in the matter of: the Resource Management Act 1991

and: submissions and further submissions in relation to proposed variation 1 to the proposed Canterbury Land and Water Regional Plan

and: **Fonterra Co-operative Group Limited**
Submitter

and: **DairyNZ**
Submitter

Statement of evidence of Ron Pellow (baseline and nutrients)

Dated: 29 August 2014

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STATEMENT OF EVIDENCE OF RON PELLOW

INTRODUCTION

1 My name is Ron Pellow.

2 I am the Executive Director of the South Island Dairying Development Centre (SIDDC), a partnership between Lincoln University, DairyNZ Limited, Ravensdown Fertiliser Co-operative Limited, Livestock Improvement Corporation Limited, The New Zealand Institute for Plant and Food Research Limited, AgResearch Limited and South Island Dairy Event. I have held this role in a full time capacity since February 2010 and on a part time secondment for the previous 17 months. Prior roles included South Island Regional Manager for DairyNZ, Business Development Manager – Eco-n at Ravensdown and various technical, sales, marketing and operations roles largely associated with maize silage and large scale agricultural contracting.

3 I have a Bachelor of Agriculture and Diploma of Agricultural Science from Massey University and a Master of Business Administration from Otago University. I have also completed the Massey University short course 'Intermediate Sustainable Nutrient Management in NZ Agriculture'.

4 At the outset I note that I have been a community member on the Selwyn-Waihora Zone Committee since the beginning of this year. I provide this evidence in my capacity as Executive Director of SIDDC, and am confident that there is no conflict in the material presented here and my input as a community member of that committee.

5 Nevertheless given the above and the fact SIDDC is the operator of the Lincoln University Dairy Farm (*LUDF*) (referred to throughout my evidence), I have as a matter of caution elected not to provide this statement as an expert. However, I do obviously have considerable experience with dairy farming, nutrients and OVERSEER®.

6 I am familiar with the Proposed Variation 1 to the Proposed Canterbury Land and Water Regional Plan (*the Variation*) to which these proceedings relate.

SCOPE OF EVIDENCE

7 In my evidence I have been asked to provide:

7.1 a brief outline of the LUDF and its pro-active management of nutrients; and

7.2 a description of the year to year variation in nitrogen loss and the associated inputs contributing to the predicted losses when using OVERSEER® for the purposes of outlining the potential issues around the "*nitrogen baseline*" as discussed in the evidence of **Mr Gerard Willis**.

Lincoln University Dairy Farm (LUDF)

8 The farm is operated by SIDDC on behalf of Lincoln University as a commercial demonstration farm, with the objective to maximise sustainable profit. It operates transparently, reporting its performance through a variety of field days, pre-arranged visitor groups and weekly reporting of data onto the SIDDC website. See www.siddc.org.nz for additional details.

9 The management focus at LUDF has consistently been on low – moderate use of N-fertiliser and imported feed, coupled with reliable irrigation water, productive pastures and a herd of high genetic merit cows to grow and harvest as much pasture as possible, and convert this into milk as efficiently as possible. The combination of pasture grown, and efficiency has enabled the farm to successfully operate with higher stocking rates and production per cow than the average Canterbury farm.

10 The farm is one of the most environmentally monitored farms in New Zealand, with a series of shallow wells, 60 lysimeters and six drainage plots, providing continuous data on a range of measures across the farm. The information collected on nutrient losses contributes to the database informing OVERSEER® of potential losses from dairy farms.

Management on Farm – Year to Year variability

11 OVERSEER® has been used on LUDF to estimate the farms nutrient losses.

12 The farm operates with very sound nutrient and wider farm management practices, including the technical input of leading scientists. Annual benchmarking of LUDF's profitability indicates the farm operates in the top 2% of dairy farms. .

13 The annual N discharge from the property can vary markedly. Actual individual year to year losses are primarily influenced by the autumn and winter drainage, rather than the specific management on the farm at that time. A sustained wet autumn / winter is, for example, is likely to result in much more drainage and nutrient loss than a dry autumn, irrespective of the management on farm.

14 NZ dairy farms, as outdoor biological systems are inherently reliant on the weather driving the daily pasture growth rates. Farms can therefore maintain similar systems over time yet reflect varied annual nutrient losses as predicted by OVERSEER®, simply due to

climatic conditions. The actual use of and timing of irrigation, nitrogen fertiliser, brought in feed and autumn stocking rate will influence the predicted N-loss in OVERSEER® despite no substantive change in the overall farm system.

Estimated Nitrogen losses at LUDF – in the 'Baseline' Period

15 LUDF has a mix of soils from free draining to poorly draining that result in the absolute numbers (kgN/ha) differing to most farms in Canterbury. The relative comparison over time and with various levels of inputs, production, and management is however very relevant to other farms – either on freely draining soils, or poorly drained soils.

16 The estimated N-loss as calculated with OVERSEER® version 6.1 are reported below. Key assumptions include:

16.1 Seven Blocks, comprising four soil types, three of which receive effluent on part of the soil.

16.2 Irrigation months and type noted, but no irrigation volume inputted (allowing OVERSEER® to calculate this).

16.3 Rainfall calculated via the climate tool

16.4 Clover level and pasture quality not specified

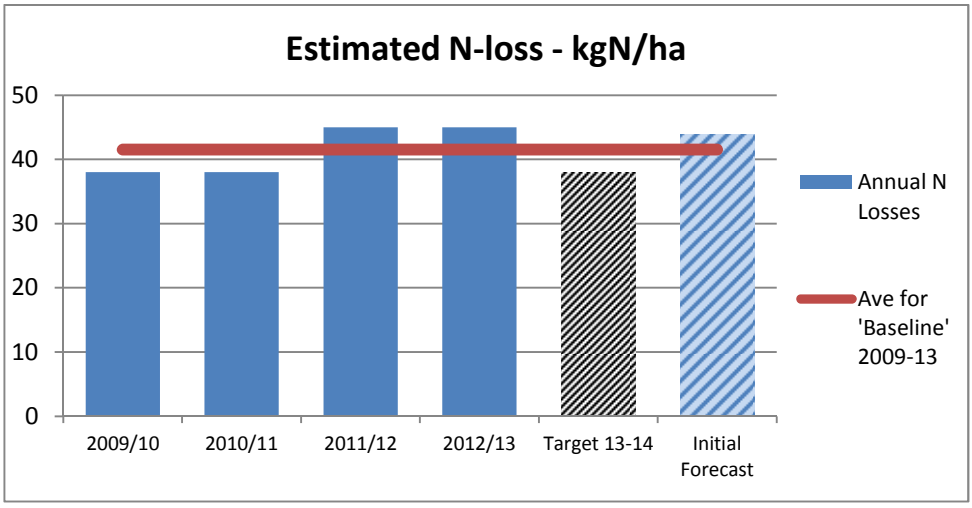
16.5 Specific cow numbers entered each month

16.6 Other protocol as per the recommendations in the "OVERSEER® r Best Practice Data Input Standards"

17 The target column shown for 2013-14 season is the nutrient loss required if the farm was to achieve the rolling 4 year average as per the pLWRP.

18 The initial forecast is the N-loss estimated for LUDF (for 2013-14) using the proposed farm management plan and budget for the season, as agreed prior to June 2013.

19 Continuing to farm through the 2013-14 season without consideration of the pLWRP (and noting this aspect was not public till well through the production year) would have resulted in the farm exceeding the desired losses to comply with the target as per the four year rolling average.



20 Once it became aware of this pending issue, LUDF made a number of voluntary changes to its management in the endeavour to reduce N-losses for the remainder of the season. These changes are documented in the LUDF focus day notes for February, May and July 2014 (see www.siddc.org.nz) - however, in summary, by choosing to meet its lower N-loss target the farm incurred a cost of nearly $100,000 in lost profit.

CONCLUSION

21 Determining potential N-losses from farms requires a range of assumptions related to both fixed aspects of the farm, (soils, location, average climate data) and variable aspects that individual farmers have, or over time, can potentially have, control over (Stocking rate, production level, irrigation system, type and volume of supplements, amount of fertiliser used, type and use of off-paddock infrastructure etc).

22 OVERSEER® is a useful tool to estimate predicted nutrient losses from farm systems. It is best used as a long term annual average model, enabling consideration of the effect of average inputs over time with its long-term average climatic data-set. When used for an individual year's actual farm inputs and production, variability is likely in the predicted losses (as the individual year's data is compared against long-term annual average climatic data).

23 Modifying the reporting of baseline compliance to target the nitrogen loss of the average of the baseline period, with tolerance up to the highest N-loss individual year within the baseline period, would recognise the normal variability of biological farm systems. It would enable a practical response throughout the season to the range of opportunities and needs within a weather driven, pastoral grazing farm system.

Dated 29 August 2014

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Ronald William Pellow