LOWE Environmental Impact

Importance of Understanding Environmental Effects on the Receiving Environment

Crusader Meats:
Wastewater Treatment

Hamish Lowe and Sam Morris

Questions

Q1. Are wastewater treatment plant upgrades needed?

Q2. Is any mitigation needed?

Crusader Meats New Zealand Limited

Site Location

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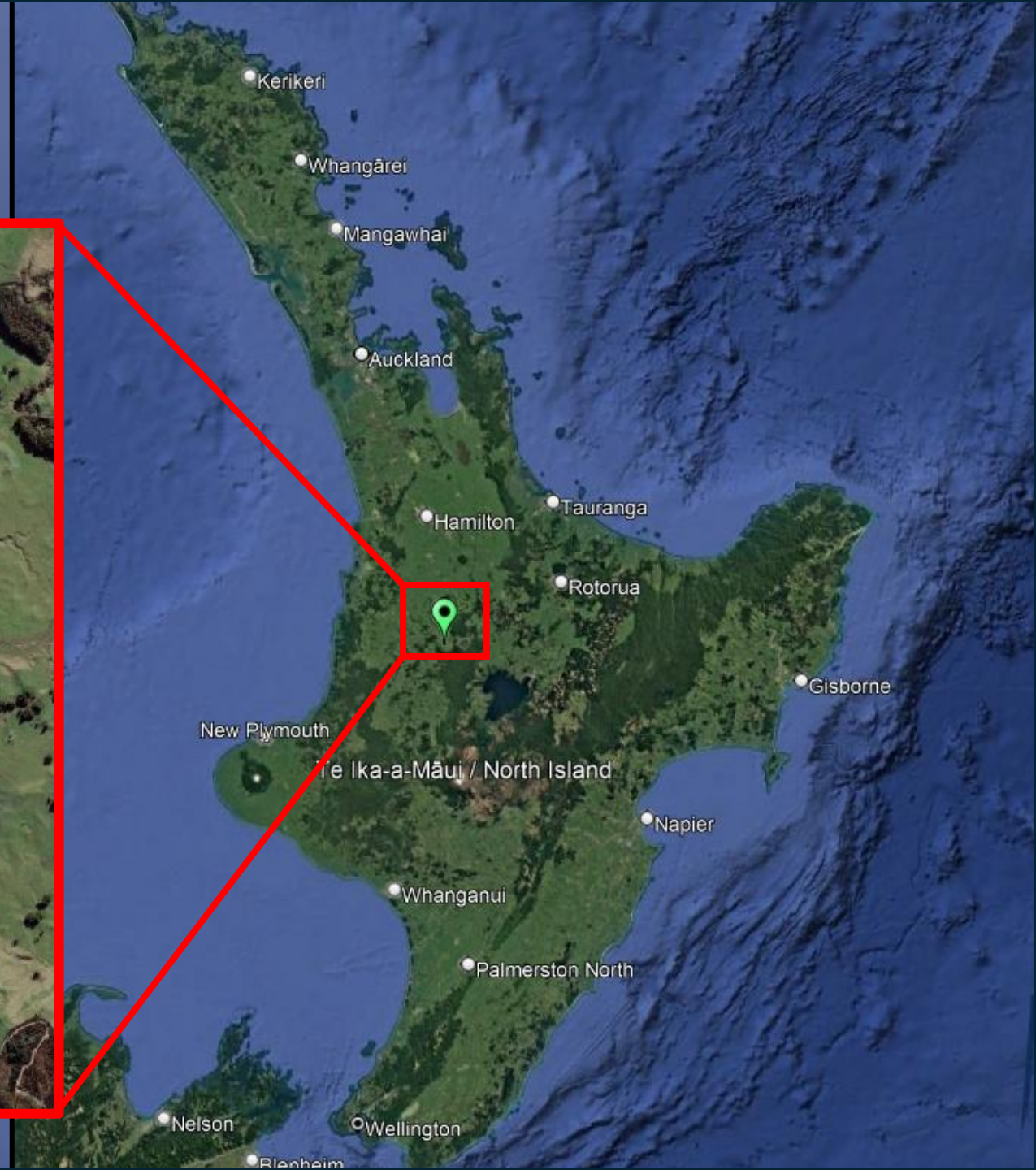
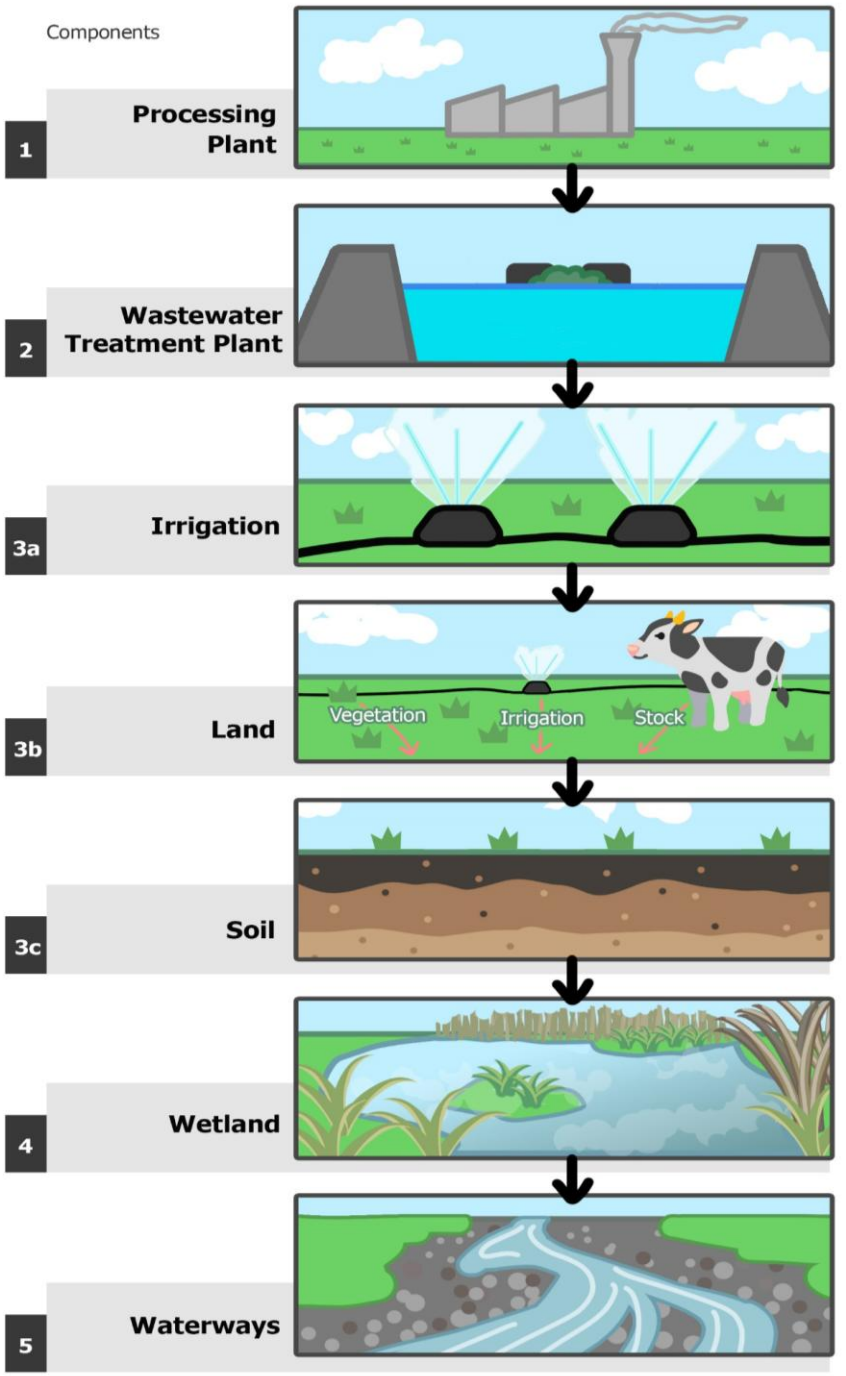


Consent Status

- **Current** granted in June 2004 and expired in 2019.
- **Renewal lodged** 2016
- **On hold**
- Applications undergone a series of revisions and changes.

Typical Opportunities to do better



Wastewater Treatment Opportunities

Component	Treatment Opportunity	Modification
Plant	Challenging	Change processes at plant. Reduce waste, water usage.
Treatment Plant	**Possible**	Upgrade treatment plant to more complex processes
Land Treatment – Irrigation	Some	Improve application regime
Land Treatment – Land Management	Some	Better fencing and stock control
Land Treatment – Soil	Little	Related to irrigation management
Wetland	**Possible**	Scope to enhance existing and create new
Waterways	Little	Limited influence

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Initial Proposal – WTTP Upgrade

- Wastewater treatment plant upgrade - nitrogen concentration reduction + new storage pond.
  - 110 down to 36 g/m^3.
- Change irrigation to pulsing
  - From 50 mm application to 10 mm applications
- Questionable approach – high level of treatment for land treatment system.
- Upgrade imposes a significant cost, which is not well justified.

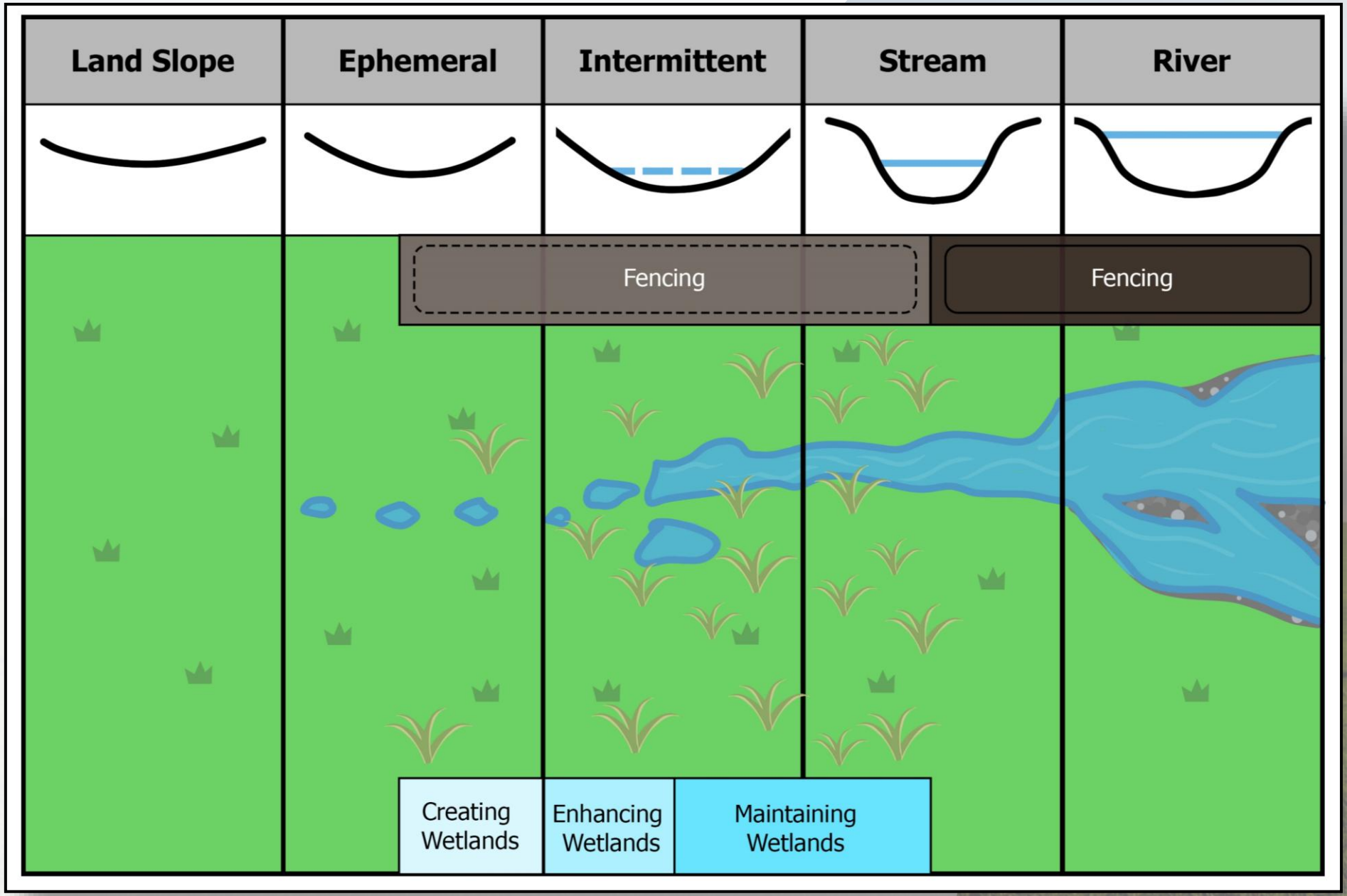
=> Needed? Come back to this.

Exploring Alternatives: Landscape

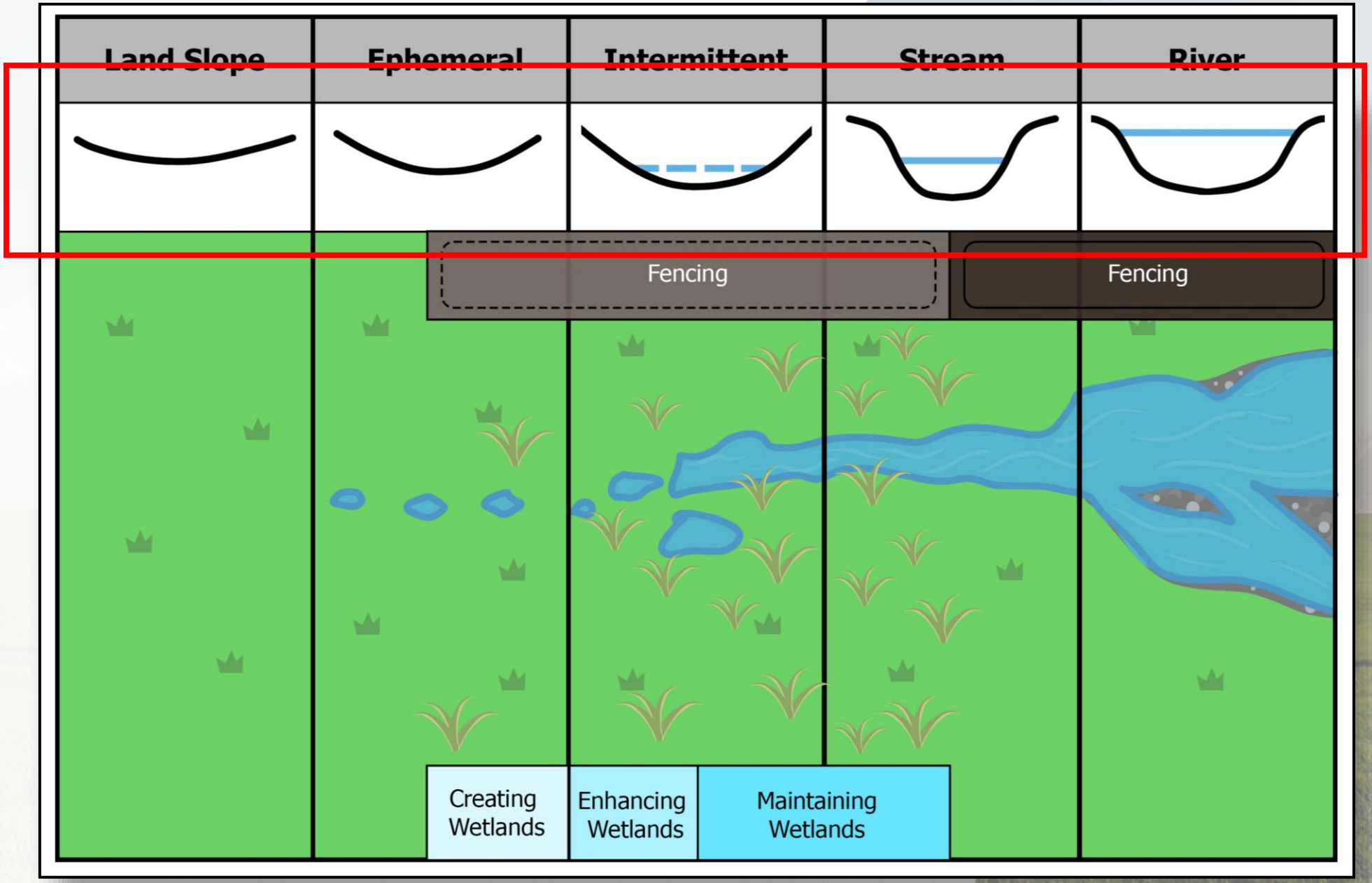




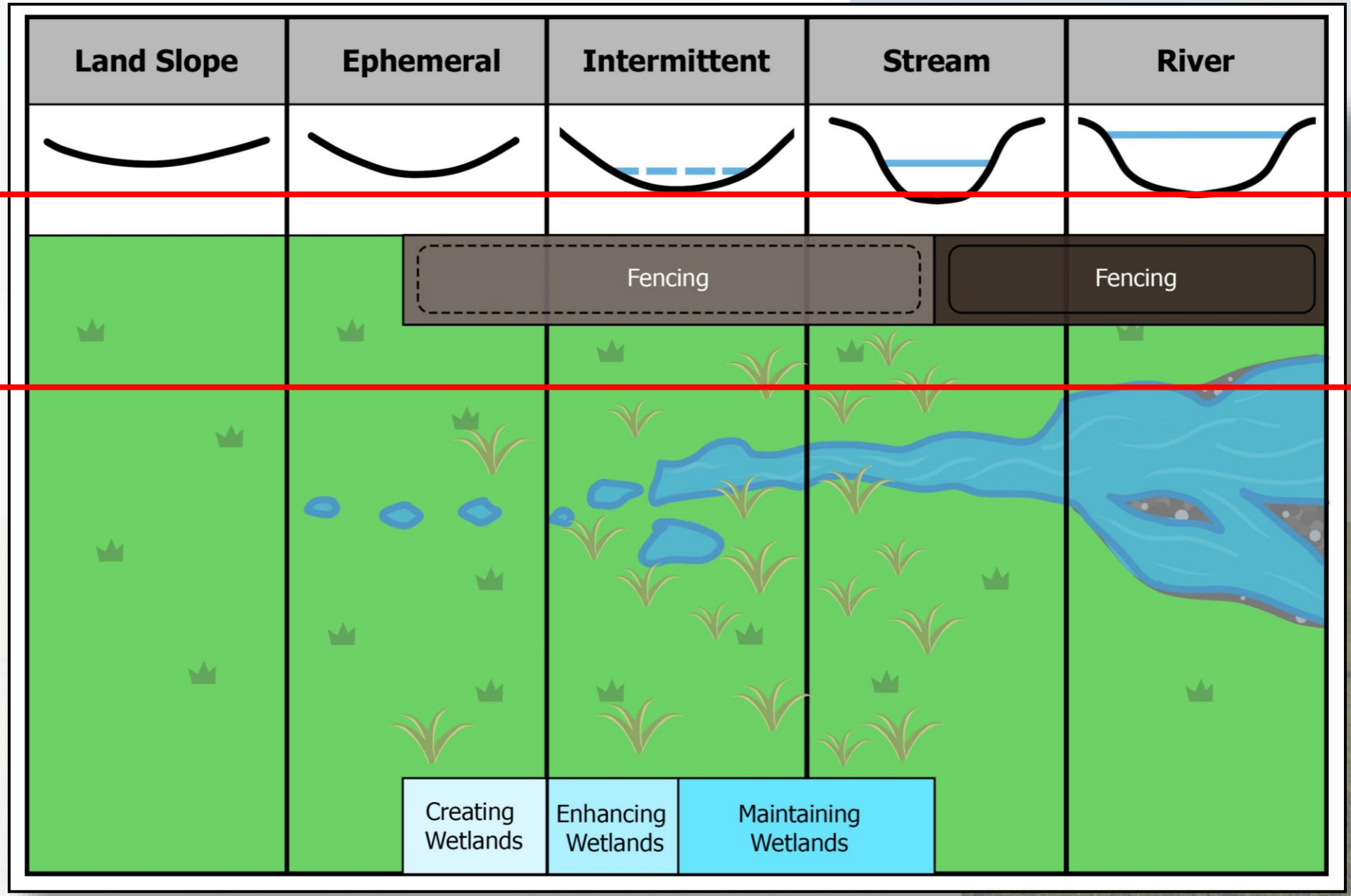

Exploring Alternatives: Waterways



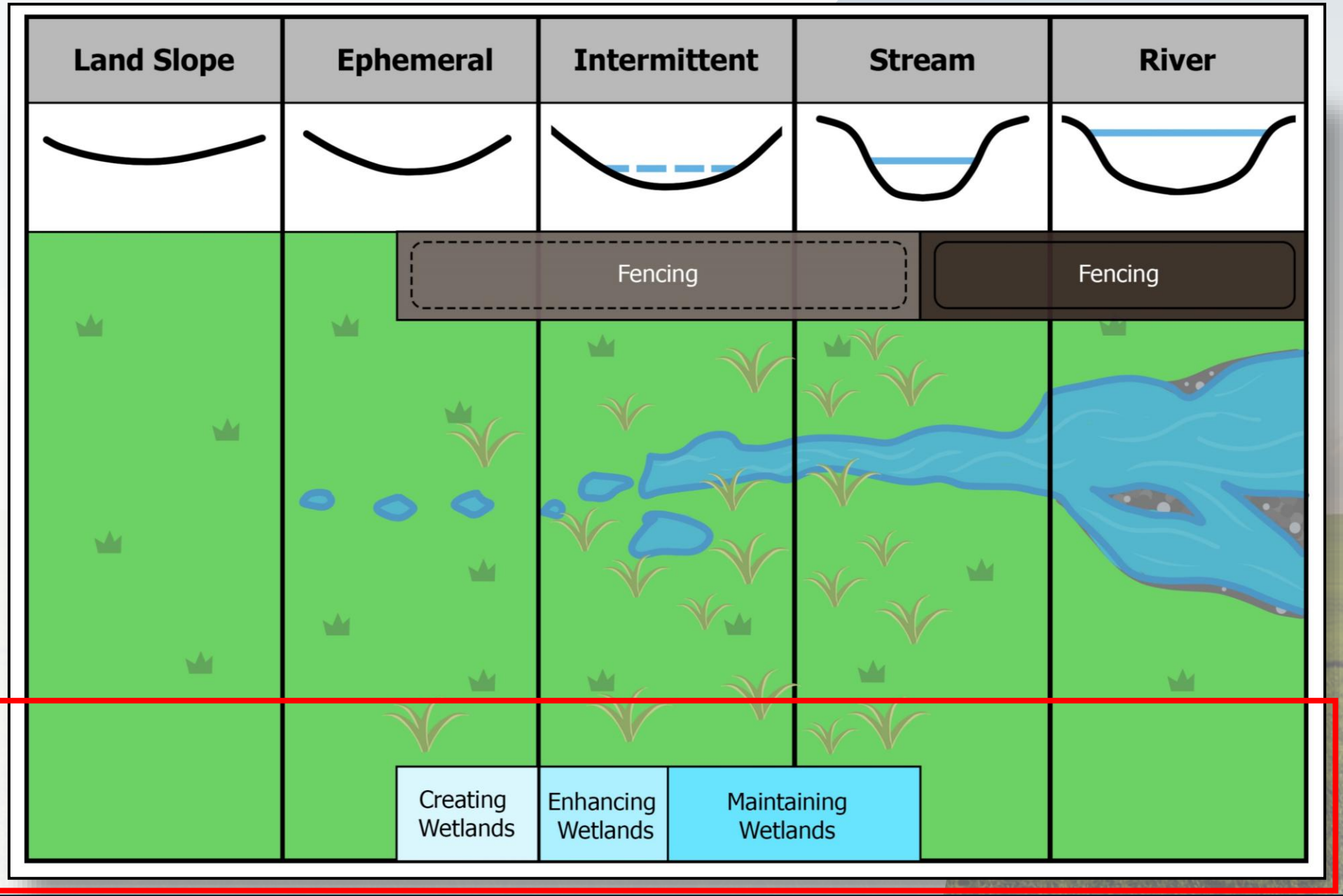
Exploring Alternatives: Waterways



Exploring Alternatives: Waterways



Exploring Alternatives: Waterways



Alternative Approach:
Enhanced Natural Wetlands

Opportunity **to use wetlands as edge of field mitigation** to improve water quality of drainage following the irrigation.

How?

Best Site Selection

Alternative Approach: Enhanced Natural Wetlands

Opportunity **to use wetlands as edge of field mitigation** to improve water quality of drainage following the irrigation.

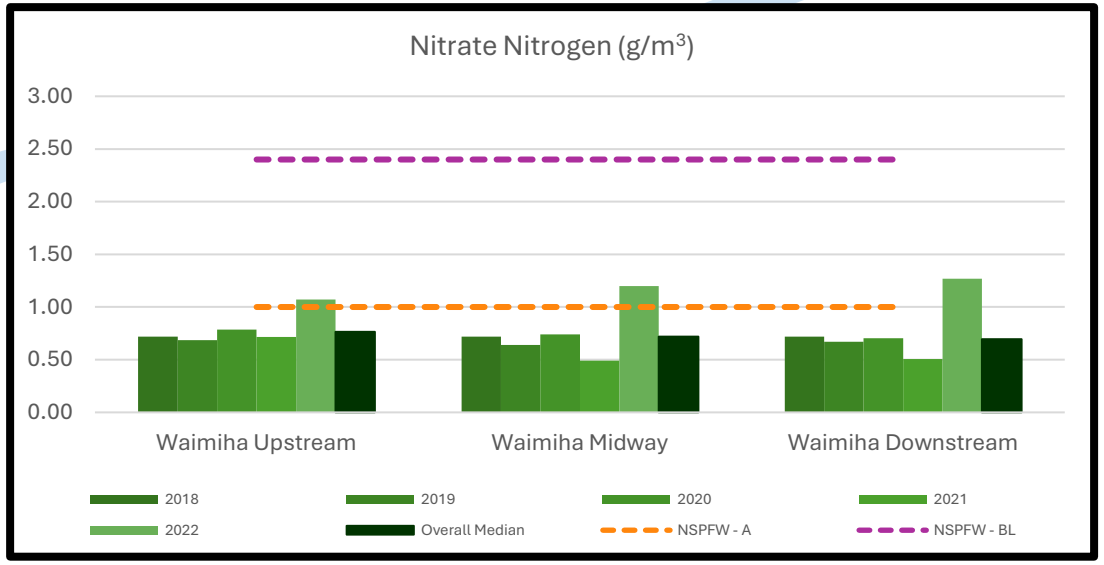
How? Use of existing wetlands and/or create wetlands for further treatment.

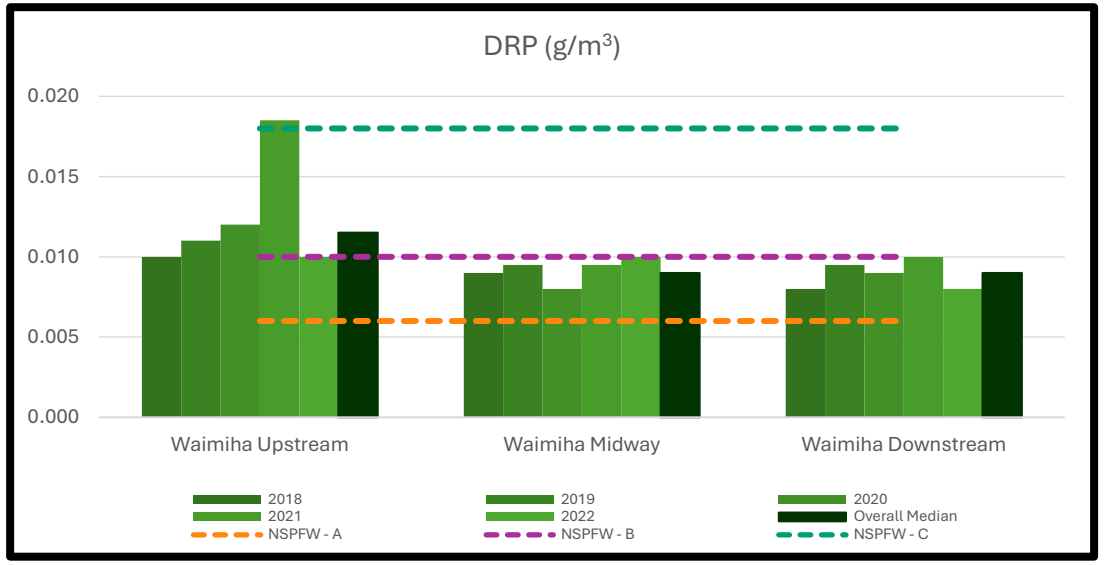
Best Site Selection Based on a water quality review, identifying contamination hotspots.

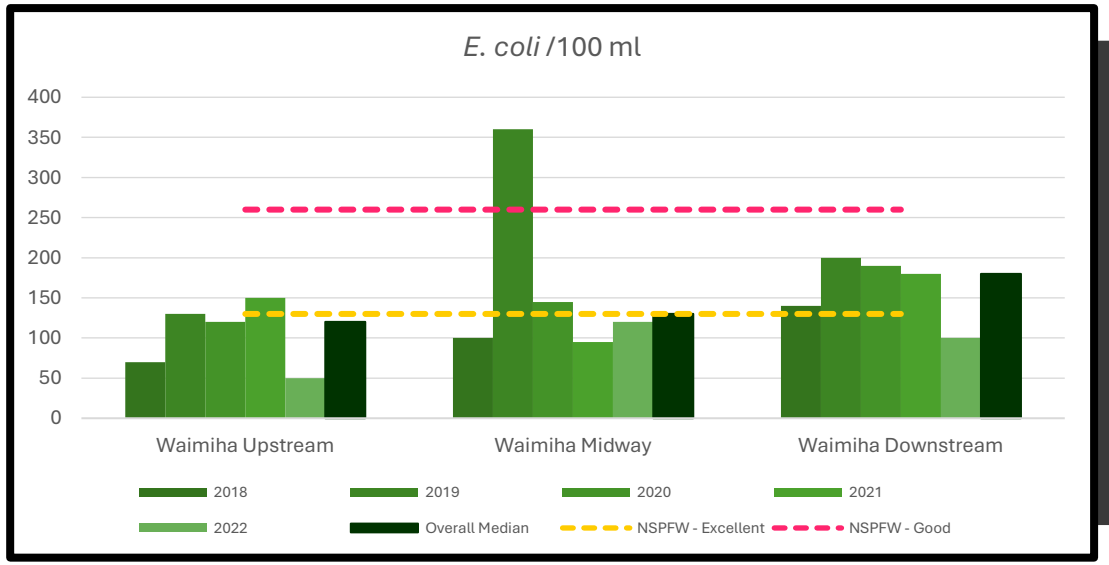
Like WWTP upgrades, are wetlands needed?

Water Quality Review:

Waimiha Stream



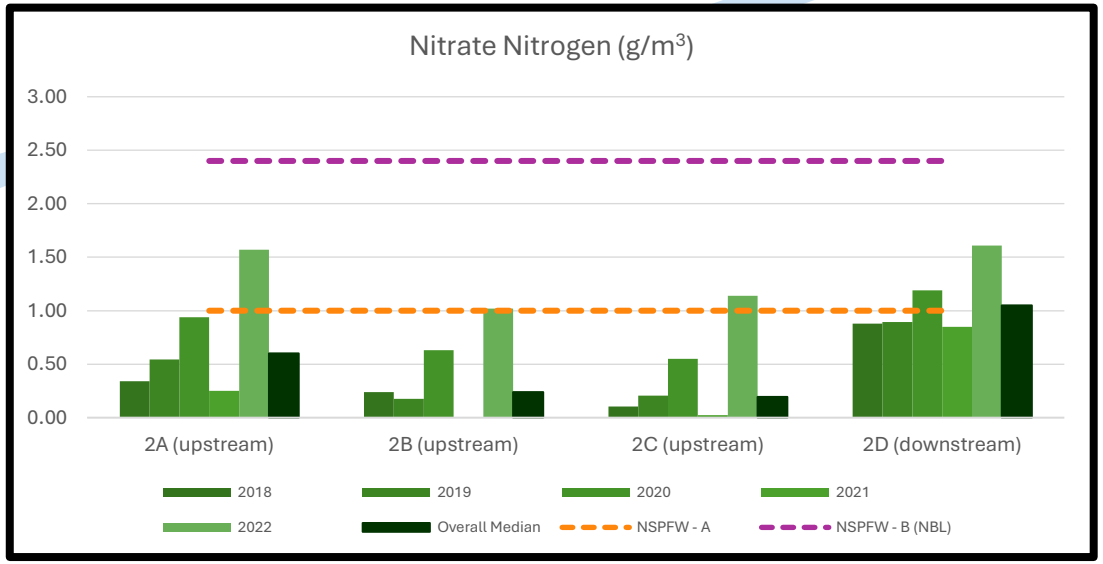


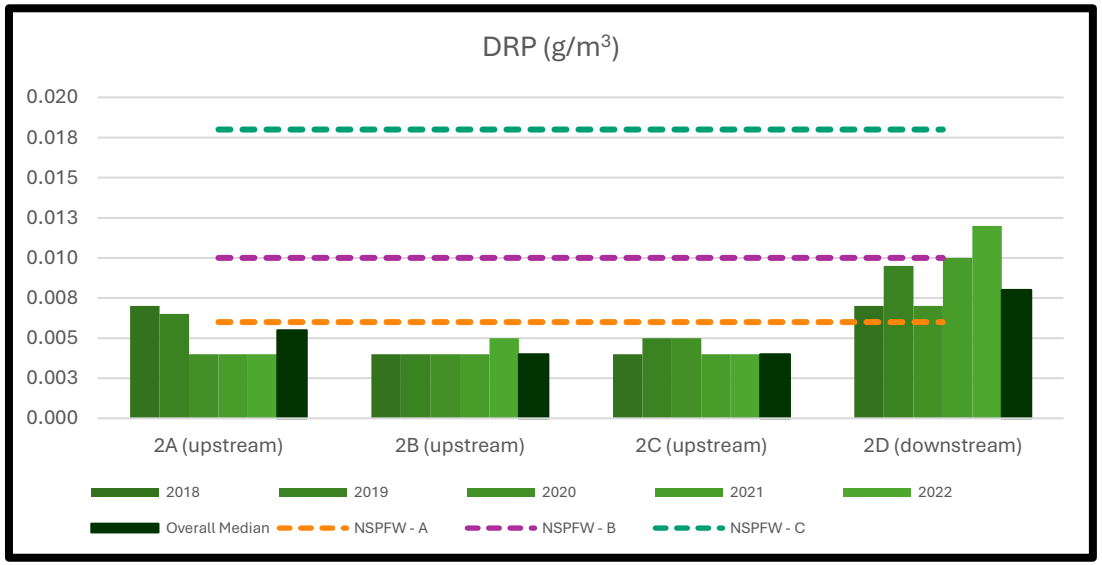


- Existing irrigation activity has **little impact on the Waimiha Stream**.
- Only parameter increasing downstream: ***E. Coli***

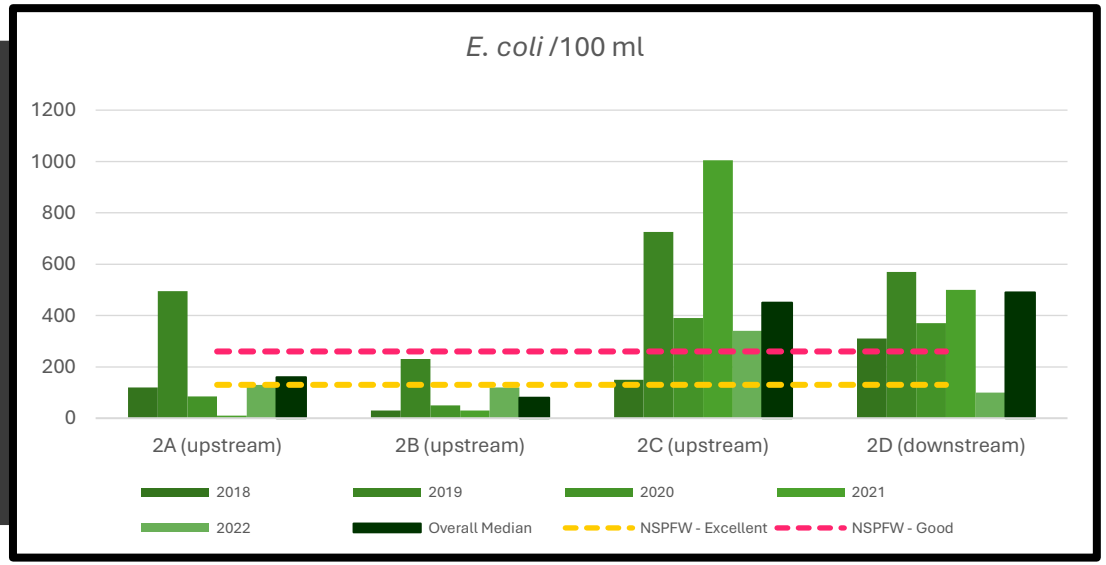
Water Quality Review:

Streams on the Property





- **Nitrogen is within Band A** of the NSPFW.
- Parameters of concern: **phosphorus** and ***E. Coli***



The Approach:

Are Wetlands the Best Approach?

- Wastewater irrigation is not causing adverse effects on water quality.
- Nitrogen concentrations are not of concern.
- Contaminants of concern (phosphorus and E. Coli) likely caused by stock access to waterways.
- **Wetlands may not be the best approach** to mitigate the contaminants of concern – as there are no elevated contaminants of concern.

The Approach:

Are there alternative approaches?

- Fencing stream headwaters, where animals have easy access.
- Additional wetland enhancement work, at selected sites, for a greater catchment water quality improvement, and for relationships / cultural purposes.

Conclusion

- No evidence of nitrogen enrichment in the waterways.
- **No need for an additional wastewater treatment system to reduce nitrogen levels**.
- Given the **primary concerns of phosphorus and *E. Coli* contamination**, prioritizing to be given to **fencing of riparian areas.**

Answers

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Takeaway

When establishing wastewater treatment schemes, it is essential to **prioritize understanding the receiving environment** before selecting a treatment approach:

This is more important than adopting a ‘standard model’ around common ideals or

developing a solution to a problem that may not be there.

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