

BEFORE THE

Waikato Regional Council Hearing
Commissioners

IN THE MATTER

of the Resource Management Act 1991

AND

IN THE MATTER

of Waikato Regional Proposed Plan Change 1 –
Waikato and Waipā River Catchments

**STATEMENT OF HAMISH LOWE
ON BEHALF OF THE WAIKATO AND WAIPA RIVER IWI IN RELATION TO
THE HEARING TOPICS FOR HEARING BLOCK 2
(Submitter No. 74035)**

3 MAY 2019

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INTRODUCTION

1. My name is Hamish Timothy Lowe.
2. I am an Environmental Scientist with Lowe Environmental Impact Limited.
3. My evidence is given in relation to matters in PC1 that relate to the interpretation and implementation of Policies and Rules, and their associated schedules, which impact on farming systems.

EXECUTIVE SUMMARY

4. The approach set out in PC1 to give effect to Te Ture Whaimana and the NPS-FM has the ability to ensure all parties can contribute and buy-in to restoring and protecting the health and wellbeing of the Waikato and Waipā Rivers. This evidence focusses on fine tuning and increasing the workability of the current proposal.
5. The framework proposed within PC1, including the rules, Nitrogen Reference Points (**NRP**) and Farm Environment Plans (**FEP**), provide for significant data to be captured about farming systems.
6. With respect to farm system related data collection, it is critical to make sure data collected serves a purpose and a benefit, as collection of unnecessary data may consume time and resources that is better directed collecting data which is actually needed. The result of the misuse of resources is the potential failure to collect and manage critical data and potentially compromise the ability to measure effective change within the allocated timeframe.
7. Accordingly, I recommend a process that involves the collation of smaller accurate data sets, which can be expanded over time as farmers understand the need for data, get accustomed to providing it, and establish record keeping procedures that provide the data in a cohesive manner. This also allows targeted and relevant mitigation solutions to be developed and implemented over time.
8. My suggestion is to retain the concept of progressive dates for Priority 1, 2 and 3 sub-catchments, and develop Schedule 1 requirements further, so that farmers can incrementally provide additional information over

time. This would allow the most critical information to be collected first, with additional information added over time. The Schedule 1 requirements could be developed in three stages, as outlined in my paragraph 46 below.

9. The above conclusion is further supported by the fact that there are a limited number of professionals with the appropriate qualifications and experience to undertake the data modelling required in the timeframes proposed. This could lead to poor quality information provision, which ultimately compromises the establishment of a robust accounting framework; a matter that is integral to the purpose of PC1 and is a mandatory requirement to give effect to the NPS-FM and Te Ture Whaimana.
10. In some cases, particularly for smaller less intensive (hobby/lifestyle) farms, the required information for the reference baseline years' assessment will not be available and one option here is to use model farms as a contingency. This approach could be expanded to low intensive farms where default input values are used where specific data is not available. Further, there may be instances where some specific input information needed for the determination of NRP's is not available, and a contingency process is needed. The decision making and discretion not to use specific farm information could be better described in the NRP input standards rather than making allowance through the rule and schedule framework.
11. OVERSEER® Nutrient Budgets (**OVERSEER®**) is now widely used and accepted in the RMA context and there is now a very well-considered view on the limitations and usability of OVERSEER®. However, when new farming systems not anticipated by OVERSEER® are used, or the farming system is either a higher or lower end farming system (i.e. high or low nutrient loss system), the modelled result may be less accurate. This is particularly so for low intensity and nutrient loss, where application of a percentage reduction will be problematic (such as hill country farms where a stocking rate limitation may be more appropriate). As such, I support prioritising mitigating losses from high loss farms.

12. If a short-term time period (two years) was used for NRP reference years, then the potential for OVERSEER® inaccuracy is increased as it is an average annualised model. Therefore, a longer term, such as 5-year time period, is supported.
13. It is unclear whether record keeping is only required for reference years. In my view it should be ongoing, but Schedule B requirements should make this clear.
14. There may be benefits to catchment water quality management by having whole or sub-catchment Certified Sector Schemes (**CSS**), rather than relying on individual farm FEPs or CSSs that either span multiple catchments, or having multiple CSSs operating in a single catchment.
15. The glossary needs additions and clarification.

QUALIFICATIONS AND EXPERIENCE

16. I have the following qualifications and experience relevant to the evidence I shall give:
 - (a) Bachelor of Agricultural Science (Honours); and
 - (b) Master of Agricultural Science (Honours in Agricultural Engineering).
17. I am a member of several relevant associations including:
 - (a) Soil Science Society of New Zealand;
 - (b) New Zealand Institute of Agricultural and Horticultural Sciences;
 - (c) Water New Zealand;
 - (d) New Zealand Land Treatment Collective; and
 - (e) Environmental Institute of Australia and New Zealand.
18. I have served two terms as an elected council member of the Soil Science Society of New Zealand. I have served on the Biowaste Material National Research Programme advisory board for more than 6 years. I am a past Chairman of the New Zealand Land Treatment

Collective technical committee, an elected position I held for four years, and served on the technical committee for 10 years. Following this long-standing relationship with the New Zealand Land Treatment Collective, I now support the Collective by providing management services.

19. I am a Certified Nutrient Management Advisor in accordance with the CNMA programme. I am a Certified Environmental Practitioner, in accordance with the EIANZ accreditation programme. I am a certified Practicing Agriculturalist, in accordance with the NZIAHS accreditation programme. I am also a certified Hearing Commissioner (Chair) in accordance with the Ministry for the Environment's Making Good Decisions programme.
20. A key focus of my work involves the sustainable management of nutrients, wastes and environmental impacts in agricultural systems. This includes nutrients in farming systems, animal and processing water supplies and wastes being applied to production agricultural land and their resulting impact on soil and water quality.
21. I regularly undertake nutrient assessments and while there are many techniques available, OVERSEER® is a key tool for use. While a lot of my OVERSEER® modelling work has involved modelling individual farms, a significant component of my farm modelling work has been modelling complex farming operations and developing and modelling scenarios to assess land use change.
22. At a national level, I have actively participated in, and facilitated, various industry debates about the appropriateness and management of agricultural, industrial and municipal wastewater systems and the appropriateness of their application in a range of environments. This includes providing guidance to Regional and District Councils throughout the country and to the Ministry for the Environment. I have contributed to a number of waste management guidelines, regional plan processes and am a contributing author to IPENZ Practice note 21 (PN21): Farm Dairy Effluent Pond Design and Construction.
23. I have helped to design and deliver a nationally accredited (NZQA) onsite wastewater qualification and assist Massey University with delivering Farm Dairy Effluent training. I am a design accreditation panel

member for both the DairyNZ Farm Dairy Effluent System Design Accreditation Programme and Irrigation Design Accreditation programme.

EXPERT WITNESS CODE OF CONDUCT

24. I confirm that I have read the 'Code of Conduct' for expert witnesses contained in the Environment Court Practice Note 2014. In the same way as I would if appearing in the Court, my evidence has been prepared in compliance with that Code. In particular, unless I state otherwise, this evidence is within my sphere of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

SCOPE OF EVIDENCE

25. My evidence addresses the following matters:

- (a) The application of PC1 to the proposed accounting framework;
- (b) Revisions made to Policies and Rules;
- (c) Revisions made to schedules.

26. My evidence is limited to matters in PC1 that relate to the interpretation and implementation of Policies and Rules, and their associated schedules, which impact on farming systems.

CONTEXT – TE TURE WHAIMANA

27. I understand that PC1 was developed in response to Te Ture Whaimana o Te Awa o Waikato – the Vision and Strategy for the Waikato River (**Te Ture Whaimana**) and the National Policy Statement for Freshwater Management (**NPS-FM**). PC1 must give effect to both Te Ture Whaimana and the NPS-FM. Where there are inconsistencies between the two documents, Te Ture Whaimana prevails.¹

¹ Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010, section 12(1)(a).

28. Paragraph 32 of the Block 1 S42A report, and the legal submissions of the Waikato Regional Council (**WRC** or **Council**),² state that the 2017 version of the NPS-FM (NPS-FM 2014 amended in 2017) must be given effect to. On that basis, all references to the NPS-FM in my evidence refer to the NPS-FM 2014 (amended 2017).
29. Te Ture Whaimana is the primary direction-setting document for the Waikato and Waipā Rivers and their catchments which include the lower reaches of the Waipā River. It sets objectives for the Waikato and Waipā Rivers.
30. My evidence does not involve a detailed review of Te Ture Whaimana, the NPS-FM or their implementation in PC1. Rather, I will concentrate on aspects that relate to the implementation of the farming related policies and rules.

OVERVIEW

31. As a result of submissions, the Block 2 s42A report reflects a significant shift in position on many aspects. This is largely a positive shift, with changes now addressing the practical limitations of many of the initial propositions.
32. The significance of the changes and the commentary on these changes is extensive. With the limited time since the release of the Block 2 s42A report and the date for filing of evidence, I have not had the opportunity to thoroughly match and compare the issues I have identified by analysing Block 2 Appendix C, to the Block 2 s42A commentary on the relevant provisions. Consequently, I accept that responses to some of the issues raised may have been addressed.
33. I believe it is important to note that developing a regulatory framework for the management of water quality is complex, with greater layers of complexity resulting from varying land uses, development pressures and the need to in many case insist or enforce changes for land use activities that are currently having unacceptable effects on water quality.

² Block 1 Legal submissions for the Waikato Regional Council, 11 March 2019, at paragraphs 76 – 79.

34. Parts C1-C6: Policies, Rules and Schedules, as refined and summarised in the Block 2 section 42A report can be further improved. When considered as a whole there are many positives that will result from the implementation of the Policies and Rules of PC1, not only in terms of water quality, but having information to allow adaptive change to be made. My view is that in some cases this is a change in culture, specifically management practices within some land use.
35. All land users need to do their bit and take some responsibility, and while there are alternatives, I am of the opinion that the Policies and Rules of PC1 are workable; they just need refinement in some areas. My evidence below highlights areas where I think clarification, and in some cases change, is needed. I have then tried to identify relief, mitigation or alternatives to assist with the workability of the proposal. I anticipate that there may be answers to issues raised, but hopefully modification can be made to make the current proposal more workable.

ACCOUNTING FRAMEWORK

Big picture

36. PC1 provides an opportunity over the next 10 years to collect information to support allocation of acceptable nutrient losses throughout the Waikato and Waipā River catchments. This helps to satisfy and fulfil the obligations of Policy CC1 of the NPS-FM, and ultimately provides a level of information to support the setting or review of freshwater objectives and limits for individual Freshwater Management Units (**FMUs**).
37. The challenge for this period is collecting sufficient data with the right focus and of the required accuracy. There is a risk that too much data could be collected, with some of it not being needed or relevant. Due to the volume of data to be collected, in a short time period, there is the potential risk that there may not be the systems to receive this data, with opportunities lost to make the most of the next 10 years. There is also the aspect of not having the necessary resourcing to capture, describe and process the data that is collected.

38. Consequently, I believe care is needed to ensure the data collected is done so in a considered manner, and potentially staged to ensure the necessary accounting framework can be established and the appropriate resourcing supplied.
39. There are a number of specific aspects of PC1 that relate to resourcing and the merits of staging, and these are covered in my evidence below.

Stocktake and accounting

40. In order to make robust decisions on developing plans that give effect to Te Ture Whaimana and the NPS-FM, a stock take of information is needed within the next 10 years. This essentially requires data capture to demonstrate trends and identify the contributors to these trends. The framework proposed within PC1 (including the rules, NRPs and FEPs) provides for important data to be captured about farming systems. With this information, WRC will be able to collate significant information to better manage the environment and fulfil the obligations of the NPS-FM.
41. However, is all the information being sought needed and does it need to be collected within the proposed timeframe? Data gathering can be significantly resource demanding, and I question if there is currently the capacity to collect and develop the FEPs within the prescribed time frames. Therefore, it is crucial to ensure that the data that is collected serves a purpose and a benefit. Collection of unnecessary data may consume time and resources that are better directed toward collecting and managing critical data, thereby compromising the ability to measure effective change within the allocated timeframe.
42. I am not questioning the need to collect data, but I am suggesting a process whereby agreed essential data is prioritised and ideally progressively collected over time. This staged proposition is a result of the following analysis:
 - (a) *Is all the data needed now?* – There is no doubt that essential data makes future decision making easier, but if all information is not needed straight away, then instead of collecting it now, can we stage data collection?

- (b) *Is all the data actually needed?* – It is easy to develop a long list of information that is nice to have, but this comes at a cost and takes time to administer. If the data is not going to be useful to inform future decision making, then is the cost and effort of collecting justified?
- (c) *What will WRC do with the data?* – There is potentially a large amount of data and information to be provided, particularly through FEPs. It is unclear if the capacity and data collection/repository systems exist within WRC to manage the collection and analysis of this data. There is the potential that despite efforts being made by farms to provide reliable and accurate data, it may not be used by WRC, at least in the short term.
- (d) *What is needed to satisfy NPS-FM requirements for accounting frameworks?* – Of the information that is provided by farmers and through FEPs, it is unclear what will be used to help satisfy Policy CC1 of the NPS-FM, including the decisions to be made in 10 years' time about allocation of contaminant loads within specific catchments. Consequently, is there scope to target the focus of essential information first?
- (e) *Industry resourcing* – Provision of information takes time and resourcing. It is questionable, at present, whether the FEP information can be provided within the currently allocated time due to the large number of farms and in some cases considerable workload, and providing critical information for the accounting framework first would seem logical.
- (f) *Timing of mitigation* - Mitigation measures will likely take time to identify and implement. In many cases individual farms will require homework to be done to determine what mitigation is needed and then more time for the identified mitigation measures to be implemented. As such, mitigation solutions, and their effectiveness, will happen over a period of time with a lag between identification, implementation and resulting benefits.

43. The above analysis points to an approach whereby data collection is progressively phased to allow the most pressing information to be collected immediately. As data collection systems come online and resource capacity increases, additional data can be added over time.
44. The mass collection of a large suite of data in a short time period creates the opportunity for gaps or incomplete data sets. Compliance with information provision requirements also forces property owners to simply give councils information because it is needed by a certain date, irrespective of accuracy.
45. In my opinion, it would be better to have smaller accurate data sets, which can be expanded over time as farmers understand the need for data, get accustomed to providing it, and establish record keeping that provides the data in a cohesive manner. It also allows mitigation solutions to be developed and implemented over time that are targeted and relevant, and not simply borne out of the need to be showing to have done something.
46. My suggestion is to retain the progressive implementation concept for Priority 1, 2 and 3 sub-catchments as per the current rules, and develop Schedule 1 requirements further so that farmers can incrementally provide additional information over time. This would allow the most critical information to be collected first, with additional information added over time. The Schedule 1 requirements could be developed in three stages:
 - (a) Part 1 - Provision of key information – within 1 year – This may be the provision solely of information as set out in Schedule A (or specifically (Schedule A(1) to (5))).
 - (b) Part 2 - Provision of the remainder of Schedule A requirements (Schedule A(6)) and mitigation planning information – within 3 years.
 - (c) Part 3 – Provision of mitigation implementation status and less essential information – within 5 years.

47. I acknowledge that in respect of Sub-catchment 3, which has a date of 1 January 2026 set out in Rule 3.11.5.1A, my proposed timeframe in Part 3 above would result in the provision of information falling just outside the 10 year period that this plan is targeting. I therefore consider that revised dates are needed for Rule 3.11.5.1A to ensure early data capture of Part 3 information.
48. I note that the Schedule 1 requirements and their refinement have been identified for further reporting in Block 3 of this PC1 process.

DIFFUSE DISCHARGE MANAGEMENT

Overseer Suitability

49. In the last 10 years there has been significant debate regarding the use of OVERSEER® in a regulatory context. Having presented evidence previously in a number of Plan Change processes, Consent Hearings and Environment Court settings, I believe there is now a very well-considered view on the limitations and usability of OVERSEER®. This is reflected in a series of national summary reports, including PCE (2018)³ and Freeman Environmental Ltd⁴.
50. However, the focus in my opinion is now shifting to how we use the information generated from OVERSEER®, and the production of statistics that are relevant and meaningful. By this I mean we need to consider how we consolidate individual farm modelling outputs and provide general guidance that may influence decisions that inform decision making across a catchment, or in the case of PC1, a FMU.
51. Notwithstanding my comments above regarding OVERSEER®, the proposed rules do not limit nutrient loss assessments to solely using the OVERSEER® model. For example Rules 3.11.5.2A(6) and 3.11.5.3(5a) allow ‘...any other software or system...’ to be used. This approach is supported for the reasons discussed below.

³ Parliamentary Commissioner for the Environment (2018). Overseer and regulatory oversight.

⁴ Freeman Environmental Ltd (2016). Using OVERSEER in Regulation: Technical resources and guidance for the appropriate and consistent use of OVERSEER by regional councils.

Accuracy of OVERSEER® for low loss properties

52. An issue that should be considered when using models such as OVERSEER® is the best fit range. Models typically apply an algorithm developed from an actual observation dataset. These observations are a subset of a possible range of results and reflect the conditions when the observations were made. Where conditions may change, such as season to season or high or lower fertility sites, it would be expected the observations would have been different. The modelling relationship that is then derived reflects a theoretical relationship with the actual observations, but importantly allows extrapolation or estimates of what may occur under alternative conditions which fall outside the actual observations.
53. The algorithm process of extrapolating beyond the data set can mean that the accuracy (or correlation) with what may actually happen becomes lessened, meaning there is potentially greater error between predictions and likely actual observations/reality. Consequently, when new farming systems not anticipated by OVERSEER® are used, or the farming system is either a higher or lower end farming system (i.e. high or low nutrient loss system), the modelled result may be less accurate. Therefore, while OVERSEER® may have an error range of +/- 20 %, when low nutrient loss farms are modelled or a new unique farming system is considered, the error range may increase. This effectively means for example, that farms with a nitrogen (**N**) loss close to 10 kg N/ha/y may have an accuracy that is not as good as a farm system with a calculated nutrient loss of 25 kg N/ha/y.
54. The consequence of the above discussion is that targeting a specific N leaching value can be problematic for a unique farming system, or a low N loss farm, because the error margins may cancel out any targeted nutrient reduction. This means for PC1, insisting on specific reductions (i.e. 10 kg N/ha/y) may be difficult for unique farming systems or low nutrient loss farms. It would be preferable, in my opinion, to use a stocking rate approach rather than a nutrient loss approach for less intensive farming operations. The exact stocking rate threshold would need consideration. A stocking rate of 6 stock units per hectare in Rule

3.11.5.2 may be appropriate, but the 18 stock units per hectare as used in Rule 3.11.5.2A may be too high.

55. It also highlights the need to ensure alternative modelling approaches can be used if different farming systems are considered that are not currently able to be modelled in OVERSEER®.

The ability to apply mitigation to low loss farms

56. In my opinion, using the current modelling approach of OVERSEER® is problematic if needing to apply mitigation options to low loss farming systems (farms with a N loss of less than 15 kg N/ha/y). This is especially so where a nominated percentage reduction may be required to be achieved, as there are limited mitigation options that prove effective at this lower end of the N loss reduction spectrum.
57. The consequence for this is that, while there is the intention for all farming systems to reduce nutrient losses, the ability for low loss farming systems to make measurable changes (as described using OVERSEER®) will be problematic; and this highlights that a blanket percentage reduction in OVERSEER® NRP's should not apply to all farms, especially the lower loss farms. Consequently, the prioritising of greater effort to be made by high loss farms is supported. This is reflected in Policy 1 where farms with a NRP above the 75th percentile are required to reduce N losses to below the 75th percentile, and also farms with losses between the 50 and 75th percentile having to demonstrate clear and enduring reductions. I support this approach.
58. Further to the discussion above regarding the accuracy and ability to mitigate nutrient losses on low N loss farms, many of these farms will be hill country farms and the ability to employ standard N mitigation measures is somewhat limited. This makes improvements and reductions in N loss on hill country problematic. I therefore support a focus on using OVERSEER® on higher loss more intensive farms above a nominated stocking rate, such as described in Rules 3.11.5.2, 3.11.5.2A and 3.11.5.4.

The need for regular OVERSEER® modelling

59. Regular OVERSEER® modelling will create a burden and extra costs for some farming systems that have little change from year to year, especially if they are low nutrient loss farms. The Block 2 s42A report summarises several options, including that identified by Fonterra (paragraph 104).
60. I support a line being drawn (say N losses less than the 50th percentile), with farms above requiring annual OVERSEER® modelling and farms below having the option of either annual OVERSEER® modelling or, alternatively, providing farm production information that demonstrates consistency with previous years.

Policy 1 and the overall rule framework

61. The Block 2 s42A report (paragraph 210) has acknowledged the need to not so heavily rely on controlling N losses. I support this, as many farming systems can contribute phosphorus, sediment and microbial pathogens and may not necessarily have the same drivers to make change.
62. The NRP has been shifted from Policy 2 to Policy 1, with the introduction of a requirement to calculate a 50th percentile in addition to the 75th percentile. In my opinion, the introduction of this tiered approach of 50th and 75th percentiles is a positive change, as it provides for the higher N loss farms to do more than the lower N loss farms and provides for graduated scale and effect.
63. However, the 50th percentile is not reflected in any rules, and the 75th percentile is. Policy 1 is directive in stating “...and requiring farmers...”. There is the scope to add an additional clause under control matters or discretion matters for Rule 3.11.5.2A, 3.11.5.3 and 3.11.5.3 which could state: “...Where the NRP exceeds the 50th percentile and is less than the 75th percentile, action will be undertaken to demonstrate clear and enduring reductions of nitrogen leaching, with anticipated reductions set, practices to achieve those reductions and timeframes detailed;...”

Policy 1 - Reductions (75th percentile)

64. It is appreciated and supported that there is a need to reduce contaminant losses from farms. However, the connection between the 80-year water quality attribute states (Table 3.11.1), mechanisms to enforce reductions (rules), and on farm practices (FEPs), is not clear. Despite the apparent lack of connectivity between these three aspects,⁵ I feel the approach will achieve the overall desired outcome of improved water quality i.e. if the three elements collectively work and achieve a reduction in contaminant load then that is the most important thing. If not, change may be needed to ensure connectivity between these elements.
65. While there may be debate about the 75th percentile approach, it is one of a number of solutions for driving an improvement in water quality. On balance, I believe the logic of making higher discharging land uses reduce more than lower discharging land uses to help produce an overall improvement in water quality, is in this instance suitable. I do note however, that the focus is on N and an assumption is made that this will help mitigate effects of other contaminants. This approach may be appropriate for flat pastoral land. However, hill country properties use limited amounts of N and the key contaminants needing mitigation will be phosphorus (**P**) and sediment; for which the NRP approach has limited effectiveness in managing. Therefore, in my view the NRP is less appropriate for hill country properties and other strategies are needed, particularly those that focus on reducing sediment and P loss. This is another reason to support a stocking rate limitation approach on the less intensive hill country properties.
66. I note that in terms of application of the 75th percentile, the Glossary identifies that it is calculated based on dairy farming properties within a FMU. However, the 75th percentile application in both the Policies and Rules makes no distinction between dairy properties and any other property. Therefore, a non-dairy farm with a high NRP (such as a support property or a property with a lot of cropping) could have a

⁵ Which may not need to be clear if a workable system can be developed.

requirement to reduce its nitrogen loss arising from the calculation of the dairy farm-based 75th percentile calculation.

Policy 2 and Farm Environment Plans

67. A key consideration of PC1 is taking the next 10 years to collect information about farming systems and improve information on the sources of freshwater contamination so that, in 10 years' time, a more accurate allocation of required improvements can be applied to farming systems in various catchments. This process requires the establishment of an accounting framework that allows the tracking of farming systems and their effects.
68. Policy 2 sets out a means to establish FEPs to not only collate information, but identify and implement on-farm changes that lead to an enhancement in water quality. While this approach is in my view appropriate, care is needed to ensure not everything is done all at once in a way that would overwhelm WRC. At this time, I do not believe sufficient industry resourcing exists to deliver FEPs to the high standard anticipated within the allocated time.
69. This issue of resourcing and a potential staging approach is discussed later in my evidence. Potential policy changes reflecting this are suggested in the evidence of Janeen Kydd-Smith.

Policy 3A - Certified Sector Schemes

70. A new policy has been added (Policy 3A) which specifically relates to Certified Sector Schemes. I believe this separation is beneficial as it clearly sets out the establishment of the CSSs. However, it does not address specific issues relating to the Scheme as a whole, including the ability of farms to join and/or leave the Scheme and issues surrounding the definition of Schedule 2 (particularly Certification versus "being Certified"). This later issue is addressed in paragraph 128.

Policy 5

71. Policy 5 recognises the immediate need to make change, but also provides for change to be made over the 80-year timeframe.

72. This policy effectively relates to the rate of change. I believe additional wording could be used to also reflect the need to identify and make changes to farming systems, data gathering and reporting, over time to reflect the availability of current industry resourcing. Further, the provision of priority data first means that data gathering is not rushed and the quality and integrity of that data is less likely to be compromised. I note that rushing data gathering is likely to compromise the accuracy of any future decisions.

73. Such a change could be:

b1 – Development of management, recording and reporting systems will need to be progressively implemented over time to ensure effective changes are made as system knowledge and industry resourcing allows;

Rule 3.11.5.1A – Interim Permitted Activity Rule

74. Rule 3.11.5.1A includes a prioritisation approach that sequences the development of FEPs. This effectively sets a compliance date for Priority 1, 2 and 3 sub-catchments that are permitted until a specific date. After these dates, properties in each of the three priority sub-catchments are subject to a higher level of management (they must develop an NRP and FEP) to put in place mitigation measures that will reduce contaminant discharges and report information to the Council.

75. I believe the staggering of provision of information, based on the prioritisation approach, is appropriate. However, as noted elsewhere (paragraph 46), the provision of information within that sub-catchment should also be staged to manage both the availability of information and the resourcing available to undertake the reporting.

SCHEDULE A - REGISTRATION

Threshold Area

76. The Block2 s42A report proposes changing the registration threshold area from 2 ha to 4.1 ha. I support this change as it excludes many lifestyle properties. While they could have a significant cumulative nutrient loss, the administration of collecting all the relevant information would potentially outweigh the benefit. It would be far more practical to

use GIS to identify the number and location of properties and assign a generic nutrient loss factor.

Lead-in time

77. The period when registration should occur (May to November 2020) has been extended from the notified version of the plan. I am not certain that once the plan becomes operative there will be sufficient time for all property owners to have submitted the necessary detail to the standard needed. Many property owners may not be aware of the reporting requirements, and once aware (and given industry resourcing limitations) they will not be able to provide the needed detail to the standard required. Failure to provide sufficient time for reporting may result in incomplete or erroneous data being supplied, with farmer attitudes being 'we need to get it in to be compliant' and 'let's just give them something'. Forcing timing may compromise the accuracy of the data sought and ultimately the decisions made based on that data could be erroneous or have limitations.
78. I suggest that the reporting of Schedule A requirements be spilt over two of the three stages identified in paragraph 46, with registration of farms and areas (1 to 5) occurring at the nominated time, and then the location details (6) being provided within a further 3 years.

When data at benchmark date is not known

79. Clause 5(d) requires a description of the activities and land area on the property to be provided as of 22 October 2016. While there is a need to establish a baseline, including setting a reference date, there is the potential that with ownership changes such detail may not exist. This is especially as it may be four years between this benchmarking date and the need to submit the information.
80. I believe there needs to be a contingency that provides for circumstances where details are not known at the date of registration. If there is no mechanism for managing unknown information, the property owner will be in a situation of having to 'make-up' the needed information.

Terminology

81. **Property** and **Enterprise** is referred to in Schedule A. **Property** is not defined in the Glossary. See the Glossary section below about consistency of terminology.

SCHEDULE B – Nitrogen Reference Point

Purpose of the NRP

82. The NRP is a value calculated to assist with the determination of a catchment 75th percentile. The NRP process can then be used on an ongoing basis to produce a revised value to compare against the original baseline NRP (used to establish the catchment 75th percentile).
83. Schedule B provides for both functions, being the contribution of a NRP to calculate a catchment 75th percentile and the ongoing computation of a NRP. However, the structure of Schedule B confuses these aspects. For example, Schedule B (b), (e) and (f) refer to the NRP being a value at a point in time. In contrast, Schedule B (c) alludes to the computation of a NRP on an ongoing basis by allowing for updates to be made as model versions are developed. Further, Schedule B (g) sets out the recording of information, which is presumably required on an ongoing basis.
84. While the approach in Schedule B is appropriate, the commentary above should be captured in the introduction and structure of Schedule B to make it clear that a NRP, if required, will be used for:
- (a) establishment of a NRP; and then
 - (b) the ongoing computation of a NRP to allow further comparisons with the baseline NRP or to simply monitor changes over time.
85. Further discussion on this matter is set out below regarding recording requirements of Schedule B (g).

Method for updating (B(c))

86. I support the proposal for updating the NRP based on model updates. However, input details from the original modelling should be kept so that

relative changes can be assessed over time. While this is a requirement of the schedule, the mechanics of keeping and maintaining the initial data are not clear, especially if an advisor is used to determine the NRP. There needs to be some database mechanism to keep the initial input information, and I suggest this is managed (and kept) by Council when the initial files for the NRP are provided to them.

Date for submitting NRP (B(e))

87. I am concerned about the capacity of the wider industry to complete and submit a NRP analysis within the allotted time (by 30 November 2020). My experience with establishing such models is that they take time if they are to be accurate and use the relevant input standards. Further, it will be challenging in some cases to identify and provide data for the reference period of 1 July 2014 to 30 June 2016. Consequently, setting a completion date some 18 months from now, when the plan is not yet operative, I believe is ambitious.
88. Again, and as discussed elsewhere in my evidence, resourcing to assist property owners undertake this task will be one of the greatest challenges. In my view, this is because the industry capacity required to meet to the standards needed does not exist, and therefore the quality of the information returned may be compromised. The consequence may be, that the short and inflexible deadline for submitting information will mean the information is not of a standard that is anticipated or desired.
89. A potential solution is submission of a NRP in two steps, with Step 1 being the best estimate based on available data, and Step 2 being a resubmission some 6 to 12 months later undertaken using more relevant and appropriate data. The ability to supply this information is detailed below, with the need to establish a contingency if the needed data for the computation of the NRP is not available.

Reference years (B(f))

90. The nominated reference year period for the NRP calculation is 1 July 2014 to 30 June 2016. While it is appropriate to establish a NRP, the period over which it is calculated needs to ensure that the NRP reflects the general farming system that was occurring around that time. In their

further submission, the River Iwi suggested that a period of more than two years (and potentially 5 years) might be appropriate.

91. If a limited time period is used, then the calculated NRP could reflect events that occurred at that time which might result in a higher, or lower, NRP. The consequence is it may also set a property NRP in which further reductions are difficult, i.e. significantly greater changes are needed; or alternatively it provides for a farming system with a high NRP which in reality requires minimal changes to meet the NRP.
92. Such examples might be where there is a change in farming policy and the farm is transitioning to an alternative land use, either being the property was destocked prior to conversion to a dairy farm, or alternatively a high intensive cropping operation is ceasing and being replaced with a more extensive operation.
93. Further, property owners are encouraged to use OVERSEER® to determine the NRP. OVERSEER® is an average annualised model, and not intended to accurately model specific changes on a property. It requires steady state farming systems to be modelled. By nominating only two years there is the potential for greater error to be introduced in the NRP through over or underestimating N losses.
94. For example, NIWA records suggest the annual average rainfall for 2014/15 was less than average (230 mm in some areas). This would likely have had an effect on stocking rates coming into the 2015/16 season as properties would likely have been destocked due to a decrease in feed available. The consequence would have been a lower N loss than 'average'. Conversely, 2016 was wetter in some areas and this would have meant greater grass growth, more stock, and potentially a higher leaching loss from both the higher stocking rate and the greater drainage.
95. I maintain the opinion that the NRP should be established and averaged over a 5 year period (ideally a rolling 5 year period) to take out a range of factors that contribute to potential variations and 'spikes' being reflected in the NRP.

96. Should Council maintain a 2 year period, then there should be an allowance, based on reasonable evidence, to use alternative years so that a more representative NRP can be established. This is further discussed in the section below.
97. Assuming the two reference years are used, an aspect of Schedule B(f) that requires clarification is how the two reference years will be used to calculate the NRP. Is it an average of the two years or does the property owner get to choose the year that is most suitable to their cause? The implications of averages and single years are discussed elsewhere in my evidence.

Contingency for limited data over reference years (B(f))

98. Direct experience in modelling farming systems in the Waikato under the PC1 framework has created challenges where the property owners have not been able to provide the necessary information. In one such modelling case the property did not have stock and fertiliser records for the reference period; and in another case a change of ownership meant the reference year details had not been passed on.
99. To provide certainty and avoid dispute at a later stage, I believe it would be advisable now to develop a system whereby alternative 'generic' data can be used if on-farm verification of the reference years cannot be provided. Such a system should be identified or at least eluded to in Schedule B so as to provide certainty that farmers will not be penalised for not having information/data which does not exist, or no longer exists.
100. While such circumstances could be addressed through non-complying activity routes (e.g. Rule 3.11.5.7), or even a discretionary consent route (Rule 3.11.5.6A), it could be more beneficial to have a process developed whereby, after sufficient evidence is provided by the property owner, they are allowed to use standard and default input parameters from model farms that represent the farming system and its locality.
101. Other councils use a similar approach, where the inability to provide the needed information to the desired level results in an alternative route being used to establish the reference values.

102. For example Environment Canterbury do not have a specific rule that is used if the information is not available or modelling in OVERSEER® is problematic. However, they have an alternative pathway to establish a nutrient loss factor. This is typically a case by case evaluation by council staff with the property owner and the outcome determines how an assessment can be undertaken and what the consenting requirements are.
103. My interpretation of the current Schedule B and Rule requirements would mean an inability to provide a NRP using the necessary standards may result in a non-complying or discretionary consent being required. In that case, when a council officer processes such an application they would need to consider the issue, information, and how to manage the provision of the NRP, at a lesser standard than anticipated. I am unclear what they would do or how they would continue with the processing of the application, or what conditions on such a consent may look like. Supporting the view above, I believe such situations could be more easily dealt with by providing an alternative route for providing data for a NRP computation within Schedule B.
104. The alternative route may in fact be better set out in the NRP data input standard specifications, which could suggest that where specific data is not available then 'generic' or 'model farm' data can be used.
105. Where there is the potential use of generic data, for whatever reason, care would be needed to ensure this alternative route is not abused. Particularly, there could be instances where property owners who, on using their specific modelling data for their farm, do not like the result and choose to adopt the generic default input parameters.
106. The decision on what data set to use, whether farm specific or generic, could be left to the judgement of the Certified Farm Nutrient Advisor (**CFNA**), or there could be a quick process whereby the CFNA checks in and gets approval from a Council 'staff member'.
107. I think it is worth putting in perspective the significance of the need for this contingency process. The vast majority of properties will have the needed information and there will be only a few farms that don't, or have small gaps in the wider dataset needed. Further, the farms with the

gaps are more likely to be lower intensified farms and will naturally have a lower NRP. Consequently, a 'cost benefit' consideration should be applied in that the use of actual data versus generic data may make limited difference for any computed NRP, i.e. there is a need to consider the hassle factor of chasing the data to the nth level of accuracy, and if such effort is worth it in regard to the bigger picture. While this discussion applies at a farm level, it can equally apply at a catchment scale where I think it is important to consider the collective debate for properties that don't have the necessary records, requiring them to provide data and how this discussion will serve to improve catchment water quality.

108. In summary, I maintain the view that a contingency process is needed should farms not be able to provide data to the standard needed. This process could be set out in the data input standards rather than having to manage minor data unavailability through needing discretionary or non-complying resource consents.

Record keeping (B(g))

109. Further to the 'Purpose of the NRP' discussion in paragraph 82, if the calculation of the NRP is for a single point in time, being the nominated period of 1 July 2014 to 30 June 2016, then there is inconsistency with the requirement for ongoing records to be kept in A(g). Clarity is needed as to whether the collected records must be kept on an ongoing basis (annually), and if so what purpose that serves to a NRP that was determined for the 1 July 2014 to 30 June 2016 period. I note that reference to irrigation refers to averaging over a 3 year period, which implies the data is not just limited to the reference years of the NRP.
110. If the records to be kept are solely for the reference years, then that should be stated. However, I question if the records required can be accurately provided for the reasons nominated above (regarding a contingency for limited data over the reference years).
111. There is a possibility that the current lack of clarity regarding record keeping is a result of earlier changes, including the removal of the 5 year rolling average requirement. If this is the case, then the current wording

should be tidied up, or alternatively, an explanation as to why recording as now proposed should be kept.

112. If the records are to be kept for more than the reference years, when is recording required to start? Should it be the reference years onwards, then consideration may need to be given to the non-compliance aspect of some farms not having the necessary records. Clarification is required, especially with regard to the implications of non-compliance, i.e. needing records, the collection of which property owners were not aware of at the time.

Implications of not having data

113. The consequence for not being able to provide historic data for the reference years is unclear. If a NRP cannot be completed to the standard needed because the information does not exist, is the property not in compliance, and can enforcement action be taken? If action is to be taken, what would the enforcement action look like?
114. The answers to the above questions need to be able to distinguish between a legitimate case of not having data and a property owner who, on determining the NRP with their actual data, is not satisfied and would like to default to a more lenient approval route, i.e. plays the 'no data card' to avoid having to make changes. Such a lenient route might result in a property going from being above the 75th percentile to being below.

Financial information

115. The Schedule B *Advice Note* does not provide clarity with regard to disclosure of financial information. It suggests that "...records may be redacted...". This in my view is ambiguous and it would be simpler and clearer if the Advice Note read "*Financial information does not need to be provided to the Waikato Regional Council*".

Specification of input standards

116. I support the deletion of Table 1 input methodology. In my view reliance should be placed on the Input Standards used in conjunction with OVERSEER® modelling. This approach also allows for updates to be

made to the standards without necessarily having to revisit the Plan as a whole.

SCHEDULE C

117. No comment is offered on Schedule C.

SCHEDULE 1

118. No comment is offered at this stage on Schedule 1.

SCHEDULE 2

Opting In and Out

119. The name change from Certified Industry Scheme to Certified Sector Scheme is appropriate, as is the process of having certified schemes assist to manage the coordination and implementation of FEPs. This process effectively provides a 'body' with the opportunity to self-manage a collective group of farms.

120. While I support the concept of CSS, I still have questions about the compulsion or inclusion of farms, when some farms may choose not to join the scheme, or depart from the scheme. This could mean that some farms in a catchment choose not to participate in a wider catchment programme, or even multiple schemes could operate in a single catchment.

121. It would be simpler if scheme approval was catchment based and there was a compulsion for farms to either elect to be in or out of a specific single catchment scheme.

Benefit of Scheme Participation

122. From a property owner's perspective, with the change in the Rule requirements (see evidence of Janeen Kydd-Smith), I see limited benefit of being part of a scheme with regards to effectiveness and efficiencies of consenting or consenting requirements. I understand this was one of the initial reasons for the Certified Industry Schemes approach.

123. However, there may be potential benefits from a FEP coordination perspective, especially when considering that the intent of FEPs is to assist in achieving the 80-year water quality attributes stated in Table 3.11-1. This would naturally benefit from having a catchment focus, as it may not be efficient to have multiple FEP focused schemes operating in the same catchment, especially if there was not cross over and coordination between the separate schemes. This approach of a single catchment scheme would allow properties to work together to achieve consistency and benefit to water quality in the overall catchment. Such an approach could be a non-regulatory tool to provide farm level and catchment changes to support the regulatory comment given through the FEP for each property.
124. As it stands, there is no resource consenting benefit for a CSS and there is the possibility of multiple CSSs in one catchment that have different objectives and methods for enhancing water quality. I suggest this is not beneficial to overall catchment management and improvements in water quality.
125. I believe there is a need to consider whether a more fundamental look at the purpose of the CSS proposition is required. Should it be catchment based? Can the bones of the CSS be used to develop a more catchment focused system and is it within the scope of this plan change? This is something that I will be giving evidence on in Block 3.

Funding of CSS

126. The funding of CSSs is not clear. I would assume this comes from some form of scheme levy. It potentially means the early participants in a scheme would fund the development and those that join later may not have the same cost. If there is no regulatory benefit of joining a scheme, then the benefit of contributing a levy/fee is unclear. This may impact on the extent of scheme participation, and ultimately the effectiveness of the CSS programme.
127. If CSSs are to be kept, the Council may potentially need to assist with funding their establishment.

Certified or Certification

128. Schedule 2 is still, in my view, a mixture of setting out certification requirements (process) and a definition of being certified (attainment).
129. While Schedule 2 sets out the process to become certified it also details what should be included and undertaken once certified. In my view these are two separate things and Schedule 2 could be better interpreted if these two aspects were noted, ideally as separate schedules. However, for simplicity, they could be split within existing Schedule 2, detailing standards and then the certification process.

DEFINITIONS/GLOSSARY

Stocking rate

130. Schedule A requires details of maximum stocking rates to be provided. The Glossary provides a definition of Stock Unit. While intuitively **Stocking Rate** is the number of **Stock Units** per hectare, this is not stated.
131. For clarity **Stocking Rate** should be defined.
132. Further, there are a number of methods for determining **Stocking Rate**, including annual average or wintered stock. Stock wintered (30 June) has historically been a common method, but this creates limitations when considering farms where stock are wintered off, and conversely wintered on.
133. For clarity and consistency, the period or date over which **Stocking Rate** is calculated should be defined.

NRP and Farm

134. The **NRP** was linked to a **Property** or an **Enterprise** and it is now linked to a **Farm**; however there is no definition of **Farm**. There is a definition of **Farming**, but this is a definition of a process. There needs to be clarification of **Farming** so that it establishes boundaries (physical and operational) that can be included in FEPs and the calculation of NRPs.

135. I note that Schedule A still refers to **Property** and **Enterprise**, however the definition has been removed. Either **Property** and **Enterprise** should be reinserted into the Glossary or **Property** and **Enterprise** changed to **Farm** and **Farm** defined.

Forests

136. The definition of **farming** excludes production forests. I assume that this allows large scale 'production forests' to be excluded from reporting as required by the array of farming activities. However, as defined, farming means that areas of production forest on farms would be excluded from any NRP assessment. As a consequence, this omits and excludes a key mitigation tool available to be used on many farms to lower the nutrient losses.
137. If the intention is to exempt large-scale forestry operations from farm operations, then allowance needs to be provided in the farm definition for small forests and plantations for land stabilisation and nutrient loss mitigation.

Certified Farm Nutrient Advisor (CFNA)

138. Modifications have been made to the requirements of a CFNA to require being certified in accordance with the Nutrient Management Certification Programme (**CNMA**). There are a limited number of us with CNMA status, with The Fertiliser Association of New Zealand Incorporated who administer the programme advising there are 192 CNMAs nationally and only 55 registered in the Waikato (a number who live outside the Waikato and work nationally).
139. With the demand on nutrient management advisor services in other regions, I struggle to see how the needed number of farms will have their NRP calculated and submitted to Council by November 2020.
140. Should the requirement to have plans and NRP completed be forced, there is a risk that incomplete and/or inaccurate work will be undertaken. This serves only to compromise the greater objective of having sound and robust data to make future decisions.

141. The suggestion I make elsewhere of a gradual implementation of reporting and on farm changes may assist to alleviate this issue. This change is also consistent with my suggested changes to Policy 5.

Certification of People

142. PC1 refers to Certified Farm Nutrient Advisor (CFNA) and Certified Farm Environment Planner (CFEP). Also, in the wider New Zealand primary production sectors are other terms, such as Certified Practising Agriculturalist (CPAg - Institute of Agriculture and Horticulture Sciences) and Certified Nutrient Management Advisor (The Fertiliser Association of New Zealand Incorporated).
143. Currently I am accredited with four industry schemes. Adding the PC1 requirements of CFNA and CFEP would make it six. If other regions developed their own requirements this would increase. Each of these programmes have a level of continuing professional development (CPD) and demonstration of skill level.
144. While I support the need to demonstrate skill levels and maintain CPD, running multiple national programmes in my view is cumbersome and time consuming, especially given nationally we have relatively small regions and a limited number of industry professionals. While greater industry capacity may develop over time, evidence from other regions hasn't seen a rapid uptake in service providers; and my observation has seen growth in capacity come from related industry bodies and organisations, such as Fonterra or fertiliser companies. While this may serve to provide capacity, I think further discussion is required to determine the appropriateness of valued added advice in a regulatory context when associated with supply companies.
145. There would be merit in having a nationally consistent professional body that could streamline certification, CPD, regulate ethics and assess levels of attainment and competence. This may have special interest modules, or areas of expertise, which provide regional or specific skill endorsements.
146. While such a national certification programme does not exist, Council have an opportunity to create a framework that allows for one to be

adopted. They also have the opportunity to be leaders in structuring a framework that other councils could adopt. This could simply be allowed for in the definitions of a CFEP or CFNA by adding:

Or appropriate equivalent national certification as deemed acceptable by the Chief Executive Officer of the Waikato Regional Council.

147. I am aware that OVERSEER Limited and several councils are discussing potential national programmes and it would seem like a lost opportunity if PC1 does not provide for possible changes that may come.
148. A further aspect of the CFEP and CRNA definition is they do not provide for CPD and ongoing demonstration of skills. Further detail should be added to both definitions requiring ongoing competency assessments and not the not the one-off acceptance.

TIMING

149. Once operative, there will be a number of changes and tasks to the regulatory requirements of managing land within the PC1 catchments. What is not clear is the progressive nature of what is required and when, and particularly what are the prerequisites. A road map setting out options for land use management and the timing that relates would help to navigate the requirements of PC1.

Hamish Lowe

3 May 2019