Kaipara District Council

Wastewater
Strategic Activity Management Plan
2021-2031

Summarising the Scheme Plans

June 2021

Status: Final

Kaipara te Oranganui

KAIPARA DISTRICT

Two Oceans Two Harbours

This document has been prepared by Kaipara District Council.

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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 2020	2nd Draft for Elected Members	D Jeffrey, M Smith, D Mugutso			
C	July 2020	3rd Draft	D Jeffrey, M Smith, D Mugutso		M Borich	
D	Dec 2020	4th Draft	M Smith			
E	Feb 2021	Final Draft for Long Term Plan 2021-2031 Consultation	M Smith	R Harvey	D Miller	J Sephton
F	June 2021	Final Draft for Long Term Plan 2021/31	D Mugutso	R Harvey	D Miller	J Sephton

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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 (KDC or 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:

- legislative framework
- links to community outcomes
- policies and strategy
- proposed Levels of Service (LoS)
- performance measures and demand
- environmental and service management.

This document should be read in conjunction with scheme plans for each scheme area, and the Council's 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 and to Council.

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 and the installation of solutions to protect the network and treatment facilities, 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.

These wastewater systems focus on protecting public and environmental health by collecting and treating wastewater prior to release into receiving environments, the quality of the discharged wastewater is managed by the Northland Regional Council (NRC) through the consents process.

1.4 BENEFITS TO THE COMMUNITY

- Vibrant communities: Manage our service to ensure communities and business are supported
- Healthy environment: Manage wastewater standards with discharge having no detrimental effects on the environment
- Facilitate circular economy increasing waste diversion achieving reduction in overall disposal costs and cumulative effects on the environment
- Supporting growth through fit for purpose infrastructure, and early planning for future demands
- Exploring all possible options including technology and behavioural changes before deciding on large infrastructure solutions (Managing Demand)
- Sustainable materials and processes that support long term operational needs.

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 wellbeing.

Guidance on the design and construction of new wastewater networks are currently 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:

Activity	Effect	Mitigation
Environmental Health	In case of failure or significant breakage, there could be contamination of public waterways which may have large environmental or personal health issues.	Remote monitoring and alarms are in place for operators to react quickly to contain any spillages. For pump stations, use of sucker trucks. For pipe breakages, quick responses, and containment of spillage before it gets to waterways.
Renewals	The rising cost of ongoing maintenance or pipe renewal may become economically unrealistic.	Use competitive bidding as afar as possible and create price and quality tension for better results.
Wastewater plants	Failure of a wastewater treatment plant (WTP) in meeting the resource consent may result in NRC issuing an infringement notice.	Ongoing close monitoring of performance and acting quickly to rectify.

Although Council is looking to update the Engineering Standards from the 2011 version, the significant negative effects would be unlikely to change.

Table 1: Potential Negative Effects

Activity	Effect on community wellbeing	Current controls
Malfunction of wastewater assets	• Social - Can cause disruption to service. This can pose a public health risk and is frustrating to the local community. • Economic - If the businesses rely on a wastewater service, then loss of service is a major inconvenience and can have a high impact on that business	• Council relies on the operation and maintenance contractor responding quickly to any malfunction. • Condition inspection of assets and the identification of potential issues help prevent major failures. • Council renewal programme replaces old obsolete assets and materials with new assets help avoid and prevent failures.
Wastewater Treatment	• Social – Wastewater treatment is key to providing good outcomes for communities and businesses, failure to treat effluent effectively before it discharges to the environment can have far reaching effects. • Economic – The need to treat wastewater effectively can come at a significant cost, trade waste agreements with businesses focus on what commercial waste is being treated and how funds are recovered, this can also have an economic impact on businesses and communities. • Environmental – Failure to treat wastewater effectively and to continuously improve treatment practices can have significant negative effects on the environment. • Cultural – The New Zealand 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 available option for the treatment and disposal of wastewater, it may have alternative factors that make it culturally significant through Treaty Partnerships and responsibilities.	• Council applies to the regional authority for a consent as it is their responsibility to ensure that wastewater is treated to an acceptable standard, it is Council's responsibility to take all practicable steps to keep within the limits set by the Regional Authority. • Relationships with iwi/hapū/marae need to be strengthened, and knowledge shared where possible to ensure the 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 whānau have to the Kaipara rivers, streams, lakes, moana and other water bodies. • Clearly defined plans for the continual treatment of community systems and the upgrade of plants and practices where applicable.

Activity	Effect on community wellbeing	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. • Wastewater services costs are currently recovered through targeted rate schemes.
Spillage of chemicals stored at 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 – The 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 activity reduced rainfall, extreme rainfall events, sea level rise and increased temperature	• Social – Assets damaged or inundated will increase costs to community and lower levels of service. • Environmental - Contamination of water systems and the environment. • Cultural – where treatment ponds become damaged or inundated this will propose significant risks to the Awa and the spiritual nature of these water bodies by introducing Wai Kino and Wai Mate to the water. • Economic – Significant cost increases due to the construction of resilience projects or relocating treatment systems.	• Climate smart behaviour throughout Council is promoted.

2 THE ASSETS

Council operates six community wastewater schemes for Dargaville, Glinks Gully, Kaiwaka, Maungaturoto, Te Kopuru and Mangawhai 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 Figure 1 below.

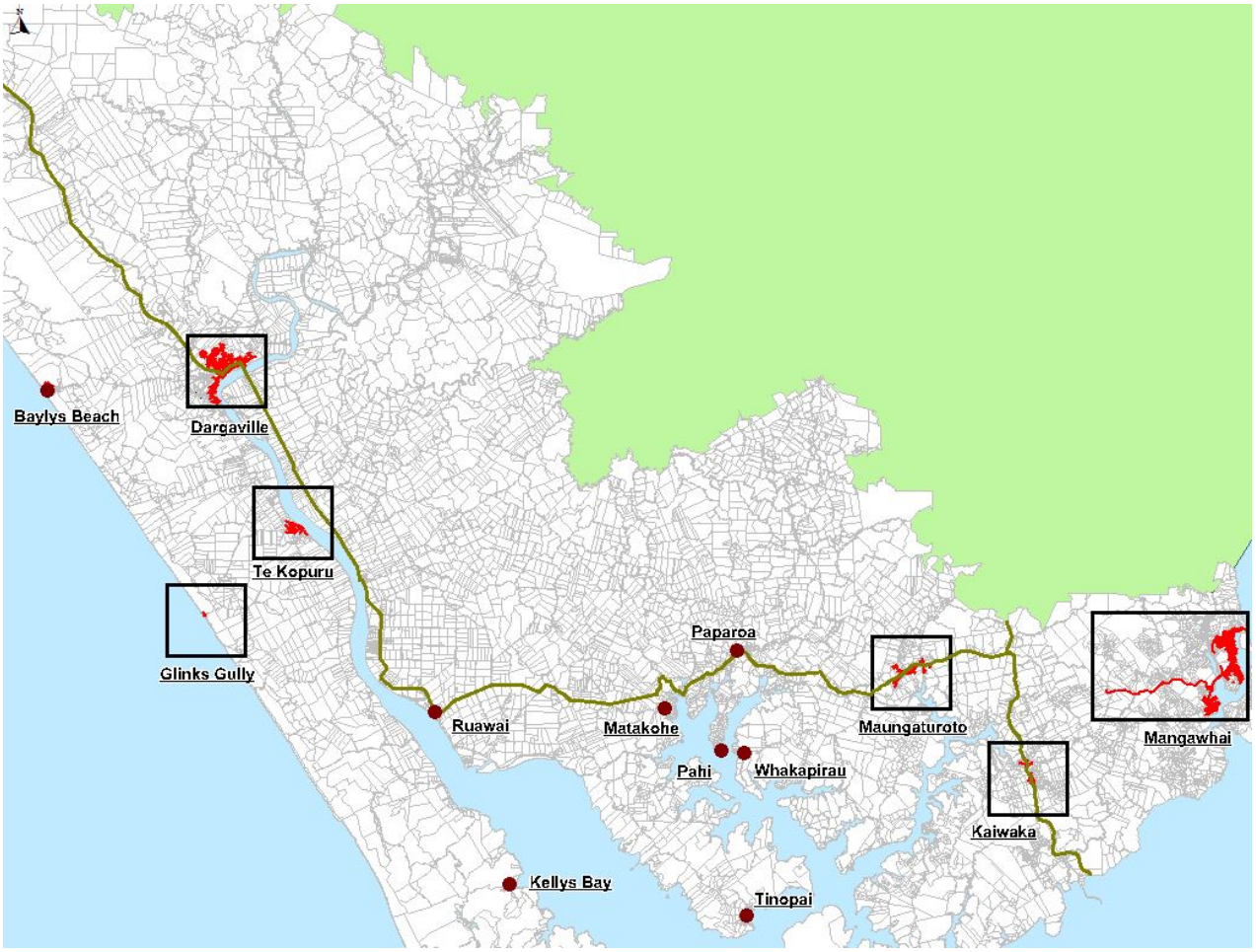
In addition to these community schemes, there are a number of smaller wastewater treatment facilities owned, operated or managed by Council. These facilities generally service campgrounds and other community facilities:

- Taharoa Domain – Kai Iwi Lakes campgrounds
- Pahi Domain campground
- Tinopai campground 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.

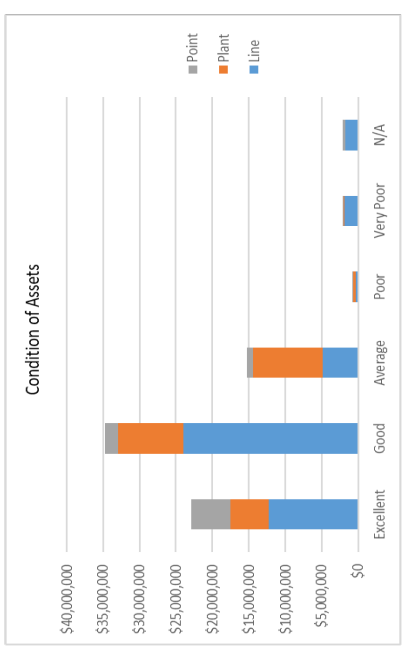
Figure 1: KDC wastewater schemes

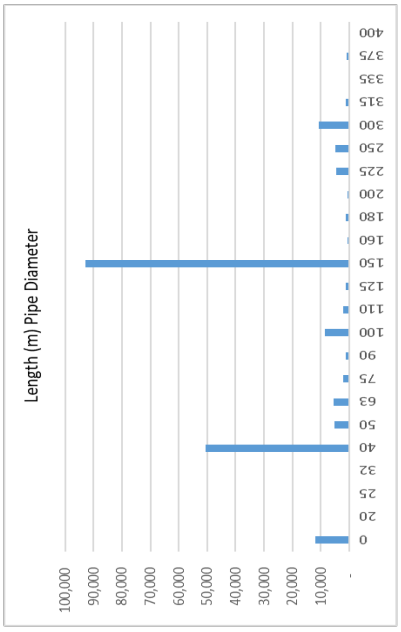


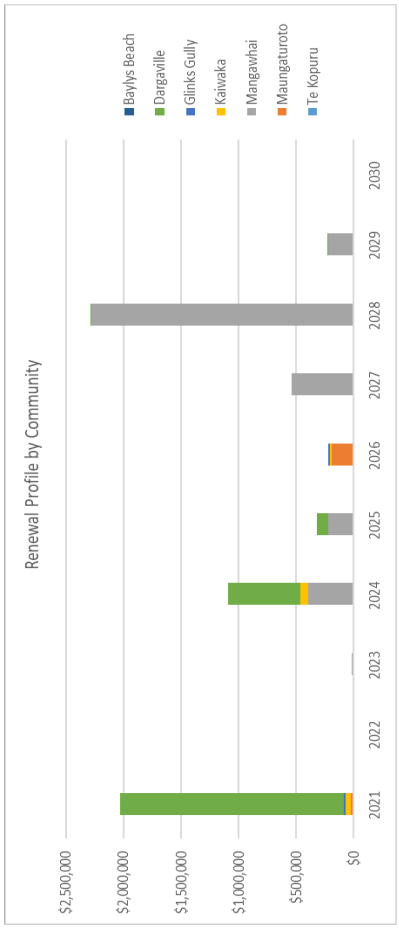
An overview of the wastewater assets and their values are provided in the tables below. Asset details for these schemes are described in the Scheme Plans.

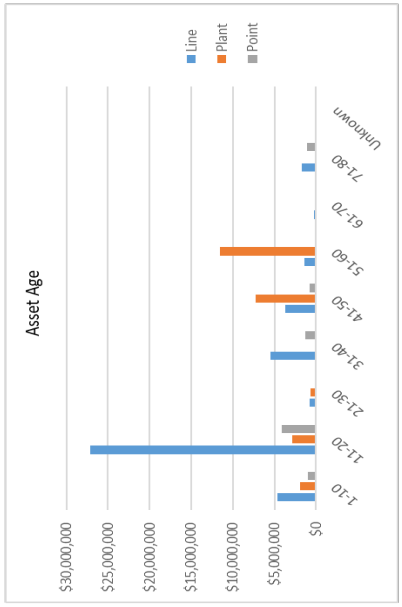
2.1 ASSET PROFILE

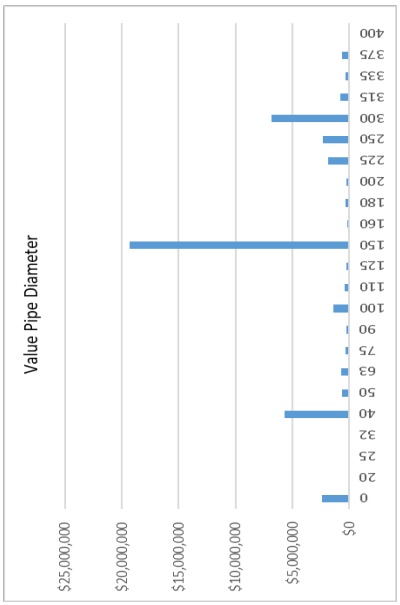
Table 2: Asset Graphs

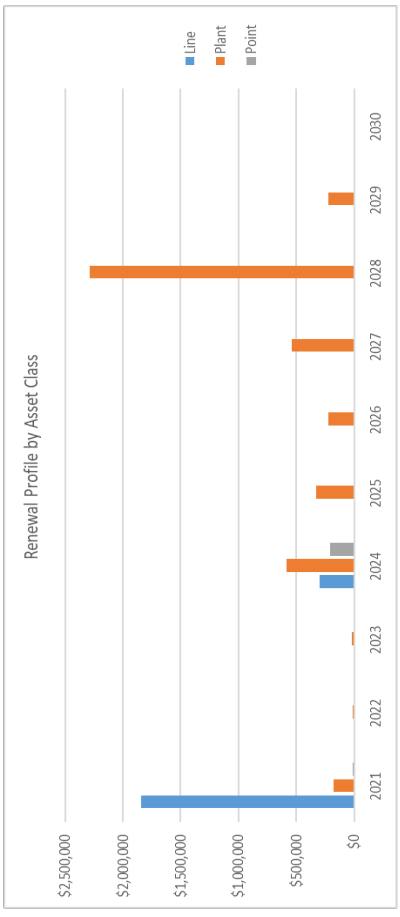


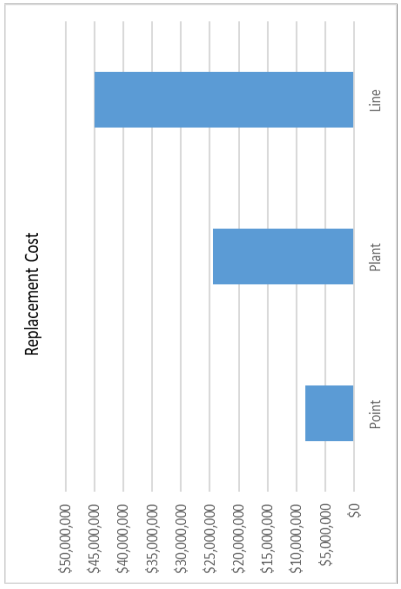


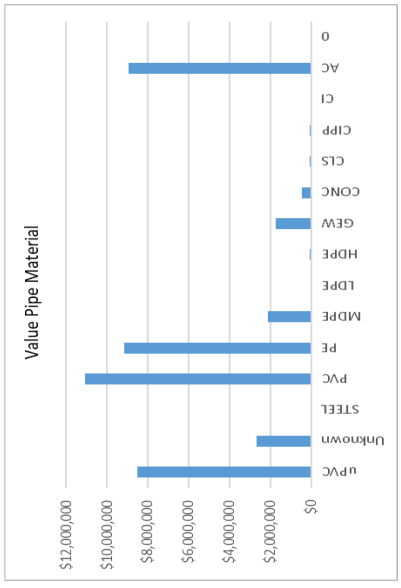












The 207km of wastewater assets have a replacement value of $45m. Over half of the assets are 11-20 years old. Pipe assets of $1.8m, mainly in Dargaville, are in very poor condition and scheduled for replacement in 2021, subject to Council funding. The plant assets have a replacement cost of $24m and 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.

Table 3: Numbers of Wastewater assets

	Dargaville		Maungaturoto		Kaiwaka		Glinks Gully		Mangawhai	
Asset Type	**2017**	**2020**	**2017**	**2020**	**2017**	**2020**	**2017**	**2020**	**2017**	**2020**
Treatment plants	1	1	1	1	1	1	1	1	1	1
Pump stations	15	15	3	3	1	1	0	0	12	12
Rising mains (m)	5,942	5,969	1,301	1,349	1,266	1,266	0	0	23,214	29,145
Gravity lines (m)	39,435	40,325	11,295	11,890	4,090	4,252	6,669	6,676	46,794	49,423
Manholes	714	742	198	210	71	76	89	91	509	526

2.2 VALUATION

Table 4: 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
Maungatūroto	$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 it is able to store and analyse asset information data to assist with management of the wastewater business.

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 Asset Management Improvement Plan (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 5: Data confidence rating

Scheme	Confidence rating
Dargaville	B
Glinks Gully	B
Mangawhai	B
Maungatūroto	C
Te Kopuru	B
Kaiwaka	C

Table 6: 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 7: Key assets in network

Council 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 Council management contract; lower end of 'Daisy Chain' at Dargaville	High (Major)
Treatment plants	Mangawhai – under Council management contract	High (Major)

3 THE CHALLENGES AND ISSUES

Key matters requiring attention for the wastewater activity are summarised in the table below.

Table 8: 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. Work is currently underway to create these models. 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. 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 Mangawhai, Dargaville, Glinks Gully, Maungaturoto, and Kaiwaka. Dargaville is driven mainly by renewal considerations and management of pump stations and wastewater treatment plant.

Issue	Discussion
	Kaiwaka is driven partially by growth considerations but also by consent renewal in 2022. Maungatūroto 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 significant growth considerations and the impact on the plant and disposal area $10 m of upgrades identified in Long Term Plan 2021-2031 to bring the capacity of the treatment plant up to a capacity of 5,000 connections (or equivalent).
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 Ponds	Dargaville, Te Kopuru, Maungatūroto 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. KDC will propose a study that 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.
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.

Issue	Discussion
	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.
Mangawhai WWTP	The Mangawhai WWTP is very different to all other KDC WWTPs in relation to the extent and nature of the technology utilised. Much of the electrical equipment has a relatively short life expectancy and therefore renewal expenditure is both large and frequent, added to the required renewals are the upgrades to the plant required to meet the constant level of growth in connected properties. Currently the plant is identified to reach capacity in 2028/2032 (approximately). A valuation base renewal forecast indicates renewal of $1.5 m being required over the next 10 years, including overdue renewal of $6,000 even with the plant only eight years old. There is a need to improve the performance of the system during peak flow events and allow transition to increased capacity (5,000 connections) due to growth and development pressure in Mangawhai.
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, demand management has the added ability of reducing demand on a treatment plant by spreading the load out over the day and during off-peak times.

The components of demand management are shown in the table below.

Table 9: Examples of wastewater demand management strategies

Demand component	Wastewater examples
Operation	Infiltration/inflow reduction, reduction in trade waste loads; reduction in the number of public wastewater systems, and investing in alternative strategies and technology to manage on and off-peak flows
Incentives	Wastewater collection and treatment pricing.
Education	Public education on water conservation and efficiency.
Demand substitution	Promote grey water re-use for toilets etcetera.
Network technology replacement	Providing technological improvements to the network particularly through new connections to even flows out over off-peak times.
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. SFF 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 SFF meat processing plant in Dargaville generates effluent as a by-product of day-to-day processing activities and is the largest contributor of effluent to the Dargaville WWTP. Excluding SFF, the current average treatment plant inflow is approximately 550m^3 per day. Water consumption figures from 2015 for SFF indicate

a wastewater flow rate of 750 to 1,000m^3 per day (six days per week) or around 650m^3 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 1,000m^3 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. There is currently little ability for council to implement anything significant due to the restrictive nature of the targeted rate schemes that are in place, as they do not allow council to use funds for other purposes like designing and implementing wastewater systems in at risk small coastal communities, as such Council is trying to focus on demand management to be able to extend the working life and efficiencies of our existing systems as a whole, in this way we are trying to introduce new technologies to our district to better manage population increase and 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 Maungatūroto 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 Maungatūroto 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 Council's 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 and
- 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 Resource Management Act 1991 (RMA). The RMA deals with:

- The control of the use of land
- Structures and works in riverbeds and in the Coastal Marine Area (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 Maungatūroto 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 forwarded to the Regulatory Department of Council to follow up and rectify. 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 Maungatūroto network and possibly 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.

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 wellbeing.

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. Council will be undertaking studies over time to be able to highlight and identify deficiencies within our systems and where the systems are not currently resilient to climate change. This will be a large piece of work to get completed as it could highlight a number of issues and projects that will be difficult to fund with the current rate base in Kaipara.

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 Maungatūroto 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 person per day (this is taken as 75% of the standard water use of 280 litres per person per day)
- 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 10: Default Dry Weather Flows from Industrial Areas)** may be used as a design basis for industrial area.

Table 10: 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 on the next page 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 11: 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			

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 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 systems.	0			
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 Dargaville PS1 which has a daily inspection frequency:

- Logbook 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 a 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 also shows the key service criteria affected as well as mode and impact of failure if the action is not carried out.

Table 12: 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

Activity	Strategy	Service criteria	Impact
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
Planned inspections of pump stations, WWTP 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	Maintaining existing LoS Pump stations are inspected twice weekly (Dargaville PS1 daily), and oxidation ponds are inspected as follows: • Dargaville (twice weekly) • Glinks Gully and Kaiwaka (weekly) • Maungatūroto and Te Kopuru (twice weekly in summer) and (weekly in winter).	Medium – wastewater overflows
Planned inspections	Modify the inspection programme as appropriate in response to maintenance trends	Maintaining existing LoS	
Planned preventative maintenance on 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

6.2 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 tables below.

Table 13: 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 wastewater overflows
Reduced capacity	Regular flushing by water blasting as identified by visual or video inspection		
	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

6.3 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 14 below.

Table 14: 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

6.4 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
- visual inspections of the ponds and any other 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 exceptions are the Maungatūroto and Kaiwaka membrane filtration plants, which require a number of additional operation/maintenance tasks.

The maintenance and operating strategies for WWTPs are summarised in the Table 15 below.

Table 15: 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

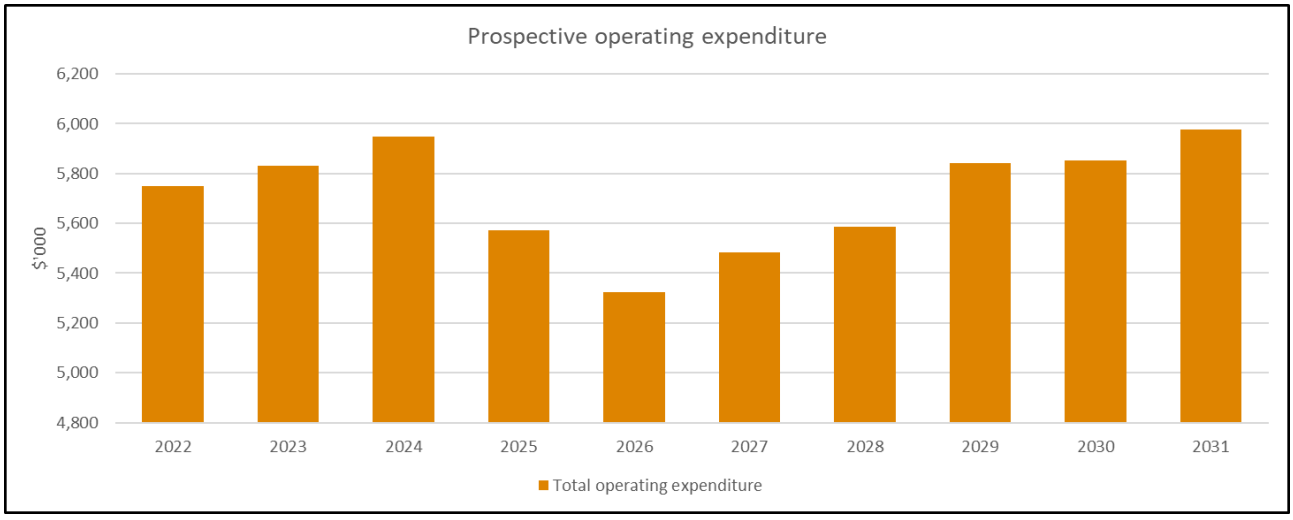
The 10 year forecast for operations and maintenance costs for wastewater assets in the Kaipara District are shown in the following graphs and tables. They do not provide for inflation over the 10 year period and do not include the following:

- 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 16: OPEX forecasts

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2020-2021 $'000	2021-2022 $'000	2022-2023 $'000	2023-2024 $'000	2024-2025 $'000	2025-2026 $'000	2026-2027 $'000	2027-2028 $'000	2028-2029 $'000	2029-2030 $'000	2030-2031 $'000
Prospective Funding Impact Statement											
Activity selection: Sewerage and the Treatment and Disposal of Sewage, All, All											
Operating funding											
Sources of operating funding											
General rates, uniform annual general charges, rate penalties	1,484	1,449	880	928	722	637	677	691	805	790	831
Targeted rates	6,018	5,796	6,090	6,420	6,647	6,779	7,025	7,368	7,819	8,133	8,340
Subsidies and grants for operating purposes	0	0	0	0	0	0	0	0	0	0	0
Fees and charges	9	26	27	28	29	30	31	32	33	34	35
Internal charges and overheads recovered	0	0	0	0	0	0	0	0	0	0	0
Interest and dividends from investments	0	0	0	0	0	0	0	0	0	0	0
Local authorities fuel tax, fines, infringement fees and other receipts	0	0	0	0	0	0	0	0	0	0	0
Total operating funding	**7,511**	**7,271**	**6,996**	**7,377**	**7,398**	**7,446**	**7,732**	**8,091**	**8,657**	**8,957**	**9,207**
Application of operating funding											
Payments to staff and suppliers	2,883	2,190	2,243	2,286	2,244	2,314	2,389	2,449	2,437	2,513	2,591
Finance costs	2,564	2,026	2,010	1,960	1,626	1,265	1,279	1,252	1,448	1,311	1,331
Internal charges and overheads recovered	1,385	1,536	1,578	1,704	1,704	1,744	1,817	1,884	1,957	2,028	2,053
Other operating funding applications	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**6,831**	**5,751**	**5,831**	**5,950**	**5,574**	**5,323**	**5,485**	**5,585**	**5,842**	**5,852**	**5,975**
Surplus (deficit) of operating funding	**680**	**1,520**	**1,166**	**1,427**	**1,824**	**2,122**	**2,247**	**2,506**	**2,815**	**3,105**	**3,232**

Figure 2: Prospective OPEX



7.2 CAPITAL EXPENDITURE

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

Table 17: CAPEX forecast

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Prospective Funding Impact Statement											
Activity selection: Sewerage and the Treatment and Disposal of Sewage, All, All											
Capital funding											
Sources of capital funding											
Subsidies and grants for capital expenditure	0	491	0	0	0	0	0	0	0	0	0
Development and financial contributions	2,436	2,167	2,168	2,157	2,151	2,145	2,141	2,140	2,117	2,117	0
Increase (decrease) in debt	-715	-54	-47	-622	-330	-359	-192	1,512	-164	-795	-818
Gross proceeds from sale of assets	0	0	0	0	0	0	0	0	0	0	0
Lump sum contributions	0	0	0	0	0	0	0	0	0	0	0
Other dedicated capital funding	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**1,721**	**2,604**	**2,121**	**1,536**	**1,822**	**1,786**	**1,950**	**3,652**	**1,953**	**1,322**	**-818**
Applications of capital funding											
Capital expenditure - to meet additional demand	2,053	4,666	1,187	43	1,158	2,350	3,326	9,851	2,908	53	3,652
Capital expenditure - to improve the level of service	528	574	0	0	0	0	0	2,662	370	0	0
Capital expenditure - to replace existing assets	515	836	687	328	799	599	733	596	743	440	455
Increase (decrease) in reserves	-695	-1,952	1,413	2,591	1,689	960	137	-6,951	747	3,934	-1,693
Increase (decrease) of investments	0	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**2,401**	**4,124**	**3,287**	**2,963**	**3,646**	**3,908**	**4,197**	**6,158**	**4,768**	**4,427**	**2,413**
Surplus (deficit) of capital funding	**-680**	**-1,520**	**-1,166**	**-1,427**	**-1,824**	**-2,122**	**-2,247**	**-2,506**	**-2,815**	**-3,105**	**-3,232**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

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

Figure 3: Prospective CAPEX

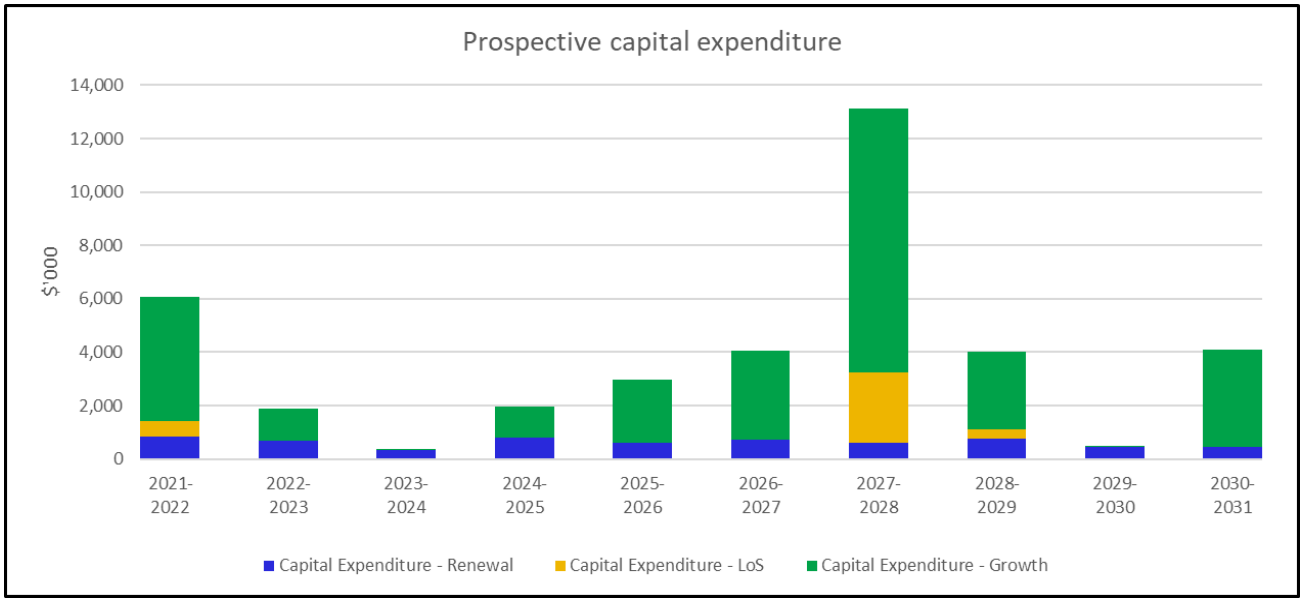


Table 18: 10 year wastewater capital projects

Primary driver	Community	LTP Project name	Expected timing	Total
Growth	Dargaville	Dargaville growth design	2021/22	$100,000
		Station Road Reticulation	2021/22	$200,000
		Dargaville wastewater growth – 1,800m wastewater line from Bowen Street to Awakino area to PS1	2021/22, 2027/28	$815,000
	Kaiwaka	Kaiwaka wastewater growth	2022/23	$100,000
	Mangawhai	Mangawhai WWTP Balance Tank	2021/22	$1,450,000
		Upgrade existing reticulation	2021/22	$750,000
		Mangawhai wastewater small extensions right of ways	Annual	$400,000
		Extend reticulation	2021/22	$400,000
		Extensions reticulation including new disposal system	2021/22 - 2030/31	$9,400,000
		Capacity upgrades to 5000 connections	2021/22 - 2027/28	$10,300,000
	Maungaturoto	Connect Maungatūroto Rail Village to Maungatūroto	2027/28	$600,000
		Maungatūroto wastewater growth – Bickerstaffe Road to Judd Road	2027/28	$360,000
		Maungatūroto wastewater growth - connection to south and south valley, Bickerstaffe Road 670m growth and renewal	2021/22	$75,000
	Te Kopuru	Te Kopuru wastewater treatment upgrade	2027/28	$350,000
LoS	Dargaville	Spring Street reticulation	2021/22	$375,000
		Dargaville wastewater treatment plant upgrade	2027/28	$2,000,000
Renewal	Dargaville	Dargaville wastewater renewals	2021/22	$263,000
		Pipe renewal from condition assessment	2021/22	$200,000
		Dargaville wastewater renewals	2022/23 - 2030/31	$2,220,000
	Kaiwaka	Kaiwaka wastewater renewals	2022/23 - 2028/29	$1,000,000
		Kaiwaka Wastewater renewals	2021/22	$228,000
		Pipe renewals from condition assessment	2021/22	$50,000
	Mangawhai	Mangawhai wastewater minor pump replacements	Annual	$450,000
	Maungaturoto	Maungatūroto wastewater renewals	2021/22 - 2028/29	$955,092
	Glinks Gully	Discharge consent	2022/23	$5,000
		Wastewater renewals	2022/23 - 2030/31	$130,000
	Te Kopuru	Te Kopuru wastewater renewals	2025/26	$9,000
	Paparoa	Investigations into community wastewater scheme	2021/22	$60,000
			Total	**$31,595,092**

Renewal Expenditure

Figure 4: Predicted renewals over 30 years graph

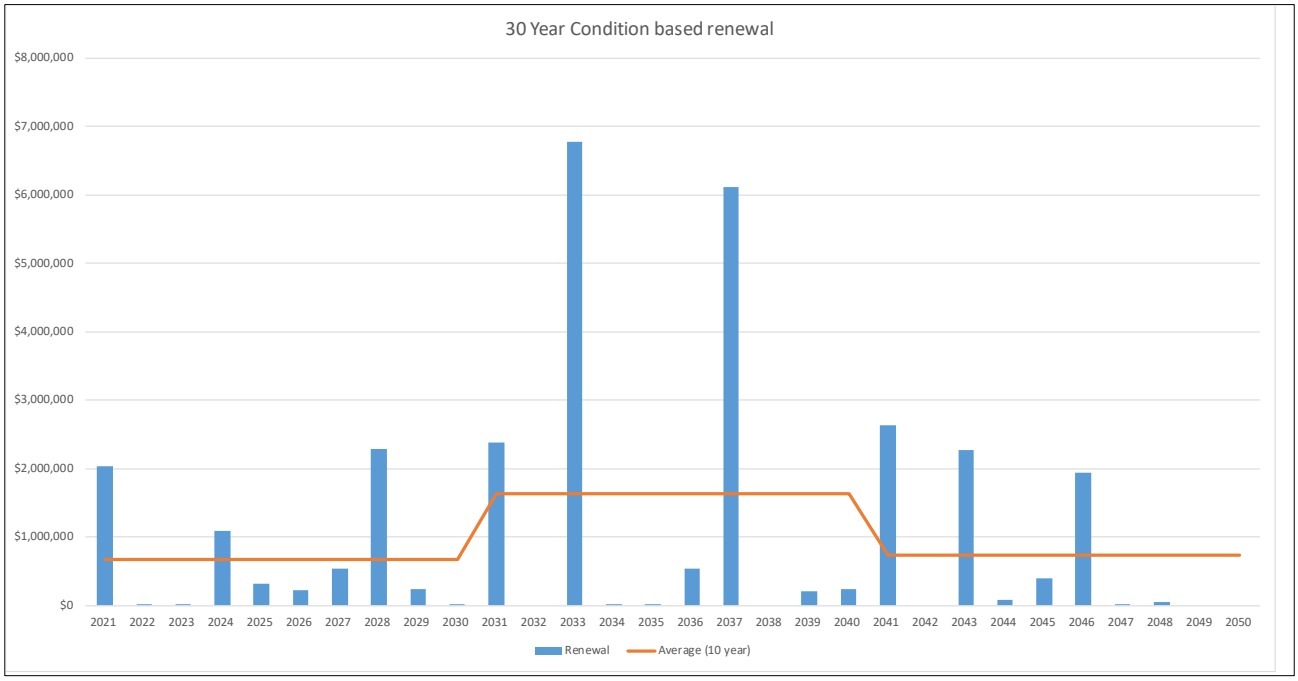


Table 19: Predicted renewals over 30 years table

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, the reticulation network of Mangawhai will grow significantly to cater for the growth. An investigation to identify the extensions necessary to the wastewater plant and network to enable it to service the urban zoned area in response to significant growth is currently underway, due to the nature of the plant and its location this is now a *Roadmap to reuse*, as the plant produces a high quality of treated effluent, and it would be beneficial to the community and the environment to be able to reuse this resource.

Maungaturoto, Kaiwaka and Dargaville are all experiencing growth although not as significant as Mangawhai. As shown in the spatial plans external influences will drive the growth in these areas and KDC will need to ensure that these effects have been identified and accounted for.

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 wastewater 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 CONTINUOUS 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 Asset Management (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 20: Overall improvement plan

Description	When
• Investigating the disposal system for MCWWS • Undertake wastewater modelling for the district • Investigation and documentation of asset conditions • Continue the extension of the MCWWS reticulation and disposal system • Start construction of the balance tank for the MCWWS • Investigate alternative usages for sludge from MCWWS • Plan for 3 waters reform • Wastewater rate equalisation will see a correction of wastewater rates across the district • Investigate and construct a wastewater treatment extension for Spring Street (Dargaville) residential subdivision • Investigate options assessment for a wastewater scheme in Paparoa	2021/2022

Description	When
• 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	2022/2023
• Construct disposal system for MCWWS • Commence development for recyclable use of sludge from MCWWS • Implement outcomes from wastewater modelling • Asset replacement and renewal work commences • Implement outcomes from 3 waters reform	2023/2024
• Construct and complete disposal system for MCWWS • Develop a recyclable use of sludge from MCWWS • Upgrade the Dargaville Wastewater Treatment Plant to increase capacity	2024/2031