



Kaipara te Orangahui

KAIPARA
DISTRICT

Two Oceans Two Harbours

Mangawhai Community Wastewater Scheme

Council Briefing – April 2023

Purpose

- To update Elected Members on progress of the peer review of the Mangawhai Wastewater Scheme and seek feedback

Context

- To update Elected Members on progress since the previous briefing in December 2022
- Key drivers and timelines
- Preferred upgrade pathway for Mangawhai WWTP
- Near term solutions to address Lincoln Downs Farm irrigation system issues
- Golf Course recycled water irrigation system and future use of Lincoln Downs Farm
- Revised cost estimates
- Next steps

Review Team

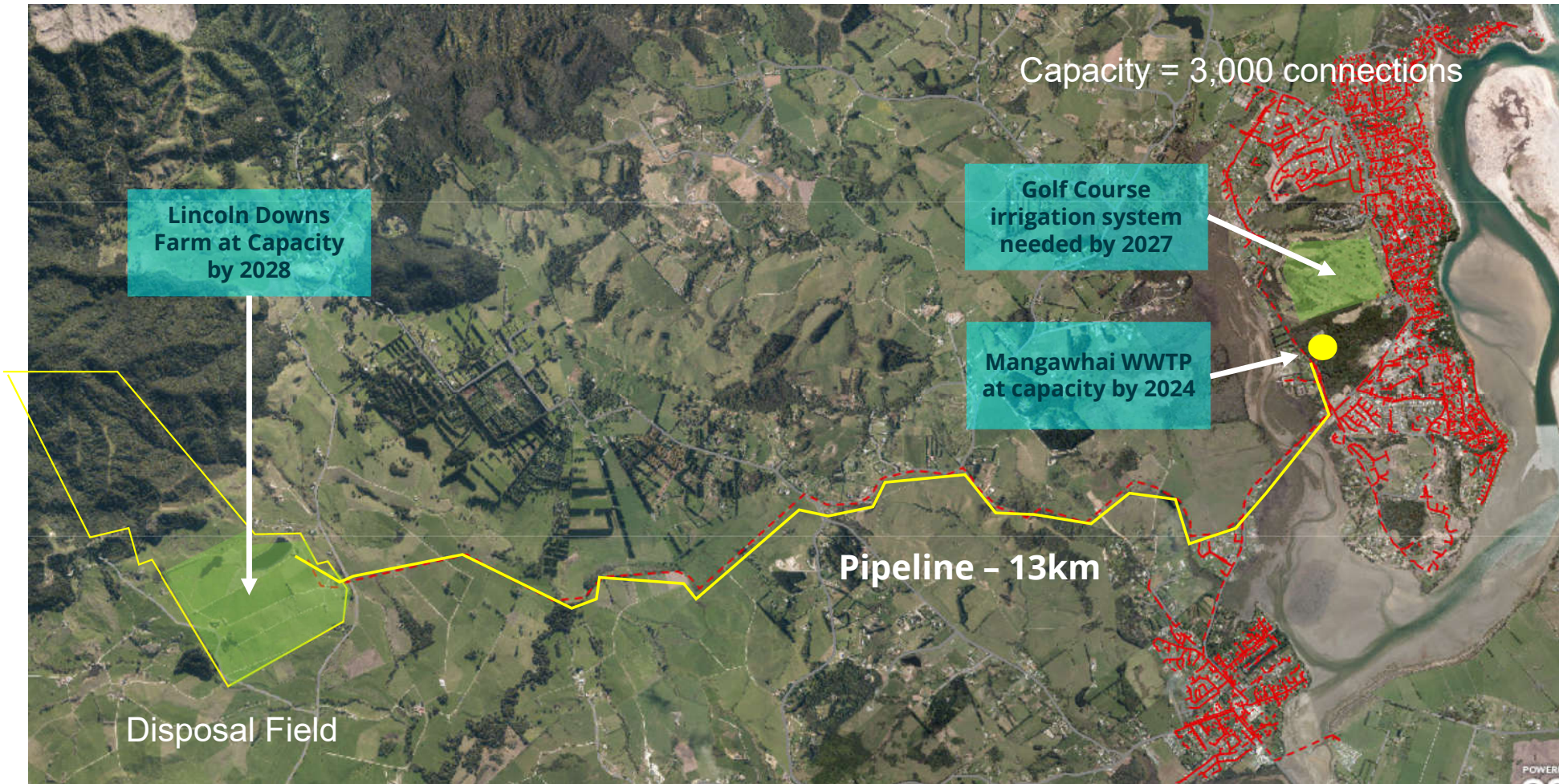
- Review has been conducted by leading experts in wastewater treatment and effluent reuse from Australia and New Zealand:
 - Clint Cantrell – SCO Consulting
 - Craig White – Beca HunterH2O
- Additional technical input:
 - Peter Gearing – Irrigation specialist
 - Rory Bishop – Alta, Construction cost specialist

Purpose

The review was to:

- Confirm the lowest cost options
- Ensure the Mangawhai Wastewater Scheme meets capacity for growth
- Improve wastewater process, similar to technology used by Watercare Service Ltd
- Remove reliance on Lincoln Downs Farm irrigation field
- Enhance effluent quality for recycled water use at the golf course
- Improve and enhance the current Lincoln Downs Farm irrigation scheme

Overview - Key drivers and timelines



Strategy Programme - Overview

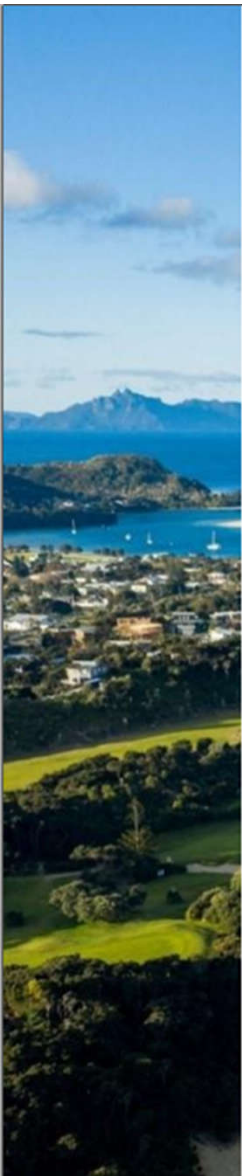
Issues	Actions	Timing	Benefit
WWTP Capacity reached by 2024	Optimise existing system & implement InDense with new decant weirs	Complete by 2024	Plant B-grade capacity boosted to 2028
Lincoln Downs Farm irrigation system community issues	Implement near term measures to mitigate effects	Complete by 2023	Alleviation of community issues & future use of farm
Medium term growth needs	Convert balance tank to 3 rd Cyclic Activated Sludge System (CASS) unit	Complete by 2025	Plant B-grade capacity boosted to 2047
Lincoln Downs Farm capacity reached by 2026/2027	Enhance WWTP effluent to A Grade quality & implement golf course irrigation system	Complete by 2026	Plant produces recycled water quality & long-term effluent management secured
Long term growth needs	Build 4 th CASS unit	Complete by 2046	Plant can service ultimate growth

Lincoln Downs Farm – Issues and near-term actions



Issues	Actions
Bacteria levels (ecoli)	Confirm levels and sources – fast sampling
Algae/cyanobacteria	Confirm options – e.g. pond aeration
Odours	Adjust spray fields, buffering, pond aeration
Liner leakage	Drain pond and repair liner
Surface runoff	Adjust irrigation operations, review land use

Growth Forecast



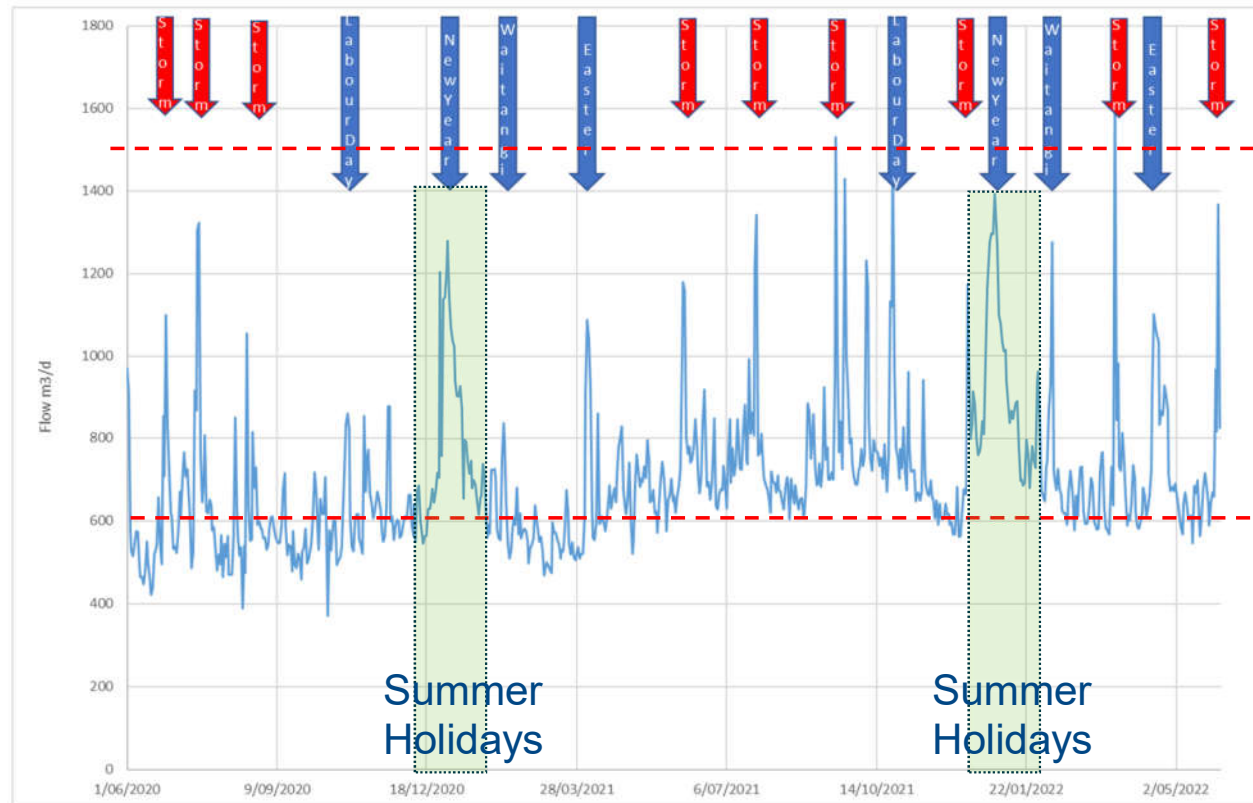
WWTP at capacity →

Browns Farm at capacity →

Year	Connections	Total Population Equivalent		
		EP		
		Resident	Summer	Peak
2023 (TODAY)	2,764	3,700	5,400	13,500
2024	2,900	3,900	5,650	14,150
2026	3,200	4,300	6,250	15,650
2028	3,500	4,700	6,800	17,100
2047	5,470	7,300	10,650	26,700
Ultimate 2051	5,800	7,750	11,300	28,350

Current Challenge

- **Hydraulic Load:** Short peak due to storms or summer visitors



Wet weather influence
Holiday Peak

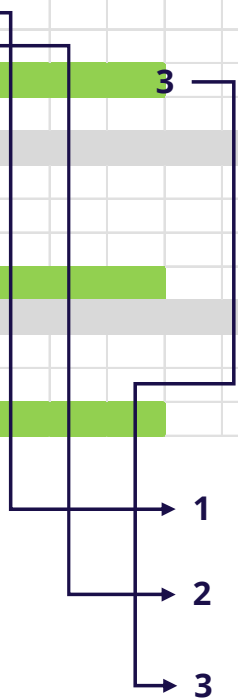
1,500 m³/day
Peak summer flow

600 m³/day
Off-peak flow

Highest peak flow recorded was 2,700 m³/day

Strategy Programme – Detailed plan of action

	2023	2024	2025	2026	2027	2028	...2047
Mangawhai WWTP Upgrades							
Design/Procure	█	█					
Optimise existing plant performance	█	█					
Implement InDense system		█	█				
Convert balance tank to 3rd CASS unit			█	█			
Implement Class A Effluent upgrades				█	█	█	
Build 4th CASS unit							█
Browns Farm Enhancements							
Near term enhancements	█						
Long term system design/consenting/procurement		█	█	█			
Long term system implementation				█	█		
Golf Course Irrigation System							
Investigations, design, consenting	█	█	█				
Procure/Construct				█	█		



- 1 ✓ Capacity boosted to 2028
- 2 ✓ Capacity boosted to 2047
- 3 ✓ Class A effluent quality achieved

WWTP Upgrades – next 3 to 4 years

Phase 1 - 2024

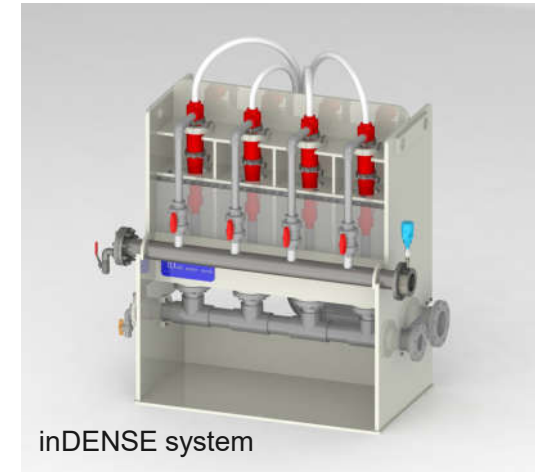


- ✓ Optimise existing systems for peak flows
- ✓ Implement inDENSE system to enhance settling

Phase 2 - by 2026/27



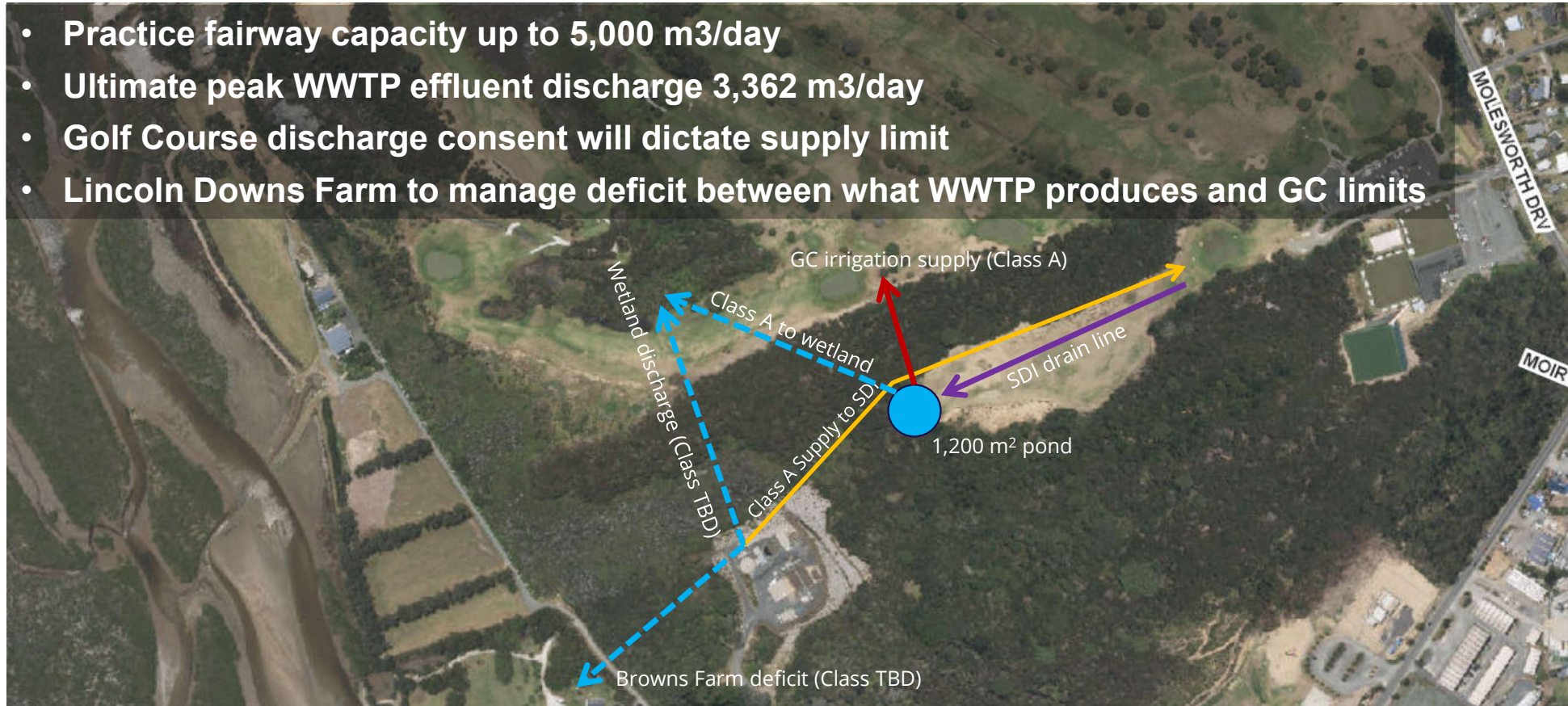
- ✓ Convert balance tank to 3rd CASS reactor
- ✓ Implement Class A = triple barrier disinfection system (UF + UV + Cl)
- ✓ Install new recycled water supply system
- ✓ Other miscellaneous upgrades* (e.g. screens, air supply, sludge tank, etc.)



* Note: additional Phase 2 upgrades may be required based on golf course discharge consent outcomes

Class A Effluent Management System - Preliminary concept

- Practice fairway capacity up to 5,000 m³/day
- Ultimate peak WWTP effluent discharge 3,362 m³/day
- Golf Course discharge consent will dictate supply limit
- Lincoln Downs Farm to manage deficit between what WWTP produces and GC limits



Indicative Cost Estimates (TBC) - Recommended pathway

Element	Timing	Indicative Cost
WWTP upgrades		
1. inDENSE system	2023 to 2024	\$1.5M
2. Convert balance tank to 3 rd CASS reactor	2023 to 2025	\$3M
3. Inlet works upgrades	2024 to 2025	\$7M
4. A grade triple barrier system	2025 to 2026	\$10M
Effluent disposal & reuse		
5. Lincoln Downs Farm + wetland	2024 to 2026	\$7M + \$8M
6. Golf Course Irrigation Supply System	2025 to 2026	\$7M
Network Upgrades	2024 to 2027	\$25M
TOTAL		\$68.5M

Please note cost estimates are being updated on 31 March 2023 (Friday)

Indicative Cost Estimates – High level WWTP options comparison

Option	2023	2024	2025	2026	2027	2028
CASS	\$500K	\$1M	\$10M	\$10M		
Capacity – time horizon	2024	2024	2028	2028	2047	2047
Capacity - connections	3,000	3,550	3,550	5,464	5,464	5,464
Effluent Class	B	B	B	A	A	A
MBR	\$4.5M	\$20M	\$10M			
Capacity – time horizon	2024	2024	2024	2034	2034	2034
Capacity - connections	3,000	3,000	3,000	4,230	4,230	4,230
Effluent Class	B	B	B	A	A	A

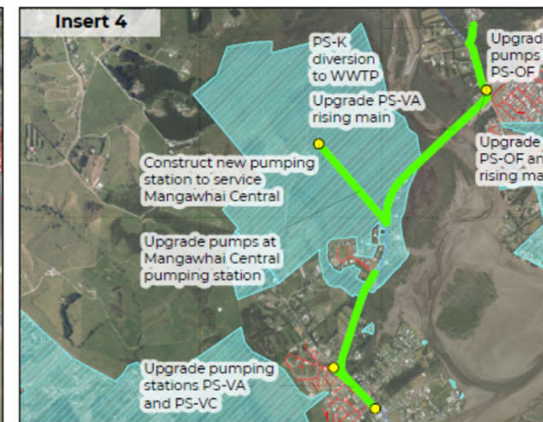
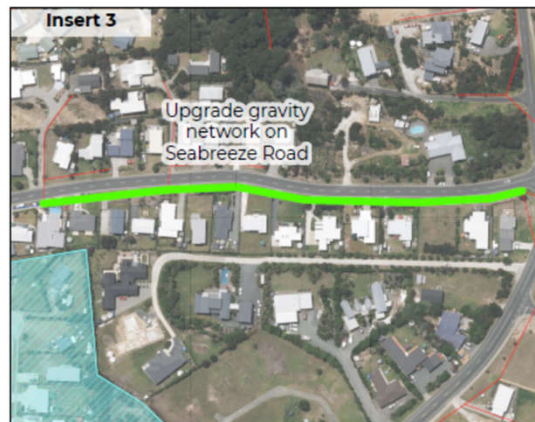
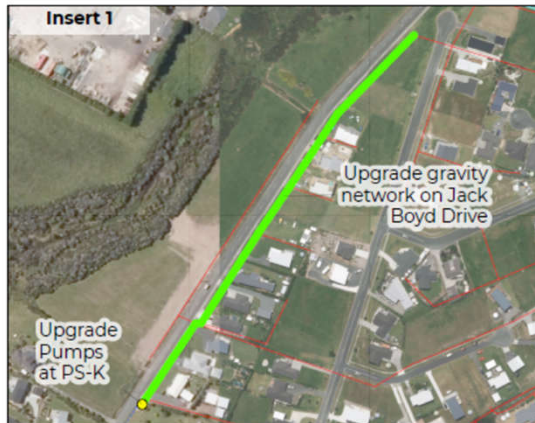
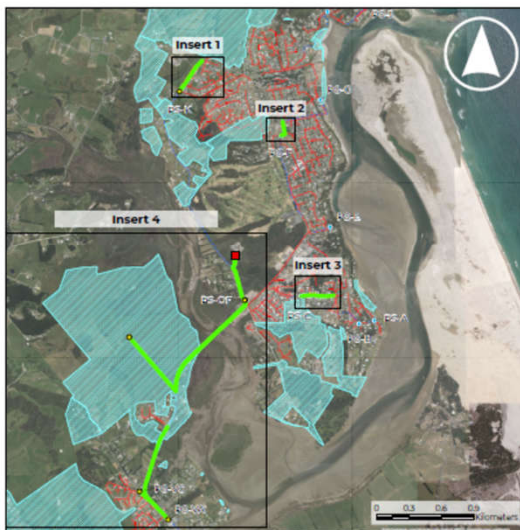
Note – does not include cost for golf course irrigation system and Lincoln Downs Farm enhancements – which are common to both options.

Please also note cost estimates are being updated on 31 March 2023 (Friday)

Reticulated Network Programme



Mangawhai Community Wastewater Network Upgrades



Projects are NOT included in the LTP 2021-31



Next steps

1. Address immediate issues at Lincoln Downs Farm
2. Complete required investigations to inform consent and designs
3. Confirm golf course consenting plan and environmental investigations
4. Optimise existing plant operational settings
5. Phase 1 design and implement InDense system and new decant weirs
6. Develop preliminary designs and refined cost estimates
7. Complete detailed designs for Phase 2 upgrades
8. Ongoing liaison and discussion with Iwi
9. Continuing discussion with third parties on opportunities for use of Lincoln Downs Farm land
10. Provide a revised funding profile for next LTP/Entity A AMP