

IN THE MATTER

of the Resource Management Act 1991

AND

IN THE MATTER

of appeals lodged against proposed Plan Change 2
to the Manawatu-Whanganui One Plan

**JOINT WITNESS STATEMENT OF FARM SYSTEM AND PLANNING
EXPERTS**

28 June 2022

INTRODUCTION

1. This joint witness statement relates to expert conferencing on farm systems and planning with a view to considering the possibility of a risk assessment approach to assessing nitrogen leaching from intensive farm land uses.
2. This joint expert witness statement relates to the appeals lodged against proposed Plan Change 2 (**PC2**) of the Manawatu-Whanganui One Plan which focuses on existing intensive farming land use activities within targeted water catchments in the region.
3. The expert conferencing was held on 28 June 2022 at Te Ao Nui Building, Palmerston North with some members joining via video / teleconference.
4. The workshop was facilitated by Michelle Rush, using participatory methods.
5. Farm system experts attending the conference were:
 - (a) Ian McNab (IM), Manawatu-Whanganui Regional Council (**Horizons**);
 - (b) David Horne (DH) for Horizons;
 - (c) Dr Anne-Maree Jolly (AJ) for Horizons;
 - (d) Stuart Ford (SJ) for Horticulture New Zealand;
 - (e) Gavin Marshall (GM) for Federated Farmers
 - (f) Dr Paul Le Miere (PL) for Federated Farmers;
 - (g) Dr Brent Clothier (BC) (Plant and Food) as an invited participant by Horizons.

The planning experts in attendance were:

- (h) Christine Foster (CF) for Horizons;
- (i) Greg Carlyon (GC) for Ngāti Turanga and Wellington Fish and Game Council;
- (j) Thomas Kay (TK) for Forest and Bird;
- (k) Chris Keenan (CK) for Potatoes New Zealand;
- (l) Sue Ruston (SR) for Horticulture New Zealand;
- (m) Gerard Willis (GW) for Federated Farmers.

Observing the conference were:

- (n) Nouman Kyamanywa, Rural Advisor, Horizons
- (o) Phil Teal, Chief Executive, Fish and Game Council.

Both observers were asked, and agreed, to be bound by the Environment Court Code of Practice.

The facilitator checked if people were comfortable with those observing. No opposition was raised to Nouman's presence as an observer.

CF stated that she was uncomfortable with Phil attending this conferencing session as an 'observer' because that is at odds with the usual requirements for expert conferencing. However, CF explained that she understood that Fish and Game had no expert available and had no other way of having any 'visibility' of the experts' discussions to understand the reasons for any risk assessment tool that might be agreed. On that basis, CF was prepared to accept Phil Teal's non-expert observer status.

During introductions Phil identified that Fish and Game had instructed Greg Carlyon to act on their behalf as a planner. This decision had been made subsequent to the decision to attend as an observer. CF reiterated her discomfort with Phil attending as an 'observer' in the light of his clarification that they had a planning expert in attendance.

(p) **CODE OF CONDUCT**

6. This joint statement is prepared in accordance with section 4.7 if the Environment Court Practice Note 2014 (the "**Practice Note**")
7. We confirm that we have read the Practice Note, and in particular Appendix 3 – Protocol for Expert Witness Conferences, and agree to abide by it.

PURPOSE AND SCOPE OF CONFERENCING

8. The purpose of expert conferencing was to identify, discuss, and highlight points of agreement and disagreement on the possibility of developing a risk matrix approach to managing the impacts of existing intensive farming land use on catchment water quality in the Manawatu-Whanganui region.
9. The scope of the issues covered at the conference included:

- (a) The identification of underlying characteristics of land and location that influence the risk to water quality from nitrogen leaching resulting from intensive farming land use;
- (b) The identification of on-farm land use practices that create risk of nitrogen leaching (these may be common, or differ between farming systems);
- (c) The identification of on-farm practices or mitigations which can be used to reduce nitrogen leaching (these may be common, or differ between farming systems);
- (d) Agreed next steps to progress the matters unable to be discussed due to time constraints.

KEY FACTS AND ASSUMPTIONS

10. [Not applicable]

METHODOLOGIES AND STANDARDS

11. [Not applicable]

AGREED ISSUES

12. Refer to Annexure A.

DISAGREEMENT AND REASONS

13. Refer to Annexure A.

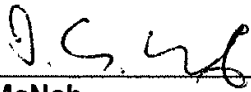
PRIMARY DATA

14. Not applicable

RESERVATIONS

15. Not applicable

Date: 28 June 2022



Ian McNab



David Horne



Dr Anne-Maree Jolly



Christine Foster



Greg Carlyon



Chris Keenan



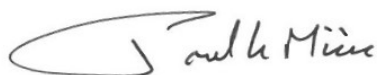
Stuart Ford

SC Ruston

Sue Ruston



Gavin Marshall



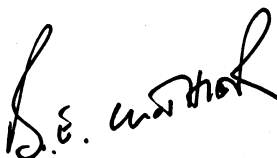
Dr Paul Le Miere



Gerard Willis



Thomas Kay



Dr Brent Clothier

ANNEXURE A

In the matter of Proposed Plan Change 2

Expert conferencing – Intensive Farming Nitrogen Risk Assessment Approach (28 June 2022)

Context

SR, GW requested an explanation of the context for the workshop. CF provided a summary of this.

Scope

GW asked are we limiting ourselves to a 'risk matrix.'

All agreed that this needed to be broader, and the terms 'framework, index, score card or other tool' were settled upon.

Examples of risk assessment approaches

AJ provided an example for discussion, demonstrating how a risk assessment approach might operate for commercial vegetables.

DH followed with an example for irrigated dairy, sheep and beef.

GM presented an example of how the Fonterra nitrogen risk score card operates.

Criteria

Participants were asked to identify criteria to guide selection of ways to assess factors/ practices/ mitigations.

All agreed to the following criteria:

- **Certain** (Unambiguous)
- **Consistently applied** (with limited discretion)
- **Verifiable – able to be interrogated** (transparent)
- **Measurability** (measurable)

- Able to show change in relation to a baseline
- Uses best available information (Evidence-based)
- Accessible.

Issue	Statements	Agreed Position	Disagreements, with reasons
Note: Except where stated, all planners do not consider themselves qualified to answer the questions under Topics 1-3 which require technical farm system expertise.			
Topic 1 – Underlying Risk Factors			
All experts agreed that under-lying (biophysical) risk factors are an important influence on the risk of N loss. GW, PL, GM, however, noted that whether these needed to be part of any risk assessment tool, depends on how PC2 intends to apply that tool within the planning framework. That question was not discussed.			
What are the underlying characteristics of land and location that present risk to water quality from nitrogen leaching resulting from intensive farming land use? For example: climate (and particularly rainfall), soil type, land slope, presence or absence of critical source areas, sub-soil drainage, proximity to waterbodies including natural wetlands? Are they certain, able to be consistently applied, and verifiable?	- Critical Source Areas (connectedness to water bodies e.g. Surface drains or pathways through which water might flow over the land) (unclear on certainty criterion). - Soil type/Soil vulnerability to N leaching (accessibility may be limited because S-Map doesn't have full coverage, but could extrapolate this to factors used by S-Map to determine vulnerability). - Rainfall intensity/Adverse weather effects (not very verifiable, NIWA source is not accessible, not easily measurable). - Attenuation (difficult to measure).	All agree that highlighted factors are agreed as having a big influence on the risk of N loss. Slope is mostly agreed to NOT be a majorly influential factor. IM: The research does not show that slope has a major effect on N loss in intensive farming uses. All agree (except CK). All agree that CSAs are potentially a risk factor for N discharge that should be considered in any assessment of risk.	CK: Slope is potentially a significant influence on N discharge from some IFLU (where cultivation occurs) in particular situations.

	- Slope (measurable). - Rainfall (volume) / Sub-soil drainage (meets criteria, measurable). - Land cover in catchment and sub-catchment (disagreement as to whether this is relevant here – moved into next question).	GM was of the view, however, that this is best done through the FEP process. All agree that attenuation is relevant but difficult to measure and cannot be done with the information we currently have. If we could measure it, it would be good (however, we do not have the time to figure this out).	
How can these underlying risk factors be categorised or 'scored' to describe the level of risk to water quality, for the purposes of characterising or quantifying them in a risk assessment methodology? What information is required (at what level of detail) to describe the risks presented by these key underlying risk factors? (Facilitator note: this question only partly answered with time available)	- Critical Source Areas: Calculating proportion of farm that is a CSA. - Soil type/Soil vulnerability to N leaching: S-Map (but lack of coverage), soil texture (and other factors that inform the S-Map formula). - Rainfall intensity/Adverse weather effects: Record failing crops (monitoring). - Slope: Lidar data (very accurate). - Rainfall (volume) / Sub-soil drainage (natural and artificial): Rain gauges (measured on farm – but must be reliability), rainfall maps, rainfall measurement sites, water balance accounting used by S-Map (at farm scale). Higher rainfall = greater risk.	Agreed by all that S-Map works provides the required information on soil type factors including vulnerability to N leaching. However, it lacks coverage in the region Vulnerability to N leaching is based on water balance accounting which is a good way to measure rainfall and a few other factors. Therefore, could unpack S-Maps formula and use those factors to inform a risk assessment. Similar issue for Lidar data which may be limited in the region. All agree that rainfall intensity and adverse weather events are very difficult to measure as there is insufficient data to provide certainty. Build this into monitoring as it can have an impact and may help overall N balance. All agree that water balance will be the best measure for rainfall/sub-soil drainage.	PL: Not convinced that it is worth going to the effort of measuring CSA (not practical) where it may not have the biggest effect on risk of N loss. IM also held this view. GM wanted it noted he did not believe there is a robust methodology for objectively assessing and quantifying (metricising) the N loss risk from a CSA, such that it could meaningfully contribute to an overall risk score for a farm within a risk assessment tool. Inclusion of CSA's in a risk assessment tool would potentially be duplicating the FEP process where CSA's are assessed for the level of risk they pose. In this process the farmer and farm plan provider can determine appropriate time bound actions to mitigate these risks.

Facilitator note: Topics 2 and 3 were considered together: this was because participants acknowledged that a land use practice may sometimes also be a land use mitigation

Issue	Statements	Agreed Position	Disagreements, with reasons
Topic 2 – Land Use Risk Factors			
What are the on-farm land use practices (including irrigation, drainage, etc.) that create risk of nitrogen leaching (which may differ between farm systems)?	- Cropping + Cultivation practices - Fallow period (vege) - Rotation selection (vege) - Crop types (vege) - Crop residue (vege) - Factor residuals into nutrient budget - Direct drill/Minimum till - Imported feed/ Feed balance/ Nitrogen from imported supplement - Stock management - Stocking rate/density (stock units) - Dry matter eaten - Stock type - Intensive Winter Grazing - Effluent management - Nitrogen fertiliser applied (vege and dairy) - Irrigation (vege and dairy) - Stock crossings	All agree (including planners) that the wider balance of land cover, the sensitivity of receiving environments, and the cumulative impacts of all IFLUs and all other existing activities, are relevant to the decision making for a consent application. However, this is a separate question to the risk of N loss from specific properties. CF and GW consider these wider factors are already partly or fully accounted for in amended policy 14-6(e). Note: PL not in the room for this	
How can these land use risk factors be categorised or 'scored' to describe the level of risk of nitrogen leaching to waterbodies, for the purposes of estimating or quantifying them in a risk			

Issue	Statements	Agreed Position	Disagreements, with reasons
matrix? (Facilitator note: this question not answered with time available)			
What information is required to describe the risks presented by the key land use nitrogen leaching risk factors (and at what level of detail)? (Facilitator note: this question not answered with time available)			
What is the most appropriate way to present information about land use risk? Can it be simplified as 'scores' or 'bands of risk' or otherwise summarised in a matrix format? (Facilitator note a): As detailed above all experts agreed to broaden the term from 'risk matrix' to framework, index, score card or other tool (which can be broadly referred to as a 'risk assessment methodology) when confirming the workshop scope (see para 9. above). Facilitator note b). This question not answered with time available)			
Topic 3: Mitigations			
Note: SF did not consider himself sufficiently qualified to contribute to the question on mitigations in the dairy industry.			
What on-farm practices or mitigations can be used to reduce nitrogen leaching in different intensive farming land use systems?	Below is a selection of mitigations and mitigations are not limited to the list provided. - Bunding, bridges + culverts	All agree to cross off pond lining as you are not allowed to have a leaky pond (All agree this is a prosecution matter).	

Issue	Statements	Agreed Position	Disagreements, with reasons
	- Timing/ season/ Seasonal restriction on N application - Variable rate irrigation or nutrient application - Application rate (kgN/ha per application) - ~~Pond lining~~ - Crop selection (e.g Sheep/ Beef/ Dairy: Plantain in diet) - Wintering off pasture (stand off, housing) - Wintering off farm/ culling - Effluent management (beyond minimum requirements) – N loading effluent area, Buffer distance - Water budgeting - Controlled traffic farming - Direct drill/Minimum till - Soil testing - Soil testing of N (before N application) (vege) - Use catch crops between vege crops - Utilising other crops in rotation (vege) - Split N fertiliser application (vege) - Develop a N balance (vege) - Use minimal tillage cultivation practices - Buffer zones within paddocks (vege) - Having a pasture phase in a commercial vege crop rotation (vege) - Land retirement - Edge of field technologies - Constructed wetlands		

Issue	Statements	Agreed Position	Disagreements, with reasons
	- Point source discharge control features.		
Can these mitigations be quantified or 'scored' in terms of their effectiveness in reducing nitrogen leaching, for the purposes of reducing risk in a risk assessment methodology? (Facilitator note: this question not answered with time available)			
How are these practices or mitigations best described for on-going monitoring purposes, for example in nutrient budgets or farm environment plans? (Facilitator note: this question not answered with time available)			
Topic 4: Risk Matrix Format			
What form could the risk assessment methodology take? (Facilitator note: this question not answered with time available) available – except for comment recorded in adjacent column)	Not discussed in detail but GW commented that there are a range of options from (a) comparative analysis of sources and pathways that are narrative and rely, to a large degree on expert judgement, (as per Wellington NRP) to, (b) more numeric ('metricised') approaches, like the Nitrogen Risk Scorecard.		
Topic 5: Other Comments and Policy Points			
How does this fit into the broader One Plan?	Consistent with the open remarks (see above), GW considers that it is necessary to consider biophysical (spatially variable) factors in the risk assessment if there is a policy/regulatory		

Issue	Statements	Agreed Position	Disagreements, with reasons
	need to assess the <i>relative</i> risk of different farms in different locations. If the policy/regulatory need is merely to assess whether N loss from a <i>particular farm</i> is likely to be increasing or decreasing over time (and what the magnitude of that change is likely to be), then the biophysical (i.e. spatially variable) risk factors are much less important and generally unnecessary to consider. Accordingly, the way that the risk assessment is used within the planning provisions will be determinative of the risk assessment approach that needs to be taken. How the risk assessment is used within PC2 is a planning matter that could be discussed in separate planning conferencing. SR agrees.		

Agreed next steps		
	1. Parties study the nitrogen risk scorecard. Reconvene farm system experts – agree on format (considering as a starter the nitrogen risk scorecard) then split into commercial vegetable production and pastoral farming system sub-groups to determine how to assess, and potentially quantify, risk. Discuss adding underlying characteristics into scorecard. CK thinks we need some science support to determine appropriate thresholds of risk for the environmental aspects of the site. 2. Take instructions from respective parties as to whether they would like the risk approach developed in more detail to inform decision-making around PC2 – Put to them the question in principle: Do we want to go down this pathway? 3. Go back to farm system experts and planners and put more detail into the framework to formulate a recommendation to the parties as to whether and how a risk assessment framework could be used in PC2.	

