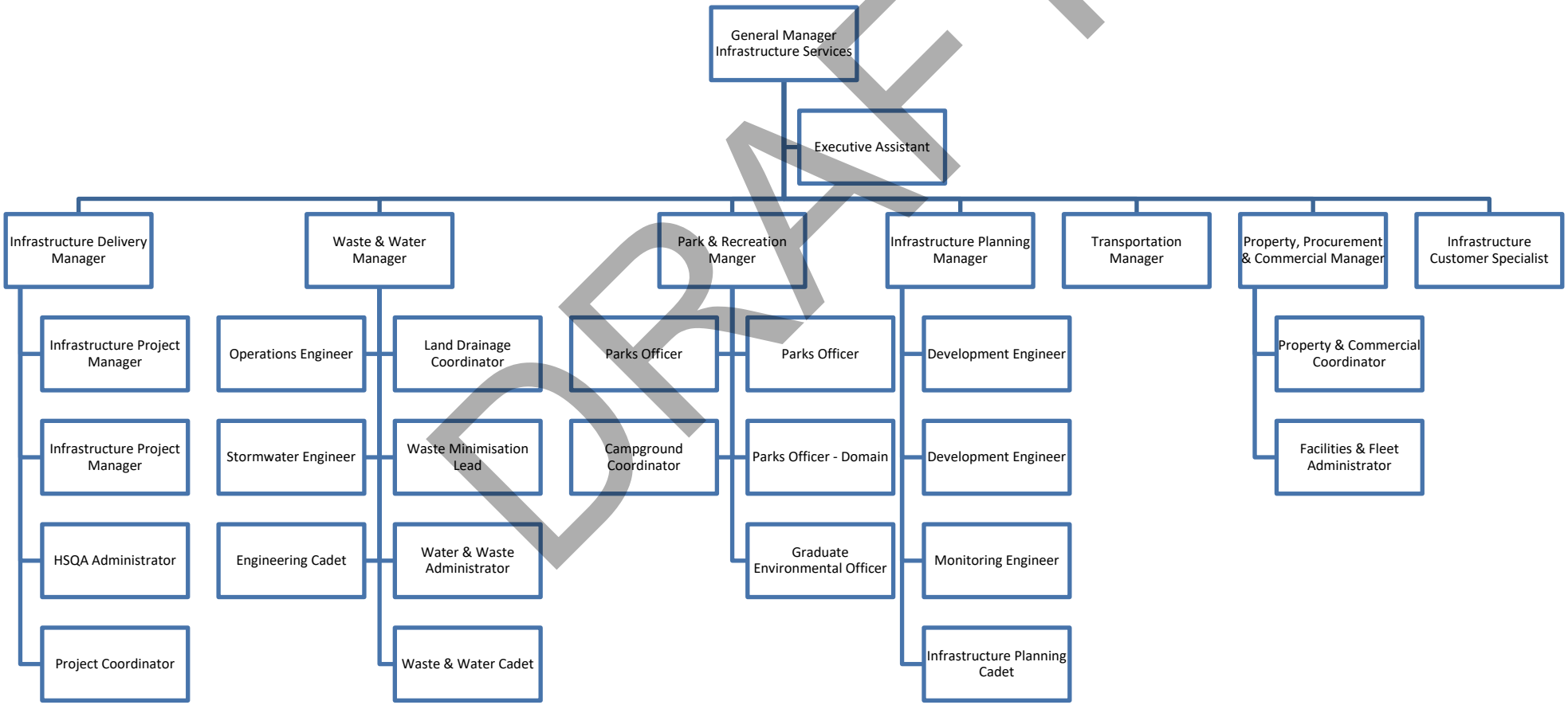
Previously, Kaipara district rates have not included a component for depreciation, meaning users of the asset were not contributing to the asset's upkeep or replacement costs. Council is progressively moving towards a position whereby rates will fund depreciation. By funding the depreciation, a reserve is set up that can be used to fund the renewal expenditure when it is required.

8 SERVICE MANAGEMENT

8.1 ORGANISATION

Figure 10 illustrates the organisation structure utilised to deliver the infrastructure services.

Figure 10 KDC organisational structure



8.2 CONTRACTUAL SETTING

Council has an in-house team of engineers to oversee the operations and management of assets. The 3 waters O&M Contractor commenced in July 2016 and a critical component of asset management (AM) has been added in the O&M Contract, capturing field repair data and cost in Council's AM tool, AssetFinda. Additional services are procured on an as required basis and may include investigation and design services. The various functions are noted in Figure 3 below.

Figure 11 Contractual setting

The Operations Contract delivers the lifecycle management outcomes on a day-to-day basis. The specification of the Operations Contract incorporates the various inspections that monitor asset condition/capacity and provide the basis for programmed maintenance. The frequency of the programmed inspections regime is established in the specification of the Operations Contract. This is supplemented as required by inspections generated from Council's customer Help Desk system.

When programmed inspections are undertaken by the Operations contractor, the act of inspection may initiate a series of responses based on the observations of the contractor. These could include:

- Programmed maintenance tasks, based on usage or time;
- Responsive maintenance based on condition or capacity;
- Planning of a Preventative Maintenance Response based on a prediction of future failure;
- Reporting for upgrading or renewal through to the professional services provider. This occurs when the scope of the intervention is not covered with the Operations Contract and requires consideration of alternatives (upgrades) or prioritisation within existing budgets (renewals);
- Ad-hoc inspections of breaks or infrastructure that allow an opportunity to inspect reticulation when responding to an incident; and
- Collection of data from inspections and interventions for incorporation into Council's GIS system.

The inspections will be recorded in the AssetFinda for Council to review and act accordingly. Any key actions are discussed at monthly contract meetings between Council and the Operations contractor.

These monthly meetings are also supplemented with meetings where the performance of the system is reviewed and a more strategic review of performance is undertaken to aid the Annual Planning process for the next financial year. These meetings will review issues that have arisen over the past period and assess current programmes and budgets. This may lead to the re-evaluation of the following year's Annual Plan or, in extreme cases, initiate a review within the current financial year to address critical infrastructure issues.

8.3 POTENTIAL ALTERNATIVE METHODS OF SERVICE DELIVERY

The geographic location of Kaipara district could lend itself to shared water services with neighbouring Councils including Whangarei District Council (WDC) and Far North District Council (FNDC), or even Council Controlled Organisations such as Watercare Services Ltd in Auckland.

This could potentially reduce costs for both KDC and Kaipara ratepayers by lowering operational and maintenance costs through consolidation of contractor staff between the two or three councils.

Although this setup may present cost saving opportunities for council, the process of amalgamating services regionally between multiple councils may take some time and will likely require central government intervention to progress.

It has been decided to have shared services between the District Councils and the Northland Regional Council for GIS services in the first instance, with further shared services being considered in other areas in the future.

9 ASSET MANAGEMENT SYSTEMS AND PROCESSES

9.1 ASSET MANAGEMENT SYSTEMS

Access to effective information systems is essential for asset managers to help them store and analyse asset information to make good AM decisions. Council uses the support tools listed in Table 10 to manage the infrastructure activities:

Table 10: AM support tools

System name	System purpose	Purpose
MapInfo (GIS)	Asset location	The location of assets are stored within tables and represented spatially via a series of points, lines or regions. Asset information from AssetFinda is exported to MapInfo.
AssetFinda	Asset register	Details on the assets size, material, date of installation and other related information for assets are recorded within AssetFinda.
IntraMaps	Enquiring and viewing asset information	Web -based GIS viewer enabling viewing and enquiry of assets.
NCS (Napier Computer System)	Accounting	Council accounting and financial systems are based on NCS software and GAAP Guidelines.

System name	System purpose	Purpose
KITE (Kaipara Information Technology Environment)	Customer service tracking	To record customer enquiries and to register and track tasks allocated to the Maintenance contractor for follow-up investigation and resolution within appropriate timeframes.
Aquavision	Telemetry	The performance of the wastewater pumping stations is monitored via the Aquavision telemetry system.
Advanced information	Telemetry	The performance of the treatment plants and pumping stations is monitored via the advanced information telemetry system.
SCADA	Telemetry	Newly installed SCADA at various water and wastewater assets helps in daily operations of WTPs and pump stations and also helps in meeting resource consent requirements.

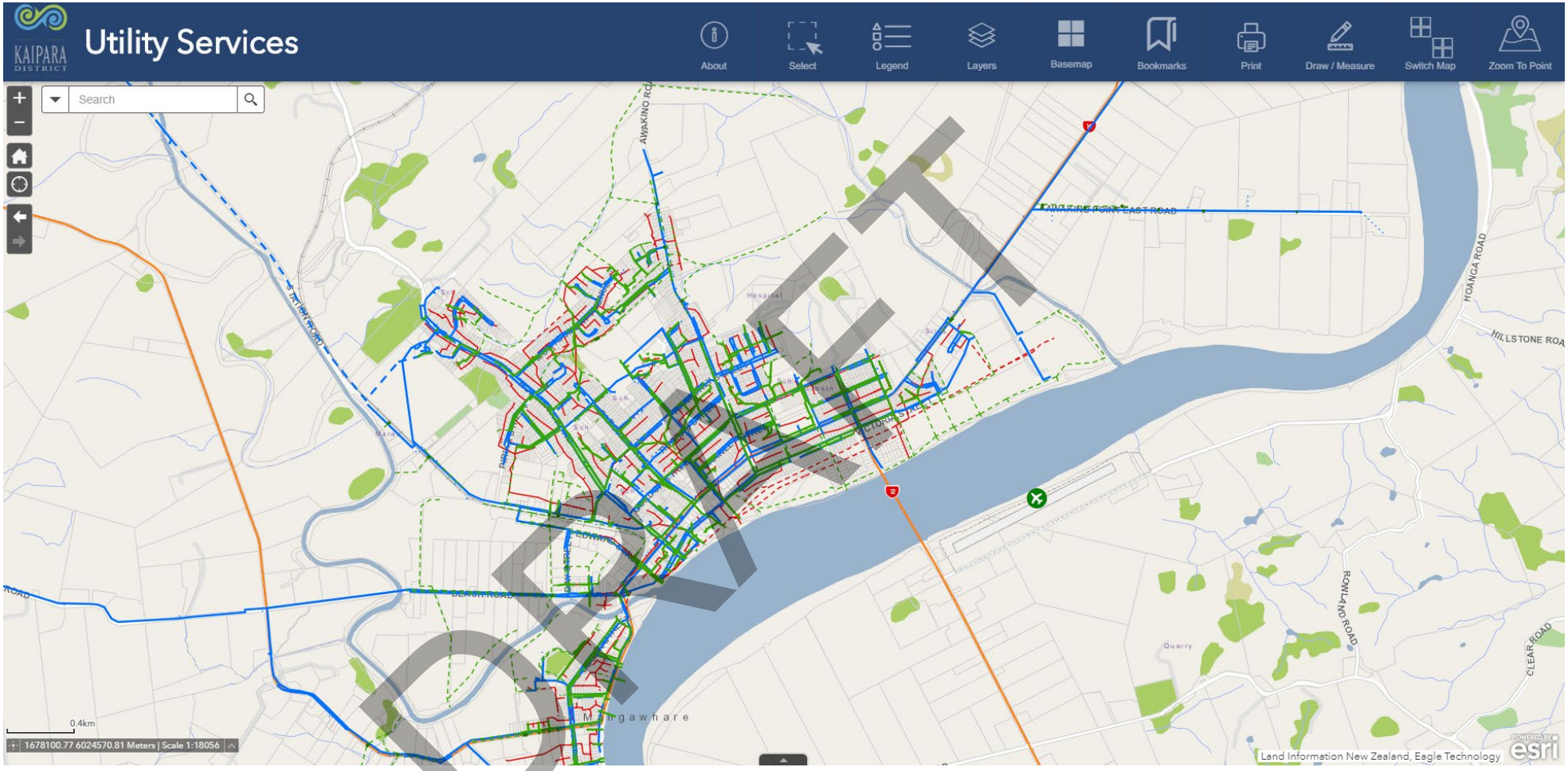
9.2 INTRAMAPS

The ESRI GIS system is the core GIS system used to store and display the spatial data related to Council's assets.

The ESRI system is a shared service with NRC and provides the information supporting the Local Maps system, which is widely used within Council as a user -friendly interface to the GIS asset data, enabling quick access to asset location and asset attribute information.

A screen shot of the Local Maps GIS web viewer is shown in Figure 4 below:

Figure 12 Local Maps screenshot



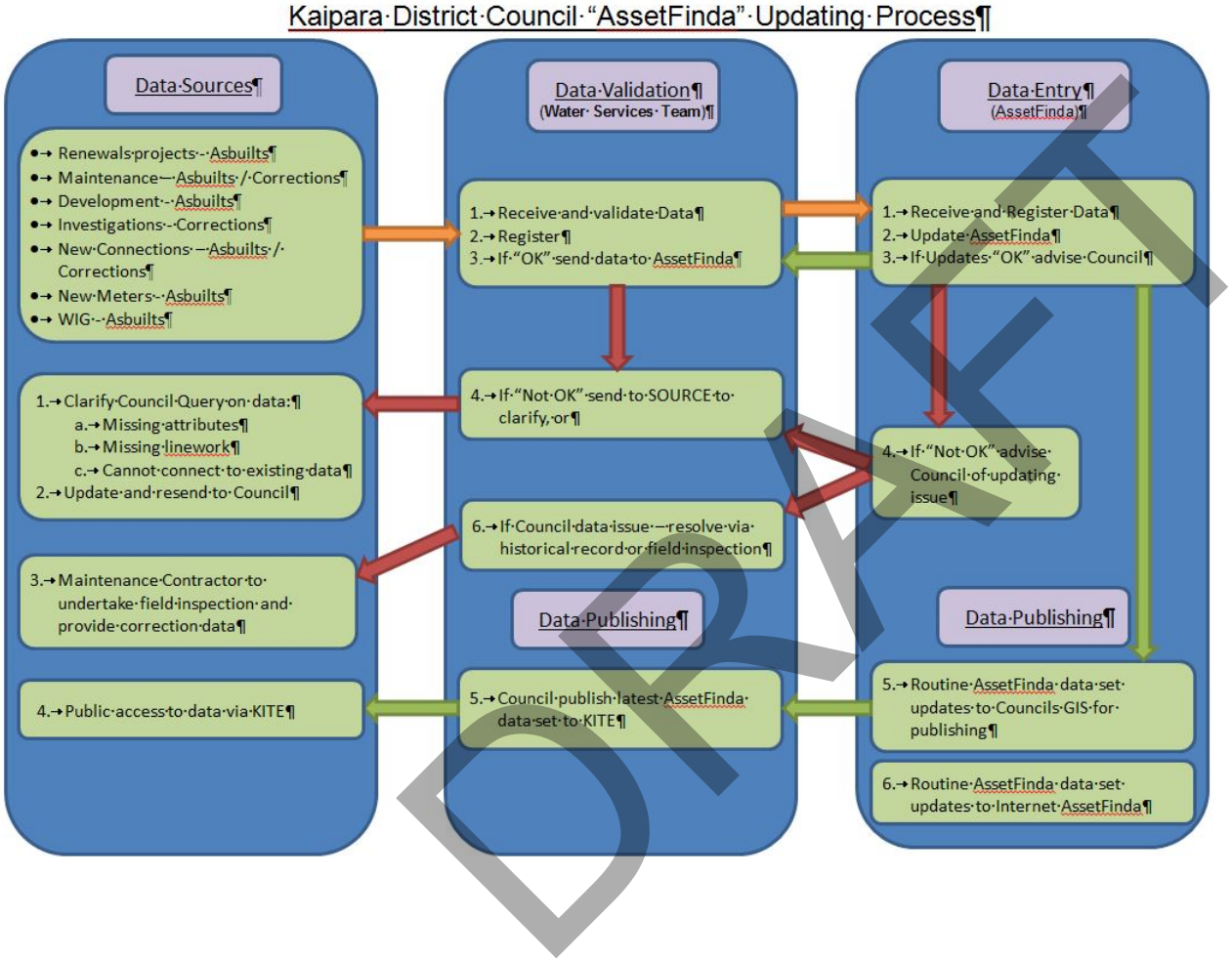
The representation of the assets within this system is believed to be reasonably comprehensive, although gaps and inaccuracies in the data are known to exist.

Improvements to data quality and identification / resolution of data anomalies will be resolved primarily through the maintenance contract and projects, when works are completed on the network.

The ESRI system is externally hosted and is updated as as-built information is received and passed on via the data maintenance process. As-built data is sourced from new development, capital works projects and from the maintenance contractor.

The data maintenance process is represented in Figure 5 below.

Figure 13 Data maintenance process



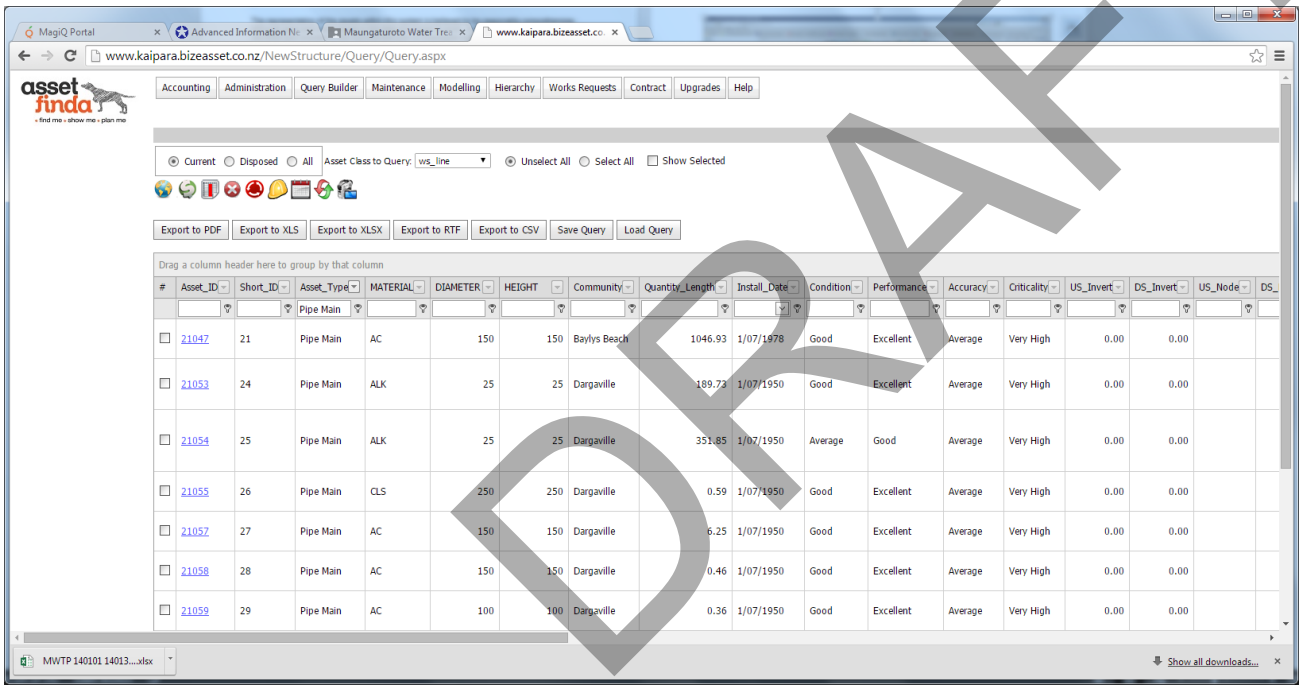
9.3 ASSETFINDA

The AssetFinda system is a spread sheet -based tool used to record asset related information. This currently includes basic assed descriptors including; asset name, size, material, install date, invert levels, condition and performance. The completeness of the data within these fields is highly variable and the accuracy cannot be currently qualified.

The system was recently upgraded to a - web -enabled system that allows greater functionality and visual representation. The system is externally hosted and maintained.

A screenshot of the AssetFinda system is included in Figure 5-4 below:

Figure 14 AssetFinda screenshot



The system has the ability to:

- undertake asset valuations and depreciation calculations for assets
- record various maintenance activities against the asset. This capability has yet to be fully defined and implemented.

There is a need for this system to be further enabled and the supporting processes implemented to ensure appropriate maintenance activity data and condition and performance data collected from the field, can be uploaded in the system and used for monitoring the decline in asset serviceability and determination of timing for asset renewal.

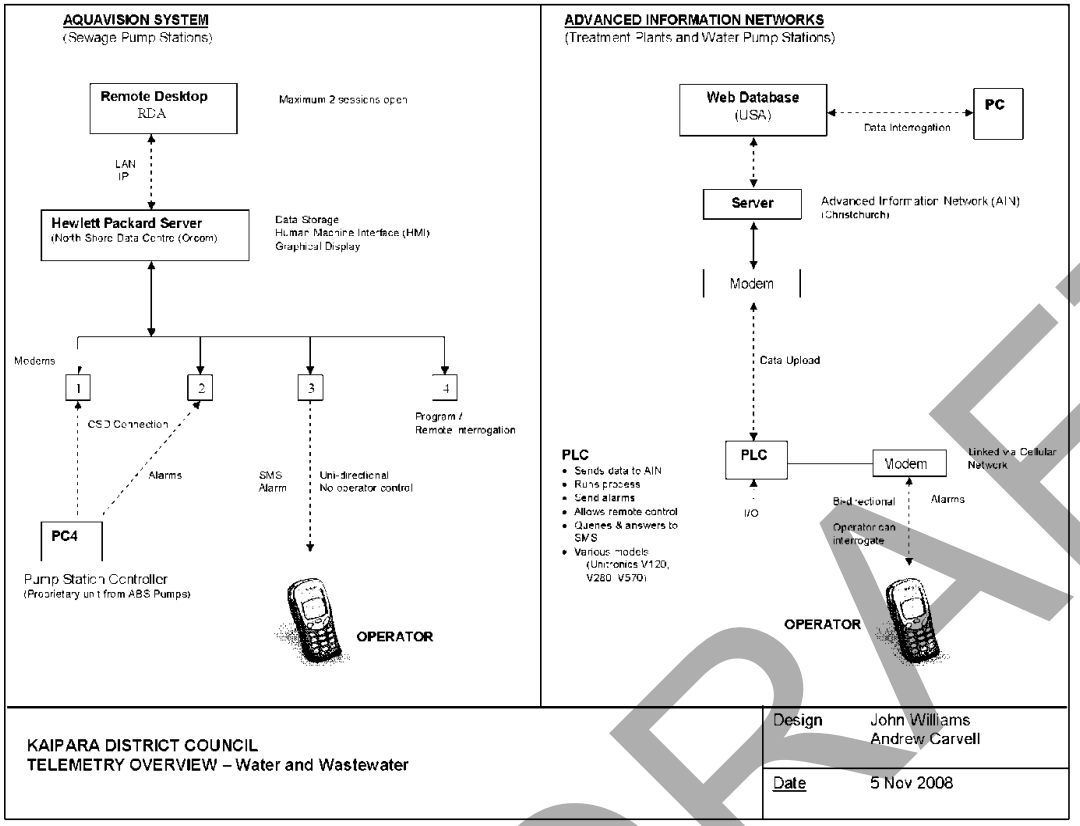
An improvement item has been identified to enable the AssetFinda system to be modified for the recording of this information.

The O & M Contractor collects data related to breaks, repairs and renewals from the field uploads it in AssetFinda to be used for monitoring the decline in asset serviceability and determination of timing for asset renewal.

9.4 TELEMETRY

Council operates a GSM telemetry system that monitors various characteristics (flows, levels, pH, and turbidity) via daily email and SMS texts to operators' mobile phones. An overview of this system is provided in Figure 17 below.

Figure 15 Aquavision telemetry system overview



Data generated through telemetry monitoring is used to demonstrate compliance of treatment plants with DWSNZ, resource consent compliance and to monitor the performance of the treatment systems, reservoir levels and pumping station levels.

The previous telemetry system was managed by an external consultant separate to the maintenance contractor which created ownership and responsibility issues.

The system also had reached the end of its economic life with numerous components not being supported.

10 RISK MANAGEMENT (INCLUDING HEALTH AND SAFETY)

10.1 RISK MANAGEMENT FRAMEWORK

Risk Management is undertaken to identify specific business risks associated with the ownership and management of assets and to determine the direct and indirect costs associated with these risks.

Council is familiar with the risks associated with activities however it has not formalised a risk management strategy. A Criticality Framework was defined in 2016 which utilises slightly different, but nonetheless aligned, definitions to the corporate framework. However, this is only half of the risk equation with the other portion being the LOF. The highest risks are associated with assets that have elevated criticality and a relatively high LOF, typically generated by deterioration of the asset due to aging or environmental attack.

A detailed assessment of the LOF has not been undertaken for each of the assets considered to have Moderate or High criticality and generally these criticalities were assigned to types of assets, or specific circumstances, rather than specific assets.

While a particular type of asset will be assigned a criticality group e.g. pipes under buildings are 'High' the actual risk level of a particular pipe under a building could vary considerably. If the pipe was relatively new, or recently confirmed to be in good condition by CCTV survey, the risk might be appropriately described and managed, as Moderate. Conversely if an asset is approaching the end of its expected working life and/or confirmed to be in poor condition then the Risk would elevate to High and a quite different management response would be required.

Generally, criticality relates to the impact of failure and this does not usually change during the life of the asset i.e. the vertical column that the asset is in does not change. LOF is closely aligned with asset condition and typically the likelihood of failure will increase as the asset ages i.e. the asset will move up the vertical column on the risk matrix to a higher risk level. Therefore, risk management relies on ongoing review of the status of particular assets with the Criticality Framework providing a useful guide to which assets warrant the most attention.

The risks specific to each activity are included in the Activity Management Plans.

10.2 HEALTH AND SAFETY

Council has a Health and Safety (2016) Policy aimed at providing and maintaining a safe and healthy working environment to Council employees, contractors and members of the public. With respect to asset management activities it is particularly important to protect staff, contractors and the public from hazards associated with Council assets. *"At the Kaipara District Council (Council) we will all keep everyone safe and healthy at work, and get better at being safe every year, by doing these things".*

Appendix A: Continuous improvement

Asset Management Improvement Programme (AMIP)

Executive summary

Continuous improvements are necessary as Kaipara District Council (KDC/Council) continues to achieve the appropriate (and desired) level of activity management practice; delivering services in the most sustainable way which meeting the community's needs.

The AMIP has been developed, identifying the highest priority activities to undertake in next 1-3 years to improve level of AM practice as follow:

- Condition Assessment;
- SCADA System;
- Asset Information System (AIMS);
- Hydraulic Modelling;
- Level of Service (LOS);
- Trade Waste Agreements;
- O&M Manual;
- Public Health Risk Management Plan (PHRM); and
- Water and Sanitary Assessment (W&SA).

An AMIP has been prepared to address the critical issues. It has to be acknowledged that, not all issues can be resolved with the available resources and a criticality criterion is applied to identify the most pressing that need attention.

A firm commitment is needed to deliver this program as it would elevate the present "Poor" status of the above activities to a "Good" status in three years' time as demonstrated in the diagram below.

Appendix B: List of acronyms and abbreviations

List of acronyms

The following lists key acronyms and abbreviations used in this document:

Term	Definition
AC	Asbestos concrete (pipe type)
AEP	Annual Exceedance Probability (e.g. 10% is once in 10 years)
AM	Asset Management
AMIP	Asset Management Improvement Plan
AMP	Asset Management Plan
AMS	Asset Management Systems
BERL	Business and Economic Research Limited
CAPEX	Capital expenditure
CDEM	Civil Defence Emergency Management
Council/KDC	Kaipara District Council
CPP	Competitive Pricing Procedures
DP	District Plan
DWSNZ	New Zealand Drinking Water Standards
EW	Earthenware (pipe type)
Fibro	Fibrolite (pipe type)
FNDC	Far North District Council
GAAP	Generally Accepted Accounting Practices
Galv	Galvanised (pipe type)
GEW	Glazed earthenware (pipe type)
GIS	Geographical Information System
HIRDS	High Intensity Rainfall Design System
IIMM	International Infrastructure Management Manual
IPCC	Intergovernmental Panel on Climate Change
KDC/Council	Kaipara District Council
LGA	Local Government Act 2002
KITE	Kaipara Information Technology Environment
LGA	Local Government Act 2002
LIM	Land Information Memoranda
LOF	Likelihood of Failure
LOS	Level of Service
LTP	Long Term Plan
MfE	Ministry for the Environment
NAMS	National Asset Management Steering Group
NCS	Napier Computer System
NES	National Environmental Standards
NIWA	The National Institute of Water and Atmospheric Research
NOVAF	Novaflex (trade name for a pipe type)
NRC	Northland Regional Council
O&M	Operations and Maintenance
ODRC	Optimised Depreciated Replacement Cost
OPEX	Operational expenditure
PHRMP	Public Health Risk Management Plan
PIM	Project Information Memoranda
PVC	Polyvinylchloride (pipe type)
RCRRJ	Reinforced concrete rubber ring joint (pipe type)
RMA	Resource Management Act 1991

Term	Definition
SWCMP	Stormwater Catchment Management Plan
URP	Usual Resident Population
SWCMP	Stormwater Catchment Management Plan
WDC	Whangarei District Council
WIG	Water Infrastructure Group
WSAA	Water Services Association of Australia
WSP	Water Safety Plan
WWTP	Wastewater Treatment Plant
WTP	Water Treatment Plant

KAIPARA DISTRICT COUNCIL

Kaipara District Council

Land Drainage Strategic Activity Management Plan 2021

Summarising the Scheme Plans

2021-2031

May 2020

Status: Draft

Kaipara te Oranganui
KAIPARA DISTRICT
Two Oceans Two Harbours

This document has been prepared by Kaipara District Council.

QUALITY STATEMENT

PROJECT MANAGER		PROJECT TECHNICAL LEAD
CHECKED BY	……/……/……	
REVIEWED BY	……/……/……	
APPROVED FOR ISSUE BY	……/……/……	

42 Hokianga Road, Private Bag 1001
Dargaville 0340, New Zealand
TEL +64 9 439 3123, FAX +64 0 439 6756

REVISION SCHEDULE

Rev No	Date	Description	Signature or typed name (documentation on file).			
			Prepared by	Checked by	Reviewed by	Approved by
A	April 2020	1st Draft				
B						
C						
D						
E						

Contents

1 INTRODUCTION

1.1 LAND DRAINAGE ACTIVITY

We protect people and property from flooding caused by severe weather events. Historically, this work was done through drainage boards. Only the Raupo Drainage District continues under a similar model. Responsibilities are mixed between Kaipara District Council and Northland Regional Council (NRC). We chose to continue with drainage districts in some areas in addition to Raupo and areas managed by NRC.

The Raupo and Northern area land drainage networks represents a major investment by the community and is of vital importance to the quality of life of the district's residents and the sustainable management of both tidal and flood waters. The community expectation that this investment in land drainage assets is secure and managed in a way which maximises return in terms of outputs and costs as reflected in the overall objective of AM, which is:

'To meet the required level of service in the most cost effective way through the creation, operation, maintenance, renewal and disposal of assets to provide for existing and future customers.'.

The goals of the land drainage networks are to achieve the following in a cost effective manner:

- Protect land from tidal waters
- Control surface water during flooding
- Divert run-off from inland hills

In order to do this a number of drains, floodgates, stopbanks and a storm pump have been constructed and integrated with naturally formed channels to achieve these goals. These assets are overseen by a self managed; drainage board comprised of representatives of the district who are assisted by Council staff and a drainage co ordinator.

A number of high risks have been associated with the land drainage network, these include but are not limited to:

- Stopbanks being overtopped at their current height due to climate change and predicted sea level rise;
- Sea level rise results in land drainage assets inability to drain sufficiently at low tide; and
- Changes in regulations inhibit Council's ability to manage and control undesirable vegetation.

1.2 WHAT WE DO

We are conscious that we need to keep climate change in mind as we maintain and develop our flood protection and control activities. Climate change means more flooding from extreme weather events and rises in sea levels, affecting not just coastal areas but also our rivers and other waterways. The results of heavy rains can put people, property, infrastructure and roads at risk. Our assets are designed for the long term, and climate change means we will have to consider how best to manage our needs against costs.

Flood protection and control works covering flood control schemes, river alignment control and land drainage. We co-ordinate land drainage work in 30 drainage districts of various sizes. These include Kaihu Valley and Mangatara Drainage Districts, both of which discharge into the Kaihu River which is administered by NRC. The largest district is the Raupo Drainage District where we provide administrative and technical support;

We have reviewed the 2017 NRC Draft Regional Policy Statement and will assess how the draft coastal flood maps will affect Kaipara district;

We maintain the current capacity of the land drainage network with:

- weed spraying
- drain clearance
- floodgate and outlet maintenance in all districts
- floodgate and stopbank maintenance in Raupo
- discretionary stopbank maintenance for the remaining districts
- Provide flood protection through various drainage system stopbanks and floodgates
- Monitor rivers for tidal and stormwater levels during weather events and warn of potential flooding
- Drains have the capacity so floodwater recedes within three tidal cycles, the design Average Recurrence Interval (ARI) for rural areas is 10%
- Stopbanks are 2.6m above Mean Sea Level, leaving 0.5m above extreme high tide for Raupo
- Raupo Drainage Committee, a formal committee of this Council, is in place to perform delegated functions
- All flood protection activities outside Raupo are administered by informal community committees supported, where practical, by our Land Drainage Co-ordinator. Landowners are responsible for maintaining privately-owned stopbanks

- NRC is responsible for catchment management

1.3 BENEFITS TO THE COMMUNITY

- Our flood protection and control works are designed to protect people, property and infrastructure from flooding and tidal flows
- Protecting productive land and infrastructure are critical to our economic well being
- We protect and enhance our natural assets and open spaces

1.4 POTENTIAL NEGATIVE EFFECTS

- Lack of drainage networks or maintenance on the existing network could result in increased flooding of farming and cropping communities in lowlying land near rivers, streams and canals
- The frequency of significant storm events and rainfall intensities are expected to increase along with sea levels in the future

1.5 PURPOSE OF PLAN

The purpose of this Activity Management Plan (AMP) is to summarise in one place Kaipara District Council's (Council) strategic and long term management approach for the provision and maintenance of its wastewater assets.

The AMP provides discussion of the key elements affecting management of Council's land drainage assets, including the legislative framework, links to community outcomes, policies and strategy, the proposed Levels of Service (LOS) and performance measures and demand, environmental and service management.

This AMP covers a period of ten years commencing 01 July 2021. All expenditure is based on unit costs as at 30 June 2019.

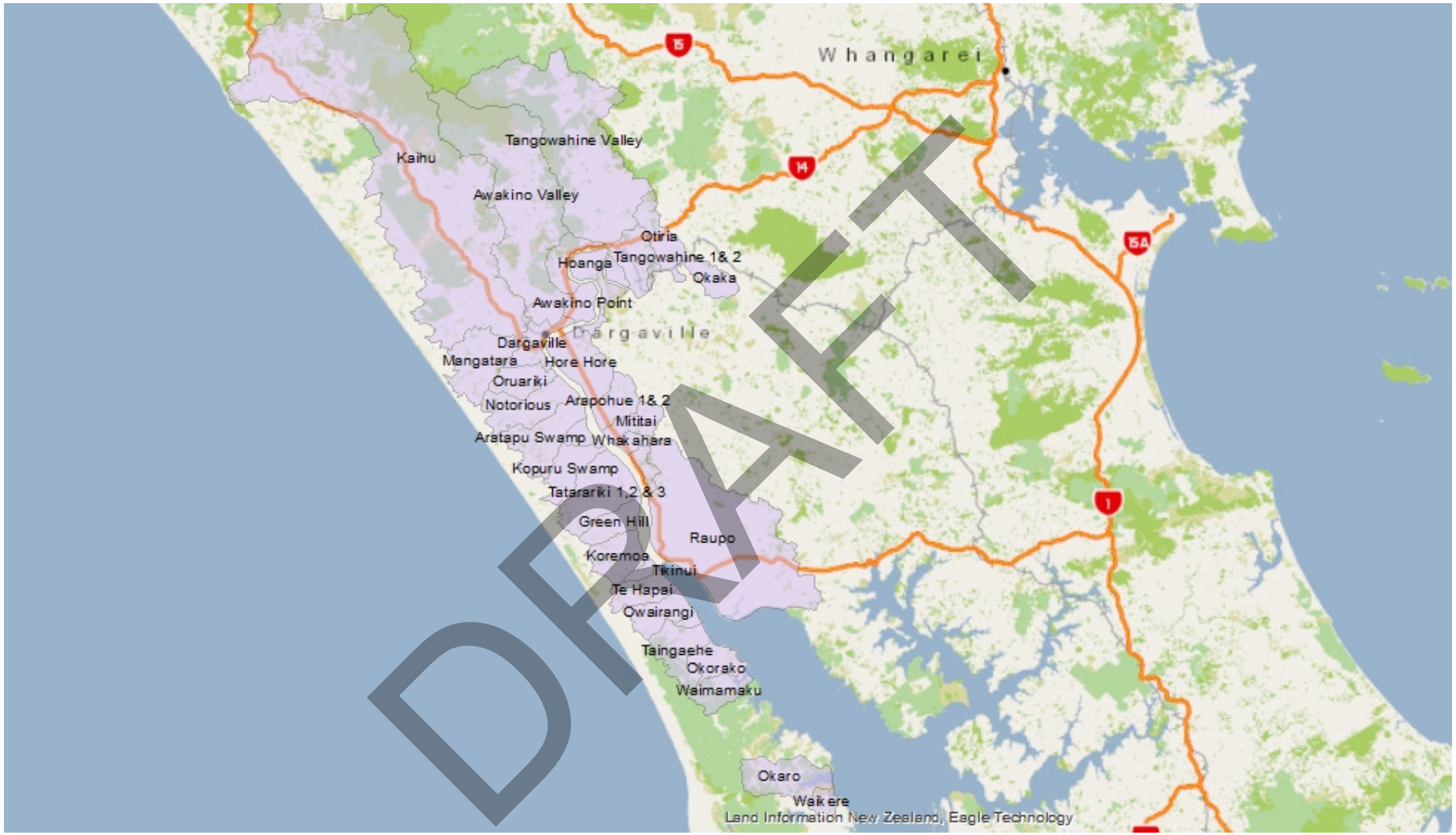
Council's LTP identifies Council's purpose in relation to land drainage as "To minimise the risks and impacts of flooding attributed to inadequate land drainage" and "to enhance the sustainability of agriculture through cost-effective maintenance and enhancement of drainage networks."

In order to achieve this purpose Council and the Raupo Drainage Board, through professional and physical works contracts, undertake the following:

- Asset management;
- Floodgate maintenance;
- Drain spraying and machine cleaning;
- Network operations and maintenance;
- Capital and refurbishment programme; and
- Consent monitoring.

1.6 DISTRICTS OVERVIEW

Land drainage districts



Okaka , Okorako, Taingehe and Waimamuku are not currently operational Land Drainage districts.

District	Summary	

Raupo		

1.7 KEY ISSUES

The key issues Council are currently managing as part of the land drainage activity are summarised in **Error! Reference source not found.** below. These issues are further addressed the Assets section of this AMP.

Table 1: Key Issues for Council's land drainage activities

2 THE ASSETS

Council operates two land drainage schemes. The details of those schemes can be found in the Raupo Land Drainage Scheme Plan and the Northern Area Scheme Plan.

The values of the assets are shown in the table below:

	Optimised Replacement Cost	Optimised Depreciated Replacement Cost	Annual Depreciation
Raupo	$11,591,395	$10,504,297	$63,083
Other Assets	$6,147,200	$5,060,283	$32,196
Total	**$17,738,596**	**$15,564,580**	**$95,279**

2.1 CRITICAL ASSETS

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

Table 2: Critical assets in network

Moderate Criticality		
Reticulation	Large culverts ≥ 900mm	• Consider pipes ≥ 900mm to be Moderate due to consequences of ground stability and/or flows taking alternative path in event of pipe failure. • Capacity of these pipes is adversely impacted by high river levels associated with major rain events and/or spring tides
Reticulation	Inlets and Outlets	• There are 3 potential issues with these grates i.e. Potential for blockages of inlet grates with debris; Potential for children to enter the drains if the grate is not in place; and Significant scouring of the beach leading to undermining of the pipe.
Reticulation	Infrastructure in lowest parts of the district	• As Identified by Flood susceptibility maps (NRC or KDC as appropriate) • Minimum of Moderate criticality
High Criticality		
Reticulation	Pipes running under buildings	• High (Major)
Flood protection	Stop banks on Wairoa (east and west), Awakino and Kaihu Rivers	• High (Extreme)
Flood protection	Flood gates	• High (Extreme)

3 DEMAND MANAGEMENT

3.1 COUNCIL'S APPROACH TO DEMAND MANAGEMENT

This section of the AMP analyses factors affecting demand including population growth and social changes. The impact of these trends is examined and demand management strategies are recommended to address demand and ensure:

- Existing assets' performance and utilisation are optimised
- The need for new assets is reduced or deferred
- Council's strategic objectives are met
- Provision of a more sustainable service
- Council is able to respond to customer needs

3.2 GROWTH AND DEMAND CHANGE

The process of demand management provides Council with a high level tool to identify where infrastructure growth is likely to occur over a period of time. It enables a natural structured growth of the public system to occur. Without this type of assessment, ad-hoc development of localised stormwater systems occurs and can leave a burdensome, somewhat redundant legacy for Council to operate and maintain.

Demand management strategies provide alternatives to the creation of new assets in order to meet demand and look at ways of modifying customer demands so that the utilisation of existing assets is maximised and the need for new assets is deferred or reduced.

Precise demand forecasting for the management of land drainage infrastructure is a difficult undertaking. This AMP has largely been based on historical data and growth predictions provided by Statistics New Zealand in order to identify potential future demand on the public stormwater infrastructure and though this may not specifically affect the RLD district, growth across the district and how it impacts on asset investment and the likely changes to the current LOS in regards to stormwater management are directly relatable.

The impact of growth is currently managed in multiple ways:

Regulatory control

Integrating the stormwater management objectives in all new projects from initial planning and design stages. This is the basic approach of the Engineering Standards 2011.

District Plan (DP)

The DP is the legal framework that is used for land use planning.

Catchment Management Planning

Catchment management planning is a key tool for facilitating the integrated approach to stormwater management to achieve the desired environmental outcomes. The draft SWCMPs developed to date are planned to be updated during the 2018/2021 period then formally adopted by Council, the RLD district will need to follow this approach to enable KDC and the Committee to better understand the drivers and effects climate change will have and how this impacts the current system. This will allow for better planning and implementation of flood protection methodologies.

Education

Education is an important tool for providing property owners with an understanding of their role and responsibility for managing their private systems. Environmental awareness is increasing as the community realises the need to protect the environment, however at the same time property owners expect to be able to develop and work their property without restriction. Council has undertaken limited education to date but it is a demand management mechanism that can be considered in the future and may be added to the AMIP. Education promotes environmental awareness and the effects of activities such as intensive land applications, where contaminants may enter the stormwater system and thus the receiving environment.

Table 4.1: Examples of land drainage demand management strategies

Demand component	Land drainage examples
Operation: Looks at LOS provided by the infrastructure and the application of best practice options for sustainable long term management.	• Maintaining the existing land drainage network through the application of efficient operations and maintenance will ensure that the current LoS is met whilst also identifying and highlighting any issues across the district, the better the network is maintained the more efficient it is; and

Demand component	Land drainage examples
	• Integration of national and international standards for land drainage design into Engineering Standards documents.
Design: Constantly changing standards allow for better land drainage design and management, Low Impact Design (LID) and treatment at source.	• Application of low impact design as per existing standards and as technology is constantly improving allow for better stormwater management, reduced peak runoff and better water quality; and • Integration of improved technology and increased awareness of changes to stormwater management internationally, attendance at conferences and allowing consultants to raise any improvements they feel will better suit environmental needs, will ensure that the best solution to meet the required land drainage LOS will be constructed whilst also maintaining focus on environmental improvements and water quality.
Incentives: Encourage the application of LID throughout the community, soakage, rain gardens and other source treatment options.	• Community education and interaction to promote the use of flow calming, detention/attenuation ponds and other source treatment options, this will enable the mitigation of damage from peak flows and to allow for water quality treatment prior to the discharge to the receiving environments
Community education/interaction: Develop partnerships with the communities in the district.	• Production of Engineering Standards to aid development in the selection of the best practicable option for land drainage management; and • Working with schools and engaging the community at an earlier level to promote water health.
Connection denial: Regulation of connections to the public system to promote long term stability.	• Where development occurs within the urban area of the land drainage district, or where substantial increases in growth are identified Council may consider the option to force developers to treat and attenuate stormwater runoff from the development within their site boundaries this will help mitigate any large flows directly impacting on the current land drainage network.

3.3 INCREASE IN LAND DRAINAGE SERVICES

With the proposed changes to the climate and sea level there is already growing concern regarding the current LOS and how this will be affected. It has already been proposed that a catchment wide hydraulic assessment will need to be conducted and a SWCMP created to identify the changes in rainfall and expected runoff, and how this will be affected by sea level rise and what the repercussions to the current RLD district may be.

3.4 TECHNOLOGICAL CHANGE

Historically the methodology for dealing with floodwaters was to collect it in large open drains and canals and discharge this through floodgates as soon as possible to remove this from the workable land. It is also noted that the current drainage district is situated in such a way that the time of concentration allows for large portions of floodwaters to be removed through the floodgates between tides before larger flows from the rear of the catchment make it to these points. This allows for the stakeholders properties to remain mainly free of floodwaters whilst the floodwaters flow in a controlled manner into the receiving environment. Discharges were made direct to the receiving environment with little regard to the potential contaminants that they may contain, and the effects they could have on the stability and functioning of the ecosystems.

Over the past two decades there has been a philosophical shift in this principle as new technologies have been developed to promote LID in the management of floodwater. This involves implementing solutions to mimic the natural environment prior to development, and managing the impacts on the receiving environments.

Such advancements in floodwater management include the application of a treatment train approach i.e. the use of two or more treatment methods in series to provide more effective contaminant removal, such as the use of ground soakage to maximise groundwater recharge and riparian planting around watercourses.

This shift in philosophy is supported by Council and guidance for its application is provided in the Engineering Standards and supporting documentation.

Technological advances in stormwater management are leading to more economically feasible devices entering the mainstream market and becoming more widely used. Stream restoration and riparian planting is replacing the standard lined channel, whilst the general treatment train approach to water quality is being applied to greatly improve discharge quality to lessen the effect on the receiving environment.

Council considers the use of wetlands and detention basins for stormwater management are integral parts to mimicking the natural flow regime in the receiving environment, whilst providing good levels of treatment.

Council is committed to working with NRC to implement new technology for stormwater management throughout the Kaipara district. A constant awareness of technology changes is necessary to most effectively predict future trends and their impact on the utility infrastructure assets.

Although as stated above there have been advances in stormwater management and how this can be implemented in either a limited capacity or on a larger grandiose scale, the terminology and engineering behind these practical solutions still hold the same for land drainage as it is stormwater that we are trying to treat and remove from the current network. Whilst there will still be a greater reliance on large canals and waterways to remove the peak flows, riparian planting, detention ponds and other source treatment options will still remain options when trying to treat for water quality and design.

This can be achieved through Council staff attending conferences, seminars and presentations along with seeking advice from professional advisors.

3.5 Water quality

Environmental considerations are an ever-changing issue. As such, there is a requirement for Council to provide the best service it can with the most up-to-date information.

With climate change and predicted sea level rise KDC will need to alter its focus and the considerations around flood levels, stormwater discharge and consented discharge limits to match the requirements from NRC, the change in public expectations and the altering natural environment.

Public perception of the impact of stormwater on the natural environment has altered noticeably over the last decade and has turned towards treating stormwater at the source and maintaining the quality of the harbours and waterways. The quality of stormwater runoff therefore has a significant impact on the quality of the receiving environment, being streams and rivers.

There is a growing awareness of the environmental issues related to the quality of stormwater runoff on the receiving environments of our streams, rivers and groundwater and its impacts on our cultural, social and economic well-being.

Council, in conjunction with NRC, and communities are dedicated to protecting receiving environments, to protect it for future generations and to improve on the existing state. This is achieved through:

- Management of silt runoff from new development earthwork areas (including silt pond requirements for developers);
- Management of point source contamination risks (through the current Engineering Standards and community education); and
- Monitoring the receiving environments.

It is likely that as time progresses and more knowledge is gained from monitoring programmes about the effects of contaminants on the receiving environments that more stringent conditions will be applied on resource consents granted by NRC, including, but not limited to:

- Targeted contaminant removal (for example reduction in zinc loads);
- Increased overall treatment efficiency of stormwater management devices; and
- Greater application of LID in the overall stormwater management on a catchment basis.

3.6 CHANGES IN WEATHER PATTERN

The MfE advises that climate scientists estimate Northland's temperature could increase 0.9°C by 2040, and 2.1°C by 2090[1]. This compares to a temperature increase in New Zealand during last century of about 0.7°C[2]. To put this in perspective, the 1997/1998 summer, which was particularly long, hot and dry, was only about 0.9°C above New Zealand's average for the 1990s. Northland is expected to experience more frequent and intense heavy rainfall events which will increase the risk of flooding and could be four times as frequent by 2090.

Some of the potential impacts of climate change of stormwater and associated public infrastructure could include:

- Increased flood frequency resulting from more intense rainfall;
- Increased number of systems that do not have an appropriate LOS capacity, due to increased overall rainfall and raised groundwater tables
- Increased coastal flooding through higher tide and surge levels;
- Increased flooding due to higher tides and rainfall breaching existing stop banks;
- Increased flooding due to higher **low** tides retaining stormwater and inundating an existing system by removing the ability for it to drain completely;
- Potential overwhelming of existing treatment devices leading to increased contaminant loadings in the receiving environment; and
- Increased coastal and fluvial erosion resulting from increased tide variations and discharges from the stormwater system.

NRC monitors rainfall at five sites throughout the Kaipara district to understand the long term effects of climate change on rainfall patterns. In addition The National Institute of Water and Atmospheric Research (NIWA) maintains rainfall monitoring through an automatic station in Dargaville.

Although the definitive effects of climate change are not known guidance is provided in a number of publications from a number of organisations. The Intergovernmental Panel on Climate Change (IPCC) releases guidance at regular intervals considering global impacts of climate change. MfE distils the information from the IPCC publication into "*Climate*

[1] Ministry for the Environment, Climate Change Projections for the Northland Region. 2 August 2012: http://www.mfe.govt.nz/issues/climate/about/climate-change-affectregions/northland.html
[2] NIWA, Past Climate Variations over New Zealand: http://www.niwa.co.nz/our-science/climate/information-and-resources/clivar/pastclimate

change effects and impacts assessment: A guidance manual for Local Government in New Zealand" and the summary report "*Preparing for Climate Change: A Guide for Local Government*" which provides New Zealand specific climate change data.

Table 4 below is an extract from the MfE publication and highlights the potential effects of climate change on stormwater networks.

Table 3: Effects of climate change on land drainage networks

Resource	Key climate influences	Impacts of climate change
• Stormwater reticulation	• Increased rainfall	• Increased frequency and/or volume of system flooding; • Increased peak flows in streams and related erosion; • Groundwater level changes; and • Changing flood plains and greater likelihood of damage to properties and infrastructure.
• Rivers	• Increased rainfall	• River flows likely to, on average, increase in the west and decrease in the east of New Zealand. • More intense precipitation events would increase flooding (by 2070 this could range from no change, up to a fourfold increase in the frequency of heavy rainfall events); • Less water for irrigation in northern and eastern areas; and • Increased problems with water quality.
• Drainage	• Increased rainfall	• Increased frequency of intense rainfall events could occur throughout New Zealand, which would lead to increased surface flooding and stormwater flows, and increased frequency of groundwater level changes.
• Coastal areas	Sea level rise; Storm frequency and intensity; Wave climate; and Sediment supply.	• Effects of sea level rise and other changes will vary regionally and locally, this will have an as yet unquantifiable effect on existing land drainage and flood protection systems; and

Resource	Key climate influences	Impacts of climate change
		• Coastal erosion is likely to be accelerated in areas it is already occurring. Erosion may become a problem over time in coastal areas that are presently either stable or are advancing.

The development of Council's Engineering Standards 2011 provides design rainfall for Dargaville, Tinopai, Maungaturoto and Mangawhai areas of the district, being the main population centres. The rainfall depths provided in the Engineering Standards have been estimated up to the 100 year event; 72 hour duration and include adjustment for 95% confidence.

For developments in other areas the current Engineering Standards acknowledges NIWA's High Intensity Rainfall Design System (HIRDS) version 2, which outlines rainfall depths + 1.65 standard error + 17% climate change allowance.

3.7 SUMMARY OF CHANGES

The table below shows a summary of how the above issues will impact on the management of land drainage assets.

Table 4: Summary of issues affecting assets

Issues	Impact on Land Drainage assets
Population growth	Potential growth in areas currently under the protection of land drainage schemes, his would require a greater investment in protection for these properties for the safety of the communities.
Technical change	New technologies for flood gates for the protection of at risk areas and the environment will be able to allow council and the land drainage districts to be able to react to the effects of climate change and sea level rise.
Economic trends	Potential high impact for Drainage districts around high value land use and protection.
Legislative changes	Unknown impact. Resource consent conditions could have a significant impact, particularly where land drainage districts drain to the receiving environment and the new FPS for fresh water.
Customer expectations	As growth occurs in the district there are different ideas about what councils levels of protection for the communities around flood protection over land drainage.
Environmental considerations	Potentially high impact in communities behind land drainage protection such as Ruawai.

Issues	Impact on Land Drainage assets
Weather changes	An increasingly important impact. As weather changes are likely to be gradual, in terms of medium term asset management planning timeframes, these effects are raised here and need to be reviewed as the SAMPs are developed in the future. Significant impacts will be closely aligned with sea level rise and climate change.

4 PROPOSED LOS AND PERFORMANCE MEASURES

4.1 COMMUNITY ENGAGEMENT

Council consults with the Drainage Committees in the first instance who represent the community. If required Council will engage the public to gain an understanding of customer expectations and preferences. This enables Council to provide a LOS that better meets the community needs. Council's knowledge of customer expectations and preferences is based on:

- Drainage Committee meetings;
- Feedback from public surveys;
- Public meetings;
- Feedback from elected members;
- Analysis of customer service requests and complaints; and
- Consultation via the Annual Plan and LTP process.

Council undertakes customer surveys on a regular basis, using the National Research Bureau Ltd. These customer perception surveys assess levels of satisfaction with key services, including stormwater, and the willingness across communities to pay for service improvements.

Summary of key survey results from 2016 regarding the stormwater service:

- 81% of residents that are provided with a piped stormwater system responded with being very/fairly satisfied with the stormwater service (82% in 2014); and
- 18% were not very satisfied. (19% in 2012).

Community satisfaction is a key performance measure of the stormwater service.

4.2 THE LEVEL OF SERVICE (LOS)

- Drains will have the capacity to enable floodwater to recede within three tidal cycles, design Average Recurrence Interval (ARI) for rural areas is 10%;
- Stop banks are 2.6m above Mean Sea Level leaving 0.5m above extreme high tide for the Raupo area;
- Raupo Drainage Committee, a formal committee of Council, is in place to perform delegated functions;
- All flood protection activities outside of RDD are administered by informal community committees supported, where practical, by Council's Land Drainage Co-ordinator, in accordance with each Committee's request for assistance. Maintenance on privately owned stopbanks is undertaken by the landowner; and
- NRC is responsible for catchment management.

The LOS reported in Table 2 12 are customer focused and are included in the 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 2016/2017 and there is no change intended over the term of the LTP commencing in 2018.

Table 2-1: LOS and performance measures

Measuring performance				
What we measure	LTP Year 1 Target 2021/2022	LTP Year 2 Target 2022/2023	LTP Year 3 Target 2023/2024	LTP Year 4-10 Target 2025/2031
The number of flood events not contained by the drainage schemes up to a 1:5 year flood.	0			
Service requests for additional cleaning of drains i.e. missed by the monitoring and maintenance programmes.	< 5 service requests per year			

Measuring performance				
What we measure	LTP Year 1 Target 2021/2022	LTP Year 2 Target 2022/2023	LTP Year 3 Target 2023/2024	LTP Year 4-10 Target 2025/2031
Biannual inspection of our drainage network to ensure it can contain a 1:5-year flood.	2 inspections per year			
Targeted maintenance of the stop bank system in the Raupo Drainage District to prevent tidal flows from inundating private property during high tide and/or when the river is in flood.	Minimum yearly inspections and targeted maintenance completed			

4.3 SYSTEM ADEQUACY

This largely reflects the capacity of the system to capture and convey the flows arising from extreme weather events without damage occurring to habitable floors or arable land. This is not well defined across the district and it is intended to undertake a number of SWCMP studies in areas subject to growth or with known historical issues. This will identify capacity shortfalls, works that should be undertaken and also- minimum floor levels that should be adopted for any new construction inside the land drainage boundaries. The SWCMPs will provide a level of clarity that the desired level of capacity can be achieved for each of the subject areas that is not currently available and will provide much needed guidance on the effects of proposed sea level and climate changes. Areas that have not been studied and/or upgraded will remain at the LOS that has been historically provided.

There are two primary elements to the discharge of floodwater and KDC has limited capability to influence either at this time:

Water quality – Floodwater discharges, collects and conveys whatever contaminants are on the ground surface into the receiving waterways. This varies from grow contaminants such as rubbish, drink bottles etcetera, biological contaminants such as e-coli, chemical contaminants such as zinc, fertilisers etcetera and particle contaminants such as clay.

There is a range of technologies available to reduce these contaminants including chemical treatment, physical filters and settling ponds together with natural processes that focus on reducing flow velocities, maintaining groundcover and encouraging natural filtration by directing flow through planted areas. These tend to work best with less intense storms when volumes and flow rates are lower.

KDC has limited resourcing in this area with the main direction coming from the land drainage committee itself, and also with the main focus being on removing flood waters as soon as possible and not relying on retention/detention structures within the existing flow paths. There are currently two detention ponds at the south end of the drainage district which perform satisfactorily in providing attenuation during large storm events, there is no requirement or focus on upgrading these at this date.

While KDC supports a greater focus on water quality it can only be implemented where practicable and is not always possible in every situation, the members and stakeholders of the RDD understand and promote water quality though temper this with the requirement to allow floodwaters unfettered access to the discharge points to maintain the current LOS to the greater community.

Flow rates – A discharge consent could specify flow rates for a particular return period storm but KDC has very limited capacity to influence this.

4.4 DESIGN PARAMETERS

Design parameters for all new land drainage assets are not well defined. Documentation on the history of land drainage in the RLD district identifies design capacities for drains and canals, but does not specify standards of construction for any assets.

As a result, the installation of new culverts has varied, with undersized and oversized culverts been installed.

The Drainage Committees, together with Council, needs to review what knowledge they have regarding design standards and document a definitive standard for the design and construction of land drainage assets.

Future standards could either be included in Council's existing engineering design standards or separately in a specific land drainage standard for design and construction

5 MAINTENANCE AND OPERATING STRATEGY

5.1 MAINTENANCE AND OPERATIONS

Table 2: : Maintenance strategies for land drainage assets

Asset/failure mode	Action	Key service criteria	Impact
General maintenance			
• All assets	• Maintain assets in a manner that minimises the long term overall total cost while ensuring efficient day-to-day- management.	• Cost/affordability	• Low/Medium – increased costs and risk of failure.
Unplanned maintenance			
• All assets • Disaster i.e. cyclone and/or major flooding, stopbank collapse, floodgate collapse, pump malfunction.	• Maintain a suitable level of preparedness for prompt and effective response to flooding, stop bank or floodgate collapse or pump failure by ensuring the availability of suitably trained and equipped staff and service delivery contractors. Specifically: local engineers and property owners.	• Flood prevention	• Medium – flooding of private property.
Planned inspections			
• All assets	• Undertake scheduled inspections as justified by the consequences of failure on LOS, costs or safety.	• All	• Low – • Slow to react to minor flooding caused by premature asset failure
Planned preventative maintenance			
• As with planned inspections	• Undertake programme of planned asset maintenance to minimise the risk of critical asset failure (e.g. pump overhaul) or where justified economically (e.g. racetrack re-levelling).	• All	• As with planned inspections

5.2 RENEWALS STRATEGIES

The general renewal strategy is to rehabilitate or replace floodgate structures or gates, culverts or the storm pump when justified by:

- **Asset performance:** Renewal of an asset when it fails to meet the required LOS. The monitoring of asset reliability, capacity and efficiency during planned maintenance inspections identifies non-performing assets. Indicators of non-performing assets include:
  - Excessive inflow of river water during high tide;
  - River water is migrating between the floodgate and the stop bank; and
  - The floodgate does not have sufficient capacity to drain floodwaters within two days.
- **Economics:** It is no longer economic to continue repairing the asset (i.e. the annual cost of repairs exceeds the annualised cost of renewal). An economic consideration is the co-ordination of renewal works with other planned works such as road reconstruction.

Planned and reactive replacement works are prioritised and then programmed or, in urgent cases, undertaken immediately.

Table 3: Selection criteria for asset renewal

Priority	Renewal criteria
1 (High)	• Failure has occurred and renewal is the most efficient lifecycle cost alternative; • Asset failure of key system component is imminent; • Regular maintenance required: **more than three visits annually;** and • Road upgrading scheduled for the current financial year.
2	• Maintenance requiring **more than three visits per two month period** in past twelve months; and • Difficult to repair, due to fragile nature of material, or obsolescence.
3	• Pipe or structure maintenance involving two to three visits annually.
4	• Existing assets have a low level of flexibility and efficiency of replacement alternative.
5 (Low)	• Existing asset materials or types are such that known problems will develop in time.

The renewal strategy will be reviewed at least annually.

If work is deferred for any reason, this work will be re-prioritised alongside the next year's renewal projects and a revised programme established.

Renewal works identified by way of the above renewal strategies may be deferred if the cost is beyond the district's ability to fund it. This situation may arise if higher priority works are required on other infrastructure assets; short term peaks occur in expenditure or if an inadequate rating base exists.

When renewal works are deferred, the impact of the deferral on economic inefficiencies and the scheme's ability to achieve the defined service standards will be informally assessed. Although the deferral of some renewal works may not impact significantly on the short term operation of assets, repeated deferral will create a liability in the longer term.

A register of all deferred works will be maintained, the total value of which will be recognised in the financial reporting.

Note*:* Stop banks, drains and canals are not considered for renewal. Their functionality is preserved through regular maintenance.

5.3 Development strategies

Currently, Council and the Drainage Committee have no intention of developing the network further.

5.4 Disposal strategies

Due to the nature of this activity, it is unlikely that any drainage assets will need considered for disposal.

The only exception to this statement is the depot building and land, which are now surplus to the needs of the Drainage Committee. Options in relation to this asset are now being considered by Council.

5.5 Land drainage operation plan

The general operational plan is to maintain the current capacity of the drainage network through regular inspection of the network and minimisation of interference in hydraulic capacity (weed clearing, spraying etcetera).

The table below shows the operational strategies carried out to ensure that the defined LOS are met and the key service criteria that are affected if the action is not carried out.

Table 4: Land drainage operational strategies

Asset/failure mode	Action	Key service criteria	Impact
Drains and channels			

Asset/failure mode	Action	Key service criteria	Impact
Drains.	• Weeds will be controlled to minimise loss of hydraulic capacity. • Frequent inspections to ensure hydraulic capacity is maintained	System capacity and efficiency	Med/High – flooding
Unable to reach assets to maintain.	Access roads to the floodgates, drains and the pump station will be maintained to provide a level of vehicular access appropriate to each area.	Responsiveness	Low – delay in completing maintenance activity
Floodgates			
Debris build-up keeps gate open/shut against water flow.	Floodgates regularly inspected and cleared if necessary, to ensure correct operation.	System capacity and efficiency	Low – minor flooding in low lying areas near river
Stop banks			
Stop banks Slumping of banks results in increased risk of overtopping.	Stop banks inspected frequently to ensure bank stability is preserved, and weak or low areas can be identified and adequately addressed.	System capacity/reliability	High – over topping results in stop bank damage and flooding
Storm pump			
Pump station Mechanical or electrical failure.	The pump station will be inspected and maintenance undertaken on the pump motor on a monthly basis to ensure pump is in satisfactory condition.	Reliability	Medium – pump failure occurs and flooding results
Portable pump Mechanical failure.	The portable pump will be tested annually to ensure standby pumping capacity is available in the event of a failure at the pump station.	Availability/reliability	Low – localised flooding

6 EXPENDITURE FORECASTS

6.1 OPERATIONS AND MAINTENANCE EXPENDITURE

The 10 year forecast for operations and maintenance costs for land drainage assets in the Kaipara District are shown in the following graphs.

They do not provide for inflation over the 10 year period and do not include the following :

- Costs that would be allocated by Finance including depreciation, interest charges, write-offs and land rates payable for land occupied by facilities
- Costs associated with staff

Table 5: OPEX forecasts

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Operating funding											
Sources of operating funding											
General rates	0	0	0	0	0	0	0	0	0	0	0
Targeted rates	1,961	2,174	2,250	2,263	2,266	2,501	2,730	2,798	2,875	2,955	3,013
Subsidies and grants - operational	0	0	0	0	0	0	0	0	0	0	0
User fees and charges	15	15	16	16	17	17	17	18	18	19	20
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**1,977**	**2,189**	**2,266**	**2,279**	**2,282**	**2,518**	**2,747**	**2,816**	**2,894**	**2,974**	**3,033**
Application of operating funding											
Contractors costs	133	121	124	127	130	134	137	141	145	149	153
Professional services	89	120	105	108	22	22	23	23	24	25	26
Repairs and maintenance	309	383	394	403	413	424	435	447	460	474	489
Other operating costs	77	87	88	90	92	94	96	98	101	103	106
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	365	453	460	470	459	483	505	518	532	547	563
Finance costs	103	95	117	129	155	229	304	289	283	274	266
Total applications of operating funding	**1,076**	**1,260**	**1,288**	**1,328**	**1,271**	**1,386**	**1,500**	**1,517**	**1,545**	**1,572**	**1,603**
Surplus (deficit) of operating funding	**901**	**930**	**978**	**951**	**1,011**	**1,132**	**1,247**	**1,299**	**1,349**	**1,402**	**1,430**

6.2 CAPITAL EXPENDITURE

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

Table 6: CAPEX forecast

GLActivityCostCentreCodeDescription	179 Raupo Land Drainage Scheme
tx_BudgetSet	74

tx_Amount	Financial Year									
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Activity Costs	**247,901**	**254,724**	**202,818**	**207,849**	**218,766**	**218,925**	**225,000**	**231,468**	**238,358**	**245,904**
Flood Protection and Control Works	**247,901**	**254,724**	**202,818**	**207,849**	**218,766**	**218,925**	**225,000**	**231,468**	**238,358**	**245,904**
1792007 Insurance Premiums:LD Raupo	1,500	1,530	1,561	1,593	1,628	1,666	1,704	1,745	1,789	1,833
1792015 Councillor Remunera:LD Raupo	2,581	2,633	2,685	2,742	2,802	2,866	2,932	3,003	3,078	3,155
1792029 Land Rates KDC:LD Raupo	2,100	2,142	2,185	2,231	2,280	2,332	2,386	2,443	2,504	2,567
1792040 Management Services:LD Raupo	50,000	51,400								
179204101 Floodgates:LD Raupo	25,000	25,700	26,317	26,975	27,676	28,423	29,219	30,067	30,969	31,960
179204102 Machine Cleaning:LD Raupo	20,000	20,560	21,053	21,580	22,141	22,739	23,375	24,053	24,775	25,568
179204103 Stopbank Repairs:LD Raupo	40,000	41,120	42,107	43,160	44,282	45,477	46,751	48,106	49,550	51,135
179204104 Pumps:LD Raupo	5,004	5,144	5,268	5,399	5,540	5,689	5,849	6,018	6,199	6,397
179204105 Spraying:LD Raupo	83,000	85,324	87,372	89,556	91,885	94,365	97,008	99,821	102,816	106,106
179204106 Miscellaneous Works:LD Raupo	9,999	10,279	10,526	10,789	11,069	11,368	11,687	12,025	12,386	12,783
1792044 Advertising:LD Raupo	576	588	599	612	625	640	654	670	687	704
1792053 Electricity Supply:LD Raupo	1,000	1,020	1,040	1,062	1,086	1,111	1,136	1,163	1,192	1,222
1792067 Printing/Stationery:LD Raupo	448	457	466	476	486	498	509	521	534	548
1792068 Staff Business Trvl:LD Raupo	576	588	599	612	625	640	654	670	687	704
1792078 Valuation Services:LD Raupo	5,117	5,219			5,555					
1792083 Rates Remissions:LD Raupo	1,000	1,020	1,040	1,062	1,086	1,111	1,136	1,163	1,192	1,222
Grand Total	**247,901**	**254,724**	**202,818**	**207,849**	**218,766**	**218,925**	**225,000**	**231,468**	**238,358**	**245,904**

6.2.1 Renewal Expenditure

To date there have been no significant renewals undertaken on land drainage assets. The cost of any renewal work undertaken to date has not been captured as renewal expenditure and as a result it is very difficult to determine historical renewal expenditure.

The installation of new culverts or replacement of old culverts for access to land over drains is a Road network function. However recently there has been a large degree of inconsistency in the sizing of these culverts which may affect both the capacity of the drain and the cost of achieving access. A method for calculating culvert size needs to be developed or culverts sizes should be calculated by Council published by Council to eliminate future inconsistencies and potential adverse effects on drain capacity.

6.2.2 Growth Expenditure

Currently no further growth development of the land drainage network is planned.

7 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 7: Summary of extreme and high risks

LOS failure indicator	Asset group	Asset sub-group	Caused by	Risk Severity	Controls	
					Existing	To develop
Flooding, slips, accidents and injuries.	Open drain network.	Public open drains.	Liability from third party accident in open drains.	H	The piping of open drains is considered on a case by case- basis.	
Unavailability of urban roads, flooding.	Piped network.	Inlets and outlets.	Vandalism.	H	Routine and reactive inspections.	
	Flood Alleviation Infrastructure.	Stop banks.	Extensive damage (earthquake or other natural hazard).	H	Response planning.	
		Flood detention systems.	Extensive damage (earthquake or other natural hazard).	H	Response planning.	
	Managerial and governance risks.	Corporate risk.	Inadequate Corporate Risk Policy.	H	Council Corporate Risk Policy developed 2012.	
Inefficient management of assets, significant asset or service failure occurs with no management plan.	Asset design and construction risks.	Asset records.	Asset records not UpToDate-.	H	Asset records from physical works projects and maintenance activities are updated into AssetFinda.	To include all asset changes in asset register.

8 CONTINUOUS IMPROVEMENT

8.1 OVERVIEW

The following priority improvement tasks have been identified after consideration of priorities identified in the indicative AM assessment and gap chart analysis:

Asset knowledge

1 **Asset capacity**. Investigation of stop bank levels and relative increase in high tide levels from design levels and assessment of potential overtopping during high rainfall events.

2 **Asset Lives**. Start collecting installation dates for all future renewals and where possible determine installation dates for existing assets.

Strategic planning

1 **Asset protection**. Investigate options to retain creeping/slumping banks in problem drains.

2 **Resource consents.** Determine impact of WASP on floodgate outlet maintenance and reflect impact in this AMP.

3 **Culvert replacement**. Determine required culvert sizes in roadside drains to ensure drain capacity preserved.

4 **Ponding areas**. Identify and map extent of ponding areas during flooding for different rainfall events.

Information systems

1 **Asset lifecycle costing**. Collect operation, maintenance and renewal costs at component level to enable a better understanding of maintenance and renewal trends to be developed and reflected in future AMPs.

Activity Management Plan (AMP)

1 **Plan update**. Update the relevant information in the AMP following the completion of the above tasks.

8.2 AM IMPROVEMENT PROGRAMME

The 3 year improvement programme identifies priorities for the improvement tasks detailed below.

Table 8: 3 Year Improvement Plan

Task ID	Task description	Priority	Measurement of achievement	Budget	Resources
i	Asset lifecycle costing	1	Operational, maintenance and renewal costs collected at an asset component level.	Nil	Land Drainage Co-ordinator
ii	Resource consents	1	Impact of WASP on maintenance activities known and reflected in AMP.		
iii	Asset protection	2	Option for bank stability identified and capital budget identified for implementation.	$39,750 annually	Contractor
iv	Culvert replacement	2	Culverts sizes for all roadside drains defined and available to public.	Nil	Land Drainage Co-ordinator
v	Asset lives	2	New assets will have install date assigned in asset register.	Nil	Land Drainage Co-ordinator
vi	Asset capacity	3	Ability of stop banks to prevent flooding during high rainfall events and king tide known and further actions identified (if required).	Included in iii	Contractor
vii	Ponding areas	3	Ponding areas during flooding mapped and available to landowners (or potential landowners).	Nil	Land Drainage Co-ordinator

KAIPARA DISTRICT COUNCIL

Kaipara District Council

Reserves and Open Spaces Strategic Activity Management Plan

2021-2030

June 2020

Status: Draft

Kaipara te Oranganui

KAIPARA DISTRICT

Two Oceans Two Harbours

This document has been prepared by Kaipara District Council.

QUALITY STATEMENT

PROJECT MANAGER		PROJECT TECHNICAL LEAD
CHECKED BY	……/……/……	
REVIEWED BY	……/……/……	
APPROVED FOR ISSUE BY	……/……/……	

42 Hokianga Road, Private Bag 1001
Dargaville 0340, New Zealand
TEL +64 9 439 3123, FAX +64 0 439 6756

REVISION SCHEDULE

Rev No	Date	Description	Signature or typed name (documentation on file).			
			Prepared by	Checked by	Reviewed by	Approved by
A	June 2020	1st Draft template	D Jeffrey			
B						
C						
D						
E						

Contents

1 INTRODUCTION

1.1 RESERVES AND OPEN SPACES ACTIVITY

Council manages and maintains a diverse range of Reserves and Open Space assets, including public open space for aesthetic, passive and active uses, public cemeteries, campgrounds playgrounds, coastal structures to access the rivers or coast, as well as public toilets to meet the needs of visitors and the traveling public.

The Reserves and Open Space asset has responsibility for the provision of facilities that are fit for purpose, affordable and meet the community's current and future needs.

Council is not the only provider of community assets in the district, however it is the main provider. Some local schools provide facilities and sports fields which are available for community use and there are other sports clubs and organisations that provide facilities, including buildings, swimming pools and sports fields.

Council's Reserves and Open Space asset has been developed over time in response to community aspirations, needs and demands. The district's Reserves and Open Space asset ensures the whole community has opportunities to access a range of facilities and public open spaces for physical activities, leisure and recreation or simply for the enjoyment of their intrinsic values.

1.2 WHAT WE DO

Actively maintain a network of parks and reserves throughout Kaipara district. Within our Council owned parks and reserves, we operate four cemeteries. We also support community run cemeteries, provide over 30 public toilets within civic areas and reserves across Kaipara district; and oversee Community run campgrounds and Kai Iwi Lakes campgrounds. We maintain and manage council owned coastal assets/facilities, including the proposed Wharves as part of the Kaipara Kick Start.

Council has a responsibility to ensure the health and well being of its communities. It does this though a number of ways, one of which is by providing open space areas that cater to an assortment of individual and group activities both formally and informally. Open space areas and facilities that support public use within these areas are vital to the social and physical well being of its citizens. Council is a major provider of open space and provides a network of open spaces to cater for physical exercise, visual amenity and environmental protection across the district; this has been built up over time to become a central part of Council's business and a valuable community asset.

Council provides the reserves and open space activity to promote and advance community well being throughout the Kaipara district and to have an open space network that provides community and recreational opportunities, cultural, landscape and ecological protection and enhancement.

1.3 PURPOSE OF PLAN

The purpose of this Activity Management Plan (AMP) is to summarise Council's strategic and long term management approach for the provision and maintenance of reserves and open spaces assets.

The AMP provides discussion of the key elements affecting management of Council's reserve and open spaces assets. This document should be read inconjunction with Lifecycle plans for each asset group, and the Kaipara District Council Asset Management Overview, which provides the background for the waters asset management activities.

1.4 RISKS AND ISSUES

The Reserves and Open Space asset is subject to various risks in the ordinary course of business. The most significant of these are:

- If levels of funding are reduced the ability of the organisation to maintain and enhance current levels of service may be compromised;
- The frequency and severity of extreme weather events may result in greater damage to Council administered public open space;
- As additional assets are added/vested this will increase maintenance costs;
- Damage to assets and consequential health and safety risks to users, staff and Contractors;
- Asset failure as a result of limited lifecycle data, meaning unexpected replacement timeframes and costs.
- There is a perception of a lack of facilities in some areas
- We rely on community-owned and/or managed sports parks. The only Council-owned and managed facility is Memorial Park in Dargaville
- As we develop new facilities and new land is vested through development this has the effect of increasing operational expenditure, if this is not allowed for then maintenance of facilities may suffer causing additional costs to bring these facilities back to a useable state
- Community volunteers play a big role in the care and development of our parks and reserves. The new Health and Safety at Work Act 2015 may add additional cost to services done by volunteers and may affect the amount of work they can do.

1.5 POTENTIAL NEGATIVE EFFECTS

Reserves and open spaces can be affected by traffic, parking congestion and noise from formal and informal activities. They are mostly seasonal or limited to short periods, and are associated with holidays, events or sporting codes. We manage them under our District Plan rules, bylaws and resource consents for development projects.

1.6 WHAT WE WILL DELIVER

Council's strategic objectives for open spaces and reserves are:

a) Update RMPs for the three priority parks Kai Iwi Lakes (Taharoa Domain), Pou Tu Te Rangi Harding Park, Mangawhai Community Park.

b) Progress projects identified in the Mangawhai Harbour and Coastal Reserves, Memorial Park and Omnibus RMPs.

c) Develop infrastructure to support visitors to our district such as freedom campers.

d) Implement the Mangawhai Community Plan:

- i Improved walkway and linkages to and along the Mangawhai harbour including an all-tide track from Heads to Village;
- ii Develop and implement a Landscape Amenity Plan for the township including a review of the maintenance of main reserves;
- iii Prepare and implement development plans for Lincoln Street, Robert Street, Kainui and Pearson Street esplanade reserve areas;
- iv Review Mangawhai walkways and develop and implement an agreed hierarchy and maintenance levels;
- v Develop and implement a town signage plan including town entrances, parks and walkways;
- vi Undertake car parking improvements at Mangawhai Heads Recreation Reserve;
- vii Redevelop Wood Street shopping precinct.

e) Implement the Walking and Cycling Strategy

- i Develop an iconic cycleway project Dargaville to Donnelly's Crossing);
- ii Support community led projects that align with the Strategy; and
- iii Improve maintenance of Council owned walkways and promotion of the district's walkways.

f) Encouraging and supporting communities to develop new facilities on Council land through Development Agreements and Licence to Occupy (LTO) arrangements and Capital Grants.

g) Implement Dargaville Town Plan projects (yet to be defined).

Our programme to deliver these objectives over the LTP period is:

Table 1 AM Programme

Description	When
• Deliver a programme of works in partnership with Taharoa Domain, Mangawhai Community Park and Pou Tu o Te Rangi Harding Park Governance Committees. • Review current terms of O&M Contract, tender and award new contract. • Ensure all wastewater systems (toilets and campgrounds) are compliant and fit for purpose. • Meet all Resource Consent requirements • Implement the agreed projects in the Mangawhai Community Plan, Kaiwaka Improvement Plan and Dargaville Placemaking Guide; • Deliver the toilet renewal and upgrade programmes • Deliver capital works programme, • Continue to deliver the Mangawhai all tide coastal walkway and linkages projects • Ongoing review of service levels and consequential contract amendments. • Deliver the Walking and Cycling Strategy: • Deliver playground renewal programme • Deliver coastal structures programme • Prepare an Infrastructure Sports Strategy	2021/2022
• Deliver a programme of works in partnership with Taharoa Domain, Mangawhai Community Park and Pou tu Te Rangi Harding Park Governance Committees. • Ensure all wastewater systems (toilets and campgrounds) are compliant and fit for purpose. • Meet all Resource Consent requirements • Implement the agreed projects in the Mangawhai Community Plan, Kaiwaka Improvement Plan and Dargaville Placemaking Guide; • Deliver the toilet renewal and upgrade programmes • Deliver capital works programme, • Continue to deliver the Mangawhai all tide coastal walkway and linkages projects • Ongoing review of service levels and consequential contract amendments. • Deliver the Walking and Cycling Strategy: • Deliver playground renewal programme • Deliver coastal structures programme • Complete with as much detail as possible	2022/2023

• Deliver a programme of works in partnership with Taharoa Domain, Mangawhai Community Park and Pou tu Te Rangi Harding Park Governance Committees. • Ensure all wastewater systems (toilets and campgrounds) are compliant and fit for purpose. • Meet all Resource Consent requirements • Implement the agreed projects in the Mangawhai Community Plan, Kaiwaka Improvement Plan and Dargaville Placemaking Guide; • Deliver the toilet renewal and upgrade programmes • Deliver capital works programme, • Continue to deliver the Mangawhai all tide coastal walkway and linkages projects? • Ongoing review of service levels and consequential contract amendments. • Deliver the Walking and Cycling Strategy: • Deliver playground renewal programme • Deliver coastal structures programme	2023/2024
• Deliver a programme of works in partnership with Taharoa Domain, Mangawhai Community Park and Pou tu Te Rangi Harding Park Governance Committees. • Review current terms of O&M Contract, tender and award new contract. • Ensure all wastewater systems (toilets and campgrounds) are compliant and fit for purpose. • Meet all Resource Consent requirements • Implement the agreed projects in the Mangawhai Community Plan, Kaiwaka Improvement Plan and Dargaville Placemaking Guide; • Deliver the toilet renewal and upgrade programmes • Deliver capital works programme, • Continue to deliver the Mangawhai all tide coastal walkway and linkages projects • Ongoing review of service levels and consequential contract amendments. • Deliver the Walking and Cycling Strategy: • Deliver playground renewal programme • Deliver coastal structures programme	2024/2031

Major CAPEX committed:

- Mangawhai Heads carpark extension;
- Mangawhai Community Park sealing car park

- Implement Mangawhai Community Park urban landscape design plan
- Mangawhai Heads to Village – all tide access;
- Mangawhai - esplanade development;
- Mangawhai Community Park;
- Wharves
- Kai Iwi Lakes (Taharoa Domain);
- Pou Tu o Te Rangi Harding Park;
- Park development, drainage, seating, shade sails over playgrounds etc.
- Implementation of Walking and Cycling Strategy; and
- Ancient Kauri Trail

Other planned Improvements include:

- Develop infrastructure to support visitors to our district;
- Improve maintenance and promotion of walkways;
- Hard surface (car park/accessway) renewal programme;
- Ensure all wastewater systems (toilets and camp grounds) are compliant and fit for purpose and upgrade if required;
- Implement the toilet renewal programme;
- Upgrade and/or renew one playground per year;
- Implement initiatives identified in Community Action Plans
- Implement Reserve Management Plans (RMPs); and

- Ongoing review of service levels and consequential contract amendments.

2 THE ASSETS

The major asset groups covered by this Plan are: Hamish to check figures

Table 2 Key assets

Asset Description		Quantity
Playgrounds		13
Public toilets / changing rooms		32
Cemeteries	Council managed	4
	Community managed	4
Walkways		5,654m
Open space	Gardens	92
	Gardens – area	13,043m^2
	Parks – maintained	103
	Parks – area mown	449,297m^2
Coastal structures	Boat ramps	5
	Groynes	4
	Impact piles	3
	Sea walls	25
	Wharf	3
Camp grounds	In-house	1
	Community	4

Green Space – Reserves and Open Space includes areas associated with townships, town centres, civic space, streetscape, coastal and beaches areas as well as parks. A total area of 118ha is actively managed, made up of 103 separate areas with 45ha mown.

Asset condition

National Parks and Recreation Assets Condition Grading Standards (PRAMS) is a nationally recognised standard condition grading schedule for Parks and Recreational Assets. The condition grading schedules have been developed from standards used by various local authorities and are intended to provide a standard definition for condition grading assessments. The assessment of asset condition is an essential part of asset management planning. Asset condition assessments are undertaken to determine:

- Where the asset is in its lifecycle;
- The remaining effective life of the asset;
- The rate of deterioration of the asset;
- When asset replacement will be required;
- The risk of failure;
- Financial projects; and
- Frequency of inspections required to manage risk of failure.

3 DEMAND MANAGEMENT

The demand trends are outlined in the KDC AM Overview. This activity plan focuses on Council's response to those trends.

3.1 COUNCIL'S APPROACH TO DEMAND MANAGEMENT

The objective of demand management planning is to actively seek to modify customer demands for services, in order to maximise utilisation of existing assets or to reduce or defer the need for new assets or services, including non-asset solutions. Future scenarios need to be investigated. Examples of new and improved services to meet customer demand include:

- Maximising the use of existing facilities and monitoring when events are on so that they do not interfere with each other;
- Tracking change in trends to modify facilities as appropriate; and
- Actively seek collaboration with the community to maximise activities and support the well-being of the community.
- Demand management strategies provide alternatives to the creation of new assets in order to meet demand and looks at ways of modifying customer demands in order that the utilisation of existing assets is maximised and the need for new assets is deferred or reduced.
- Demand management is practiced continuously to maintain the total demand at reasonable and sustainable levels. The five key components of demand management when promoted as a package or strategy rather than in isolation can dramatically reduce the demand on the network.

The key components with examples are provided in the following table:

Table 3 Demand components

Demand Component	Recreation example
Legislation/Regulation	Manage facilities in line with legislation e.g.Playground compliance with relevant NZ standards
Education	Educating the community around the activities that are available as alternatives to mainstream activities (i.e. baseball compared with rugby)
Incentives	Provide incentives for new clubs, sports, less used time slots etc.
Operation	Maximise use of existing facilities, including shared facilities
Demand Substitution	Promote alternative sports codes, provide maps for alternative less used reserves and walkways

4 PROPOSED LOS AND PERFORMANCE MEASURES

4.1 CUSTOMER'S NEEDS

Kaipara District Council is the main provider of Reserves and Open Space assets in the district. What services are provided by Council depends on what customers value or need. Our key customers and what they value are broadly defined below:

- Community: the community in general, visitors and neighbours of the facilities wanting an appealing environment and wanting to participate in various activities;
- Parks and reserves users: sports clubs, boat owners, beach and foreshore users e.g. families, picnickers, walkers/runners, dog walkers wanting a comfortable environment with appropriate amenities such as seating, parking and toilet facilities;
- Businesses: businesses in general and concessionaires, tourist operators and event organisers wanting a visually appealing environment, access for tourists and opportunities to hold events;
- Elected Members: representing the interests of the community;
- Iwi: recognition of special status and consultation on cultural aspects
- environmental impacts; making sure we don't have a negative impact on the environment
- Other Stakeholders: Department of Conservation (DoC), Regional Council, special interest groups wanting systems and procedures which meet statutory obligations or involvement in decision making; and
- Internal Customers: such as roading, stormwater and land drainage wanting co operation to manage areas of overlap and understanding of conflicting needs.

Annual Customer Surveys – Since 2000 Council has undertaken an annual survey of residents. This survey provides an insight into community perceptions and interpretations of Council services. It includes questions about two Reserves and Open Space services being satisfaction with parks and public toilets. The survey also ranks Council against the performance of other local government organisations. Undertaking the annual survey also provides valuable historical information to determine whether Council is improving or not on the LOS being provided to customers.

Community aspirations and feedback from these sources is summarised below:

a) More reserves and open space facilities

- Improved pedestrian safety, increased car parking and development of public space particularly Mangawhai;
- Upgrading toilets to ensure they are accessible, are safe to use, fit-for-purpose and meet consent conditions;
- Car parking to support centralising sports facilities (Sportsville);
- Improved walkway and linkages to and along the Mangawhai harbour;
- Working with communities to develop their public places (Sense of Place in townships); and
- Encouraging and supporting communities to develop new facilities on Council land through Development Agreements and Licence to Occupy (LTO) arrangements and Capital Grants.

b) Increased wishes for improved LOS in terms of:

- Maintenance of reserves and open space;
- Consideration of Contract for Service arrangements with local communities;
- and
- Providing services and infrastructure for short stay visitors..

c) Changing management and operating LOS in terms of:

- Opening and closing access to some reserves and open space facilities to reduce vandalism;
- Reviewing gardens, developing a hierarchy and town themes and re-focusing in key locations (town centres, key facilities and town entrances);
- Reducing or formalising vehicle access to certain reserves and open space areas;
- Formalising existing use of sports/open space areas and facilities with clubs or organisations through LTO/lease arrangements; and
-

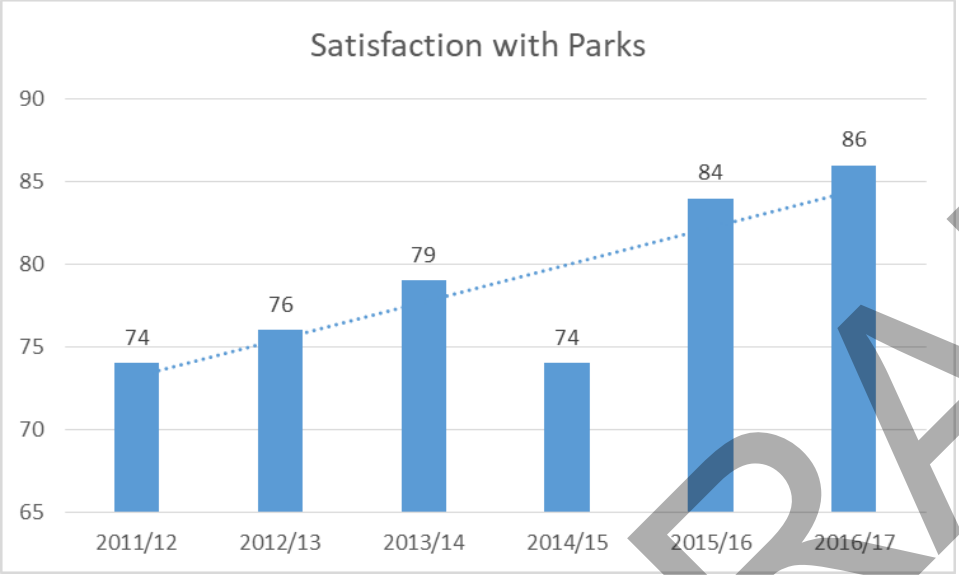
4.2 LEVELS OF SERVICE

The LOS reported in Table 2-12 are customer focused and are included in the 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.

Table 4 LOS and performance measures

	Measuring performance				
What we measure	Actual 2019/2020	LTP Year 1 Target 2021/2022	LTP Year 2 Target 2022/2023	LTP Year 3 Target 2023/2024	LTP Year 4-10 Target 2025/2031
Percentage of residents who are very satisfied or satisfied with their local parks and sports fields. Measured by: Residents Survey		85%	86%	87%	87%
Percentage of residents who are very satisfied or satisfied with the district's public toilets. Measured by: Residents Survey		>75%			
Compliance with parks maintenance contract specifications monthly audits.		90%			
Parks maintenance contract: number of health and safety audits per month.		Contractor: 4 Council: 1			

Customer performance measures that are included in the annual resident's survey have given a good indication of the public's perceptions and interpretations of Council services in terms of parks and public toilets which are areas of high interest to the public.

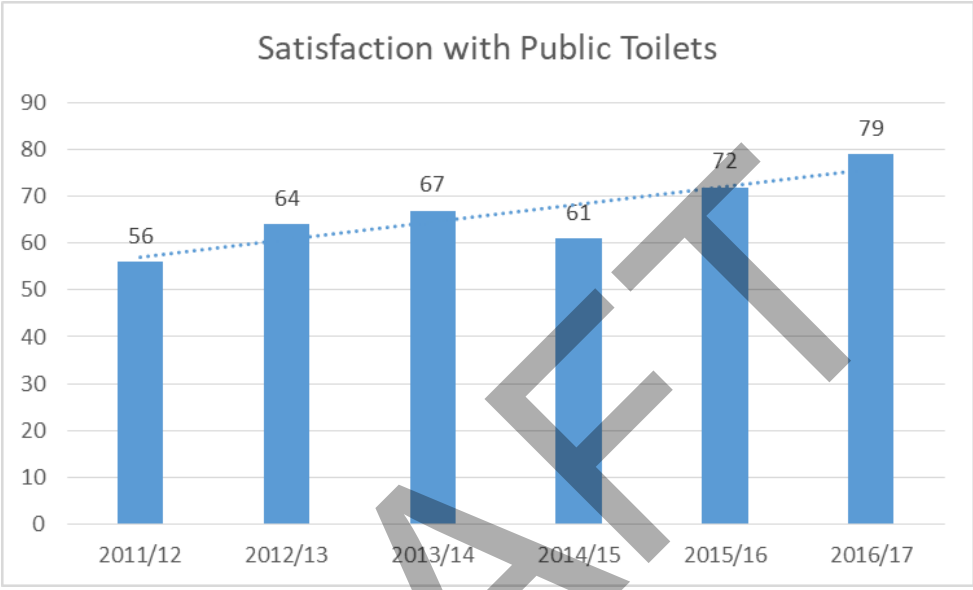


In terms of parks over the last 3 years has seen a continued high level of satisfaction with parks (84-91%), this reflects continued LoS improvements and improved mowing and maintenance contract specifications, and development of key parks.

The main reasons residents were not satisfied with Council controlled local parks or sports fields in the district were:

- Lack of/poor maintenance and/or untidy; and
- Need upgrading/improvements.

There were no notable differences between Wards and socio economic groups in terms of those residents not very satisfied with Council controlled parks or sports fields.



In terms of public toilets over the last 3 years has seen a continued high level of satisfaction with public toilets (79-84%)

- The main reasons residents were not satisfied with public toilets were:
- They need to be cleaned more;
- Need upgrading/improving/in poor condition; and
- Disgusting/dirty/need cleaning more often.

Level of service gaps

Based on these LOS drivers the following changes in LOS are proposed over the 10 years of this AMP:

Improve customer expectations:

a) Toilets are accessible, safe to use and fit-for-purpose - Implement a toilet renewal programme.

b) Playgrounds are fit-for-purpose and safe.

c) Parks carpark/accessway are well maintained.

d) Walkways are well maintained.

e) Sports fields are fit-for-purpose e.g. adequate changing rooms, parking, drainage and toilets.

f) Gardens are focused in key locations (town centres, key facilities and town entrances).

g) Communities work in partnership with Council to develop their public places.

Legislative requirements

a) Ensure all wastewater and water systems (toilets and camp grounds) are compliant and fit-for-purpose.

b) Implement an Asset Management Improvement Plan (AMIP).

c) Ensure playgrounds met the playground standards; upgrade and/or renew one playground per year.

Council's strategic objectives

a) Update RMPs for the three priority parks Kai Iwi Lakes (Taharoa Domain), Pou Tu Te Rangi Harding Park, Mangawhai Community Park.

b) Progress projects identified in the Mangawhai Harbour and Coastal Reserves, Memorial Park and Omnibus RMPs.

c) Develop infrastructure to support short stay visitors to our district .

d) Implement the Mangawhai Community Plan:

- Improved walkway and linkages to and along the Mangawhai harbour including an all-tide track from Heads to Village;
- Develop and implement a Landscape Amenity Plan for the township including a review of the maintenance of main reserves;
- Prepare and implement development plans for Lincoln Street, Robert Street, Kainui and Pearson Street esplanade reserve areas;

- Review Mangawhai walkways and develop and implement an agreed hierarchy and maintenance levels;
- Develop and implement a town signage plan including town entrances, parks and walkways;
- Undertake car parking improvements at Mangawhai Heads Recreation Reserve;
- Redevelop Wood Street shopping precinct.

e) Implement the Walking and Cycling Strategy

- Develop an iconic cycleway project Dargaville to Donnelly's Crossing);
- Support community -led projects that align with the Strategy; and
- Improve maintenance of Council owned walkways and promotion of the district's walkways.

e) Encouraging and supporting communities to develop new facilities on Council land through Development Agreements and Licence to Occupy (LTO) arrangements and Capital Grants.

f) Implement Dargaville Town Plan projects (yet to be defined).

5 MAINTENANCE AND OPERATING STRATEGY

5.1 MAINTENANCE AND OPERATIONS

Operations covers the day to day running of the Reserves and Open Space activity to achieve the agreed level of service e.g. mowing, edge control, weeding, cleaning of toilets, playground inspection, burials, litter removal.

Maintenance is what is required to keep the Reserves and Open Space assets in good working order such as replacing damaged equipment or repairing minor structures such as furniture, signs.

Maintenance falls into two broad categories as follows:

- Proactive - Proactive inspection and maintenance works planned to prevent asset failure; and
- Reactive - Reactive action to correct asset malfunctions and failures on an as-required basis and particularly includes repairs and maintenance in response to vandalism activities.

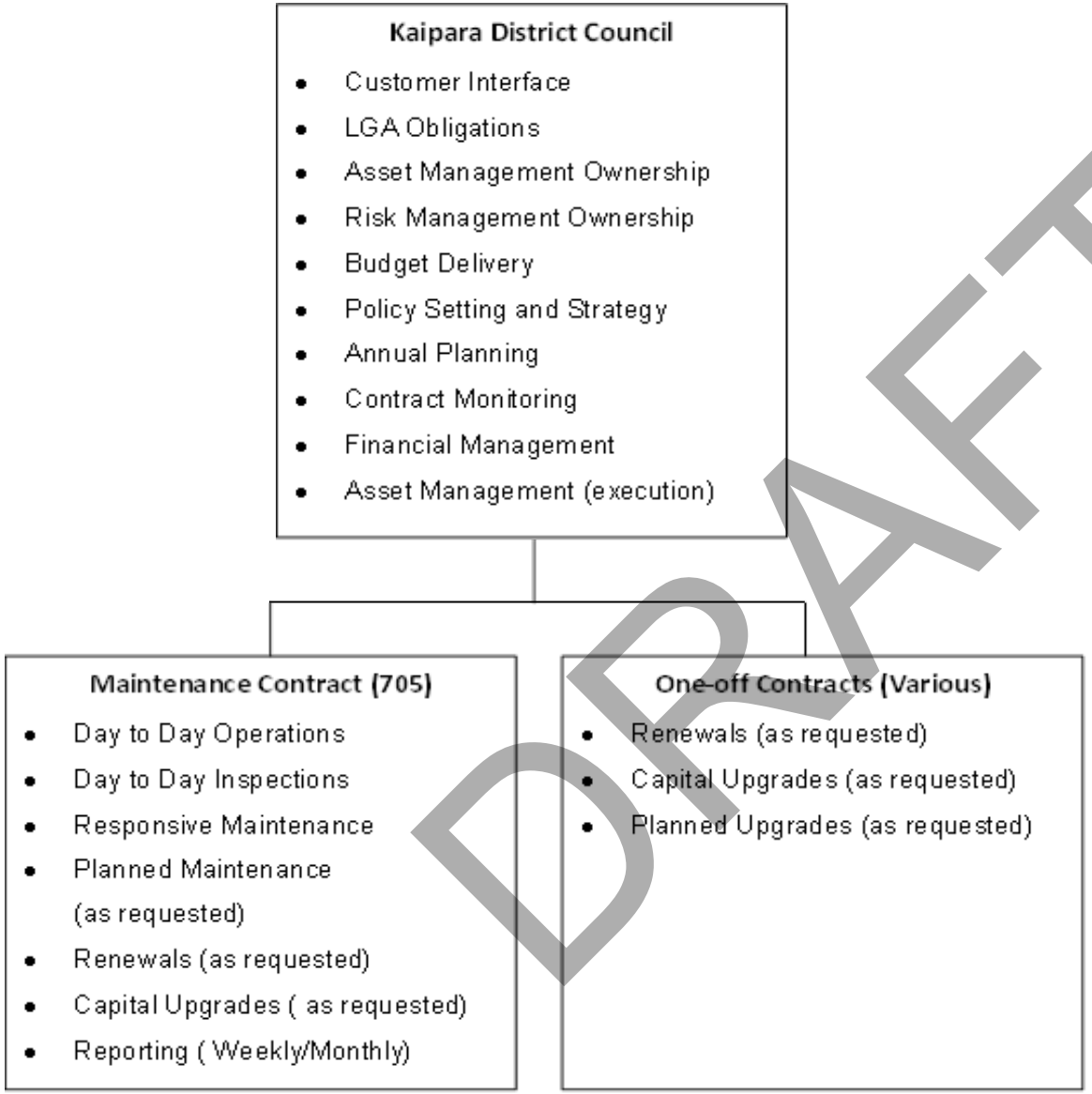
Service delivery arrangements

Council's Parks Maintenance contractor undertakes operational strategies to programme and carrying out reactive and preventative maintenance. The contract is a mix of routine works, ordered and day works. Council also has two Parks Officers that oversee the maintenance and operations contract, provide field support, monitor the contractor's activities, undertake formal auditing and provide community liaison across the district.

Community groups maintain some assets or provide services under a Contract for Service framework such as Pahi Toilets, Kelly's Bay camp ground, Baylys Beach walkways,

Council's Parks maintenance contractor is responsible for delivery of maintenance of parks, reserves, cemeteries and , litter control, burials, maintenance and cleaning of public toilets/changing sheds, the inspection and repair of playgrounds, maintenance of gardens, hedges and trees. Council has a contract with them consisting of a range of schedules that provide specifications for services.

Roles and responsibilities



Reactive and preventative maintenance

Operations and maintenance on Council's assets are completed to the specified LOS. This includes the maintenance of parks, reserves, cemeteries and litter control in parks and reserves, burials, maintenance and cleaning of public toilets and changing sheds, the inspection and repair of recreation facilities, maintenance of gardens, hedges and trees. Council's operational actions for Reserves and Open Space activity include:

Table 5 Maintenance activities

Purpose	Asset operations and maintenance	Description
Reactive Response	Unplanned operations	Unplanned operations provide services in response to customer or service faults. This includes additional cleans toilets, illegal dumping.
Preventative Response	Planned operations (day to day operations)	Planned operations on Reserves and Open Space assets to ensure their continued service and maximised functionality. This includes weekly inspections of parks and playgrounds.
Preventative Response	Peak period operations	With a large influx of visitors over the peak summer period, Council's contractor must ensure public toilets are coping with the demand by increasing frequency of visits.
	Ongoing monitoring	Continuous monitoring of the Reserves and Open Space assets is critical for ensuring the contract specifications are delivered, there are no public risks from faults or hazards and damaged assets are identified.
	Resource consents monitoring	The operations of some Reserves and Open Space assets require compliance with resource consents. This requires conditions to be audited and date collected and provided to the consent authority annually.
	Wastewater compliance	Regular auditing of wastewater systems ensures their continuous operations and the risk to the environment is minimised. Auditing is carried out annually.
	Condition surveys	Planned condition surveys are undertaken to understand the deterioration of assets and plan for any works to address defects found.

When programmed inspections are undertaken by the maintenance contractor, the act of inspection may initiate a series of responses based on the observations of the contractor. These could include:

- Routine maintenance;

- Responsive maintenance based on observation/condition;
- Planning of a preventative maintenance response based on a prediction of failure; and
- Reporting for upgrading or renewal to KDC.

Maintenance types

Table 6 Maintenance types

Assets	Description
Reactive	Reactive maintenance is typically initiated by RFS or a failure of asset as in public toilet fault.
Cyclical	Cyclical maintenance is initiated through planned inspections such as weekly playground inspections.
Routine	Routine maintenance is initiated through contractor inspections or Council audits. This includes activities such as top-up of cushion fall or wash down of buildings.

6 EXPENDITURE FORECASTS

6.1 OPERATIONS AND MAINTENANCE EXPENDITURE

The 10 year forecast for operations and maintenance expenditure are shown in Figures XXX below. The forecast expenditure information is based on the LTP 2015/2025 financial forecast, which provides a relative degree of confidence in the values reported. To be updated

Table 7 OPEX forecasts

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Operating funding											
Sources of operating funding											
General rates	1,208	1,381	1,466	1,537	1,578	1,635	1,675	1,698	1,739	1,781	1,827
Targeted rates	0	0	0	0	0	0	0	0	0	0	0
Subsidies and grants - operational	0	0	0	0	0	0	0	0	0	0	0
User fees and charges	37	44	45	46	47	48	49	51	52	53	54
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**1,246**	**1,425**	**1,512**	**1,583**	**1,626**	**1,684**	**1,724**	**1,748**	**1,790**	**1,834**	**1,882**
Application of operating funding											
Contractors costs	20	20	21	23	23	24	25	26	27	28	28
Professional services	143	113	115	118	120	123	125	117	120	123	126
Repairs and maintenance	691	827	887	911	936	963	985	1,008	1,032	1,057	1,084
Other operating costs	132	127	130	132	135	138	141	145	148	152	156
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	206	272	292	301	309	318	326	330	337	346	355
Finance costs	30	28	26	25	25	32	31	29	27	25	23
Total applications of operating funding	**1,221**	**1,387**	**1,471**	**1,509**	**1,549**	**1,598**	**1,635**	**1,654**	**1,691**	**1,729**	**1,772**
Surplus (deficit) of operating funding	**25**	**38**	**40**	**74**	**77**	**85**	**89**	**94**	**99**	**104**	**110**

6.2 CAPITAL EXPENDITURE

The 10 year forecast for capital expenditure is shown in the table below: To be updated

Table 8 Capex forecast

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	0	0	0	0	0	0	0	0	0	0	0
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	500	500	510	521	532	543	445	341	233	119	0
Increase(decrease) in debt	-16	-29	-32	-34	123	-43	-46	-50	-54	-58	-63
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**484**	**471**	**478**	**487**	**655**	**500**	**398**	**291**	**179**	**61**	**-63**
Applications of capital funding											
Capital Expenditure - Growth	350	150	153	156	159	163	167	171	175	179	184
Capital Expenditure - LoS	915	370	377	385	553	337	256	262	151	155	159
Capital Expenditure - Renewal	25	75	77	78	80	82	0	0	0	0	0
Increase (decrease) in reserves	-781	-86	-88	-59	-60	4	65	-47	-48	-169	-295
Total applications of capital funding	**509**	**509**	**519**	**561**	**732**	**585**	**488**	**385**	**278**	**165**	**47**
Surplus (deficit) of capital funding	**-25**	**-38**	**-40**	**-74**	**-77**	**-85**	**-89**	**-94**	**-99**	**-104**	**-110**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

6.2.1 *Renewal Expenditure*

In the Reserves and Open Space area the strategy for replacement has historically been based upon a working knowledge of the assets and a professional judgement on the viability and integrity of the asset to be either maintained or replaced by Council. Decisions to replace assets have historically been made by the need to retain the status quo LOS.

Part of Council's Reserves and Open Space staff work involves looking at numbers, age and location of its different asset groups and determining the need for renewal of the asset before replacement is required.

A move to a Reserves and Open Space asset management database inventory system for assets combining location, condition, materials and lifecycle information has seen a more comprehensive planning and decision making process evolve, meaning more robust decisions being made and a more systematic approach as asset knowledge improves, being employed by and allow for depreciation planning in renewal of assets.

Lifecycle activities

- Council's Reserves and Open Space asset contains many facilities and services that, from the time they are installed or developed, start to age with use and reduce in performance on delivering service;
- For Council to ensure its Reserves and Open Space asset is managed at the level expected by the community and legislation it is important to understand what asset Council has, its condition and lifecycle profile;
- All assets regardless of what they are, have a lifecycle. Council is improving the understanding of the lifecycle of its assets. This information is being used for forecasting of maintenance, budgets, and refurbishment of the asset and replacement timing;
- Council's Playground Audit undertaken in 2020 built on information previously collated in and there is now sound knowledge of this asset group;
- A Condition Assessment of toilets was carried out in 2019 and this has provided sound knowledge of this asset group;
- Collection of fixed assets in the Reserves and Open Space asset group began in early 2016 and continued in 2020 and is deemed to be 90% complete with knowledge of types of structures, materials, condition and location being collated and added to the Asset Finda data base.;
- Coastal asset data was collected in 2014. This was reviewed in 2017 to confirm Council -owned assets. Forecasting of maintenance budgets does not include community -owned assets; and

- Collection of data will continue so as to improve management of the assets and this is recognised in the Asset Management Improvement Plan (AMIP).

6.2.2 *Growth Expenditure*

Level of Service Expenditure

Any here?

6.2.3 *Level of Service Expenditure*

The key assumptions of Council are described below. The following are the key risks that underlie the forecast financial assumptions:

- On the whole, Kaipara's community open spaces are adequate to meet the levels of growth forecast for the district;
- Service levels are generally assumed to remain the same;
- The cost of new and replacement assets will rise in line with inflation;
- The south-eastern area is prone to population fluctuations with increasing demand for services over the summer holiday period;
- Community activities will be affected by changing age demographics in the district; and
    - With the expected population growth LoS will increase due to extra demand and usageKey asset assumptions

Council currently has limited data regarding lifestyle assumptions for its Reserves and Open Space assets. Data collection has been noted as a priority in the AMIP. Once a condition assessment of assets has been undertaken and data collection systems implemented Council will be in a better position to know where the assets are in there lifecycle and plan renewal/replacement. The current assumptions are illustrated in the following table.

Table 9 Asset lives

Reserves and Open Space asset life assumptions		
Asset type	**Expected life (years)**	**Average remaining life (years)**
Walkways		n/a
Play equipment	10	11
Outdoor furniture	5	n/a

Bins	5	n/a
Signs	5	n/a
Carparks	20	n/a

7 RISK MANAGEMENT (INCLUDING HEALTH AND SAFETY)

A risk evaluation exercise across the whole of the Reserves and Open Space asset to determine the types of risk events and then evaluation of the risks against the probability and consequences for each event, should that event occur, has not been conducted. It is identified as part of the AMIP.

In some cases with Reserves and Open Space assets the treatment may simply be a change to operational procedures or, in other cases, may involve major improvement works or changes to infrastructural construction standards. The treatment for a risk either involves reducing or mitigating the likelihood of the event occurring or otherwise mitigating the consequences should it occur. In many cases the occurrence of the risk event cannot be mitigated. This is particularly true for naturally occurring events, for example a flood. The consequences of an event of this type can be evaluated and mitigation measures adopted.

Do you have something similar to table below for Reserves and open Spaces? Table 5-3 identifies Council high and extreme risks, together with potential impact, current controls and an action plan to mitigate, minimise or manage the risk.

Table: WS 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	Apply to vary consent to draw water at lower levels from Rotu. Investigate alternative, more secure source.

8 CONTINUOUS IMPROVEMENT

8.1 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.

Council has demonstrated its commitment to AM improvement over the last few years and wishes to meet core requirements as defined by the Office of the Auditor-General for the Water Supply AMP.

8.2 AM IMPROVEMENT PLAN

Key areas to achieve improved core asset management activities and delivery of Council's Reserves and Open Space are listed under six main themes as identified in the following table (these directly link to the Improvement Plan and Monitoring section of the AMP and the projects identified):

Table 10 Asset knowledge improvements

Asset knowledge	Strategic planning processes	Asset capital processes
• Asset Hierarchy/Identification; • Physical Data - Attributes and Location; • Operations and Maintenance Records; • Condition Assessment; • Performance/Capacity Monitoring; • Lifecycle Cost; • Asset Age/Lives; and • Valuations/Accounting.	• Demand Analysis; • Failure Prediction; • Risk Assessment; • Renewal Processes; • Customer Service Level Reviews; and • Long Term Financial Planning.	• Project Identification/Prioritisation; • CAPEX Evaluation; • Contract Monitoring and Control; • Construction/Design Standards; • Asset Handover; and • Asset Rationalisation/Disposal

Table 11 Operations and maintenance processes

Operations and maintenance processes	Information systems	Organisational and commercial
• Operations and Maintenance Policy Strategy; • Operations and Maintenance Manuals; • Emergency Response Plans; • Contract Monitoring and Control; and • OPEX Analysis/Review.	• Asset Register; • Plans and Records; • Financial System; • Maintenance Management Functions; • Capacity Modelling; • Spatial Information Systems (GIS); • Customer Management System; • Project Management; • System Integration; and • Availability/User Friendliness.	• Asset Management Review/Improvement; • Commercial Polices (Contracting); and • Corporate Commitment.

The priority areas are improving asset knowledge and information systems for storing this knowledge. Until this is complete it will be difficult to determine life cycle costs, valuations or renewal profiles.

8.3 IMPROVEMENT PLAN PROGRAMME

The overall objectives for the AMIP programme are as follows:

- improve Council's asset management maturity for high value and high risk asset groups, in particular coastal structures and public toilet asset groups;
- build internal asset management capability with the Parks and Community team;
- achieve medium level of asset management practice for the 2021 Reserves and Open Space Asset Management Plan (AMP);
- enable the AMP to become a live document within Council;

- AMP adequately prepared with the underlying information for the community activity to support the LTP 2021/2031 process; and
- key information and projects / programmes are to be substantially completed or well underway by June 2017 to allow adequate time to analyse and internally debate Council's investment programmes and services.
- The AMP was refined to reflect Council's latest thinking and priorities. The revised AMP programme is detailed below including status (underway, not started or not programmed to start), priority (high or medium) and assigned responsibility.

Table 12 AM Improvements

AM Improvement Area	Project No.	Action	Asset group	Indicative timeframe	Priority	Responsibility	Status	Comments
Strategic Planning								
	2	Formally adopt the public toilet strategy for consistent decision -making.	Public toilets	2017/18	High	Parks and Recreation Manager	Draft document to start yet	Draft has been prepared. The strategy will enable decision-making district-wide and inform any investment programmes.
Levels of Service	3							
	4							
Future Demand	5	Review the existing and future capacity of the community managed cemeteries.	Cemeteries	2022-23	Medium	Parks and Recreation Manager	Not programmed to start yet	There is adequate capacity of the Council -managed cemeteries. It is unclear if this is the case for the community managed cemeteries.

AM Improvement Area	Project No.	Action	Asset group	Indicative timeframe	Priority	Responsibility	Status	Comments
	6	Review the recommendations from the district-wide Walking and Cycling Strategy that has been adopted by Council.	Walkways, green space	2018/19	Medium	Parks and Community Manager	Ongoing to start yet	There is high demand for complete walking and cycling networks. The green space may require enhancements to complete these networks.
	7	New RMPs (Reserves and Open Space).	Green space	Ongoing	High	Parks and Community Manager	Underway	Development of Omnibus RMP to progress .
Asset Data	8	Clarify asset ownership of coastal structural assets (i.e. Council, private, community).	Coastal structures	2017/18	High	Parks and Community Manager	Complete	Important to understand asset ownership as impact O&M and renewal responsibilities.
	9	Collect the asset data for roads and carparks located in cemeteries.	Cemeteries	June 2017	High	Parks and Community Manager	Underway	This is important for completing cemetery asset inventory.
	10	Clarify asset ownership of walkways.	Walkways	2017/18	High	Parks and Community Manager	Not programmed to start yet	Important to understand asset ownership as impact O&M and renewal responsibilities.
	11	Collect the asset data including condition of the hard surfaces and formed walkways (excluding Mangawhai).	Walkways	June 2017	High	Parks and Community Manager	Underway	Asset data of walkways has been collected for Mangawhai. The existing asset condition of steps is variable.
	12	Undertake structural assessments of viewing	Coastal structures	2017/18	High	Parks and Community	Not programmed	Viewing platforms are high risk assets and need to be inspected on three yearly basis by

AM Improvement Area	Project No.	Action	Asset group	Indicative timeframe	Priority	Responsibility	Status	Comments
		platforms and walkways by suitably qualified Engineer.	and walkways			Manager	to start yet	Structural Engineer and annual inspections in the other years.
	13	Update the inventories with asset age progressively as assets are replaced or created.	Green space, playgrounds, public toilets, coastal structures, walkways	2016/17 (and ongoing)	Medium	Parks and Community Manager	To start (as new project added in)	For the major asset groups only. This will become a business as usual activity once established.
Asset performance	14	Assess the current state of the existing wastewater systems and the ability to meet peak demand	Camp ground	July 2017	High	Parks and Community Manager	To start (as new project added in)	Review the existing Water and Sanitary Services Assessment as a starting point for the assessment.
Lifecycle Management Plans								
								This has been completed
	17							
	18	Review the Maintenance Contract.	All	2016/17	High	Parks and Community Manager	Underway	Final review with the new Council to tender early 2022
	19	Maintenance Contract options reviewed. Develop new contract.	All	2016/17	High	Parks and Community	Complete	Options to be reviewed by September 2021

AM Improvement Area	Project No.	Action	Asset group	Indicative timeframe	Priority	Responsibility	Status	Comments
						Manager		
	20							
	21	Develop an annual weed management programme with priority on adopted RMP Taharoa Domain, Harding Park MCP, Mangawhai Harbours, Memorial Park or areas of collaboration.	Green space	2016/17	High	Parks and Community Manager	Underway	Needs completeing
	22	Ensure all Council owned coastal structure assets have resource consents.	Coastal structures	2017/18	High	Parks and Community Manager	Not programmed to start yet	This will be undertaken after asset ownership has been completed (refer to separate project above). This is expected to be May 2017.
Renewal planning	23	Develop sound renewal programme for the viewing platforms and walkways based on the structural assessments to ensure that they are compliant with latest safety standards.	Coastal structures and walkways	2017/18	High	Parks and Community Manager	Not programmed to start yet	This will be based on any defects identified through the assessment as well as meeting modern legislative requirements, in particular landings.
	24	Develop condition based renewal programme for roads	Cemeteries	2017/18	High	Parks and Community	Not programmed	Renewal programme will be over a five year timeframe. This will feed into the LTP

AM Improvement Area	Project No.	Action	Asset group	Indicative timeframe	Priority	Responsibility	Status	Comments
		and carparks located in cemeteries based on the condition survey.				Manager	to start yet	2018/2028.
	25							
	26	Develop a maintenance/renewal programme for coastal structures to ensure all assets are "Good" PRAMS 3.	Coastal structures	2016/17	High	Parks and Community Manager	To start	Condition was surveyed in 2014. Poor condition assets have been upgraded (e.g. Tinopai).
	26							
Investment strategies								
Risk Management								

Kaipara District Council

Solid Waste Activity Management Plan

2021-2031

June 2020

Kaipara te Oranganui
KAIPARA DISTRICT
Two Oceans Two Harbours

This Document has been prepared for the benefit of Kaipara District Council.

Quality Statement

Project Manager	Roading and Solid Waste Manager	
Prepared By Donna Powell	Infrastructure Technical Officer	18/03/2020
Checked By	Peer Reviewers	
Reviewed By Donna Powell	Infrastructure Technical Officer	
Approved For Issue By	General Manager Infrastructure	

Revision Schedule

Rev No	Date	Description	Signature or Typed Name (documentation on file)			
			Prepared by	**Checked by**	**Reviewed by**	**Approved by**
A	April 2020	Draft for review	Donna Powell			
B		Draft - final review	Donna Powell			
C		Draft - approved for adoption				
D		Approval of AMP				

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EXECUTIVE SUMMARY

INTRODUCTION

The purpose of this Solid Waste activity management plan is to ensure that assets are operated and maintained, so that they provide the required level of service for present and future customers.

This AMP is a key planning tool and is directly related to the Waste Minimisation and Management Plan 2020 (WMMP), other documents that may also ience the Solid Waste activity and assets include KDC's Long Term Plan, Annual Plan, General Bylaws, District Plan, Solid Waste contracts and Closed Landfill Management Plans.

LEVELS OF SERVICE

Levels of service are driven by customer expectations, compliance with statutory requirements and Council policies.

KDC's Solid Waste vision is "***To reduce waste and increase recycling and resource recovery for the protection of the environment and human health.***". In order to align to this vision KDC aims to provide affordable, hygienic, refuse collection and disposal that is environmentally sustainable, meets statutory requirements and the needs of Kaipara's communities. As such, the Solid Waste assets and services provided by KDC primarily support the community outcomes of 'A trusted Council making good decisions for the future" and 'A district with plenty of active outdoor opportunities".

FUTURE GROWTH AND DEMAND

This section outlines the existing demand, demand forecasts, growth and expectations. Increase in demand place additional wear on assets and services which may reduce the remaining life of assets and require the development of new capacity.

The future demand in the region for waste management and minimisation services will be driven by a number of primary drivers including:

- Demographic change (e.g. population and/or household changes)
- Change in commercial and industrial activity and economic conditions
- National policy, legislation and regulation
- Impact of waste minimisation programmes, services and future initiatives

- Community expectations.

LIFE CYCLE MANAGEMENT

Due to the limited number of solid waste assets owned by KDC, the asset groups covered by this Solid Waste AMP are: Transfer Stations; Closed Landfills; Collection Cages; Public Litterbins. When managing these assets KDC must ensure the interests and expectations of stakeholders are met alongside regulatory compliance requirements. This Solid Waste Activity Management Plan (AMP) documents this approach by outlining the asset management processes and practices used to develop optimised lifecycle management strategies. The AMP is therefore a vital component of KDC's planning process and demonstrates how we address multivariate requirements by integrating management, financial and technical practices to deliver the strategies and initiatives planned. This AMP demonstrates how KDC intends to meet key goals and objectives for the solid waste assets, looking ahead 10 years whilst acknowledging that, in practice, asset management planning tends to consider much longer timeframes.

RISK MANAGEMENT

The main risks associated with the solid waste activity include: Illegal substances being deposited without Council knowledge, leachate contamination, legislative and regulatory changes that have the potential to impact on operations, adjacent landowner issues, environmental contamination occurs through events beyond the control of Council and a potential risk also exists where operators may fail to meet contractual obligations. Monitoring and management of 14 closed landfills is a significant aspect of the solid waste activity and KDC is working closely with the Northland Regional Council (NRC) on this as well as related consent requirements.

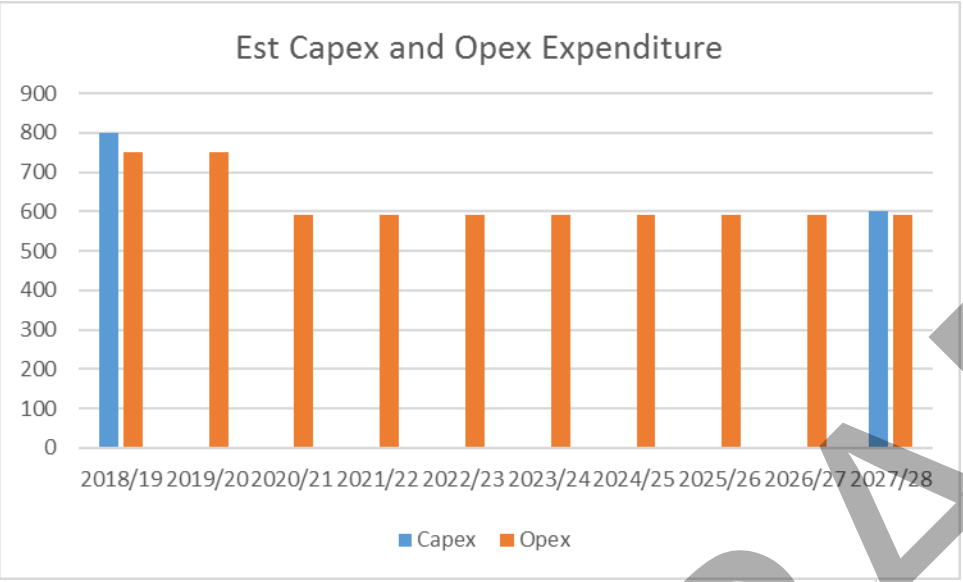
FINANCIAL PROJECTIONS

Currently KDCs solid waste collection and disposal service is based on a user pays system for the collection and disposal of kerbside solid waste and recyclables, however currently alternatives are being investigated and consulted on with expected implementation in year 1- 2 of the upcoming LTP period, this may see a mixture of user pay and targeted rates for services, with waste minimisation being a much larger priority it is expected there will be significant investment in Waste Minimisation initiatives (see proposed improvements)

Capital works projects will see the above mentioned projects completed, engineering assessments will also be completed on the Closed landfills, priority given to the closed landfills in coastal and flood inundation zones so provisional funds can be established for protection works. It is expected that the capital project for leachate improvements at the Hakaru Closed landfill will be completed prior to this AMP period, there will only be an operational cost to factor in here.

See Chart below for a summary forecast of expenditure over the next 10 years.

Figure 1: Summary Capex and Opex expenditure.



IMPROVEMENT PLAN

It is important for KDC to ensure that asset management practice is aligned with best practice and is always forward-looking when it comes to improvement in practices and standards. As such, a Solid Waste Asset Management Improvement Plan is being implemented to address gaps identified and a summary of this is outlined below. Further detail can be found in Section 8:

- If not already completed in 20/21 expand the Council Solid Waste team to enable more focus on Waste Minimisation and improvements to the activity;
- Assets registered in Asset finder, includes Closed Landfills & litterbins and locations;
- Proposal and Investigation of New purpose build Resort/processing Centre with Plastics washing and shredding plant in central Kaipara etc
    - partnership with local businesse/s
    - Investigate sources of funding
    - Investigate options for expanding Resort/processing centres to include composting of green waste and food waste.
    - Build in central location for ease of access and low-cost transportation (Mgto Rail?)

- Develop Litterbin Strategy and Policy
- Implement new Refuse and Recycling contract – Propose to split the contract
    a) Contract for Kerbside General Waste and Recycling collection and disposal & Transfer Station Management.
    b) Contract or Partnership with private business for Recycling processing.
- Installation of compaction bins (Mangawhai – Insley St shops, Dargaville waterfront)
- Installation of weigh bridges at the Dargaville Transfer Station and the new resort centre.
- Provision of Waste Minimisation, sustainable and circular economy education to communities and business, through Council Website/publicity and external groups funded by Council.
- Implement licensing of all refuse operators, this will include monthly or quarterly reporting of refuse and recycling collected
- Set up Trailer for community recycling at community events
- Build new Resort/processing plant in partnership with winning contractor above.
- Implement changes set by Central Government, these could include Container deposit Schemes, kerbside collection standardisation of refuse and recycling, both products collected and how we collect them.
- Climate Change readiness of Closed Landfills
- Reutilisation of some key Closed Landfill Sites, ie develop dog park at Kaiwaka site.

1 INTRODUCTION

1.1 PURPOSE OF THIS ACTIVITY MANAGEMENT PLAN

The specific purpose of this plan is to:

- Demonstrate responsible stewardship of the solid waste assets including transfer stations and closed landfill sites.
- Provide the basis for compliance with the local Government Act (LGA) tracking changes in service potential and determining optimal long-term financial strategies for solid waste assets.
- Provide a basis for customer consultation on levels of service and price/quality trade-offs.
- Manage the environment, social and financial risks associated with solid waste assets.
- Assess the demand and key performance indicators for solid waste assets.

This AMP provides discussion of the key elements affecting management of Council's Solid Waste asset, including the legislative framework, links to community outcomes, policies and strategy, the proposed levels of service , performance measures and demand, environmental and service management. This AMP period being 2021 – 2031

Asset condition and location are examined and a financial summary is presented to define the investment planned to address issues, enable consent compliance and to ensure that an uninterrupted service is available and facilities provided to meet customers' needs now and into the future.

All financial forecasts have been prepared from Council's historical budget allocations. The information contained within the AMP is substantially complete and up-to-date. With the document being used on a day-to-day basis the information will change to meet the District's changing needs.

1.2 KEY BUSINESS ACTIVITIES, GOALS AND OBJECTIVES

Solid Waste assets and services form an infrastructure network which is critical to the health and quality of life of Kaipara District's residents, primarily supporting the community outcomes of 'Safety and a Good Quality of Life' and 'Special Character and Healthy Environment'. Kaipara District Council's (KDC) Solid Waste vision is "To reduce waste and increase recycling and resource recovery for the protection of the environment and human health".

There are currently no operational landfills in the Kaipara District. Instead, two transfer stations are provided in Dargaville (Awakino) and Mangawhai (Hakaru) for the handling of non-hazardous solid wastes. Provisions are available for the disposal of some hazardous waste at both transfer stations which are then dealt as per requirements e.g. paints, televisions.

The Solid Waste assets owned by Council are limited to land and minor site facilities. Most assets used in the delivery of the solid waste services to Kaipara are owned by appointed Contractors. This means that Council does not directly carry the capital costs of asset ownership, including finance charges, depreciation and renewal costs. Overall, the Council manages approximately $70,000 (excluding land) of solid waste infrastructure assets on behalf of the community. The Solid Waste asset operates as a user pays system with those using the system paying either at the point of collection or disposal. There are also 14 closed landfills that KDC monitors in accordance with resource consent conditions.

KDC aims to provide affordable, hygienic, refuse collection and disposal that is environmentally sustainable, meets our statutory requirements and meets the needs of our communities. The community expectation is that KDC will provide solid waste services and levels of service that meet the needs and affordable expectations of the community. We are aiming to continue to deliver the current levels of service within this activity.

1.3 DRIVERS FOR ASSET MANAGEMENT

This plan has been written to provide information required for good asset management planning as set out in:

- LGA 2002 Schedule 10 and amendments
- Office of the Auditor General criteria for AMPs 2006
- International Infrastructure Management Manual (IIMM) 2011, published by New Zealand Asset Management Support (NAMS)

Key achievements from previous AMP 2017 – 2020

- Dargaville closed landfill capping has been completed and now meets consent requirements.

Hakaru Leachate issues will be resolved in the 2020/21 construction year.

1.4 RELATIONSHIP WITH OTHER PLANS AND STRATEGIES

Activity management plans are a key component of the Council planning process, linking with the following plans and documents:

- Long Term Plan (LTP) – Required by Local Government Act 2002 to cover a period of at least 10 years, contains key information about Council's activities, assets, level of service (LoS) and cost of providing services.
- Annual Plan (AP) - Detailed action plan on Council's projects and finances for each particular year.
- Waste Management and Minimisation Plan – carried out under the Waste Minimisaton Act 2008 and follows a waste assessment and is reviewed every 6 years, this plan sets out how Council will progress efficient and effective waste management and minimisation.

1.5 SCOPE OF ASSETS AND SERVICES

The Solid Waste assets can be grouped as Transfer Stations, Closed Landfills, Public Litterbins and Collection Cages owned by KDC. These are limited to land and minor site facilities. These are:

- Freehold title (with a 'gift back' clause) to the land on which the Hakaru landfill is situated
- Freehold title to 3 of the 14 closed landfill sites.
- 7 Closed Landfills on Road Reserve.
- Freehold title to the land on which the Dargaville Transfer Station is situated.
- Leachate detention ponds, treatment facilities and landfill capping at some closed landfill sites
- Leachate monitoring boreholes (Temaire, Mangawhai, Parawanui, Hakaru and Glinks)
- Minor infrastructure assets at closed landfills (fencing, accesses, stormwater, landscaping and planting)
- Shed/garage located at Dargaville Transfer Station and used as office/storage by Contractor, Bottle collection Bay and Recycling Container.
- Collection cages at specific points for bagged solid waste to be dropped into by residents.
- All assets associated with the Hakaru Transfer Station are privately owned by the respective contractors, other than the land and a few minor assets (pump station and telemetry) that are owned by Council. At the Awakino Road site, other assets include a wetland and office/storage shed and the recently added recycling storage areas.
    - Need to add in about the further landfills that we know little about

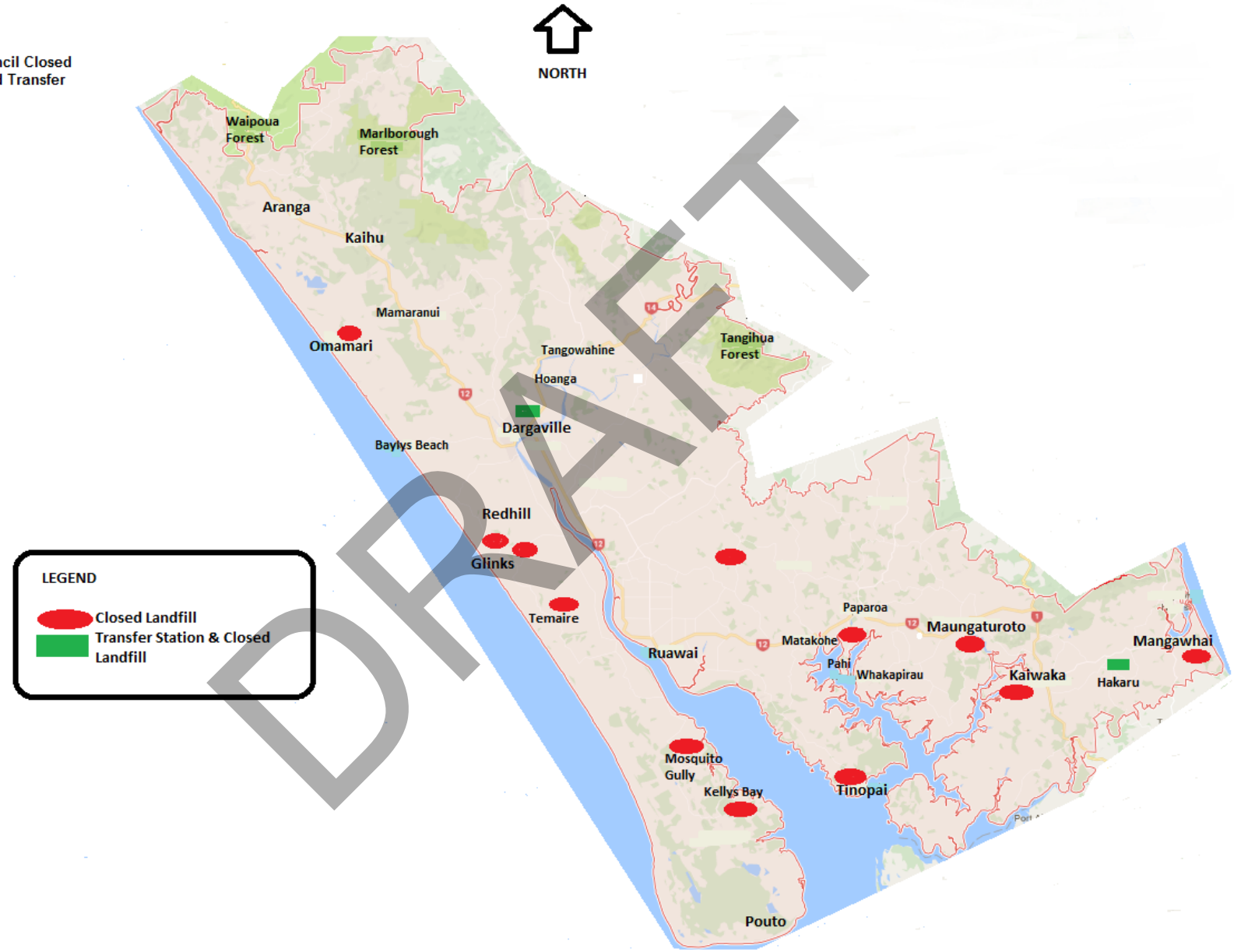
Overall, the Council manages $70,000 (excluding land) of solid waste infrastructure assets on behalf of the community. The land values are revalued regularly (a copy of the latest valuation is presented in Appendix A of this document). The Council-owned minor site facilities and infrastructure are not currently valued

by Council for formal depreciation and renewal purposes. Asset value is relatively minor and most assets are owned by the Contractors. Nevertheless, annual budget provisions are made for the replacement of minor site assets as required.

KAIPARA DISTRICT

Figure 2

Location of Council Closed Landfill sites and Transfer Station



The majority of solid waste infrastructure assets have lifecycles far greater than 10 years however, to facilitate and demonstrate alignment with the Long Term Plan 2021/2031, the content in this AMP focuses upon the next 10 years. In practice, asset management planning tends to consider much longer timeframes.

The main solid waste services provided to the Kaipara District include:

- Transfer Stations (Dargaville and Hakaru)
- Weekly (kerbside) General Waste Collection
- Weekly (kerbside) Recycling Collection
- Public Litterbin Servicing
- Closed Landfill Management
- Abandoned Vehicle Removal
- Illegally Dumped Rubbish Removal & investigation

More information can be found in the WMMP 2020 which is available of the KDC Website.

The above solid waste services are managed through the following:

- In-house management and overview of Solid Waste Contracts, Illegal litter pickup and disposal and abandoned vehicle removals, as reported through Council's Helpdesk system.
- Contract for Eastern and Western Waste and Recyclables Collection, Disposal and Dargaville Transfer Station Operation
- Contract for operation and management of Council's Transfer Station (Hakaru).
- Closed landfill monitoring and compliance in partnership with NRC and Resource Consent conditions.
- Leachate removal (Hakaru Landfill site) – pending construction of onsite treatment facility 2020/21 construction season

1.6 RATIONALE FOR SERVICE

To promote and facilitate waste reduction, to collect refuse and recyclables from households, to dispose of waste and hazardous substances safely, and to continue with the rehabilitations and management of closed landfills.

In response to the asset management drivers outlined in Section 1.3, the Council aims to provide affordable, hygienic solid waste collection and disposal that is environmentally sustainable, meets Council's statutory requirements and meets the needs of its communities, at the current levels of service.

The key legislative rationale for continued Council involvement in the activity and ownership of assets is contained in:

- The Health Act 1956, which requires the Council to provide 'sanitary works', the definition of which includes works for the collection and disposal of solid waste.
- The Local Government Act 2002 (section 130) precludes the Council from transferring ownership or control of a strategic asset, or construct, replace or abandon a strategic asset, unless it has first consulted with the community and included the proposal in the LTP.
- The Waste Minimisation Act 2008, the purpose of which is to encourage waste minimisation and a decrease in waste disposal.
- The Resource Management Act.

Contribution to Community Outcomes

The table below sets out the Community Outcomes in Council's Long Term Plan 2018/2028. The solid waste service will contribute to the achievement of the outcomes as follows:

Table 1: Contributions to Community Outcomes

Refuse contributes to the following Community Outcomes	How this activity or service contributes
A trusted Council making good decisions for the future	The Solid Waste activity is managed in a safe, economic and environmentally friendy way
A district with welcoming and strong communities	Providing litter bins and removing illegally dumped rubbish as soon as practically possible.
A district with plenty of active outdoor opportunities	Pollution from leachate from landfills requires management to protect environmental quality

1.7 EFFECTS OF SOLID WASTE ACTIVITY

Historically, solid waste (refuse) disposal has been provided free to communities. Landfill sites across the Kaipara District provided easy access for the public to dispose of unwanted household and commercial waste with limited controls on what was being deposited. Through legislation, public awareness and changing community expectations regarding waste disposal, recycling and environmental concerns, waste management has changed significantly.

Recognition of the potential effects (both positive and negative) has grown overtime. The main effects of the Solid Waste asset can be described under the categories of: Environmental, Social and Economic.

Table 2: Potential Significant Negative Effects.

Negative Effect	Description	Council's Mitigation Measure
Solid Waste Activity (Social and environment effects)	**Kerbside Collections:** Loose kerbside recycling materials and broken solid waste bags may become windblown litter and odorous if not collected promptly.	This is managed through contract specification with regards to kerbside collection and also bylaws around when refuse and recycling should be placed out for collection.
	Transfer Station and Recyclable Facilities: Excessive recyclable and general refuse materials may become windblown litter.	This is managed through contract specification and regular inspections by Council staff to insure sites are tidy. Additional storage and fencing will be considered if this becomes an issue.
	Closed Landfills: Closed landfills can be targets for illegal dumping (fly tipping) which can become odorous and untidy. Also potential for odour issues arising from landfill gases escaping into the atmosphere.	Closed Landfills are inspected quarterly for fly tipping and gas odours**.**
	Public Litter bins: Capacity problems can cause bins to become over full (in holiday seasons) and overflowing litter is blown around the area	Council regularly reviews bin capacity and suitability with Contractors – this is largely managed by contractors, additional collections are completed over the seasonal periods where required.
Discharges of pollutants to water and land. (Environmental effects)	**Transfer Stations:** There is a possibility of stormwater contamination on site if materials are not managed well.	This is managed via separation of leachate and stormwater management systems and regular inspections of the separate systems
	Closed Landfills: If closed landfills are not capped off and vegetated correctly, they may release additional solid waste or leachate to the environment.	Closed landfills are Consented under the Northland Regional Council there are strict monitoring conditions on leachate discharge.

Negative Effect	Description	Council's Mitigation Measure
Disruptions of Service (Social and economic effects)	**Kerbside and Litter bin Collections:** Disruption to kerbside solid waste services can cause a public health effect if wastes are not collected in a timely manner	This is managed by the contractor – Council can utilise Sub contractor if Refuse contractor does not met contract conditions.
	Transfer Stations: Failure to open these sites can prevent businesses operating and create public health risks with the storage of waste on properties	Waste can be stored at residences or business for short periods of time. In the event of a long term closure waste, both kerbside and general waste can be transported directly to Puwera Landfill south of Whangarei.
Discharge or Migration of Landfill Gas (Environmental and economic effects)	**Closed Landfills:** Potentially explosive/flammable Landfill gases may have a noxious odour and could damage soil health and vegetation, there is also concerns around the emissions of greenhouse gases.	Council monitors Closed landfills as per Resource Consent conditions which includes monitoring for evidence of Landfill Gas, Northland Regional Council also monitor.
Unaffordable or uneconomic cost of Services (Social and economic effects)	**Recycling:** The loss of viable markets for recovered materials can have a negative effect on the economic viability of recycling	This is managed by Council Contractors. Council provides drop off locations for recycling through the two Transfer Stations and a recycling kerbside collection in the main urban areas, the Contractor is responsible for all marketing. This is a user pays service with no rate payer funding.
	Self-Haul Waste: Disposal costs are governed by conditions outside of council control – Gate and other disposal charges are influenced by these.	All refuse disposal is user pays and managed by the Refuse Contractors, any rise in costs by contractor has to be justified and approved by Council.
	Kerbside Collection: This is also influenced by conditions outside of council control.	As for above disposal is user pays and managed by Refuse Contractors.
	Transfer Stations: Gate charges are directly influenced by the cost of disposal at landfill.	Transfer station disposal costs are user pays, and any increases in gate charges need to be approved by Council.

Negative Effect	Description	Council's Mitigation Measure
		Transfer Station disposal activities are user pay basis, Council provides a small budget for property and asset maintenance.
	Public Litter bin Collections: Issues caused by illegal dumping of household rubbish and capacity issues over seasonal periods	This is managed by Council Contractors and a free service to the public. Capacity is increase over seasonal periods and bins monitored.
	Closed Landfills: Central government legislation governs how we manage Closed landfills, any changes could result in additional cost.	This is beyond Council control and any changes need to be managed and prioritised. Regular inspections are completed to ensure Closed Landfills are up to the current standards.
Illegal dumping: (Environmental, economic and Social effects)	Any reports of dumping are dealt with promptly and if offenders identified they are prosecuted.	When dumping is reported Council manages the clean up as soon as practicably possible, offenders are prosecuted where evidence is found.

Table 3 : Potential Significant Positive Effects

Positive Effect	Description
Public Health Benefits	Council offers kerbside collection services and provides Transfer Stations in two locations across the district. This provides safe and sanitary disposal to a significant majority of residents.
Economic Benefits	Access to waste disposal and recycling services at reasonable cost supports economic activity.
Environmental Benefits	Provision of recycling services, and other waste minimisation activities reduces the refuse going to landfill and reduces potential negative effect of these activities.

1.8 KEY ISSUES AND ASSUMPTIONS FOR THE FUTURE

The key issues relating to the future provision of solid waste services in the Kaipara District have been identified as follows:

- **Ability to meet community expectations around the District -** Although the latest NZCPM Survey indicated a slight drop in satisfaction from the previous quarter, Council considers that there is still a high percentage of satisfaction with the level of service being provided.
- It is expected that the demographics of the District will change especially at the Eastern end of the district, expectations for services currently not provided may increase, this will directly impact on the volume being collected and disposed of through the transfer station gates.
- **Increasing Disposal costs at Landfills –** Disposal costs at Landfills are governed by ETS, Waste Levy, Environmental Protection Costs and other general operational expenses, these are outside of Council control and are expected to significantly rise in the coming year, with Central Government investigating options to rise the Waste Levy from the current $10 per tonne to $60 per tonne over the next 3 years.
- **Sustainable pricing for District-wide kerbside solid waste and recycling bag collection -** For the service to continue to be sustainable, it requires the Contractor to price at a level that maintains its viability, encourages use and grows usage of the service, however some of the costs associated with this activity especially disposal costs are often outside of the Contractors control. The Contractors currently rely on the sale of refuse bags to ensure a sustainable collection and disposal service, options are being explored by both Council and Central Government with regards to both general refuse and recycling collections that would see improvements to the current service provided but will likely see an increase in costs to both Council and users. The current recycling collection is not sustainable and needs changes in both collection services provided and processing activities.
- **Waste Diversion –** current recycling conditions are making it very hard to keep diversion rates down, this is largely due to lack of markets for recycled products(NZ wide issue) and the High transportation costs to get the product to market, Council is going to look at future options of providing the first step of processing of products to allow for a much better quality product to be sold at markets. Central Government are also looking at introducing changes to help in this area such as Compulsory Product Stewardship, Container Deposit Schemes, Standardisation of Kerbside collections, these are expected to come into play over the next 1 – 2 years and will effect costs for the provision of this service.
- **Increase in illegal dumping (fly tipping) including abandoned vehicles -** This may occur as a result of changes made nationally that can influence disposal costs i.e. the cost of carbon credits and Waste Levy raises effect the cost to dispose to landfill,
- **Availability of Waste data –** There are several waste streams that are known to exist but are difficult to quantify, This means that both waste disposed to landfill and waste diverted/recovered are likely to be underestimated. The 2008 Bylaw is currently under review, this will see a requirement of all

waste contractors/collectors to provide data (type and amount collected and where it is being disposed of), this will allow for a more accurate picture of waste generated in the Kaipara District.

- **Whangarei District Council Disposal Facility** – Kaipara District Council will continue to use this Facility.
- **Increase in retired population and decrease in solid waste volume –** An increase in retired population directly relates to a decrease in solid waste being picked up and delivered to the transfer stations. The viability of these transfer stations is based on the volumes of solid waste transferring through them.
- **Leachate and capping conditions of Closed Landfills -** this is managed by way of regular inspections as per consent conditions, with maintainence needs identified and carried out as budgets allow.
- **Increasing statutory requirements on existing and closed landfills -** The potential for additional (unforeseen?) costs, which have not been forecast, may apply to Council on its closed landfill sites requiring additional resource and/or expenditure to meet requirements e.g. there is a potential risk that any renewed consents will have more stringent conditions than previously, there is also risk that due to climate change coastal closed landfills will require upgrading.
- **Financial operational costs associated with closed landfill site management -** Closed landfill sites require on-going management throughout their resource consent lifespan and following on from that term. The minimum requirement being regular annual inspections of the site, reporting and possible maintenance work as a result, data information updating and Resource Consent renewals . These are all ongoing costs which have to be allocated and budgeted for.
- **Climate change –** Council is planning to carry out investigations with regards to informal Closed Landfills in particular those in coastal areas, also consented closed landfills that are in Coastal areas, a forward works plan will be developed to have these landfills brought up to a standard that protects them into the future.
- **Organic Waste** – Council will investigate potential opportunities to work/partner with private investors to introduce organic waste collections.

2 LEVELS OF SERVICE

2.1 INTRODUCTION

Transfer station facilities are currently provided at Dargaville and Hakaru. User-pays charges apply to solid waste and some recycling deposited at the transfer stations. These are operated as a self-funding enterprise by the appointed Contractor.

Solid Waste services are delivered through two main contracts. These cover:

- Weekly bagged (kerbside) Solid Waste and Recycling collection in Urban areas and some Rural areas at designated points, public litterbin clearing across the District and operation of the transfer station in the western part of the District (Awakino Road, Dargaville). The kerbside collection service is self-funding (user pays) and the appointed Contractor collects revenue from the sale of Council approved bags, litterbin clearing and litterbin control; and
- The operation of the solid waste transfer station in the south eastern part of the District (Hakaru, Mangawhai).
- Currently all solid waste from Dargaville and Hakaru is transferred to Whangarei's Puwera commercial landfill.
- Recycling services are undertaken weekly in association with the weekly bagged kerbside collection (major urban areas only) from Mangawhai to Dargaville.
- Abandoned vehicles services and illegal dumping retrieval are carried out as and when required, separate to contracted services.
- There are also a number of historic closed landfill sites that KDC has responsibilities for and carries liability for ongoing monitoring and maintenance, as well as reinstatement obligations for their closures.
- Setting service levels and associated performance measures assists to define the service standard that the customer can expect from the Council. Performance measure targets provide a basis for measuring the Council's performance through identified indicators.

Proposed Levels of Service

The minimum level of service proposed for use in the development of the Council's next Long Term Plan 2021/2031 set for activity is:

- Receptacles in public places comply with Litter Act 1979
- All residents have access to rubbish collection or Transfer Station drop off service at cost
- All residents have acess to recycling collection or Transfer Station drop off service at cost.
- Legal compliance for closed landfills.

KDC recognises that a key asset management function is to understand who our stakeholders are, what they value and why. Stakeholders are defined as groups or individuals with either a direct or indirect interest in KDC's solid waste asset management policies and practices. Key stakeholders are listed in the KDC Activity Management Overview.

2.2 COMPLIANCE AND STRATEGY

Solid Waste is governed by many statutes, regulations, standards and Codes of Practice. KDC aims to achieve material compliance with all relevant legislation, regulations, standards and codes of practice that relate to solid waste management, including any relevant environmental legislation.

Compliance Requirements

Legislation provides the minimum requirements for levels of service. The main legislation driving solid waste activities are:

- Resource Management Act 1991 (RMA);
- Local Government Act 2002 (LGA);
- Waste Minimisation Act 2008 (WMA);
- Climate Change Response Act 2008 (CCRA).

The Resource Management Act 1991

The RMA provides guidelines and regulations for the sustainable management of natural and physical resources. Although it does not specifically define "Waste", the Act addresses waste management and minimisation activities and facilities through national, regional and local policy, standards, plans and consent procedures. In this role, the RMA exercises considerable influence over facilities for waste disposal, recycling, recovery, treatment and others in terms of the potential impacts of these facilities on the environment.

Under Section 31 of the RMA, regional councils are responsible for controlling the discharge of contaminants into or onto land, air or water.

Under the RMA, Territorial Authority responsibility includes controlling the effects of land-use activities that have the potential to create adverse effects on the natural and physical resources of their district. Facilities involved in the disposal, treatment or use of waste or recoverable materials may carry this potential. Permitted, controlled, discretionary, non-complying and prohibited activities and their controls are specified within district planning documents, thereby defining further land-use related resource consent requirements for waste related activities.

Local Government Act 2002

The LGA sets out the requirements of Council to deliver services and the responsibility of the Council to make assessment of services provided. This Solid Waste Activity Management Plan constitutes the process by which this assessment is carried out by Council and reported to the public through the LTP.
The LGA places an obligation on Council to strive towards sustainable development for the District. The Social, Economic, Environmental and Cultural wellbeing of the community must be considered when objectives are developed for the solid waste activity.

Waste Minimisation Act 2008

The WMA encourages a reduction in the amount of waste generated and disposed of in NZ and aims to lessen the environmental harm from waste and aims to benefit the NZ economy by encouraging improved use of materials throughout their life. The WMA sets out to achieve this through the following:

- Places a levy on wste disposal to landfills;
- Funds waste minimisation grants;
- Allows regulations to be made to make it mandatory for territorial authorities and the waste sector to report on waste to improve waste minimisation;
- Manages producer responsibility programmes;
- Directs territorial authorities with respect to waste minimisation responsibilities;
- Set up a Waste Advisory Board to provide independent advice to the Minister for the Environment with respect to waste minimisation.

Part 4 of the WMA is fully dedicated to the responsibilities of TAs which “must promote effective and efficient waste management and minimisation within their districts” (s42). Kaipara District Council has a statutory responsibility to promote effective and efficient waste minimisation and, for this purpose to adopt a waste management and minimisation plan. This legislation requires the completion of a Waste Assessment prior to the review of the WMMP. Council is currently undergoing this process with a Waste Assessment completed in 2016 and the 2017 Waste Management and Minimisation Plan out for Public Consultation, it is expected this will be adopted in Sept 2017. – Kaipara District Council has a statutory responsibility to promote effective and efficient waste minimisation and, for this purpose to adopt a waste management and minimisation plan.

Climate Change Response Act 2008

The CCRA provides the basis for the NZ Greenhouse Gas Emission Trading Scheme. This Act requires landfill owners to purchase emission trading units to cover methane emissions generated from the landfill.

Other Legislation

The following is a summary of other legislation that must be considered with respect to waste management.

- The Hazardous Substances and New Organisms Act 1996 controls the handling and disposal of hazardous substances;
- The Health Act 1956 aims to prevent nuisance and promote public health;
- LGA (Rating) Act 2002 allows Council to determine a rate or charge for any activity Council chooses to get involved in;
- The Health and Safety at Work Act 2015;
- The Litter Act 1979 – is enforced by territorial authorities, who have a responsibility to monitor litter dumping, act on complaints, and deal with those responsible for litter dumping.

Along with the above national legislation there is also Northland and Local Legislative Requirements.

Regional and Local Policies, Regulations and Strategies

- Northland Regional Policy Statement;
- Northland Regional Air Quality Plan;
- Northland Regional Coastal Plan;
- Northland Regional Water and Soil Plan
- KDC LTP & Annual Plans
- KDC Solid Waste Asset Management Plan
- KDC General Bylaws 2008 Part 4
- Waste Management and Minimisation Plan 2017 – 2022 (currently under review)

Industry Guidelines and Standards

In addition to legislation and policy there are also a number of industry guidelines and standards specific to waste, some of the more relevant standards and guidelines are listed below:

- NZS 7603:1979 Specification for refuse bags for local authority collection.
- SNZ HB 4360:2000 Risk Management for Local Government
- AS/NZS ISO 31000:2009 Risk Management Principles and Guidelines
- NZS 3910:2013 Conditions of contract for building and civil engineering construction
- NZS 4454:2005 Composts, soil conditioners and mulches
- MFE – A Guide for the Management of Closing and Closed Landfills in New Zealand.

2.3 STRATEGIC GOALS

The Acts and regulations outlined in the previous section state the minimum requirements for some Levels of Service and objectives. Further to this, Council states the following five goals that drive the focus for solid waste services provided:

Table 4: Solid Waste Goals

Goal	How the Solid Waste asset contributes
To maximise the diversion of waste from landfill.	The 2017 Waste Minimisation and Management Plan sets out how Council will support this goal.
To provide safe, environmentally sustainable and hygienic refuse collection and disposal.	Council provides Kerbside General Refuse and Recycling Collections, and two transfer stations for drop off of refuse and recycling. To implement licensing in accordance with the current (2016) bylaw no later than March 2018.
To reduce illegal dumping and associated negative environmental impact.	Council provides an affordable user pays system and transfer station facilities located in areas of the District which is financially sustainable. All reported illegally dumped rubbish to be cleaned up within 72hrs. Refuse searched and when offender identified an infringement is issued.
To provide services to residents that represent great value and maximise local employment and business.	Kerbside collection, recycling and transfer station activities are all managed by contractors and are based locally within the Kaipara.
To ensure compliance and knowledge of current and relevant legislation.	Council consults and works with other local authorities/councils

2.4 COMMUNITY EXPECTATIONS

The types of services provided by KDC is largely driven by community expectations. Understanding community/stakeholder expectations is therefore an important part of the process for setting levels of service and managing solid waste assets to meet these. The main tools used by KDC to seek feedback from the community is through the Customer Service Request system, Face book Surveys and an Annual survey conducted by Key Research Ltd.

Customer Service Requests

Fig 3 – Comparison between total SR's and Solid Waste SR's

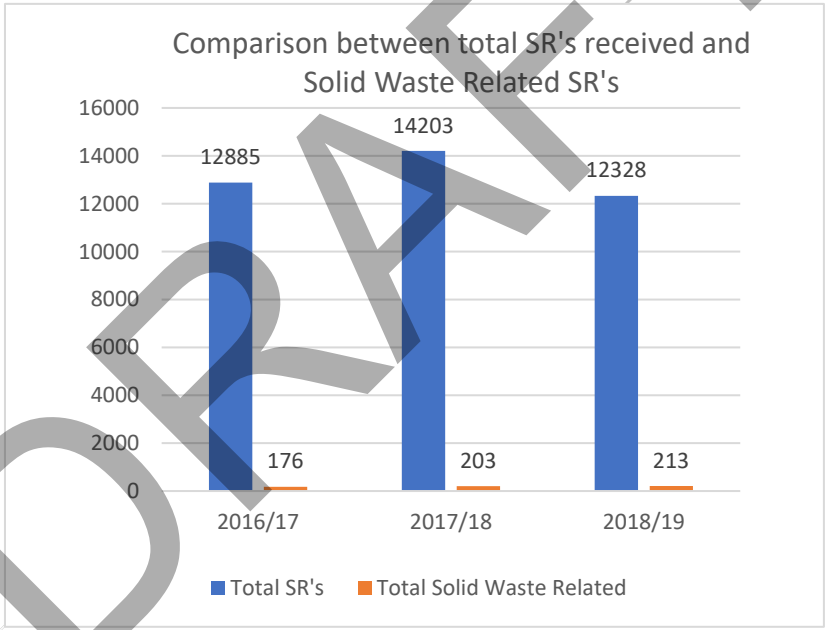
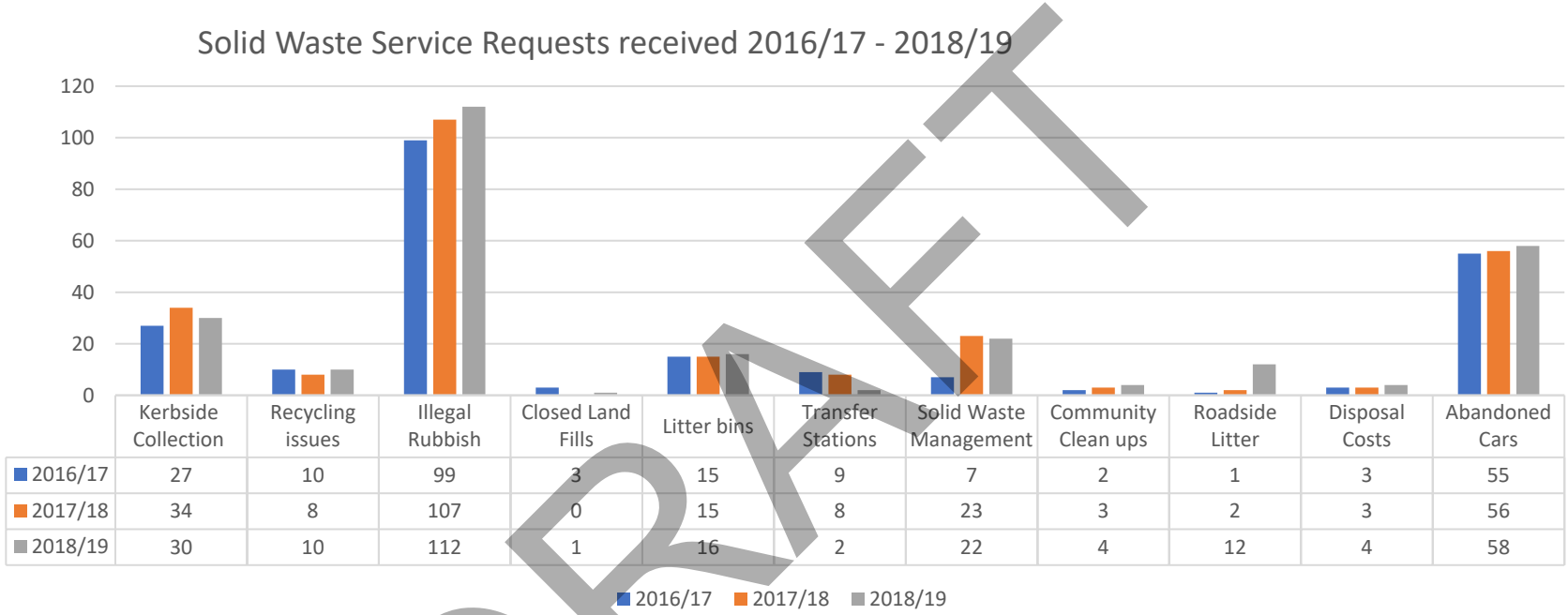


Fig 3 - shows a comparison of Solid Waste Service Requests with all Service Requests received by Council.

The percentage of Solid Waste related service requests ranges from 1.37% in 2016/17 up to 1.72% in 2018/19.

Fig 4 – Breakdown by type of Solid Waste Service Request



	Kerbside Collection	Recycling issues	Illegal Rubbish	Closed Land Fills	Litter bins	Transfer Stations	Solid Waste Management	Community Clean ups	Roadside Litter	Disposal Costs	Abandoned Cars
2016/17	27	10	99	3	15	9	7	2	1	3	55
2017/18	34	8	107	0	15	8	23	3	2	3	56
2018/19	30	10	112	1	16	2	22	4	12	4	58

Fig 4 – demonstrates a breakdown in service request types, illegal rubbish continues to be the main source of complaints(illegal rubbish is mostly made up of roadside dumping of general household rubbish, there is also a small component of illegal bags used at collection points, it also shows that abandoned vehicles continue to be an issue.

Survey Results

Fig 5 – Shows a comparison of survey results from 2016 – 2019.

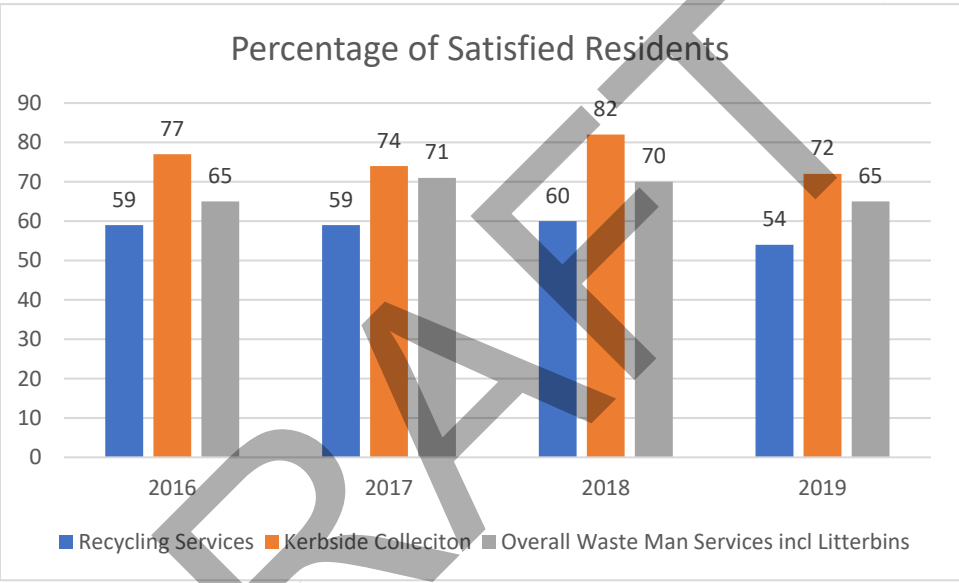


Figure 5 demonstrates that indications from the Annual survey conducted by Key Research Ltd 2016 are that Recycling and Kerbside Collection services are improving overall there is a decline in satisfaction with litter bin services being provided across the District, capacity seems to be the main issue, this is an issue due to freedom campers and house hold rubbish being dumped in litterbins. A review of litter bin capacity, frequency of clearing and locations forms part of the Solid Waste improvement plan, Section 7 IP 3. This is scheduled for 2017/18 financial year.

Table 5 : Performance Levels and Targets

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
Percentage of residents who are satisfied or very satisfied with waste management.	70%	70%	75%	75%
Total amount of recycling(diverted from landfill) as a percentage of total waste collected	1% more than previous year.	1% more than previous year.	1% more than previous year.	1% more than previous year.
Closed landfill activities meet legislative compliance. No resource consent abatement notices, infringement notices, enforcement orders or convictions.	NIL	NIL	NIL	NIL

2.5 CURRENT FEES AND CHARGES

Solid Waste Collection

Only one Council bagged (kerbside) collection contract is operational in the District. The contract uses a bag system and the charges are as follows:

General Refuse Bagged (kerbside) collection $3.10 per bag

Recycling Bagged (Kerbside) collection $1.50 per bag

The charges are subject to change from time to time, after proof of justification by Council's appointed Contractor. The charge per bag is not dissimilar from a variety of other councils in New Zealand as shown in the table below.

Table 6: Cost Comparison for Rubbish Charges: Other Councils (2020)

Name	Population	Cost of bags General Waste Kerbside (65L)	Cost per M³ General Refuse at Transfer Station	Cost per M³ Green Waste at Transfer Station
Tararua District Council	18,500	$6 (per bag at Trans station)	$45	$15
Hauraki District Council	18,550	$2.80 (subsidised by rates)	$63	$40
Far North District Council	64,647	$3.00	$46	$22
Whangarei District Council	87,600	$2.80 (subsidised by rates)	$50	$25
Gisborne District Council	48,016	$2.80 (subsidised by rates)	$131 (or $328 p/t)	$49 (or $149 p/t)
Whakatane District Council	37,100	$4	$96 (or $242 p/t)	$19 (or $57 p/t)

Solid Waste Disposal

The rates for disposing of solid waste at the Hakaru Transfer Station and the Dargaville Transfer Station are as follows:

Hakaru Transfer Station $68.00 per cubic metre

Dargaville Transfer Station $53.00 per cubic metre

Both charges are subject to change based on Consumer price index by Council's appointed Contractor, any price rise requests have to be approved by a full Council meeting prior to being implemented.

Recycling

The total volume of material currently recycled within the District is not accurately known. From past audits and observation it is expected to be approx. 19 - 21% of the total waste stream. Recycling is not a Council-owned initiative but is a project being undertaken by Kaipara Refuse Ltd.

District-wide in approved areas $1.50 per bag

Transfer station Charge – Dargaville from $2 per Car

Transfer station Charge – Hakaru from $3.50

NB: for a comprehensive list of fees and charges refer to the Council Website.

3 FUTURE GROWTH AND DEMAND - INTRODUCTION

The KDC Activity Management Plan presents the growth and demand factors that impact on the Council's solid waste management infrastructure and this plan describes how we plan to respond to growth and demand for solid waste management services in the future.

Important drivers for future growth and demand are:

- Population
- Dwelling Growth
- Economic development
- Central Government & Waste Minimisation Initiatives(need to improve recycling facilities and options – these are not limited to the Kaipara District but are NZ wide).
- Changing Customer needs and expectations

However proposed government initiatives that relate to kerbside Collection of general waste and recycling could see a shift in user pays to a targeted or general rate funded activity, this will see an increase in services provided in particular to the Rural sector.

Implications for Solid Waste: Because the district's kerbside collection and Transfer Station operations being a user pays service, there will be no impact on solid waste services. **Implications for Solid Waste:** Because the district's kerbside collection and Transfer Station operations being a user pays service, there is very little impact on solid waste services as a result of unoccupied dwellings increasing.

3.1 ECONOMIC DEVELOPMENT

The annual average unemployment rate in Kaipara district was 4.3% in June 2019, down from 4.6% a year earlier (Infometrics, 2019). Kaipara's unemployment rate is consistently lower than in other parts of Northland and typically sits near the national average.

3.2 CENTRAL GOVERNMENT AND WASTE MINIMISATION

Notwithstanding the above, there are several drivers for waste minimisation in the Kaipara district:

User Pays

The user pays nature of the KDC refuse collection service encourages waste minimisation. The advent of recycling in the district is also aimed at reducing current landfill levels. Based on earlier estimates this transferral could reach as high as 35%(through the life of this AMP). Recycling is an initiative that has no ratepayer funding. Instead, KDC currently supports recycling by distributing the Waste Minimisation Levy that is returned from central government. However, only limited recycling services are offered by the service providers undertaking both the kerbside collection and Transfer Station operations for KDC.

Increasing awareness of waste minimisation opportunities will tend to slow the rate of increase in waste quantities. On this basis, the waste stream from existing waste sources is expected to increase at a slow rate over the next ten years. The increase generated by population growth can be expected to be offset initially by the effects of increased waste minimisation efforts.

3.3 GENERAL REFUSE.

The tables below show that Kaipara district residents only create approx. half of the waste per year per capita than those in the rest of New Zealand, Kaipara's total measured waste disposal is equivalent to only 0.2% of NZ's overall annual waste disposal, this could be attributed to more relaxed rules in Kaipara that allow open fires, incinerators etc, waste that is disposed of via this method is unreported.

There is insufficient reliable historical data available to analyse long term trends in waste generation in the Kaipara district. However, the trend towards greater recycling and waste minimisation is likely to characterise waste volumes generated over the next decades.

General Refuse Disposal Comparison with the rest of NZ

Table 9: Kaipara district disposal quantities

Year	Total Waste – tonnes/year	No of households	Average kg/Waste per household	Population	Average Kg/Waste per capita per day	Average Kg/Waste per capita per year
2017	4776	9380	509	22,935	0.57	208
2018	6585	9689	679	23,565	0.77	281
2019	7067	9962	709	24,100	0.80	292

Table 10: New Zealand disposal quantities

Year	Total Waste – tonnes/year	No of households	Average kg/Waste per household	Population	Average Kg/Waste per capita per day	Average Kg/Waste per capita per year
2019						
2015	2,500,000	1,792,500	1395	4,596,700	1.49 kgs	544
2006	3,156,000	1,638,200	1926	4,027,947	2.14 kgs	783

3.4 RECYCLING

Over time recycling data is getting better and more accurate, although Council don't have a lot of data what we do have tells us that we are well on the way to achieving a significant diversion from Landfill, for the 2016/17 year we are at 21.41% diversion, with another quarter still to report on Council expects to achieve 23% for this year. This is up on the 12.77% for the whole of 2015/16. This can be attributed to better reporting, ie Council now gets data from Hakaru Transfer Station operations and because some private providers are no longer operating the majority of recycling is coming to either Councils Dargaville or Hakaru Transfer Station.

Table 11: Diverted Quantities (Tonnes)

QUANTITIES (Tonnes)	2017 (Tonnes)	2018 (Tonnes)	2019 (Tonnes
Total Waste taken to Transfer Stations (including recycling)			
Co Mingled	147	138	36
Clear Plastic	16		
Milk Bottles	10		
Green Plastic	4		
HDPE Mixed	10		
Milk Bottles Coloured	11		
Mixed Plastic	0.8		
Plastic Film	23		
Glass	546	60	127
Aluminium Cans	7.4		
Steel Cans	14.8		
Scrap Metal	144	143	104
Cardboard & Paper	511	543	462
Batteries	190	2	3.4

NOTES:

- Hakaru data has been estimated for the last quarter of 2016/17 (based on quantity reported for previous 6mths)

- 2014/15 & 2015/16 data only includes an estimate for Hakaru under mixed recyclables. Prior to 2017 there was no reporting of quantities from Hakaru.

- Higher recycling figures for 2016/17 can be attributed to the closure of a private scrap metal dealer, all recycling going to this dealer was unreported, it is now being captured, and the reporting of quantities from Hakaru Transfer Station.

- Dargaville scrap metal data is not included but will be reported from 2017/18.

Gas Bottles		0.6	2	
E Waste		2	7	
Green waste		48	160	
Tyres		5.1	2.3	
Total Recycling	1086		1086	
% Diverted from Landfill	19%		19%	
Total to Landfill	4545		4651	

Organic Waste

Another possible waste reduction activity would be diversion of green waste from the landfill. At present only a very small volume of green waste is disposed of at Hakaru and Dargaville Transfer Stations. The tipping fees in the district are believed to be a significant incentive for users to divert green waste themselves. As a result green waste diversion would be minimal and can be ignored. Council as part of the Solid Waste improvement plan Section 7 (IP 7) would like to promote and educate people around home composting. This is proposed for 2018.

Waste Minimisation and Management Plan

KDC's Waste Minimisation and Management Plan (2017) contains strategies for the management of waste streams, minimisation of waste generation and disposal for the Kaipara district over the next ten years. Details of Council's waste strategies will occur through the Long Term Plan 2018/2028.

3.5 FUTURE WASTE STREAM OPTIONS

Transfer Stations – Hakaru and Dargaville.

Waste from the Eastern area is taken to Hakaru Transfer Station. The estimated volume is approx. 342 tonnes per month. This waste includes the Eastern Kerbside collection, loose refuse and loose recycling.

Waste from the Western area is taken to the Dargaville Transfer Station. The estimated waste volume is approximately 296 tonnes per month. Refuse disposed here includes kerbside collection, loose refuse and loose recycling.

All the general waste collected at the above transfer stations is transported, moderately compacted, in hook bins loaded on to trucks to Puwera Landfill South of Whangarei. Recycling collected at both Transfer Stations is managed by the appropriate Contractor.

The user pays nature of the KDC refuse collection service also encourages waste minimisation. The advent of recycling in the district is also thought to help reduce current Transfer Station tonnages.

As there are no operating landfills in the Kaipara area, Puwera is the most economical option for refuse disposal.

Kaipara district Commercial or Industrial Waste

Some waste from commercial and industrial undertakings in Kaipara district is currently collected from commercial operators and disposed of outside the District. For example, Countdown in Dargaville operates a waste management system where some material is recovered and recycled (paper and cardboard), organic material (food waste) is diverted to animal feed, and the residual waste is disposed of at Whangarei district Council's Puwera Landfill. The volume of waste available from this source is not known, and could only be established by a detailed and extensive survey of businesses in the district. To redirect elements of this waste stream to either Kaipara owned Transfer Stations would involve a significant price incentive or subsidy, this is not an option being considered with our current user pays policy.

4 LIFECYCLE MANAGEMENT

4.1 INTRODUCTION

It is considered that both transfer station (Hakaru and Dargaville) sites will be able to meet both current and future volume increases.

The assets most likely to require renewal or refurbishment over the twenty year planning period are the leachate control devices, monitoring equipment, improvements to refuse sorting and recycling facilities and minor stormwater matters.

Other aspects of landfill operations will continue such as management and control of pests, dusts, stormwater, leachate along with capping, any other items required by resource consent and liability for any eventual closure of landfill sites and their return to pasture.

The following section outlines what KDC does to manage and operate these assets.

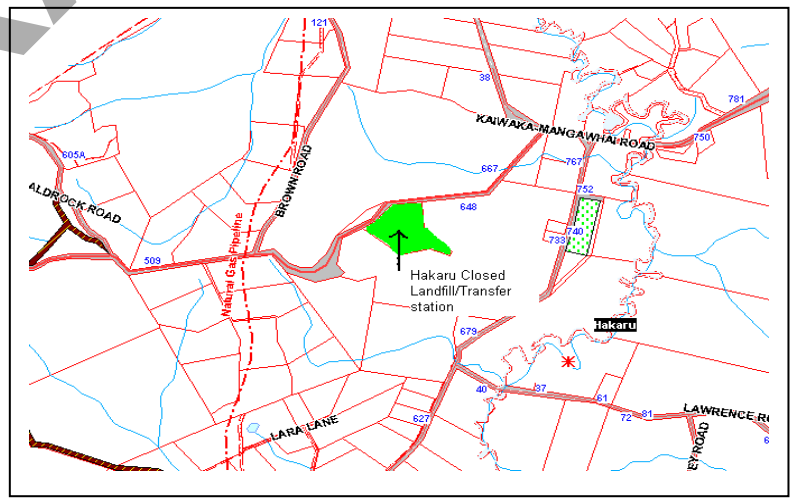
4.2 TRANSFER STATIONS

4.2.1 HAKARU TRANSFER STATION

Figure 6 – Hakaru Transfer Station Site

Aerial Map

Location Map



Asset description

This facility caters for the south eastern area of the District which includes the communities of Mangawhai, Kawaka, Maungaturoto and their surrounds and is located approximately six kilometres east of Kaiwaka on the Kaiwaka-Mangawhai Road. The location of the site is shown in Figure 6. The surrounding countryside is rolling pastureland with scattered dwellings and ancillary farm buildings.

While the site now operates as a transfer station, it was initially developed as a landfill in 1997 and operated as such until 2005. In 2007 operation of the transfer station commenced at the site and the landfill was closed. KDC has an obligation to restore the site to a levelled high quality pasture and gift the land back to the original owner or benefactors no later than 30 years from settlement, this would be expected around 2027.

The land at this site, which covers an area of approximately 4.4 hectares, is owned by the KDC however all major infrastructure and processing assets in relation to the transfer station operation on the site are owned and operated by the Contractor.

Operation and Maintenance

Operations and maintenance of the transfer station are completed by the Council contractor

Renewals and Improvements

All infrastructure associated with the operation of the site as a Transfer Station facility (e.g. buildings, collection bins, machinery) are owned and managed by the Contractor. There are no planned renewals for any part of the Transfer station operation.

4.2.2 DARGAVILLE (AWAKINO RD) TRANSFER STATION

Asset Description

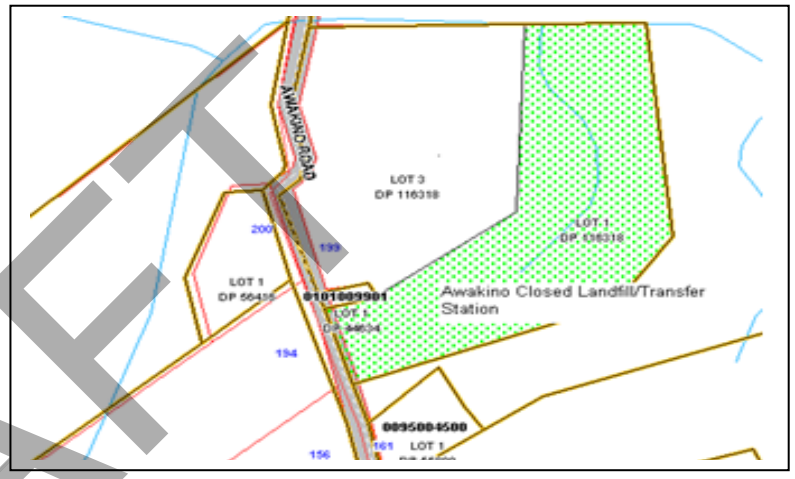
This facility caters for the north western area of the District which includes the communities of Dargaville, Te Kopuru, Baylys and the surrounding communities and is located on the outskirts of Dargaville in a semi-rural location. The location of the site is shown in Figure 7. The surrounding land is rolling to flat predominately grazing and cropping. The surrounding catchment empties into the nearby Awakino River.

While the site now operates as a transfer station, it was initially developed as a landfill with disposal operations commencing in about 1922. In 2011/2012 an investigation on possible locations and options for a new transfer station and possible recycling facility was carried out. The current site at Awakino Road proved to be the best option for the foreseeable future. In 2000/2001 the landfill was closed and the transfer station commissioned.

Figure 7: Dargaville Transfer Station Site

Aerial Map

Location Map



Operation and Maintenance

- Stormwater **-** Stormwater is diverted around the site along a stormwater bypass which feeds into the treatment area. The treatment area consists of an artificial pond/wetland planted to filter and polish the stormwater before entering the surrounding drainage system. In 2009 two sumps were excavated to capture stormwater runoff from the solid waste transfer area.
- Resource Consent Requirements - The NRC discharge consent (Permit N°4433) for any leachate leaving the Awakino Landfill was issued on 10 November 1994 and expired in 30 June 2003. Renewal process in currently underway and it is expected to have consent in the 2017/18 financial year. Although the consent is essentially for the Closed Landfill there are likely to be conditions that will effect transfer station operations. Until the consent is finalized it is intended to continue monitoring in accordance with consent N° 4433

Renewals and Improvements

No renewal works are planned at the site. Council owned infrastructure associated with the operation of the site as a transfer station facility consists of a buildings used as office and storage all other infrastructure e.g. collection bins and machinery, are owned and managed by the Contractor. Some improvements to refuse sorting and recycling facilities can be expected.

Disposal/Closure Plan

While there is currently no defined plan for post-closure use of this site, the intention is likely to be for Council to retain the site and surrounds and incorporate it into the land Council owns surrounding the site into pasture and graze under a lease arrangement.

4.3 CLOSED LANDFILLS

There are 20 known closed landfills of which 14 are Consented in the Kaipara District. A further 6 sites were locations identified where informal or illegal dumping has occurred in the past.

The closed landfills require ongoing maintenance, monitoring, periodic renewal of assets, possible creation of new assets to keep the closed landfills in compliance with NRC requirements and identified Community Outcomes under the LGA 2002. The 14 Consented Closed landfills are as follows:

Pahi Road (Paparoa)	Dargaville Borough (Awakino Road closed landfill, now operates as a transfer station)
Glinks Gully	Hakaru (Mangawhai/Kaiwaka Road, now operates as a transfer station).
Kaiwaka (Oneriri Road)	Parawanui Road
Mangawhai	Te Maire
Tinopai	Mosquito Gully
Access Road (Ruawai)	Kellys Bay
Omamari	Bickerstaff Rd

There are a further six informal or illegal tips (that Council is aware of) that are no longer in operation.

Pouto Point – illegal	Te Kowhai Road - illegal
Tangiteroria – illegal	Te Kopuru, Clean Street - illegal
Kaihu - illegal	Franklin Road - previously consented, no longer required.

At present, maintenance is undertaken on an 'as required' basis, as most of the closed landfills require only reactive maintenance and occasional vegetation control as they are now under pastoral grazing or other passive usage. Historic records and information for these sites is incomplete. While Council records and information on some of the landfill sites is very good, much of the information on many of the sites is limited due to their age and by the information provided at the time of Council amalgamation from the previous Dargaville Borough Council and Hobson and Otamatea County Councils. Most of the sites were developed before resource consenting was required. Council's information and records are improving as information from inspections and monitoring continues and as consents are renewed. Further information is also contained in Appendix B.

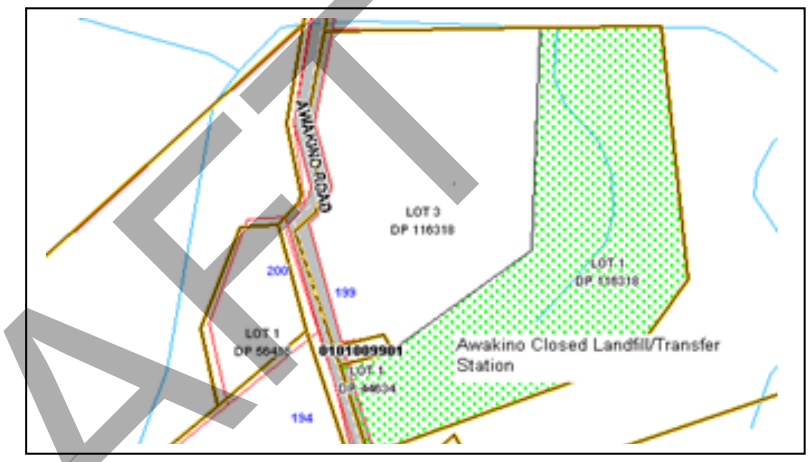
4.4 OPERATION AND MAINTENANCE OF CLOSED LANDFILLS

4.4.1 DARGAVILLE (AWAKINO) CLOSED LANDFILL

Figure 8: Location Dargaville Closed Landfill

Aerial View of Site

Location



While the site now operates as a transfer station, it was initially developed as a landfill with disposal operations commencing in about 1922. The landfilling extended over an area of approximately 30,000m^2.

The site was operated as an open tip with few controls and few records were kept of volumes received at the site. However, it is estimated that 300,000 to 350,000m^3 of solid waste was landfilled at the site during its 74 years of operation.

Currently the bulk of the old landfill site is being grazed under a lease agreement, assets associated with the old landfill site are minimal and consist of a stormwater diversion system and artificial pond. The remaining land that was part of the original landfill area is the site of the operational Transfer Station.

Resource Consent Requirements - The NRC discharge consent (Permit N°4433) for any leachate leaving the Awakino Landfill was issued on 10 November 1994 and expired in 30 June 2003. Renewal process in currently underway and it is expected to have consent in the 2017/18 financial year. Until the consent is finalized it is intended to continue monitoring in accordance with consent N° 4433

Capping - In 1996 a temporary cap was placed on the landfill site. Final capping is yet to occur, but is proposed to take place between 2017 - 2019. It is anticipated that all physical works required to remediate the site, including reshaping, capping, leachate collection system, topsoil and grassing, will be

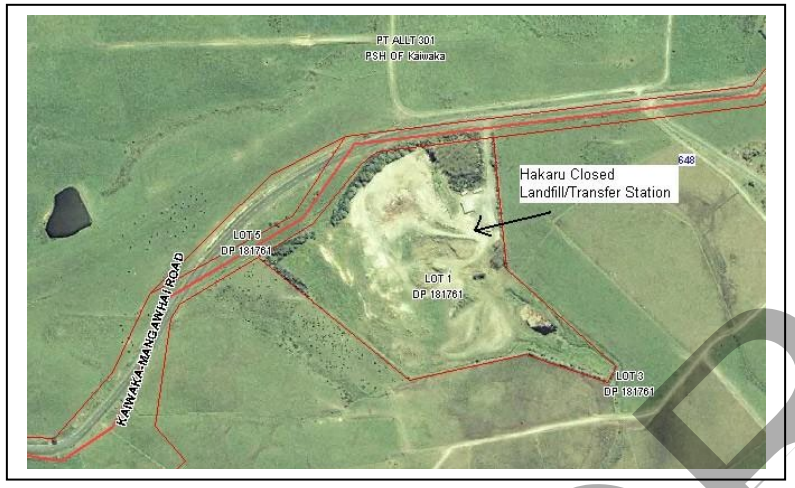
undertaken within 2 years of granting of any resource consents by NRC.

The completed consent will detail the type of capping required, it is expected that capping will consist of clean fill that is currently being placed there by contractors and topped up with clayey material from onsite to help waterproof the final cap.

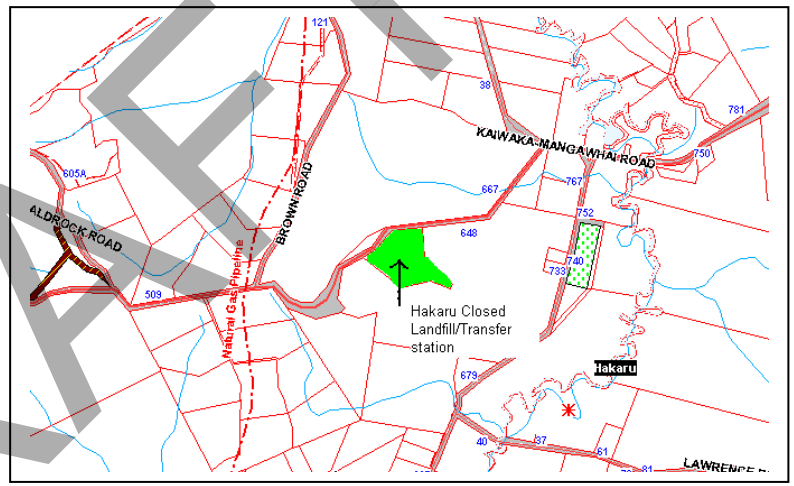
4.4.2 HAKARU CLOSED LANDFILL

Figure 9: Location Hakaru Closed Landfill

Aerial View of Site



Location



While the site now operates as a transfer station, it was initially developed as a landfill by an independent contractor under contract to Council, commencing operation in 1997. The operational and environmental parameters within which the landfill is to be operated is defined in the *Hakaru Landfill Management Plan*, originally prepared in 1997 and updated in 2003. In 2007, operation of a transfer station commenced at the site and the landfill was closed. Council therefore has no long term asset liabilities, but does have a liability for any eventual closure of the landfill site and return to pasture.

The Hakaru Landfill Management Plan, originally prepared in 1997 and updated in 2003, defines the operational and environmental parameters within which the landfill is to be operated by the Contractor to the satisfaction of KDC and the NRC.

KDC has an obligation to restore the site to a levelled high quality pasture and gift the land back to the original owner or benefactors no later than 30 years from settlement, this would be 2027.

Leachate - Leachate - The existing resource consents for the site were granted on the basis that leachate would be monitored and an appropriately designed treatment system would be installed once operational volumes and concentration of leachate was determined. Until a suitable onsite treatment facility is developed, leachate is to be transported off-site by tanker for disposal.

The present leachate treatment system provides for the collection of leachate from the base of the landfill in a pump chamber. From this chamber, leachate is then pumped to an elevated holding pond located on the northeastern side of the site outside of the filling area. Leachate is collected once a week by a local effluent disposal contractor and disposed of at a facility operated by that firm in Wellsford.

Council is going through a process of reviewing options and is expected to finalise option for leachate treatment for physical works in 2018/19.

4.4.3 PAHI ROAD CLOSED LANDFILL

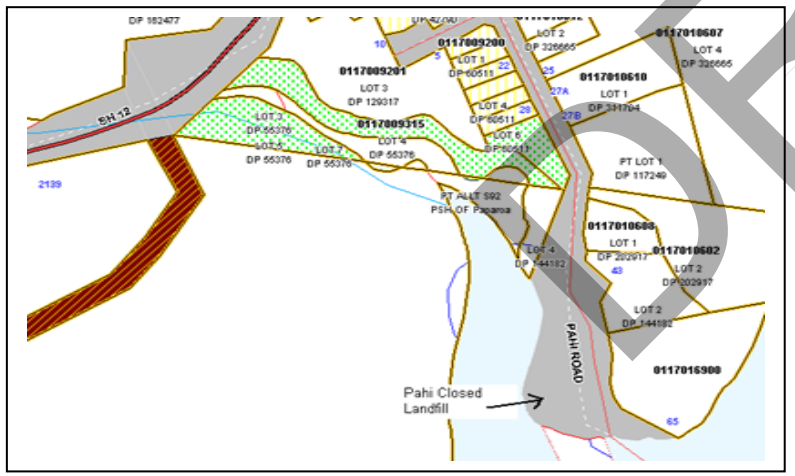
Site Location: Pahi Road, Paparoa

Legal Description: The Pahi Landfill is located on Pahi Road approximately 1 km south of the Paparoa township. The site is within the road reserve and part is within the former Paparoa Stream bed.

Landowner: Kaipara District Council

Figure 10: Location Pahi Road Closed Landfill

Aerial View of Site



Location

The landfill opened prior to 1985 and was operated until 2003 when it was capped and closed. Records show that Water Rights were issued for the landfill by the Northland Catchment Commission as early as 1987 and possibly before. In the earlier stages of its life the landfill was well protected from salt and freshwater intrusion by significant bunds. During this time the extent of the landfill was restricted to the unused portion of the road reserve adjacent to the mangrove swamp beside the Paparoa Stream and part of the site is within the former Paparoa Stream Bed. Records show that toward the end of the landfills life it was significantly overfilled and had started encroaching on to the neighbouring mangroves.

During operation the site was used similarly to many landfills. Solid Waste was tipped at the site and progressively buried by subsequent loads of solid waste. Latterly a trash compactor was used at the site to extend the life of the landfill.

4.4.4 Kaiwaka Closed Landfill

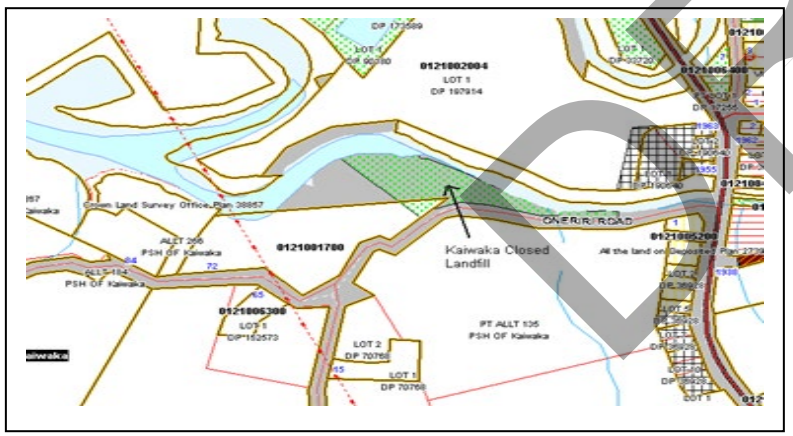
Site Location: Oneriri Road, Kaiwaka (in an old limestone quarry situated between the road and the Kaiwaka River).

Legal Description: The Kaiwaka Landfill is located on Oneriri Road between the road and the Kaiwaka River approximately 800m east of State Highway 1. The legal description of the site is Road Reserve and it adjoins Part Allot 141 Blk 111 Otamatea SD.

Landowner: Kaipara District Council

Figure 11: Location Kaiwaka Closed Landfill

Aerial View of Site



Location

History

Kaiwaka Landfill operated as a landfill prior to 1974 and closed in 1996 when it was used as a transfer facility until the Hakaru Landfill was commissioned. The final consent for land filling activity on the site was granted in 1993 and included provisions for the closure of the landfill by March 1995.

During operation the site was used similarly to many landfills. Solid Waste was tipped at the site and progressively buried by subsequent loads of solid waste. In the latter years of the landfills operation solid waste was regularly covered, leachate ponds were established to detain leachate and contaminated stormwater runoff from the tip area.

4.4.5 Mangawhai Closed Landfill

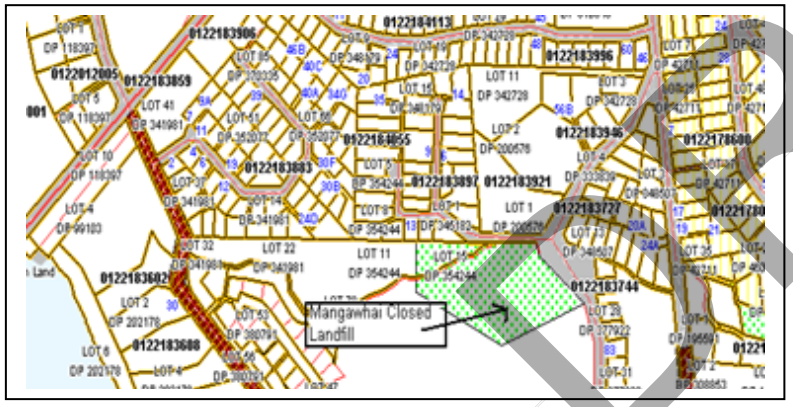
Site Location: Moir Point, Mangawhai

Legal Description: Lot 2 Deposited Plan 99103.

Landowner: Private Owner

Figure 12: Location Mangawhai Closed Landfill

Aerial View of Site



Location

History

Was a ‘formal’ tip, on privately owned land. Has been closed, capped and consented.

4.4.6 Tinopai

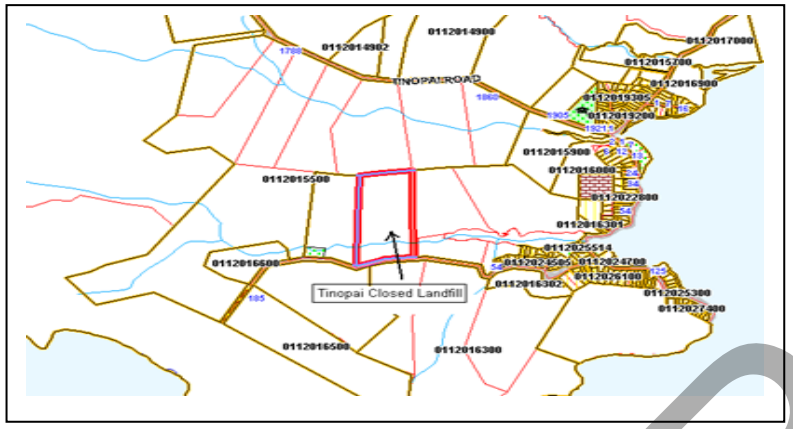
Site Location: Sandy Beach Road, Tinopai

Legal Description: Lot 27 DP16979 Hukatere SD

Landowner: Private Owner

Figure 13: Location Tinopai Closed Landfill

Aerial View of Site



Location

History

Was a 'formal' tip, on privately owned land. Has been closed, capped and consented.

4.4.7 Access Road Closed Landfill (Ruawai)

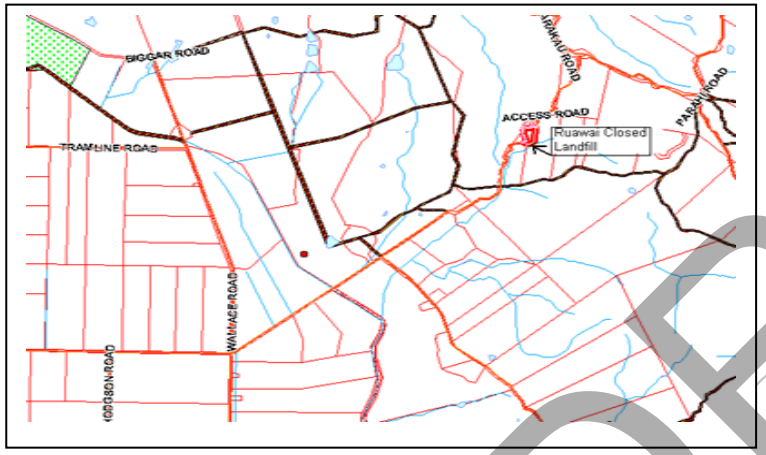
Site Location: The Access Road Landfill is located on Access Road near Ruawai. The site is located approximately 1 km south of the intersection with Oparakau Road.

Legal Description: The legal description of the site is Lot 1 DP 138215 Blk XIII Tokatoka SD.

Landowner: Kaipara District Council.

Figure 14: Location Access Rd Closed Landfill (Ruawai)

Aerial View of Site



Location

History

Access Road Landfill operated as a landfill from 1990 to 2001. Consent for landfilling activity on the site was granted in 1994. During operation the site was used similarly to many landfills. Solid Waste was tipped at the site and progressively buried by subsequent loads of solid waste.

4.4.8 Omamari Closed Landfill

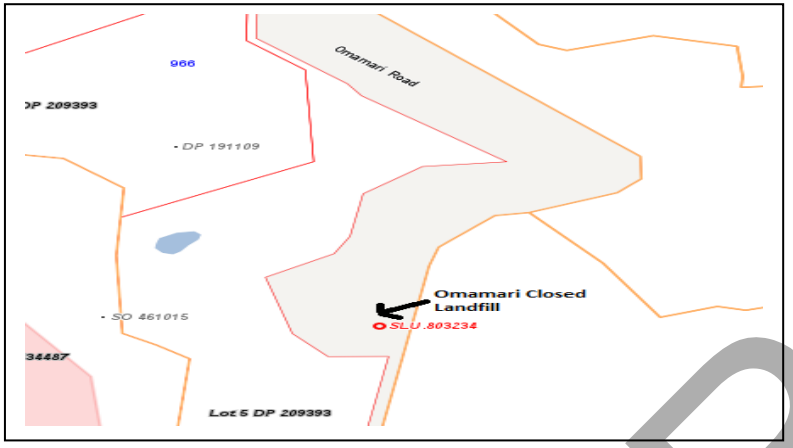
Site Location: Omamari Road, Omamari

Legal Description: Road Reserve

Landowner: Kaipara District Council

Figure 15: Location Omamari Closed Landfill

Aerial View of Site



Location

History

Omamari Landfill operated up until 1997 and was capped in 2000.

4.4.9 Glinks Gully Closed Landfill

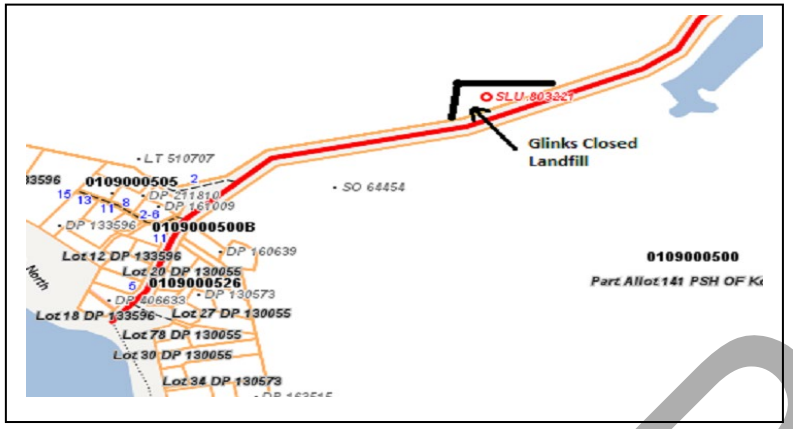
Site Location: Glinks Gully Road, Glinks Gully.

Legal Description: Pt Allot 141 Kopuru Parish Blks IV, V Kopuru.

Landowner: Department of Conservation (DOC).

Figure 16: Location Glinks Gully Closed Landfill

Aerial View of Site



Location

History

The Glinks Gully landfill opened sometime during the 1960's and operated until 1992 when it was capped and closed.

4.4.10 Parawanui Closed Landfill

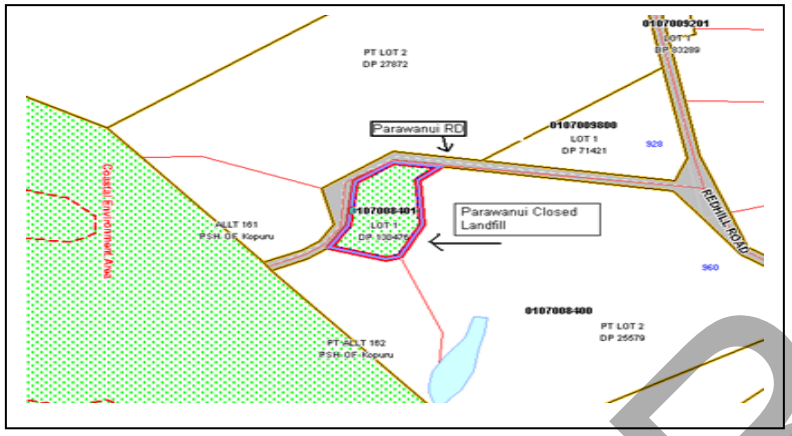
Site Location: Parawanui, Te Kopuru.

Legal Description: Lot 1 DP 130476 Blk IV Kopuru SD - interest in easement.

Landowner: Kaipara District Council.

Figure 17: Location Parawanui Closed Landfill

Aerial View of Site



Location

History

Parawanui landfill operated from 1950 through until its closure in 1997. It has since been capped and consented.

4.4.11 Cole Road (Te Maire) Closed Landfill

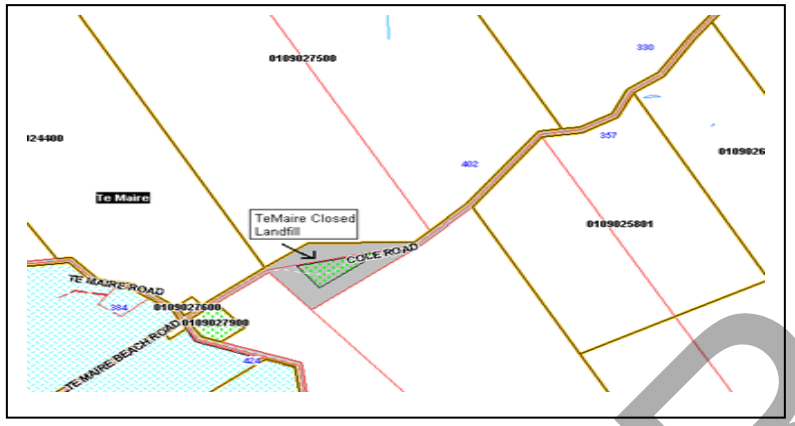
Site Location: Cole Road (Te Maire), Repia.

Legal Description: Road Reserve.

Landowner: Kaipara District Council.

Figure 18: Location Cole Road (Te Maire) Closed Landfill

Aerial View of Site



Location

History

Was a 'formal' tip. Following the closure of the landfill in 1994, final capping and stabilisation of the site was carried out.

4.4.12 Mosquito Gully Closed Landfill

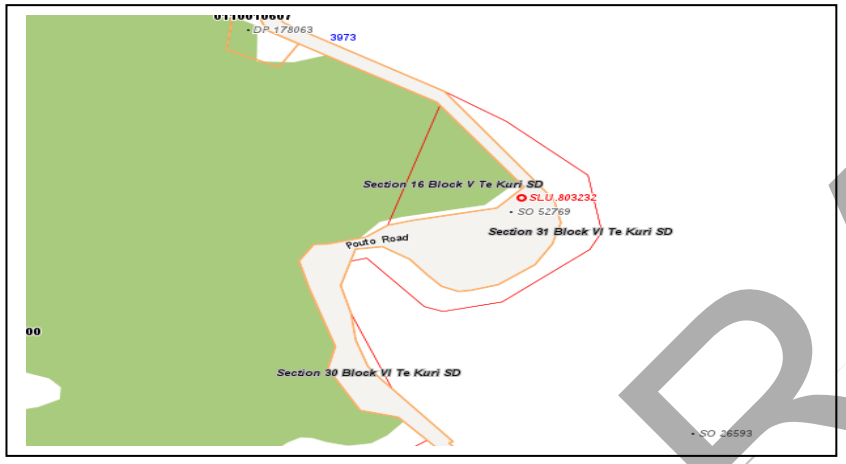
Site Location: Pouto Road, Mosquito Gully.

Legal Description: The Mosquito Gully Landfill is located on a portion of road reserve adjacent to the carriageway of Pouto Road, approximately 25km south of Te Kopuru, directly adjoining Section 16 BLK VI Te Kauri SD.

Landowner: Kaipara District Council.

Figure 19: Location Mosquito Gully Closed Landfill

Aerial View of Site



Location

History

The site operated as a landfill prior to 1985 and closed in 1997. The principal mode of operation was as a 10m x 4m pit 2.5m-3m deep. Solid waste was dumped into the pit until the freeboard was reduced to approximately 200mm at which time a new pit was excavated with the material from the new pit being used to cap the old pit. Over its life, the only ongoing recorded problems were associated with windblown solid waste littering farmland downwind of the site.

Additional refinements to the operation also included the construction of a “fish pit” to mitigate any potential odour problems. The “fish pit” consisted of a capped circular hold with a manhole lid. Council records also show that burning of solid waste was a regular occurrence at the site.

4.4.13 Kellys Bay Closed Landfill

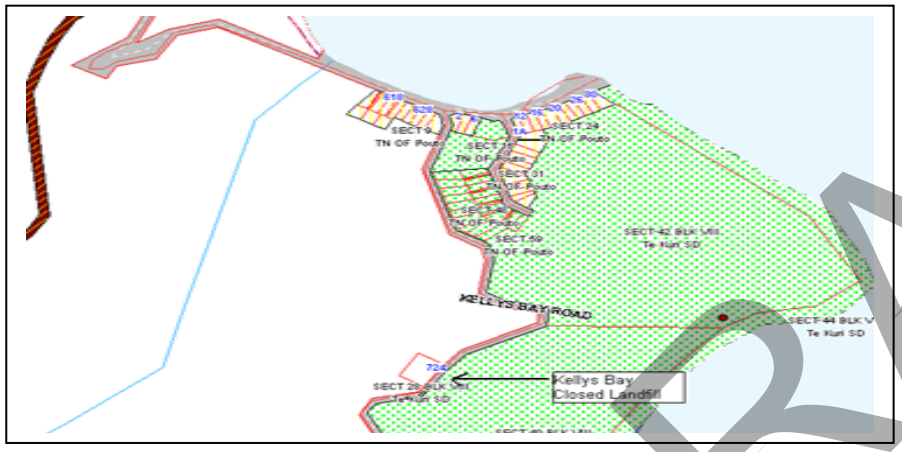
Site Location: Kellys Bay Road, Kellys Bay.

Legal Description: The Kellys Bay Landfill is located on a portion of road reserve adjacent to the carriageway approximately 1 km south of Kellys Bay, directly adjoining Sec 40 Blk VIII Te Kauri SD.

Landowner: Kaipara District Council.

Figure 20: Location Kellys Bay Closed Landfill

Aerial View of Site



Location

History

Council records indicate that the site operated as a landfill prior to 1985 and closed in 1997. The principle mode of operation was as a 10m x 4m pit 2.5m-3m deep. Solid waste was dumped into the pit until the freeboard was reduced to approximately 200mm at which time a new pit was excavated with the material from the new pit being used to cap the old pit. Council records show that burning of solid waste was a regular occurrence at the site and the only problem appears to have been associated with these fires resulting in the placement of a water tank for firefighting on the site.

Additional refinements to the operation also included the construction of a “fish pit” to mitigate any potential odour problems. The “fish pit” consisted of a capped circular hold with a manhole lid. Consent conditions restricted each open pit to a maximum of 50m^2 however there are no records that indicate the actual volume or extent of solid waste pits at the site. Following a review of the District’s solid waste disposal facilities, it was decided to close the site in 1997.

4.4.14 Bickerstaff Rd Closed Landfill

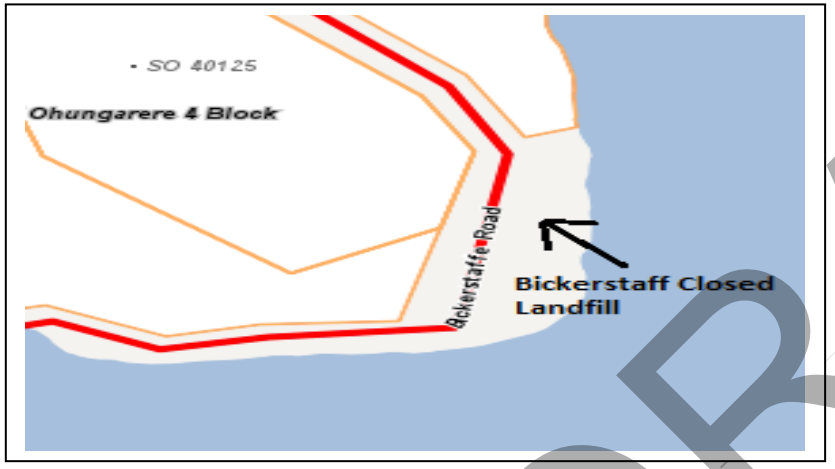
Site Location: Bickerstaff Rd, Maungaturoto. The site is situated on the boundary of the CMA and is bordered by Bickerstaff Rd to the west and the estuary of the Wairau Creek in the upper Kaipara Harbour.

Legal Description: The Bickerstaff Landfill is located on a portion of road reserve adjacent to the carriageway approx. 1.6 kms along Bickerstaff Rd.

Landowner: Kaipara District Council.

Figure 21: Location Bickerstaff Rd Closed Landfill

Aerial View of Site



Location

History

The Site was used illegally for a number of years for the "fly-tipping" of refuse. KDC have no records which indicate the duration of waste disposal or the nature of the waste deposited at the site. The landfill covers an area approximately 0.68ha and extends for approx. 175m along the shoreline.

Remedial works are to be undertaken at the site to mitigate risk associated with recently exposed refuse. The objective of the remedial works is to remove visible Asbestos Containing Material from within the wider site and refuse in the foreshore area, and to encapsulate exposed refuse via the placement of a capping layer and rock buttress. The encapsulation will reduce the risk to human health and the environment from exposure to refuse and contaminants.

The Management and Monitoring Plan will be implemented at the site following the remedial works. Remedial works are to be completed by Nov 2019, with the remaining consent conditions valid until 2051.

4.5 ILLEGAL DISPOSAL AREAS

Pouto Point – was an illegal unconsented tip. Area is filled, covered and forms part of an open space recreational area

Tangiteroria - Was an informal (illegal) tip and has not been consented.

Kaihu - Was an informal (illegal) tip and has not been consented.

Te Kowhai Road - Site has been covered with fill, fenced off and partly planted with native plant species.

Te Kopuru, Clean Street - Site has been covered with fill, fenced and is currently grazed**..**

Franklin Road - Previously consented, no longer required.

4.6 LITTERBINS

Litterbins are provided in the urban areas of Dargaville, Ruawai, Paparoa, Maungaturoto, Kaiwaka, Mangawhai Heads and Mangawhai Village and the holiday areas of Omamari, Baylys, Glinks Gully, Pouto, Kellys Bay, Tinopai, Pahi and Paparoa.

In total, there are approximately 105 litterbins located throughout the Kaipara District. Most are between 5 and 10 years old and in reasonable condition.

The frequency of litterbin collection depends on seasonal demand, but is at least three times per week. This increases to daily between December and March.

Over the next 10 years it is expected that approx. $20,000 will be spent on litterbins, based on the current spend of approximately $2,000 per year. This is mainly a result of replacement of damaged litterbins or to undertake maintenance of existing bins to enable continued operation.

Illegal Litter and Abandoned Vehicles

Illegal litter remains a concern for Council and the public. Levels of illegal litter dropping have remained static. Most service requests received through Council's Helpdesk system are associated with the same specific locations in the District. Council's involvement with abandoned vehicles removal has increased over time as the value of metal, vehicles and vehicle parts has decreased. There are limited opportunities within the Kaipara District to sell unwanted cars that have reached the end of their life and operators outside the area will charge for collection rather than pay. For both abandoned vehicles and illegal litter, costs are requested (where possible) from the perpetrator and infringements are issued where a perpetrator is identified.

Abandoned vehicles and illegal litter are removed as a health and safety and aesthetic service. This service is carried out on an as required basis when Council is notified.

4.7 COLLECTION CAGES

The KDC has in the past provided some collection cages at points where some rural roads intersect, over the past 2 years these are being replaced with collection extensions and collection points (smaller catchment of properties). Collection cages were notorious for attracting illegal dumping and the pest animals that come with illegal dumping.

Of the original 11 there are now only 2 formal collection cages located in the Kaipara District, these are both in small coastal holiday areas where the collection and disposal service passes a road which services a number of residential properties but does not warrant individual pickup from each property on the road.

These remaining cages are emptied weekly in association with the kerbside collection and disposal service carried out in the area.

Remaining cages are 6 - 8 years old, of wooden construction and in average condition.

Past maintenance of the cages has been limited to minor repairs due to vandalism. Any renewal of the cages will be done on a case by case basis and based on the amount of use and the location of the cage. If there is a noticeable increase in volumes of solid waste at particular sites If there is a reduction in the use of the cage Council may remove the cage. Council does not intend to increase the number of cages in the foreseeable future.

4.8 RESOURCE CONSENTS

Kaipara District Council is responsible for a number of consents associated with solid waste management. Historically it has struggled to keep track of expiry dates of consents and undertake timely renewal of consents before they expire. Renewal of resource consents can be costly and resource hungry. This is potentially a big issue and area of risk to Council.

The key issues are:

- Tracking of expiry dates, and ensuring that renewal of the consents is undertaken in good time
- Monitoring of sampling and leachate composition, and reporting trends to NRC as appropriate
- Monitoring of general consent conditions relating to stormwater, public health safety etcetera.
- Installation of additional leachate facilities may be required in the future, as a result of any consent monitoring.

KDC is committed to working with NRC to ensure better communication on consenting and renewal of consents. Currently there are only two expired consents with no others due to expire until 2025 . These has been noted as an area of improvement and part of the Solid Waste Improvement Plan (IP3).

Refer to the in Appendix 2 for individual Closed Landfill requirements.

4.9 CONDITION ASSESSMENTS AND PLANNED RENEWALS

The asset base for the operational transfer stations and closed landfills are minimal with respect to KDCs obligations to plan for asset renewals. The undertaking of formal condition assessments is therefore not considered to be a high priority exercise at present, as the costs will outweigh the risks. However, the monitoring of assets that are directly relevant to the resource consents is an area that carries moderate risk and Council will be undertaking annual visual inspections of closed landfill sites as per consent requirements and in association with NRC.

4.10 ASSET VALUATIONS

The Council-owned minor site facilities and infrastructure are not currently valued by Council for formal depreciation and renewal purposes. Nevertheless, annual budget provisions are made for the replacement of minor site assets as required. The valuation of Council's Solid Waste assets is currently limited to valuation of the land only, at closed and operational landfill sites. The current land values, where known, are provided in Appendix A and further information is in Section 7.

5 RISK MANAGEMENT

5.1 INTRODUCTION

The risk management framework, and management approach is outlined in the KDC Activity Management Overview. This plan focuses on the solid Waste risks.

5.2 SOLID WASTE RISKS

The main risks identified to date are outlined in Tables 14, 15 and 16 below.

Moderate-High Risks

At present, there are very few Solid Waste asset risks that are rated *high* or *extreme.* The solid waste asset risks have generally all been rated as *low* or *moderate*. A summary of risks as well as proposed risk management strategies are as follows:

Closed Landfills

Since closure, little is known of the specific contents of the 14 (legal) closed landfills. Whilst most of the solid waste deposited is most likely to have been domestic waste, there is also some possibility that over time pesticides, paint, oil and/or other potentially hazardous wastes were also deposited at some landfills. Ongoing monitoring of groundwater samples indicates that the risk of leachate contamination is fairly low, and over time is reducing.

Table 14 - Closed Landfills – Risk Ratings

Risk Identified	Risk Rating	Risk Management Strategy
Illegal substances deposited without Council knowledge.	High	Regular inspection of closed landfills.
Leachate contamination from groundwater.	Moderate	Ongoing monitoring programme.
Adjacent landowner issues.	Moderate	Early resolution if/when issues arise.
Not meeting Resource consents conditions	Moderate	Regular inspections and monitoring carried out with Northland Regional Council staff . Working closely with NRC on resource consent renewals processes.
Resource consent expiry	Low	Consent database created for forward planning of consent renewals

Unknown historic illegal landfills on council land.	Moderate	Document known sites and develop/maintain relationships with NRC and or stakeholders to ensure minimal cost incurred.
Impact of Climate Change – Unknown cost to protect Closed landfills in coastal areas	High	Have engineering assessments completed on all coastal closed landfill sites including known illegal ones, plan upgrade works to protect.

Operational Solid Waste Facilities

As with the closed landfills, the main risk issues with the operational Solid Waste facilities are concerned with potential environmental contamination, either as a result of negligence or through accidental of unintentional acts.

Table 15 - Operational Solid Waste Facilities – Risk Ratings

Risk Identified	Risk Rating	Risk Management Strategy
Environmental contamination occurs through events beyond the control of Council.	High	Monitor Contractors' QA processes on a regular basis.
Operator fails to meet contractual obligations.	Moderate	Work with Operator to resolve issues in a 'partnering' environment.
Central government legislation drives up disposal costs - this relates to Waste Minimisation levy's	Moderate	Joint advocacy with industry organisations and other councils.
Illegal Dumping of Rubbish – due to decrease in service level (e.g. missed collections, costs of disposal, distance to travel)	Moderate	Signs disallowing dumping of rubbish Management of contracts Monitor complaints By law enforcement
Public and Contractor Health – Contractors and members of the public are not exposed to Health risks.	Moderate	Monthly Site Audits and Reporting Contract Management
Public and Contractor Safety - accidents causing injury and damage to Kaipara Residents, visitors or property.	Moderate	Monthly Site Audits and Reporting Contract Management

Other Business Risks

The main business risks are centred around potential loss of corporate knowledge relating to the Solid Waste asset, therefore to capture it all in the AMP has identified this risk and manages it accordingly.

Table 16 - Other Business Risks - Risk Ratings

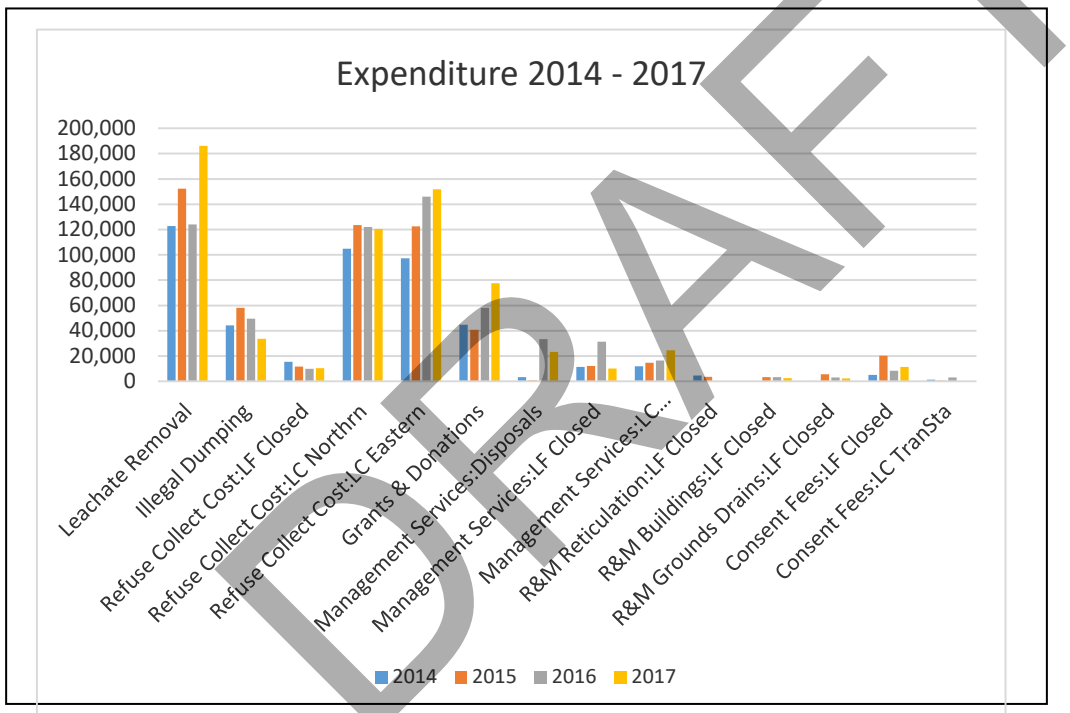
Risk Identified	Risk Rating	Risk Management Strategy
KDC may have to implement Central Government initiatives that are currently being investigated, these will have an effect on costs to dispose and collect, and current services offered. these include but are not limited to: Increasing disposal Levy, Standardising Kerbside Refuse and Recycling both how we collect and what we collect, introduction of Container Deposit Schemes and Compulsory Product Stewardship of some products.	High	
Environmental contamination occurs through events beyond the control of Council.		Monitor Contractors' QA processes on a regular basis
Inadequate condition/performance assessments – lack of reliable data for renewals/replacements and valuations	Moderate	Develop a process to ensure that knowledge is transferred, stored and accessible.
General Maintenance, Operation and Collection Contract Management – unsatisfactory resulting in unnecessary or excessive costs and/or insufficient output or quality. Poor Contractor performance	Moderate	Develop Contracts with clear delivery targets and performance measures. Contract Management with Quality Assurance Audits and updates where necessary.
Loss of information, caused by staff turnover or illness.	Moderate	Electronic Filing system utilised. Data bases kept update.

6 FINANCIAL PROJECTIONS

6.1 INTRODUCTION

Along with community outcomes and customer expectations, the issues, challenges, risks and works outlined in the previous sections all impact on expenditure. The following section outlines the budgeting process, summarises the main assumptions, describes the standards applied, outlines the different funding mechanisms and overall affordability and impacts in regards to rates.

Figure 23 – Expenditure 2014 - 2017



Fees and Charges are approved by Council for solid waste disposal are set out below. Both Contracts for refuse disposal are $0 contracts, i.e income to cover disposal is covered by user pays at the time of disposal, rates only fund litter bin emptying, illegal dumping retrieval and Closed Landfill Consents and Monitoring. Make reference to website as fees can change

6.2 BUDGETING PROCESS

Consistent with the Local Government Act 2002 (LGA), KDC's budgeting process is iterative. Initial budgets are set with consultation between senior management and managers which then goes to Council meetings. At the end of the meetings, the Council has a budget it feels is in line with community expectations and is prepared to send out for public consultation via the Long Term Plan (LTP). Based on submissions received from members of the community, feedback is sent back to the Council for final ratification before being formally adopted by Kaipara District Council.

Future capital works include theLeachate control/disposal improvements at Hakaru Landfill with estimates of $800,000 and $1.2mil respectively.

With respect to the Hakaru (closed landfill) site, the Council currently spends approx. $127,000 - $180,000 annually on the removal and disposal of leachate from the site. An investigation of options surrounding the disposal of leachate at the site is nearing completion and it is expected works will commence on improvements in the 2017/18 financial year.

Other assets likely to require renewal or major refurbishment over the twenty year planning period are: leachate control devices, monitoring boreholes, capping, minor storm water and other site assets. Minor assets including litterbins are replaced as operational expenses, and are not capitalised.

Overall, the bulk of the costs likely to arise in the 10 year forecast horizon are related to operational costs. Minor maintenance work is identified and carried out as a result of quarterly consent monitoring. See the table below for a summary forecast of expenditure over the next 10 years.

Table 17: Summary Capex and Opex expenditure.

	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
CAPEX	$600									$600
OPEX	$750	$750	$590	$590	$590	$590	$590	$590	$590	$590

6.3 FINANCIAL ASSUMPTIONS

The key assumptions of the Council were outlined in previously in Section 1 and are summarised again below.

- Service levels are generally assumed to remain the same.
- Ability to meet community expectations around the District - Should the demographics of the District change, expectations for services currently not provided may increase or decrease. This directly impacts on the volume being collected and disposed of through the transfer station gates.

- Inflation is based on Council's knowledge of its business base and on Business and Economic Research Limited (BERL) predictors for the next ten years.
- Financial dollars are in today's dollar figures, as opposed to Net Present Value, meaning that long term projected rate of inflation has been included.
- The south-eastern area is prone to population fluctuations with increasing demand for services over the summer holiday period.
- Solid waste volumes will be affected by changing age demographics in the District (any demographic change, such as decrease in age groups below 60 and an increase in those over 60 will typically change the volume and types of waste compared to households with children. Potentially, should this happen, Kaipara may see a reduction in volume and type of collected and disposed of waste).
- The rating base will continue to remain reasonably static throughout the course of this AMP.
- Leachate disposal costs for the closed Hakaru Landfill site will continue to increase.
- Leachate and Capping conditions of Dargaville closed Landfill will require capital expenditure.
- Sustainable pricing for District wide kerbside solid waste and recycling bag collection can be maintained.
- Financial cost for maintaining Closed Landfills to consent compliance.
- Whangarei District Council Disposal Facility remains financially viable.

6.4 ASSET VALUATION

The Solid Waste infrastructure assets owned by Council can be summarised as:

- Freehold title with gift back clause to the land on which the closed Hakaru landfill is situated
- Freehold title to the land occupied by 3 of the closed landfill sites
- Freehold title to the land on which the Dargaville Transfer Station is situated (also the associated closed landfill)
- Leachate detention ponds at several closed landfill sites
- Leachate monitoring boreholes
- Capping
- Other minor stormwater drainage, accesses, fencing etcetera
- Resource Consents for the closed, current and future landfill sites
- Building located at the Awakino Road Dargaville Transfer Station and used by the Contractor as storage and office.
- Recycling storage at Awakino Road Dargaville Transfer Station.

The valuation of Council's Solid Waste assets is currently limited to valuation of the land only, at closed and operational landfill sites. The current land values, where known, are provided in Appendix A.

The majority of Solid Waste infrastructure and plant assets are all owned by the contracted service providers, and are not subject to valuation from a Council point of view. The minor site assets such as leachate control devices, monitoring boreholes, stormwater pipes etcetera are not currently valued, and hence are not currently being depreciated by Council. This has been noted as an Improvement Plan item (IP 1) in Section 8

6.5 DEPRECIATION

There is currently no depreciation charge for the minor Solid Waste assets employed. Although not likely to be a large sum, given the relatively modest size of the Solid Waste asset portfolio, it is a requirement of PBE IPS AS 17 Accounting Standards that all infrastructure assets are depreciated. PBE IPS AS 19 Accounting Standards also require that contingent liabilities be identified and brought into account. These are outlined further in the following sections.

6.6 SOLID WASTE REVENUE AND FINANCING POLICY

Table 18: Council's Revenue and Financing Policy. Relevant extracts with regard to closed landfills and transfer stations are as follows:

Closed Landfills: Maintenance of sites			
User Group	**Economic Allocation**	**Fairness and Equity Adjustment**	**Final financing Mechanism**
Private Reason for Decision	0% -	0% No adjustment	0% -
Public Reason for Decision	100% Provision of environmentally acceptable, low risk Closed Landfill facilities	100% No adjustment	100% Uniform Annual General Charge
Transfer Stations: Provision for the sanitary disposal of Solid Waste			
User Group	**Economic Allocation**	**Fairness and Equity Adjustment**	**Final financing Mechanism**
Private Reason for Decision	0% -	0% No adjustment	0% -
Public Reason for Decision	<5% Provision of environmentally acceptable, low risk Transfer Station Facilities	0% No adjustment	95% User Pays <5% Uniform Annual General Charge

6.7 FINANCIAL FORECASTS AND FORWARD WORKS PROGRAMME

The financial forecasts presented in this AMP are based upon the assumption/scenario that Council will implement strategies and policies over the next 10 years that will have the effect of significantly reducing solid waste volumes to landfill. The impact of such strategies and policies are likely to mean that unit costs of disposal to landfill will go up (if full cost recovery is to be achieved) and that recycling initiatives will become a more significant cost to Council.

Validation and Confidence Levels

With respect to capital expenditure Council has a standardised Project Information Sheet for proposed Capex expenditure projects . These will be used on solid waste projects that are undertaken directly by Council. Major capital projects will be undertaken through Council's normal contracting process, which has its own project information and reporting sheets.

Council is confident with the financial forecasts presented within this AMP with, Initial forecasts being set after consultation with senior management which then goes to Council, when Council feels it is in line with public expectations, this then is send out for public consultation via the LTP. Based on submissions received, feedback is sent back to the Council for final ratification before being adopted.

Consistent with the Local Government Act 2002(LGA) the budgeting process is iterative.

Capex Expenditure Summary

Over the lifespan of this AMP Council will be undertaking the following capital works:

- Litterbins - $20,000 for replacement of litterbins expected over the next 10 years (2021/2031). Based on the current spend of approximately $2,000 per year.
- Hakaru Closed Landfill – Leachate treatment plant upgrade - Expenditure is subject to the final design but expected to be between $450,000 and $600,000.

Renewal of Existing Assets

The Solid Waste assets likely to require renewal or major refurbishment over the ten year planning period are leachate control devices, monitoring boreholes, capping, minor stormwater and other site assets.

At this stage, the likely timing of these renewals is still largely unknown, as further work will be required to assess their current condition and remaining effective lives. Minor maintenance work is identified and carried out as a result of quarterly consent monitoring

See Tables 19 and 20 for more detail on 10 year expenditure forecasts.

Operational and Maintenance Expenditure Summary

The bulk of the costs likely to arise in the 10 year forecast horizon are related to operational costs. These are categorised in the forecasts under the following headings:

- District Disposal Operations – user pays
- Maintenance of Closed Landfills – cost to Council
- Transfer Station Operations – user pays
  - The Hakaru Transfer Station Contract is a zero dollar value contract and user pays applies, all buildings, major plant and machinery are owned by the contractor and there is very little cost to Council for providing this service.
  - The Dargaville Transfer Station Contract is a zero dollar value contract and user pays applies, major plant and machinery are owned by the contractor and there is very little cost to Council for providing this service. There are some buildings and storage facilities on site which are Council owned, Council has some minor budgets for building & grounds maintenance.
- Litter Control – this covers the costs associated with the collection (and disposal) of litter from the litterbins situated in all towns at Council's cost, and includes abandoned Car retrievals.

In summary, the preferred option identified for service delivery is for the status quo, with improved efficiencies through bundling of the current separately operation contracts into a new single contract model.

The table below shows key information for each of the closed landfill sites. Further information is also contained in Appendix A & B. The following pages provide further detail for site specific operations and maintenance requirements for the closed landfills.

6.8 EXPENDITURE FORECAST FOR 2017/2018 - 2026/2027

Current expenditure forecast for the period 2017/18 – 2026/27 are:

Table 19 – Solid Waste Consolidated Financial Forecast* $000

	Forecast 2020/21	Forecast 2021/22	Forecast 2022/23	Forecast 2023/24	Forecast 2024/25	Forecast 2025/26	Forecast 2026/27	Forecast 2027/28	Forecast 2028/29	Forecast 2029/30
Operating Budget	$ 000	$ 000	$ 000	$ 000	$ 000	$ 000	$ 000	$ 000	$ 000	$ 000
Total Operating and Maintenance	677	677	677	677	677	677	677	677	677	677

Table 20 - Financial Forecast Breakdown 2017/2027

Description District Disposals	Forecast 2020/21	Forecast 2021/22	Forecast 2022/23	Forecast 2023/24	Forecast 2024/25	Forecast 2025/26	Forecast 2026/27	Forecast 2027/28	Forecast 2028/29	Forecast 2029/30
	$	$	$	$	$	$	$	$	$	$
Grants Subs[1]	80	80	80	80	80	80	80	80	80	80
Management Services[2]	50	50	50	50	50	50	50	50	50	50
R & M Grounds & Drains	5	5	5	5	5	5	5	5	5	5
Illegal Dumping	60	60	60	60	60	60	60	60	60	60
Abandoned vehicles	11	11	11	11	11	11	11	11	11	11
Description Litter Control	Forecast 2020/21	Forecast 2021/22	Forecast 2022/23	Forecast 2023/24	Forecast 2024/25	Forecast 2025/26	Forecast 2026/27	Forecast 2027/28	Forecast 2028/29	Forecast 2029/30
	$	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**

[1] This will increase when Government Levy to Landfill is increased.
[2] This budget will depend on direction of new contracts, ie user pays or targeted rates and how we collect, it will also be directly affected by Central Government initiative implementation

Northern Litter Control	148	148	148	148	148	148	148	148	148	148
Eastern Litter Control	166	166	166	166	166	166	166	166	166	166
Refuse Collection LC	18	18	18	18	18	18	18	18	18	18
Description District Closed Landfills	Forecast 2020/21	Forecast 2021/22	Forecast 2022/23	Forecast 2023/24	Forecast 2024/25	Forecast 2025/26	Forecast 2026/27	Forecast 2027/28	Forecast 2028/29	Forecast 2029/30
	$	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**
Consent Fees	20	20	20	20	20	20	20	20	20	20
Management Services	30	30	30	30	30	30	30	30	30	30
Reticulation R&M	30	30	30	30	30	30	30	30	30	30
Building R&M	4	4	4	4	4	4	4	4	4	4
Grounds R&M	5	5	5	5	5	5	5	5	5	5
Leachate	0	0	0	0	0	0	0	0	0	0
Description Transfer Station Operations	Forecast 2020/21	Forecast 2021/22	Forecast 2022/23	Forecast 2023/24	Forecast 2024/25	Forecast 2025/26	Forecast 2026/27	Forecast 2027/28	Forecast 2028/29	Forecast 2029/30
	$	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**
Management Services	50	50	50	50	50	50	50	50	50	50
Consent Fees	5	5	5	5	5	5	5	5	5	5
Description Capital Expenditure	Forecast 2020/21	Forecast 2021/22	Forecast 2022/23	Forecast 2023/24	Forecast 2024/25	Forecast 2025/26	Forecast 2026/27	Forecast 2027/28	Forecast 2028/29	Forecast 2029/30
	$	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**
Hakaru Land Buy Back										600

Works required as identified by Engineering Assessments of Closed Landfills[3]			600	600	600	600	600	600		
Construction of Central Resort Centre – including compost facility and incineration plant		2000								
Solar Powered Compacting Bins	50									

7 ASSET MANAGEMENT PRACTICES AND INFORMATION SYSTEMS

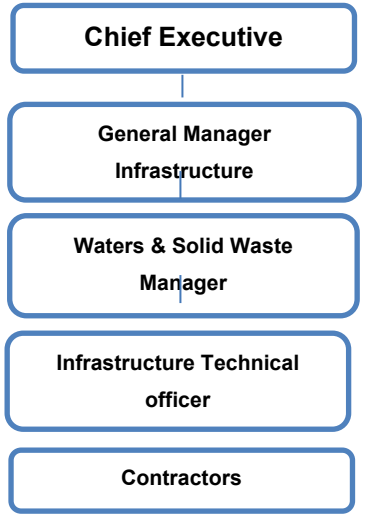
7.1 ASSET MANAGEMENT PLANNING

Asset management processes, practices, and systems are outlined in the KDC Activity Management Plan Overview. **Accountabilities and Responsibilities**

KDC has a dedicated in-house team that manages both the strategic and operational matters for solid waste. This is done through direct employment of: a General Manager Infrastructure, a Roading & Solid Waste Manager and an Infrastructure Technical Officer. In summary, reporting occurs as follows: Contractor(s) report to the Infrastructure Technical Officer, who reports to the Roading and Solid Waste Manager. The Roading Manager reports to the General Manager Infrastructure, who reports to the Chief Executive. Overall, Asset management is the responsibility of the General Manager Infrastructure, with responsibility being delegated to the Roading and Solid Waste Manager's team for the day to day operations.

Figure 24 Asset Management Accountabilities and Responsibilities – Solid Waste

[3] Estimates based on resource consenting and capping works requirements for the 6 landfills that we currently know very little about. AEE, Consent, design and build.



Physical works associated with the assets are primarily provided for through two contracts as illustrated in Figure 24 These cover the bulk of Council's Solid Waste assets across the District and deal with the day-to-day operations and maintenance. Council staff undertake inspections of all sites over the course of a year. As well as this NRC staff undertake inspections as part of resource consent monitoring. Any work identified in either inspection is then arranged by (Kaipara District) Council staff .

The assets are managed, both strategically and operationally, by in-house staff. There is one primary contact which provides for daily operational management of its solid waste services, contracts and asset.

8 IMPROVEMENT PLAN

8.1 INTRODUCTION

It is important for Council to ensure that asset management practice is aligned with good practice that is fit for purpose and is always "forward-looking" when it comes to improvement in practices and standards. The previous sections have highlighted some of the main issues and challenges Council is facing for solid waste management. In response to this, an asset management improvement programme for solid waste is being implemented, with a number of items identified for improvement.

8.2 IMPROVEMENTS TO SOLID WASTE ASSET MANAGEMENT

The purpose of the Improvement Plan is to:

- Identify and develop implementation of the asset management planning process.
- Identify and prioritise ways to cost-effectively improve the quality of the AMP.
- Identify indicative tasks, timescales, priorities and human and financial resources required to achieve asset management planning objectives.

The main drivers for asset management and thus improvements have been outlined in the previous sections (e.g. meeting regulatory requirements, managing risks, improving data and information).

Improvement Tasks

Table 22: Key improvement tasks

Nº	Task for Improvement	Priority	Target Date	Responsibility
IP 1	If not already completed in 20/21 expand the Council Solid Waste team to enable more focus on Waste Minimisation and improvements to the activity;	1	2021/22	KDC
IP 2	Assets registered in Asset finder, includes Closed Landfills & litterbins and locations	3	2021/22	KDC
IP 3	Proposal and Investigation of New purpose-built Resort/processing Centre & transfer station, investigation will include but are not limited to the following: - Options for first stage processing of main recyclable products onsite - Partnerships with Local business/s opportunities - Collaboration opportunities with Northland Councils - sources of funding - Options for treatment/composting of greenwaste and foodwaste - Options for incineration - Investigate options for location to add low cost transportation to markets such as Rail. - maintain current transfer stations with new centre constructed in Central Kaipara.	2	2021/22	KDC

Nº	Task for Improvement	Priority	Target Date	Responsibility
IP 4	Installation of compaction solar powered bins in various locations coastal and some urban	2	2021/22	KDC
IP 5	Provision of Waste Minimisation, sustainable and circular economy education to communities and business, through Council Website/publicity and external groups funded by Council.	2	2021/22	KDC
IP 6	Installation of Weighbridge at Dargaville Transfer Station	1	2021/22	KDC
IP 7	Investigation and installation of sound proofing at Dargaville and Hakaru Transfer station	2	2021/22	KDC
IP8	Closed Landfill Assessments for Climate Change readiness (only closed landfills in Coastal or flood inundation areas)	1	2022/23	KDC
IP 9	Build new Resort/processing plant with Incinerator (if viable and can get consent)	3	2022/23	KDC
IP 10	Implement changes set by Central Government, these could include Container deposit Schemes, kerbside collection standardisation of refuse and recycling, both products collected and how we collect them.	1	2022/23	KDC – May utilize consultants for design
IP 11	Begin work on Closed Landfill remediation as identified in assessments.	1	2023/24	KDC
IP 12	Potential Reutilisation of some key Closed Landfill Sites, ie develop dog park at Kaiwaka site in partnership with Parks team	3	2024/31	KDC
IP 13	Continue Closed Landfill Remediation works	2	2024/31	KDC

PRIORITY: 1 = High, 2 = Medium, 3 = Low

8.3 MONITORING AND REVIEW

The Improvement Plan will be monitored, reviewed and updated on an annual basis. The AMIP will then be adjusted accordingly (demonstrating an iterative cycle of continuous improvement) taking into account overall progress, changing business priorities, risks and affordability.

APPENDIX A - TABLE 23: ASSET VALUATIONS (LAND VALUES ONLY)

Location	Legal Land Description	Land Ownership	Consent Number	Land Valuation	Leachate Treatment	Comments
Access Road, Ruawai	Lot 1 DP 138215 Blk XIII Tokatoka SD – Val 0113018100 – Freehold Land.	KDC	7234	LV $87,000 CV $94,000	Detention pond	Not operated since 1998. Has been capped.
199 Awakino Road, Dargaville	Lots 1, 3 , 4 DP 116318 Blk XII Kaihu SD Blk IX Maungaru SD – Val 0101009300 Freehold land	KDC	4433	LV $340,000 CV $395,000	Detention pond and wetland	Transfer station operated by Kaipara Refuse. Landfill closed, Consented and Capped
Hakaru, Kaiwaka-Mangawhai Road	Lot 1 DP 181761 Blk XV Waipu SD – Freehold land with gift back clause. Valuation 0122003701	KDC	7562	LV $320,000 CV $650,000	Pumped to holding pond permanent leachate treatment solution to be implemented 2020/21	Transfer station operated by Northland Waste. Landfill closed,Capped and consented
Kellys Bay	Road Reserve Sec 40 BLK VIII Te Kuri Sd-Rec Res Valuation - 0110010000	KDC	7226	N/A	No	Operated as trench and burn system. Closed and Capped.
Mosquito Gully Pouto Rd	Parcel ID 5237004	KDC	7227			Closed and Capped
Moir Point, Mangawhai	Lot 2 DP 99103	B Ogilvy	4816	Private Land	Monitoring bores exist	Privately owned land. Closed and capped.

Location	Legal Land Description	Land Ownership	Consent Number	Land Valuation	Leachate Treatment	Comments
Glinks Road	Pt Allot 141 Kopuru Psh Blks IV, V Kopuru	DOC	7227	N/A	No	Operated as trench and burn system. Closed and capped.
Omamari Road	Road Reserve	KDC	4814	N/A	Wetland	Closed and capped.
Oneriri Road, Kaiwaka	Road Reserve	KDC	4809	N/A	No	Closed and capped.
Pahi Road	Road Reserve	KDC	2257	N/A	No	Closed and capped.
Parawanui Road	Lot 1 DP 130476 Blk IV Kopuru SD Freehold Land Valuation - 0107008401	KDC	4811	LV $39,000 CV $41,000	No	Closed and capped.
Te Kowhai Road, Ruawai	Road Reserve	KDC	N/A	N/A	No	Capped.
Cole Road	Road Reserve	KDC	4815	N/A	No	Closed and capped.
Sandy Beach Road, Tinopai	Lot 27 DP 16979 Hukatere SD	Liang Li	4812	Private Land	No	Closed and capped.
Bickerstaff Road	Road Reserve	KDC	38848	N/A	No	Closed to be capped

Appendix B - Table 24: Data Base of all Closed Landfill Consents

	Site	Land Ownership	Post Closure Management Plan	Current consent	Expires	Consent conditions	Monitoring Required	Inspection	Outstanding work Requirements
1	Dargaville (Awakino)	KDC	Completed	**4433**	**2052**	Reg Testing by NRC	yes	Six-monthly	Capping and leachate control, renew consent
2	Ruawai (Access Road)	KDC	Completed*	**7234**	**2035**	Cap and leachate pond check yearly, water and sediment tests NRC 2xyearly. Drains, fly tipping quarterly	yes	Quarterly	
3	Pahi	KDC	Completed	**2257**	**2035**	Annual water and sediment tests NRC (winter and ebbtide)	yes	Annual	**Needs engineering assessment**
4	Kaiwaka (Oneriri Rd)	KDC	Completed*	**4809**	**2035**	Cap and leachate pond check yearly, water and sediment tests NRC 2xyearly. Drains quarterly	yes	Quarterly	**Needs engineering assessment**
5	Kaiwaka (Hakaru)	KDC	Outstanding	**7562**	**2053**	Reg testing by NRC	yes	Quarterly	leachate improvements 20/21
6	Mangawhai	Private	Completed	**4816**	**2050**	Reg testing at 2 piezometers by NRC,	yes	Annual	
7	Tinopai	Private	Completed	**4812**	**2030**	Drains and Cap check yearly, water tests NRC yearly.	yes	Quarterly	
8	Parawanui	KDC	Completed	**4811**	**2035**	Cap check yearly, water tests NRC yearly	yes	Quarterly	
9	Glinks Gully	DOC	Completed	**4810**	**2035**	Sampling completed by KDC	yes	six-monthly	
10	Omamari	KDC	Completed	**4814**	**2049**	Cap check yearly, water tests NRC yearly	yes	Annual	
11	Kellys Bay	KDC	Completed	**7226**	**2035**	Cap check yearly. Drains, fly tipping quarterly	yes	Quarterly	
12	Mosquito Gully		Completed	**7227**	**2035**	Cap check yearly. Drains, fly tipping quarterly	yes	Quarterly	
13	Te Maire		Completed	**4815**	**1996**	Cap check yearly. Drains, fly tipping quarterly	yes	Quarterly	Consent has expired no request has been received

Site		Land Ownership	Post Closure Management Plan	Current consent	Expires	Consent conditions	Monitoring Required	Inspection	Outstanding work Requirements
									from NRC re renewing this consent
14	Bickerstaff	KDC	Completed	**38848**	**2051**	Cap and leachate check yearly, sediment monitoring annually for first 5 years.	yes	Annual	**Needs engineering assessment**
15	Franklin Road	KDC	No	**4916**	**1992**		nil	nil	
16	Te Kowhai Road		No	**illegal**			nil	nil	**Needs engineering assessment**
17	Tangiteroria		No	**illegal**			nil	nil	Need location
18	Pouto Point		No	**illegal**			nil	nil	Need Location
19	Kaihu		No	**illegal**			nil	nil	Need Location
20	Te Kopuru		No	**illegal**			nil	nil	Complete engineering assessment

APPENDIX C - Acronyms

LoS	Levels of Service
WMA	Waste Minimisation Act
LGA	Local Government Act
RMA	Resource Management Act
SR	Service Requests
CCRA	Climate Change Response Act 2008
WMMP	Waste Minimisation and Management Plan
AMP	Asset Management Plan

KAIPARA DISTRICT COUNCIL

Kaipara District Council

Stormwater Strategic Activity Management Plan

2021-2031

Summarising the Scheme Plans

June 2020

Status: Draft

Kaipara te Oranganui
KAIPARA DISTRICT
Two Oceans Two Harbours

This document has been prepared by Kaipara District Council.

QUALITY STATEMENT

PROJECT MANAGER		PROJECT TECHNICAL LEAD
CHECKED BY	……..... ……/……/……	
REVIEWED BY	……..... ……/……/……	
APPROVED FOR ISSUE BY	……..... ……/……/……	

42 Hokianga Road, Private Bag 1001

Dargaville 0340, New Zealand

TEL +64 9 439 3123, FAX +64 0 439 6756

REVISION SCHEDULE

Rev No	Date	Description	Signature or typed name (documentation on file).			
			Prepared by	Checked by	Reviewed by	Approved by
A	April 2020	1st Draft				
B	June 2020	2nd Draft				
C						
D						
E						

Contents

1 INTRODUCTION

1.1 PURPOSE OF PLAN

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

The SAMP provides discussion of the key elements affecting management of Council's Stormwater assets, including the legislative framework, links to Community Outcomes, policies and strategy, the proposed Levels of Service (LoS) and performance measures and demand, environmental and service management. This document should be read in conjunction with Scheme plans for each scheme area, and the Kaipara District Council Activity Management Overview, which provides the background for asset management activities.

1.2 STORMWATER ACTIVITY

Stormwater drainage protects our communities, infrastructure and public places from flooding by discharging stormwater and collecting contaminants to minimise adverse effects from rain, runoff and high tides. Stormwater drainage on state highways is managed by NZ Transport Agency (NZTA).

The provision of sustainable stormwater systems is about finding a balance between maintaining and enhancing natural watercourses and providing piping to enable urbanisation to occur while collecting and treating stormwater runoff from the effects of urbanisation prior to it entering the receiving environment waters such that they are not detrimentally affected.

With the changing climatic conditions, potentially higher intensity storms are likely to occur and thus a conservative approach to managing stormwater is considered appropriate.

With the Kaipara Harbour bounding a large proportion of the Kaipara district, this provides a significant focus for effectively managing stormwater runoff and minimising adverse effects on that major receiving environment. This also brings to focus the requirement to prepare and plan for any expected sea level rise, in line with any reports or changes to strategy from Northland Regional Council (NRC).

In providing stormwater systems, Council's aim is to protect people, dwellings, private property and public areas from flooding by providing a stormwater system that meets the LoS set out in this SAMP, and to discharge stormwater and collect contaminants in a manner that protects the environment and public health.

Council's approach to stormwater management is to minimise the impacts on the built environments by reducing adverse effects from stormwater runoff on the environment. The stormwater network is progressively developing and management requirements will need to be continuously reviewed to ensure the assets are maintained appropriately.

The community outcomes that the stormwater drainage activity contributes to most are largely expected to be unchanged from the LTP 2015/2025 i.e.

What We Want To See

- *To ensure that stormwater flooding and discharge to the environment is contained and managed to minimise negative impacts on people, culture, property and the environment.*

Why We Do It

- *To protect people, dwellings, private property and public areas from flooding by removing stormwater in a timely manner;*
- *To discharge stormwater and collect contaminants in a manner that protects the environment and public health;*
- *Council's approach to stormwater management is to minimise the impact on built environments by reducing adverse effects from stormwater runoff on the environment; and*
- *The stormwater network is subjected to high intensity rainfall events.*

The Level of Service

- *To provide s systems in urban areas with the capacity to drain water from normal rainfall events and cope with a 1 in 50 year rain event so that habitable floors are protected and public areas drain in a timely manner.*
- *Respond in a timely manner when habitable floors are threatened;*
- *Where stormwater drainage systems exist, to comply with resource consent conditions; and*
- *Services to customers will be reliable and dependable.*

Note: It is to be noted that Council does not manage stormwater drainage on State Highways. Stormwater drainage management does not include floodwaters from rivers or land drainage.

1.3 WHAT WE DO

Kaipara District Council runs five community stormwater drainage schemes for Dargaville, Baylys, Te Kopuru, Kaiwaka and Mangawhai;

- The schemes protect Habitable Floors from flooding by removing and discharging stormwater and collecting contaminants in a way that protects our environment and public health; and
- Respond promptly and reasonably to threats of flooding on habitable floors; and
- Maintain the performance of the stormwater drainage systems to the expectations of the community; and
- Stormwater drainage systems are designed and managed to best current practice: upholding safety, cultural, social, environmental and economic values; and
- Stormwater drainage systems in Whakapirau, Glinks Gully, Kelly's Bay, Pahi, Whakapirau, Tinopai, Paparoa, Maungaturoto and Matakohe are mostly incorporated into our roads network however pockets of open drain systems exist throughout the district.

Council undertakes the following with assistance from their Maintenance Contractor, and other service providers as required:

- Asset management;
- Customer services;
- Network operations and maintenance;
- Capital and renewal works programme; and
- Consent renewal, monitoring and compliance.

1.4 BENEFITS TO THE COMMUNITY

Our stormwater drainage activities protect public health and contribute to our cultural, social, economic and environmental well-being by:

- protecting habitable floors from flooding by removing and discharging stormwater;

- draining water from public areas in reasonable time in normal rainfall events (as defined by Level of Service events up to 1:50 year or 2% Annual Event Probability);
- manage up to the 1:50 year rain event for habitable floors above the 1:50 year flood level.
- complying with resource consent conditions;
- following best current practice in management of health and safety, cultural, social, environmental and economic outcomes;
- incorporating water sensitive design to promote resilient catchments;
- collecting contaminants in a way that protects our environment, and;
- planning for climate change to support resilient catchments in the future.
- we provide and maintain infrastructure that supports the economy of the area. We will ensure that people who are able to, will be connected to Council schemes;
- we are intent on lifting Kaipara district's well-being by providing infrastructure where people live close together, which protects the health of both the community and the environment.

2 THE ASSETS

The five Council operated community stormwater schemes are in Baylys Beach, Dargaville, Te Kopuru, Kaiwaka and Mangawhai. The location of each of these communities within Kaipara district is illustrated in the figure shown. These townships all have piped urban stormwater networks of varying scales. Rural areas and the smaller townships are currently serviced primarily by the roading infrastructure department.Stormwater systems predominantly incorporated into the road network are provided in Glinks Gully, Kelly's Bay, Pahi, Whakapirau, Tinopai, Paparoa, Matakohe and Maungaturoto. The Ruawai scheme is operated under the Raupo Land Drainage scheme.

An overview of the stormwater assets in the district is provided *in the asset overview and asset valuation summary tables below.*

Table 11: Extent of assets

Table 1 Extent of assets

Community	Pipeline length (m)	Open drain(m)
Baylys	4,222 (6% increase)	10 (0% increase)
Dargaville	36,479 (2% increase)	24,391 (30% decrease)
Te Kopuru	1,370 (819% increase)	3,918 (18% decrease)
Kaiwaka	2,098 (27% increase)	262 (0% increase)
Mangawhai	29,760 (20% Increase)	35,243 (382% increase)
Grand total	**82,833** (25% increase)	**70,652** (50% increase)

NB: Various natural assets such as overland flow paths and soft assets including riparian planting are located throughout the district. Increases in assets from the previous AMP are due to growth and active data collection projects. Decreases are mostly due to asset not being verified as existing.

Figure 1 Location of Stormwater Schemes

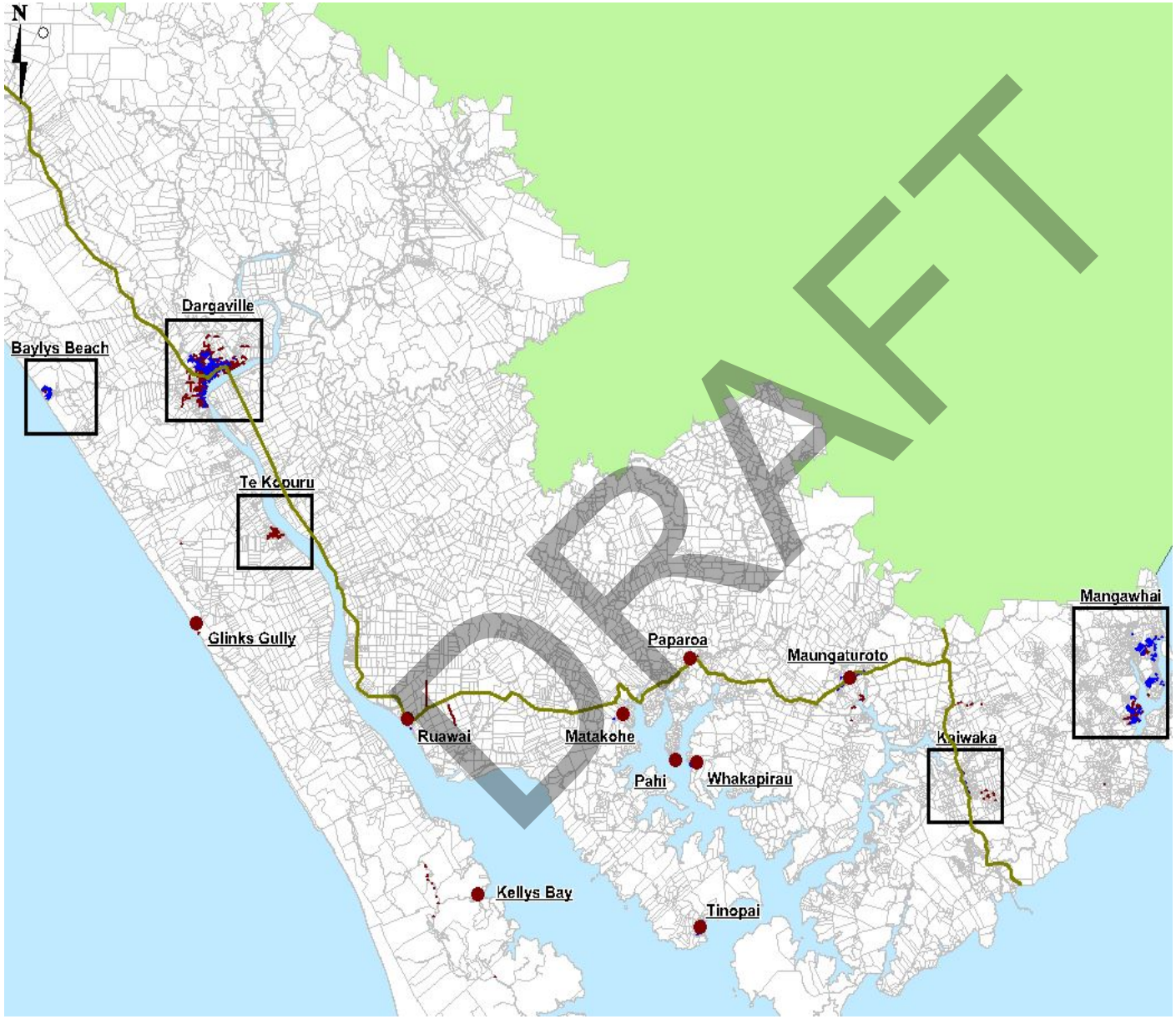


Figure 2 Asset valuation

Asset Type	Replacement cost ($)	Depreciated replacement cost ($)	Annual depreciation ($)
Stormwater Lines			
Gravity Main and Catchpit Leads	$23,129,493	$13,999,507	$321,773
Service Connections	$1,212,428	$959,349	$18,716
Open Drain	$2,977,271	$2,962,227	$458
Culvert	$1,067,815	$765,088	$14,404
Drain	$729,771	$721,374	$567
Other Drainage	$318,202	$294,095	$3,044
Sub Total	**$29,434,981**	**$19,701,640**	**$358,962**
Stormwater Points			
CatchPit & Soakpits	$2,639,893	$1,832,773	$29,457
Inlets & Sumps	$445,048	$396,542	$4,450
Manhole	$5,974,080	$4,426,106	$59,741
Outlet	$608,543	$538,023	$6,085
Floodgate	$2,302,111	$434,973	$43,821
Sub Total	**$11,969,674**	**$7,628,417**	**$143,554**
Stormwater Ponds & Stopbanks			
Dargaville stopbanks	$7,093,101	$6,649,558	$27,721
Dargaville detention ponds	$45,485	$45,485	$0
Mangawhai detention ponds	$195,877	$194,645	$112
Sub Total	**$7,334,464**	**$6,889,689**	**$27,833**
Total	**$48,739,119**	**$34,219,746**	**$530,349**

Source 2018 Valuation

Note * =Maungaturoto, Pahi, Paparoa and Whakapirau stormwater systems form part of the Roading asset base

2.1 ASSET DATA

Council has a number of information systems that store asset data and enables various analysis to aid in the management of the activity.

It is recognised that condition and performance data relating to the stormwater assets has not been well documented. The current asset register contains a number of unknown, incomplete and incorrectly coded- asset attributes. This affects Council's asset knowledge and asset valuations and does not provide a sound basis for determining maintenance needs and forecasting renewals of stormwater assets.

The improvement of Council's data collection and entry processes has previously been identified as a critical project and is now currently underway with CCTV investigations and other data cleansing projects within the Kaipara district currently being investigated to improve the knowledge of our existing assets.

Following completion of the improvements, Council will continue to focus more on using previously un-utilised functions of their support tools, such as the recording of maintenance history at asset component level in the asset management system (AssetFinda) each time a works order is completed, managing defects and requests through the Works Request functions and fine tuning valuation and renewals.

As more information is recorded, an initial assessment and listing of renewal needs will be able to be created from AssetFinda. This could create a risk of significant changes to the level of expenditure required and will need to be reviewed and assessed by Council in line with Council's Renewals Policy.

The data improvement actions are listed in the Improvement Plan

2.2 PIPELINES

The stormwater network is made up of 87.3 km* (56.7km in 2015 assessment) of pipeline, 83.0km is tagged as Waters asset (the remainder being Transport and private assets). The increase is because of added assets to the management system, newly found and growth.

- 22% of pipe diameters are unknown (18.3km) this is compared to 37% (20.7km) in 2015;
- 32% of pipe materials are unknown (26.7km) compared to 57% (32.4km) in 2015; and
- 19% of pipes have unknown diameters and unknown materials 15.9km) this compares to 34% (19.3km)in 2015

The majority of pipe material is concrete with small amounts of asbestos cement and PVC. 2020 data no longer shows a RCRRJ as a pipe material, this is due to the asset cleansing project which has standardised material codes based on good practice guidelines.

2.3 ASSET PROFILE

Figure 2 Asset profiles

A review of the asset register to ensure all assets have been properly recorded has been identified as an item in the Improvement Plan, along with a data cleansing project to reduce the number of unknown asset attributes in the asset register.

Asset age is based solely on the instillation date held in the asset management system. For older assets, the Infrastructure department has very low assurance of the accuracy of this date and there is no known solution to improve this accuracy. Many older assets have an age which is classed as a best guess. This is the main reason an in-depth condition assessment of the existing network is being undertaken; the age cannot be reliably used as a condition estimate for the renewal strategy.

Data on asset condition has previously been low. The default setting for condition being 'Excellent' has meant historical the data has shown a network that is in much better condition than it is. Current Improvement Plans are working toward asset condition of the majority of the older assets with condition assessments on the newer assets left to an estimate based on age.

Table 3 Data confidence rating

Scheme	Confidence rating
Dargaville	C
Kaiwaka	D
Mangawhai	C
Baylys Beach	D
Te Kopuru	B

Table 4 Confidence rating key

Grade	Confidence rating	Accuracy
A	Accurate	±5%
B	Minor inaccuracies	±15%
C	Significant data estimated	±30%
D	All data estimated	±40%

2.4 CRITICAL ASSETS

The criticality framework is documented in the KDC Asset Management Overview. The key assets and their criticality are presented below. This is based on the Project Max report.

Historical evidence and local knowledge has identified the assets in the table below which could be considered to be "critical", in that failure of these assets could compromise the stormwater network. A greater level of management has been applied to the most Critical asssets.

Criticality allows for prioritization of renewals, maintenance and routine operational checks.

Table 5 Critical stormwater assets

Moderate Criticality		
Reticulation	Large culverts ≥ 900mm	• Consider pipes ≥ 900mm to be Moderate due to consequences of ground stability and/or flows taking alternative path in event of pipe failure. • Capacity of these pipes is adversely impacted by high river levels associated with major rain events and/or spring tides
Reticulation	Inlets and Outlets	• There are 3 potential issues with these grates i.e. • Potential for blockages of inlet grates with debris; • Potential for children to enter the drains if the grate is not in place; and • Significant scouring of the beach leading to undermining of the pipe.
Reticulation	Infrastructure in lowest parts of the district	• As Identified by Flood susceptibility maps (NRC or KDC as appropriate) • Minimum of Moderate criticality
High Criticality		
Reticulation	Pipes running under buildings	• High (Major)
Flood protection	Stop banks on Wairoa (east and west), Awakino and Kaihu Rivers	• High (Extreme)
Flood protection	Flood gates	• High (Extreme)

NB: All other assets are deemed Low criticality

3 CHALLENGES AND KEY ISSUES

3.1 IDENTIFIED NEGATIVE EFFECTS AND ISSUES

The stormwater activity is an essential service that is provided to our communities and the environment. Discharges from the urban stormwater network can impact cultural, social, environmental and economic well-being. In addition to managing the quantity of stormwater it is recognised that the activity also includes the quality of discharges to and from the network on the receiving environment. Both aspects of urban stormwater discharge have the potential to have significant negative effects on the environment and these should be mitigated as best as is practicably possible.

Guidance on the design and construction of new stormwater networks for urban and rural areas is provided in the Engineering Standards (The Standards) published by Kaipara District Council. Holistically, the design of systems in accordance with the Standards will minimise the impacts of stormwater discharges on the receiving environment; however, it is acknowledged that differences in design standards between old and new systems can result in a disparity between LoS provided throughout the network.

The negative effects/issues identified by Council and mitigation measures in place are listed below:

Table 6 Identified negative effects/issues

Identified negative effect/issue	Mitigation
Level of Service (LOS) versus Feasibility The construction and maintenance costs of infrastructure upgrades to meet a set level of service is beyond the means of the community to afford.	The provision of a set level of urban stormwater management should be assessed on a case-by---case basis. This will be managed through consultation with communities to determine the most practicable way forward, without negatively impacting on public health and the environment or creating risk to persons or property. Council is committed to improving the natural environment but acknowledges that this will take time to make significant improvements due to the low population of the district and the type of land use within. Council will work closely with NRC to ensure that conditions of resource consents are fair and justifiable from a risk and sustainability viewpoint.
Contamination of Urban Watercourses	The engineering standard provides minimum standards for stormwater infrastructure. It includes guidance on both quantity and quality control to reduce the impact of development on the

Identified negative effect/issue	Mitigation
Urban stormwater runoff has the potential to adversely impact the receiving environment stakeholders and users. .	receiving environment. Updates will include best practice for Water Sensitive Design and treatment. Continue to improve understanding of coastal/estuarine outfalls and the effects on the environment and incorporate best practice into catchment management plans. For existing developments, Council assesses the effectiveness of the existing stormwater management through the following methods: Individual site management and monitoring for identified high risk industrial and commercial sites; Champion the use of Water Sensitive Design; and Interaction with and education of the public to make people aware of potential impacts; and Ongoing monitoring of watercourses, in conjunction with NRC, to establish contaminant profiling allowing for targeted treatment schemes where required.
Contamination of Rural Watercourses Rural stormwater runoff is likely to have a different contaminant profile than that from the urban areas. Depending on land use rural runoff potentially has elevated levels of nitrogen and phosphates than urban stormwater, due to fertiliser usage and animal husbandry.	The engineering standard provides general guidance for the management of rural stormwater runoff. The section primarily relates to quantity control of runoff, although there is a recommendation that appropriate water quality treatment options be considered in conjunction with attenuation. The Engineering Standards will be updated to reflect best practice in Water Sensitive Design and treatment.
Climate Change Increasingly climate change effects, particularly increased rainfall intensity and sea level rise will challenge the resilience and capacity of the network	The impacts of climate change and sea-level rise on the existing networks and future growth needs to be investigated and any negative effects need to be mitigated as much as practicable, through design of growth network, current capacity, existing flood protection/land drainage measures, and the possibility of future flood protection/land drainage districts. Increasing challenges to the low-lying infrastructure in Dargaville and Mangawhai will need to be met with innovative solutions so LoS can be maintained. Increased focus on water sensitive design and green infrastructure will play a big part in these solutions. Focus on flood protection devices in low-lying areas of Dargaville and Mangawhai is critical.

Identified negative effect/issue	Mitigation
Flooding Direct Impact Urban catchments create a greater amount of impervious coverage (such as roads, roofs and paved areas) than would be seen in the natural environment. Runoff is generated quicker from paved areas and can result in overland flow paths and localised flooding, which can damage property and increase the risk to life.	Within urban areas Council's Engineering Standards consider that attenuation of discharges up to the 100-year event should be no more than the pre-development condition. This allows for protection of the receiving environment from potential erosion and flooding. The attenuation of runoff allows for flooding to be controlled locally, within the specific device. Online tools are being developed to enable better planning around problem areas such as overland flow paths. It should be acknowledged here that effects of Climate Change on the district's weather patterns can result in a reduced LoS delivered by the older parts of the stormwater network. Although these systems will be upgraded over time, priority will be given to areas where flooding as a result of capacity issues impacts upon property or life.
Network Resilience and Capacity not supported by a holistic design Historical focus on grey infrastructure has not gained the district the potential advantages of water sensitive design	The historical focus on grey infrastructure has enabled systems that have high flow outlets to the receiving environment, are less likely to return water to ground and are less robust. In the long term, continuing this philosophy will negatively impact on the capacity for aquifers to recharge and the catchments to be resilient under increasing hydrologically challenging times. There is now a focus on green infrastructure and water sensitive design.
Stormwater Infiltration Studies of the stormwater network in Dargaville and Mangawhai have found stormwater leaking into the wastewater system	This is believed to be a common problem throughout the district. Increased loading on the wastewater system has the negative effect of overloading wastewater treatment facilities, which in turn can result in increased discharges to the receiving environment. Not only does this reduce the efficiency of the treatment facility, it can also increase pathogens and other contaminant levels within the receiving environment. Aging infrastructure particularly in Dargaville is due to long term under investment. The problem has been identified as originating from both the public and private stormwater systems. A robust renewals program is planned.
Infrastructure not maintained to the correct standard Base infrastructure maintenance and renewals has been under resources leaving capacity and resilience issues.	A robust maintenance schedule is being developed with the maintenance contractor and asset management improvements are set to allow clarity on ownership and responsibility of core assets and green infrastructure assets

Identified negative effect/issue	Mitigation
Green infrastructure devices have been poorly catalogued and maintained	
Future growth The spatial plans have identified the likely growth areas in Kaipara. Fast growth without good infrastructure planning has in some cases such as Mangawhai left deficit in funding and LoS provision.	Formal, reticulated stormwater systems and funding will be required in the future for small townships so LoS can be maintained with growth. Investigations will need to cover capacity of existing infrastructure and identify a plan to allow and facilitate future growth, this should be covered in Catchment Management Plans. These plans will be updated for Mangawhai and Dargaville and created for all other areas in conjunction with Spatial Plans. Mangawhai network capacity and resilience has suffered due to fast unplanned growth. Because 5 schemes have targeted stormwater rates, funding for works beyond these schemes is currently very small and an overall funding model should be agreed on to engage community growth.
Public safety Public safety is at the forefront of network operations some assets however have an inherent risk	All risks to the public are elevated with urgency to the maintenance contractor and continual improvement is applied to the built environment. Some concern has been raised in urban areas regarding open drains. When concerns are raised, these should be investigated to understand the community's reasons why the drain needs to be piped and then each case assessed with regards to safety, to determine if the piping is warranted. Generally council policy is to not pipe open drains (and not allow private piping of open drains) unless there a strong evidence to for a positive safety gain.
Asset data Many aspects of the asset management system still require improvement.	The current asset data still has gaps and inconsistencies although improvements have been made since the last AMP. Asset data management is a process of continual improvement and there are multiple improvement projects underway and planned. Accurate asset data is essential information to enable Council to effectively and efficiently plan future works and capital upgrades as well as routine operational monitoring of the network. Asset inconsistencies also present a risk in giving the public incorrect information about asset locations. Further clarification of ownership and associated operation and maintenance responsibilities is needed across the district. Some work has been done since the last AMP so that definitions of

Identified negative effect/issue	Mitigation
	ownership are clearer for Transport and Waters assets and an agreement on how to ensure Transport assets are populated to the Waters database has been reached. There are still many roading assets not represented in the Waters database though, and some assets have incorrect ownership tags. These will require asset cleansing surveys.

Refer to Infrastructure Services Risk register for an overview of associated risks.

4 DEMAND MANAGEMENT

4.1 COUNCIL'S APPROACH TO DEMAND MANAGEMENT

The impact of growth is currently managed in multiple ways:

- Regulatory control

  Integrating the stormwater management objectives in all new developments from initial planning and design stages. This is the basic approach of Council's Engineering Standards

- District Plan

  The District Plan is the legal framework that is used for land use planning. The proposed District Plan does not allow an increase in downstream flows post development.

- Catchment management planning

  Catchment management planning is a key tool for facilitating the integrated approach to stormwater management to achieve the desired environmental outcomes. The draft catchment management plans developed to date will be updated during the 2018/2021 period then formally adopted by Council.

- Education building community knowledge

  Education is an important tool for providing the community with an understanding of their role and responsibility for managing their private stormwater systems, especially in regard to green infrastructure. Environmental awareness is increasing as the community realises the need to protect the environment, however at the same time property owners expect to be able to develop their property without restriction. Council has undertaken limited education to date however it is a demand management mechanism that can be considered in the future and may be added to the SAMP improvement document. Education promotes environmental awareness and the effects of activities such as car washing, where contaminants may enter the stormwater system through sumps.

Table 7 Examples of stormwater demand management strategies

Demand component	Stormwater examples
Operation Looks at LoS provided by the infrastructure and the application of Best Practice Options for	Maintaining the existing stormwater network through the application of an efficient operations and maintenance contract will ensure that the current LoS is met whilst also identifying and highlighting any issues across the district, the better the network is maintained the more efficient it is.

Demand component	Stormwater examples
sustainable long term management.	Integration of National and International standards for stormwater device design into Engineering Standards documents.
Design Constantly changing standards allow for better stormwater design and management, Water Sensitive Design and treatment at source.	Application of Water Sensitive Design as per existing standards and as technology is constantly improving allow for better stormwater management, reduced peak runoff and better water quality. Integration of improved technology and increased awareness of changes to stormwater management internationally, attendance at conferences and allowing consultants to raise any improvements they feel will better suit environmental needs, will ensure that the best solution to meet the required LOS will be constructed whilst also maintaining focus on environmental improvements and water quality.
Incentives Encourage the application of Low Impact Design throughout the community, soakage, rain gardens and other source treatment options.	Community education and interaction to promote the use of flow calming and pollutant capture devices such as rain gardens, detention/attenuation ponds and other source treatment options, this will enable the mitigation of damage from peak flows and to allow for water quality treatment prior to the discharge to the receiving environments.
Community education/interaction Develop partnerships with the communities in the district.	Production of Engineering Standards to aid development in the selection of the Best Practicable Option for stormwater management. Printed/electronic factsheets to promote stormwater and the receiving environment. Working with schools and engaging the community at an earlier level to promote water health,
Connection denial Regulation of connections to the public system to promote long term stability.	Where development lies outside of the prescribed growth zones, or where substantial increases in growth are identified Council may consider the option to force developers to treat and attenuate stormwater runoff from the development within their site boundaries or to fund the upgrades to the network required to connect them.

4.2 TECHNOLOGICAL CHANGE

Historically the methodology for dealing with stormwater runoff was to quickly remove it from urban and risk areas as quickly as possible through pipe networks and dedicated overland flow paths. Discharges were made direct to the receiving environment with little regard to the potential contaminants that they may contain, and the effects they could have on the stability and functioning of the ecosystems.

Over the past two decades there has been a philosophical shift in this principle as new technologies have been developed to promote Water Sensitive Design in the management of stormwater. This involves implementing solutions to mimic the natural environment prior to development and managing the impacts on the receiving environments. These solutions seek to increase the Resilience of the network and can add to other values such as ecological corridors.

Such advancements in stormwater management include the application of a treatment train approach (i.e. the use of two or more treatment methods in series to provide more effective contaminant removal), such as the use of ground soakage to maximise groundwater recharge and riparian planting around watercourses.

This shift in philosophy is supported by Council and guidance for its application is provided in the Engineering Standards and supporting documentation.

Technological advances in stormwater management are leading to more economically feasible devices entering the mainstream market and becoming more widely used. Stream restoration and riparian planting is replacing the standard lined channel, whilst the general treatment train approach to water quality is being applied to greatly improve discharge quality to lessen the effect on the receiving environment.

Council considers the use of wetlands and detention basins for stormwater management are integral parts to mimicking the natural flow regime in the receiving environment, whilst providing good levels of treatment.

Council is committed to working with NRC to implement new technology for stormwater management throughout the district. A constant awareness of technology changes is necessary to most effectively predict future trends and their impact on the utility infrastructure assets. This can be achieved through Council staff attending conferences, seminars and presentations along with seeking advice from professional advisors.

4.3 LEGISLATIVE CHANGE

Legislative change can significantly affect Council's ability to meet minimum levels of service and may require improvements to infrastructure assets. Changes in environmental standards and the Resource Management Act 1991 may affect stormwater discharge requirements.

In addition, changes in legislation can influence the ease at which new resource consents are obtained or existing consents are renewed. Experience has demonstrated that resource consent conditions are becoming more stringent with increased monitoring requirements being commonplace and the likelihood of additional treatment being necessary.

The Ministry to the Environment (MfE) is promoting a series of National Environmental Standards that can be enforced as regulations under the RMA. One of the sections under development relates to Ecological Flows and Water Levels in rivers, lakes, wetlands and groundwater resources. Although the receiving environment is already assessed in resource consent applications, the impact of this Standard is likely to require greater consideration of discharge quantities and quality of

stormwater into the receiving environment.

NRC is in the process of finalising the plans and policy surrounding proposed sea level rise and climate change, once this has been formally adopted KDC will prepare and adopt any changes required to its Standards and District Plan to meet the new requirements.

4.4 ENVIRONMENTAL CONSIDERATIONS

Environmental considerations are an everchanging issue. As such, there is a requirement for Council to provide the best service it can with the most UpToDate information.

With climate change and predicted sea level rise KDC will need to alter its focus and the considerations around flood levels, stormwater discharge and consented discharge limits to match the requirements from NRC, the change in public expectations and the altering natural environment.

Public perception of the impact of stormwater on the natural environment has altered noticeably over the last decade and has turned towards treating stormwater at the source and maintaining the quality of the harbours and waterways.

Urban stormwater runoff contains a range of contaminants which typically include organic and inorganic materials, metals and hydrocarbons. During very intense rainfall events contamination of stormwater from the wastewater network may also be present. The quality of stormwater runoff therefore has a significant impact on the quality of the receiving environment, being streams and rivers.

There is a growing awareness of the environmental issues related to the quality of stormwater runoff on the receiving environments of our streams, rivers and ground water and its impacts on our cultural, social and economic well-being.

Council, in conjunction with NRC, and communities are dedicated to protecting receiving environments, to protect it for future generations and to improve on the existing state. This is achieved through:

- Management of silt runoff from new development earthwork areas (including silt pond requirements for developers);
- Management of point source contamination risks (through the current Engineering Standards 2011 and community education); and
- Monitoring the receiving environments.

It is likely that as time progresses and more knowledge is gained from monitoring programmes about the effects of contaminants on the receiving environments that more stringent conditions will be applied on resource consents granted by NRC, including, but not limited to:

- Targeted contaminant removal (for example reduction in zinc loads);

- Increased overall treatment efficiency of stormwater management devices; and
- Greater application of LID in the overall stormwater management on a catchment basis.

Council will promote the best practicable option for the operation of the public stormwater infrastructure on behalf of the community as a whole, implementing strategies and programmes as appropriate. Review of existing consents, engineering standards and the provisions of the District Plan will be undertaken at regular intervals to allow comprehensive development guidance to be provided.

The stormwater network discharges into either rivers, streams or the Coastal Marine Area (CMA). The following table identifies those systems that discharge directly into the CMA, which may receive increased focus by NRC.

4.5 CLIMATE CHANGE

The changing climatic conditions are explained in the KDC Activity Management Overview. The effects of this on Stormwater are that high intensity rainfalls create an increased flooding frequency.

The impact of long term changes in weather patterns on the existing systems have been factored into this Activity Plan and the Infrastructure Strategy, however there is more work on-going to better identify these issues and what councils response should be.

Some of the potential impacts of climate change of stormwater and associated public infrastructure could include:

- Increased flood frequency resulting from more intense rainfall;
- Increased number of systems that do not have an appropriate LOS capacity, due to increased overall rainfall and raised groundwater tables;
- Increased coastal flooding through higher tide and surge levels;
- Increased flooding due to higher tides and rainfall breaching existing stop banks;
- Increased flooding due to higher low tides retaining stormwater and inundating an existing system by removing the ability for it to drain completely;
- Potential overwhelming of existing treatment devices leading to increased contaminant loadings in the receiving environment; and
- Increased coastal and fluvial erosion resulting from increased tide variations and discharges from the stormwater system.

NRC monitors rainfall at five sites throughout the district to understand the long term effects of climate change on rainfall patterns. In addition, the National Institute

of Water and Atmospheric Research (NIWA) maintains rainfall monitoring through an automatic station in Dargaville.

The Council's Engineering Standards provides design rainfall for Dargaville, Tinopai, Maungaturoto and Mangawhai areas of the district, being the main population centres. The rainfall depths provided in the Engineering Standards have been estimated up to the 100 year event; 72 hour duration and include adjustment for 95% confidence.

For developments in other areas the current Engineering Standards acknowledges NIWA's High Intensity Rainfall Design System (HIRDS) version 2, which outlines rainfall depths + 1.65 standard error + 17% climate change allowance.

Council manages the impact of urban growth and development on the stormwater infrastructure and receiving environment through the application of Stormwater Catchment Management Plans (SWCMPs) and planning provisions set out in the District Plan. Council currently has SWCMPs for Dargaville and Baylys Beach areas of the district and a SWCMP is currently being developed for Mangawhai as the previous version was finalised in 2005.

The functions of an SWCMPs include the following:

- Assess stormwater management of the wider catchment and not just the development site;
- Integrate with growth plans of the district, to assess future performance of the stormwater network;
- Identify potential quality issues that could develop as a result of future development;
- Identify catchment wide stormwater management principles to minimise ad-hoc localised solutions;
- Act as a vehicle to communicate with Iwi, the community and other stakeholders.
- Identify potential risks (both flood and flow related); and
- Identify mitigation options for the stormwater network.

The outputs from the SWCMPs can be used to define capital work's programmes and developer contributions.

4.6 IMPACT OF TRENDS ON INFRASTRUCTURE ASSETS

The impact of growth is currently managed in multiple ways:

Regulatory control

Integrating the stormwater management objectives in all new developments from initial planning and design stages. This is the basic approach of Council's Engineering Standards.

District Plan

The District Plan is the legal framework that is used for land use planning. The proposed District Plan does not allow an increase in downstream flows post development.

Catchment management planning

Catchment management planning is a key tool for facilitating the integrated approach to stormwater management to achieve the desired environmental outcomes. The draft catchment management plans developed to date will be updated during the 2018/2021 period then formally adopted by Council.

Education

Education is an important tool for providing property owners with an understanding of their role and responsibility for managing their private stormwater systems. Environmental awareness is increasing as the community realises the need to protect the environment, however at the same time property owners expect to be able to develop their property without restriction. Council has undertaken limited education to date however it is a demand management mechanism that can be considered in the future and may be added to the SAMP improvement document. Education promotes environmental awareness and the effects of activities such as car washing, where contaminants may enter the stormwater system through sumps.

There are currently no identified growth driven capital projects for stormwater over the next three years. Where infrastructure is installed, this will likely be installed by developers.

Stormwater is unique from other Council services as stormwater is not consumed or directly influenced by population growth. The level of surface permeability and the frequency and intensity of rainfall events are the two main parameters impacting future stormwater flows and demands and these are constantly changing.

Growth in the district generates an increase in impervious surfaces (driveways, buildings and roads etcetera) which places additional demand on existing stormwater assets or requires new stormwater assets. Currently, the proportion of the district that is impervious is unknown but is a factor considered in the development of Stormwater Catchment Management Plans (SWCMP). It is acknowledged that this will increase with growth, especially in the Mangawhai development area. Council uses the below options to manage the increases in stormwater runoff:

- Tolerate the consequences with an implicit reduction in the level of service provided;
- Increase constructed soakage;

- Provide piped solutions to cater for the increased flow and/or increase the capacity of existing assets.

In general, the forecasts assume that any additional demand for services created by the increased growth levels will be absorbed by the rating base growth and by more efficient delivery of services. Costs of implementation for growth can also be reduced through developers constructing pipelines to required sizes and then vesting with Council.

Design parameters

Design parameters for all new Council stormwater assets are set out in the Kaipara District Council Engineering Standards 2011. In summary these requirements include the following:

- Flood protection requirements for habitable buildings
- Protection of existing overland flow paths, watercourses, wetlands etcetera
- Catchment management planning
- Required design periods for primary and secondary design flow including rainfall depths by community
- Minimum freeboard height to floor levels
- Requirements for pipe size, material, location and layout of reticulation.

5 PROPOSED LOS AND PERFORMANCE MEASURES

The LOS reported in the table below are customer focused and are included in the 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.

Table 8 LOS and performance measures

Measuring performance				
What we measure	**LTP Year 1** **Target** 2021/2022	**LTP Year 2** **Target** 2022/2023	**LTP Year 3** **Target** 2023/2024	**LTP Year 4-10** **Target** 2025/2031
Network System adequacy For each flooding event, using a maximum of 1:50 year (Annual Event Probability 2%), the	<10			

Measuring performance				
What we measure	LTP Year 1 Target 2021/2022	LTP Year 2 Target 2022/2023	LTP Year 3 Target 2023/2024	LTP Year 4-10 Target 2025/2031
number of habitable floors affected. (Expressed per 1,000 properties connected to the district's stormwater system.)				
Response time The median response time in an urgent flooding event (defined as an event is where a habitable floor is reasonably at risk of being effected P1), measured from the time that the Council (or subcontractor) receives notification to the time that service personnel reach the site.	<2 hours for urgent events			
Customer satisfaction The number of CSR received regarding single network issues (however reasonably defined) per year/1000 properties. This includes all CSR that relate to SW infrastructure whether directed to the contractor or individual council staff member.	<18			
Discharge compliance Abatement notices, infringement notices, enforcement orders, convictions.	0			

Strategies for achieving service levels

To achieve the desired LOS specific improvements and management processes will be implemented.

System adequacy

This largely reflects the capacity of the system to capture and convey the flows arising from extreme weather events without damage occurring to habitable floors or business premises. This is not well defined across the district and it is intended to undertake a number of SWCMP studies in areas subject to growth or with known historical issues. This will identify capacity shortfalls, works that should be undertaken and also minimum floor levels that should be adopted for any new

construction. The SWCMP will provide a level of clarity that the desired level of capacity can be achieved for each of the subject areas that is not currently available. Areas that have not been studied and/or upgraded will remain at the LOS that has been historically provided.

Discharge compliance

There are two primary elements to the discharge consent for stormwater drainage and KDC has limited capability to influence either at this time :

Water Quality – Stormwater discharges collect and convey whatever contaminants are on the ground surface into the receiving waterways. This varies from grow contaminants such as rubbish, drink bottles etcetera, biological contaminants such as e-coli, chemical contaminants such as zinc, asbestos etcetera and particle contaminants such as clay.

There is a range of technologies available to reduce these contaminants including chemical treatment, physical filters and settling ponds together with natural processes that focus on reducing flow velocities, maintaining groundcover and encouraging natural filtration by directing flow through planted areas. These tend to work best with less intense storms when volumes and flow rates are lower.

KDC has limited resourcing in this area with some detention ponds in newer areas but otherwise limited capacity to focus on water quality. However, a number of older areas still largely rely on open drains and this has some beneficial effects on water quality compared to piped systems.

While KDC supports a greater focus on water quality it can only be implemented where development is occurring within the current planning timelines and resourcing. Where development is occurring there are strict controls in place to manage the runoff of silt arising from earthworks.

Flow Rates – A discharge consent could specify flow rates arising from a storm with a particular return period, however, KDC has very limited capacity to influence this. The limited number of detention ponds in newer areas will have a beneficial effect in reducing flow rates however KDC has no plans in place at this time to expand this capacity other than through the subdivision processes.

Current consents are listed in the Scheme Plans.

Customer satisfaction

This is a much more difficult measure to influence as it reflects the customers overall perception of the quality of the stormwater service that they receive or experience. This will be heavily influenced by whether or not they have had a personal experience (and the outcome of that), the unpredictable frequency and magnitude of storm events that have occurred in the survey period and overall satisfaction with the conduct of the council (via personal experience, experience of others and media coverage) and their understanding of how the stormwater drainage system works and its associated limitations. Feedback (both positive and negative) is most valuable when it identifies the specific reason for that view, assuming there is one.

Notwithstanding the above, a customer satisfaction survey, or compilation of complaints, will indicate the overall alignment between community expectation and what is being achieved and this may signal the need for change. This is particularly the case if stormwater is ranking significantly lower than other Council services. A sudden change in the level of satisfaction from year to year should trigger a discussion about what has changed or occurred, during that time that could have influenced this.

6 MAINTENANCE AND OPERATING STRATEGY

6.1 MAINTENANCE AND OPERATIONS

The day-to-day operational, inspection and maintenance of the stormwater network is carried out by the three waters maintenance contractor under Contract 798. The contract start date was July 2016 and the contract is administered by Council staff.

All work is performed, and materials used, to comply with the latest edition of the following standards:

- The Stormwater SAMP;
- Contract 798 – 3 Waters Operations and Maintenance 2016/2019; and
- The Kaipara District Council Engineering standards and policies.

The operation and maintenance standards for all work activities are specified in the maintenance contract, with performance measures including response times.

Current operation and maintenance activities undertaken across the stormwater network include:

- Normal routine maintenance to ensure that drains including natural watercourses are kept open and functioning;
- Maintaining the capacity of the natural watercourses which collect and convey stormwater runoff from private properties, Council's stormwater systems and the roading network;
- Replace any broken pipes, inlets, or collapsed manholes or catch pits;
- Repair any scouring due to flooding or malfunctioning of a stormwater drain;
- Spraying of stormwater drains annually;
- Inspection of the stormwater stopbanks, floodgates and floodwall annually;

- Inspection of floodgates located in low spots in Dargaville before high rainfall and high tide events (Note these inspections are currently undertaken by the Roading Contractor);
- Investigations with CCTV survey if necessary when reactive maintenance cannot resolve the network problem; and
- Record faults and maintenance undertaken (a future improvement has been identified to begin recording maintenance history and costs at asset component level in AssetFinda.

The table below 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 9 Maintenance and operating strategies

Activity	Strategy	Service criteria	Impact
General maintenance	Council will manage the assets in a manner that minimises the long term overall total cost and enables delivery of the desired LOS in the most costeffective way over the long term. Competitive pricing will be ensured by utilising our Procurement Strategy, CPP contract structures and performancebased term contracts where applicable. A register of all deferred maintenance will be maintained, the total value of which will be recognised in the financial reporting. A review and assessment of levels of deferred maintenance has been identified as a future improvement in the Improvement Plan.	Maintaining existing LOS Cost/affordability	Low – Medium Increased costs and risk of failure.
Unplanned maintenance – Disaster i.e. climatic event	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 response service for obstructions to drainage facilities that may result in flooding of buildings or urban properties.	Responsiveness	Medium Potential flooding of private property and damage to public roads and utilities.

Activity	Strategy	Service criteria	Impact
Unplanned maintenance	Council will provide a repair service and respond to and repair / overcome broken or leaking pipes. A suitable level of preparedness for prompt and effective response to asset failures will be managed by ensuring suitably trained and equipped staff to allow prompt repair of critical assets and mitigation of any hazards. Term contracts specify response times.	Responsiveness (Response time for obstructions to drainage facilities that may result in flooding to buildings is 6 hours)	Medium Flooding of private property and damage to public roads and utilities.
Planned Inspections • Reticulation • Drains • Stopbanks, floodgates, floodwalls	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.	Maintaining existing LOS	Medium Flooding of private property and damage to public roads and utilities.
Planned – preventative maintenance	Council will undertake a programme of planned asset maintenance to minimise the risk of critical equipment failure or where justified economically. Major maintenance needs will be identified through the scheduled asset condition inspections and those generated from the investigation of customer complaints.	Maintaining existing LOS. Cost/affordability	Medium

7 EXPENDITURE FORECASTS

7.1 OPERATIONS AND MAINTENANCE EXPENDITURE

The 10 year forecast for operations and maintenance costs for stormwater assets in the Kaipara District are shown in the following graphs.

They do not provide for inflation over the 10 year period and do not include the following :

- •Costs that would be allocated by Finance including depreciation, interest charges, write-offs and land rates payable for land occupied by facilities
- •Costs associated with stormwater staff

Table 10 OPEX forecasts

7.2 CAPITAL EXPENDITURE

The proposed stormwater capital works programme over the next 10 years, and illustrated below, is a blend of renewals and LOS improvements.

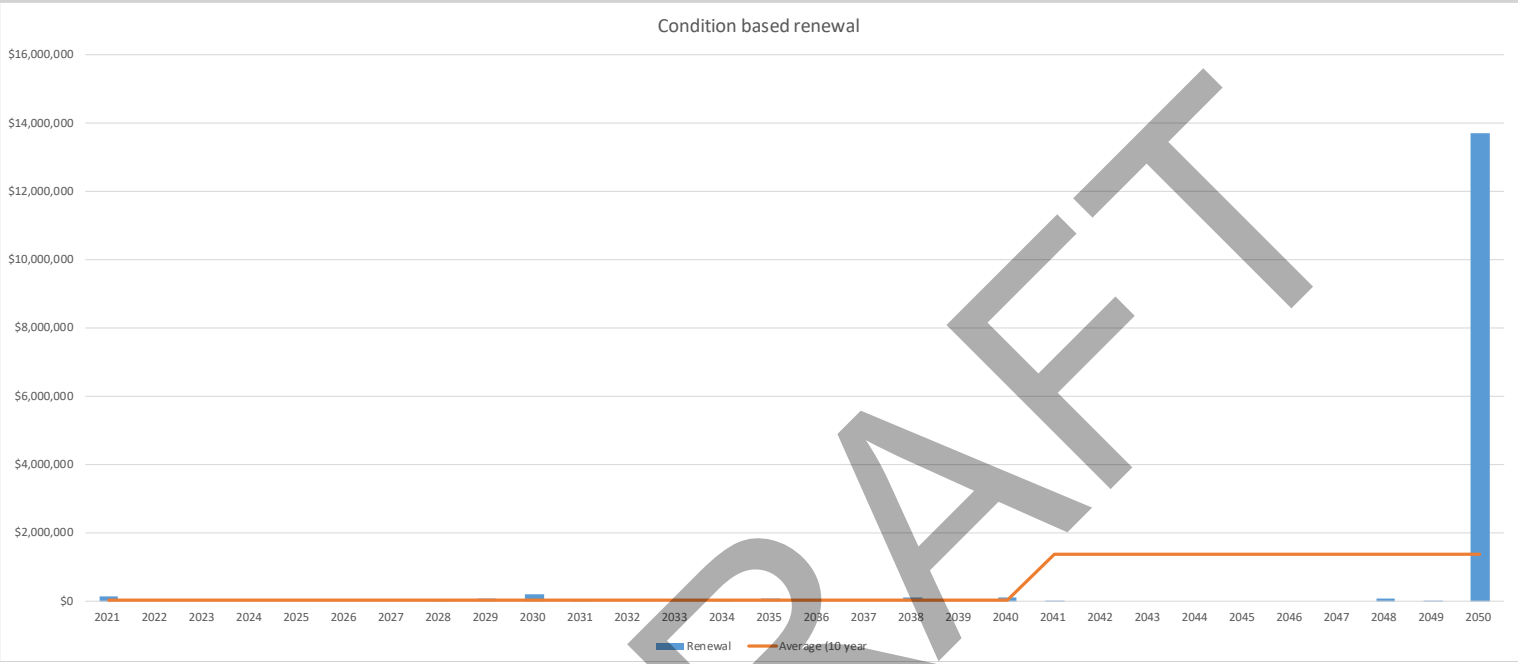
The LOS improvements are dominated by proposed works arising out the Mangawhai Community Plan and are still subject to further definition and consultation. The balance of the LOS improvements are focused on improving stormwater coverage of Baylys. Renewals have a nominal start and then build up rapidly in following years in the Dargaville system only. This is an indicative programme that reflects the lack of good quality condition information on the system.

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

Table 11 CAPEX forecast

Renewal Expenditure

Table 12 Predicted 30 year renewals



Year	Line	Point	Total
2021	$1,579	$146,430	**$148,009**
2022	$0	$0	**$0**
2023	$0	$0	**$0**
2024	$0	$0	**$0**
2025	$0	$0	**$0**
2026	$0	$0	**$0**
2027	$0	$0	**$0**
2028	$1,280	$0	**$1,280**
2029	$90,386	$0	**$90,386**
2030	$214,866	$0	**$214,866**
2031	$0	$6,754	**$6,754**
2032	$0	$0	**$0**
2033	$0	$0	**$0**
2034	$1,597	$0	**$1,597**
2035	$77,303	$0	**$77,303**
2036	$0	$0	**$0**
2037	$0	$0	**$0**
2038	$104,928	$0	**$104,928**
2039	$0	$0	**$0**
2040	$130,830	$0	**$130,830**
2041	$384	$0	**$384**
2042	$0	$0	**$0**
2043	$0	$0	**$0**
2044	$0	$0	**$0**
2045	$0	$0	**$0**
2046	$0	$0	**$0**
2047	$0	$0	**$0**
2048	$91,934	$1,304	**$93,238**
2049	$16,255	$0	**$16,255**
2050	$13,709,697	$2,500	**$13,712,197**

The current level of condition and/or performance data relating to the stormwater assets is not well documented. The future collection of this data and entry into the AssetFinda database has been identified as an activity to be completed within the AMIP. Over time, as more information is recorded, an initial assessment and listing of renewals needs will be able to be created from AssetFinda for subsequent review and verification.

Growth Expenditure

There are currently no growthdriven capital projects identified for stormwater over the next three years. Where infrastructure is installed, this will likely be installed by developers. No provision has currently been made within the capital works budget for Council to contribute towards increasing the capacity of stormwater infrastructure installed by developers if it will benefit the wider community, this will be assessed as a casebycase basis.

Level of Service Expenditure

TBC

8 AM IMPROVEMENT

8.1 OVERVIEW

The SAMPs have been developed as a tool to help Council manage their assets, deliver the LOS and identify the expenditure and funding requirements of the activity. Continuous improvements are necessary to ensure Council continues to achieve the appropriate (and desired) level of AM practice; delivering services in the most sustainable way while meeting the community's needs.

Council has demonstrated its commitment to AM improvement over the last few years and wishes to meet core requirements as defined by the Office of the AuditorGeneral for the Stormwater SAMP.

Table 13 Overall improvement plan

Improvement Plan 2021/2022 - Stormwater Drainage	
Year 1 - 2021/2022 Planned improvement / change	• Continue data cleansing projects and continually improve and record asset data management procedures to enable robust hydrological modelling, valuation and renewals functions. • Ensure all policy and procedural updates relating to stormwater uphold best current practice in water sensitive design and use of green infrastructure. • Create hydrological models for specific areas of the stormwater networks in Mangawhai, Kaiwaka, Dargaville, Te Kopuru, Baylys Beach, Maungaturoto and Paparoa where LoS or growth design questions need answering. • Complete CCTV condition assessments in Dargaville and Mangawhai so asset conditions can be used in the renewal's strategy. • Complete asset data for stop banks in the Urban area. Develop a standard for routine condition assessment of these assets in 100m lengths by the contractor and complete this assessment. • Model infrastructure requirements in Dargaville for flood susceptible areas to allow LoS under increasing rain intensity and River level.. • Complete Manhole surveys so that more that 80% of Lid Levels and Depth to Inverts are recorded for Mangawhai and Dargaville.

Improvement Plan 2021/2022 - Stormwater Drainage	
	• Complete asset ownership survey for Dargaville • Create overland flow maps for the whole district. Required for reliable Stormwater Catchment Management Plans (CMP), land use planning and renewals strategy. Incorporate this into public maps system • Complete the new CMP for Dargaville and Mangawhai • Finalize the renewals and valuation policy in combination with improved functions of asset data management software. • Finalize renewal plans for Dargaville and Mangawhai in coordination with the Strategic Asset Management Plan (SAMP) and Asset Management database functionality. • Finalize routine maintenance check procedures using Asset Management database functionality • Finalize procedure for approving to-be vested SW ponds and routine check procedures for those ponds in the O&M plan • Start restoration of Mangawhai stormwater ponds requiring upgrade to meet current standards • Complete Operations and Maintenance Plan for Mangawhai as per SW consent (all expected operations procedures documented so O&M contract has clear guidance, particularly for inlet/outlets, OLFP checks, ponds and discharges from industrial areas. • In accordance with new engineering standards, finalize requirements for as built drawings so import of assets to the management system is partly automated.
Year 2 - 2022/2023 Planned improvement / change	• Continue data cleansing projects and continually improve and record asset data management procedures to enable robust hydrological modelling, valuation and renewals functions. • Ensure all policy and procedural updates relating to stormwater uphold best current practice in water sensitive design and use of green infrastructure. Ensure Planning department have full access to resource required to action

Improvement Plan 2021/2022 - Stormwater Drainage	
	• Complete CCTV condition assessments in Kaiwaka, Maungaturoto, Paparoa, Te Kopuru and Baylys beach so asset conditions can be used in the renewal's strategy. • Complete the CMP for Kaiwaka, Maungaturoto, Paparoa, Te Kopuru and Baylys beach. • Finalize the renewals plan for Kaiwaka, Maungaturoto, Paparoa, Te Kopuru and Baylys beach in coordination with the SAMP and Asset Management database functionality. • Continue restoration of Mangawhai stormwater ponds requiring upgrade to meet current standards • Complete asset ownership survey for Mangawhai • Complete a survey of open drains in with attention to safety, condition and core information. Make cost benefit conclusions for future funding of piping open drains. • Complete asset data for stop banks outside the Urban area. Complete the condition assessment of these assets in 100m lengths by the contractor. • Model infrastructure requirements in Mangawhai for flood susceptible areas to allow funding for LoS • Complete Operations and Maintenance Plan for Dargaville (detail clear expectations for O&M contract particularly for critical assets; inlet/outlets, flood gates, stopbanks, ponds and discharges from industrial areas) • Finalize procedures for O&M contract service requests using asset management database functionality • Finalize the Stormwater Bylaw and/or Policy
Year 3 - 2023/2024 Planned improvement / change	• Continue data cleansing projects and continually improve and record asset data management procedures to enable robust hydrological modelling, valuation and renewals functions. • Ensure all policy and procedural updates relating to stormwater uphold best current practice in water sensitive design and use of green infrastructure.

Improvement Plan 2021/2022 - Stormwater Drainage	
	• Complete Manhole surveys so that more that 80% of Lid Levels and Depth to Inverts are recorded for all other areas (Mangawhai and Dargaville done Y1). • Complete Operations and Maintenance Plan for remaining schemes, not limited to Kaiwaka, Te Kopuru, Baylys Beach, Maungaturoto and Paparoa. • Complete asset ownership survey for remaining schemes, Kaiwaka, Te Kopuru and Baylys Beach plus Maungaturoto and Paparoa. • Continue restoration of Mangawhai stormwater ponds requiring upgrade to meet current standards • Complete the CMP for all remaining areas with stormwater infrastructure, not limited to: Whakapirau, Tinopai, Pahi, Glinks Gully, Kellys bay, Ruawai, Pouto and Matakohe. • Form renewal plans for all remaining areas, not limited to: Whakapirau, Tinopai, Pahi, Glinks Gully, Kellys bay, Ruawai, Pouto and Matakohe in coordination with the SAMP and Asset Management database functionality.
Years 4-10 - 2024/2031 Planned improvement / change	• Continue data cleansing projects and continually improve and record asset data management procedures to enable robust hydrological modelling, valuation and renewals functions. • Ensure all policy and procedural updates relating to stormwater uphold best current practice in water sensitive design and use of green infrastructure. • Complete restoration of Mangawhai SW ponds requiring upgrade to meet current standards • Rerun hydrological models for specific areas of the stormwater networks LoS or growth design questions need answering. • Validate unit cost of assets against real world costs and review unit costs against findings. • Survey all green infrastructure assets for inclusion into data management and plan for maintenance requirements.

KAIPARA DISTRICT COUNCIL

Kaipara District Council

Wastewater Strategic Activity Management Plan

2021-2031

Summarising the Scheme Plans

June 2020

Status: Draft

Kaipara te Oranganui
KAIPARA DISTRICT
Two Oceans Two Harbours

This document has been prepared by Kaipara District Council.

QUALITY STATEMENT

PROJECT MANAGER		PROJECT TECHNICAL LEAD
CHECKED BY	…… ……/……/……	
REVIEWED BY	…… ……/……/……	
APPROVED FOR ISSUE BY	…… ……/……/……	

42 Hokianga Road, Private Bag 1001

Dargaville 0340, New Zealand

TEL +64 9 439 3123, FAX +64 0 439 6756

REVISION SCHEDULE

Rev No	Date	Description	Signature or typed name (documentation on file).			
			Prepared by	Checked by	Reviewed by	Approved by
A	April 2020	1st Draft				
B	June 2020	2nd Draft				
C						
D						
E						

Contents

1 INTRODUCTION

1.1 PURPOSE OF PLAN

The purpose of this Strategic Activity Management Plan (SAMP) is to summarise in one place Kaipara District Council's (Council) strategic and long term management approach for the provision and maintenance of its wastewater assets.

The SAMP provides discussion of the key elements affecting management of Council's wastewater assets, including the legislative framework, links to community outcomes, policies and strategy, the proposed Levels of Service (LOS) and performance measures and demand, environmental and service management. This document should be read in conjunction with Scheme plans for each scheme area, and the Kaipara District Council Activity Management Overview, which provides the background for asset management activities.

1.2 WASTEWATER ACTIVITY

The wastewater activity focuses on protecting public and environmental health by collecting and treating wastewater prior to release into receiving environments. Growth and the need to provide for visitors in peak periods, especially in coastal communities, have resulted in Council's ongoing commitment to significant wastewater infrastructure development. The increasing cost of wastewater infrastructure and environmental compliance is placing a considerable amount of pressure on smaller communities. However, ensuring waste does not threaten people or the environment they live in is of high importance to communities.

The provision of sustainable wastewater systems requires all those connected to take on a degree of responsibility towards various aspects of the system operation. Just because a public system exists does not mean those connected can have a 'flush and forget' mentality.

In wastewater systems certain sanitary wastes should not be flushed down toilets as they cause blockages in pipes and pumps which leads to system overflows and adversely affect the environment. Costs are incurred when maintenance staff respond to such incidents which are ultimately passed back to the users who have concerns regarding rising costs.

Allowing surface water to access the wastewater system causes overflows from the wastewater system in rain events. System providers are required to prevent such overflows which can require huge storage facilities for wet weather events. These come at significant cost and the preferred solution is to prevent entry of surface water in the first place. Again, individuals can assist with this by taking on board a degree of responsibility and noting where surface water flooding may be entering their house wastewater system and preventing this. Another area that causes system overflows is allowing roof water downpipes to be directed into the wastewater gully traps.

1.3 WHAT WE DO

KDC operates six community wastewater schemes for Dargaville, Glinks Gully, Kaiwaka, Te Kopuru, Mangawhai and Maungaturoto.

The wastewater systems focus on protecting public and environmental health by collecting and treating wastewater prior to release into receiving environments.

1.4 BENEFITS TO THE COMMUNITY

- We provide and maintain infrastructure that supports the economy of the area. We will ensure that people who are able to will be connected to Council schemes;
- We are intent on lifting Kaipara district's well-being by providing infrastructure where people live close together, which protects the health of both the community and the environment; and
- We protect and enhance our natural assets and open spaces by ensuring we meet our compliance with the discharge consents.

1.5 POTENTIAL NEGATIVE EFFECTS

The wastewater management activity is an essential service that we provide to our communities and the environment. Discharges from the wastewater network via system failures or pipeline breakages could result in contamination of waterways and environmental or public health risk and can impact upon cultural, social, environmental and economic well-being.

Guidance on the design and construction of new wastewater networks is provided in Chapter 7: Wastewater Reticulation and Onsite Treatment; Engineering Standards 2011, published by Council. Holistically the design of systems in accordance with the Standards will minimise the impacts of wastewater discharges on the receiving environment; however, it is acknowledged that differences in design standards between old and new systems can result in a disparity between LOS provided throughout the network.

Significant negative effects include:

- In case of failure or significant breakage, there could be contamination of public waterways which may have large environmental or personal health issues;
- The rising cost of ongoing maintenance or pipe renewal may become economically unrealistic; and
- Failure of a wastewater treatment plant (WTP) in meeting the resource consent may result in Northland Regional Council (NRC) issuing an infringement notice.

2 THE ASSETS

Council operates six community wastewater schemes for Dargaville, Glinks Gully, Kaiwaka, Maungaturoto, Te Kopuru and Mangawhai in order to protect public health by providing Kaipara district with reliable wastewater service in a manner that minimises adverse effects on the environment. The location of each of these communities within Kaipara district is illustrated in the figure below.

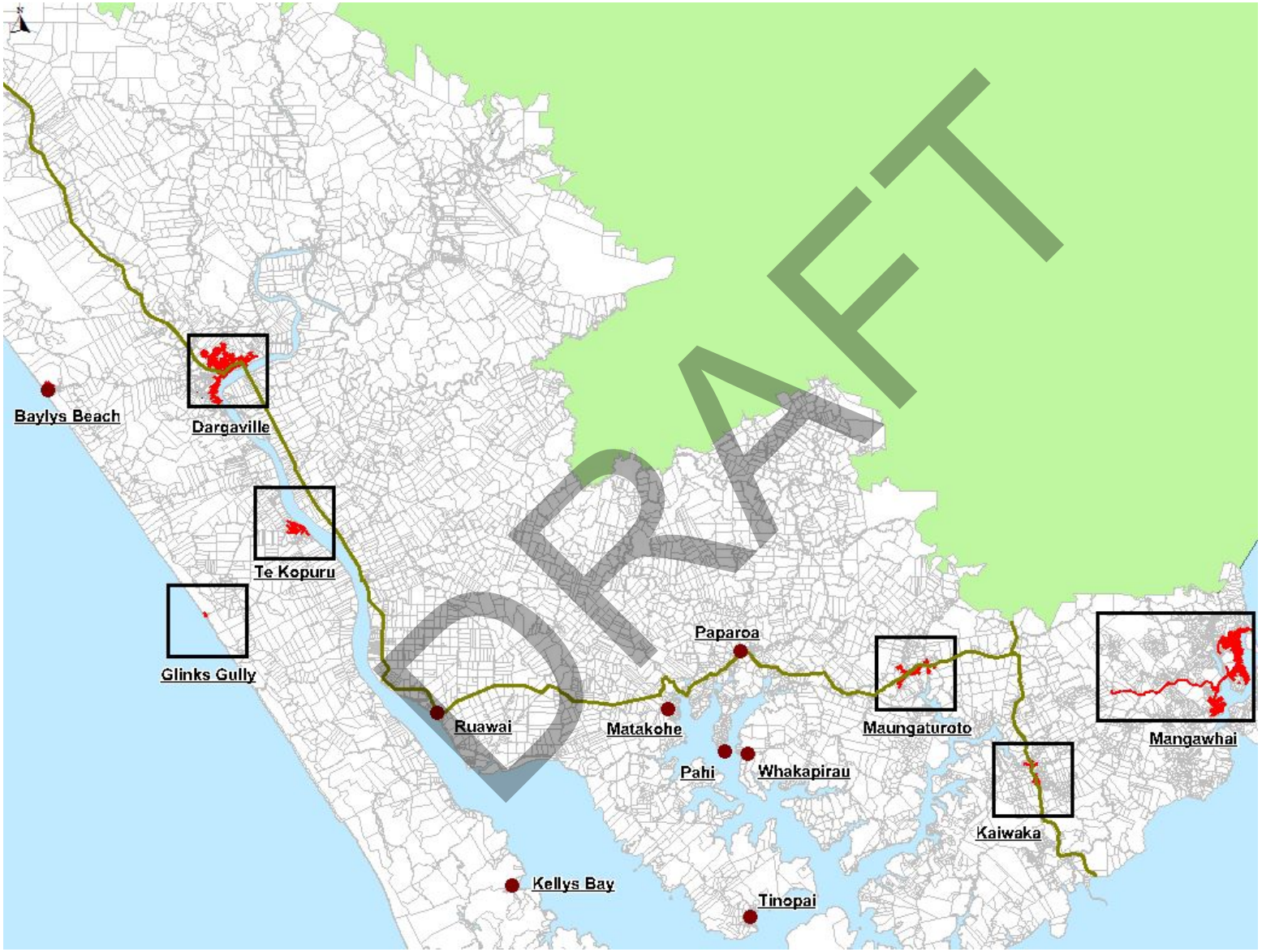
In addition to these community schemes, there are a number of smaller wastewater treatment facilities owned, operated or managed by Council. These facilities generally service camp grounds and other community facilities:

- Taharoa Domain – Kai Iwi Lakes camp grounds;
- Pahi Domain camp ground;
- Tinopai camp ground; and
- Ruawai public toilet wastewater system.

The above facilities are not included in this SAMP as the costs related to the operations and maintenance of these assets are funded from the community facilities budgets and they are managed under separate service agreements.

Extension of connections, disconnections to Council systems and exit from a scheme will be progressed where a business case shows benefits are in line with costs.

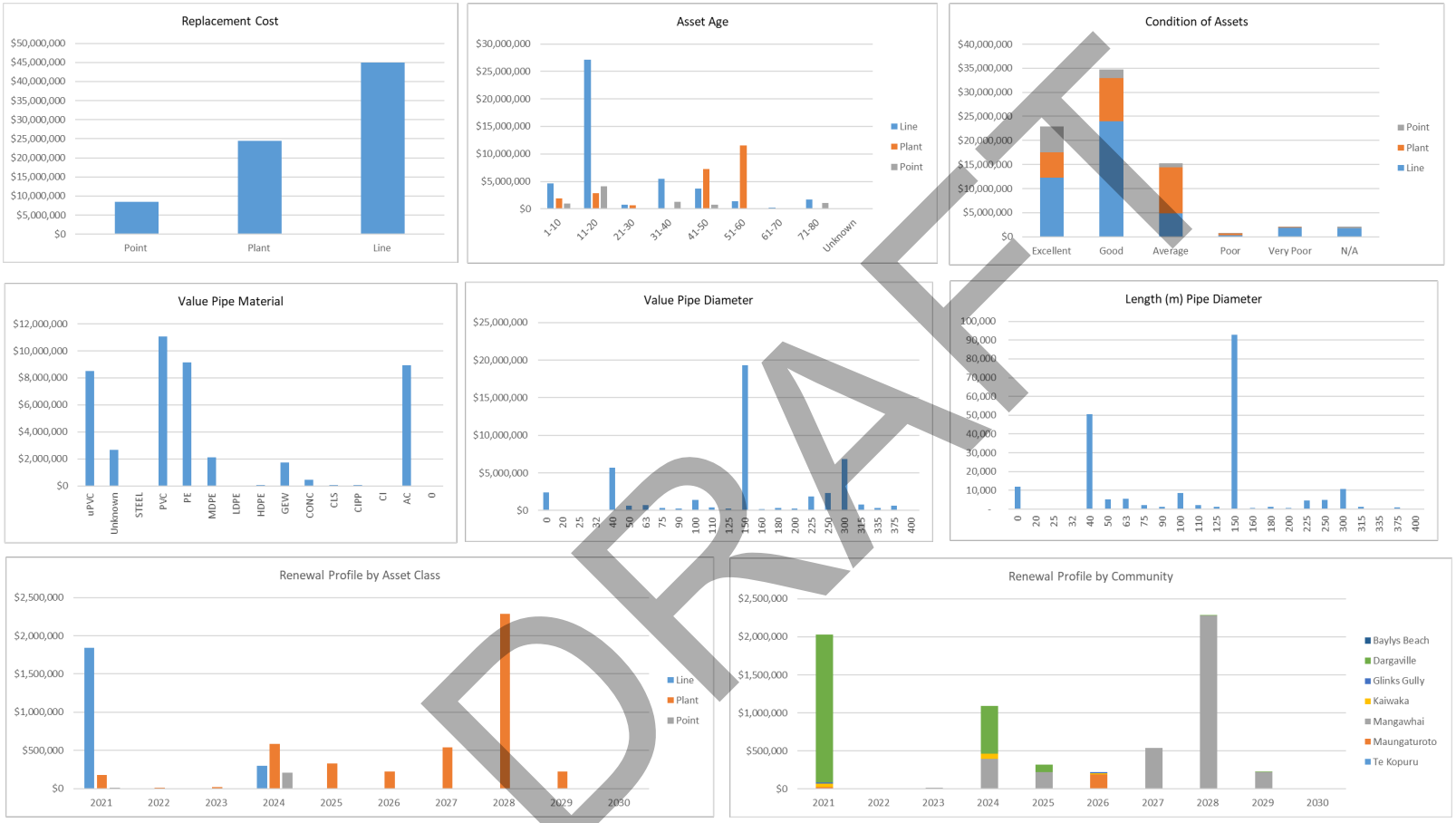
Figure 1 KDC WW schemes



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

2.1 ASSET PROFILE

Table 1 Asset Graphs



The 207km of wastewater assets have a replacement value of $45m. Over half of the assets are 11-20 years old. $1.8m of pipe assets mainly in Dargaville, are in very poor condition and are scheduled for replacement in 2021, subject to council funding. The plant assets have a replacement cost of $24m and are mostly 41-60 years old. Plant replacements of $4.3m are scheduled in the 10 year period subject to council funding. Point assets have a replacement cost of $8.5m and are in excellent condition.

2.2 VALUATION

Table 2 Wastewater depreciated valuation

Pipes	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Dargaville	$15,619,549	$7,187,512	$215,320
Glinks Gully	$135,213	$77,835	$1,690
Kaiwaka	$1,477,047	$648,723	$21,878
Mangawhai	$26,740,746	$21,441,657	$338,318
Maungaturoto	$3,674,154	$1,765,323	$54,648
Te Kopuru	$1,825,364	$770,392	$28,011
Total	**$49,472,072**	**$31,891,442**	**$659,865**

Plant	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Dargaville	$4,268,773	$2,654,194	$98,922
Glinks Gully	$129,939	$47,530	$4,390
Kaiwaka	$389,910	$174,655	$7,536
Mangawhai	$18,673,973	$14,066,241	$502,078
Maungaturoto	$2,318,795	$1,297,979	$59,211
Te Kopuru	$312,772	$186,272	$4,341
Total	**$26,094,162**	**$18,426,872**	**$676,478**

Source 2019 wastewater valuation

2.3 ASSET DATA

Council has a number of systems and processes in place where they are able to store and analyse asset information data to assist with management of the wastewater business. Details of each system and its capabilities are included in Section 8 (Asset Management Systems and Processes).

It is recognised that the current level of condition and performance data relating to the wastewater assets is not well documented. The current asset register contains a number of unknown, incomplete and incorrectly coded asset attributes. This affects Council's asset knowledge, asset valuations and data confidence, and does not provide a sound basis for determining maintenance needs and forecasting renewals of wastewater assets.

The improvement of Council's data collection and entry processes has been identified as an activity to be completed within the AMIP, along with a "data cleansing" project to reduce the number of unknown/incorrect asset attributes currently in the asset register.

Following completion of the above activities, Council will move towards using previously un-utilised functions of their support tools, such as the recording of maintenance history at asset component level in Assetfinda each time a works order is completed.

As more information is recorded, an initial assessment and listing of renewal needs will be able to be created from Assetfinda. This could create a risk of significant changes to the level of expenditure required, and will need to be reviewed and assessed by Council in line with Council's Renewals Policy.

Advice has been received regarding an ongoing CCTV inspection programme for gravity wastewater pipes together with a sampling and testing programme for pressure pipes (rising mains). This is included in the Management Services budget. Ongoing data cleansing will also be undertaken in the Assetfinda database to provide more robust information on which to base asset valuation and renewal forecasts.

Table 3 Data confidence rating

Scheme	Confidence rating
Dargaville	B
Glinks Gully	B
Mangawhai	B
Maungaturoto	C
Te Kopuru	B
Kaiwaka	C

Table 4 Confidence rating key

Grade	Confidence rating	Accuracy
A	Accurate	±5%
B	Minor inaccuracies	±15%
C	Significant data estimated	±30%
D	All data estimated	±40%

2.4 CRITICAL ASSETS

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

Table 5 Key assets in network

Critical wastewater assets		
Local wastewater reticulation	Bridge crossings of streams Local wastewater reticulation for Pipes ≥ 200mm in residential areas Pipes in CBD of Dargaville Pipes within, or crossing, State Highways – unless otherwise defined by Business and Community Customers.	Moderate
Pump stations	Stations other than Dargaville PS 1, 2, 3, and 4 and major Mangawhai stations.	Moderate
Rising mains	Rising mains other than large mains at Mangawhai and lower end of 'Daisy Chain' at Dargaville.	Moderate
Treatment plants	Maungaturoto.	Moderate
Local wastewater reticulation	Pipes running under buildings.	High (Major)
Pump stations	Dargaville main collection and transmission stations i.e. PS 1,2,3 and 4; Mangawhai major effluent and treated effluent pump stations.	High (Major)
SCADA system		High (Major)
Rising mains – specific large mains	Mangawhai Heads – under management of Build/Operate scheme;	High (Major)

Critical wastewater assets		
	Lower end of 'Daisy Chain' at Dargaville.	
Treatment plants	Mangawhai – under management of Build/Operate scheme.	High (Major)

3 THE CHALLENGES AND ISSUES

Key matters requiring attention for the wastewater activity are summarised in the table below.

Table 6 Key Issues

Issue	Discussion
System capacity	None of the KDC wastewater systems have hydraulic models or an overall assessment of the capacity of the various key elements that make up the systems. This generates a number of issues including: • Unknown capacity for growth to occur and difficulty approving extensions when impact on downstream system is unknown; • With the extent of renewals increasing it is critical to ensure that correct capacity is provided for future growth through that process; • Extent to which infiltration and inflow is present, what issues are associated with excessive Inflow and Infiltration (I/I) and how growth can be accommodated if I/I is reduced; • Pump station capacity relative to demand, ability to manage peak flows and what, if any, emergency capacity would optimally be required; • Capacity constraints within reticulation system, particularly pipes that are serving an arterial role; • Treatment capability relative to consent requirements and growth capacity. This also highlights fundamental limitations of the simple pond systems relative to likely future consent requirements; and • Ability to charge development contributions when balance of current and growth capacity not known. • The proposed system capacity studies are to obtain an overview of these issues for the subject schemes. This may lead to future more detailed studies being required.

Issue	Discussion
	Given the relatively small size of most of the schemes the actual extent of the network needing to be properly modelled is expected to be relatively small with large parts of the network able to be simply specified by minimum pipe sizes. The studies will therefore focus on key elements and identifying the main constraints. To be effective these studies will require reliable flow measurement in both dry and wet weather flow situations and this may require the installation of temporary flow gauging. Schemes proposed for inclusion in first three years are Dargaville, Kaiwaka, Maungaturoto, Glinks Gully and Mangawhai. Dargaville is driven mainly by renewal considerations and management of pump stations and WWTP. Kaiwaka is driven partially by growth considerations but also by consent renewal in 2022. Maungaturoto is driven by growth considerations. Glinks Gully is driven by consent renewal in 2024 and consideration of whether the scheme should be extended and potential for needing to renew the seepage beds. Mangawhai is driven by growth considerations.
Infiltration and Inflow Management	Many of the KDC schemes experience containment issues during wet weather and this is a clear indicator that Inflow and Infiltration (I/I) is present. This will be contributed to by the age of the networks and the low lying- nature of several of them. NRC is known to be concerned about the extent and frequency of wastewater overflows. The WaterNZ National Performance Review indicates that the Dargaville system has the highest number of overflows per 1,000 properties of any reported. The accuracy and validity of this measure is however highly suspect and will be confirmed with the next review. Some of the problem may be caused by pipes and pump stations simply being too small for the connected demand and the system capacity studies above will provide some indication of such situations.
Oxidation Pond Study	Dargaville, Te Kopuru, Maungaturoto and Kaiwaka all utilise oxidation ponds in various formats. These systems are cheap and simple to operate however have their limitations in relation to the extent and type of treatment that they can provide. While daily costs are low the periodic desludging costs can be considerable and are considered to be an Operational cost. The proposed study will align with the system capacity study with a specific focus on providing a view on the ongoing viability of oxidation ponds as a treatment process, what can be done to optimise their performance and providing a future outlook on necessary maintenance and upgrading. It is intended that this be undertaken before the desludging of the Dargaville oxidation ponds.

Issue	Discussion
Kaiwaka Consent Renewal	The Kaiwaka discharge consent expires in 2022. This funding provides for initial scoping of the process for renewal and gathering of information that will contribute to that process.
Specific Discharge Non-compliance	Some of the WWTPs regularly have periods of non-compliance with specific requirements of their discharge consents. With oxidation ponds this can be difficult to manage as they are biological systems with key adjustable controls other than aeration. A specific issue at this time is ammoniacal nitrogen at Te Kopuru and a study is provided to identify the cause and propose remedies.
Condition Assessment	The KDC systems comprise a mix of pipes of varying diameters, gravity/pressure, materials, ages, criticalities and operating environments. All of these factors influence that effective working life of the pipe and the drivers for renewal. Given the costs involved in renewals as the major driver of capital expenditure it is important that KDC has good information to both predict when renewal might be required (long term planning) and justifying the actual renewals to be undertaken (short term planning). Condition assessment is a key tool for both these disciplines and for gravity pipes it typically CCTV based- while pressure pipes utilise a range of technologies. KDC now has a structured CCTV inspection process in place that is essentially driven by criticality, age and size.
Mangawhai WWTP Renewals	The Mangawhai WWTP is very different to all other KDC WWTPs in relation to the extent and nature of the technology utilised. Much of this equipment has a relatively short life expectancy and therefore renewal expenditure is both large and frequent. A valuation base renewal forecast indicates renewal of $1.5 million being required over the next 10 years, including overdue renewal of $6,000 even with the plant only eight years old. The study is intended to focus on the renewal profile of the plant and review the actual condition of the subject equipment to determine if the life expectancy used for valuation purposes can effectively be utilised for renewal planning. It is hoped that lives can be extended but the WWTP is a hostile environment for much of this equipment and this cannot be a guaranteed outcome.
Advice on Mangawhai Operations Contract Renewal	The current Trility contract for the operation of the Mangawhai scheme expires in 2019, although it has a renewal option that Council could utilise. The current operating cost is over $1 million per year, excluding power. It would be appropriate as this time approaches that KDC considers what options it has going forward and whether the required levels of resourcing and performance can be achieved at a lower cost. This funding provides for advice that may be required during this process but is not intended to provide for a full open tender for the service.

Issue	Discussion
Valuation, SAMP updating and LOS Review	These are time-bound processes that need to be provided for during the three years of the LTP.

4 DEMAND MANAGEMENT

4.1 COUNCIL'S APPROACH TO DEMAND MANAGEMENT

Demand forecasting for this SAMP has been based on forecast population growth for each community applied to measured or theoretical per capita flow rates and has included discussion with key discharges where relevant (for example Silver Fern Farms (SFF)).

No allowance has been included for infiltration or inflow reduction.

Loading reduction refers to the reduction of raw material entering the treatment plant. This is not achieved by simply reducing the flow volume (for example by households using less water), as this results in the same amount of raw material being transported by less water and can lead to an increase in blockages with more concentrated waste. Such a scenario can also result in an increase in reticulation system odour as the more concentrated material is transported less efficiently to the treatment plant and decays in the pipes.

A more effective means of achieving loading reduction may be to eliminate food scraps entering the network via under sink waste disposal grinders, implementing a Trade Waste Bylaw or having agreements with major dischargers requiring pre-treatment.

Demand management strategies provide alternatives to the creation of new assets in order to meet demand and look at ways of modifying customer demands so that the utilisation of existing assets is maximised and the need for new assets is deferred or reduced.

The components of demand management are shown in the table below.

Table 7 Examples of WW demand management strategies

Demand component	Wastewater examples
Operation	Infiltration/inflow reduction, reduction in trade waste loads; and Reduction in the number of public wastewater systems.
Incentives	Wastewater collection and treatment pricing.
Education	Public education on water conservation and efficiency.
Demand substitution	Promote grey water re-use for toilets etcetera.
Connection denial	Where treatment plants are at maximum capacity it is necessary to refuse connection to new users.

Demand component	Wastewater examples
Low flow fixture and fittings	Promoting the installation of six by three dual flush toilet suites and low flow taps in bathrooms and kitchens.

Loading reduction principles currently practiced include infiltration inflow reduction. Council has developed a strategy for resolving infiltration issues previously.

Council has adopted a Wastewater Bylaw that provides greater control on wastewater discharges. Silver Fern Farms is operating under a Trade Waste Agreement and their effluent quality has improved significantly such that the Dargaville WWTP is receiving much lower loading.

4.2 SILVER FERN FARMS (SFF)

The Silver Fern Farms (SFF) meat processing plant in Dargaville generates effluent as a by-product of day- -today processing activities and is the largest contributor of effluent to the Dargaville WWTP. Excluding SFF, the current average treatment plant inflow is approximately 550m3 per day. Water consumption figures from 2015 for SFF indicate a wastewater flow rate of 750 to 1,000m3 per day (six days per week) or around 650m3 per day on average over seven days. SFF indicate that this flow is unlikely to change and that a long--term planning figure for capacity assessments would be a peak of 1,000m3 per day.

SFF currently treat their own wastewater prior to discharging it into the Dargaville WWTP. Their effluent quality now generally conforms to the trade waste consent issued to SFF in 2009.

4.3 INCREASE IN DEMAND FOR WASTEWATER SERVICES

As the population increases in the growing coastal areas such as Pahi, Tinopai, Whakapirau and Baylys, there is an increasing expectation from ratepayers for Council to provide wastewater collection and disposal services for these areas. This is being driven by the ratepayers increasing awareness of the natural environment and the desire to minimise the adverse impacts of activities upon the environment. There is also a need to monitor demand in smaller rural communities such as Ruawai and Paparoa due to the potential inability of the environment to cope with growth.

4.4 TECHNOLOGICAL CHANGE

Changes in technology have a significant potential to alter the demand placed on the utility services and also have the potential to provide techniques and processes for the more efficient provision of wastewater services. For example, low pressure wastewater systems eliminate the need for deep pipe systems in order to establish minimum flushing grades. The further development of membrane filtration in waste treatment process means very high treatment levels can be achieved for less cost than previously expected.

The recent improvement in the cost of membrane filtration technology has allowed its adoption at Maungaturoto as an addition to the pond treatment system. This technology produces a very high-quality effluent that provides good removal of viruses. Accordingly, it is ideally suited for discharges into the Kaipara Harbour where shellfish gathering is undertaken.

Monitoring of the Maungaturoto scheme should prove instructive and allow assessment of its application to both larger and smaller schemes. The key point of interest will be the running costs in terms of both power and filter unit replacement rates. In addition, the current scheme allows a staged development that is well suited to a staged scheme development due to the uncertain rate of growth in Maungaturoto. Recent developments in pipeline rehabilitation techniques such as grouting, patch lining and replacement with pipes of better material and with more watertight jointing have been shown to be valuable tools in managing the infiltration problem. Whilst the use of modern pipelines in urban growth areas are able to significantly reduce infiltration, by themselves these technologies will not prevent a long term increase in groundwater intrusion due to the deterioration of jointing in older catchments. There is also emerging evidence that achieving targets for flow reduction may not be possible without including the complete length of service laterals in rehabilitation programmes.

A constant awareness of technology changes is necessary to effectively predict future trends and their impact on the utility infrastructure assets.

4.5 LEGISLATIVE CHANGES

Central government is focusing on a complete overhaul of the current systems and processes, and while these changes have yet to be finalised and implemented it is councils role to try to understand what these changes may be and try to prepare for them, these changes my include:

- How assessments of environmental effects are reviewed, likely to have financial hardship removed as a reason to allow poor discharge,
- Changes to allowable limits of discharge, particularly with a focus on nutrient loading and faecal coliforms

With whatever the final outcomes are from the Central Government review on three waters, there will be future costs to council to ensure that we continue to meet current and future consenting requirements.

4.6 ENVIRONMENTAL CONSIDERATIONS

Where the absence of a reticulated wastewater collection and treatment scheme could result in continued adverse effects on the environment, Council may be required to extend existing schemes or provide a new scheme to mitigate such impacts. Where such issues are identified a full range of solutions will be investigated with preference given to privately managed solutions.

An important aspect of the wastewater activity is ensuring that any discharge of contaminants to the district's land, air and natural water resources is managed responsibly. The statutory framework defining what activities require resource consent is the RMA 1991. The RMA deals with:

The control of the use of land;

Structures and works in riverbeds and in the CMA; and

The control of the taking, use, damming and diversion of water, and the control of the quantity, level and flow of water in any water body, including:

- The setting of any maximum or minimum levels or flows of water;
- The control of the range, or rate of change, of levels or flows of water; and
- The control of discharges or contaminants into water and discharges of water into water.

Council's wastewater reticulation and treatment plants (including oxidation ponds) have an essential role in ensuring that wastewater produced across the district is properly collected, treated and disposed of in ways that meet community and cultural expectations and avoid causing significant adverse effects on the environment.

The RMA requires resource consents in the form of discharge permits for all discharges of treated wastewater. Other resource consents may also be required for installation and operation of wastewater infrastructure (e.g. pipelines across rivers and streams, and in coastal areas, monitoring of water supply bores for wastewater activities).

Environmental and treatment plant performance monitoring is required by many of the consents held by Council. A new measure was recently introduced by NRC to limit the number of annual discharge events into local rivers or streams from Council's reticulation, to a maximum level of 5. Recent studies in the Dargaville wastewater network have identified issues with infiltration from the stormwater network. This increased loading on the wastewater system could potentially create overloading at wastewater treatment facilities and increased discharges to the receiving environment.

Infiltration issues have also been identified in the Maungaturoto wastewater system with flows during heavy rainfall events likely to exceed the allowed maximum daily discharge consented for Maungaturoto. A small sub-catchment within the Maungaturoto network was selected to undergo smoke testing to identify potential sources of inflow/infiltration during 2012/2013. The findings of this survey identified that it was the private connections and roof guttering connections to the

wastewater reticulation that were the primary sources of inflow/infiltration. These instances were to be forwarded to the Regulatory department of Council to follow up and to get rectified. Whilst in this instance, the public wastewater network was not found to be contributing significantly to the inflow/infiltration issue, it is still being considered to extend the exercise to the wider Maungaturoto network and possible other communities.

Significantly the WaterNZ National Performance Review for 2015/2016 identified that the Dargaville wastewater system was the worst of the 44 councils in New Zealand who contributed data. Wet weather overflows were reported at approximately nine events per 1,000 properties with the median for 'small' councils being around three. This data is based on self-reporting and incomplete information and should not be taken too literally. However, it does indicate that the Dargaville system is performing, or being reported, significantly differently to other communities.

The extent of inflow and infiltration is one of the desired outcomes from the Capacity Studies that are proposed in this SAMP.

The oxidation pond in use at Te Kopuru is also monitored through sampling by NRC. Recent samples have indicated instances of non-compliance with consent conditions, thought to be due to sludge accumulation in the pond. De-sludging of the oxidation pond at Te Kopuru has been completed as a step toward improving the performance of the system.

NRC undertakes summer monitoring at popular swimming locations in the district, two freshwater and eight coastal sites. Samples are taken weekly between December and April each year to ensure the water is safe for swimming. Each site is given a grading based on the results compared to the MfEs "Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Area" publication (2002).

The results of this monitoring programme can be used to identify non-compliant locations and instigation of investigations into possible sources of contamination which may include contamination of stormwater from the wastewater network during intense rainfall events.

There is a growing awareness of the environmental issues related to wastewater discharge on the receiving environments and its impact on our cultural, social and economic well-being.

4.7 CLIMATE CHANGE

The changing climatic conditions are explained in the KDC Activity Management Overview. The effects of this on wastewater are that high intensity rainfalls create an increased flooding frequency and may contribute to wastewater overflows.

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 wastewater have been factored into this and the Infrastructure Strategy, there is more work on-going to better identify these issues and what councils

response should be.

4.8 CHANGES IN WATER DISCHARGE VOLUMES

Changes in water consumption patterns can affect wastewater assets. This can occur by an increase in per capita usage resulting in more wastewater or decreases in water usage which may result in more concentrated and possibly corrosive wastewater. It is considered unlikely that there will be significant changes in per capita water use throughout the planning period of this SAMP, although loss or gain of a commercial discharger is possible.

The current economic climate forces businesses to reconsider how and where they operate. Council works with both Fonterra in Maungaturoto and SFF in Dargaville to provide mutual beneficial arrangements. Fonterra takes water from Council's water supply system but discharges wastewater through its own treatment system, whereas SFF is supplied water by Council and discharges wastewater that is partially treated into Council's system. Council is currently working with SFF to introduce a trade waste agreement.

Any changes to these arrangements with commercial users will have impacts on the cost structure of each scheme. If Council is to be successful in developing and growing business within the district it will be necessary to work with the existing and new businesses to provide sufficient wastewater treatment capacity. Providing economic wastewater treatment will be a key benefit to encourage business growth and development in Kaipara.

4.9 IMPACT OF TRENDS ON INFRASTRUCTURE ASSETS

The main impact of the above trends is the expectation for Council to design, construct and operate wastewater collection, treatment and disposal systems in coastal communities to meet the growing demands of population growth and urban development or to upgrade treatment facilities for existing serviced areas in order to discharge treated effluent to land. The immediate and long term costs associated with these possible schemes is presently unknown.

Thorough investigation of all options to provide wastewater solutions will be required and any decision for Council to become involved in the creation of additional systems would only proceed where a business case supports the financial sustainability of the scheme funded entirely by the users.

Design parameters

The design parameters for all new Council wastewater assets are set out in Council's Engineering Standards 2011. The key design assumptions include the following:

- Number of persons per household equivalent – 4;

- Average dry weather flow – 210 litres per day per person;
- Industrial flow and trade waste shall be calculated as follows:
  - When the industrial waste and trade waste from a particular industry are known, these shall be used for the reticulation design; and
  - When this information is not available, the dry weather flow rates shown in Table 6-1 may be used as a design basis for industrial area.

Table 8 Default Dry Weather Flows from Industrial Areas

Minimum design flow	Flow rates (l/s/ha)
Light water usage	0.4
Medium water usage	0.7
Heavy water usage	1.3

5 PROPOSED LOS AND PERFORMANCE MEASURES

5.1 CUSTOMER EXPECTATIONS

Customers are demanding a higher standard of wastewater services and will need to be kept informed as to the impact of changes in the legislative requirements for wastewater treatment and the subsequent impact on individual schemes. The cost of maintaining or improving treated wastewater quality standards will need to be clearly communicated to the communities.

This increased customer demand has been witnessed in the Far North and Whangarei districts where tolerance for unplanned wastewater discharges, such as during storm events, has reduced. Improving the management of unplanned discharges is a LOS and key task under this SAMP.

The LOS reported in the table below are customer focused and are included in the 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.

Table 9 LOS and performance measures

Measuring performance				
What we measure	**LTP Year 1** **Target** 2021/2022	**LTP Year 2** **Target** 2022/2023	**LTP Year 3** **Target** 2023/2024	**LTP Year 4-10** **Target** 2025/2031
The number of dry weather sewage overflows from Council's *sewerage systems, expressed* per 1,000 sewerage connections to that sewerage system. The resource consent provides for severe weather events and power failure exceptions.	≤1			
Where Council attends to sewage overflows resulting from a blockage or other fault in the territorial authority's sewerage system, the following median response times apply: Attendance time: from the time that the territorial authority receives notification to the time that service personnel reach the site. (Department of Internal Affairs measure)	≤2 hours			
Where Council attends to sewage overflows resulting from a blockage or other fault in the territorial authority's sewerage system, the following median response times apply: Resolution time: from the time that the territorial authority receives notification to the time that service personnel confirm resolution of the blockage or other fault.	≤48 hours			
The total number of complaints received by Council about sewage odour. Expressed per 1,000 sewerage connections.	≤10			
The total number of complaints received by Council about sewerage system faults e.g. blockages, breaks. Expressed per 1,000 sewerage connections. (Department of Internal Affairs measure)	≤27			
The total number of complaints received by Council about Council's response to issues with its sewerage system. Expressed per 1,000 sewerage connections. (Department of Internal Affairs measure)	≤50	≤48	≤46	≤44
The number of abatement notices, infringement notices, enforcement orders and convictions received by Council in relation to its resource consents for discharge from its sewerage	0			

Measuring performance				
What we measure	LTP Year 1 Target 2021/2022	LTP Year 2 Target 2022/2023	LTP Year 3 Target 2023/2024	LTP Year 4-10 Target 2025/2031
systems.				
Major capital projects are completed within budget.	Achieved			

6 MAINTENANCE AND OPERATING STRATEGY

6.1 MAINTENANCE AND OPERATIONS

The inspection requirements for pump stations required by the maintenance contract are detailed below, with the frequency noted as twice weekly, with the exception of the Dargaville PS1 which has a daily inspection frequency:

- Log book completed including pump hours and AMPs drawn while running;
- Check operation of all pumps and clear blockages
- Check ozone units and/or odour control devices
- Pump out and clean wet wells, remove all grease and sludge
- Record evidence of overflows and advise of damage or impact, advise NRC
- Test alarms
- Download telemetry data and record any relevant information for monthly report

This inspection programme is supplemented by more detailed annual inspection that is used to determine any renewal or upgrading requirements. The timing of the annual inspection is undertaken to enable the results of the inspection to be incorporated into the annual planning round.

The annual inspection includes:

- Detailed mechanical check of all pumps, motors and valve gear
- Electrical check of all electrical equipment
- Review of all telemetry
- Maintenance of accesses, water-blasting of the wet well and removal of accumulated debris
- Preparation of a report to note maintenance, renewal and upgrading requirements
- To date maintenance of pump stations has been restricted largely to where a problem obviously exists. Diagnosis of problems other than by cursory inspection has been very restricted

- Pump station maintenance is currently conducted only on 'essential' or 'critical' equipment on a contract basis. All maintenance work is carried out by the Utilities Contractor. Emergency work is also undertaken under this contract and is commenced upon notification received from the Help Desk or SCADA-GSM alarm. Other upgrades are contracted separately in accordance with the technical demands of the work.

The table below 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 10 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 overall costs and risk of failure.
Unplanned maintenance – disaster i.e. climatic event, major spillage, system malfunction.	Council will maintain a suitable level of preparedness for prompt and effective response to civil emergencies or system failures by ensuring the availability of suitably trained and equipped suppliers. Specifically: electrical contractors and water/wastewater works contractors.	Responsiveness.	Potential wastewater overflows to private property.
Unplanned maintenance – pump stations – blockages WWTPs and pump stations – 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 30 minutes in the Dargaville central business area and 1 hour for all other areas)	Medium – Wastewater Overflows.
Unplanned maintenance – pipelines – blockages, odour, pipe breaks	Sufficient spares to be stocked (by contractor) to address regular failures.	Responsiveness. (Response time for unplanned priority works is 30 minutes in the Dargaville central business area and 1 hour for all other areas)	Medium – Wastewater Overflows

Activity	Strategy	Service criteria	Impact
Planned inspections Pump stations, WWTP, 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.	Maintaining existing LOS Pump stations are inspected twice weekly (Dargaville PS01 daily) and oxidation ponds are inspected as follows: • Dargaville – twice weekly; • Glinks Gully and Kaiwaka – weekly; • Maungaturoto and Te Kopuru – twice weekly (summer) and weekly (winter).	Medium – Wastewater Overflows
Planned inspections	Modify the inspection programme as appropriate in response to maintenance trends.	Maintaining existing LOS.	
Planned – preventative maintenance pump stations, WWTPs, pipelines	Council will undertake a programme of planned asset maintenance to minimise the risk of critical equipment failure (e.g. pump overhaul) or where justified economically (e.g. Access Road re-seal).	Maintaining existing LOS. Cost/affordability.	Medium – Wastewater Overflows

Reticulation

The maintenance and operating strategy for wastewater reticulation is to retain the current LOS and acceptable level of risk while minimising costs. The strategies designed to meet the objectives of this SAMP are described in the table below.

Table 11 Pipeline maintenance and operating strategies

Asset failure mode	Action	Service criteria	Impact
Pipes – blockages,	Blockages to wastewater pipes cleared by rodding, root cutting or water blasting,	System capacity/reliability.	Medium – Reduced network capacity
Reduced capacity,	Regular flushing by water blasting as identified by visual or		

Asset failure mode	Action	Service criteria	Impact
	video inspection.		Wastewater Overflows
	Use of a suction truck to remove accumulations of material and raw wastewater.		
Stormwater infiltration,	Video and smoke testing to identify illegal connections, breakages, obstructions and infiltration,		
Manholes infiltration, degradation,	All manholes inspected over a six-year period to identify structural or infiltration problems.	System capacity/reliability.	Medium – Reduced capacity

Pump stations

The operating and maintenance strategy for pump stations is that all reasonable measures will be taken to ensure a continuous service is provided. The maintenance and operating strategies are summarised in the table below.

Table 12 PS maintenance and operating strategies

Asset failure mode	Action	Service criteria	Impact
Pump stations – Mechanical or electrical failure.	Pump stations will be operated so that real time knowledge of flows and pumping hours can be obtained through the telemetry system.	Availability/reliability	Medium – Wastewater Overflows
	The pump stations will be inspected twice weekly to ensure pumps are operating satisfactorily.	System capacity	
	Annual mechanical overhaul, electrical check and general operational check of facilities.	Availability/reliability	
Pump stations complaints of odour.	Check ozone units for odour control (where applicable), twice weekly (daily for PS1) pump out wet wells and hose down grease and sludge.	Customer service	Low – Complaints on odour

Treatment

Each WWTP is operating under a resource consent approved by NRC. This considers the various legislative requirements along with the views of the community. During the consent application process, Council will liaise with the various affected parties and particularly the Department of Conservation and relevant Iwi groups.

The Operational Plan will be driven by resource consent conditions in the first instance and then the technical requirements of each system. Typical considerations include:

- Monitoring the quality of effluent discharge;
- Control of the quantity of discharge;
- Monitoring the operation of the plant in terms of odour or appearance;
- Control of vegetation;
- Amenity issues relating to operation; and
- Reporting performance to NRC.

With the negotiation of trade waste agreements it will be necessary to add requirements to monitor the quality of the effluent coming into WWTPs from various commercial users.

The majority of the WWTPs in the Kaipara district are very simple operations and require only periodic inspection to ensure continuous operation. Human input is limited to:

- Cleaning and calibrating equipment;
- Remove floating debris from the oxidation pond;
- Regulate the operation of the aerators to achieve desired levels of dissolved oxygen;
- Remove any build-up of weeds;
- Testing oxidation pond parameters; and
- Unblocking spray system.

The exception is the Maungaturoto membrane filtration plant, which requires a number of additional operation/maintenance tasks.

The maintenance and operating strategies for WWTPs are summarised in the table below.

Table 13 WWTP maintenance and operating strategies

Asset failure mode	Action	Key service criteria	Impact
WWTP – treatment process not effective.	Regulate dissolved oxygen levels through use of the aerators.	System effectiveness.	Medium/High.
	Monitor effluent pH levels.		Abatement notice for non-complying discharge.
Cost efficiency.	The plant will be operated to minimise electricity and maintenance costs while achieving effluent quality standards.	Cost/affordability.	Low – increased costs.
Mechanical equipment.	Regularly check the operation of mechanical assets and on monthly basis, service the aerators and arrange repairs as required by the contract. Monitor spray irrigation system and unblock as required.	Reliability	Medium/High.
Premature failure.			Abatement notice for non-complying discharge.

7 EXPENDITURE FORECASTS

7.1 OPERATIONS AND MAINTENANCE EXPENDITURE

The 10 year forecast for operations and maintenance costs for wastewater assets in the Kaipara District are shown in the following graphs.

They do not provide for inflation over the 10 year period and do not include the following :

- Costs that would be allocated by Finance including depreciation, interest charges, write-offs and land rates payable for land occupied by facilities
- Costs associated with wastewater staff

Table 14 OPEX forecasts

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Operating funding											
Sources of operating funding											
General rates	0	0	0	0	0	0	0	0	0	0	0
Targeted rates	1,961	2,174	2,250	2,263	2,266	2,501	2,730	2,798	2,875	2,955	3,013
Subsidies and grants - operational	0	0	0	0	0	0	0	0	0	0	0
User fees and charges	15	15	16	16	17	17	17	18	18	19	20
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**1,977**	**2,189**	**2,266**	**2,279**	**2,282**	**2,518**	**2,747**	**2,816**	**2,894**	**2,974**	**3,033**
Application of operating funding											
Contractors costs	133	121	124	127	130	134	137	141	145	149	153
Professional services	89	120	105	108	22	22	23	23	24	25	26
Repairs and maintenance	309	383	394	403	413	424	435	447	460	474	489
Other operating costs	77	87	88	90	92	94	96	98	101	103	106
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	365	453	460	470	459	483	505	518	532	547	563
Finance costs	103	95	117	129	155	229	304	289	283	274	266
Total applications of operating funding	**1,076**	**1,260**	**1,288**	**1,328**	**1,271**	**1,386**	**1,500**	**1,517**	**1,545**	**1,572**	**1,603**
Surplus (deficit) of operating funding	**901**	**930**	**978**	**951**	**1,011**	**1,132**	**1,247**	**1,299**	**1,349**	**1,402**	**1,430**

To be updated

7.2 CAPITAL EXPENDITURE

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

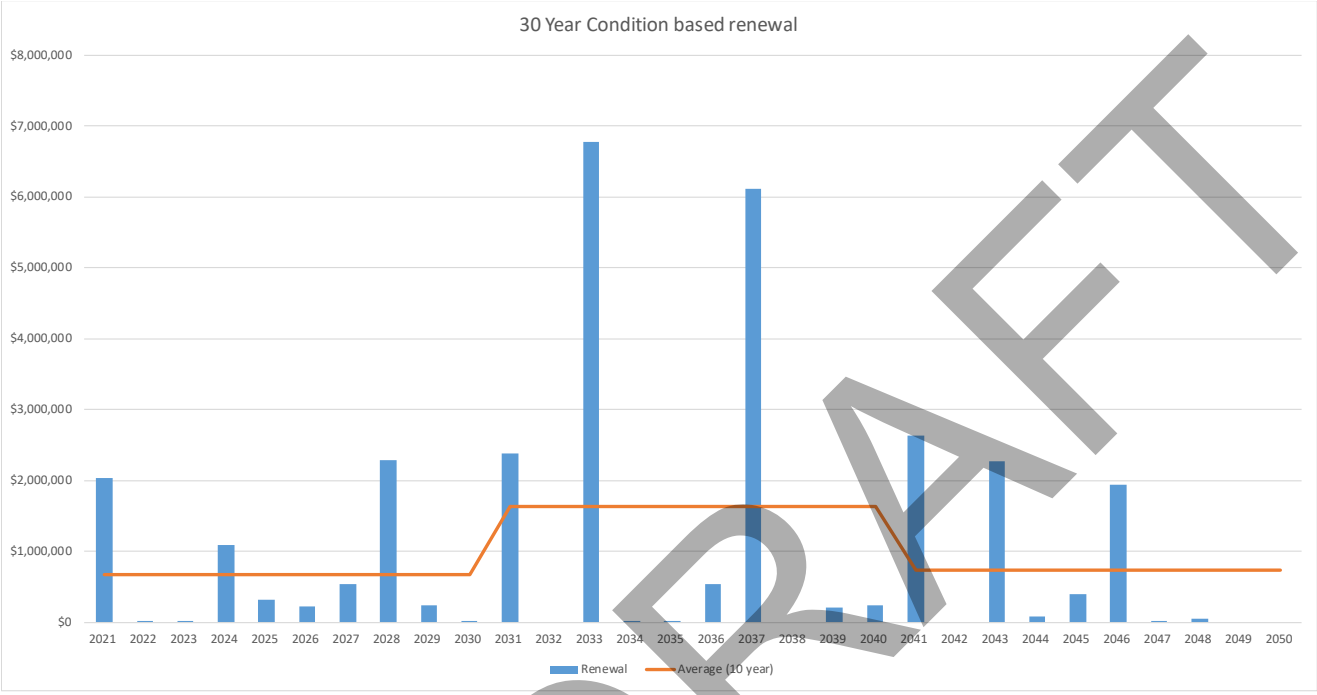
Table 15 CAPEX forecast

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	0	0	0	0	0	0	0	0	0	0	0
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	-62	485	146	391	1,303	1,281	-294	-321	-345	-370	-370
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**-62**	**485**	**146**	**391**	**1,303**	**1,281**	**-294**	**-321**	**-345**	**-370**	**-370**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	197	5	5	5	1,482	1,517	6	6	6	6	6
Capital Expenditure - Renewal	741	1,410	1,119	1,336	479	466	2,156	2,087	2,260	2,321	2,511
Increase (decrease) in reserves	-98	0	0	0	353	430	-1,208	-1,115	-1,262	-1,296	-1,457
Total applications of capital funding	**839**	**1,415**	**1,124**	**1,342**	**2,314**	**2,413**	**953**	**978**	**1,004**	**1,031**	**1,060**
Surplus (deficit) of capital funding	**-901**	**-930**	**-978**	**-951**	**-1,011**	**-1,132**	**-1,247**	**-1,299**	**-1,349**	**-1,402**	**-1,430**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

To be updated

Renewal Expenditure

Figure 2 Predicted renewals over 30 years



Year	Line	Plant	Point	Total
2021	$1,843,317	$177,537	$10,388	**$2,031,242**
2022	$0	$10,800	$0	**$10,800**
2023	$0	$18,743	$0	**$18,743**
2024	$296,434	$585,536	$207,969	**$1,089,939**
2025	$0	$324,685	$0	**$324,685**
2026	$0	$219,163	$0	**$219,163**
2027	$0	$538,783	$0	**$538,783**
2028	$0	$2,288,495	$0	**$2,288,495**
2029	$0	$225,153	$7,798	**$232,951**
2030	$0	$5,505	$0	**$5,505**
2031	$0	$2,383,299	$0	**$2,383,299**
2032	$0	$0	$0	**$0**
2033	$3,285,345	$3,491,273	$0	**$6,776,618**
2034	$0	$10,800	$0	**$10,800**
2035	$0	$18,743	$0	**$18,743**
2036	$0	$532,861	$0	**$532,861**
2037	$1,519,860	$3,743,531	$859,537	**$6,122,928**
2038	$0	$0	$0	**$0**
2039	$0	$200,518	$0	**$200,518**
2040	$0	$233,396	$0	**$233,396**
2041	$0	$2,631,998	$7,117	**$2,639,115**
2042	$0	$0	$0	**$0**
2043	$0	$2,277,695	$0	**$2,277,695**
2044	$0	$86,870	$0	**$86,870**
2045	$0	$340,853	$59,094	**$399,947**
2046	$0	$499,092	$1,439,038	**$1,938,130**
2047	$0	$18,743	$280	**$19,023**
2048	$0	$25,099	$19,698	**$44,797**
2049	$0	$0	$0	**$0**
2050	$0	$0	$0	**$0**

Growth Expenditure

It is anticipated that in the next 10 years, reticulation network of Mangawhai will grow significantly to cater for the growth. An investigation to identify the extensions necessary to the wastewater system to enable it to service most of the urban zoned area has been undertaken.

Level of Service Expenditure

Dargaville and Mangawhai LOS CAPEX is shown above spread over 10 years. This is primarily associated with the upgrading of PS1 and PS2 and associated rising mains in Dargaville and connecting current residents in Mangawhai to the existing WW scheme. While some of this can be associated with renewals the timing and nature of this project is primarily associated with reducing the number of wet weather overflows and this is a LOS driver. An amount of is also provided for installation of safety grilles on pump stations which is a safety enhancement.

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 5-3: High risks

To be added

9 CONTINUOUS IMPROVEMENT

9.1 OVERVIEW

The SAMPs have been developed as a tool to help Council manage their assets, deliver the LOS and identify the expenditure and funding requirements of the activity. Continuous improvements are necessary to ensure Council continues to achieve the appropriate (and desired) level of AM practice; delivering services in the most sustainable way while meeting the community's needs.

Council has demonstrated its commitment to AM improvement over the last few years and wishes to meet core requirements as defined by the Office of the Auditor General for the Wastewater SAMP-.

The following table contains a schedule of issues and proposed responses. Contained within this list are significant improvements in Council's ability to manage its wastewater assets.

In particular, the capacity studies will provide Council with an overview of its main wastewater systems in relation to current capacity, the level of Inflow and Infiltration, capacity to absorb growth and key constraints. This will significantly influence future renewals and system upgrades.

The other significant element is the condition assessment programme. The investment in this programme is significant and will run over a number of years. This will provide the necessary justification for the renewal of assets that need to be renewed. For assets that are considered to have useful life remaining it will provide detailed information about the overall state of the asset, the rate of deterioration that is occurring (potentially split by size, material, operating environment) and arising from this information a more robust understanding of the extent and timing of future renewals. Some revision of asset valuation might also occur out of this but this is a somewhat academic improvement.

The detailed condition assessment of the Mangawhai WWTP will provide insight into the management of relatively short-lived assets which require quite a different approach to long lived assets such as pipes.

Table 16 Overall improvement plan

Improvement programme 2021/2031	
Year 1 – 2018/2019 Planned improvement / change	• Investigating the disposal system for MCWWS • Undertake wastewater modelling for the District • Investigation and documentation of asset conditions

Improvement programme 2021/2031	
	• Continue the extension of the MCWWS reticulation system • Investigate alternative usages for sludge from MCWWS
Year 2 – 2019/2020 Planned improvement / change	• Work programme implemented for disposal system MCWWS • Continue wastewater modelling for the District • Work programme designed for asset replacement or renewal • Determine feasible option for sludge usage MCWWS
Year 3 – 2020/2021 Planned improvement / change	• Construct disposal system for MCWWS • Commence development for recyclable use of sludge from MCWWS
Years 410 – 2021/2028 Planned improvement / change	• Construct disposal system for MCWWS • Develop a recyclable use of sludge from MCWWS

KAIPARA DISTRICT COUNCIL

Kaipara District Council

Water Supply Strategic Activity Management Plan

2021-2031

Summarising the Scheme Plans

April 2020

Status: Draft

Kaipara te Oranganui
KAIPARA DISTRICT
Two Oceans Two Harbours

This document has been prepared by Kaipara District Council.

QUALITY STATEMENT

PROJECT MANAGER		PROJECT TECHNICAL LEAD
CHECKED BY	……..... ……/……/……	
REVIEWED BY	……..... ……/……/……	
APPROVED FOR ISSUE BY	……..... ……/……/……	

42 Hokianga Road, Private Bag 1001

Dargaville 0340, New Zealand

TEL +64 9 439 3123, FAX +64 0 439 6756

REVISION SCHEDULE

Rev No	Date	Description	Signature or typed name (documentation on file).			
			Prepared by	Checked by	Reviewed by	Approved by
A	April 2020	1st Draft	D Jeffrey			
B	June 2021	2nd Draft	D Jeffrey, M Smith, D Mugutso inputs			
C						
D						
E						

Contents

1 INTRODUCTION

1.1 PURPOSE OF PLAN

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

The AMP 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 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

- 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. There are pre-existing raw water supplies for agricultural purposes on the Kaihu (Dargaville) and Maungaturoto bulk watermains that have a historical obligation by council for the supply of non-potable water.
- We own and maintain the whole water supply network for the five schemes;
- Activities include collecting raw water for treatment at the treatment plants
- We treat raw water to produce quality and quantities of drinking water to government mandated 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 AS/NZS 4401.

A snapshot of the number of connections for each of Council's Water Supply schemes is provided in Table 21 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

Council also undertakes:

- water billing;
- customer services;
- asset management;
- Planning services - Growth, Renewals, Level of Service, future and township planning,
- treatment plant operations and maintenance;
- network operations and maintenance;
- capital and refurbishment programme; and
- consent monitoring and compliance.

1.4 BENEFITS TO THE COMMUNITY

Water supply is crucial to our economic and social wellbeing. Along with supplying to the domestic consumers, we also support industries such as Silver fern Farms 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:

- To provide a constant, adequate, sustainable high-quality water supply to Kaipara's reticulated areas;
- Clean, safe water is essential for communities and local economic development; and
- Public water supplies ensure communities receive water at the cost of production.

(Source: Annual Report 2018/19)

1.5 POTENTIAL NEGATIVE EFFECTS

The potential significant negative effects on the community of undertaking the Water Supply activity are detailed in

Table 5-2 below. This AMP 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 AM 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 Councils 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.

Activity	Effect on community well-being	Current controls
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.
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.

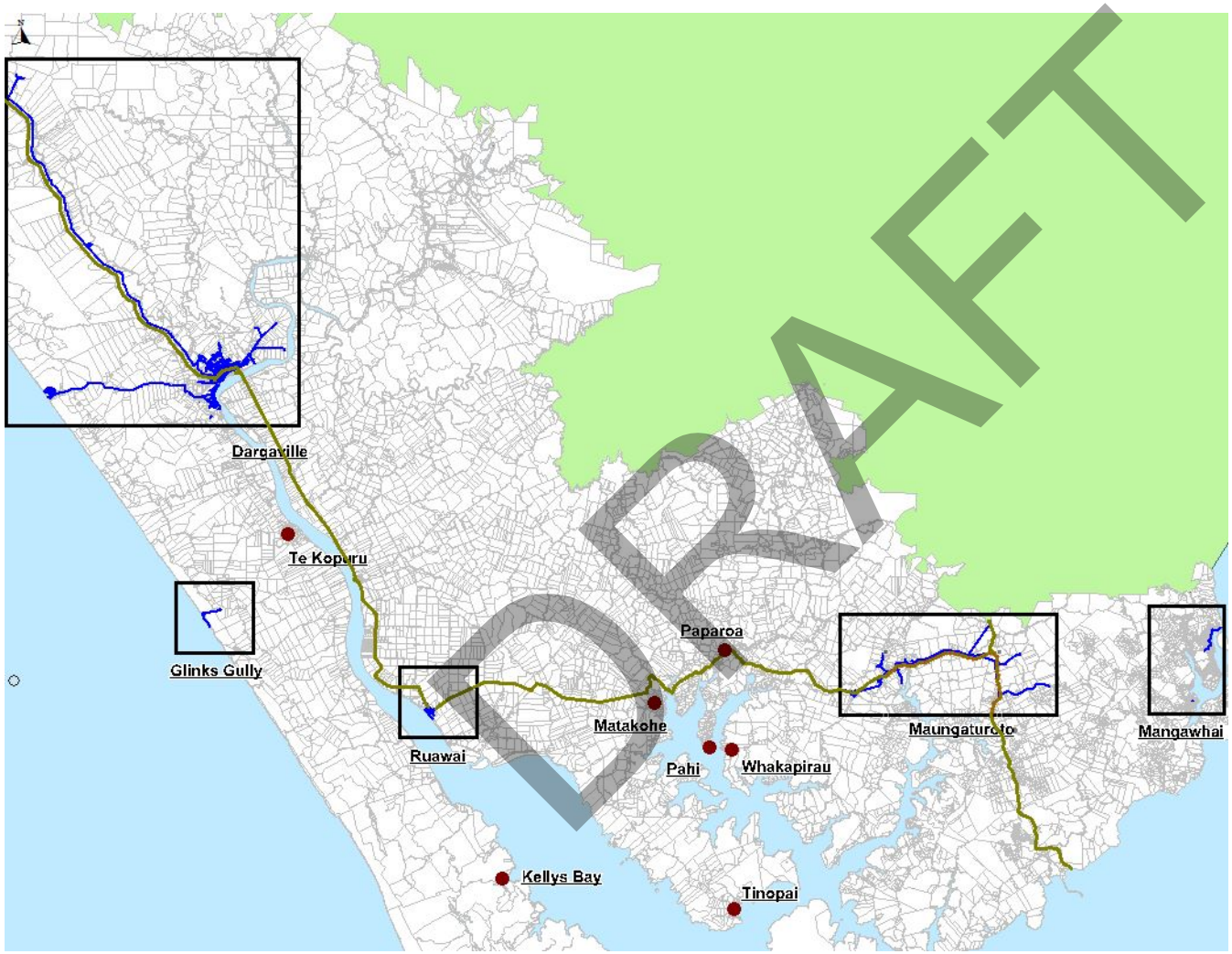
2 THE ASSETS

2.1 WATER SCHEMES

The location of each of the Water Supply schemes 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 consent conditions.

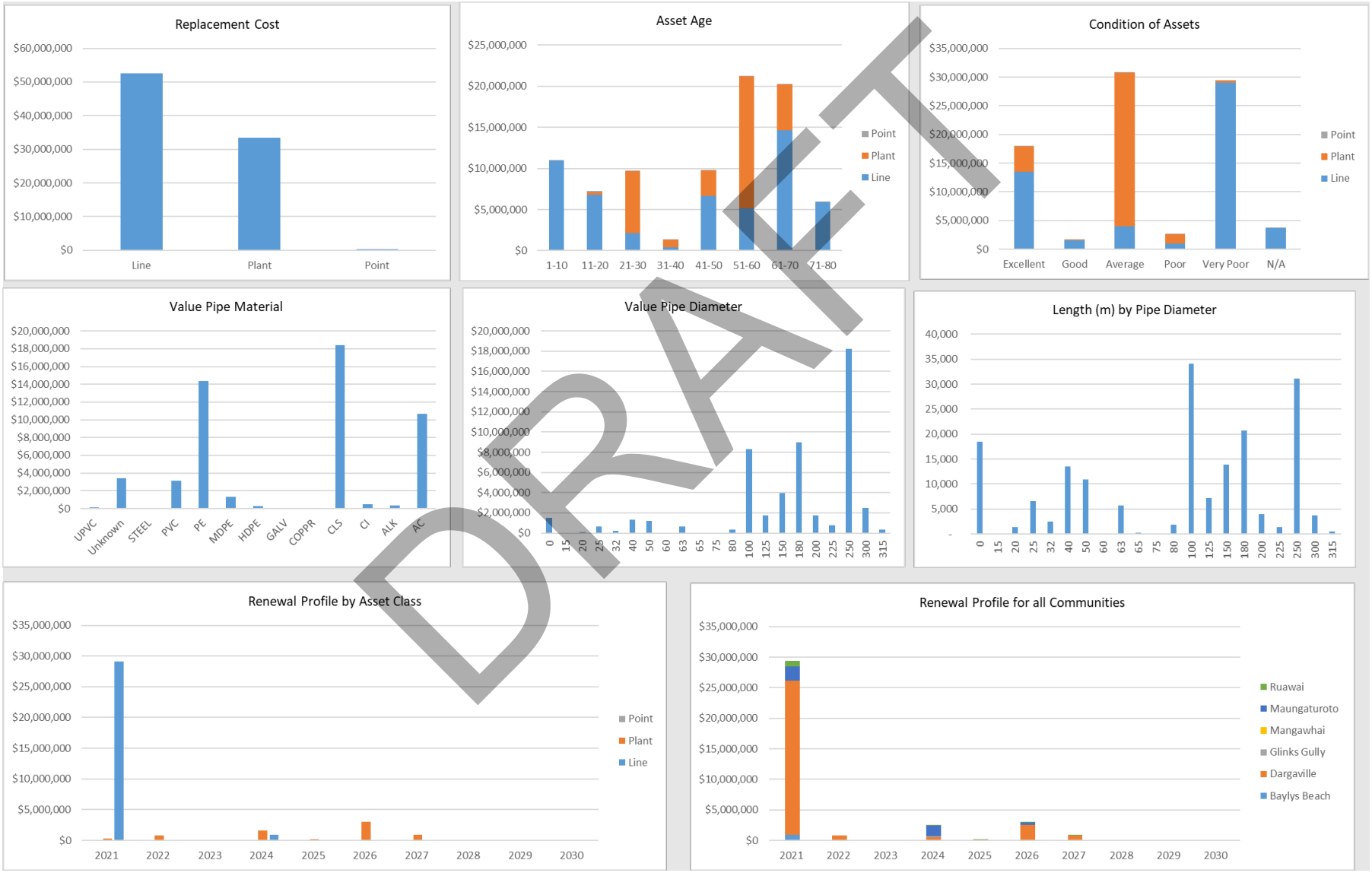
Figure 1-1: Location of communities with water supply schemes



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

2.2 ASSET PROFILE

Table 3-1: Asset Profile Graphs for Activity



2.3 VALUATION

Table 3 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

Valuation Summary			
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 above ground assets consisting of 5 water treatment plants, 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.

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 above ground 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 councils renewal profile, this may require council to adopt a position of" fix on failure" until this can be completed.

Asset performance

The current performance of our water assets has been mixed as evidenced by the performance metrics included in the Annual Report 2018/2019. The performance measures in section 6 were all achieved except for Dargaville, Mangawhai and Glinks Gully average consumption of drinking water.

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 4 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 5 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

Asset group	Specific asset group	Criticality
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
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 Council is a beautiful area that spans both coasts, it has the benefits of enjoying several long-established water sources that provide high quality water, it 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) 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 dryer 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.

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

Table 6 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 safe guard 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 effected, Northland is looking to get dryer 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, there will need to be a significant change to ensure security of water for the future.

	• Public Health - there are initiatives coming from central govt that are paying attention to the health of water ways 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. • 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 are 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 Dargaville are highlighting the need for 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

Economic – 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 identification of an investigation and possible implementation of a water supply scheme for the whole community within the next 30 years. .

Kaiwaka – The cost of home ownership in Auckland is driving people to look at locations outside Auckland that either provide for an extended commute of 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 Kaiwaka and as such Council has created a spatial plan with this community 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, but 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 Govt 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 have 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 requirement. 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 that 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 . 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 has identified the requirement to reform the regulation, delivery and management of drinking water. This has culminated into the setting up of a Drinking Water Regulator Taumata Arowai, under the Water Services Regulator Bill 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:
>
> 1) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations, and
>
> 2) safeguarding the life-supporting capacity of air, water, soil, and ecosystems, and
>
> 3) 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 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 AMP given the lack of detailed information available, some items around security of water supply have been factored into this and the Infrastructure Strategy, there is more work on-going to better identify these issues and what councils 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 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 AMP 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 NZ Building Code requirements for backflow prevention
- Requirements for pipe size, material and depth of construction
- Pipe installation, disinfection and testing requirements for new water assets

Currently there are sections of the networks under councils 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 2-12 are customer focused and are included in the 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 2018-2028 LTP and there is no change intended over the term of the LTP commencing in 2021.

Table 7 LOS and performance measures

Measuring performance				
What we measure	LTP Year 1 Target 2021/2022	LTP Year 2 Target 2022/2023	LTP Year 3 Target 2023/2024	LTP Year 4-10 Target 2025/2031
The extent to which Council's drinking water supply complies with part 4 of the NZDWS (bacteria compliance criteria).	Dargaville, Maungaturoto, Ruawai, Glinks Gully and Mangawhai			
The extent to which Council's drinking water supply complies with part 5 of the NZDWS (protozoal compliance criteria).	Dargaville, Maungaturoto, Ruawai, Glinks Gully and Mangawhai			
The percentage of real water loss from our networked reticulation system (average for total network of all schemes). Real water loss is calculated by subtracting the meter readings and 'other components' from the total water supplied to the networked reticulation system.	≤28%	≤28%	≤27%	≤26%
Median response time for attendance for urgent call-outs; from the time the local authority receives notification to the time that service personnel reach the site.	≤2 hours			
Median response time for resolution of urgent call-outs; from the time the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.	≤48 hours			
Median response time for attendance for non-urgent call-outs; from the time the local authority receives notification to the time that service personnel reach the site.	≤3 hours			
Median response time for resolution of non-urgent call-outs; from the time the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.	≤3 days			

Measuring performance				
What we measure	LTP Year 1 Target 2021/2022	LTP Year 2 Target 2022/2023	LTP Year 3 Target 2023/2024	LTP Year 4-10 Target 2025/2031
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
Water take consents:	100% compliance with Northland Regional Council water take consents			
The average consumption of drinking water per day per resident within Kaipara district. Average calculated by the billed metered consumption (m3) x 1000 divided by the no of connections x 365 x 2.5 (occupancy rate).	Dargaville – 275 Maungaturoto – 340 Ruawai – 130 Glinks Gully – 52 Mangawhai – 230			
Major capital projects are completed within budget.	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 6 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 8 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	Responsiveness (Response time for unplanned priority works is 1 hour for system malfunction or rupture and	Medium No water to parts of schemes. Potential flooding of private property and

Activity	Strategy	Service criteria	Impact
	repair service and respond to and repair or overcome broken or leaking pipes, power outages and equipment or system failures.	2 hours for all other unplanned priority works, apart from service restoration).	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.
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 9 OPEX forecasts WS.

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Operating funding											
Sources of operating funding											
General rates	0	0	0	0	0	0	0	0	0	0	0
Targeted rates	1,961	2,174	2,250	2,263	2,266	2,501	2,730	2,798	2,875	2,955	3,013
Subsidies and grants - operational	0	0	0	0	0	0	0	0	0	0	0
User fees and charges	15	15	16	16	17	17	17	18	18	19	20
Internal recoveries	0	0	0	0	0	0	0	0	0	0	0
Investments and other income	0	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	**1,977**	**2,189**	**2,266**	**2,279**	**2,282**	**2,518**	**2,747**	**2,816**	**2,894**	**2,974**	**3,033**
Application of operating funding											
Contractors costs	133	121	124	127	130	134	137	141	145	149	153
Professional services	89	120	105	108	22	22	23	23	24	25	26
Repairs and maintenance	309	383	394	403	413	424	435	447	460	474	489
Other operating costs	77	87	88	90	92	94	96	98	101	103	106
Employee benefits	0	0	0	0	0	0	0	0	0	0	0
Internal charges	365	453	460	470	459	483	505	518	532	547	563
Finance costs	103	95	117	129	155	229	304	289	283	274	266
Total applications of operating funding	**1,076**	**1,260**	**1,288**	**1,328**	**1,271**	**1,386**	**1,500**	**1,517**	**1,545**	**1,572**	**1,603**
Surplus (deficit) of operating funding	**901**	**930**	**978**	**951**	**1,011**	**1,132**	**1,247**	**1,299**	**1,349**	**1,402**	**1,430**

7.2 CAPITAL EXPENDITURE

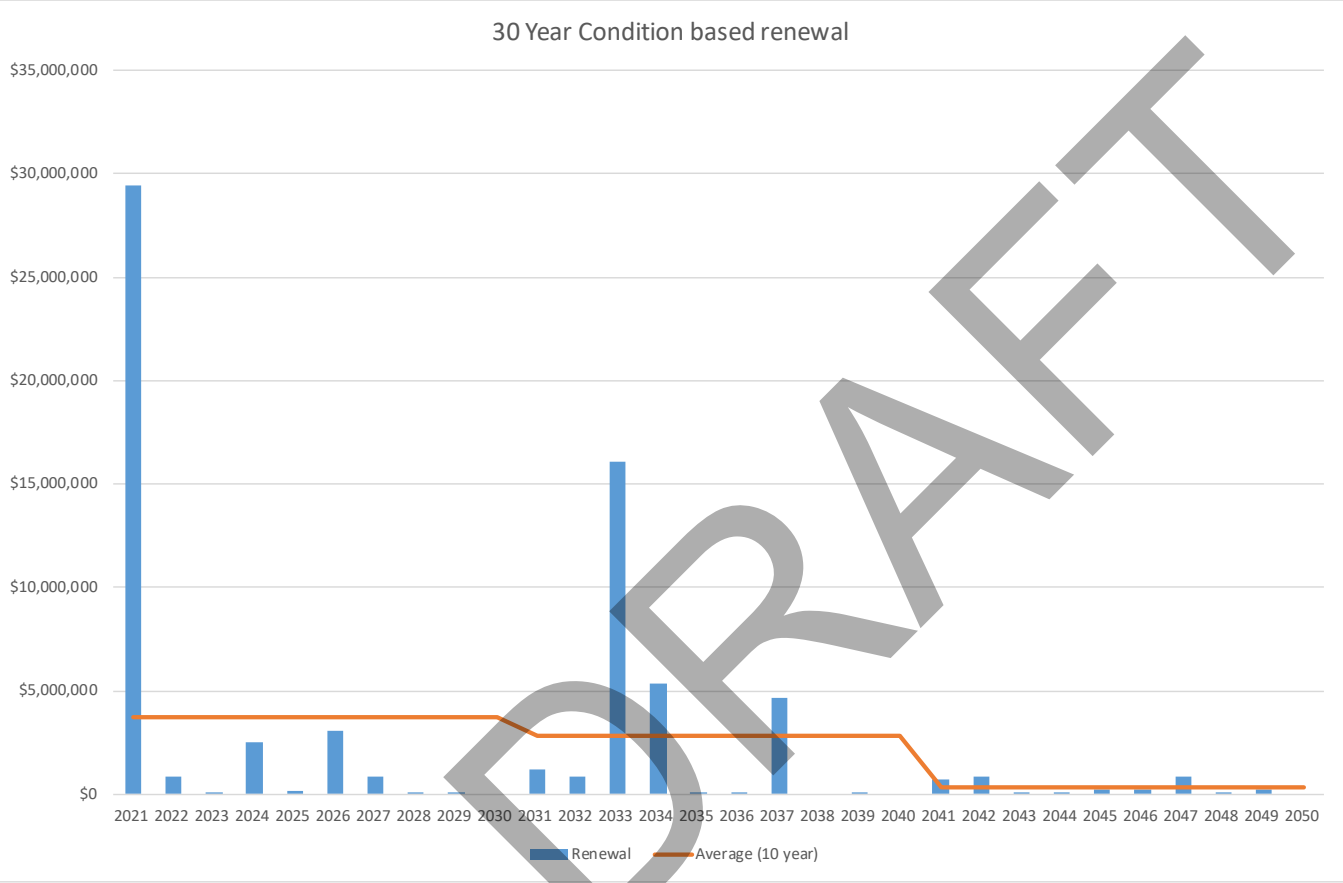
The 10-year forecast for capital expenditure is shown in the table below:

Table 10 CAPEX forecast WS

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Capital funding											
Sources of capital funding											
Subsidies and grants - capital	0	0	0	0	0	0	0	0	0	0	0
Development contributions	0	0	0	0	0	0	0	0	0	0	0
Financial contributions	0	0	0	0	0	0	0	0	0	0	0
Increase(decrease) in debt	-62	485	146	391	1,303	1,281	-294	-321	-345	-370	-370
Sale of assets	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**-62**	**485**	**146**	**391**	**1,303**	**1,281**	**-294**	**-321**	**-345**	**-370**	**-370**
Applications of capital funding											
Capital Expenditure - Growth	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure - LoS	197	5	5	5	1,482	1,517	6	6	6	6	6
Capital Expenditure - Renewal	741	1,410	1,119	1,336	479	466	2,156	2,087	2,260	2,321	2,511
Increase (decrease) in reserves	-98	0	0	0	353	430	-1,208	-1,115	-1,262	-1,296	-1,457
Total applications of capital funding	**839**	**1,415**	**1,124**	**1,342**	**2,314**	**2,413**	**953**	**978**	**1,004**	**1,031**	**1,060**
Surplus (deficit) of capital funding	**-901**	**-930**	**-978**	**-951**	**-1,011**	**-1,132**	**-1,247**	**-1,299**	**-1,349**	**-1,402**	**-1,430**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Renewal Expenditure

Table 11 Predicted renewals for district



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 AM 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 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 experience 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 12 WS 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	Apply to vary consent to draw water at lower levels from Rotu. Investigate alternative, more secure source.
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.

Description		Potential impact	Current controls	Action Plan
Asset group	**Risk**			
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. Investigate alternative, more secure source, provide extra cover to pipe where insufficient.
	Damage from external influences (farmers, stock etcetera) or singular pipe bridge failure.	Localised pipe failure, causes loss for supply for short period.		
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.
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				

Description		Potential impact	Current controls	Action Plan
Asset group	Risk			
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 AM 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 13 Improvement plan

Improvement programme 2021/2031	
Year 1 – 2021/2022 Planned improvement / change	• Develop a central database and Geographic Information Systems (GIS) mapping for condition assessment information and generate a renewal programme • Replace the manual system for consents, compliance and monitoring with a central management software system • Continue the data cleansing project to improve our knowledge of our assets, including asset life to help with renewal planning • An ecological study of the Kaihu River to assess the possibility of varying the water take consent. • Water loss management by ensuring the contractor adheres to reactive timeframes for leak requests and is proactive in leak detection and effective meter reading. • Review and update water safety plans for all five Water Supply schemes using the latest requirements from Northland District Health Board (NDHB). • Continue with condition assessments of Water Supply assets in alignment with wastewater and stormwater services, and feed into the renewals programme.

Improvement programme 2021/2031	
	Develop hydraulic computer models for Dargaville, Maungaturoto and Ruawai reticulation networks, predicting pressures and flows to confirm network capacity and manage growth • Review data management procedures and include development of a system for recording maintenance and costs at asset component level in our asset register.
Year 2 – 2022/2023 Planned improvement / change	• Continue developing a central database and Geographic Information Systems (GIS) mapping for condition assessment information and generate a renewal programme • Continue developing a central database and Geographic Information Systems (GIS) mapping for condition assessment information and generate a renewal programme • Review and update the water safety plans for all five Water Supply schemes using the latest requirements from NDHB. • Continue with the condition assessments of Water Supply assets in alignment with wastewater and stormwater services, and feed into the renewals programme. • Continue developing hydraulic computer models for Dargaville, Maungaturoto and Ruawai reticulation networks, predicting pressures and flows to confirm network capacity and manage growth • Review data management procedures and include development of system for recording maintenance and costs at asset component level in the asset register • Water loss management by ensuring the contractor adheres to reactive timeframes for leak requests and is proactive in leak detection and effective meter reading.
Year 3 – 2020/2021 Planned improvement / change	• Continue developing a central database and Geographic Information Systems (GIS) mapping for condition assessment information and generate a renewal programme • Continue developing a central database and Geographic Information Systems (GIS) mapping for condition assessment information and generate a renewal programme • Review and update the water safety plans for all five Water Supply schemes using the latest requirements from NDHB. • Continue with condition assessments of Water Supply assets in alignment with wastewater and stormwater services, and feed into the renewals programme;

Improvement programme 2021/2031	
	• Continue developing hydraulic computer models for Dargaville, Maungaturoto and Ruawai reticulation networks, predicting pressures and flows to confirm network capacity and manage growth • Water loss management by ensuring the contractor adheres to reactive timeframes for leak requests and is proactive in leak detection and effective meter reading.
Years 4-10 – 2021/2028 Planned improvement / change	• Review and update the water safety plans for all five Water Supply schemes using the latest requirements from NDHB. • Continue with condition assessments of Water Supply assets in alignment with wastewater and stormwater services, and feed into the renewals programme. • Water loss management by ensuring the contractor adheres to reactive timeframes for leak requests and is proactive in leak detection and effective meter reading.