

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of the Proposed Canterbury Land and
Water Regional Plan

**SUPPLEMENTARY STATEMENT OF EVIDENCE OF GERARD MATTHEW WILLIS
RESPONDING TO QUESTIONS FROM THE GROUP 2 HEARING**

1. INTRODUCTION

1.1 My full name is Gerard Matthew Willis and I have the qualifications and have the experience set out in my statement of evidence for the Group 1 hearing. I again agree to comply with the Environment Court's Code of Conduct for Expert Witnesses.

2. SCOPE OF EVIDENCE

2.1 This evidence responds to questions put to me by Commissioners during presentation of my Group 2 hearings evidence on the Canterbury Land and Water Regional Plan ("the Plan"). It covers the following questions:

- (a) Whether it would be beneficial to place some additional spatial constraint of the consideration of the calculation of the top 10% or 25% of nutrient leaching performance (as well as soil type) for the purposes of Policy 4.31 and 4.32?
- (b) Whether some qualification should be placed around the words "environmental effects and risks" as they are used in the Farm Environment Plan Framework (and in particular in the wording of Schedule 7, Part A 1(a)(ii)¹ and Part B 4 and 6)?
- (c) Whether Schedule 5 (Mixing Zones and Receiving Water Standards) could or should have wider application in terms of permitted activity rules and rules requiring discharge consents than they currently do?

¹ This reference uses the numbering contained in the Section 42A Report. In the redline version included in my Group 2 hearing evidence in chief I have renumbered that provision to Part A 1 (b).

3. QUESTION 1 – POLICIES 4.31 AND 4.32

- 3.1 As answering this question requires knowledge of farm nitrogen leaching performance under different environmental conditions, I have relied on the technical evidence of Mr Cullen and in particular, paragraph 3.2.
- 3.2 There is an argument that the scale at which the top 10% or 25% is calculated ought to acknowledge all the factors that are outside a farmer's control. These would be rainfall, evapotranspiration rates, temperature and soil type ("environmental variables").
- 3.3 Theoretically, under such an arrangement a database could be kept of all farms in the region and their respective environmental variables. Using such a database the 10th and 25th percentile of the population of farms with similar environmental variables could be easily calculated. When an application is assessed it would then be compared against the 10th (or 25th) percentile of farms with the same environmental variables as its own.
- 3.4 Such an approach would be the most accommodating of new dairy farming. That is because no farming environment is disadvantaged more than any other. In other words, it would be just as "easy" for a farm to establish in an inherently high leaching area as in an inherently low leaching area.
- 3.5 Having considered the implications of such an approach and, in particular, the incentives that would exist in terms of enhancing the sustainability of dairy farming as that relates to water quality, I do not support the approach. More specifically my reasons for not supporting that approach are that:
- (a) It would be difficult for the Regional Council to maintain the database required.
 - (b) There could be perverse outcomes in terms of nitrogen use *efficiency*. That is, due to the possibility of very small data sets, new farms could be compared with existing farms that do not necessarily represent good practice in terms of nitrogen leaching. Thus poor nitrogen use efficiency farms could be considered acceptable.
 - (c) It is unlikely to drive the preferred behaviour of intensive/high leaching uses being located in areas where there is lower potential for leaching. It is similarly unlikely to drive the next preferred behaviour, namely the adoption of on-farm mitigation measures to reflect the more challenging environment.

- 3.6 That point made, it would be unrealistic to expect new farms to be in the top 10% or 25% of farms that have the “easiest” environmental operating conditions. Some balance is required if we are to avoid creating a hurdle that no new farm could cross no matter what mitigation is employed.
- 3.7 For that reason I support continued acknowledgement of the soil type in the calculation of the 10% or 25% but propose that clarification be added to the policy such that this assessment be undertaken at the *sub regional scale*. In other words, for Policy 4.31 a new farm would have to demonstrate that they could operate at a level of N loss that represents that 25th percentile of farms in the sub region on the same soil type. That seems to me a pragmatic approach that acknowledges some natural constraints on nitrogen loss performance without going as far as to provide an opportunity for the establishment of high N losing, N inefficient farms.
- 3.8 The change proposed in Policy 4.32 is shown in paragraph 5.14.

4. QUESTION 2 – SCOPE OF FARM ENVIRONMENT PLANS

- 4.1 The intended scope of farm environment plans (FEPs) can be deduced from:
- (a) Policy 4.28 (as proposed in the Section 42A Report), which states that the purpose of Farm Environment Plans is to minimise the loss of nutrients
 - (b) Policy 4.38 (as proposed in the Section 42A Report), which refers to delivering good practice in a *range* of farming activities, including nutrient discharge management, efficient and effective use of water for irrigation, stock movements across waterways, offal and farm rubbish pits effluent storage and fertiliser use.
 - (c) The mandatory list of matters set out in section 5 of Part B of Schedule 7. These include:
 - (i) Nutrient management;
 - (ii) Irrigation management;
 - (iii) Soil management (“in order to minimise the movement of sediment, phosphorous and other contaminants to waterways”);
 - (iv) Collected animal effluent;

- (v) Livestock management (“to avoid damage to the beds and margins of a waterbody and to avoid the direct input of nutrients sediment and microbial pathogens”); and
- (vi) Offal pits and rubbish dumps (“to minimise risks to health and water quality”).

4.2 On that basis it is clear to me that the focus of FEPs is on water quality (and nutrients in particular) although water use efficiency is also an express focus. Damage to beds of water bodies and risk to human health are also relevant but I read this as being within the context of water quality and aquatic ecosystem health.

4.3 On that basis it is my opinion that the existing reference in Schedule 7 Part A to “environmental effects” is too broad.

4.4 I have considered a number of options for alternative wording and consider that the purpose of FEPs is best captured by reference to Table 1 (as Table 1 focuses on water quality and in particular nutrients, sediments and microbial pathogens) and to water use efficiency. Hence I proposed the following amendment to my proposed wording of Schedule 7 Part A 1 (b):

“A methodology that will enable development of a plan that will identify ~~environmental effects and~~ risks to the achievement of the outcomes of Table 1 or to the efficient use of water that are specific to the property.”

5. QUESTION 3 – USE OF SCHEDULE 5

5.1 There are just four references to Schedule 5 in the Plan.

5.2 Policy 4.10 requires that the effects of discharges of contaminants to surface water or groundwater meet the receiving water standards of Schedule 5.

5.3 This is translated into rules in²:

- (a) Rule 5.72 - Discharge of stormwater (as a permitted activity). In that rule Schedule 5 applies where the discharge of stormwater is to surface water; and
- (b) Rule 5.76 - Other discharges to water not otherwise classified (being permitted activities).

² Reference to Schedule 5 is also made in Rule 5.55 (Land drainage discharges) but only in respect to the Schedule’s definition of Mixing Zone.

5.4 Where a consent is required, Schedule 5 will need to be “had regard to” as a result of Policy 4.10 (although that would not be the case in respect of any restricted discretionary consent if that policy is not specifically referred to as a matter of discretion).

5.5 In short, the Schedule (and the standards it contains) is conceived as a providing a threshold for permitted point source discharges. Of some note, in no case is Schedule 5 applied to a discharge to land in circumstances where a contaminant may enter water (i.e. the Schedule 5 standards never imposes a threshold receiving water standard for discharges to land that may enter water). That is ostensibly because the Schedule 5 standards are “after reasonable mixing standards” and the concept of reasonable mixing only applies in relation into direct discharges to water.

5.6 This raises two key planning questions:

(a) Will Schedule 5 apply to all point source discharges to water?

In my view the answer to that is yes. The only permitted activities allowing a point source discharge to water are Rules 5.72 and 5.76 which, as noted above, both refer to Schedule 5. The rules allowing discharges to water as a consented activity are rules 5.28 (agricultural), 5.57 (sub surface drains) and 5.63 (sewage). Rule 5.57 is a discretionary activity rule. Rule 5.63 is a non-complying rule. Hence in both instances Policy 4.10 (and hence Schedule 5) will apply to decision-making. Rule 5.28 is an RDA rule and hence Schedule 5 may not apply but this is appropriate given the nature of that particular discharge.

(b) Should Schedule 5 apply to discharges to land in circumstances where that discharge may enter water and/or to land use (farming) rules?

In board terms my answer to that is no. As I understand it the standards are specifically designed to be measured outside of a specific mixing zone (i.e. the point of measurement is clearly defined). The appropriate point of measurement for a non point source discharge is, by definition, undefinable. Moreover many of the standards included in Schedule 5 will not be relevant to a land use or non point source discharge and yet if the standard were imposed there would be an obligation to demonstrate compliance with each standard.

5.7 That said I accept that an in-stream concentration standard for certain, directly relevant contaminants may be appropriately applied as a permitted activity threshold

or standard/term for a consentable non point source discharge/land use. I note for example the use of the nitrate-nitrogen concentration standard in that context in the Decisions Version of the Hurunui and Waiau Rivers Regional Plan.

- 5.8 However, Schedule 5 does not include a nitrate-nitrogen standard. The Schedule does include a dissolved inorganic nitrogen concentration (DIN) standard but this is unrelated to the toxicity issue sought to be addressed by the nitrate-nitrogen standard. The purpose of a DIN standard is to either limit periphyton/plant growth or is set more broadly for general water quality management. Schedule 5 also contains a dissolved reactive phosphorus (DRP) standard and an E.coli standard.
- 5.9 Although those three standards are of direct relevance to diffuse discharges from agricultural land uses, Ms Hayward's evidence informs me that there are both technical issues and practical difficulties in applying those standards to permitted activity rules governing land use and associated diffuse discharges.
- 5.10 I note in particular Ms Hayward's evidence that:
- (a) Compliance with the water quality standards of Schedule 5 does not necessarily mean that compliance with Table 1 will be assured. Similarly, non compliance with the water quality standards of Schedule 5 does not mean the outcomes of Table 1 will not be achieved. This is because each catchment has different flow conditions, water clarity and substrate types; and
 - (b) Water quality data that would allow assessment against the standard by a landholder is patchy. This would mean in places it would not be possible for a landholder to know or easily ascertain whether they would be in compliance with a permitted activity condition requiring compliance with Schedule 5.
- 5.11 On that basis I agree with Ms Hayward that it would be inappropriate to apply Schedule 5 as part of the permitted activity land use/diffuse discharge rules. However, I also agree with Ms Hayward that Schedule 5 could have wider application by inclusion in the relevant policies and rules associated with land uses and associated discharges requiring consent (where it would not otherwise apply as under the Plan as proposed in the Section 42A Report).
- 5.12 For the reasons already given, in doing so it will be important to ensure that the standards are not applied inappropriately and that account is taken of the different characteristics (including whether periphyton/plant growth in a waterbody is nitrogen or phosphorus limited). Hence I propose that distinctions be made in the application

of the policy according to waterbody types using the typology already included in Schedule 5.

5.13 Furthermore, I note that Ms Hayward suggests that a nitrate-nitrogen standard be added to the list of toxicants in Schedule 5. I agree that this will be important as my suggested approach to applying the DIN standard would otherwise mean that there would be no upper limit of nitrogen on lowland water bodies.

5.14 Hence, I proposed that Policies 4.31 and 4.32 be amended as follows³

4.31 *In areas where regional water quality outcomes are at risk of not being met, as shown by an Orange colouring on the Series A Planning Maps, a changed or new farming activity will be required to show that there is no net increase in nutrients discharged from the property or:*

- a. *That advanced mitigation farming practices are applied such that the property operates in the top 25% of ~~nutrient nitrogen discharge loss performance per hectare per year (estimated using Overseer™)~~ minimisation practices when measured against ~~practices in the relevant farming industry in areas of the same or similar soil type~~ within the same sub region; and*
- b. *That the activity does not result in water quality standards in Schedule 5 for DRP being exceeded in the receiving surface water body; and*
- c. *That the activity does not result in water quality standards in Schedule 5 for TN and TP being exceeded in any lake; and*
- d. *That the activity does not result in water quality standards in Schedule 5 for DIN being exceeded in a Upland, Banks Peninsula, Lake-fed or Spring-fed lower basin waterbody; and*
- e. *That the activity does not result in water quality standards in Schedule 5 for nitrate nitrogen being exceeded.*

4.32 *In areas where regional water quality outcomes are not being met, as shown by a Red colouring on the Series A Planning Maps and in Lake Zones as shown on the Series A Planning Maps, a changed or new farming activity will be required to show that there is no net increase in nutrients discharged from the property or:*

- a. *That advanced mitigation farming practices are applied such that the property operates in the top 10% of ~~nutrient nitrogen discharge loss performance per hectare per year (estimated using Overseer™)~~ minimisation practices when measured against ~~practices in the relevant farming industry in areas of the same or similar soil type~~ within the same sub region; and*
- b. *That the activity does not result in water quality standards in Schedule 5 for DRP being exceeded in the receiving surface water body; and*
- c. *That the activity does not result in water quality standards in Schedule 5 for TN and TP being exceeded in any lake; and*
- d. *That the activity does not result in water quality standards in Schedule 5 for DIN being exceeded in a Upland, Banks Peninsula, Lake-fed or Spring-fed lower basin waterbody; and*
- e. *That the activity does not result in water quality standards in Schedule 5 for nitrate nitrogen being exceeded.*

5.15 I also propose a corresponding amendment to Rule 5.45.

5.45 *The use of land for a changed farming activity or a new farming activity, where the property is partly or wholly in an area coloured Orange on the Series A Planning*

³ Note text in Blue font is that contained in the Section 42A Report. Text in Red font is that proposed in my evidence in chief (group 2 hearings) and text in Green font is as now proposed in response to questions from the Commissioners.

Maps, is a restricted discretionary activity provided the following condition is met:

1. *A farm environment plan is prepared, implemented and audited in accordance with Schedule 7 Parts A and C.*

The CRC will restrict the exercise of discretion to the following matters:

1. *The content of, compliance with, and auditing of the Farm Environment Plan;*
2. *The potential effects of the land use on surface and groundwater quality, and sources of drinking water;*
- ~~3. *The contribution of nutrients from the proposed activity to the nutrient allocation status of the management zone.*~~
3. *The extent of compliance with the matters contained in Policy 4.31.*
4. *The extent to which the proposed activity will prevent or compromise the attainment of the environmental outcomes sought by, or is inconsistent with, the objectives and policies of this Plan relating to nutrient management and water quality.*

5.16 Finally, based on the supplementary evidence of Ms Hayward, I propose that Schedule 5 be amended by including within the “Toxicant water quality standards for all water classes except Class NATURAL” a nitrate-nitrogen standard as follows.

	Level of protection (% species)		
	99%	95%	90%
	Adverse effects on aquatic organisms are less than negligible	Adverse effects on aquatic organisms are less than minor	Adverse effects on aquatic organisms are minor
	Numerical standards		
	µg/l	µg/l	µg/l
NON METALIC INORGANICS			
Nitrate-Nitrogen (as annual median)	1,000	2,400	3,800