IN THE ENVIRONMENT COURT

IN THE MATTER	of two appeals pursuant to Clause 14 of Schedule 1 of the Resource Management Act 1991
BETWEEN	**CLIVE BOONHAM** (ENV-2021-AKL-000061)
	Appellant
AND	**MANGAWHAI MATTERS INCORPORATED AND OTHERS** (ENV-2021-AKL-000062)
	Appellant
AND	**KAIPARA DISTRICT COUNCIL**
	Respondent

EVIDENCE OF SUSAN DAVIDSON ON BEHALF OF KAIPARA DISTRICT COUNCIL (WASTEWATER AND WATER SUPPLY INFRASTRUCTURE PLANNING AND FUNDING)

11 FEBRUARY 2022

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1. INTRODUCTION, QUALIFICATIONS AND EXPERIENCE

1.1 My name is Susan Davidson. I am the General Manager, Sustainable Growth and Investment and the acting General Manager, Infrastructure Services at Kaipara District Council (**Council**).

1.2 I hold a Bachelor of Commerce degree from the University of Canterbury. I am also a fully qualified chartered accountant. I was admitted to the NZ Society of Accountants (now Chartered Accountants, Australia & New Zealand) on 10 March 1982.

1.3 I am currently employed as the Council's General Manager, Sustainable Growth and investment, a role I have held since 4 November 2019. In addition, I have also held the role of General Manager, Infrastructure Services (in an acting capacity) since 20 September 2021.[1] I was initially employed by the Council on 18 May 2018 as General Manager Risk, IT, & Finance. Prior to being employed by the Council, I held the role of Chief Operating Officer at New Plymouth District Council from 2014 to 2017. Prior to that I held the role of Chief Executive at Stratford District Council from 2011-2014. Prior to that I held the role of Senior Consultant to Local Government at Morrison Low from 2006-2011. Prior to that I held the role of Chief Executive at Banks Peninsula District Council from 2003-2006. Prior to that I held senior financial roles in the private sector at Trust Bank New Zealand Limited, NZ Cement Holdings, and Deloitte.

1.4 In my current role as General Manager, Sustainable Growth and Investment I am responsible for Finance, Treasury and Risk.

1.5 In my role as General Manager, Infrastructure Services (currently in an acting capacity for 9 months from September 2021 – June 2022), I am responsible for the areas of Water, Wastewater, Stormwater, Land Drainage, Roading, Parks and Open Spaces. This involves both daily operations and planning and delivery of capital projects. The role also involves the management of Development Agreements.

[1] When the Council's General Manager, Infrastructure Services, Mr Jim Sephton, commenced a secondment to the Department of Internal Affairs.

1.6 This evidence is provided on behalf of the Council in respect of the appeals against the Council's decision to grant Proposed Private Plan Change 78 (**PC78**).

2. EXECUTIVE SUMMARY

2.1 With respect to wastewater:

(a) Mangawhai is serviced by the Mangawhai Community Wastewater Scheme (**MCWWS**). The MCWWS was first commissioned in 2009 to reduce reliance on septic tanks, and improve the water quality of the Mangawhai Estuary. As at December 2021 there were 2502 properties connected to the MCWWS.

(b) The Council requires all new development in urban Mangawhai to connect to the MCWWS, and encourages existing development to also connect, due to the improved environmental outcomes from connecting, and on the basis this will result in lower average costs. The Council intends overtime to progressively upgrade the capacity of the MCWWS to 5,000, 7,000 and then 10,000 connections.

(c) To ensure there is sufficient capacity in the MCWWS to provide for growth, including the growth proposed under PC78 at the rate identified by Mangawhai Central Limited (**MCL**), the Council is actively planning to upgrade a number of aspects of the MCWWS, and has set aside funding for this in its Long Term Plan 2021-2031 (**LTP**).

2.2 With respect to water supply for Mangawhai:

(a) Mangawhai does not have a reticulated water supply available at present[2], and water is currently provided through rainwater tanks.

[2] For completeness I note a small groundwater bore operated by the Council supplies 18 properties on Wood Street.

(b) The Council has had high level discussions with Whangarei District Council (**WDC**) regarding a possible extension of WDC's reticulated water supply to Langs Beach to service Mangawhai. While the Council has committed funding to further investigate the feasibility of this, there is currently no concluded agreement between the Council and WDC, and no further funding committed in the LTP.

2.3 In terms of the proposed roading connection between Old Waipu Road and Cove Road (which I understand may be relevant to the Court's decision on PC78) there is currently funding set aside in the LTP in 2023 for investigation and design work, and 2028 for construction.

3. SCOPE OF EVIDENCE

3.1 My evidence addresses the Council's infrastructure planning for wastewater, water, and a proposed roading connection between Old Waipu Road and Cove Road, relevant to PC78.

3.2 In relation to wastewater my evidence addresses:

(a) The MCWWS, its current capacity, and the status of planned future upgrades.

(b) The funding decisions that have been made in relation to the MCWWS in the Council's LTP.

3.3 In relation to water supply for Mangawhai in general, and in particular the PC78 area, my evidence addressing the following:

(a) A statement of the Council's current position on and funding for reticulated water supply in Mangawhai.

(b) Discussions between the Council and Whangarei District Council regarding a possible extension of the Whangarei District Council's reticulated water supply to Langs Beach to service Mangawhai.

(c) The current status of Mangawhai Central Limited's application (RM210368) to the Council to construct a water storage reservoir on the Mangawhai Central site, that I understand would be used as part of a proposed private water reticulation network to service sites requiring reticulated water supply in the Residential 3A and 3B Zones of PC78.

3.4 In relation to the proposed roading connection between Old Waipu Road and Cove Road, my evidence discusses the likely timing of this and the funding that has been committed by the Council.

4. THE MANGAWHAI COMMUNITY WASTEWATER SCHEME, ITS CAPACITY, AND PLANNED FUTURE UPGRADES

Overview

4.1 The Council's planning in relation to the MCWWS is currently summarised in a document dated 21 January 2022 prepared by WSP titled *Mangawhai Community Wastewater System Master Plan Strategy*. A copy of the Strategy was presented to Elected Members at a briefing on 2 February 2022. The Strategy has received the endorsement of Elected Members to progress this planning. A copy of the Strategy is **attached** to my evidence as **Attachment A**[3], and I refer to it in various parts of my evidence. An extract from the Minutes of the Briefing to Elected Members on 2 February 2022 is **attached** to my evidence as **Attachment B**.

4.2 The MCWWS was first commissioned in 2009 to service Mangawhai Village and Mangawhai Heads. The key driver for commissioning the scheme in 2009 was to reduce reliance on septic tanks, and improve the water quality of the Mangawhai Estuary.

4.3 When the MCWWS was first commissioned in 2009, approximately 800 properties connected.[4] As at December 2021 there were 2,502 properties connected.

[3] I note the Strategy that is attached contains a "draft watermark" as this is how it was presented to the Elected Members.
[4] Mangawhai Community Wastewater System Master Plan Strategy, dated 21 January 2022, page 1.

4.4 In terms of the general layout of the MCWWS, wastewater is currently collected from connected properties in Mangawhai Village and Mangawhai Heads, and treated at the Council's Wastewater Treatment Plant (**WWTP**) on the western side of Thelma Road South within the Mangawhai reserve area (Lot 2 DP 450057) before being piped approximately 12kms to the Council's 65-hectare effluent disposal field at Brown Road farm. **Attached** to my evidence as **Attachment C** is a diagram showing a schematic of the MCWWS. **Attached** to my evidence as **Attachment D** is an aerial photograph of Mangawhai showing the current extent of the MCWWS network in red. The Mangawhai Central site lies (essentially) between Mangawhai Village and Mangawhai Heads and it is planned that growth in the Mangawhai Central site will be serviced by the MCWWS.[5]

4.5 The Council requires all new development in urban Mangawhai to connect to the MCWWS, and encourages existing development to also connect, due to the improved environmental outcomes from connecting, and on the basis this will result in lower average costs.

4.6 The Council intends, over time, to progressively upgrade the capacity of the MCWWS to 5,000, 7,000 and then 10,000 connections, as and when required in response to growth.[6]

4.7 Under the Council's infrastructure Strategy 2021-2051 the Council is planning to service all growth in Mangawhai using the MCWWS, and planning to progressively increase the capacity of the MCWWS in response to population growth.[7]

The current capacity of the MCWWS

4.8 In terms of the current capacity of the MCWWS it is important to note that this is not "one dimensional" and involves the capacity of:

(a) The WWTP itself;

(b) The capacity of the mains (i.e. pipes); and

(c) The capacity of the current wastewater disposal field at Brown Road farm and identifying other options.

[5] See pages 14, 320 and 462 of the LTP.
[6] Mangawhai Community Wastewater System Master Plan Strategy, dated 21 January 2022, page 6.
[7] Page 158 of the LTP.

4.9 The current capacity of the WWTP is approximately 2,800 connections,[8] at peak flows over the Christmas period and during storm events. As at December 2021 , there were 2,502 properties connected. This means, in terms of the WWTP, there is capacity for approximately 300 further connections to ensure peak inflows can be treated. This figure is obviously only an estimate, as when capacity is reached depends on actual usage and flows.

4.10 With respect to the capacity of the Council's wastewater reticulation network (pipes and pump stations) there is currently a study underway to identify where any upgrades are required.

4.11 As I have already noted, once wastewater has been treated at the WWTP at 21 Thelma Road South it is then pumped to the Council's disposal field at Brown Road farm. The effluent disposal field occupies an area of 65.5 hectares and is estimated to provide sufficient effluent disposal capacity for approximately 3,000 connections.[9] For completeness, I note the Council is currently investigating different aspects of how the Brown Road farm disposal field is operated. These may have the effect of enabling the disposal field to operate more efficiently, effectively increasing the number of connections that can be provided, and delaying the need for the next effluent disposal option to be implemented.

Planned future upgrades to the MCWWS and allocated funding

4.12 As explained above, the Council intends that all future urban growth in Mangawhai, including growth at Mangawhai Central, will be serviced by the MCWWS.[10]

4.13 The costs associated with upgrading different aspects of the MCWWS are a significant item of expenditure for the Council. The Council primarily funds these costs through the collection of development contributions. Accordingly, the Council's policy for a number of years has been to monitor the number of connections to the MCWWS each year, and ensure that sufficient capacity is provided ahead of growth.

[8] Page 14 of the LTP.
[9] Mangawhai Community Wastewater System Master Plan Strategy, dated 21 January 2022, page 7.
[10] Page 14 of the LTP.

4.14 However, the timing of upgrades to the MCWWS is a matter that must be determined very carefully. Undertaking upgrades "too early" (i.e. too far in advance of demand) creates a risk of the capital being expended ahead of when the investment is needed if growth is slower than predicted or does not occur. It also creates a risk of costs not being paid for by development contributions and instead being funded by the Council through debt, increasing debt levels.

4.15 The number of new connections per year to the MCWWS has varied over time.[11] At present, the Council anticipates between 70-100 new connections per year across all of Mangawhai.[12] However, the 70 – 100 is just an estimate. The actual number of additional connections to the MCWWS each year going forward depends on developers. I note that just because land is zoned for development does not mean that development will immediately take place. Developers may decide to stage development, or hold off on developing for a number of years and "land bank". Indeed, the current PC78 site remains largely undeveloped, despite being zoned in 2008 for development under Private Plan Change 22 Estuary Estates, which became Chapter 16 of the (now) Operative District Plan on 5 May 2008. Since that time only some preparatory Resource Consents have been initiated to start the physical development.[13]

4.16 To ensure there is sufficient capacity in the MCWWS to provide for growth the Council is actively planning to upgrade a number of aspects of the MCWWS, and has set aside funding for this in its LTP. These planned upgrades are discussed below.

The Balance Tank and Wastewater Treatment Plant

4.17 I understand that a key constraint in operating the MCWWS is the ability of the WWTP to process incoming peak flow. Peak flows occur, at present, over the Christmas period and during high rainfall events. For the MCWWS WWTP, like all WWTPs, it is peak flow that is the key

[11] Over the last LTP there was an average of 94 connections per year.
[12] Page 14 of the LTP.
[13] To date these resource consents have included consents for earthworks, subdivision and road alignment, a supermarket and a commercial and industrial precinct.

constraint limiting the capacity of the WWTP to (at present) approximately 2,800 connections. Noting that outside of the peaks, the MCWWS operates for much of the year at considerably below its current capacity.

4.18 In response to the issue of peak flows constraining capacity, the Council is proposing to install a Balance Tank along with Inlet works, that will enable the peak flow of the existing WWTP to increase from 70L/S to 100L/S by providing a flow control system and up to 900m3 of storage.[14]

4.19 It is anticipated that the Balance Tank be completed by the end of 2022, and funding has been set aside in the LTP.[15] Further funding has been approved by Council over that provided in the LTP as a result of increased scope of works and higher costs, based on tenders received by the Council.

4.20 The installation of the Balance Tank to increase the peak flow of the WWTP is the first step in the Council progressively increasing the capacity of the WWTP by upgrading key parts of the WWTP to address capacity constraints, resulting in the WWTP having a capacity of around 5,000 connections by 2028 using a Membrane Bioreactor and having converted the Balance Tank into a reactor. The timing of these upgrades can be bought forward, if necessary.

Upgrades to the reticulated wastewater network

4.21 A network model is currently being developed which will identify new or replacement pump stations and upgrades and extensions to the Council's reticulated wastewater network. Capital works have been planned and budgeted for in the LTP in 2022 to ensure that the reticulated network continues to function along the key route of Molesworth Ave to the pump station.[16]

[14] Mangawhai Community Wastewater System Master Plan Strategy, dated 21 January 2022, page 5.
[15] See page 462 of the LTP.
[16] LTP, 462.

Providing for additional effluent disposal capacity at the Mangawhai Golf Club

4.22 As I have already explained, the MCWWS currently disposes effluent to land at Brown Road farm, with capacity for effluent disposal for approximately 3,000 connections.[17]

4.23 As of December 2021, there are 2,502 properties connected to the MCWWS. Accordingly, at present there is, in terms of effluent disposal, capacity for a further approximately 500 properties to be connected to the MCWWS.

4.24 To provide for additional effluent disposal field capacity, once the capacity for a further 500 connections at Brown Road farm is expended, the Council is planning to provide for additional effluent disposal capacity, by applying treated effluent (overnight) to irrigate the Mangawhai Golf Course. Applying treated effluent to the Mangawhai Golf course will provide, in terms of effluent disposal, capacity for a further 450 properties to be connected to the MCWWS.

4.25 The Mangawhai Golf Club Committee are, in principle, supportive of this. Initial discussion has been had with their members at the AGM in December 2021 and a special meeting will be held to discuss any further concerns and to sign an agreement. **Attached** to my evidence as **Attachment E** is a letter dated 21 January 2022 from the Chair of the Board of the Golf Club, Mr Merrick, expressing very strong support for waste water being provided to the Club for irrigation.[18] The next steps are preparing an assessment of environmental effects and applying for resource consent from the Northland Regional Council. It is anticipated that wastewater disposal at the Mangawhai Golf Club will be in place by 2024, before capacity at Brown Road farm is reached.[19]

4.26 In terms of funding, $1.5 million in funding is currently committed in the LTP in relation to effluent disposal at the Golf Club.[20] The Council has

[17] As explained above, the Council is currently investigating different options in terms of how the effluent disposal field is managed that may enable this to effectively be increased.
[18] At page 4 of his letter he states he regards this project as being critical to the long-term survival of the Golf Club.
[19] Mangawhai Community Wastewater System Master Plan Strategy, dated 21 January 2022, page 7.
[20] Page 462, LTP.

since received updated reports indicating that this is likely to be insufficient, and that the total cost is likely to be in the region of $4.9-$6 million. The Council will seek to amend the funding set aside in the LTP to make allowance for these increased costs, as part of its next LTP likely to be early 2023.

Disposal options beyond Brown Road farm and the Mangawhai Golf Club

4.27 With the addition of effluent disposal at the Mangawhai Golf Club (predicted to be achieved by 2024), the MCWWS will have, in terms of effluent disposal, capacity for approximately 3450 connections. That is approximately 950 more properties than are connected to the MCWWS at present.

4.28 As I have already explained, the Council is planning for the MCWWS to be progressively upgraded overtime beyond 5000 connections and to service all growth in Mangawhai.

4.29 The Council has not confirmed what disposal option will be used once the Brown Farm Road and Mangawhai Golf Course (if approved) effluent disposal fields reach capacity. Options include:

(a) The acquisition or lease of additional land for effluent disposal;

(b) Discharge of treated effluent to the Mangawhai Estuary; or

(c) Discharge of treated effluent into the sea, via an ocean outfall.[21]

4.30 The Council has not currently decided which of these options it will pursue. This will require consultation with the community, preparation of an options assessment, and an application for consent to be made for the Council's chosen option. The Council is conscious that this may be a lengthy process, and is committed to commencing engagement with the community on this later this year.

4.31 Provision has been made in the LTP for $7.9m of expenditure towards a new disposal system and a further $2.6m in 2032 with further investment

[21] See the Council's Infrastructure Strategy 2021-2051, at page 192 of the LTP.

provided for as part of the Infrastructure Strategy 2021-2051.[22] The amount of funding can be reassessed through the LTP process, if required, once there is greater certainty as to strategy and cost.

4.32 In terms of MCL's intentions for the PC78 site, Mr Tollemache has indicated MCL has advised him that its estimated rate of connections are 55 connections in Year 1, 60 connections in Year 2 and 70 connections in Year 3.[23] Beyond that MCL has provided no estimate of its likely rate of connections, although I note that at a rate of 50-70 connections per year it would take 15-20 years for the site to reach its estimated capacity of 1000 residential units, allowing time for planned upgrades to the MCWWS to take place.

4.33 Overall, the Council is committed to progressively upgrading the capacity of the MCWWS to service all planned growth in Mangawhai, including the growth proposed under PC78, at the rate indicated by MCL, and ensuring that additional capacity in the MCWWS will be available when needed.

Development contributions and rates

4.34 While not the subject of this hearing, for completeness I note that in relation to the funding of the MCWWS the Council:

(a) In its current Development Contributions Policy collects a development contribution for wastewater in Mangawhai of $24,797 per additional connection.[24]

(b) In addition, the Council collects an annual Wastewater Targeted Rate of $1,054 per unit connected to the MCWWS, and a rate of $790 where a property is within 30m of a public sewer line, and therefore considered capable of connecting to the MCWWS.[25]

[22] LTP, 462.
[23] Evidence of Mark Tollemache, paragraph 12.26.
[24] See Table 1 of the Council's Development Contributions Policy, page 368 of the LTP.
[25] See pages 78-79 of the LTP.

4.35 The Council can, and will, reassess development contributions and rates from time to time, to ensure that costs associated with upgrades to the MCWWS can be met.

4.36 In addition, I note that the Council has the ability under Chapter 22 of the Operative District Plan to impose a condition of land use or subdivision consent requiring a financial contribution to be paid for the installation or upgrading of wastewater infrastructure, provided a development contribution has not been taken for the same purpose.[26]

5. THE COUNCIL'S CURRENT POSITION ON RETICULATED WATER SUPPLY IN MANGAWHAI

5.1 Mangawhai does not have a public reticulated water supply at present, and water is currently provided through rainwater tanks.

5.2 The Council's Infrastructure Strategy 2021-2051 records that:

"*The Council will seek to provide reticulated water supply in a staged manner. As major developments are implemented it would be beneficial to partner with developers or seek external funding options where applicable to be able to construct the initial stages of water supply and treatment*."[27]

5.3 The Council has had high level discussions with Whangarei District Council regarding a possible extension of the Whangarei District Council's existing reticulated water supply to Langs Beach to service Mangawhai. The Council has committed funding to further investigate the feasibility of this. However, at the time of lodgement of this evidence there is no concluded agreement between the Council and Whangarei District Council. Nor is there currently any further funding committed in the LTP to establish a reticulated water supply in Mangawhai.

5.4 I understand that it is proposed that part of PC78 (being the Residential 3A and 3B zones) would need to be serviced by reticulated water supply.

[26] See Rule 22.10.7.
[27] See page 190 of the LTP.

5.5 Mangawhai Central Limited has indicated in its discussions with the Council to-date that it intends to provide a private water reticulated supply to service these parts of the plan change area. Accordingly, reliance is not being placed on a commitment by the Council to provide a reticulated system.

5.6 Mangawhai Central Limited have applied to the Council for land use consents associated with the construction of a water storage reservoir on the Mangawhai Central site (RM210368). At the time of filing of this evidence I understand that application is currently on hold, due to a request for further information.

6. THE PROPOSED CONNECTION BETWEEN OLD WAIPU ROAD AND COVE ROAD

6.1 A matter which I understand may be relevant to the Court's decision-making on Plan Change 78 is a proposed roading connection between Old Waipu Road and Cove Road. When this is completed, I understand that it may allow for a second roading connection to be eventually provided into the Plan Change 78 site, in addition to the proposed connection off Molesworth Drive.

6.2 In case it is of assistance to the Court I note that the Council is currently committed to this project through its LTP with funding currently set aside in:

(a) 2023 - $250,000 for investigation and design work: and

(b) 2028 - $10m for construction.[28]

6.3 This funding has been provided in the LTP, and will be provided based on Development Contributions collected for roading being 88% of the cost and a loan raised for the balance.

Sue Davidson
11 February 2022

[28] See page 464 of the LTP.

Attachment A – Mangawhai Community Wastewater System, Master Plan Strategy dated 21 January 2022

Project Number: 3-AWE028.00

Mangawhai Community Wastewater System

Master Plan Strategy

21 January 2022

CONFIDENTIAL

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Contact Details

Andrew Springer

WSP
Level 3 The Westhaven
100 Beaumont St
Auckland 1010
+64 9 355 9500
+64 27 563 9859
andrew.springer@wsp.com

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Prepared by
A Springer

Reviewed by
L-M Mulder

Approved for release by
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B	Updated following client comment
C	Updated following client comment

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Disclaimers and Limitations

This report ('**Report**') has been prepared by WSP exclusively for Kaipara District Council ('**Client**') in relation to developing a strategy to manage growth in Managwhai Wastewater System ('**Purpose**') and in accordance with the Panel of Professional Services Agreement, 2020]. The findings in this Report are based on and are subject to the assumptions specified in the Report and available information provided by KDC. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

INTRODUCTION

This document describes the current situation at the Mangawhai Community Wastewater System, (CWWS) the history of the system, the current challenges and the effects of continued growth in the community.

An interactive workshop with KDC and WSP team members was held on 3 November 2021 which considered the needs of Mangawhai and the key elements that require action to accommodate future growth.

The key outputs from the workshop were to provide this strategic plan report and provide an outline programme. The programme is summarised later in this report.

This document provides the framework and direction necessary to meet the capacity and programme driven by growth of the Mangawhai CWWS. It is envisaged that this strategy will become a live document underpinning the direction for network, treatment and disposal solutions.

HISTORY

In 2009 the Mangawhai Community Wastewater System was commissioned to serve Mangawhai and Mangawhai Heads. In the first year about 800 properties moved on from their septic tank and connected to the new system. Today over 2400 properties are connected to the system taking wastewater from homes, schools, shops, cafes, and small commercial premises.

By providing the Mangawhai Community Wastewater System (MCWWS) Kaipara District Council have removed more than 90% of the septic tanks from operation, each with their own discharge to the local area. This has improved quality of the Mangawhai Harbour. The harbour is now a safe place to swim or gather Kai, and the ecology is thriving. The harbour is the heart of Mangawhai and is beating strongly.

GROWTH

Over recent years Mangawhai has seen between 70 and 100 new connections every year, causing a rapid rise in population served. In 2021 MCWWS was determined to be serving 2,411 properties, with many more requests for connection.

The current Wastewater system, commissioned in 2009, built at the time with an expectation of additional augmentation by 2014 (Mangawhai WWTP Design Report, Water Infrastructure Group, 2009) and expected to be upgraded to 3 reactors by 2023. Growth rates have exceeded all expectations but owing to different wastewater characteristics (less flow and stronger) no direct comparison can be made in terms of houses connected between original design and current plant.

The Mangawhai Spatial Plan (2020) identifies areas of growth in Mangawhai, the most likely density and type of housing, and rate of population growth. This forecast shows over 14,000 people living in Mangawhai by 2043 (high growth forecast).
So, the challenge for Kaipara DC is to provide the necessary infrastructure to allow the growth to progress, but not to build large assets and investment that creates a financial burden on the existing community.
This plan outlines the related wastewater activities and assets needed to meet growth and when they are required to enable sufficient developer contributions and phasing can occur.

A connection is assumed to be 300 litres per day and 2.7 people at off peak season, but 600 litres per day and 5.4 people per day during peak population season. This is based on data gathered in 2018.
Growth forecast from the spatial plan is given below for off peak season, resident population:

Table 1 : Growth forecast from Mangawhai Spatial Plan

Mangawhai Population Projection (connections)	2018 - Baseline	2043
High growth	5,031(1,863)	14,466 (5,357)
Medium Growth	5,031 (1,863)	10,796 (3,998)

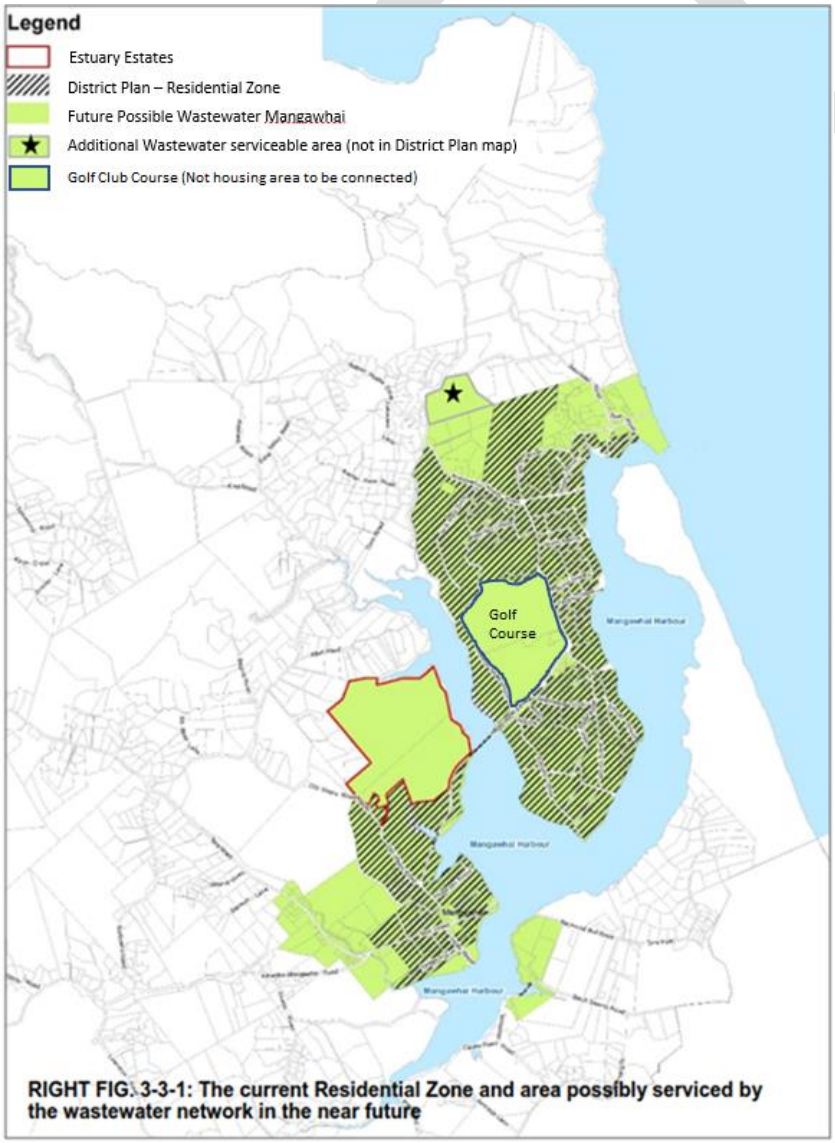

Figure 1 : Areas connected to MCWWS (grey) and areas to be connected (figure from the Mangawhai Spatial Plan)

CURRENT WASTEWATER SYSTEM

The current Wastewater system is formed by a network of gravity and pumped sewers. Many properties have historic septic tanks below the sewer levels, so the system has a large number of small on property grinder pumps to lift house wastewater to the network. No changes are proposed to these pump systems.

Mangawhai Heads is predominantly a gravity network (sewage flows downhill) but has several smaller pump stations to lift low lying areas into the network. Flow passes to Thelma Road (Outfall pump station).

Flow from the north of Mangawhai Heads passes to Thelma Road through Jack Boyd Drive (Pump Station K) to Thelma Road.

Mangawhai Village Pump Station (Pump Station VA) is the main pumping location in Mangawhai, and the rising main discharges to Thelma Road. The rising main crosses the causeway with a number of smaller pump station connections.

All flow arriving at Thelma Road is pumped to the Mangawhai Community Wastewater Treatment Plant (CWWTP). In an emergency there is some 52m^3 of storage at the pump station allowing operational response, and the pumps can pass 70 l/s to the CWWTP.
The Inlet works at the CWWTP consists of elevated screen and flow measurement, before splitting the flow into 2 of CASS (Cyclic Activated Sludge System) treatment reactors – also called the Bioreactors. In these reactors air is used to power treatment bacteria that breakdown organic matter and convert toxic ammonia to nitrate. The nature of the CASS is a cyclic process with aeration, settlement and decanting all in the same reactor. There are 2 of 900 m^3 reactors, which due to the nature of the process typically operate 60% full except in wet weather.

The treated water is decanted from the CASS at 210 l/s to a balance tank. This rate is needed to ensure that all water entering the reactor tank can leave the tank in the limited period for decanting.

Decanted effluent is balanced and pumped through 4 of modular sandfilters to remove floating solids, before mixing with sodium hypochlorite for disinfection, and then pumping to Brown Road.

Brown Road irrigation farm is 12 km from the CWWTP and is dedicated to the disposal of treated wastewater. The site consists of a 170,000 m^3 storage pond to buffer wet periods when land disposal cannot occur and has 65.5 ha under irrigation. Due to proximity of neighbours, the type and operation of irrigation varies across the site with limits due to wind direction and speed, rainfall and previous wetting cycles. This farm site is also leased to a local grazier for stock grazing coordinated with the operations team to ensure adequate separation and dry off periods. This helps manage the grass which is very prolific with the plentiful supply of water.

CAPACITY LIMITS

The Wastewater System has several capacity limits at different points in the system. These are summarised as hydraulic and organic loading with some parameters being instantaneous and others average over the year.

• Incoming Flow	Thelma Road PS 70 l/s.
• Inlet Works	CWWTP 70 l/s.
• Bioreactor Decanter	210 l/s – to allow 70 l/s max peak flow
• Sand Filters	28 l/s. This ensures that 95% of all flow is fully treated, only bypassing in wet weather.
• Transfer Pumps to Brown Road	70 l/s.
• Transfer Pipe to Brown Road	70 l/s – Pressure rating of pipe limits flow rate
• Brown Road Irrigation.	5000 m3/ha/yr. Consented Discharge Rate
• Brown Road Farm	65.5 ha in operation. – Max usable area in use. 3000 connections
• Bioreactor Capacity	2800 connections – Aeration and max. Biomass level

The figure below gives estimated timeline of capacity exceedance

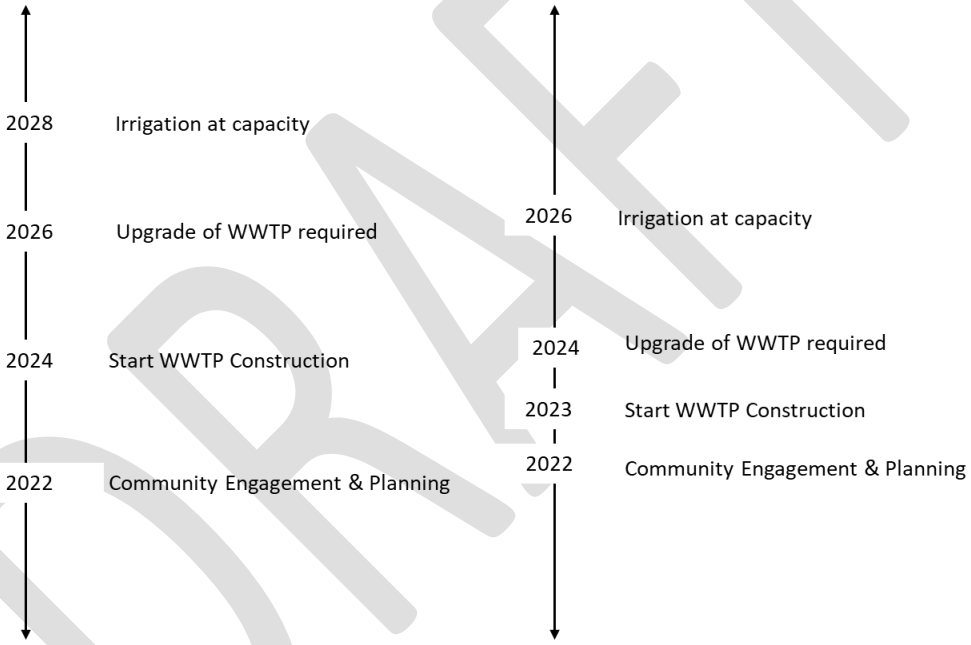

Figure 2 : Timeline for Upgrades at 70 Connection (Left) and 100 Connections/year (Right)

In 2020 there were 77 new connections. Based on connection rate continuing at this value the CWWTP will require upgrade to be complete 2024-2026 depending on growth rate. The 100 connections growth rate may be too rapid to allow assets to be consented and procured, constructed and commissioned before capacity limits are reached. The strategic approach to this issue is described below.

NETWORK STRATEGY

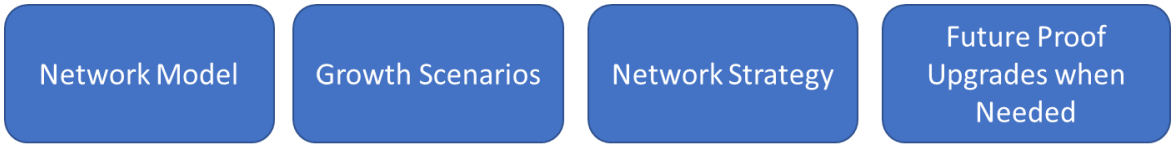

Figure 3 : Network strategy development

In 2020 WSP were commissioned to develop a wastewater network model. This is now calibrated based on measured flow, and now WSP are developing growth scenarios considering area and density of housing. These models will inform what additional capacity is needed, where and when across the system. This will enable options and costs to be developed with upgrades to the network occurring when needed in the future. All network strategy plans will be incorporated in the District Plan due end of 2022.

SHORT TERM FLOW MANAGEMENT

Growth will not only increase the daily average flow but will see an increase in peak flows. If Building codes are enforced the daily peak increase will be around 3 x average in wet weather as rainwater tank overflows are not connected to the system and outdoors areas prevented from draining to gully traps.

The recently approved Balance Tank project will enable Thelma Road to be upgraded to 100 l/s peak flow, with a new inlet screen (to deal with higher flow), flow control system and 900 m^3 of storage. This means that more flow can pass to the CWWTP, without upgrading the CWWTP system and disposal system. The tank built will be converted to a Bioreactor when the overall capacity through the system is upgraded a few years later.

Figure 4 : 3D Model of Mangawhai WWTP with Balance Tank

The balance tank and Thelma Road upgrade will be complete end of 2022.

TREATMENT PLANT

The next stages of expansion will depend on when growth occurs. By planning now for a 5000, 7000 and 10000 connection upgrade, infrastructure and plant layout can be developed to protect footprint and enable sequential upgrade of plant. As example, the current sludge plant has sufficient capacity now, so need not be upgraded until there are 7000 connections. Over the next 20 years several treatment plant upgrades may be necessary, but to manage investment vs developer contributions these will be built in stages. The first upgrade of treatment capacity is to treat all wastewater from 5000 connections.

A previous options study (Mangawhai WWTP Options, WSP, 2019) identified a Membrane Bioreactor is a suitable solution, with the ability to get more treatment capacity in the existing reactors and able to produce a very high quality disinfected effluent. This approach means that more reactors are not needed in the near future, and expansion up to 10,000 connections can be built within the existing site designation.
The 5000 connections reactor shown on the figure below is to be constructed in 2022 and used as a balance tank initially and repurposed to treatment when disposal route is available, and balancing is not required.

Membrane Bioreactors have several key benefits:

- Very high quality effluent
- Chemical Free Disinfection
- Opportunity for Reuse
- Suitable for any disposal route
- Compact Treatment Plant
- More capacity from the existing tanks
- Modular Expansion

Figure 5 : Tank Concept Layout of CWWTP Upgrades to 10,000 connections

DISPOSAL STRATEGY

The existing Brown Road Farm land disposal area is limited to 65.5 ha land suitable for irrigation, all of which is in use. The consented capacity of this land is 5000m^3/ha/yr., the average flow of 2990 connections. Once growth reaches 3000 connections, a new disposal route is needed.

Currently all estimates for programme (presented at the end of this document) assume another farm to the West of Mangawhai, but this is expected to require a long rising main, new storage and land purchase to use. In 2022 options development and community engagement options will be developed to consider alternative disposal. Early indications show that local harbour discharge is substantially cheaper by avoiding land purchase, long rising main and irrigation storage, and system. To follow this route, it requires a very high standard of effluent. Clarks Beach and Snells Beach WWTP discharges are in a similar situation and have been consented for harbour discharge, with Membrane Bioreactor achieving low nutrient levels and making the discharge almost bacteria free. To further protect Kai, UV disinfection will reduce viruses. Another alternative will be a sea outfall pumped around Mangawhai to ocean. Community effluent reuse also gives an opportunity for disposal within the community, but still will require infrastructure for disposal in wet conditions. All disposal routes require high quality, bacteria free water. Farm, harbour or ocean or reuse will require extensive assessment of options and environmental effects, together with community engagement and resource consenting. A new disposal route is not expected to be achieved until 2028.

Effluent reuse offers the opportunity to share the high quality water produced for the irrigation of public areas, such as Mangawhai Golf Course, parks, recreation areas, or commercial applications, such as a local concrete factory, or a purple pipe system to domestic, non-potable usage. Mangawhai Golf Course are keen to reuse treated effluent and have community and iwi support for this approach. The irrigation in dry conditions at this golf course will increase the disposal of treated effluent as an annualised capacity by a further 450 connections, and could be in operation by 2024, before the Brown Road farm capacity is reached.

All disposal routes will require community engagement, options assessment and environmental assessment and resource consenting, so are expected to take 6-8 years before can be operational.

RISKS AND CONTINGENCY

What if Growth Occurs Early?

There are many undeveloped plots in Mangawhai, and several developments expected to bring housing and commercial units online. The rate of construction cannot be controlled by KDC, but estimates based on historic growth are 70 to 100 connections per year.
So, if we get more houses now, we will see an increase in peak flow when storms occur. The balance tank will enable more flow to pass to the CWWTP but not needing additional treatment capacity in the short term. If the total number of connections exceed the capacity of the Bioreactors, then the balance tank can be controlled to drop some of the daily load to the tank and return it later at night when the daily peak has passed. This may be needed for 1-2 weeks in the peak summer period only. Careful operation of the WWTP is needed to manage the short term extra load but can be accommodated by increased operator attendance and procedures.

The Mangawhai Golf Course provides around 450 more connections capacity on the disposal field.

This means that the additional disposal, balance tank and CWWTP upgrade plans can be made to cope with a greater rate of growth should it occur.

How do we fund this?

Funding to meet the costs of upgrade due to new development will be gathered by developer contributions. As the workstreams develop towards clear future solutions, the costs will be known, and the contribution can be increased if needed. If an additional 1000 connections were to occur, then the developer contributions of over $20m would be required to fund just the treatment plant upgrade. A review of the developer contribution will be made once the network strategy is known to ensure adequate funding for all areas of upgrades – network and CWWTP.

What if Mangawhai has a potable water supply in future causing water usage to increase?

There are no plans currently to bring potable water to every house in Mangawhai. This may of course change in a few years, so the current capacity estimates are based on Mangawhai continuing with roof tank supply. The worst case scenario is that potable water will occur, but this will be after the 5000 connections upgrade, which means that capacity will be reached a few years earlier but still more than 10 years away. To provide long term robust infrastructure the sensitivity of this effect will be considered in Network, CWWTP and Disposal sizing.

STRATEGY PROGRAMME

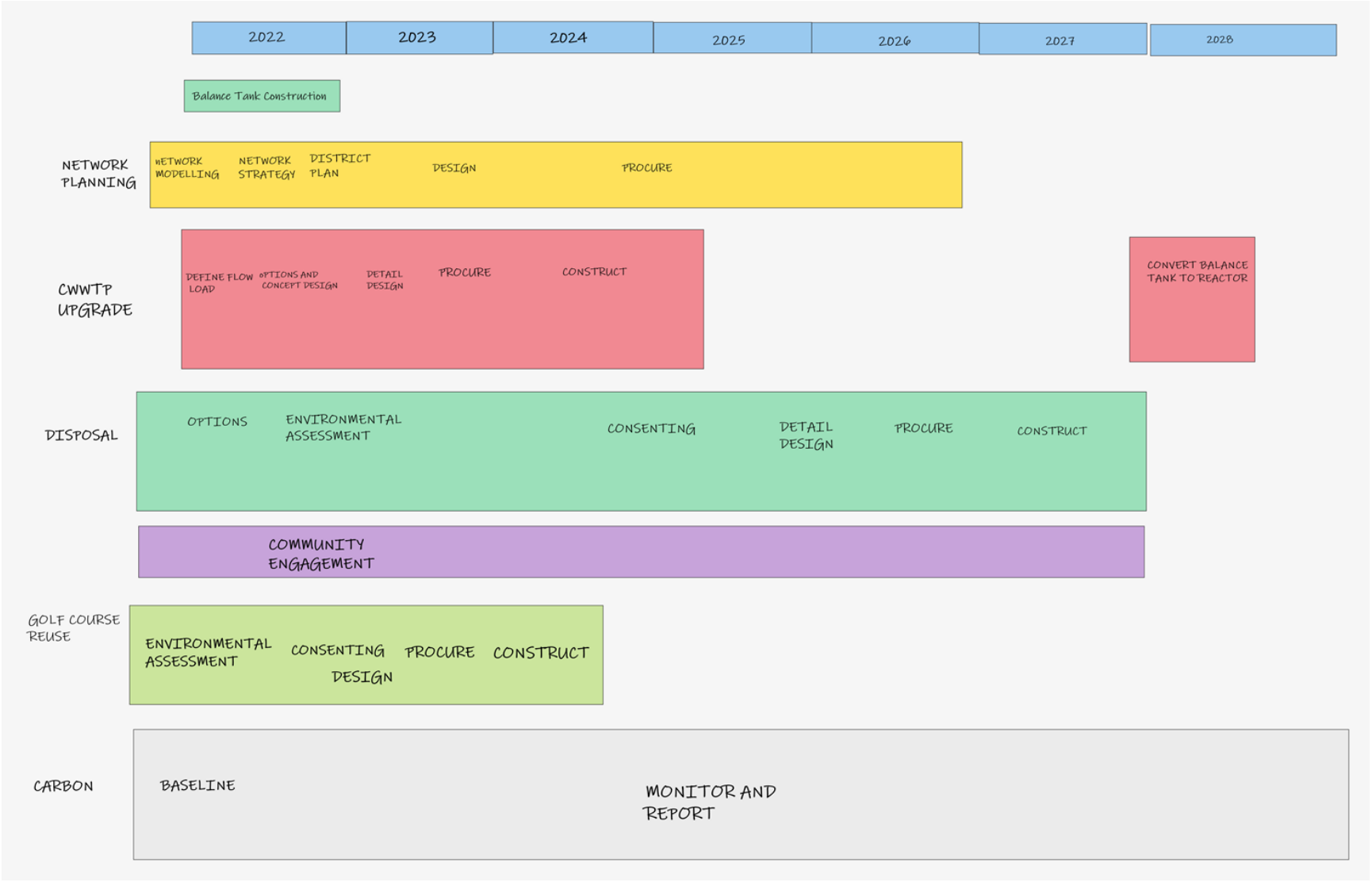

Figure 6 : Strategy Programme

PROGRAMME

As identified in this strategy above a number of steps towards the ultimate solution can be beneficial and achievable in the short term that will provide additional capacity in the MCWWS allowing for a greater level of growth. The figure below shows a comparison of timeline for 100 connections per year, and 100 connections per year with strategy

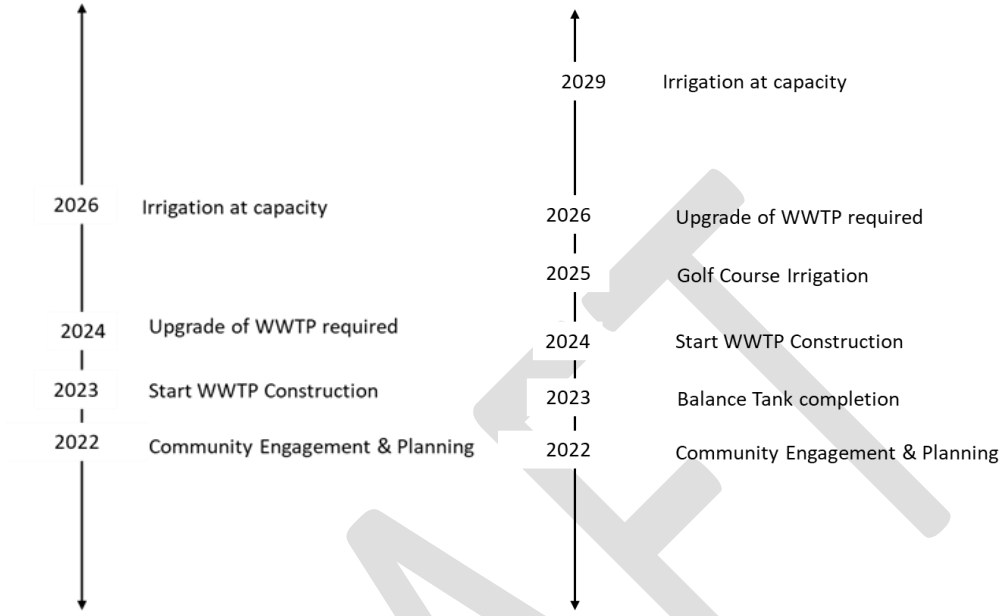

Figure 7 : Comparison of population drive timeline (left) and strategy mitigation timeline (right) for 100 connections/year

NEXT STEPS

For KDC to stay ahead of growth in the Mangawhai community it is necessary to work on several areas simultaneously. Key first steps in 2022 are

- Confirm Growth forecasts and Actual Capacity – monitoring of flow and load over holiday period 2021/2
- Develop Network Strategy
- Commence construction of balance tank.
- Progress environmental assessment and consent application for Golf Course Reuse
- Update LTP
- Prepare Community Engagement Strategy
- Consider disposal and treatment options
- Engage with community on possible treatment and disposal options

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Attachment B - Minutes of the Briefing to Elected Members on 2 February 2022

KAIPARA DISTRICT

Kaipara te Oranganui • Two Oceans Two Harbours

Kaipara District Council

Briefing Minutes

Date:	**Wednesday, 2 February 2022**
Time:	**9.31 am – 11.57 am**
Location:	**Conference Room, Northern Wairoa Memorial Hall, Dargaville and broadcast on the KDC Youtube Channel**
Members Present:	Mayor Dr Jason Smith Deputy Mayor Anna Curnow Councillor Jonathan Larsen Councillor Victoria del la Varis-Woodcock (via video link) Councillor Mark Vincent Councillor Peter Wethey Councillor David Wills Councillor Eryn Wilson-Collins
Absent:	Councillor Karen Joyce-Paki

The Mayor opened the Briefing with a karakia.

3. Mangawhai wastewater scheme - Master Plan Strategy

Eros Foschieri presented this item via video link.

The following matters were raised:

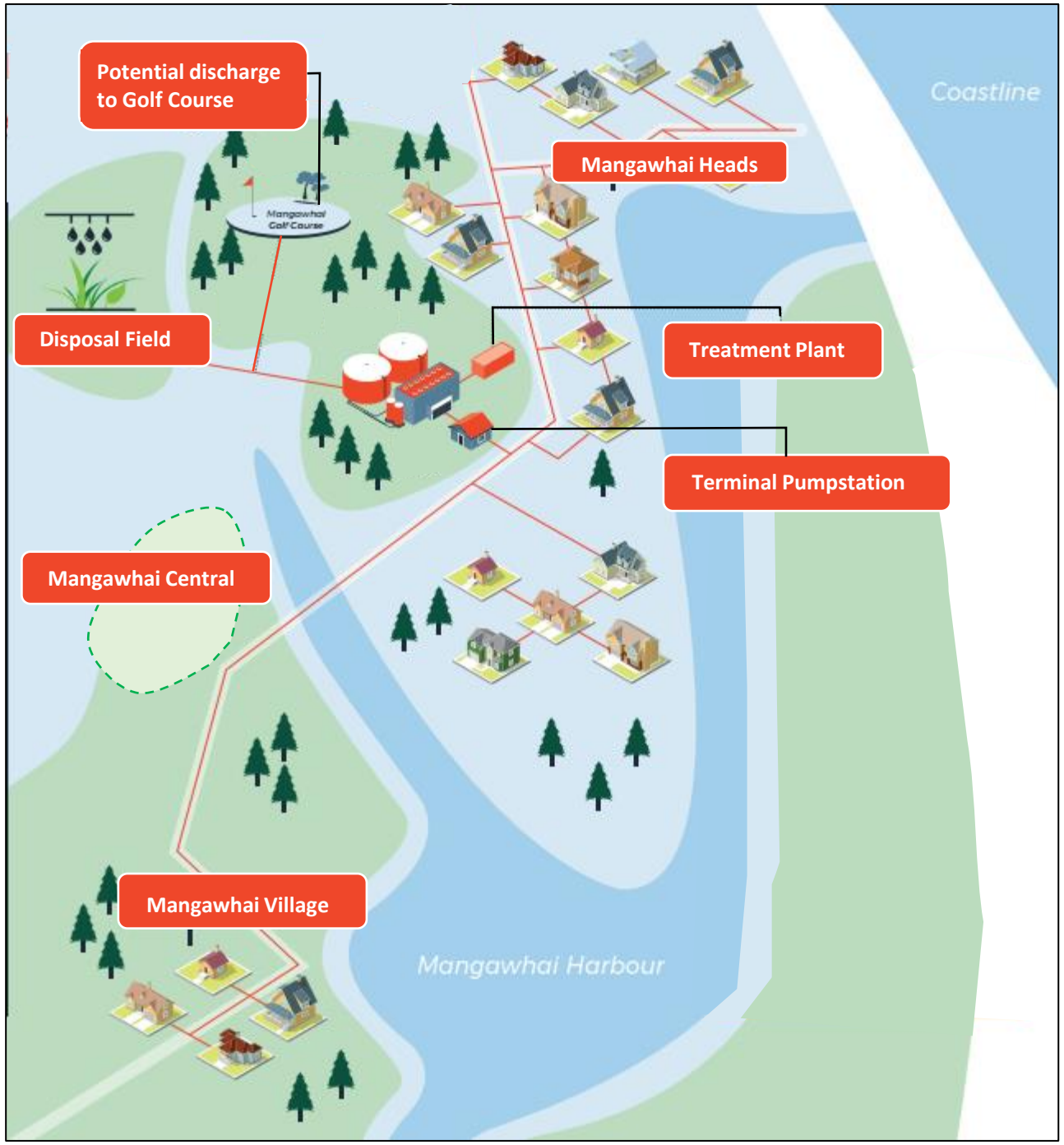
- Background to project was described and discussed
- Noted that Council staff are looking at innovative ways to advance the project to achieve a fit for purpose and cost-effective result
- Emphasised that elected members would have a role to play in an advisory group to ensure that governance are involved
- Procurement processes and strategies were discussed
- Resource management processes and strategies were discussed

- Design and functionalities were described and discussed
- The golf course disposal option was discussed, with possible options/implications explained
- Noted that the matter is ongoing, and solutions are being developed
- Modelling approaches were described and discussed.

Council direction:

- Provide a quarterly report on progress being made
- Continue as presented.

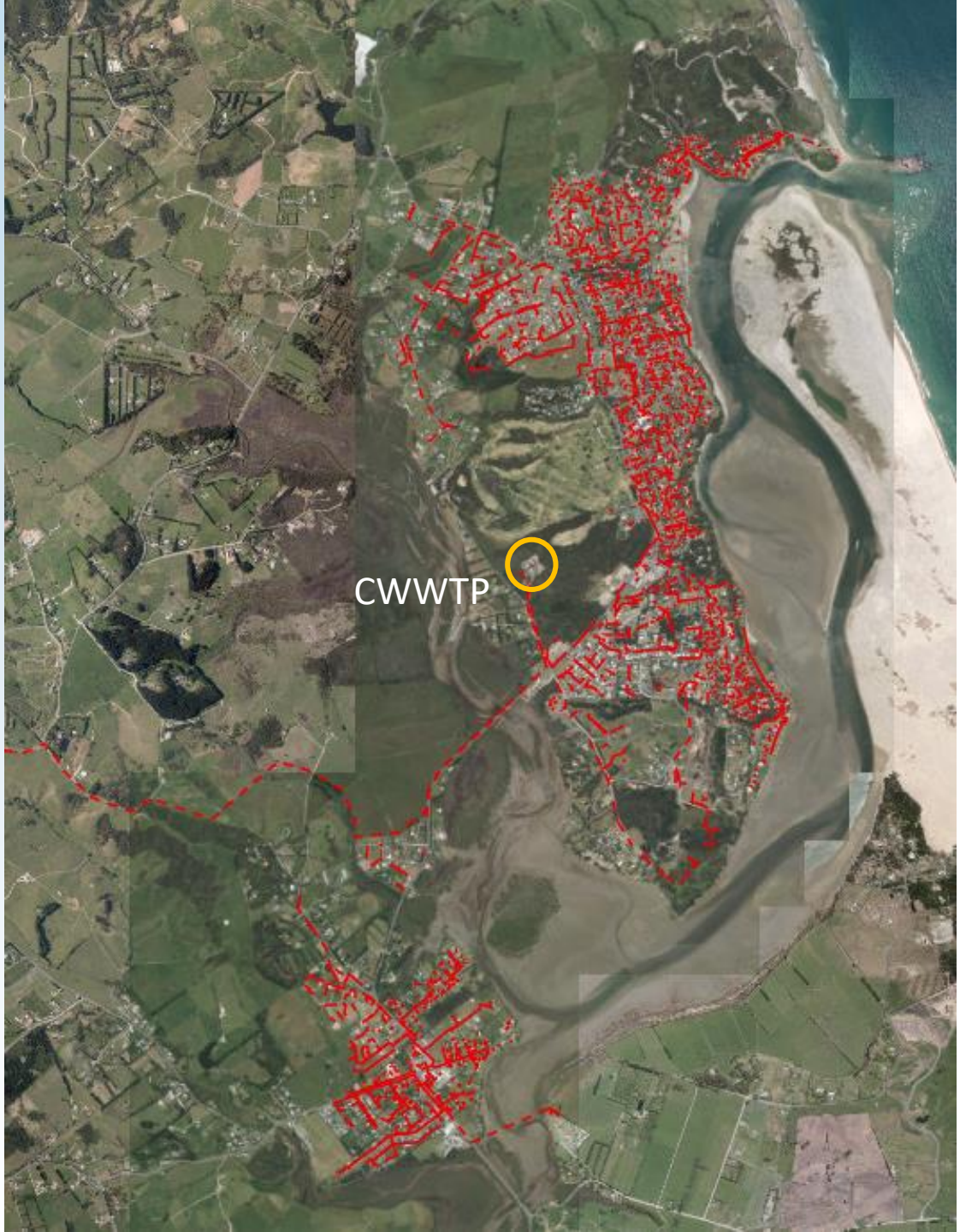
Attachment C – Schematic of the MCWWS


Potential discharge to Golf Course
Mangawhai Golf Course
Disposal Field
Mangawhai Heads
Treatment Plant
Terminal Pumpstation
Mangawhai Central
Mangawhai Village
Coastline
Mangawhai Harbour

Attachment D – Aerial showing the extent of the MCWWS

Mangawhai Community Wastewater Scheme

Wastewater Network



Attachment E – letter from the Mangawhai Golf Club

MANGAWHAI
GOLF CLUB
NEW ZEALAND

January 21 2022

Ms S Davidson
GM Sustainable Growth and Investment
Kaipara District Council
Mangawhai

Re: Support for Waste Water Re-use on Mangawhai Golf Course

Dear Sue,

Since January 2020 at the behest of Councilor Peter Wethey, the Mangawhai Golf Club has been actively involved in the developing KDC project relating to future strategy of the re-use of wastewater from the Mangawhai Treatment Plant. The project has had a primary outcome goal to irrigate the fairways of Mangawhai Golf Course and the broader consideration of the larger area of Mangawhai Park. Our representation at all stages of this project has been led by our Club Ambassador and ex-Chairman/President, Mike Howard. Mike has kept the Board fully informed throughout the journey thus far and has always had 100% support from the Board.

We are aware of the stages of the process thus far including, initial discussions, regular update meetings with your personnel, engineering consultants (WSP), development and presentation of well researched technical background information and on-going interface with local Iwi representatives . The latter has also involved no fewer than 3 separate personalised tours of the whole golf course and especially the wetland area, the maintenance and care of which is of strong interest to Te Uri O Hau.

More latterly, we understand Mike has introduced your personnel and WSP to Grant Puddicombe of Puddicombe Golf who are world respected golf course architects and irrigation experts. The introduction was done to ensure that your personnel had access to suitably qualified resource when it came to determining best possible irrigation and installation solution for this specialist project.

221 Molesworth Drive, Mangawhai, Northland, New Zealand; PO Box 66, Mangawhai 0540
Telephone: 09 431 4807 carry@mangawhaigolf.co.nz mangawhaigolf.co.nz

Your personnel have also met with members of our Board for a specific briefing session and most recently we had the pleasure of your attendance at our 2021 AGM to brief our members on the current status of the project.
It goes without saying that in the 2 years life cycle of this project the Board and Management have and remain totally committed and supportive of the concept of using the treated water as the irrigation source for our vulnerable golf course. We fully appreciate that this is a major decision confronting the KDC and must be progressed in a controlled manner because it ultimately reflects long term planning and investment for this total community.

Patently, it is in the best interests of the Mangawhai Golf Club (Course) to have access to this critical water resource. There is no other form of this resource that could possibly deliver the water we need, especially October through until April annually. One just has to look at the course right now to see the unsightly presentation of the whole area of the course being burnt off. That is except the greens and tee blocks which have the benefit of our very modest bore allocation from NRC.

It is a strategic intent to consider the potentially dire consequences of NRC having to reduce our allocation in the future as the impacts of more and more severe droughts in our region take effect on the water table, as has been forecast.
Currently there are no other water resources with the potential to satisfy the volume requirements of the golf course. Without access to the treated waste water there has to be real concern about the future viability of our nationally respected Mangawhai Golf Course (currently ranked 31 of 400 courses). Certainly, the effects of drought have been hard felt by the golf course over the last 5-7 years with the course condition getting progressively worse over that period.

As noted above, we fully acknowledge the real potential benefit to the golf course of the KDC supply of treated water and sincerely appreciate the KDC's commitment thus far, to find the rationale for the golf course to be a significant source for the reuse volumes of treated water, in order to alleviate the pressures of the existing Brown Road facility. It is our strong contention that the real benefits of using the golf course are really a community benefit. The course has the capacity to take 40-50% of the current production of the plant, and most of that over the critical spring/summer months. That offers up huge relief for the Brown Road facility over the high-volume months. It could well be that we can take even more than the 100-120,000m3 especially up the back of the course (Holes 12,13,13,15,16,2 and of course the huge practice area). It is worth noting that as long as there is a golf course, demand for water supply will only ever be a permanent demand.

It has previously been recorded that if the Golf Course/Club does well, then the Community benefits immeasurably. At little context!
Last year we recorded just under 40,000 rounds of golf of which just over 8000 were visitor rounds – even with the Covid lockdowns at different times of the year. No other club in Northland (and only two others north of the Harbour Bridge) achieve that volume of visitor rounds and will only grow. Our total membership numbers are now well over 1100 - representative of a significant percentage of the overall population of the area. Based on previous surveys conducted by the golf club, it is not unreasonable to suggest that visitors would conservatively spend upwards of $200 each in the community on each visit.

Additionally, as has been historically established, the golf club directly injects well over $500,000 into the community annually through wages/salaries/ prizes/supplies and our fundraiser events.

The best is yet to come. The advent of the new Te Arai Links Golf Courses just to the south of Mangawhai and a fully complimentary Mangawhai course will see a quantum change in the structure of golfing tourism in New Zealand. It is widely regarded that, because of the standards of the Te Arai Links courses and the fact they will have an element of open green fee play across its both courses, this area can easily become the new golfing destination of the country. It will take some time and it will take commitment (and accommodation infrastructure) but the international and national attention these new courses will attract (and the proximity to Auckland) will see a significant volume increases in golfing tourism as from 2023.

It is the intention of the Board of the Mangawhai Golf Club to have our club and course in the best possible condition to compliment these great new assets to the area. We will be working with all possible local businesses (and we expect there will be new businesses resulting) to capitalise on this unique opportunity. One only needs to talk to Arrowtown Golf and Business Community to see what benefits have accrued down there since the advent of Millbrook and The Hills. We believe this development presents a positive and exciting opportunity for KDC also, as a key leader of the community.
A waterless fairway Mangawhai Golf Course will be a major setback to achievement of the dynamic year- round economic potential it presents. However, perhaps more importantly, the ability to sustain an environmentally healthy green belt in the middle of The Heads community will quickly evaporate.

We sincerely believe we must collectively capitalise on the full scope of the opportunity presented. A non- land- based disposal strategy for the wastewater is the total waste of the one resource we have so little of in this area. The Mangawhai Golf Course and surrounding Mangawhai Park offer a credible, permanent option to re-use a significant volume of on-going total plant output in a sustainable and environmentally beneficial manner. At the same time this land resource provides relief at the optimal flow time of the year for the existing facility. Without wanting to appear to be "blinkered" we can only affirm our belief that an ultimate KDC investment in providing this water resource to the golf course will have far reaching positive benefits to the environmental and economic well-being of the whole Mangawhai community.

The Mangawhai Golf Club has continued to act positively as a committed community partner, supporting many groups in the community. We see ourselves as a "responsible Hub of the community". We fully understand and appreciate the challenges of being fiscally responsible and genuinely acknowledge the need for KDC to coherently present a strong case to the community for the investment that has to be made for future dissipation of treated water volumes primarily on the local golf course.

This appears to make infinite sense on a number of platforms, not the least of which being:

- a/ for the community good
  b/ the future community development and economic benefit as a significant (golf) tourism growth destination.

c/ the ability to future proof the largesse of Mangawhai Park as an environmentally sustainable recreational asset, no longer held captive by the lack of water to counter the growing challenges of more and more drought.
d/ to enhance the environmental potential of what we call a classic sand- based golf course surrounded by (more and more) native flora and fauna.
e/ the ability to look forward to sustain and enhance the "significant wetlands" within our midst, in partnership with local Iwi/ KDC to convince the NRC that it is a resource worthy of saving and an appropriate strategy needs to be jointly agreed.

We hope the Mangawhai Golf Club has clearly illustrated their on-going and fervent support for your treated water reuse project. It is easy for us to say it is critical for the long-term survival of the golf course in the community, but we totally acknowledge it is your project for the community and there are challenging cost aspects to this.
We reiterate and commit our unreserved support to the Kaipara District Council in looking to reuse the wastewater on the golf course. We will continue to help and support in any way possible. If there is anything more, we could do, please do not hesitate to connect with us to help the Board of The Golf Club understand in what other ways we could possibly assist and bring this exciting project to fruition.

Yours sincerely

pp Carry Dale Carry Dale, G.M

John Merrick
Mangawhai Golf Club Board Chair

221 Molesworth Drive, Mangawhai, Northland, New Zealand; PO Box 66, Mangawhai 0540
Telephone: 09 431 4807 carry@mangawhaigolf.co.nz mangawhaigolf.co.nz