IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER Lake Rotorua Nutrient Management – **PROPOSED PLAN CHANGE 10** to the Bay of Plenty Regional Water and Land Plan

BETWEEN DairyNZ Limited

AND Bay of Plenty Regional Council

STATEMENT OF PRIMARY EVIDENCE OF CARLA FRANCES MULLER FOR DAIRYNZ LIMITED AND FONTERRA CO-OPERATIVE GROUP LIMITED

22 February 2017

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1. EXECUTIVE SUMMARY

1.1. Mitigating nitrogen leaching to significant levels, such as the 2032 proposed nutrient discharge allocations (NDA) in the Bay of Plenty Regional Council's Proposed Lake Rotorua Nutrient Management Plan Change 10 (PC10), impose substantial economic costs on dairy farmers and in turn the community. While the cost of mitigating nitrogen leaching to these levels varies from farm to farm, they are likely to require major farm system changes and may mean some dairy farms are no longer viable in their current land use.

1.2. It is possible that PC10 does not present the most cost-effective way to achieve the community desired water quality objectives. PC10 requires dairy farmers to significantly reduce nitrogen leaching. However, there is no requirement to reduce phosphorus losses. As Dr. Stephens notes in his evidence (sections 5 and 6) there have been recent changes in the understanding of how nitrogen and phosphorus interact in Lake Rotorua, and emphasises the importance of the science review.

1.3. Mitigating nitrogen leaching does not mitigate phosphorus losses proportionally. Nitrogen and phosphorus losses originate in fundamentally different processes, and the Bay of Plenty Regional Council (the Council) has prioritised nitrogen management at to a far greater extent than phosphorus management. The decision about which nutrient to prioritise markedly alters the choice of mitigation. It is most cost-effective to select mitigations based on which nutrient is prioritised.

1.4. Over-regulating nitrogen leaching will not achieve the desired water quality objectives in the most efficient (cost-effective) way. If there is an 'overshoot' on regulating either, or both, nutrients, the cost of attaining a trophic level index ("TLI") of 4.2 or less in Lake Rotorua, will be greater than it need be, risking considerable, unnecessary economic cost and social harm to the community.

1.5. It is acknowledged that while having a moderate economic impact, the 2022 proposed NDAs in PC10 will help reduce nitrogen leaching on farm and contribute to the water quality objectives in Lake Rotorua. However, there is economic evidence that imposing the 2032 proposed NDAs will impose severe cost on farmers and the community. Because Lake Rotorua can achieve a TLI of 4.2 under phosphorus limitation and increased nitrate as nitrogen loading, the 2032 proposed NDAs should be revised as a result of a robust science review of co-limited and phosphorus limited approaches to achieving the desired water quality objectives for Lake Rotorua.

2. SCOPE OF EVIDENCE

2.1. In my evidence I provide information on the cost of mitigating nutrient losses on farm and how the most cost-effective method for achieving the desired water quality objectives is dependent on creating policies that are based on the relative reductions in nitrogen leaching and phosphorus loss required to meet these objectives. My evidence will deal with the following points:

a) I will provide information on the cost of mitigating nitrogen leaching on dairy farms, including stepping through the economic evidence in the Joint DairyNZ and Fonterra

Submission on the Proposed Plan Change 10 to the Bay of Plenty Land and Water Regional Plan (DairyNZ and Fonterra Submission).

b) I will explain the relationship between nitrogen leaching and phosphorus losses in order to demonstrate that in the future, if a review of PC10 results in phosphorus reductions being required, it will be important to understand the most cost-effective way of meeting these for the community. I will explain that if phosphorus reductions are required at a farm level, then the most cost-effective solution for farmers is to implement mitigation strategies that are targeted to the relative nutrient reductions required to meet the water quality objectives for Lake Rotorua.

3. INTRODUCTION

3.1. My full name is Carla Frances Muller.

3.2. I am employed by DairyNZ Limited ("DairyNZ") as an Economist, specialising in environmental economics. I work across research and development at the interface of farm, financial and environmental impacts, as well as regional and national economic impact assessments.

3.3. I have been employed with DairyNZ since November 2013.

Qualifications and experience

3.4. I hold a degree in Applied Economics (2013) and a Masters in Environmental Management (First Class Hons.) (2016) from Massey University.

3.5. I have completed the Intermediate Sustainable Nutrient Management course, which uses the Overseer model. I also have training in the use of Farmax, a farm modelling tool.

3.6. For my Masters thesis I analysed the impact of nutrient regulation on dairy farm land values in Southland.

3.7. I have presented at conferences of the New Zealand Agricultural Economics and Resource Society, the Australian Agricultural Economics and Resource Society and the Fertiliser and Lime Research Centre. Topics for these papers and presentations have included “The impact of reducing nitrogen leaching – An overview of the process and regulatory context in South Coastal Canterbury” and “Modelling dairy farm systems: processes, predicaments and possibilities”.

3.8. I have provided technical information for use in planning processes under the National Policy Statement for Freshwater management in various regions, including Canterbury, Southland and in the Waikato. This has included the provision of technical information on the impact of reducing nitrogen losses from dairy farms in the Waikato and Waipa River catchments for the Technical Leaders Group and presenting information to the

Collaborative Stakeholders Group for the Healthy Rivers Plan Change. I am part of the Technical Advisory Group for the Southland Economic Joint Venture project which is providing technical advice for the limit setting process in the Southland Region.

Background

3.9. I am familiar with Bay of Plenty Regional Council's Proposed Lake Rotorua Nutrient Management Plan Change 10 (PC10) to the Bay of Plenty Regional Water and Land Plan with respect to nutrient management and economic farm impacts in particular.

3.10. I have not been involved in the development of PC10. In March 2016 I was asked to analyse the economic effects on three case study farms in the Lake Rotorua catchment. To do this work, I was given farm data for case study farms in Rotorua, this included Overseer and Farmax files and proposed NDA calculations. DairyNZ used Overseer and Farmax to undertake farm systems modelling to calculate the economic cost of PC10. This farm systems modelling was completed by Taisekwa Chikazhe, who specialises in farm systems modelling at DairyNZ, I then reviewed this work. The results of this analysis was appended to the DairyNZ and Fonterra Submission (page 21).

Code of Conduct

3.11. I have read the Environment Court's Code of Conduct for Expert Witnesses contained in the Environment Court's Practice Note 2014, and I agree to comply with it. In that regard, I confirm that this evidence is within my area of expertise except where I state that I am relying on the evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this evidence.

4. BACKGROUND

4.1. PC10 sets nutrient regulations for dairy farms in the Lake Rotorua catchment. It sets a NDA for each farm with managed reduction targets that must be met in 2022, 2027 and 2032. It also requires dairy farmers to create a nutrient management plan to demonstrate how these nitrogen targets will be achieved and how they will manage phosphorus loss.

4.2. I note that some of the terms in the Proposed Lake Rotorua Nutrient Management Plan Change 10- Staff Recommendations (Strikeout Version) are different to those that were in the Proposed Lake Rotorua Nutrient Management Plan Change 10 (Version 4.0); nitrogen discharge allowances have been changed to nitrogen discharge allocations and nitrogen management plan has been changed to a nutrient management plan. I support the recommendations in the Proposed Lake Rotorua Nutrient Management Plan Change 10- Staff Recommendations (Strikeout Version) to alter these. The terms from Proposed Lake Rotorua Nutrient Management Plan Change 10- Staff Recommendations (Strikeout Version) are used in my evidence.

4.3. In section 5 of my evidence I set out the case study analysis I undertook to assess costs of proposed PC10 to dairy farmers. From this I conclude that achieving the 2032 NDA and managed reduction targets will incur economic costs for dairy farmers in the Lake Rotorua catchment ranging from an 8% to 22% reduction in operating profit (excluding interest and tax). Operating profit refers to the cash and non-cash income minus cash expenses, depreciation and non-cash adjustments.

4.4. My understanding of PC10 is that there is no farm level target for managing phosphorus loss from rural land uses. Reducing nitrogen and phosphorus losses from dairy farms will require different mitigation strategies as these nutrient losses have very different pathways.

4.5. The evidence pertaining to our best current understanding of the water quality science in Lake Rotorua is covered by Dr. Stephens and Professor Hamilton. From this, my understanding is that it will be important to manage both nitrogen and phosphorus on an ongoing basis in order to achieve the desired water quality in Lake Rotorua.

5. COST OF MITIGATING NITROGEN LEACHING

5.1. For dairy farms, mitigating nitrogen losses imposes economic consequences, which increases as the required reduction in nitrogen leaching increases. PC10 requires a standard dairy sector percentage reduction in nitrogen leaching of 31.3% by 1 July 2032. Of this 31.4% must be achieved by 1 July 2022 and 65.7% must be achieved by 1 July 2027. Farm-system modelling has shown that this will impose an economic cost on dairy farmers in the catchment, with a significant likelihood that some farms may have to undergo land use change due to insufficient viable mitigation strategies that can achieve the proposed 2032 NDA in the current land use.

5.2. The Statement of evidence of Mr. Matheson on Behalf of the Council focuses, in part, on the economic impact on famers of meeting proposed nutrient limits. Mr. Matheson (paragraph 16) acknowledges that the impacts of meeting nutrient limits are likely to have a differing financial impact across farms. He notes that dairy farmers will need to increase production to minimise financial impact and despite this increase in productivity most of the dairy farm case studies experienced a decline in operating profit as a result of meeting their proposed NDA.

5.3. In my opinion, allowing productivity gains to offset the economic cost of meeting proposed NDAs in farm systems modelling, as in Mr. Matheson's evidence (paragraph 17) is likely to understate the actual impact of meeting the nitrogen limits in PC10. The majority of farmers can be assumed as rational economic actors, who will seek to optimise their output based on their given level of skills (i.e., are limited by their current expertise). In order to lift productivity, they would need to increase their skill level through either training or advice from a consultant. Both options carry an economic cost and this needs to be considered when estimating the economic cost of meeting nutrient regulations.

5.4. The mitigations modelling I undertook, starts from the premise that mitigations, such as those required in LR R9 in PC10, will have a cost. If it were simple and profitable to reduce nitrogen leaching, farmers would naturally do this voluntarily, negating the need for a regulatory approach. While improving production of milksolids per cow, in combination with reduced stocking rates, has been shown in scientific farmlet trials (Macdonald, 2014), it is acknowledged that these lower stocking rate systems can be more difficult to manage, with more rapid shifts in pasture surplus and deficit situations.

5.5. Over time, we can expect such improvements incrementally, but not on all farms to the same extent. The expected pace of historical improvement would not provide enough of a productivity improvement to offset the expected cost of nitrogen mitigation. Historically, over the 20 year period from 1992 to 2012, milksolids (MS) production per cow in New Zealand rose from 259 kg MS per cow to 346 kg MS per cow, a compound annual growth rate of less than 1.5% (Dairy Statistics, 2014). Indeed, these slow historical improvements have done little more than counteract the historical increases in input costs that are also expected to continue to occur into the future.

5.6. The Statement of evidence of Mr. Matheson on Behalf of the Council also notes that the NDAs in PC10 are likely to require some dairy, and dairy support, farmers to make farm system or land use changes beyond what was envisaged by the Council and the Stakeholder Advisory Group. This is because the average dairy farm sector reduction has risen by a third from 25% to 35.3% in PC10 compared to recommendations in the *Rotorua NDA Impact Analysis* Report (Perrin Ag., 2014).

5.7. The Statement of evidence of Professor Doole on Behalf of the Council (paragraph 19) identifies the impact of proposed NDAs will vary markedly between sectors, even when trading occurs. Nonetheless, dairy farm profits are projected to fall sector-wide from the need to acquire additional NDA through trading to remain viable.

5.8. The significant economic cost of meeting the 2032 proposed NDAs was also identified by the DairyNZ and Fonterra Submission which found for three case study farms in the Lake Rotorua catchment, two were already meeting their 2022 managed reduction target but would still be required to implement further mitigation strategies to meet their 2027 and 2032 managed reduction targets. One farm was not meeting their 2017 target and would require mitigation to meet all of their managed reduction targets through to their 2032 proposed NDA.

5.9. My analysis, appended to the DairyNZ and Fonterra Submission, estimated that, while the level of mitigation required to meet the proposed NDA and the mitigation choices are farm specific, in general:

a) To meet the 2022 proposed NDA requires small changes on the farm system. For example, changing effluent solid application, increasing standoff pad times, changing high risk fertiliser applications and small reductions in stocking rate to match feed supplies. The economic impacts of these changes whilst again farm specific, ranged from **0% to -5%** reduction in operating profit (excluding subsequent interest repayment and tax). Only farms already meeting their 2022 proposed NDA would not suffer a reduction in operating profit.

b) To achieve the 2027 proposed NDA targets requires medium system changes, including reductions in fertiliser, slight decreases in stocking rate and changes in supplementary feeding practices. The economic impact of these changes is also farm specific but threefold greater, ranging from a **-2% to -16%** reduction in operating profit (excluding interest and tax).

c) To achieve the target for 2032 significant system changes are required to all farms. For example, through changes in wintering and young stock practices, removing cropping, reducing fertiliser applications and reducing stock numbers. This has severe impacts on all farms, ranging from a **–8% to -22%** reduction in operating profit (excluding interest and rent) relative to the farm's current operating profit.

5.10. As noted above, farm system research findings are for operating profit only. Operating profit refers to the cash and non-cash income (change in value of dairy livestock) minus cash expenses, depreciation and non-cash adjustments (such as unpaid labour). Operating profit excludes interest and tax.

5.11. Business viability is another key consideration. A business must have enough operating profit after mitigation to assure payment of interest, debt and tax obligations. To achieve the 2032 proposed NDA, operating profit reduced between 8% and 22%. When interest is included the reduction in operating profit, including interest payments, doubles, to between 15% and 38% for the three case study farms. This economic analysis uses an average (five years) interest payment for owner operators in Bay of Plenty Region and therefore, there is the acknowledgement that some farmers will have higher interest costs and some will have lower, meaning the true range of impact upon farm earnings is likely to be even more severe for some in the community.

5.12. The case study analysis in this evidence statement is for three case study farms. The negative economic impact is the same trend that was observed in the evidence of Mr. Matheson. The key difference between these two evidence statements is that Mr. Matheson increases dairy farm productivity (production efficiency) to minimise the negative economic impact. Even with productivity gains most of the dairy farm case studies in Mr. Matheson's study still experienced a decline in operating profit as a result of meeting their proposed NDA. The evidence of Professor Doole extrapolates the results from a case study analysis by Mr. Matheson to a catchment level and expects an overall negative economic impact on the dairy sector. While every farm will experience a different economic impact, there is strong evidence to support an overall negative economic impact for dairy farms.

6. RELEVANCE OF MANAGING PHOSPHORUS FOR WATER QUALITY OBJECTIVES

6.1. The evidence of Dr. Stephens has shown that managing phosphorus is important in meeting the water quality objectives of Lake Rotorua of a TLI of 4.2.

6.2. In the Plan Change 10- *Staff Recommendations (Strikeout Version)* the Bay of Plenty Regional Council has LR P2 which includes "manage phosphorus loss through the implementation of good management practices through the use of Nutrient Management Plans", this has been amended from "manage phosphorus loss through the implementation of management practices that will be detailed in Nitrogen Management Plans". I acknowledge this is an attempt to manage phosphorus losses from farms. The amount of phosphorus loss this will reduce on farm will depend the definition of good management practices and on current practice relevant to good management practice.

6.3. I support LR M2 (c)(iii) which provides scope for a science review by the Bay of Plenty Regional Council to include assessment of land-based phosphorus loss mitigations.

7. RELATIONSHIP OF NITROGEN AND PHOSPHORUS MITIGATION

7.1. Nitrogen and phosphorus have very different characteristics and pathways, and hence mitigation strategies. Nitrogen is most often leached through the soil, while the majority of phosphorus is lost through overland flow, often attached to soil particles (Parliamentary Commissioner for the Environment, 2013). The most cost-effective nutrient mitigations are specific and target the areas with the highest loss risk for each nutrient. For example, a low cost mitigation option for nitrogen is adjusting the timing of nitrogen fertiliser applications, but this will have no impact on phosphorus losses. On the other hand, while a low cost phosphorus mitigation option is using low solubility phosphate fertiliser (where soil conditions are appropriate), it has no impact on nitrogen leaching. Some nutrient mitigation strategies have co-benefits; they will reduce both nitrogen leaching and phosphorus loss, however these are normally significant changes to a farming system, such as removing cropping or substantially decreasing stocking rate.

7.2. My analysis appended to the DairyNZ and Fonterra Submission used three case study farms to determine the economic impact of meeting their proposed NDA. The mitigations applied targeted nitrogen leaching and as such, had very minor reductions in phosphorus losses. These are summarised in Table 1 below. These results show that there is very little benefit, in terms of reduced phosphorus losses, for these case study farms when they are reducing nitrogen leaching. What little phosphorus they do remove, has a very high cost when relying on nitrogen mitigations to reduce phosphorus. Two case study farms were able to remove 2% of their phosphorus losses, which is only 4 kilograms on one farm, and this has a high cost, between 15% and 20% reduction in operating profit (including interest). One farm was able to reduce phosphorus loss by 6%, however this reduces operating profit (including interest) by 38%.

Table 1: Reductions in phosphorus losses through nitrogen mitigation (Overseer estimates, version 6.2.1)

Scenario	Time period	Nitrogen leaching (kg N/ total ha)	Phosphorus loss (kg P/ total farm)	Percentage change in phosphorus loss	Nitrogen target (kg N/ total ha)	Percentage change in operating profit (including interest)
Farm 1						
Current	now-2017	73	488	0	NA	0
No change	2017-2022	73	488	0	93.4	0

No change	2022-2027	73	488	0	93.4	0
M.1	2027-2032	68	488	0	68.6	-3
M.2	2032- onwards	56	476	-2	55.6	-15
Farm 2						
Current	now-2017	106	652	0	NA	0
M.1	2017-2022	83	652	0	83.4	-4
M.2	2022-2027	73	652	0	73.7	-3
M.3	2027-2032	62	652	0	63.2	-11
M.4	2032- onwards	55	640	-2	52.7	-20
Farm 3						
Current	now-2017	79	358	0	NA	0
No change	2017-2022	79	358	0	82.6	0
M.1	2022-2027	73	355	-1	73.1	-7
M.2	2027-2032	61	344	-4	62.7	-27
M.3	2032- onwards	51	338	-6	52.4	-38

7.3. Other DairyNZ work (Burger, in prep.[1]) has also found that on-farm strategies required to reduce nitrogen are very different than for phosphorus. The most cost-effective mitigation for nitrogen or phosphorus is one that targets each specific nutrient, and if a farmer was trying to mitigate nitrogen and phosphorus it is likely a different set of mitigation options would be selected in order to minimise the cost. Work in the Waituna catchment in Southland provides a detailed example of this, a case study farm is shown in Figure 1 below. This case study farm shows results that were of a similar pattern to other farms in this study.

[1] Burger, in prep. Waituna Economics Report. David Burger, DairyNZ.

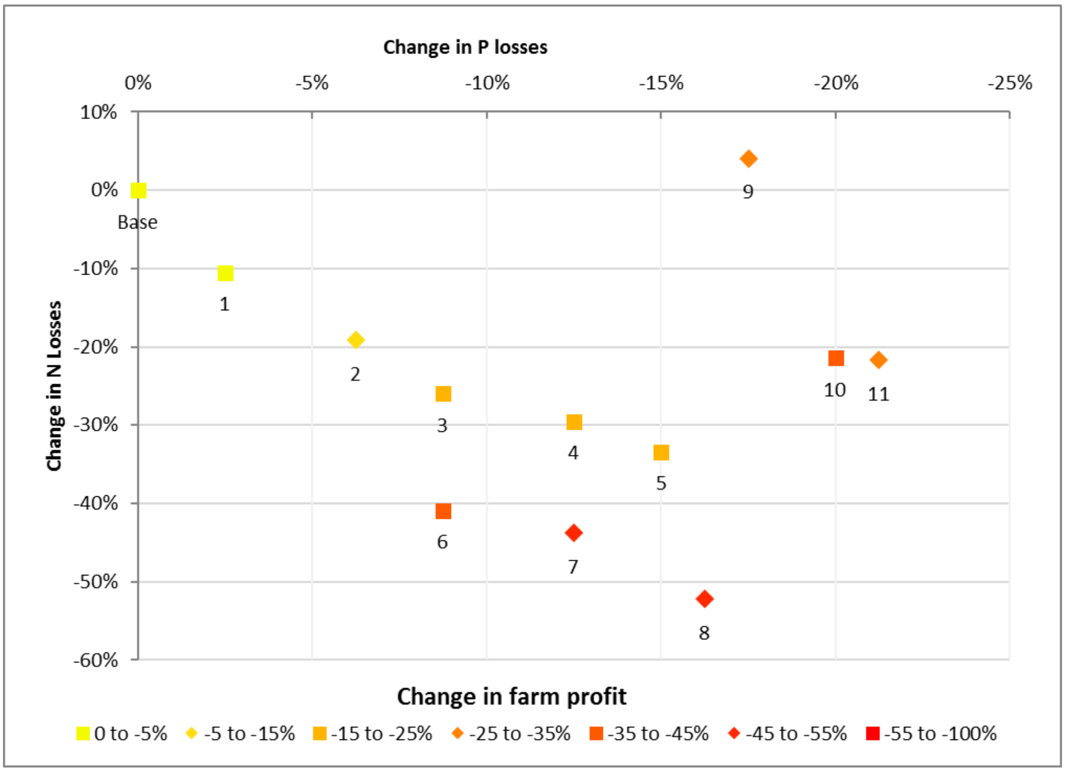

Figure 1: Relative cost and effectiveness of mitigation strategies

7.4. Figure 1 shows the relationship between changes in nitrogen and phosphorus losses for different mitigation strategies. If a farm was required to reduce only nitrogen leaching, by more than 40% they would utilise mitigation strategy 6 as it has a lower economic cost than mitigation options 7 and 8, it has very little (less than 10%) impact on phosphorus loss. If a farm was required to reduce phosphorus losses only then they would choose mitigation strategy 9 as it has a lower economic cost than mitigation options 10 and 11. However, if they were required to substantially reduce both nitrogen leaching and phosphorus loss then they would choose mitigation option 8 which has significant reductions in nitrogen and phosphorus losses and a very high economic cost (more than 45% reduction in operating profit). This illustrates that the most cost-effective mitigation options are likely to be different depending on which nutrients are required to be reduced.

7.5. In addition to this, some mitigation strategies can have a negative impact on the other nutrient. For example, targeting high reductions in nitrogen leaching (> 30%) offsets the associated impacts on phosphorus when mitigation includes the use of infrastructure (feed pads, stand-off pads), which has implications for effluent volume and block management.

7.6. Based on this, it is important to target the required mitigations on farm to that which will achieve the water quality objectives for Lake Rotorua. The 2022 managed reduction target from a farm's NDA will help reduce nitrogen leaching on farm and contribute to the water quality objectives in Lake Rotorua, however, the 2032 proposed NDAs could pose a high economic cost on farmers and the community.

7.7. PC10 requires farmers to carry a significant cost burden in achieving the water quality objectives. It is important to set rules that are going to achieve the desired objectives in the most cost-effective way, including targeting the relative reductions required in different nutrients to achieve the water quality objectives in a nitrogen, phosphorus or co-limited lake.

8. MITIGATING PHOSPHORUS

8.1. McDowell (2007) suggested that typically 80% of phosphorus losses from catchments originate from 20% of the land area, while others such as Sharpley et al. (1999) suggest this figure is even higher, at 90% from 20% of the land area. These areas are termed critical source areas (CSAs) and are created through the interaction by environmental factors, hydrological conditions and management activity. Many CSAs on farms cannot be modelled within nutrient loss modelling tools at this stage (including laneways, races, troughs, gateways and stock camps). Therefore, the majority of phosphorus loss is unable to be captured in Overseer and has not been explored by catchment modelling to date, emphasising the uncertainty surrounding the decision to prioritise nitrogen management in PC10.

8.2. Phosphorus mitigations can be considered more independent of production than nitrogen mitigation strategies (Anastasiadis et al., 2012). Phosphorus mitigation strategies are likely to include capital costs such as fencing waterways and CSAs. While the most cost-effective ways to mitigate phosphorus depend on the farm context, they are likely to include options such as remedying CSAs, ensuring Olsen P levels are at agronomic optimum, fencing water ways and utilising riparian planting. Targeting CSAs with mitigation strategies is likely to be an efficient and cost-effective method to reducing phosphorus loss (McDowell et al., 2004). DairyNZ has developed two resources that relate to phosphorus losses; *Good Management Practices* (DairyNZ, 2016) and *Nutrient Management on Your Dairy Farm* (DairyNZ, 2013), these resources include an overview of phosphorus loss pathways and how these can be managed, including a guide to what good management practice (GMP) may include.

8.3. AgResearch have conducted preliminary research into phosphorus mitigation effectiveness in the Lake Rotorua catchment, using knowledge of strategies successful at preventing, detaining or ex-filtrating phosphorus from surface water runoff and through-flow elsewhere in New Zealand (McDowell, 2010). Those phosphorus mitigation strategies impose widely varying costs ($0-$500/kg phosphorus mitigated) but include numerous individual mitigations that carry moderate to high effectiveness (up to 50% effectiveness) at relatively low cost (≤$100/kg phosphorus mitigated). This research, on behalf of the Bay of Plenty Regional Council found that low-cost (<$100/kg phosphorus mitigated) phosphorus mitigation strategies applied in New Zealand, can reduce anthropogenic phosphorus losses by up to 77%, but typically by 10-30% each (i.e., multiple phosphorus mitigations deliver greater effect) (McDowell, 2010). The evidence of Dr. Stephens, demonstrates that such effectiveness is within the range required for reductions in anthropogenic phosphorus loads, to result in conditions equivalent to or better than those currently arising in Lake Rotorua from alum-dosing (e.g., phosphorus limitation and a TLI ≤4.2).

8.4. Given the potential cost for mitigating phosphorus, especially after addressing CSAs and moving to GMP, there is a need to understand the most cost-effective way of mitigating phosphorus loss if a science review supports managed reductions in phosphorus losses. Potential mitigations for phosphorus loss includes on farm mitigations (such as McDowell, 2010), catchment and edge-of-field mitigations and in-lake interventions. Understanding the cost-effectiveness of these alternative types of mitigations will help to minimise the cost to the community if phosphorus loss is required following a science review.

9. CONCLUSIONS

9.1. Achieving the 2032 proposed NDAs in PC10 will impose substantial economic costs on dairy farmers and in turn the community. These costs will require major farm system changes for some dairy farmers and some dairy farms will no longer be viable.

9.2. Mitigating nitrogen leaching does not mitigate phosphorus losses proportionally. Nitrogen and phosphorus losses originate in fundamentally different processes. The decision about which nutrient to prioritise markedly alters the choice of mitigation. Until there is a science review, there is uncertainty about the potential effectiveness of phosphorus mitigation in achieving the water quality objectives for Lake Rotorua. If a science review finds that reducing phosphorus losses can meet the desired water quality objectives, then the economic costs of various mitigation options (on farm, edge-of-field or in-lake interventions) need to be explored to minimise the cost to the community of reaching the water quality objectives.

9.3. Given the economic evidence that the 2032 proposed NDAs will impose large costs on farmers, I support the science review.

10. REFERENCES

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