

IN THE ENVIRONMENT COURT AT WELLINGTON

IN THE MATTER of the Resource Management Act 1991
 (“**the Act**”)

AND

IN THE MATTER of clause 14 of the First Schedule of the
 Act

BETWEEN **FEDERATED FARMERS OF NEW ZEALAND**

ENV-2010-WLG-000148

AND

DAY, MR ANDREW

ENV-2010-WLG-000158

AND

MINISTER OF CONSERVATION

ENV-2010-WLG-000150

AND

HORTICULTURE NEW ZEALAND

ENV-2010-WLG-000155

AND

WELLINGTON FISH & GAME COUNCIL

ENV-2010-WLG-000157

Appellants

AND

**MANAWATU-WANGANUI REGIONAL
 COUNCIL**

Respondent

**STATEMENT OF REBUTTAL EVIDENCE BY LINDSAY EUAN FUNG FOR
 HORTICULTURE NEW ZEALAND IN RELATION TO THE APPEALS ON THE
 PROPOSED ONE PLAN FOR MANAWATU WANGANUI REGIONAL
 COUNCIL ON SURFACE WATER QUALITY**

(20 APRIL 2012)



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QUALIFICATIONS AND EXPERIENCE

1. My name is Lindsay Euan Fung and I prepared a statement of evidence dated 14 March 2012. In that statement of evidence I have set out my qualifications and experience and confirms that I will comply with The Code of Conduct for Expert Witnesses contained in the Environment Court's Consolidated Practice Note dated 1 November 2011. I reaffirm that that information and confirmation applies to this rebuttal evidence.

SCOPE OF REBUTTAL EVIDENCE

2. In my evidence (14 March 2012) I note that in the "Supplementary Statement by Jon Roygard and Maree Clark on Nutrient Load Scenarios and Methodology" (24 February 2012) the authors cite nitrogen loss rates for horticulture in the order of 100 – 300 kg N ha⁻¹ year⁻¹ from the Clothier *et al.* (2007) report¹ (paragraph 83), and further note that these figures themselves are derived from four earlier studies that may not accurately reflect vegetable production in the region.
3. The authors then proceed to use these crop loss rates to estimate horticultural contributions to the study catchment loads and refer to a high rate (80 kg N ha⁻¹ year⁻¹) from Clothier *et al.* (2007) to demonstrate that horticulture could have a disproportionate effect on catchment load, relative to land area (paragraphs 84 – 86).
4. These figures (100 – 300 and 80 kg N ha⁻¹ year⁻¹) are then quoted by a number of submitters or are used by submitters as a basis for further calculations:
 - (a) Dr Alison Dewes (Wellington Fish & Game Council) quotes the values presented by Roygard and Clark for the Waikawa catchment (paragraph 9.8).
 - (b) Dr Olivier Ausseil (Wellington Fish & Game Council) uses an assumed nitrogen loss rate of 80 kg N ha⁻¹ year⁻¹ for the basis of his assessments (paragraph 8.13, table 13).

¹ Clothier, B., Mackay, A., Carran, A., Gray, R., Parfitt, R., Francis, G., Manning, M., Duerer, M. & Green, S. (2007) Farm strategies for contaminant management: a report by SLURI, the Sustainable Land Use Initiative, for Horizons Regional Council. PalmerstonNorth, New Zealand: AgResearch

- (c) Ms Helen Marr (Minister of Conservation and Wellington Fish & Game Council) also refers to the Roygard and Clark values for the Waikawa catchment (paragraph 116) and Clothier *et al.* (2007) in determining rankings of land uses in terms of “nutrient losses” (paragraph 113; despite there being no data for phosphorous losses for horticulture).
 - (d) Dr Michael Scarsbrook (Fonterra Co-operative Group Limited) uses the 80 kg N ha⁻¹ year⁻¹ value to calculate that horticulture contributes 21 % of the (annual) total nitrogen to Lake Horowhenua (paragraph 185).
 - (e) Mr Gerard Willis (Fonterra Co-operative Group Limited) refers to “evidence of Dr Roygard (page 169, paragraph 305) that market gardening and cropping can leach more nitrogen per hectare than dairying” in footnote 9 to paragraph 42.
5. As presented in my evidence, I consider that the basis for these values is dubious given the limited number of studies and the focus on single crop or a small sub-set of a typical crop rotation for horticultural land use, and that other data (with lower rates of nitrogen loss) have not been considered by Horizons.
 6. Further, with respect to the value of 80 kg N ha⁻¹ year⁻¹ as noted in paragraph 3 above, there is no mention of this in the Clothier *et al.* (2007) report and where it is introduced in the evidence from Roygard and Clark there is no apparent explained basis for the value.
 7. In Ms Helen Marr’s evidence (2 April 2012), a summary of suggested practices that can minimise nutrient losses is referred to in paragraph 119 (and provided in Appendix 4). These are more applicable to pastoral farming systems it should be noted that only the proposed practices from Clothier *et al.* (2007) are most pertinent to horticulture (pages 20, 21 of the Clothier *et al.* 2007 report), as has been stated in my evidence of 14 March 2012 (paragraph 39).
 8. Ms Helen Marr also notes in paragraph 104 of her evidence that “all the catchments currently sought to be included in a management regime for non-point source pollution by the MOC and WFGC are generally not achieving the water

quality limits relevant to non-point source pollution or life-supporting capacity or both.” Later in paragraph 106 she states *“I am not aware of any evidence that the major cause of these breaches of the limits I have identified in a – d above is caused by point source discharges”* and that non-point sources are the major contributors to elevated levels of pollutants, nitrogen in particular.

9. With regards to Lake Horowhenua it is unclear how much of the Lake's elevated levels of pollutants can be attributed to point and non-point sources, current and historical inflows, and ground and surface water inflows. The NIWA Lake Horowhenua Review (2011) does not identify the relative contributions from these sources but does note that historical sewage discharges into the lake from Levin *“have accumulated in the lake sediment and are a major cause of the present hypertrophic condition”* (page 9). Fertiliser leaching (nitrogen) is attributed to be a source of lake nitrogen levels from both surface and groundwater.
10. Further, as noted in my evidence, phosphorous is predominantly entering the lake via the Queen Street drain (paragraph 35).
11. Therefore it is important to note that for Lake Horowhenua, all land uses in the catchment have significantly contributed to the degraded state of the water quality and sources are both point and non-point.

L E Fung

20 April 2012