

**IN THE ENVIRONMENT COURT
WELLINGTON REGISTRY**

**I TE KŌTI TAIAO O AOTEAROA
TE WHANGANUI-A-TARA ROHE**

UNDER	the Resource Management Act 1991
IN THE MATTER	of appeals under sch 1, cl 14(1) against the decision of Manawatū-Whanganui Regional Council on Plan Change 2 to the One Plan
BETWEEN	TE RUNANGA O RAUKAWA ENV-2021-WLG-20 NGĀTI TURANGA ENV-2021-WLG-21 ANDREW DAY ENV-2021-WLG-22 WELLINGTON FISH AND GAME COUNCIL ENV-2021-WLG-23 Appellants
AND	MANAWATŪ-WHANGANUI REGIONAL COUNCIL Respondent

**SUPPLEMENTARY STATEMENT OF EVIDENCE OF DR ANNE-MAREE JOLLY ON
BEHALF OF MANAWATŪ-WHANGANUI REGIONAL COUNCIL**

COMMERCIAL VEGETABLE GROWING

Dated: 17 January 2024


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SUPPLEMENTARY STATEMENT OF EVIDENCE OF ANNE-MAREE JOLLY**A. INTRODUCTION**

- [1] My full name is Anne-Maree Jane Jolly.
- [2] I prepared a statement of evidence dated 6 October 2023 (**Evidence**) on the management of nitrogen leaching from commercial vegetable growing (**CVG**) for Proposed Plan Change 2 to the One Plan (**PC2**), on behalf of the Manawātū-Whanganui Regional Council (**Horizons**). I also prepared a statement of reply evidence dated 13 November 2023 (**Reply Evidence**).
- [3] My experience and qualifications are set out in my Evidence.
- [4] I repeat the confirmation given in my Evidence that I have read and will comply with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023, and that my evidence has been prepared in compliance with that Code.

B. SCOPE

- [5] This supplementary evidence responds to requests for further information in emails from the Registry dated 22 November 2023, in relation to further nitrogen leaching data. In particular, I address information requested regarding commercial vegetable growing (**CVG**). Professor Horne addresses pastoral intensive farming land uses (**IFLU**) in his supplementary statement.
- [6] To avoid doubt, any reference to Table 14.2 in this supplementary evidence is to the recalibrated Table 14.2 in DV-PC2.

C. FARM DATA

- [7] The Court has requested, for each targeted water management sub-zone (**WMSZ**), broken down by IFLU type:
- (a) The number of farms that can meet the amended Table 14.2;
 - (b) The number of farms that can meet the relevant specified reduction target; and

(c) The number of farms that will need to apply for a discretionary activity consent.

[8] Due to the limited availability of data, it is difficult to provide a precise response to the Court's requests. It is my understanding that there are approximately 50 unconsented CVG operations to which PC2 applies. Most of these operations are located within the Horowhenua targeted WMSZs, and the remaining known operations are located in Coastal Rangitikei.

[9] CVG within the Horowhenua was split into three different systems for the purpose of the nitrogen modelling (Bloomer et al. 2020): potatoes and onions, intensive vegetables, and brassica dominant. While there is one potatoes and onions system, it is unknown how many of the other approximately 50 operations fall into the other two vegetable systems. It is also known that there is one potato grower in the Coastal Rangitikei catchment.

D. NUMBER OF FARMS THAT CAN MEET RECALIBRATED TABLE 14.2

[10] The nitrogen modelling by Bloomer et al (2020) indicated that only the potatoes and onions system can meet the recalibrated Table 14.2. Therefore, the number of growers that are able to meet Table 14.2 is approximately two, based on the information available to me. My own Overseer modelling supports the potato and onion findings of Bloomer et al (2020).¹

[11] I note that Bloomer et al (2020) modelled in Overseer version 6.2.3. Recent Overseer updates have improved the modelling of crops. Based on preliminary investigations comparing the same baseline files between Overseer versions 6.5.0 and 6.5.4, a number of crop rotations have seen large decreases in nitrogen loss and most showed at least some decrease. This means there is a possibility that some intensive vegetables and brassica dominant systems may now meet Table 14.2. However, from available data,

¹ Dan Bloomer, Georgia O'Brien, and Luke Posthuma *Modelled loss of nutrients from vegetable growing scenarios in Horowhenua: OverseerFM 6.3.2 Modelling of Representative Rotations within Hokio_1a, Hokio_1b, and Ohau_1b WMSZ* (Page Bloomer, January 2020); available at Statement of Reply Evidence of Anne-Maree Jolly (13 November 2023) at Attachment A.

it is not possible to say how many. It is likely that most will still need to use the specified reduction or discretionary pathways.

- [12] An important point to note is that irrespective of Overseer version changes CVG will broadly be required to adopt the same practice changes as intended in the DV-PC2. It is these practice changes that drive the nitrogen leaching improvements sought through implementation of the One Plan.

E. NUMBER OF FARMS THAT CAN MEET THE RELEVANT SPECIFIED REDUCTION TARGET OR REQUIRE CONSENT AS A DISCRETIONARY ACTIVITY

- [13] Differentiating between growers who would use the specified reduction pathway and those who would use the discretionary pathway is more challenging.

- [14] Bloomer et al (2020) does not provide the level of detail required to determine the potential number of growers who could meet the specified reduction pathway. However, the report does conclude that nitrogen leaching reductions between 31% to 44% were achievable based on the properties that were modelled across the three vegetable systems. Nonetheless, it is likely that not all growers will be able to meet the 35% reduction required for the specified reduction pathway.

- [15] My own Overseer modelling at a crop rotation level using Bloomer et al (2020) data indicated that both the modelled intensive vegetable and brassica dominant rotations could achieve at least a 35% reduction when adopting a range of good and best management practices.² Some rotations would have to adopt more practice change than others. The exact number of growers in each system which could achieve this is difficult to determine, given the variability between different grower operations and the lack of data (noting that Bloomer et al (2020) modelled a good representation of CVG operations impacted by PC2, but not all of them).

- [16] Based off the information available it is my view that intensive vegetable systems are more likely to apply for consent using the specified reduction

² Statement of Evidence of Anne-Maree Jolly (6 October 2023) at [37]–[38].

pathway compared to the discretionary pathway. As I discuss below, this decision will likely depend on a range of factors at the time of consenting.

[17] While brassica dominant growers will be applying for consent (in the hypothetical scenario posed by the Court) under either the specified reduction pathway or the discretionary pathway (that is, they are unlikely to meet Table 14.2 on the basis of current modelling), I cannot say with any certainty what proportion of those growers would choose each pathway.

[18] Ultimately, in my view, there will be different drivers as to which consenting pathway a grower chooses to apply under, for example relating to a range of practical considerations (cost, labour and skill set availability, land ownership arrangements etc), as well as the capability of the grower.

F. SUMMARY

[19] In summary, for reasons explained above, I am unable to provide a detailed breakdown of the numbers of growers which would fall into each of the consenting categories listed at paragraph 7 above. Based on the information I have on hand, and having regard to Bloomer et al (2020) and my own modelling, my general expectation would be that growers mostly fall into the following consenting groups (noting that there will be some variation between these categories based on the individual growers' circumstances):

- (a) Table 14.2: Potato and onion rotations;
- (b) Specified reduction pathway: Intensive vegetable rotations; and
- (c) Discretionary pathway: Brassica dominant rotations.

[20] Also, for some individual growing operations the nitrogen leaching predicted by more recent versions of Overseer may be less than under earlier versions due to improved accuracy of Overseer with regard to crop model improvements.

17 January 2024

Dr Anne-Maree Jolly