

# Northland Water Storage and Use - Prefeasibility

25 November 2019



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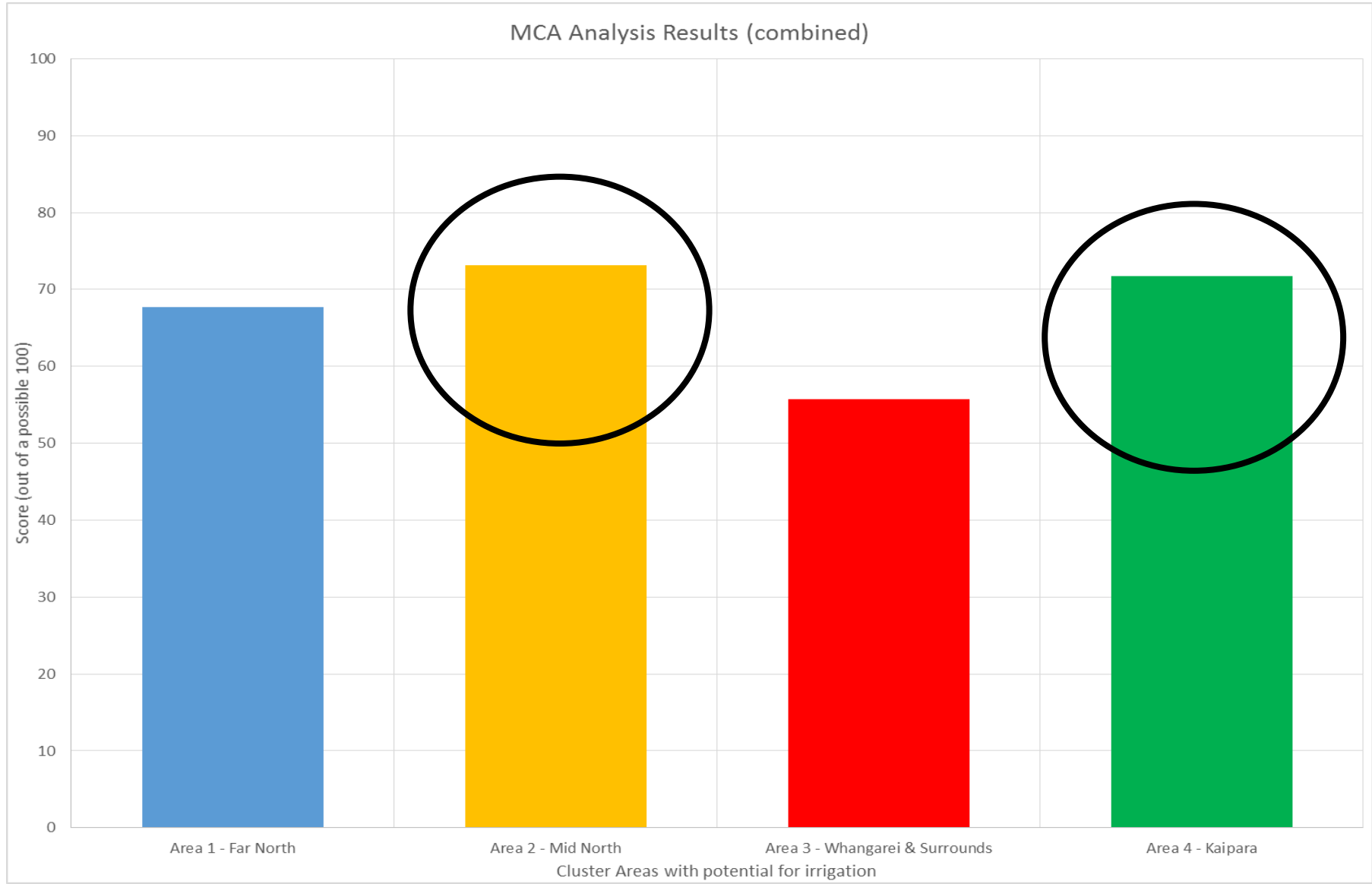


# How we got here

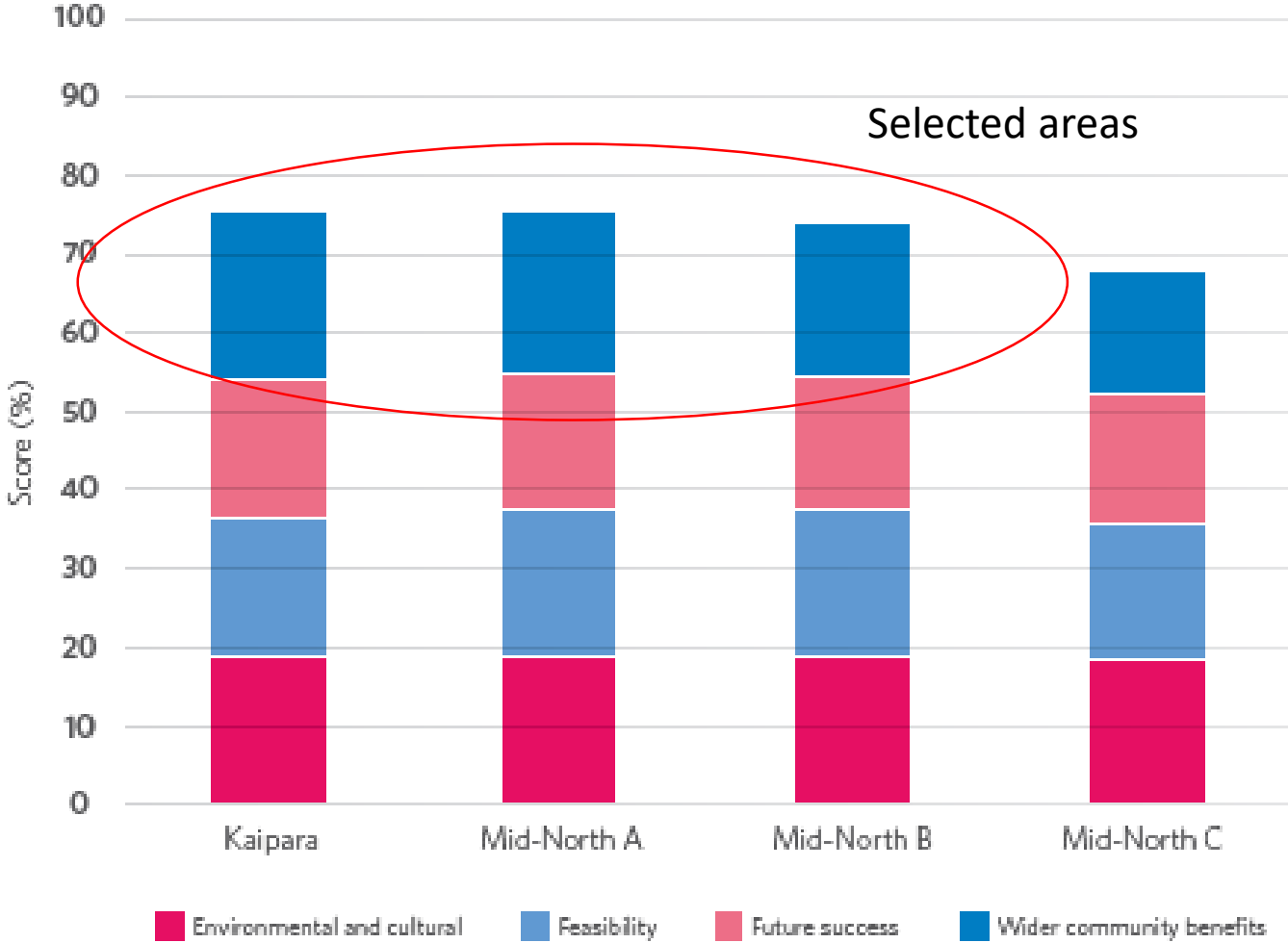
- In 2013/2014 drought conditions led to Northland Inc. fielding a number of enquiries from the farming community about water storage
- In April 2014 Minister Guy challenged the Northland community to apply for funding through MPI's Irrigation Acceleration Fund (IAF)



Studies identified two specific clusters that would most likely benefit: **Mid-North** and **Kaipara**



# Scoping study narrowed it down to 3 Areas

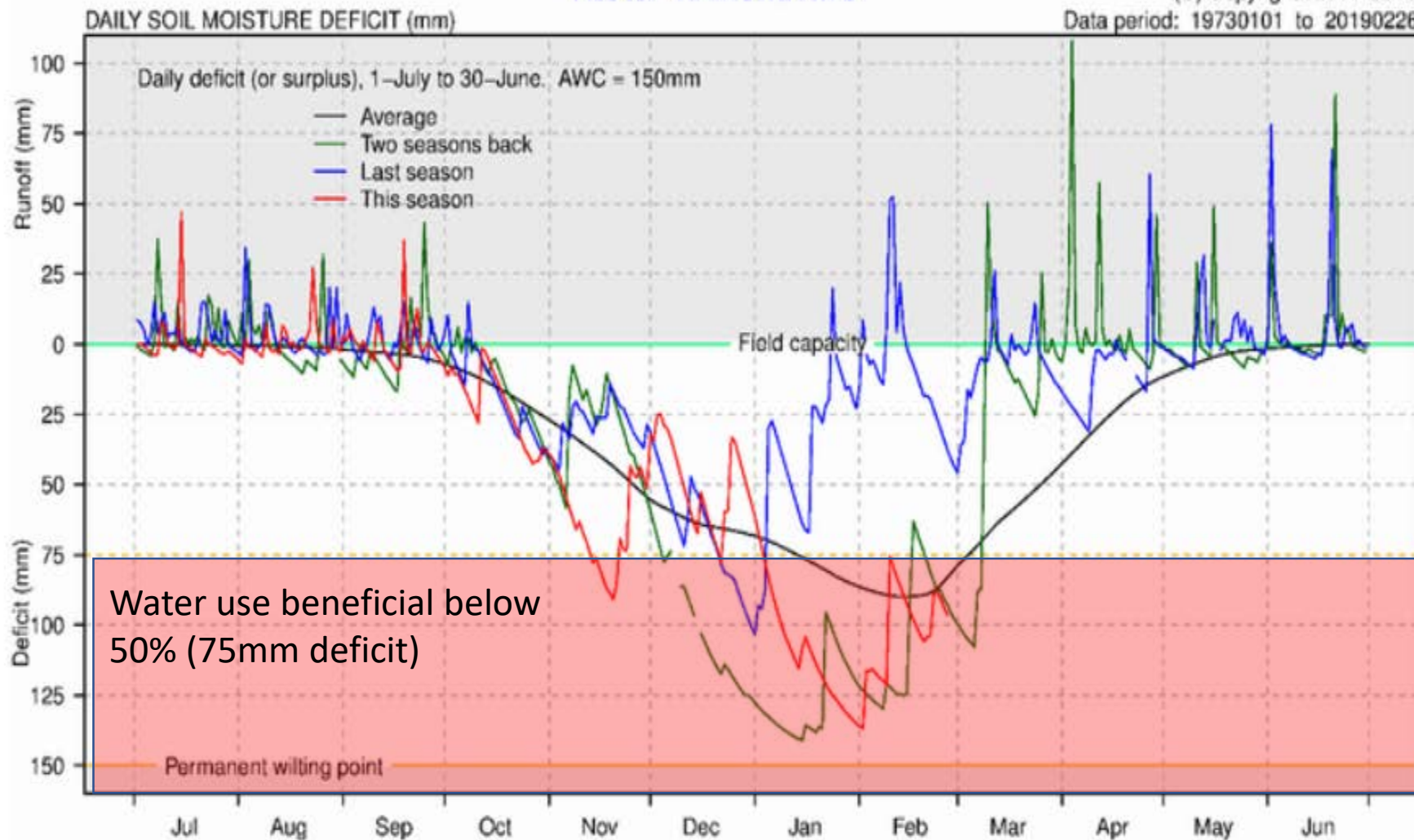


# Need for Water - Kaikohe

A53487 KAIKOHE AWS

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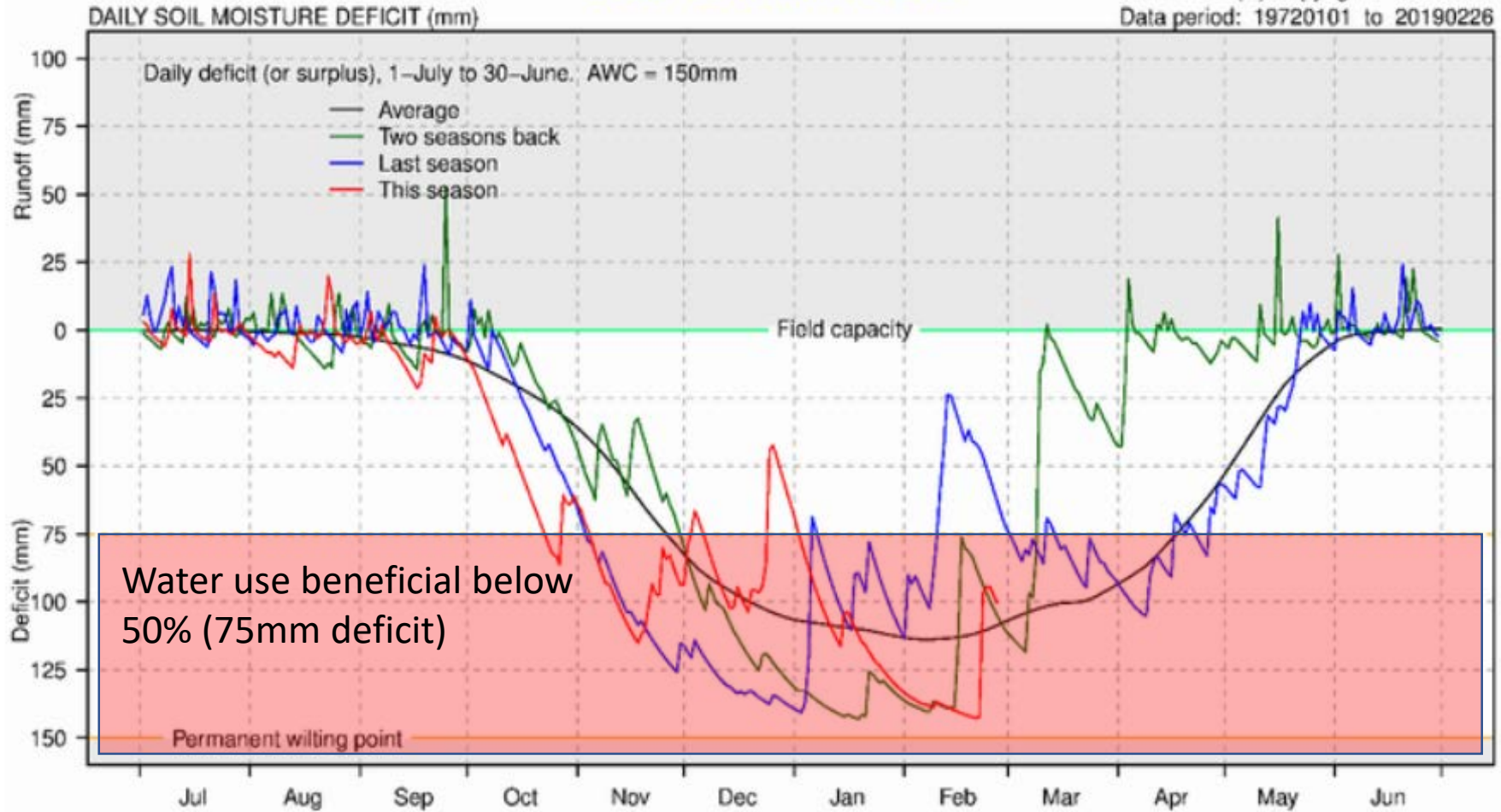
Data period: 19730101 to 20190226



# Need for Water - Dargaville


## A53987 DARGAVILLE 2 EWS


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Data period: 19720101 to 20190226




# Scheme option 1: Kaipara

Water storage will encourage diversification of existing land-use as well as provide a reliable water supply within Dargaville and the wider community.

 **19,000** ha of land that could benefit from irrigation (command area) shown in green

 **6,300** ha irrigable area within the command area (assumed 30% uptake)

 **4,000** m<sup>3</sup>/ha peak irrigation demand

 **3,400** m<sup>3</sup>/ha/year average irrigation demand

 **\$115** million total capital cost

 **\$17,000** /ha capital cost

 **\$390** /ha/year operational costs

 **950** additional people predicted to be employed

 **\$85** million /year regional GDP increase





# Scheme option 2: Mid-North A

Supply of a reliable water supply will enable higher value uses of land in turn providing significant opportunities within Kaihohe and the wider community.

-  **2,300** ha of land that could benefit from irrigation (command area) shown in green
-  **1,600** ha irrigable area within the command area (assumed 70% uptake)
-  **3,500** m<sup>3</sup>/ha peak irrigation demand
-  **1,800** m<sup>3</sup>/ha/year average irrigation demand
-  **\$22** million total capital cost
-  **\$11,100** /ha capital cost
-  **\$180** /ha/year operational costs
-  **500** additional people predicted to be employed
-  **\$70** million /year regional GDP increase



# Scheme option 3: Mid-North B

A reliable water supply will enable higher value uses of land, including supply to the possible industrial park, providing significant opportunities within the community.



**2,800** ha of land that could benefit from irrigation (command area) shown in green



**1,700** ha irrigable area within the command area (assumed 60% uptake)



**3,900** m<sup>3</sup>/ha peak irrigation demand



**1,900** m<sup>3</sup>/ha/year average irrigation demand



**\$32** million total capital cost



**\$15,900** /ha capital cost



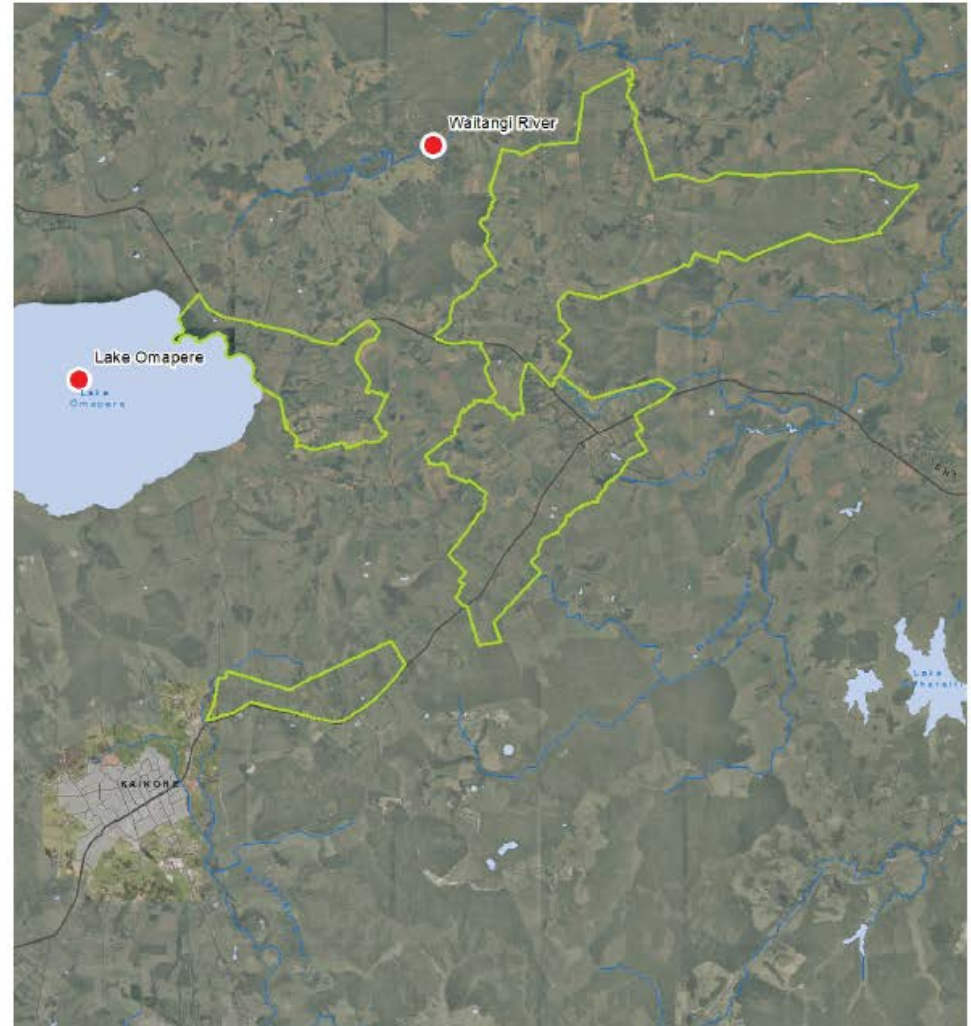
**\$210** /ha/year operational costs



**650** additional people predicted to be employed



**\$75** million /year regional GDP increase





PROVINCIAL  
DEVELOPMENT  
UNIT

New Zealand Government

## FUNDING AGREEMENT

BETWEEN

MINISTRY OF BUSINESS,  
INNOVATION AND EMPLOYMENT

AND

NORTHLAND REGIONAL COUNCIL  
TE KAUNIHERA Ā ROHE O TE TAITOKERAU

FOR

NORTHLAND WATER STORAGE & USE  
(FEASIBILITY GRANT AND  
CONSTRUCTION FACILITY TERMS)

Commenced 8 July 2019, ends 31 March  
2023

### Conditions Precedent

- Governance framework;
- MOU between the NRC, KDC, FNDC
- Evidence of Co-Funding

### Funding

- **Pre-feasibility Phase, up to NZ\$3M**
- Feasibility Phase, up to NZ\$2M
- Commitment Phase, up to NZ\$2M
- Allows carry over through phases
- Remaining balance (\$18.5M less money used above) as loan for construction

# PGF Investment Principles

## Economic

Strengthen economies by shifting land use to higher value, sustainable uses, while avoiding increases in livestock intensification.

Water storage will help address disparities in Māori access to water for land development.

## Community

Small scale community level projects will be supported rather than mega irrigation schemes.

There must be public benefit from government funding of a project.



# PGF Investment Principles

## Environment

Water storage proposals should demonstrate that they will support land use that does not increase - and ideally reverses - negative impacts on water quality.

Proposals should maintain the health of waterways.

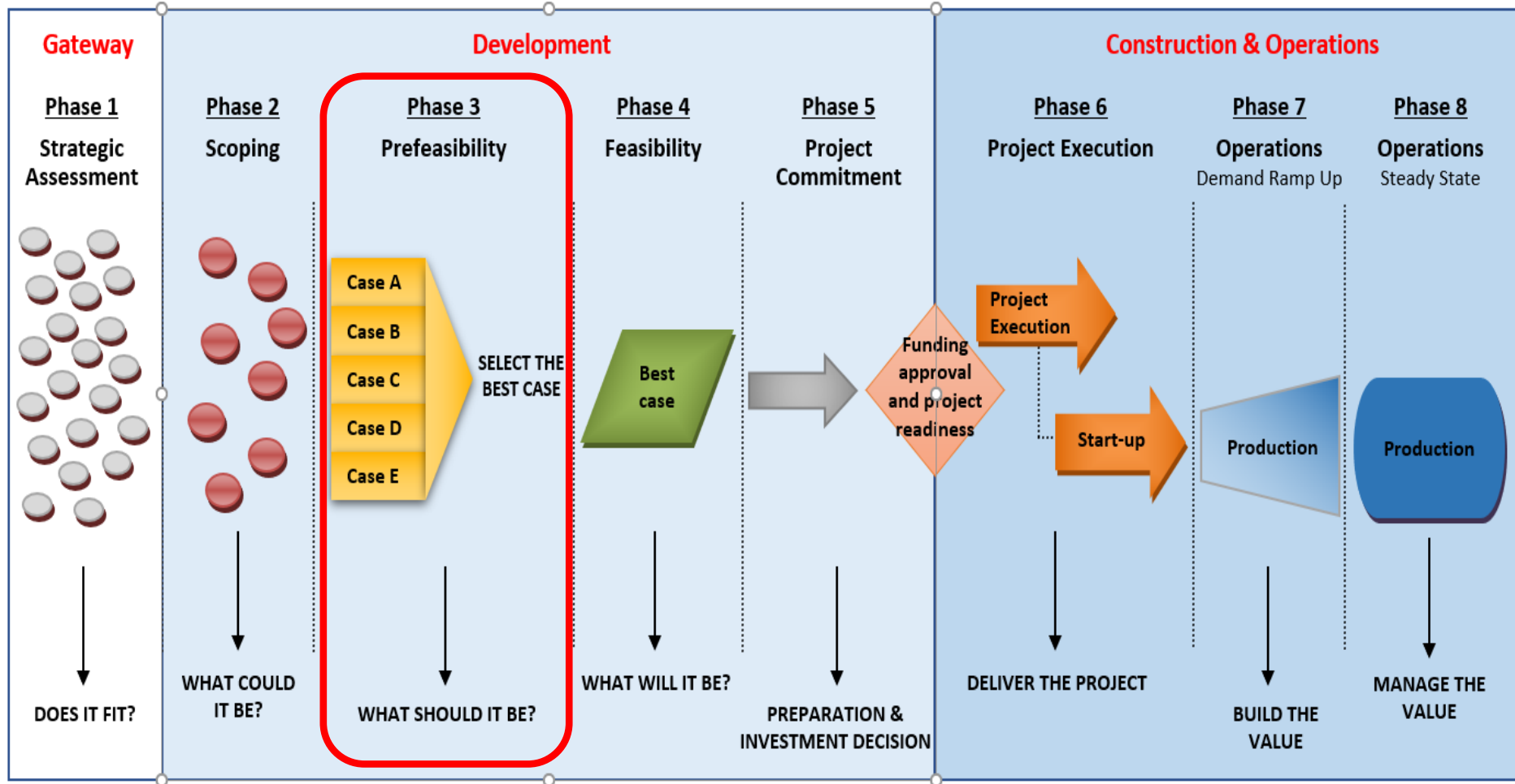
## Climate Change

Where practicable, proposals should contribute positively to the target of reducing greenhouse gases, and demonstrate how they will contribute to mitigating or adapting to climate change effects and a just transition to a low emissions economy.

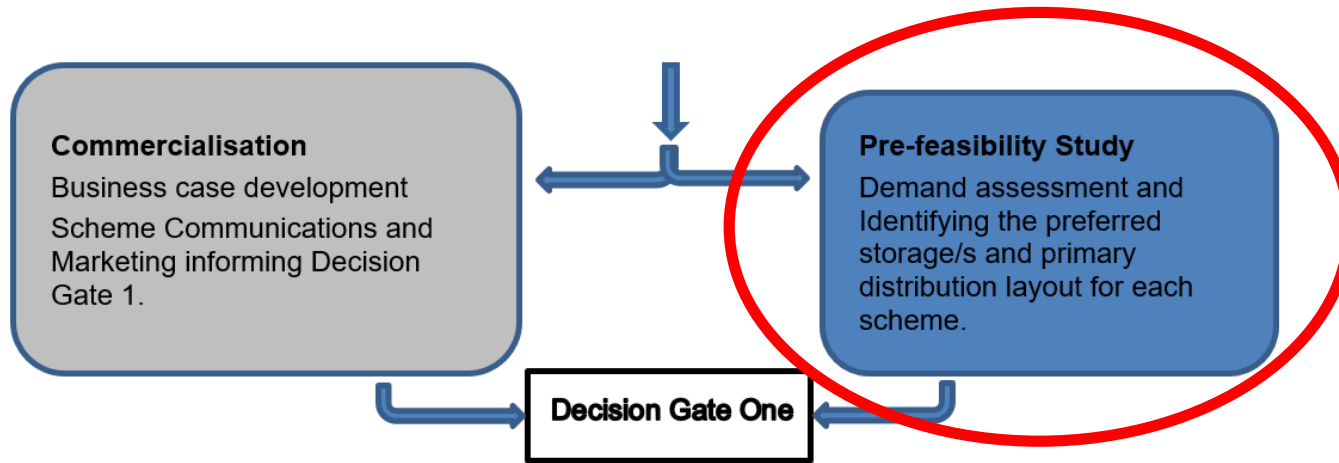
Proposals should consider the potential to contribute to community resilience to climate change.



# Current Phase - Prefeasibility



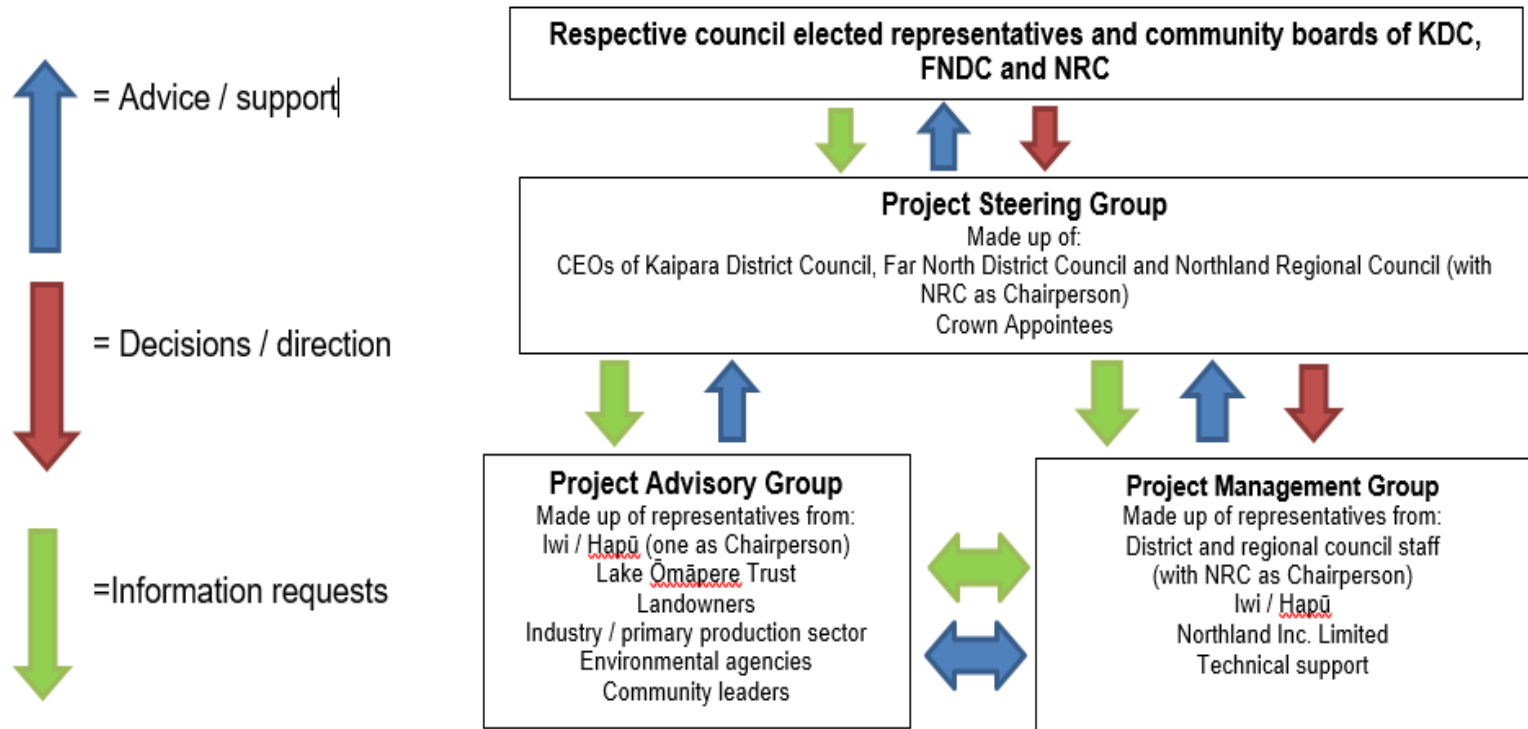
# Demand Assessment and Design Study



## Objectives

- Assess water user/grower demand
- Lead grower engagement
- Develop water take and storage options
- Undertake concept level design engineering
- Support NRC and its consultants engage and build key stakeholder relationships

## Governance Structure



The project governance structure and terms of references for the three bodies within the structure have been designed with the Pre-feasibility Phase in mind and may need to be amended if the project progresses beyond this stage.



# Project steering group

	Representative
<b>Northland Regional Council</b>	Malcolm Nicolson (Chair)
<b>Far North District Council</b>	Sean Clarke
<b>Kaipara District Council</b>	Louise Miller
<b>Crown representatives</b>	Dover Samuels Murray McCully
<b>Crown Observer</b>	Jane Francis

# Project advisory group

Entity
Kaipara mana whenua
Mid-North iwi / hapū
Lake Ōmāpere Trust
Fish & Game New Zealand
Department of Conservation
Federated Farmers of New Zealand
Horticulture NZ
Irrigation NZ
Landowner – Kaipara
Landowner – Mid-North
Community leader – Kaipara
Community leader – Mid-North
Integrated Kaipara Harbour Management Group

# Update on work to date

# Water Investigations

## Command Area Refinement

### – 95% Complete

- Detailed soil, land use and landcover mapping
- Daily irrigation models

## Water Resource Analysis

### – 95% Complete

- Regional Plan Rules
- Catchments defined
- High level storage area identification & dam break analysis
- Catchment yields
- Storage modelling analysis

## Development and Refinement of Long List

### – 90% complete

- Potential storage sites identified
- Site walkovers (7<sup>th</sup> and 8<sup>th</sup> of October)
- Multi-Criteria Analysis

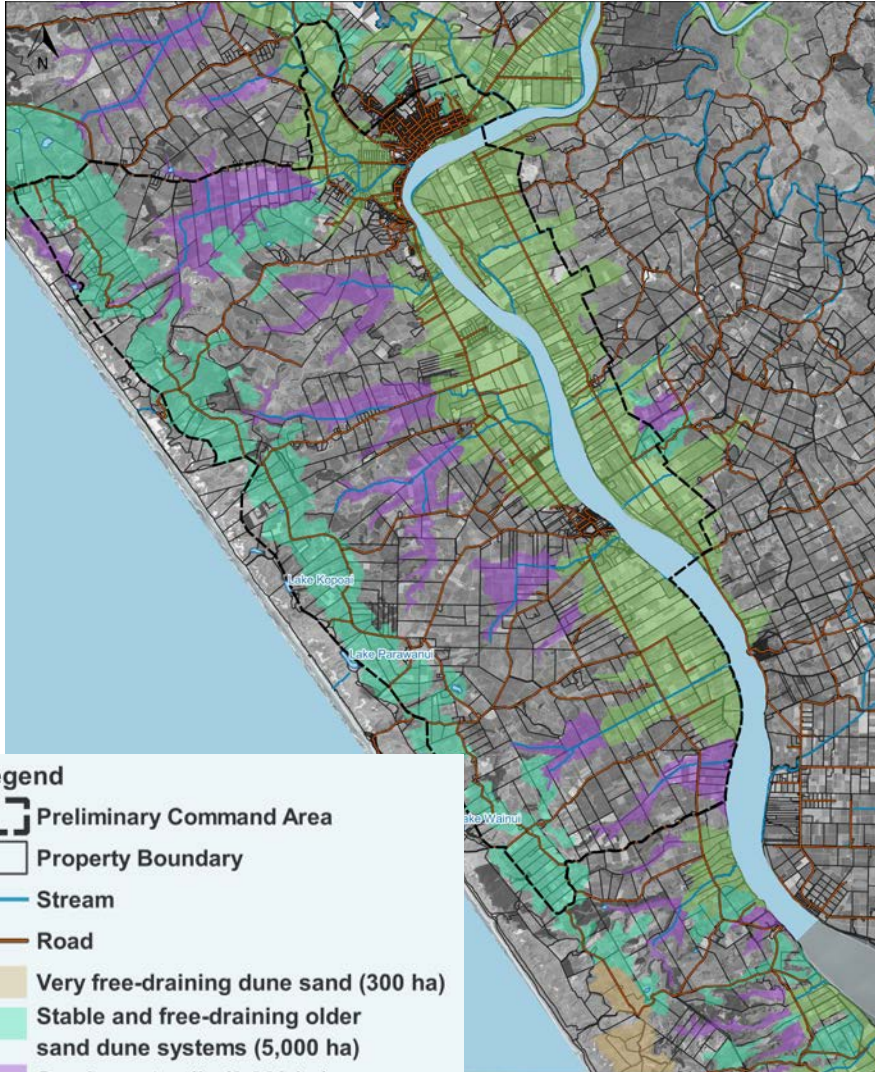


# Water Demand

## Horticulture:

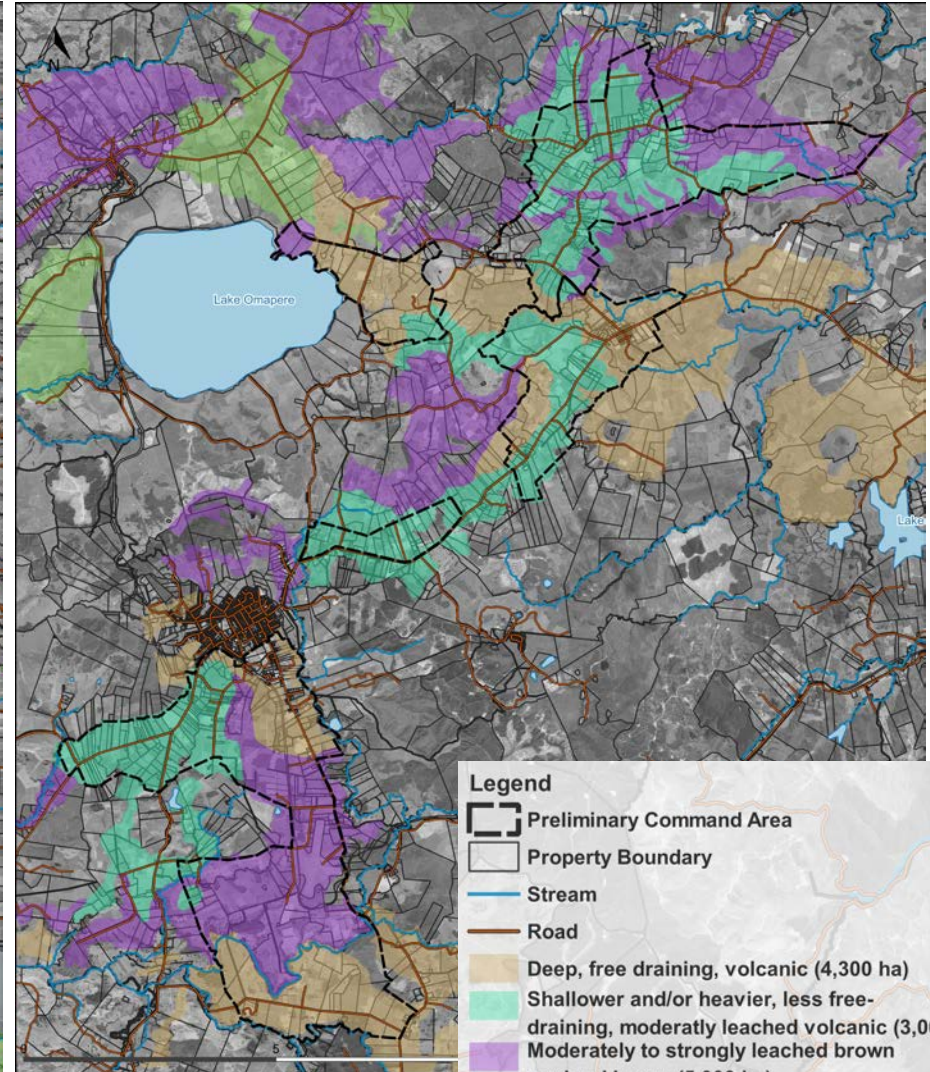
PAR: 4 mm/day

Annual Vol: 4,000 m<sup>3</sup>/ha











### Legend

-  Preliminary Command Area
-  Property Boundary
-  Stream
-  Road
-  Very free-draining dune sand (300 ha)
-  Stable and free-draining older sand dune systems (5,000 ha)
-  Sandy peat soils (3,300 ha)
-  Alluvial and Estuarine Soils (8,200 ha)



### Legend

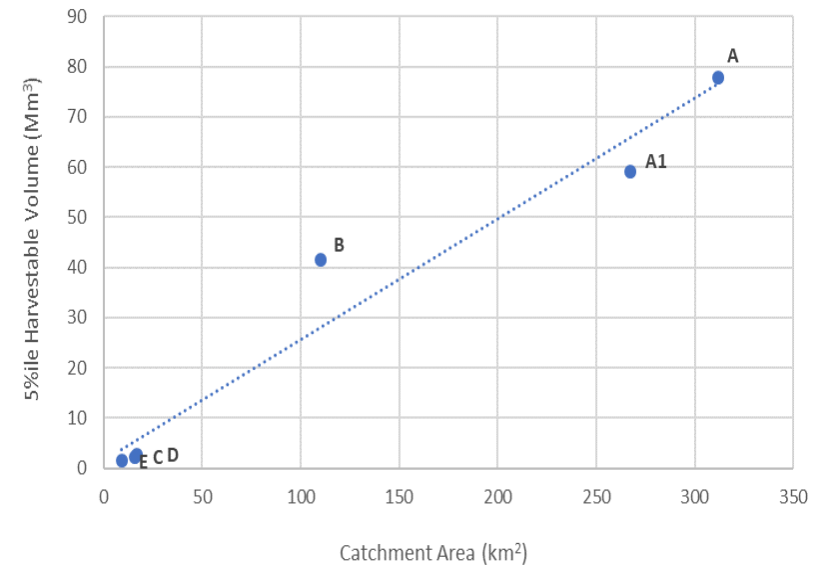
-  Preliminary Command Area
-  Property Boundary
-  Stream
-  Road
-  Deep, free draining, volcanic (4,300 ha)
-  Shallower and/or heavier, less free-draining, moderately leached volcanic (3,000 ha)
-  Moderately to strongly leached brown and red loams (5,000 ha)
-  Strongly to very strongly leached brown loams, 'ironstone soils' (1,100 ha)

# Water Supply (Kaipara)

Preliminary results – prior to final model validation

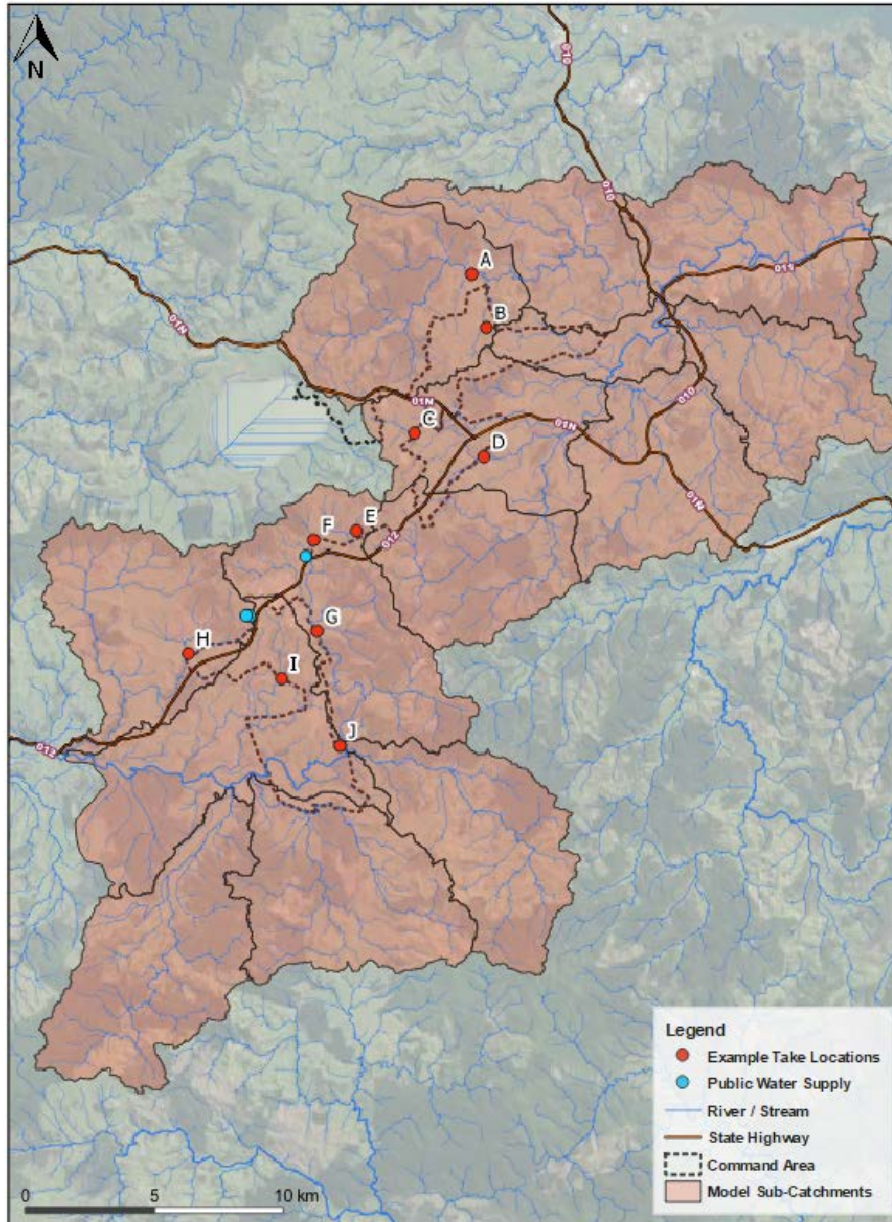


Potential Take Site	Annual Harvestable Volume (Mm <sup>3</sup> )	Irrigable Area Supported (1000's ha)
A	80	20
A1	60	15
B	40	10
C	2	0.5
D	3	0.75
E	1	0.25

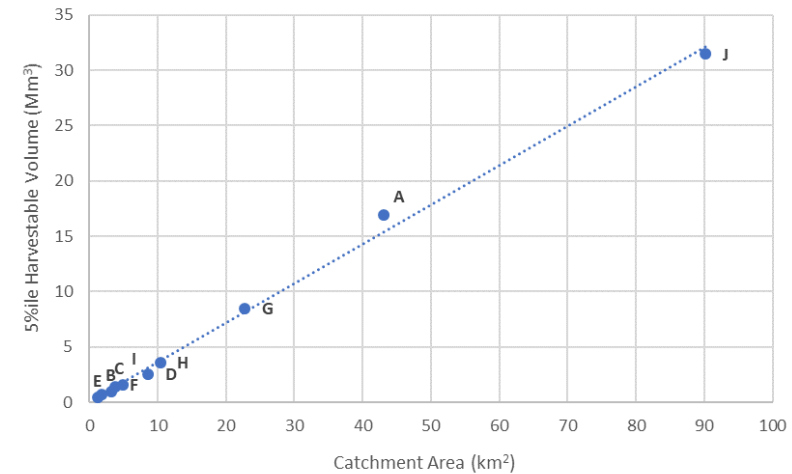


# Water Supply (Mid North)

Preliminary results – prior to final model validation



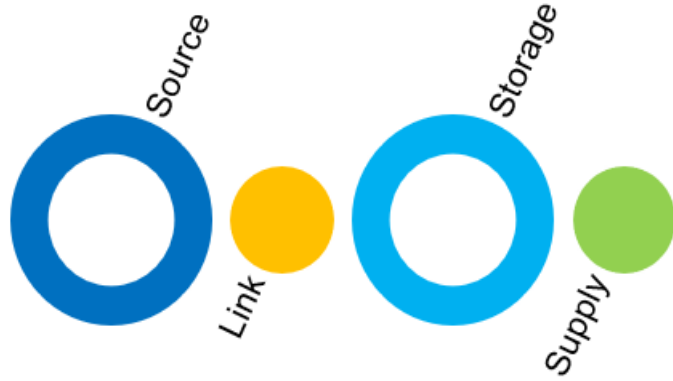
Potential Take Site	Annual Harvestable Volume (Mm <sup>3</sup> )	Irrigable Area Supported (1000's ha)
A	15	3.75
B	0.5	0.13
C	1	0.25
D	2	0.5
E	0.5	0.13
F	1	0.25
G	8	2
H	3	0.7
I	1	0.25
J	30	7.5



# Conceptual Design

*“Bookends” design scenarios. Provides a “pick and mix” for ongoing community engagement, design and implementation phases*

**Concentrated**

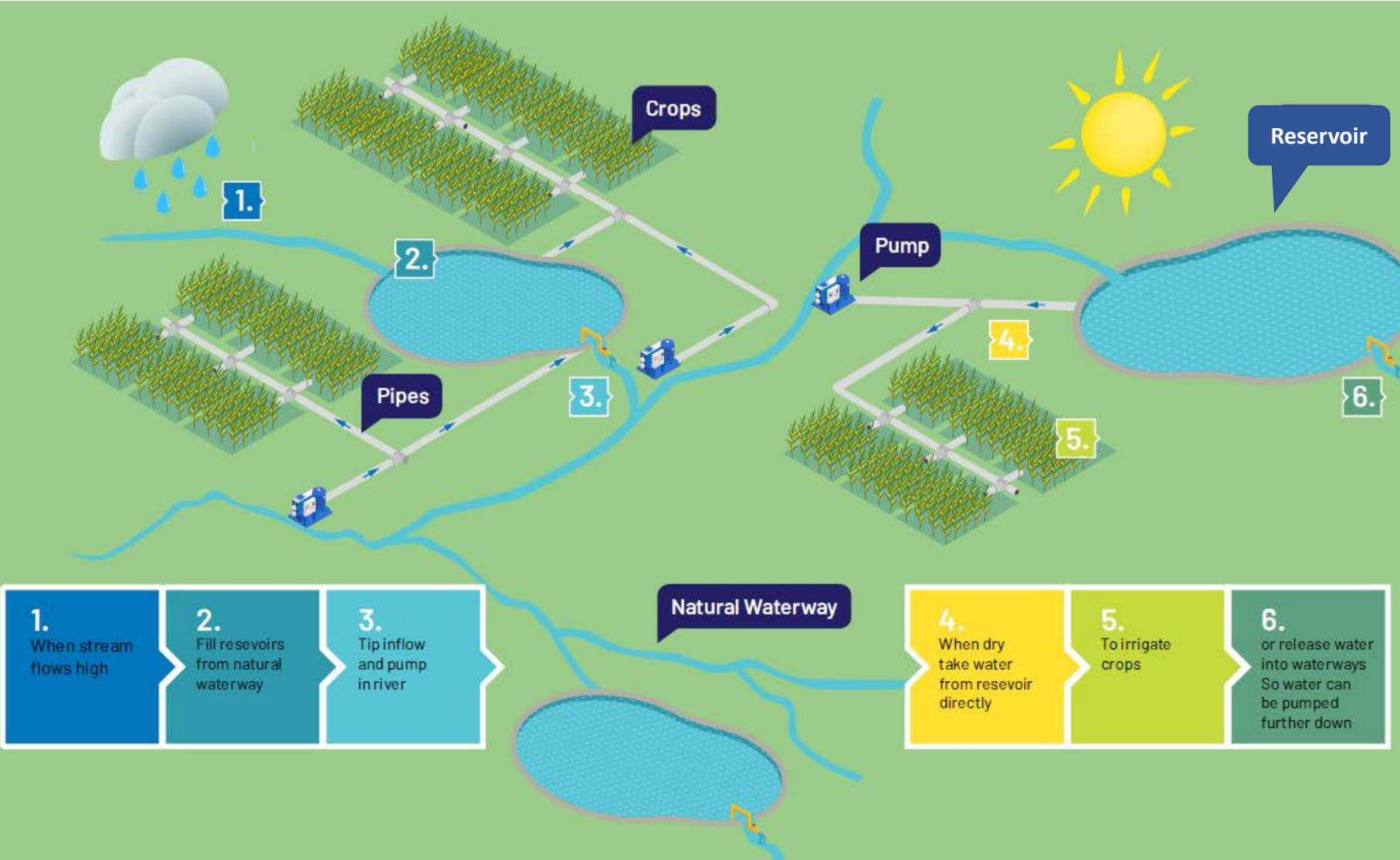


**Distributed**

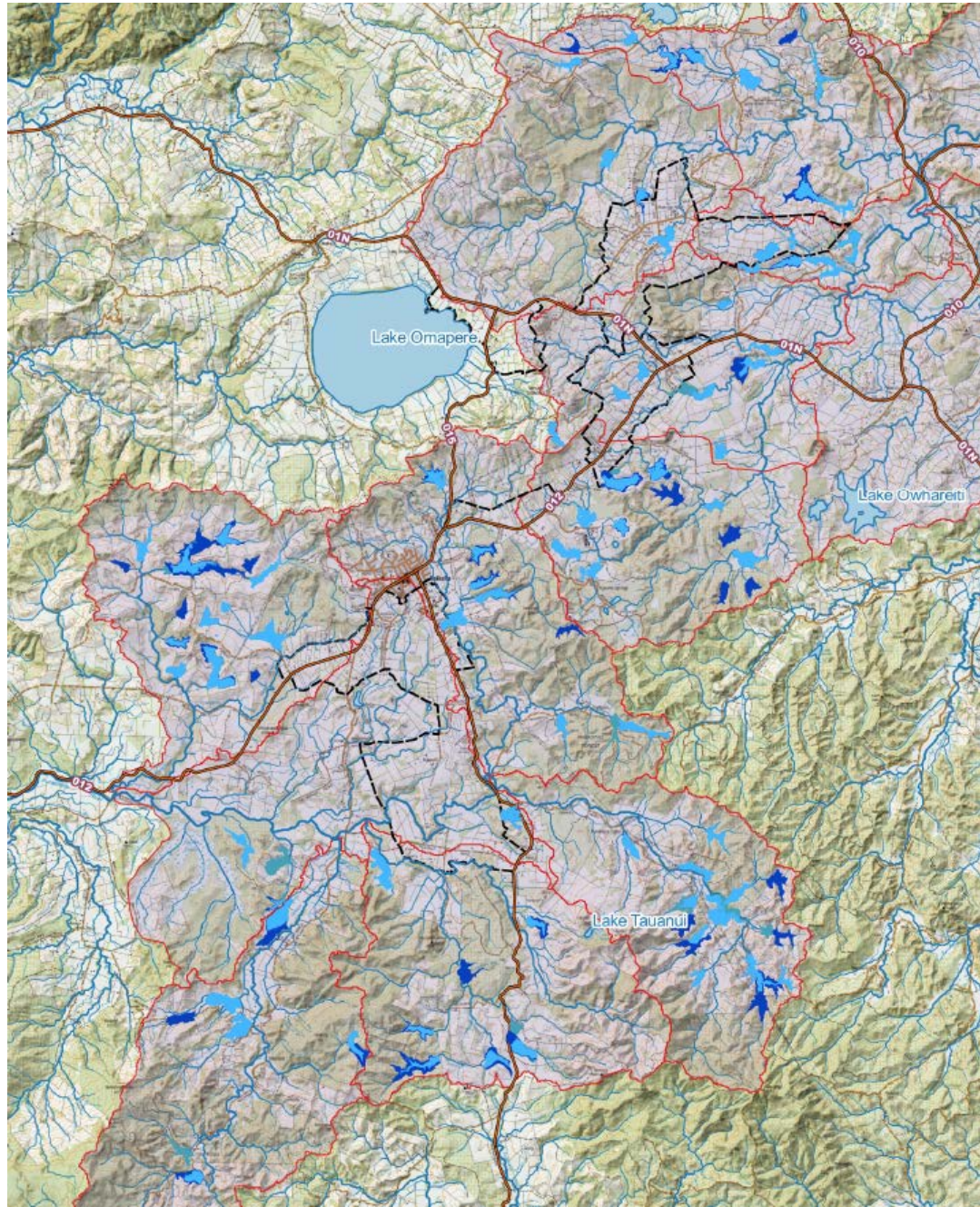




# Possible distributed storage concept



# Storage assessments - High level view



# Water storage options

- Modelling being undertaken to identify possible storage areas
- Using a reservoir identification tool
- Multiple criteria supported for identification by tool
- Long list of options to be filtered based on criteria such as:
  - Exclusions (eg. land cover)
  - distance from source/demand
  - geotechnical viability, etc



# 2<sup>nd</sup> PGF Application

- 2nd PGF application has been prepared;
- Aim is to secure enough funding to progress schemes in both Kaikohe and Kaipara
- Lodged late September – expect decision later this year.



# Project milestones

- *High level project information sheets – 16 Sept*
- *Soil / command area assessed – 20 Sept*
- *Face to face engagement begins – 23 Sept*
- *Draft decision model developed – 23 Sept*
- *Water availability assessment completed – Nov*
- *Business case development starts – 1 Nov*
- *Drop in days Mid-North, Kaipara – late November*
- Storage options developed – 9 Dec
- Impact assessment and costing completed – 16 Jan
- Pre-feasability and business case completed – 28 Feb
- Recommendation to Ministry – 27 March



# Next steps

- Complete landowner engagement
- Complete water availability and storage assessments
- Start preparing cost estimates
- Develop recommendation report for review.
- Pre-feasibility study due for completion in March 2020.

