BEFORE INDEPENDENT HEARING COMMISSIONERS

AT HAMILTON

IN THE MATTER   of the Resource Management Act 1991

AND

IN THE MATTER   of the hearing of submissions on Proposed Plan
                       Change 1 to the Waikato Regional Plan

STATEMENT OF SUPPLEMENTARY EVIDENCE OF
RICHARD ALLEN FOR FONTERRA CO-OPERATIVE GROUP LTD (74057)

RESPONSE TO PANEL REQUEST FOR FURTHER INFORMATION
10 SEPTEMBER 2019

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CHAMBERS

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1. EXECUTIVE SUMMARY

1.1 The Hearing Panel issued a Minute dated 14 August 2019 requesting that Fonterra provide further information in relation to additional nitrogen leaching metrics – 25th, 30th, 50th and 60th percentiles for each FMU.

1.2 A farm systems expert called by Fonterra in the Block 2 hearings, Mr James Allen, presented information to the Panel that set out the N loss distribution curves for Fonterra supply farms for each FMU. The data presented by Mr Allen came from the Fonterra nitrogen programme database and the additional information now requested is held by Fonterra rather than the external expert.

1.3 The information requested has therefore been provided below as supplementary evidence to my earlier evidence in chief, as policy manager for Fonterra. I have knowledge of the data and can respond to questions from the Panel on this topic if required.

2. INTRODUCTION

2.1 My full name is Richard Grant Allen.

2.2 My qualifications and experience are as set out in my evidence in chief.

2.3 I was involved on behalf of Fonterra in preparing its submissions and further submissions on Proposed Plan Change 1 (**PC 1**). I also gave evidence at the Block 1 and 2 hearings. I am therefore familiar with the provisions of PC 1 to the Waikato Regional Plan and I am authorised by Fonterra to provide this statement on its behalf as a Fonterra representative.
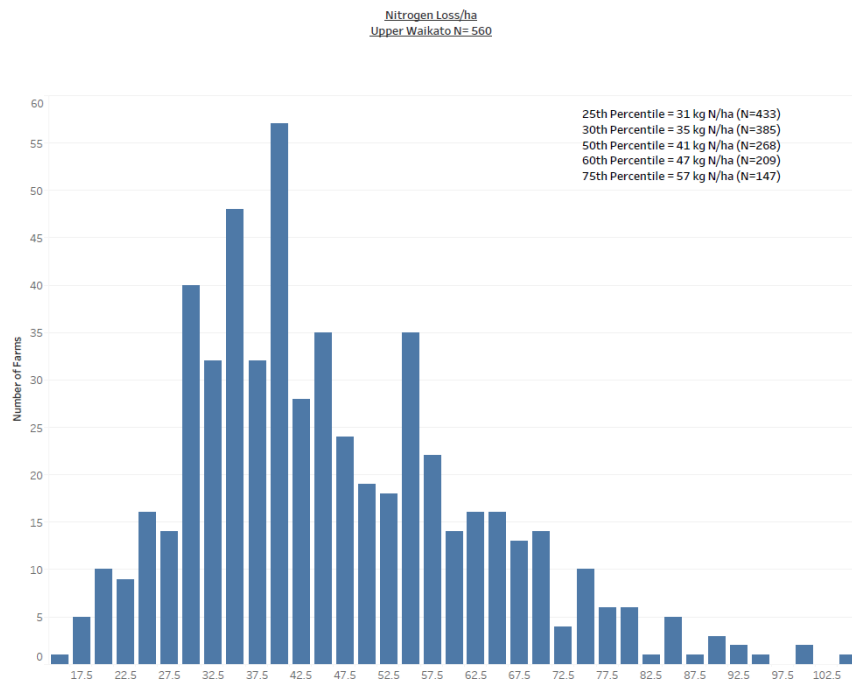
Scope of Supplementary Evidence

2.4 My statement covers:

(a) Provision of the additional percentile data as requested by the panel.

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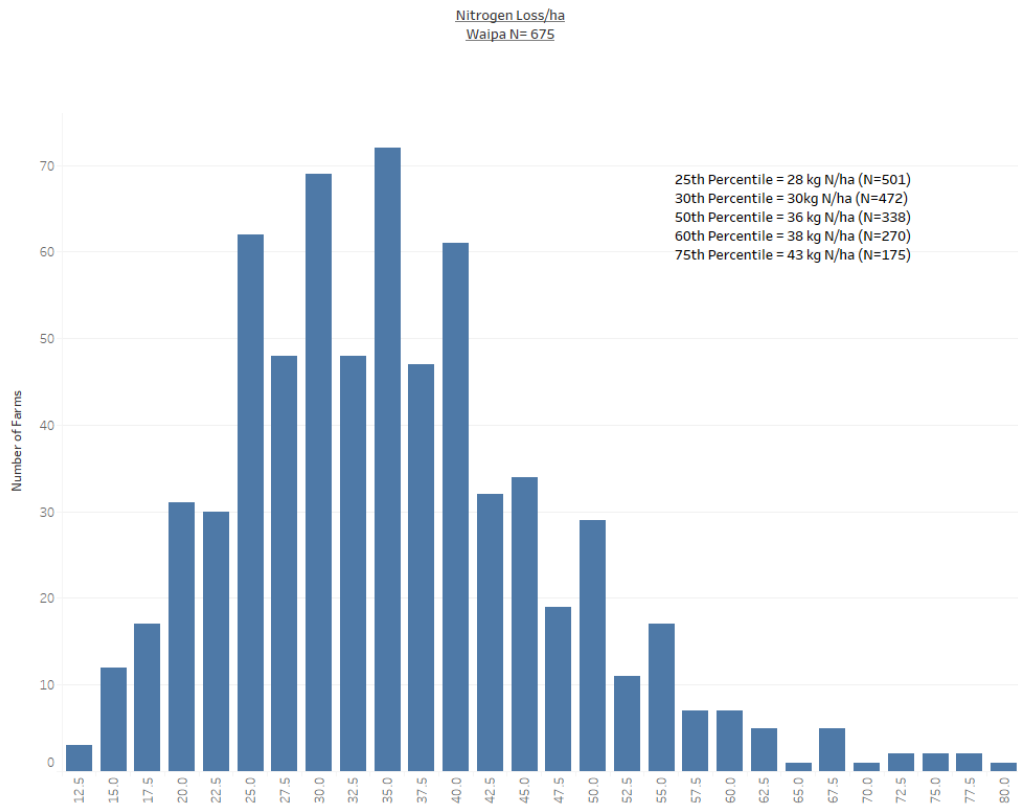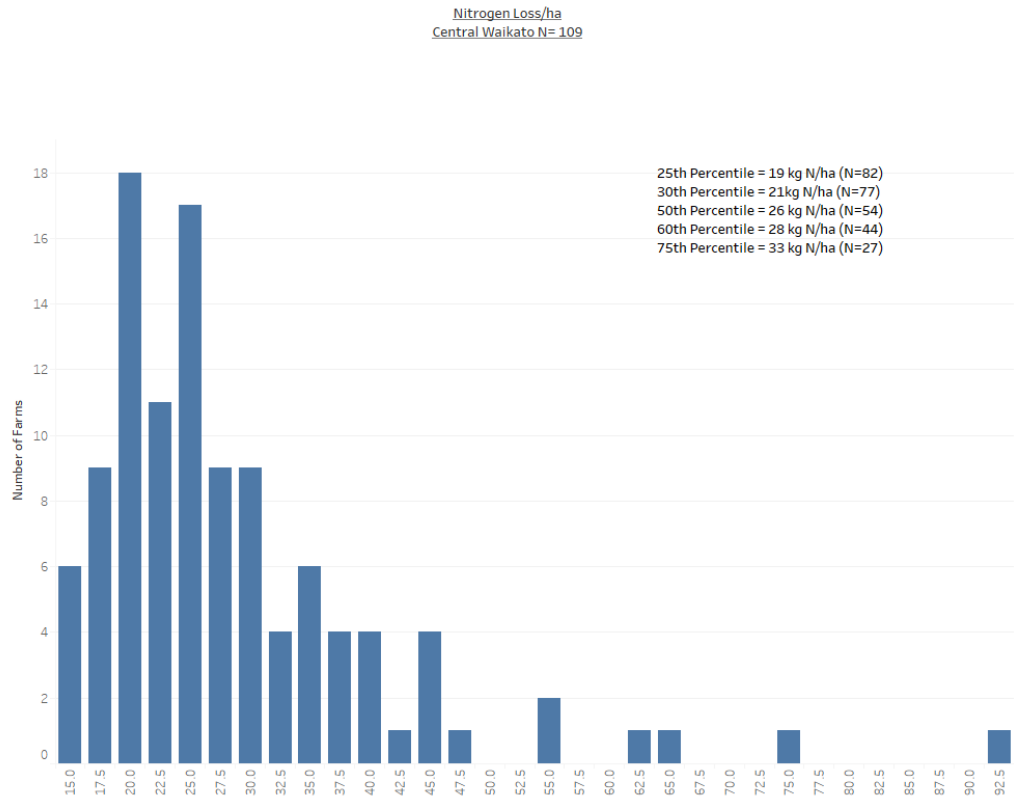
    (b)   Additional context in terms of the data's limitations.

3.   WAIKATO / WAIPA NITROGEN LOSS PERCENTILES
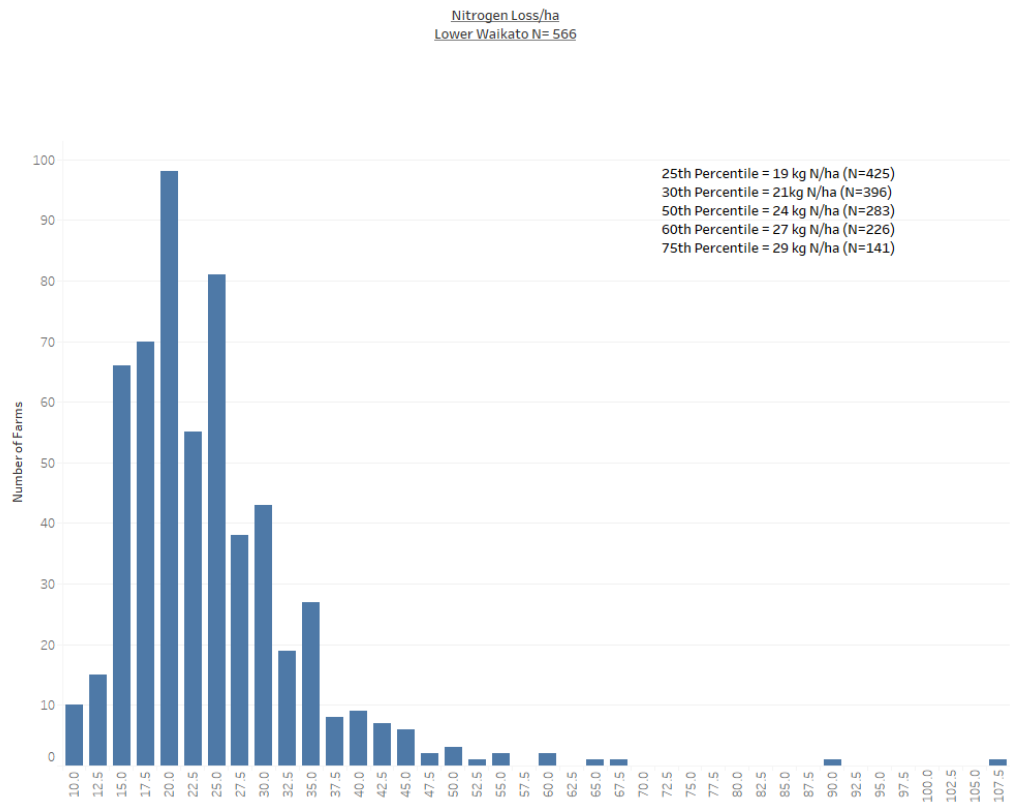
3.1   The tables below use the same 2015/2016 farm dataset as the FMU 75th%ile information presented to the Panel in the evidence of Mr James Allen in Block 2 for Fonterra. As requested in the Panel's Minute, the 25th, 30th, 50th and 60th percentile N leaching numbers from the Overseer modelling exercise carried out at the end of that dairy season have been added to the graphs.

Nitrogen Loss/ha
Upper Waikato N= 560

25th Percentile = 31 kg N/ha (N=433)
30th Percentile = 35 kg N/ha (N=385)
50th Percentile = 41 kg N/ha (N=268)
60th Percentile = 47 kg N/ha (N=209)
75th Percentile = 57 kg N/ha (N=147)

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Nitrogen Loss/ha
Central Waikato N= 109

25th Percentile = 19 kg N/ha (N=82)
30th Percentile = 21kg N/ha (N=77)
50th Percentile = 26 kg N/ha (N=54)
60th Percentile = 28 kg N/ha (N=44)
75th Percentile = 33 kg N/ha (N=27)

Nitrogen Loss/ha
Waipa N= 675

25th Percentile = 28 kg N/ha (N=501)
30th Percentile = 30kg N/ha (N=472)
50th Percentile = 36 kg N/ha (N=338)
60th Percentile = 38 kg N/ha (N=270)
75th Percentile = 43 kg N/ha (N=175)

Nitrogen Loss/ha
Lower Waikato N= 566

25th Percentile = 19 kg N/ha (N=425)
30th Percentile = 21kg N/ha (N=396)
50th Percentile = 24 kg N/ha (N=283)
60th Percentile = 27 kg N/ha (N=226)
75th Percentile = 29 kg N/ha (N=141)

4. DATA LIMITATIONS AND CONTEXT

4.1 While the Fonterra nitrogen data can provide an indication of the average N loss from Waikato / Waipa dairy farms as modelled by Overseer in the 2015 / 2016 season, there are significant limitations that should be recognised when using the data to consider the NRP as set out in PC 1. I consider it appropriate to explain these limitations.

4.2 First, the data relates to Fonterra farms only and it is likely that a full dairy dataset would result in slightly different averages as the various dairy companies are not uniformly represented across farm systems type, soil type or climate bands that exist in the Waikato / Waipa.

4.3 Second, the data used to populate the individual Overseer files was collected from farmers in a non regulatory context – Fonterra (and the other dairy companies) were providing information back to farmers on

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N loss risk in order to raise awareness and understanding of the issue; there was no compliance element to the programme beyond the requirement to provide the data. The farm level data was not audited, although the Overseer processes applied to the data were (i.e. the development of the Overseer files was externally audited against the Best Practice Data Input Standards).

4.4   Fourth, the data was entered into Overseer in line with the Best Practice Data Input Standards as they were in 2016, and therefore the outputs from that process do not incorporate any variations to that protocol that WRC intend to apply in the future. Most significantly, all Overseer files used to generate the leaching numbers in the graphs have been created with S map data where available, with soil order only used where S map coverage is not available.

4.5   Finally, the data presented was from files originally processed using Overseer version 6.2.3 but to generate these graphs the original files have been rerun in version 6.3. This would not be the same version of Overseer that will be used to generate the NRP curve (and the 75th%ile) under PC 1 as proposed. The degree of variation that will occur due to version updates is not possible to determine. Farms that appear as over the 75th%ile in the current version might fall below and vice versa with future Overseer version changes applied to the same farm data.

5.   LOAD REDUCTIONS RESULTING FROM THE 75TH PERCENTILE

5.1   While I acknowledge that it might be considered to be outside the scope of the question asked, given the nature of the Panel's request for information on other percentiles, I do consider it important to draw attention briefly to the following matters (all of which can be found in the background reports or evidence for PC 1):

(a)   As described by Mr James Allen in Hearing Block 2, using the 75th%ile as the rule threshold has been estimated to reduce the total dairy load (of N below the root zone) by 7%. This percentage

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was calculated based on the Fonterra nitrogen programme 2015 / 2016 data as set out below.

Table 1: Current load, load reduction with the 75th%ile applied, and FMU percentage reductions: (all at rootzone, Overseer N leaching output)

| FMU	Original N Level (Tonnes of N)	New Level after 75th Percentile Reduction (Tonnes of N)	Percentage Reduction	Total Tonnes of N Reduced
Upper Waikato	5,670	5,254	7.33%	416
Central Waikato	394	356	9.63%	38
Lower Waikato	1,842	1,689	8.29%	153
Waipa	3,129	2,938	6.11%	191
Total	**11,035**	**10,237**	**7.23%**	**797**

(b)   The Vision and Strategy's 80-year targets for nitrogen in the lower Waikato River are 350 mg/m^3, from the 2010–2014 current state of 595mg/m^3. This represents a reduction over the 80 year period of approximately 41 % of total N load.

(c)   My understanding of PC 1's objectives is to achieve *10% of the required change* in the next 10 years, not a 10% reduction in the *total N load* in the Waikato/Waipa catchments.

(d)   I further understand that CSG chose the 75th%ile because that, together with the expected N loss load reductions from good practice and efficiency actions in the FEPs and the NRP property "cap", would achieve more than 10% of the required change in relation to N.   My analysis of the data has confirmed this (refer Appendix 1).

(e)   I am not aware of any assessment of the additional economic costs that would be incurred as a result of lowering the threshold below the 75th%ile.

Richard Allen
10 September 2019

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APPENDIX 1 – EXAMPLE CALCULATION

To illustrate the my earlier point I have set out an approximation of the impact of a 7.2% total dairy load reduction on the achievement of whole of catchment short term objectives for nitrogen. To maintain consistency with PC1, I have used the 2010-14 current state TN concentration (i.e. 595 mg/m^3), the 80-year target of 350 mg/m^3, and I have assumed a dairy contribution to instream TN load in the lower Waikato River of c. 50% (taken from Dr Cox's Block 1 evidence[1]; refer to figure below – dairy = blue region).

Waikato River at Port Waikato:
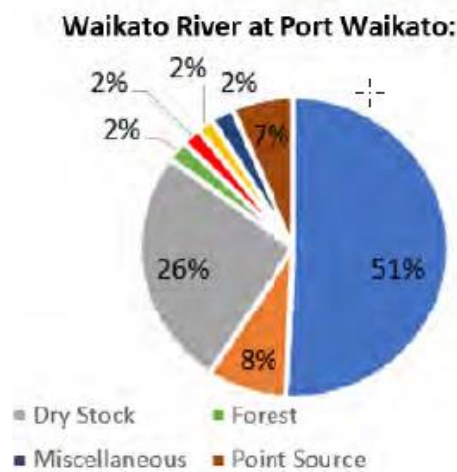
The difference between the 2010-2014 current state concentration at Tuakau (of 595mg/m^3) and the desired long term concentration at Tuakau (of 350mg/m^3) equates to a reduction of 245mg/m^3. Accordingly, PC1 requires 10% progress towards this 245 mg/m^3 reduction over the 10-year duration of PC1 – which corresponds to 24.5 mg/m^3 decrease (hence an in-stream concentration of 595-25 = 570 mg/m^3).

Based on the c.50% dairy contribution to total terminal load at Tuakau Bridge (assuming this would be similar to the 51% calculated at Port Waikato by Dr. Cox), it is reasonable to consider that a 7.2 % decrease in dairy load equates to a 3.6% decrease in total load at Tuakau. Applying the 3.6% reduction to the current state concentration - 3.6% of

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[1] Dr Timothy Cox Block 1 EIC 14 February 2019, Figure 10, p44

595 = 21.4 mg/m^3 decrease. This compares to the required 10% progress of (595-350)x0.1 = 24.5 mg/m^3. Although only an approximation, the data and assumption indicate the 75th percentile rule alone would result in around 9% (i.e. 21.4/245) x 100) progress towards 80- year target (based on the 2010-14 current state concentrations).

Once the unquantifed non-dairy reductions and the efficiency gains anticipated through FEP actions are factored in to the reduction calculation it would seem highly likely that the PC 1 rule framework as proposed can achieve the reductions that represent 10% of the progress toward the long term N target attribute states.