



HOROWHENUA FMU WATER QUALITY INTERVENTIONS JOBS FOR NATURE UPDATE

INTRODUCTION

- Opening/welcome;
- House keeping;
- Horizons team;
- Jobs for Nature
 - Background;
 - Other work streams;
 - The wetland complex proposal:
 - Journey so far; and
 - The continuing journey.



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BACKGROUND

- Initial wetland complex concept idea was developed by the Horowhenua wetland alliance;
- March 2020 - Covid lockdown;
- Jobs for Nature funding announced and application rounds opened;
- Horizons submitted a number of applications;
- Application was successful;
- Deed of Funding signed 24th February 2021.



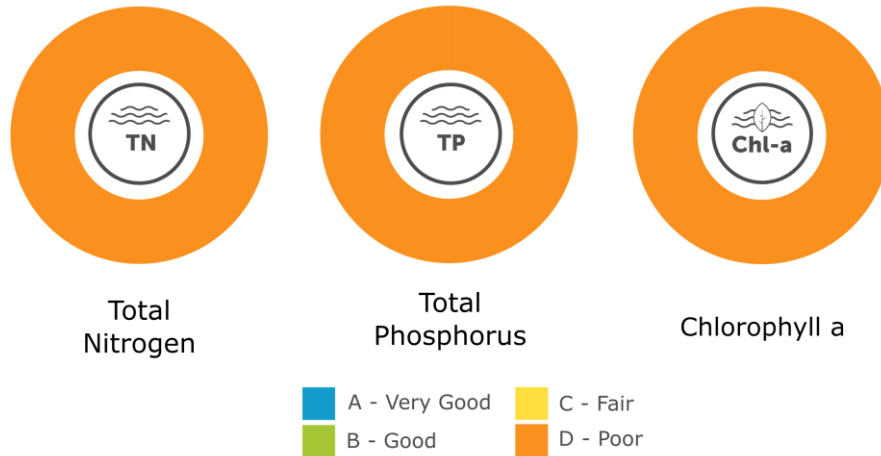
OTHER WORK STREAMS

- Expansion of targeted monitoring of the Waikawa and Ōhau catchments;
- Groundwater model for the Waiopēhu FMU;
- Lake Horowhenua nutrient budget;
- Ōhau and Waikawa estuary nutrient threshold work;
- Nutrient accounting framework within the Waiopēhu FMU.
- Reports can be found here <https://www.horizons.govt.nz/managing-natural-resources/horowhenua-water-quality-interventions>



Water Quality | Lakes

- Lake water quality is measured in Punahau | Lake Horowhenua every month

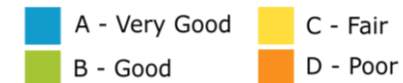


Punahau | Lake Horowhenua

- Lake SPI examines the amount of native and invasive plants growing in them



Lake SPI

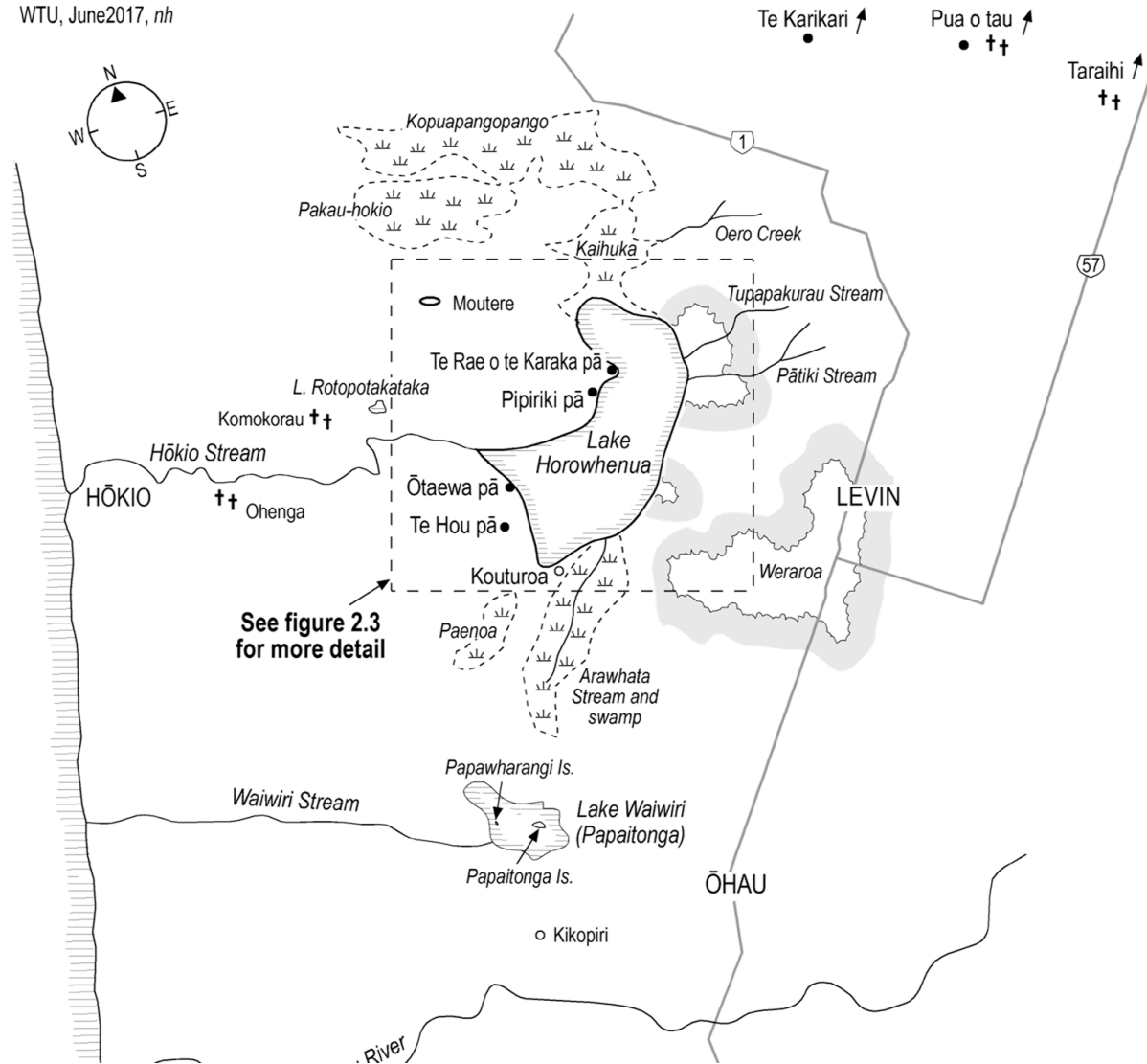


Lake Waiwiri &
Lake Kopureherehere

PROCESS TO DATE

- Establishment of a Governance Group for the project;
- Representatives from MTA, LHT, Raukawa, HDC, HRC.
- Land take over occurred June 2021 (142 hectares);
- Establishment of the Horowhenua Wetland Complex Community Stakeholder Group;
- WECA, HEKA, Fish and Game, Forest and Bird, DOC, DairyNZ, HortNZ, Woodhaven, Federated Farmers, Tararua Growers Association, Hōkio Community.

WTU, June2017, nh



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PROCESS TO DATE

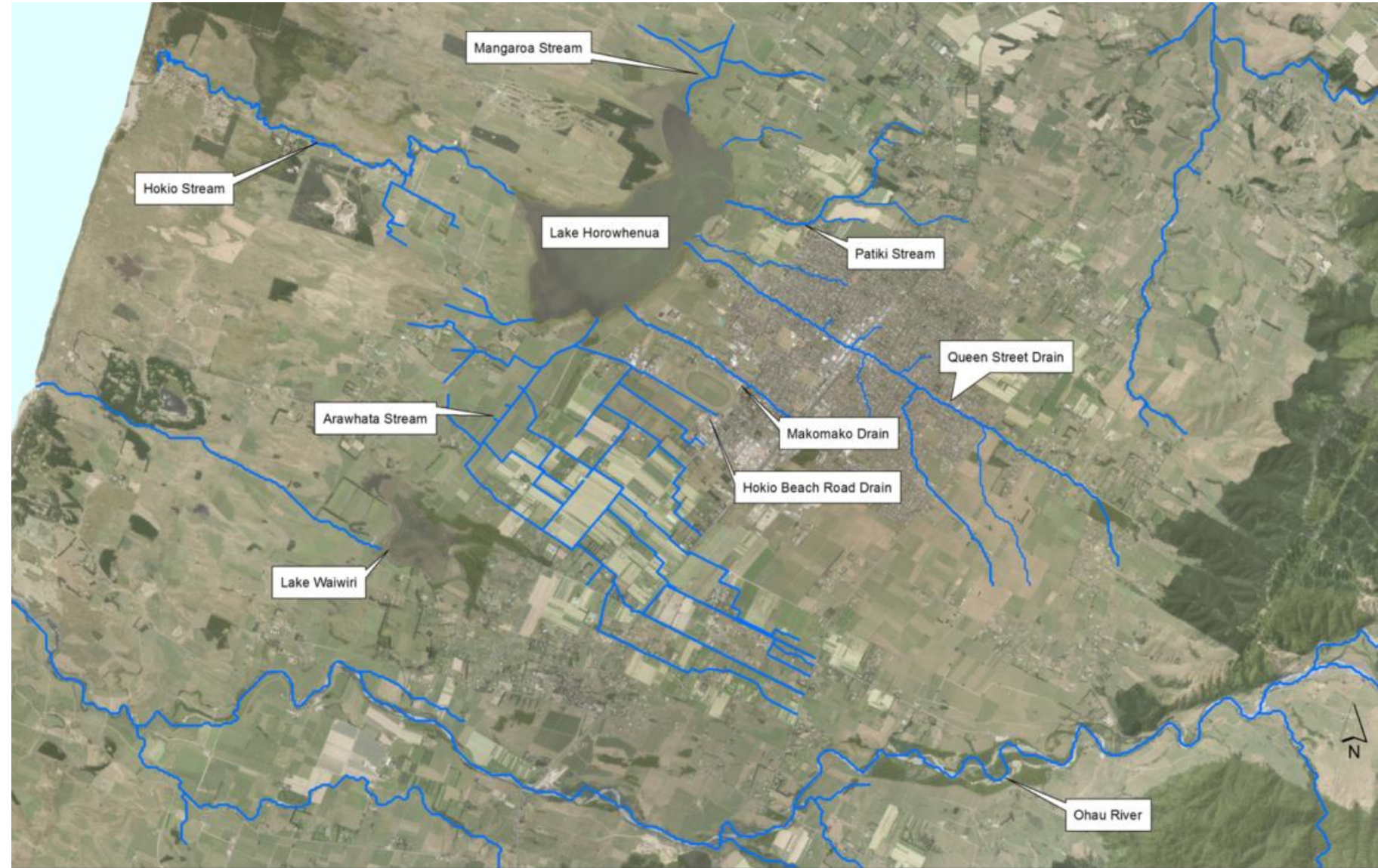
- Wetland Design Group
 - Jacobs, Tonkin and Taylor, NIWA, and mātauranga input from the Lake Horowhenua Trust and Muaūpoko.
- Monitoring programme developed around the farm streams/drains;
 - Flows;
 - Contaminants;
 - Soil profile;
 - Groundwater direction.
- Multi Criteria Analysis completed;
- Bush fragment fenced and further planting;
- Draft conceptual design



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WHY THE ARAWHATA?

- Largest tributary
- Intensive land use
- Significant nitrogen and sediment load into the lake

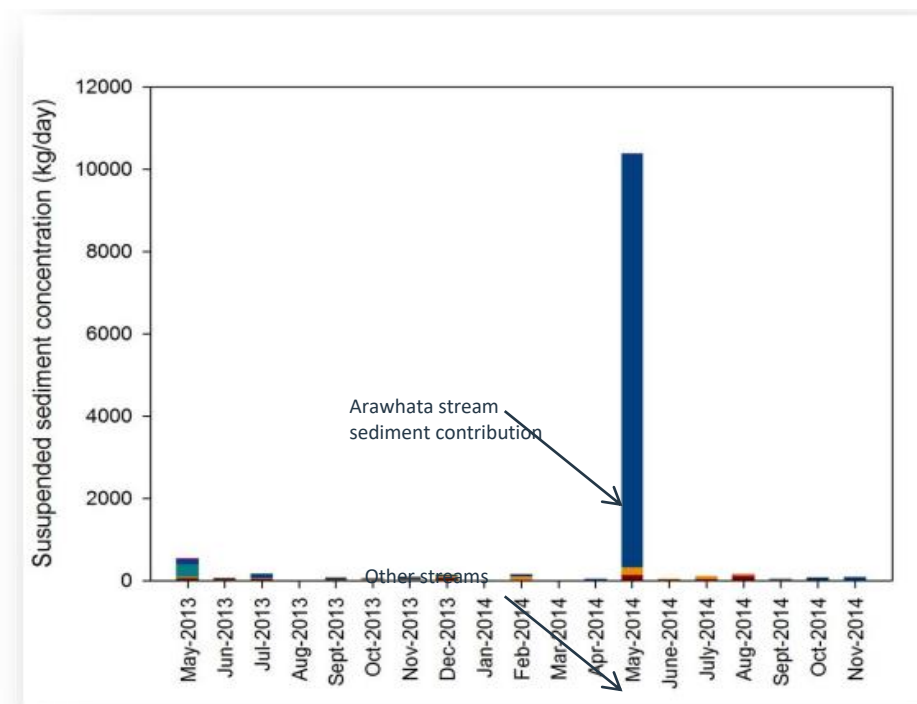


WHY THE ARAWHATA?

Site	Clarity	DRP	Ammoniacal- N	Nitrate- N	QMCI	MCI	ASPM
Patiki Stream at Kawiu Road	N/A	D	B	C	D	D	D
Arawhata Stream at Hokio Beach Road	B	D	B	D	D	D	D
Mangaroa Stream at Lindsay Road	D	D	C	B	N/A	N/A	N/A
Hōkio Stream at Lake Horowhenua	D	D	C	B	D	D	D

LAWA 5 year median

	Nitrate (mg/L)	Clarity (m)	Turbidity (NTU)	DRP (mg/L)	<i>E. coli</i> (n/100)
Patiki Stream at Kawiu Road	5.97	0.47	4.83	0.0325	295
Arawhata Stream at Hokio Beach Road	10.35	0.79	3.895	0.024	445
Mangaroa Stream at Lindsay Road	1.79	0.28	15.2	0.0275	180
Hōkio Stream at Lake Horowhenua	0.4975	0.35	11.55	0.0105	72

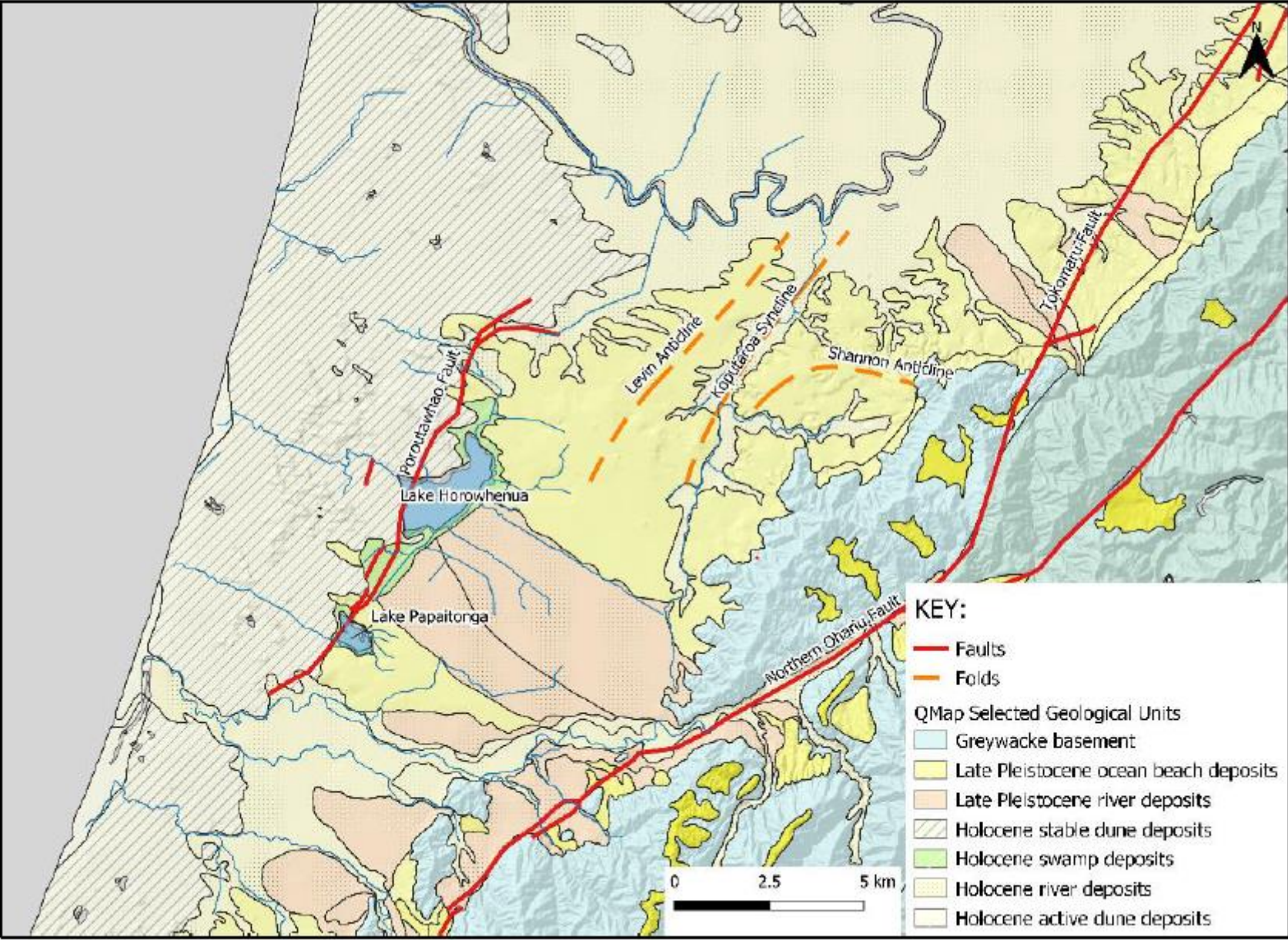


■ Mangaroa Stream,
 ■ Patiki Stream,
 ■ Domain Drain,
 ■ Queen Street Drain,
 ■ Makomako Rd Drain,
 ■ Arawhata Stream,
 ■ Hokio Sand Rd Drain



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Geology of the Waiopehu/Horowhenua area



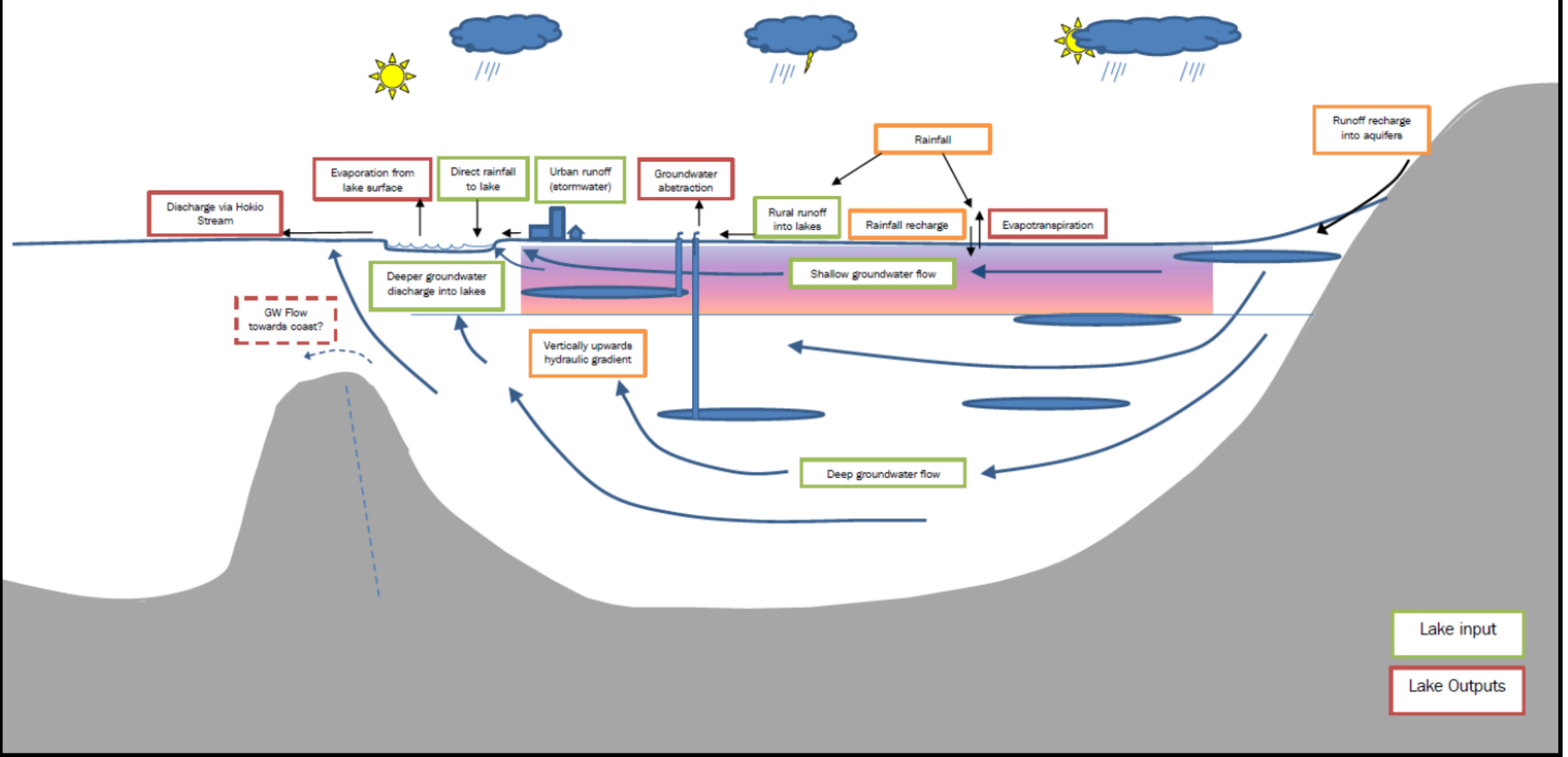
West

Lake Horowhenua

Levin

Tararua Ranges

East



WHOLE OF CATCHMENT INTERVENTIONS

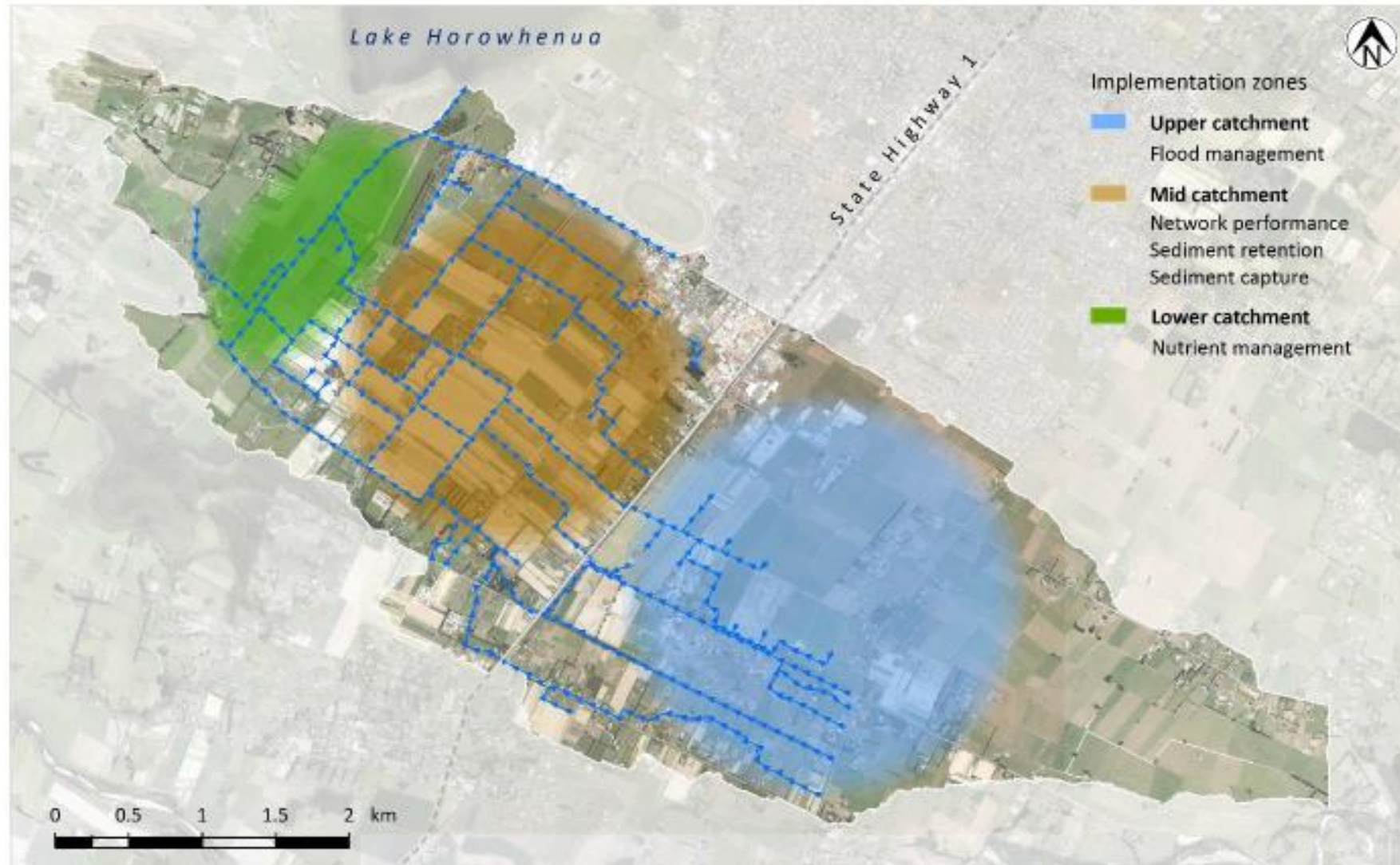


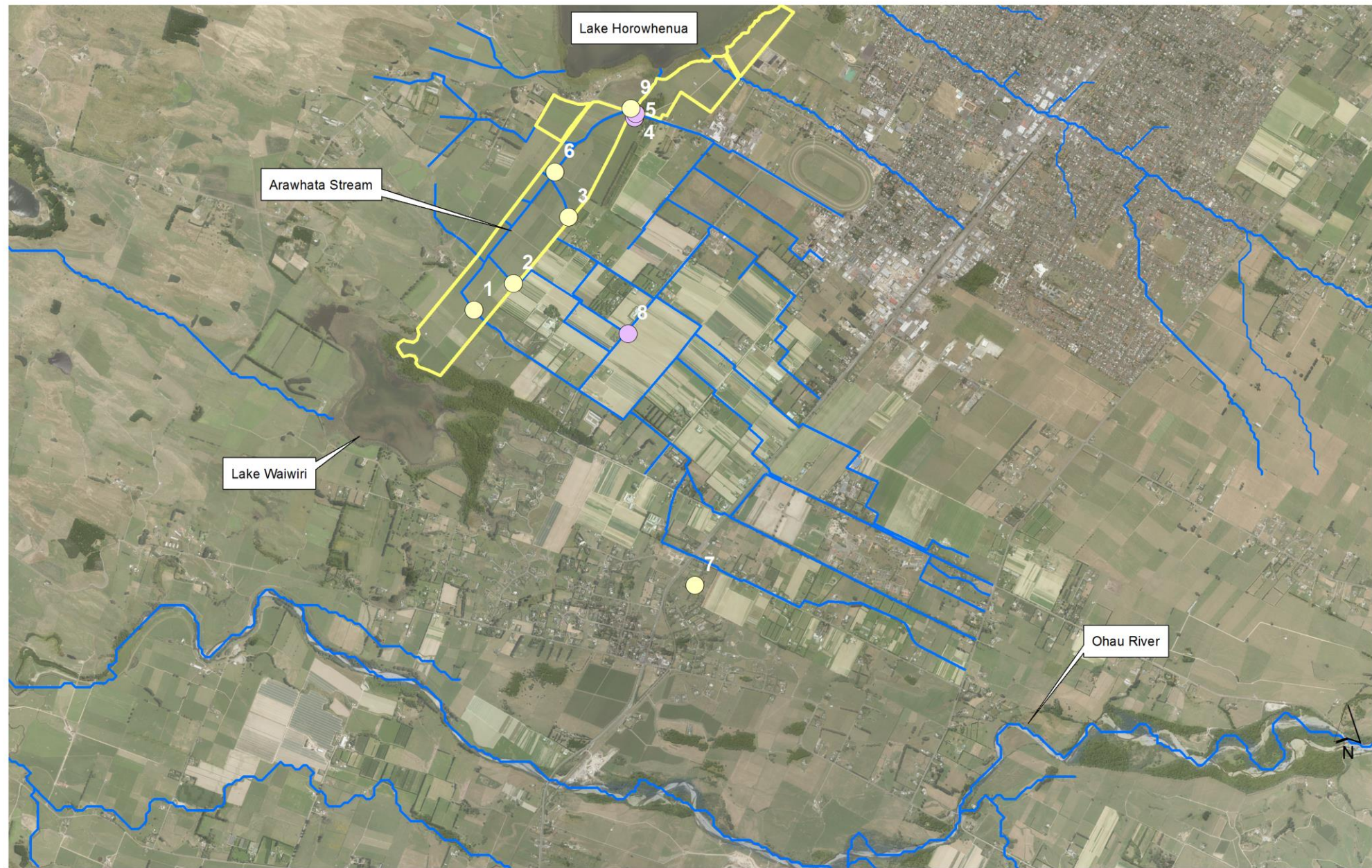
Figure 26. General spatial arrangement for implementation of management options

LAND AREA – IS THIS THE RIGHT SPOT?



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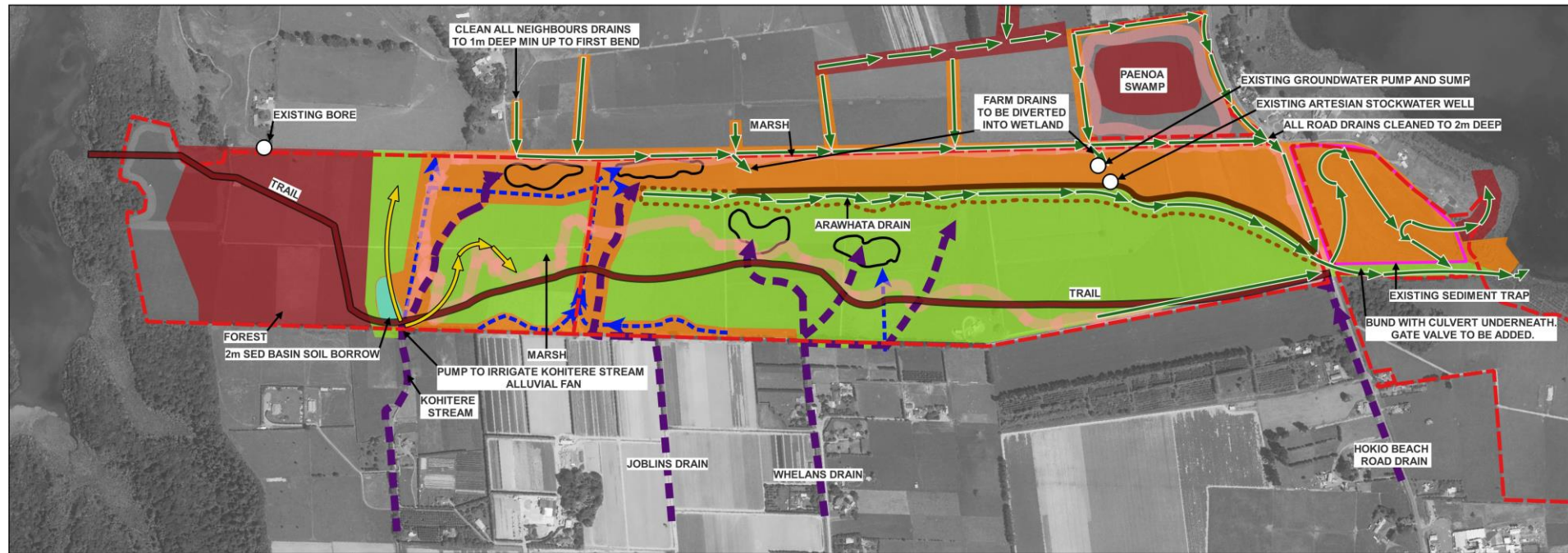
New sites
recently installed



Arawhata catchment - new sites







Legend

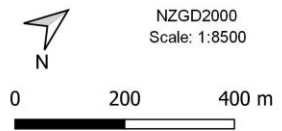
- Land Boundary
- Deeper cut wetland areas
- Existing Stopbank
- Proposed Stopbank

- ➡ Surface irrigation perforated pipe to irrigate Kohitere stream alluvial fan
- ➡ Subsurface perforated drain pipe laid in invert of existing/new drains then drain backfilled with wood chips, bark and hay

- Channel taking flow from drains in vegetable growing area to feed into wetland
- Approximate edge of wetland wetted area
- Sediment Basin

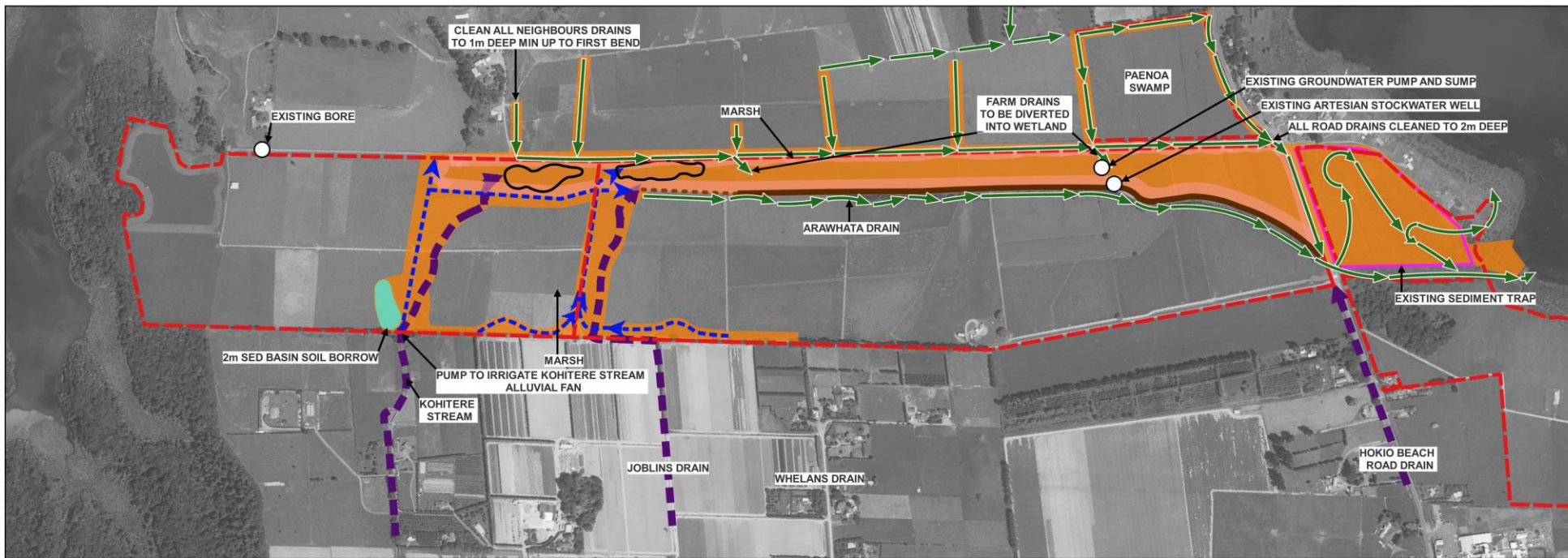
Construction Phases

 - Phase 1
 - Phase 2
 - Phase 3



Phase 3 Components

- Planting in Paenoa Swamp
- Divert – channels in western area into Paenoa swamp
- Planting upland (southern) forest area
- Further fill in wetland areas with more planting
- New dispersed outlet into Lake Horowhenua
- Construction of walking trail



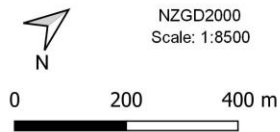
Legend

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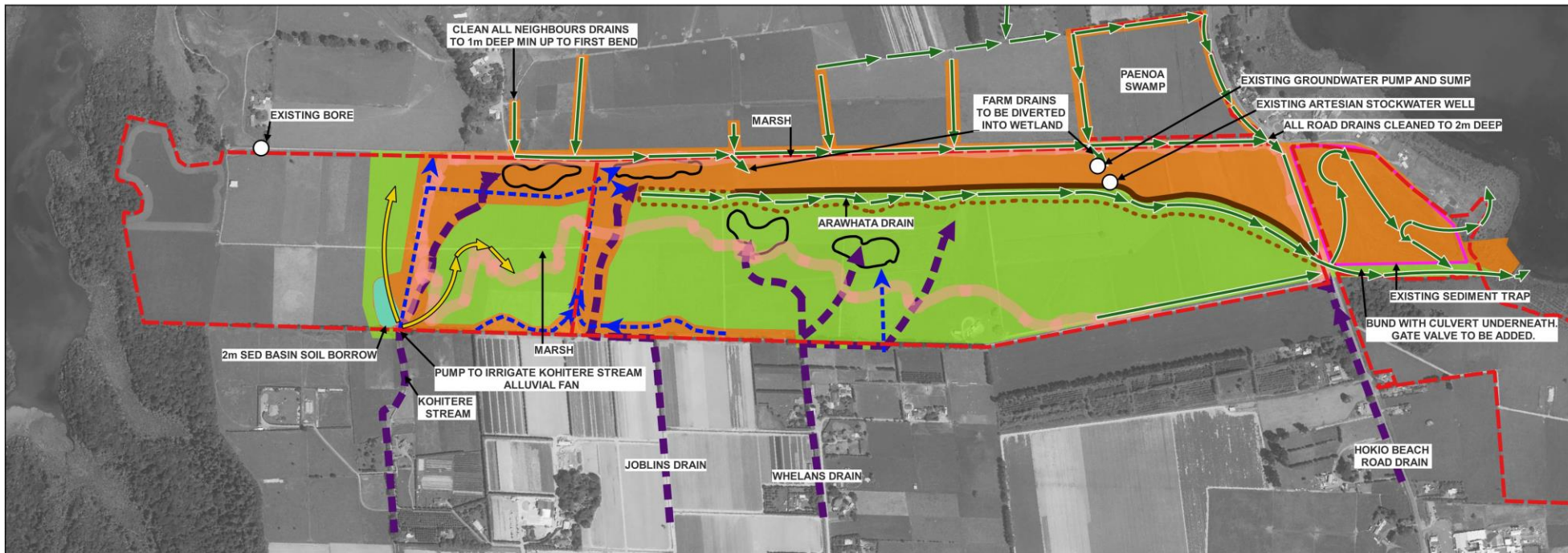
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- Construction Phases
- Phase 1



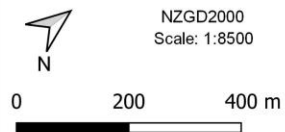
Phase 1 Components

- Sediment Basin construction at Kohitere Stream/site boundary
- Installation of perforated pipe in existing Kohitere and Joblins Drain channels (within the site boundary) and drains as well as new drains along the property boundary either side of Joblins Drain, backfilled with woodchips/bark/hay for groundwater treatment (Blue dashed arrows).
- Construction of new channels at flatter grade than ground slope such that water can be discharged onto surface of wetlands from Kohitere stream and Joblins Drain. (purple arrows)
- Surface water overflow from sediment trap directed into new channels (purple) under gravity.
- Partial planting through wetland areas.
- Retention of existing groundwater pump + southern well for irrigation
- Plants for phase 1 need to be purchased.
- Collection of groundwater along the boundary either side of Joblins Drain
- Cleaning out/deepening farm drains on neighbour's land such that groundwater is intercepted. Invert to still be sloped and discharged to Arawhata Stream.
- Extension of stopbanks along Arawhata Stream west side.
- Construction of sliding weir gate on culvert in Arawhata Stream alongside the existing sediment trap. This will normally be shut to direct flows through the sediment trap.
- Add rip rap on slope of the existing sediment trap outlet to control water level and protect embankment.
- Sediment trap to be retained as is



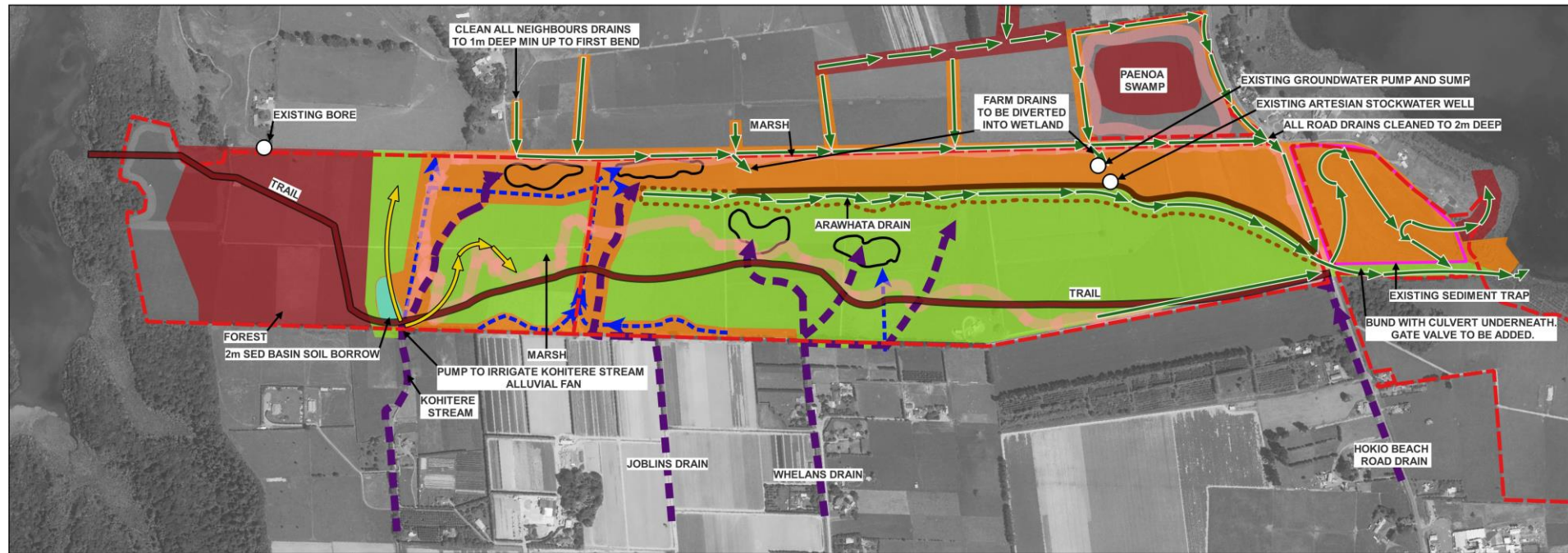
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- Approximate edge of wetland wetted area
- Construction Phases**
- Phase 1
- Phase 2



Phase 2 Components

- Construction of new channels at flatter grade than ground slope such that water can be discharged onto surface of wetlands from Whelans Drains.
- More planting in Phase 1 and Phase 2 areas
- New bund on east side of existing Arawhata Stream to contain Phase 2 wetland.
- A lower section of bund/stopbank will be built at the downstream end alongside Hokio Beach Road to discharge treated wetland flow into the main Arawhata drain.
- New groundwater collection drains along Hokio Beach road and wetland site boundary.
- Installation of small new pump to irrigate sediment pond water into Kohitere Stream alluvial fan in areas where it cannot flow under gravity.



Legend

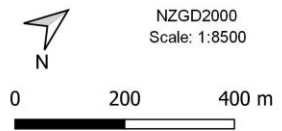
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Construction Phases

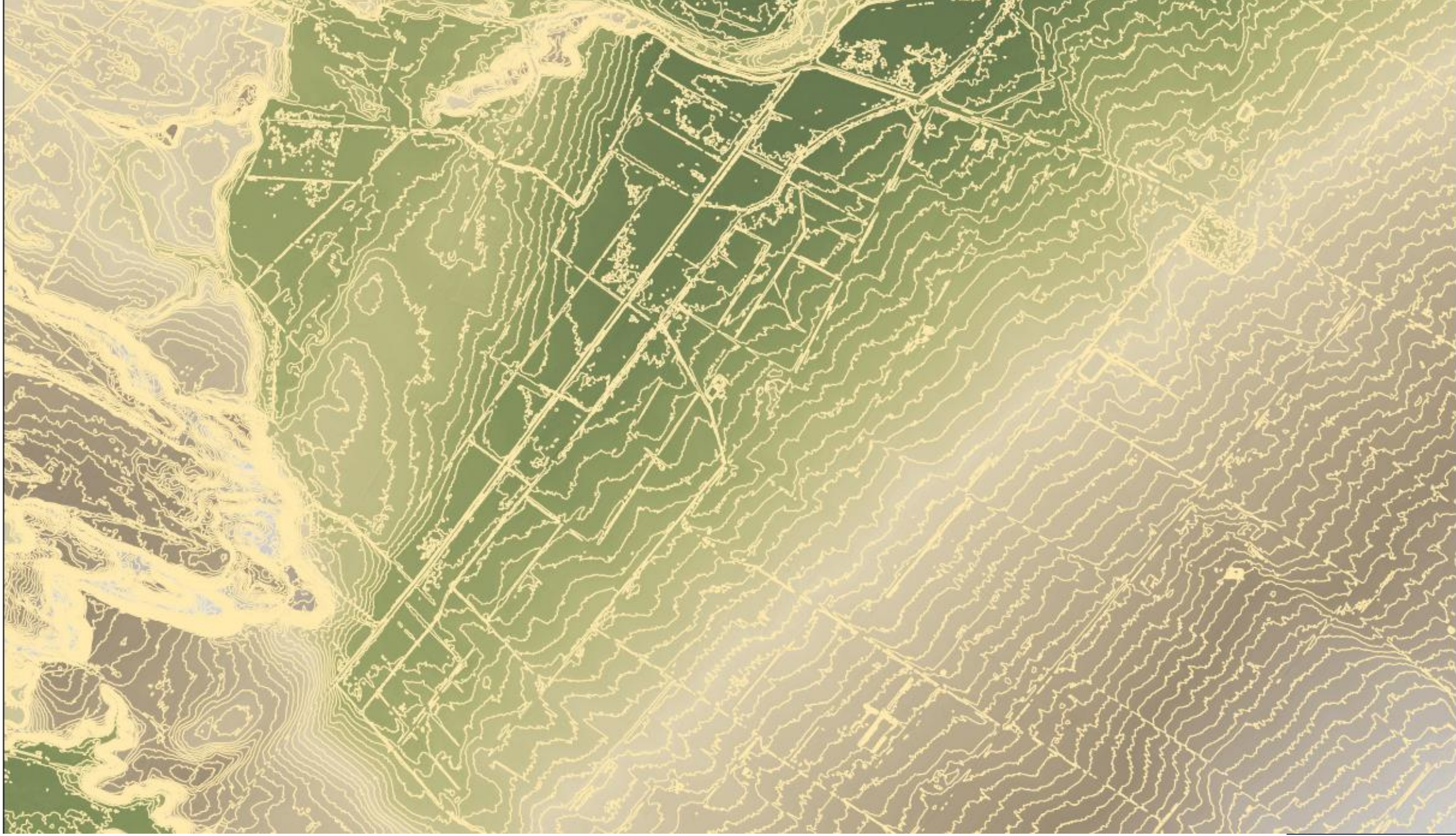
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FEEDBACK

- The current conceptual design is in draft form;
- General feedback on the proposal is being gathered, to be considered in the next steps;
- This feedback will be used to decide whether changes to the proposal are required.



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