

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of submissions and further submissions by Rangitata Diversion Race Management Limited to the proposed Canterbury Land & Water Regional Plan

STATEMENT OF REBUTTAL EVIDENCE OF NIGEL ROLAND BRYCE (HEARING 2)

1.0 INTRODUCTION

1.1 My name is Nigel Roland Bryce. I am an Associate Director and Planner at Ryder Consulting Limited, an environmental consulting business. My qualifications and experience were outlined in my evidence in chief for Hearing 1.¹

1.2 I repeat the confirmation given in my evidence in chief,² that I have read and agree to comply with, the Code of Conduct for Expert Witnesses, as set out in the Environment Court's Consolidated Practice Note. I confirm, for completeness, that I have complied with the code in preparing this brief of evidence.

2.0 SCOPE OF EVIDENCE

2.1 The purpose of this brief of evidence is to respond to the evidence of the following witnesses:

- Dr Jim Cooke on behalf of Nelson/Marlborough, North Canterbury, and Central South Island Fish and Game Councils ('F&G');
- Ms Alison Dewes on behalf of F&G.

2.2 I discuss various matters raised by these witnesses in turn below.

3.0 EVIDENCE OF DR JIM COOKE

3.1 Dr Cooke sets out F&G's review of an alternative approach to managing nutrient discharges in Canterbury. This is expanded upon in the evidence of Mr Marsh³ who sets out (in general terms) the proposed rule regime advocated by F&G. Further, the memorandum of F&G's legal counsel (Ms Maree Baker-Galloway) provides a synopsis of the proposed farming rules. Key to this alternative approach is that all existing farming activities must achieve a '20kg/N/ha/year sustainable leaching standard'. The reasoning behind this leaching standard is set out principally within the evidence of Dr Cooke.

3.2 I have not had the opportunity to review the planning evidence of Mr Phillip Percy (in relation to which F&G requested an extension of time and which I understand will be made available on 19th April 2013). Therefore, this rebuttal evidence is prepared on the basis that a further review of Mr Percy's evidence will likely be required in order to determine the appropriateness of the policy and rule provisions proposed by F&G. If needed I will prepare a further brief of rebuttal evidence to address Mr Percy's evidence.

¹ Dated 4th February 2013 for Hearing 1.

² at paragraph 1.3 of my evidence in chief (Hearing 2).

³ at page 17 of Mr Marsh's evidence.

- 3.3 I understand that F&G's approach seeks to:
- (a) Identify the values of water bodies that need protecting, then set limits to protect these values;
 - (b) For nitrogen, the approach is then to set catchment specific loads that will maintain the river quality within the limits; and
 - (c) Calculate leaching allowances for individual properties that will result in acceptable catchment loads (20kg/N/ha/year sustainable leaching standard).
- 3.4 The F&G approach appears to be heavily influenced by the catchment specific approach advanced for the Hurunui-Waiiau Catchment and advanced under the Proposed Hurunui-Waiiau River Regional Plan (a decision on the submissions and further submissions to this planning instrument is still outstanding). While laudable, the approach (and underlying model used to reflect the need for an alternative approach) relies on a number of assumptions. As will become apparent from subsequent paragraphs of this statement, I question the appropriateness of some of the assumptions. As a consequence, I do not believe that the argument being advanced by F&G is appropriate, especially given the regulatory process that it seeks to underpin. Further, I believe that the approach plays down the importance of the Audited Self Management ('ASM') programmes advanced within the Regional Plan (both in the notified version and as recommended by the Reporting Officer) and the ability for these processes to assist with managing nutrient discharges across the region until such time as catchment specific limits are set from July 2017.
- 3.5 Dr Cooke reinforces that F&G is concerned that the Regional Plan provisions (as notified) have the potential to result in a change in land use resulting in a 10% increase in N load as a permitted activity. I understand that the 10% increase in N load is taken from the definition of 'changed' under the Regional Plan (as notified), which defines a more than a 10% increase in the loss of nitrogen from land used for a farming activity above average nitrogen loss from the same land for the period between 1 July 2011 and 30 June 2013, as a change to that farming activity. Dr Cooke's evidence assumes that all pastoral farming activities will intensify land practices up to the permitted level of loss while they can (or until sub-regional plan changes come into effect).⁴ I question if this assumption is valid and realistic. While I acknowledge that it represents a 'worst case' situation, my recent involvement in the agricultural sector (and indeed projects that Ryder Consulting is currently involved with) is that parties are seeking to actively improve their management of nutrient, even where they are promoting an increased intensity. A case in point is a proposed dairy conversion of Ohau Downs by Five River Ltd (located within the Mackenzie Basin). The latest iteration of this proposed dairy conversion is projected to result in no increase in N discharged from the property (the existing N discharge is estimated to be 10kg/ha/year) even though the proposal seeks to significantly intensify stocking rates to support this dairy conversion. I raise this here, given that it is an example of how seriously many farmers are taking water quality considerations and to identify the extensive measures that some are advancing to achieve the environmental outcomes being set by the Council and supported by several components of the regional community. As set out in my evidence in chief (Hearing 2), the RDRML is well advanced in implementing ASM programmes into the operation of the RDR and associated irrigation schemes (this includes the development of FEPs that have been designed to comply with Schedule 7 of the Regional Plan). While the formal adoption of FEPs at both a scheme and property level is subject to the final resolution of the land use consent which the Company is currently advancing, it reflects the fact that the RDRML and its shareholders take nutrient management very seriously and are moving towards implementing these processes.⁵ As a consequence, this assumption does not adequately take account of farm management practices that may already be adopted to offset N loss from existing farming operations (including those properties that are already governed by

⁴ refer paragraph 48 and 51.

⁵ at paragraph 5.15.

ASM programmes or that will likely be adopted by the time these rules are formally adopted).

- 3.6 Dr Cooke (at his paragraph 27) refers to Rule 5.42-5.45 that provide for this 10% increase in N load potential outcome. I note firstly, that of the rules listed by Dr Cooke, only Rule 5.42 provides for a change to an existing farming activity as a permitted activity. Rules 5.43 (restricted discretionary consent), 5.44 (discretionary activity consent) and Rule 5.45 (non-complying activity consent) all require resource consent for a change to an existing farming activity that does not comply with the relevant conditions prescribed with the respective rules. Further, Rule 5.42(1) specifies that any change to an existing farming activity is only permitted if the land holder has been granted a water permit, or holds shares in an irrigation company that has been granted a water permit, that authorises irrigation of land and the land is subject to conditions that specify the maximum amount of nitrogen that may be leached. In such instances, if the property owner does not comply with condition 1, then resource consent is required under Rule 5.43 (as a restricted discretionary activity). In situations where the Regional Council has approved water permits, one has to assume that the conditions that specify the maximum amount of nitrogen that may be leached, are appropriate and meet section 70⁶ of the Resource Management Act 1991 and achieve the Act's purpose. Put another way, for those existing properties governed by water permits that include nutrient limits, these limits must have been set having regard to matters such as the cumulative effects of nutrient discharges proposed under the water permit. As such, while it is appropriate, in my opinion, to apply a 'worst case' scenario, as Dr Cooke has sought to do, it is questionable whether farmers would automatically take up the 'as of right' 10% increase in N load as a permitted activity, and whether in all cases this would result in a 10% increase in N load. This is particularly the case when accommodating ASM processes or situations where farming activities are already restricted by nutrient management conditions (which limits nutrient discharges under their respective consents).
- 3.7 Dr Cooke sets out the process that F&G went through to estimate current nitrogen loads in three catchments in Canterbury (including the Ashburton Catchment which is of particular interest to the RDRML) and provides an overview of the 'simple model' that was used to assess an alternative method of estimating nitrogen load as a function of land use and catchment attenuation. Dr Cooke notes that the load estimates used within the model reflect current land use and assume steady state (that is leachate from current land use is reflected in current instream nitrogen load). A key concern that I raise with this assumption is that it ignores 'lag time' effects.
- 3.8 Dr Cooke sets out that the F&G model adopts an attenuation coefficient, which seeks to take account of processes such as immobilisation, denitrification, and uptake by periphyton or aquatic macrophytes. Dr Cooke states "*the average attenuation adopted within the model is an estimate of the effects of all of these processes without attempting to quantify their relative importance*". However, in addition to the likely attenuation that is occurring, there is also the possibility of hydro-geological 'lag' in the system where the increased nitrogen leaching load from activities in the catchment have yet to reach surface water bodies monitored. An acknowledged example of this 'lag effect' is within the Lake Taupo catchment

⁶ Under section 70(1) of the RMA, "*before a regional council includes in a regional plan a rule that allows as a permitted activity—*

(a) a discharge of a contaminant or water into water; or

(b) a discharge of a contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water,—

the regional council shall be satisfied that none of the following effects are likely to arise in the receiving waters, after reasonable mixing, as a result of the discharge of the contaminant (either by itself or in combination with the same, similar, or other contaminants):

(c) the production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials:

(d) any conspicuous change in the colour or visual clarity:

(e) any emission of objectionable odour:

(f) the rendering of fresh water unsuitable for consumption by farm animals:

(g) any significant adverse effects on aquatic life".

where the transmission time for soil nitrogen leached to the Lake is estimated to take decades.⁷ Dr Cooke notes that while modelling does not take account of 'lag times' between the leaching of nitrogen in the paddock, and its eventual appearance at a river measuring point, in his opinion, it is sufficient to demonstrate a trajectory of change.⁸

- 3.9 Based on my own understanding of these processes, a lack of consideration given to an understanding of catchment specific flow paths and lag effects would diminish the robustness of the approach advanced by F&G (especially as this relates to an understanding of cause and effect). While I appreciate that the approach advanced by F&G is, itself, an interim response tailored to arrest water quality degradation, in my opinion, there is a lack of robustness underpinning this approach that calls into question it being applied as a regulatory approach in the Regional Plan.
- 3.10 While their evidence is geared towards addressing the appropriateness of OVERSEER and the use of this model as a regulatory tool, I note Dr Robert's and Dr Edmeade's both reinforce that the amount of nitrate N leaving the root zone does not necessarily represent the amount reaching water bodies.⁹ Further, Dr Edmeade's states *"that the proportion of nitrate moving into the ground water depends on what hydrologists refer to as the attenuation and understands that for convenience this is taken to be about 50% but that it can vary considerably depending on the catchment. The estimated nitrate N leaving the root zone and getting into water bodies could be calculated if the attenuation figure was known in a given catchment but it would need to be qualified by the size of the Type B error"*. As such, the attenuation factor is a key mechanism in being able to accurately predict N loss from below the root zone.
- 3.11 F&G have applied an N attenuation coefficient of 0.26 to the Ashburton Catchment,¹⁰ however, Dr Cooke does not apply any sensitivity analysis as to how accurate this calibration process was in determining the attenuation coefficient. I see this as being relevant to determine the weight that should be applied to this approach, especially given that a detailed analysis of the surface and subsurface hydrogeologic and biophysical characteristics of the three catchments has not been performed.¹¹
- 3.12 In relation to the adoption of 20kg/N/ha/year sustainable leaching standard advanced by F&G, this reflects the approach adopted within Rule 5.46 (as notified), which the Reporting Officer has recommended be deleted from the PL&WRP. I address this at paragraphs 7.13 to 7.19 of my evidence in chief (Hearing 2). In short, I support a move away from a region-wide nitrogen discharge limit as the basis to regulate nutrient management activities, especially when this is applied at such a broad scale and which does not respond to catchment specific nutrient management issues.

4.0 EVIDENCE OF MS ALISON DEWES

- 4.1 Both Mr Marsh and Ms Dewes for F&G signal a desire to make all farming activities within red and orange zones a controlled activity on the basis that ASM programmes should be underpinned by a regulatory approach.¹² I do not support this approach for the reasons that I set out below.

⁷ As set out in the Waikato Regional Plan (Variation 5) Lake Taupo (Section 3.10)

⁸ Paragraph 77.

⁹ Dr Edmeade's at paragraph 26(d), and Dr Robert's at paragraph 30 of their evidence in chief (Hearing 2).

¹⁰ Dr Cooke states at paragraph 38 that this was achieved through a calibration process whereby we iteratively varied attenuation coefficients (K) in Equation 1 until agreement was achieved with the observed river loads. For this exercise, we focused on the average annual observed loads for each catchment shown in Table 1. We compared these average loads to the average of those calculated using Equation 1 for the two time periods (2000 and 2013).

¹¹ As set out at paragraph 41 of Dr Cooke's evidence.

¹² refer paragraph 172 of Ms Dewes evidence in chief (Hearing 2)

- 4.2 Ms Dewes sets out the limitations of an ASM approach and refers to Mr Ian Brown's evidence produced as part of the Proposed Hurunui Waiau River Regional Plan Hearing.¹³
- 4.3 While I agree there are limitations to ASM programmes, especially where property owners are slow to take up this approach, in my opinion, this should not overshadow the fact that the ASM process which the RDRML is currently seeking to implement on the ground is geared towards managing on-farm environmental impacts. The RDRML and its associated irrigation schemes have already altered their company constitutions to provide greater powers to impose sanctions through an irrigation schemes ability to 'shut off water', where a landowner does not seek to advance ASM processes appropriately. Further, should the rule regime recommended by the Report Officer be adopted, the Council would also have the ability to take enforcement action in situations where farms undertaking 'high risk farming activities' located within the red or Lake zones have not undertaken corrective measures to ensure that the FEP's achieve the appropriate audit grade (required under Rules 5.41 and 5.42 and as specified within Schedule 7). In this situation, the Council could seek to ensure that a resource consent for a discretionary activity was applied for under Rule 5.47.
- 4.4 In my opinion, the revised rule framework recommended by the Reporting Officer, while still relying upon an ASM process to manage nutrients over the interim period (before catchment specific limits are advanced under Sections 6-15 of the Regional Plan), adopts a more targeted approach at managing those 'high risk farming activities' that have the potential to generate greatest nutrient discharges and manages these activities in accordance with Schedule 7 (as amended). For those 'high risk farming activities' occurring within those more sensitive nutrient management zones, the recommended rule structure provides for a more thorough and comprehensive risk assessment process, which in my opinion, is geared towards sustainably managing nutrient discharges from these farming activities.
- 4.5 The key concern of F&G is a further degradation of water quality in those areas located within the orange and red nutrient management zones and the need to impose greater regulatory control over farming activities occurring within these zones (by way of a controlled activity consent). In my opinion, the ASM process recommended by the Reporting Officer (under proposed Rule 5.41(2)) imposes a greater requirement for the FEP to address environmental risks, risks specific to that property and measures necessary to address these effects and risks. This provides individual property owners with comprehensive guidance on those matters that are required to be addressed within the FEP. While the recommended approach advanced by the Reporting Officer does not seek to impose an on-farm nutrient allowance (as is sought by F&G), I believe that the permitted activity rules recommended by the Officer are geared towards maintaining water quality over the interim period and thus are both an acceptable and appropriate response to what is a complex and difficult issue (subject to those amendments that I have recommended within Appendix B to my evidence in chief (Hearing 2)).
- 4.6 I note that Rule 5.41 only regulates 'high risk farming activities' located within the red zone and the rules proposed by the Reporting Officer do not address 'high risk farming activities' occurring in the orange zone. To ensure that 'high risk farming activities' occurring within the orange zone are subject to a more robust FEP assessment process, it would be appropriate, in my opinion, to include reference to the 'orange zone' into Rule 5.41. Without this amendment there is the potential that 'high risk farming activities' could be subject to a less onerous FEP process.
- 4.7 Providing that the FEPs are being regularly audited (either annually or every two years for properties governed by Scheme Management Plans and where there is no change to existing farming activities over this audit period) I do not consider that a resource consent for a controlled activity is warranted. I reach this conclusion having considered the operation of existing ASM processes and those that are to be implemented by the likes of the RDRML,

¹³ at paragraph 158.

which are specifically tailored towards sustainably managing nutrient discharges in the Ashburton Catchment.

Nigel Roland Bryce, B.REP, NZPI.

10th of April 2013