In the matter of	the Resource Management Act 1991
And	a submission and further submissions on Proposed Waikato Regional Plan Change 1 – Waikato and Waipā River Catchments (PPC1)
Submitters' Names:	Theland Farm Group Limited ("Theland") Ata Rangi (2015) Limited Partnership ("Ata Rangi") Southern Pastures Limited Partnership ("Southern Pastures")
Submission Numbers:	Theland submitter number: 82022 Ata Rangi submitter number: 74045 Southern Pastures submitter number: 74062
Hearing Topics:	**Block 2** C1: Diffuse discharge management C2: Cultivation, slope and setbacks C3: Certified Schemes C4: Stock exclusion C5: Treaty settlement and Maori ancestral land C6: Urban/point source discharges
Type of Evidence:	Primary
Witness:	Dr Debbie Anne Care
Date:	8 May 2019

STATEMENT OF EVIDENCE OF DR DEBBIE ANNE CARE

Summary statement

1. The proposed amendments set out in the Block 2 s42A report focuses on Nitrogen ("N"), rather than all four contaminants which are the subject of PC1. This emphasis on N as a measure of improvement does not consider the unique characteristics of some sub-catchments. Consequently, some farms/farmers who have previously implemented the use of Farm Environment Plans ("FEPs") and "best practice" within those sub-catchments may be unfairly penalised by the implementation of the rules in Proposed Plan Change 1 ("PC1"). This approach lacks justification from an environmental science perspective.

2. Requiring "reduction" in nutrient loss (primarily determined by a measurement of N) and making no provision for the requirement to "maintain" within sub-catchments that already meet the Table 3.11-1 targets (noting that this is still being discussed through caucusing and its final form is yet to be determined), is unjustified.

3. The use of Overseer as a tool to model, monitor and manage on-farm systems within a farm is generally accepted. However, the margin of error in Overseer and variability between farms means that it should not be used as a standard via the 75th percentile (or a "50th percentile").

4. Restricting land use change in the manner proposed through the amendments to the rules does not make sense from a farm management and nutrient management perspective.

5. Sub-catchment approaches, the definition and use of an Enterprise approach and the content of FEPs are critical to the final form of PC1. I reserve my position on those matters insofar as I have addressed these in the context of Block 2.

Role and relevant experience

6. My full name is **DEBBIE ANNE CARE** and I am an Independent Environment Consultant.

7. I hold a New Zealand Certificate of Science, from Waikato Institute of Technology, a Bachelors' Degree in Earth Science from Waikato

University, Hamilton, a Master of Science Degree (1st Class Honours) in Plant Science from Waikato University, Hamilton and a PhD in Botany from Auckland University, Auckland.

8. I also hold Postgraduate qualifications in Nutrient Management (Intermediate and Advanced) and in Effluent System Design from Massey University. I have also completed a Farm Dairy Effluent Hydraulic Design Course.

9. I am a certified assessor and was involved in the development and research for the Farm Dairy Effluent Warrant of Fitness programme. I have previously held the role of the chair of the Farm Dairy Effluent System Design Accreditation Committee. This committee audits system designs and confers accreditation to effluent design companies.

10. I wrote and delivered the Effluent Farm Management Programme for Primary ITO. This is a 2-day course for farm managers that manage effluent on farm.

11. I was employed as a scientist at AgResearch for 25 years and was also employed at DairyNZ for 5 years. I am currently an independent environment consultant in the primary industries. I have worked in the environmental area with Ata Rangi, Wairarapa Moana, Theland Tahi and Miraka farmers. I was one of the consultants that delivered Sustainable Milk Plans in the Upper Waikato, in particular to Miraka suppliers.

12. I have prepared and delivered several FEPs in the years since PC1 was notified. I have been and continue to be involved in sub-catchment groups where positive water quality outcomes are the key objective.

13. I note that I have worked with (and continue to work with) Waikato Regional Council officers responsible for the implementation of the provisions of PC1 in relation to FEPs. This work involves assisting with the development and drafting of FEPs for farms and liaising with Waikato Regional Council officers to assist their understanding of how these will be implemented on farm. I do not consider there to be

any conflict of interest in relation to the evidence I give on behalf of Ata Rangi, Southern Pastures and Theland Tahi ("my clients").

Code of conduct

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

Background

15. I have been engaged by my clients to participate in the expert caucusing to address content of FEPs and sub-catchment approaches to managing diffuse discharges of contaminants. I have also been engaged to provide evidence as and where considered necessary on related topics within PC1.

16. I understand that Block 3 will specifically address FEP content, the "Enterprise" approach, and sub-catchment approaches. However, Block 2 touches on those matters and covers other topics which are of concern to my clients. Accordingly, the purpose of my evidence is primarily to provide my opinion on matters addressed in the section 42A report on Block 2 which are relevant to those matters which will be specifically addressed in Block 3. My evidence addresses the following matters:

    (a) Use of the Nitrogen Reference Point ("NRP") and Overseer;
    (b) FEPs as a tool for management;
    (c) Land use change; and
    (d) Enterprise and sub-catchment approaches.

NITROGEN REFERENCE POINT

Relief sought in submissions

17. My clients' submissions opposed the provisions in Schedule B – NRP with amendments and sought the following relief:

AMEND PPC1 to include provision for the establishment of an auditing procedure or other mechanism which ensures the accuracy and reliability of the input data and use of the OVERSEER Model for the purposes of establishing a Nitrogen Reference Point. For example, through the Farm Environment Plan process.

18. My clients' submissions did not seek wholesale changes to Policy 1. However, a range of proposed amendments are set out in the Block 2 s 42A report which include reference to and reliance on the use of a NRP.

Section 42A officer report Block 2 – Policy 1

19. The s42A report proposes the following amendments to Policy 1:

Policy 1: ~~Manage d~~ Diffuse discharge management ~~s of nitrogen, phosphorus, sediment and~~ microbial pathogens /Te Kaupapa Here 1: Te whakaaere i ngā rukenga roha o te hauota, o te pūtūtae-whetū, o te waiparapara me te tukumate ora poto

Reduce ~~Manage and require reductions in~~[29] catchment-wide and[30] sub-catchment~~-wide~~ diffuse[31] discharges of nitrogen, phosphorus, sediment and microbial pathogens, by:

a1. Requiring all farming activities to operate at Good Farming Practice, or better; and[32]

a2. Establishing, where possible, a Nitrogen Reference Point for all properties or enterprises; and[33]

a. Enabling activities with a low level of contaminant discharge to water bodies ~~provided those discharges do not increase~~[34]; and

b. Requiring farming activities with moderate to high levels of contaminant discharge to water bodies to reduce their discharges proportionate to the amount of (2016) discharge and the water quality improvements required in the sub- catchment[35]; and

b1. Calculating the 75th percentile and 50th percentile nitrogen leaching values and requiring farmers with a Nitrogen Reference Point greater than the 75th percentile to reduce nitrogen loss to below the 75th percentile and farmers with a Nitrogen Reference Point between the 50th and 75th percentile to demonstrate real and enduring reductions of nitrogen leaching, with resource consents specifying an amount of reduction or changes to practices required to take place; and[36]

b2. Where Good Farming Practices are not adopted, to specify controls in a resource consent that ensures contaminant losses will be reducing;[37]

b3. Except as provided for in Policies [1(a) and] 16, generally granting only those land use and discharge consent applications that demonstrate clear and enduring reductions in diffuse discharges of nitrogen, phosphorus, sediment and microbial pathogens; and[38]

b4. Except as provided for in Policies [1(a) and] Policy 16, generally not granting land use consent applications that involve a change in the use of the land, or an increase in the intensity of the use of land, unless the application demonstrates clear and enduring reductions in diffuse discharges of nitrogen, phosphorus, sediment and microbial pathogens; and[39]

c. Progressively excluding cattle, horses, deer and pigs from rivers, streams, drains, wetlands and lakes.

Analysis and comment

20. I am concerned that the proposed amendments include amending the use of the term "manage" to a requirement to "reduce catchment-wide and sub-catchment" diffuse discharges.

21. The amendment means that sub-catchments where the 80-year attributes are met as shown in Table 3.11-1 (noting that these "attributes" are still subject to expert caucusing and are not yet settled), would still have to reduce even though they meet the targets. In my opinion, it is appropriate that for those sub-catchments to work to "maintain or reduce". Maintaining the values will not have a detrimental impact on sub-catchments lower in the catchment and from a practical perspective, seeking to reduce loads where that is not necessary will undermine the likelihood of achieving the outcomes sought in PC1.

22. Furthermore, while the wording has been changed to "Diffuse discharge management" in Policy 1, there is still a strong focus on N with the main criteria for assessment being the NRP. There is no mention of how the other 3 contaminants will be measured. Putting the emphasis on N only creates an "uneven playing field" for farmers.

23. The "requirement" in "b." is contradictory for sub-catchments where there are perceived high contaminant losses especially for N, yet the sub-catchments are already at their 80-year targets (for example median Nitrate in Table 3.11-1 – sub-catchments 64,66,67,72,73,74). How can farms in those sub-catchments that are meeting current and future targets be expected to decrease further?

24. I understand that this is aimed at managing the so-called "load to come" for the higher N leaching farms in the Upper Waikato. The "load to come" concept is based on the premise that there is ground

water that is up to 80 years old and that the N concentrations we are seeing currently are a reflection of practices well in the past, so that recent and current practices have yet to have their impact.

25. I disagree with this proposition and concur with the evidence of Mr Jon Williamson (expert witness for Wairakei Pastoral Limited) who presented in Block 1. In my opinion, Mr Williamson demonstrates that there is no "load to come" for N and, based on my knowledge and experience in the upper Waikato catchment I agree with his conclusion. Accordingly, while establishing an NRP may be a legitimate "tool" for managing diffuse discharges, the magnitude of any NRP should not be used to penalise farms where water quality targets are met.

26. The 75th percentile for NRP has been used to prioritise high intensity farms by using N loss as a proxy for intensity. In my opinion, this approach is flawed as many intensive farming systems that could have higher losses for the other 3 contaminants will not be "caught" by using the 75th percentile for NRP. For example – a farm that winter milks, brings in considerable supplement, has animals on farm all year and considerable effluent generated which has to be disposed of but has a very low NRP because it has high organic matter or clay soils only has a leaching figure of 25 kg N/ha/year.

27. Conversely, a farm that only calves in spring and brings in minimum supplement could be leaching 65 kg N/ha/year because it is on freer draining soils. The Good Farming Practice ("GFP") approach would capture both operations and ensure that they are operating to minimum standards and losses, yet the high N loss farm would still be penalised disproportionately.

28. A further flaw in this approach is the introduction of a 50th percentile value for "medium" intensity farms – again based on N. This reliance on the use of N and the NRP is, in my opinion, inconsistent with other parts of the s 42A report regarding NRP and use of Overseer. For example, the s42A report provides considerable discussion of the use of Overseer as a regulatory tool and how it can be used as a tool to model N loss in the context of a particular farm. This could then identify changes on farm which may increase or decrease N loss and

that is then modelled to show whether a positive or negative outcome is likely.

29. That approach of using the NRP as a tool seems reasonable to me. However, using this to establish a 50th and 75th percentile level as a type of standard, given the degree of error inherent within Overseer, seems to contradict the other parts of the discussion of the s42A report on the use of Overseer.

30. I note that Wairakei Pastoral has sought the deletion of the use of the 75th percentile and I am inclined to agree with its position. If there is to be real changes on farm to achieve the outcomes sought in PC1, use of either the 50th or 75th percentile as a fixed measurement will not get the support of farmers.

Section 42A officer report Block 2 – Schedule B

31. The s42A report proposes the following changes to Schedule B:

> A property or enterprise with a cumulative area greater than 20 hectares (or any property or enterprise used for commercial vegetable production) must have a Nitrogen Reference Point calculated as follows:
>
> a. The Nitrogen Reference Point must be calculated by a Certified Farm Nutrient Advisor ~~to determine~~by modelling the amount of nitrogen being leached from the property or enterprise during the relevant reference period specified in clause f), except for any land use ~~change~~ approved under Rules 3.11.5.6 or 3.11.5.7 where the Nitrogen Reference Point shall be determined through the Rule 3.11.5.6 or 3.11.5.7 consent process.
> b. The Nitrogen Reference Point shall be the highest modelled annual nitrogen leaching loss that occurred during a single year (being 12 consecutive months) within the reference period specified in clause f), except for commercial vegetable production in which case the Nitrogen Reference Point shall be the average annual nitrogen leaching loss during the reference period.
> c. The Nitrogen Reference Point must be calculated using the ~~current~~ most recent version of the OVERSEER® Model as the default model (~~or any~~ other models may be approved for use by the Chief Executive of the Waikato Regional Council, if justified on a case by case basis). The Nitrogen Reference Point must be updated using the initial reference data whenever a new version of the OVERSEER® Model, or any other approved model used to prepare the Nitrogen Reference Point, is released.
> d. The Nitrogen Reference Point data shall comprise the data used by ~~electronic output file from~~ the OVERSEER® or other approved model to calculate the Nitrogen Reference Point, and where the OVERSEER® Model is used, it must be calculated using the OVERSEER® Best Practice Data Input Standards ~~2016~~ or replacement technical guidance that relate to the version of the OVERSEER® model being used, with the exceptions and inclusions set out in ~~Schedule B Table 1~~ a Waikato Regional Council Nitrogen Reference Point Guide. Where another approved model is used, it will conform to the data input standards as approved by the Chief Executive of the Waikato Regional Council.
> e. The Nitrogen Reference Point Analysis (inputs and outputs) ~~and the Nitrogen Reference Point data~~ must be ~~provided~~ published to

Waikato Regional Council within the period ~~1 September 2018~~ 1 May 2020 to ~~31 March 2019~~ 30 November 2020.

f. The Nitrogen Reference Period ~~reference period~~ is ~~the two financial years covering~~ 1 July 2014~~/2015 and 2015/~~ to 30 June 2016, except for commercial vegetable production in which case the reference period is 1 July 2006 to 30 June 2016.

g. The following records (where relevant to the ~~land use undertaken on the property or enterprise~~ calculation and compliance auditing of the Nitrogen Reference Point) must be retained for the life of the plan and/or relevant consent, whichever is longer, and provided to Waikato Regional Council at its request:

   i. ~~Stock numbers as recorded in annual accounts together with stock sale and purchase invoices~~Records of stock numbers and stock classes, births and deaths, stock movements on and off the property, grazing records and transport records;
   ii. ~~Dairy production data~~Total annual milk solids as stated in the milk supply statement;
   iii. ~~Invoices for fertiliser applied to the land~~Records of fertiliser type and amount, including annual accounts, and any records of fertiliser application rates and placement;
   iv. Quantity and type of ~~Invoices for~~ feed supplements ~~sold or~~ purchased and used on the property;
   v. Water use records for irrigation (to be averaged over 3 years or longer) in order to determine irrigation application rates (mm/ha/month per irrigated block) and areas irrigated;
   vi. Crops grown on the ~~land~~ property (area and yield), quantities of each crop consumed on the property, and quantities sold off farm; and
   vii. Horticulture crop diaries and NZGAP records; and
   viii. The Nitrogen Reference Point Data as defined in Schedule B clause d; and
   ix. Soil test data – including anion storage capacity; and

A map which shows property boundaries, block management areas, retired/non-productive areas and areas used for

Analysis and comment

32. I do not seek to comment on the planning aspects or implications of the use of Schedule B for the purpose of the farming rules. Rather, I wish to comment on the parts of Schedule B which have an environmental science component.

33. I am generally comfortable with the proposed changes to Schedule B which clarify the use of Overseer as a tool to model NRP for a farm or enterprise. However, the technical guidance to be developed by Waikato Regional Council for the use of Overseer to model N loss values must be cognisant of the most up to date research and consider the national context so that the most accurate modelling is carried out to calculate outputs. The role and responsibility of the Certified Farm Nutrient Advisors will be critical. As such, farmers will need to be confident that the creation and auditing of Overseer files and NRPs has be carried out correctly.

34. This is important from a business and environmental perspective. However, it is also important that the public and community has confidence that the process is robust. Bearing that in mind, in my opinion it would be appropriate that the qualifications of a Certified Farm Nutrient Advisor are that they have, as a minimum, an Advanced Nutrient Management certification and a minimum of two years' experience.

FEPs

Relief sought in submissions

35. My clients' submissions supported Policy 2 which refers to FEPs but sought amendments as shown below:

> AMEND Clause d) of Policy 2(d) to read: "d. Requiring the degree of reduction in diffuse discharges of nitrogen, phosphorus, sediment and microbial pathogens to be proportionate to the amount of current discharge (those discharging more are expected to make greater reductions), and proportionate to the scale of water quality improvement required in the sub-catchments which is capable of being achieved in the short-term taking into account the particular characteristics of each sub-catchment;..."
>
> ADD a NEW clause that reads: "da. Providing for and allowing opportunity for offset mitigation between properties or enterprises which will achieve the degree of reduction in diffuse discharges of nitrogen, phosphorus, sediment and microbial pathogens proportionate to the amount of current discharge and proportionate to the scale of water quality improvement required in the sub-catchments capable of being achieved in the period to 2026, taking into account the particular characteristics of each sub-catchment."

Section 42A officer report Block 2 – Policy 2 (now specifically referring to FEP)

36. The s42A report proposes the following changes to Policy 2:

> **Policy 2: Farm Environment Plans ~~Tailored approach to reducing diffuse discharges from farming~~ activities/Te Kaupapa Here 2: He huarahi ka āta whakahāngaihia hei whakaiti i ngā rukenga roha i ngā mahinga pāmu**
>
> Reduce ~~Manage and require reductions in~~[40] catchment-wide and[41] sub-catchment ~~-wide~~[42] diffuse discharges of nitrogen, phosphorus, sediment and microbial pathogens from farming activities on properties and enterprises through Farm Environment Plans[43] that:
>
> a1. Set out clear, specific and time-framed minimum standards for Good Farming Practice; and Take ~~Taking~~ a tailored, risk based approach to

define mitigation actions on the land that will reduce diffuse discharges of nitrogen, phosphorus, sediment and microbial pathogens~~, with the mitigation actions to be specified in a Farm Environment Plan either associated with a resource consent, or in specific requirements established by participation in a Certified Industry Scheme~~[45]; and

a. Undergo ~~Requiring~~ the same level of rigour in developing, monitoring and auditing ~~of mitigation actions on the land that is~~ set out in a Farm Environment Plan, whether the consent holder is a member of a Certified Sector Scheme or not ~~it is established with a resource consent or through Certified Industry Schemes~~[46]; and

b2. Are flexible and able to be updated so that continuous improvement, new technologies and mitigation practices can be adopted, such that diffuse discharges of nitrogen, phosphorus, sediment and microbial pathogens further reduce over time.[47]

b ~~Establishing a Nitrogen Reference Point for the property or enterprise; and~~[48]

c ~~Requiring the degree of reduction in diffuse discharges of nitrogen, phosphorus, sediment and microbial pathogens to be proportionate to the amount of current discharge (those discharging more are expected to make greater reductions), and proportionate to the scale of water quality improvement required in the sub-catchment; and~~[49]

d. ~~Requiring stock exclusion to be completed within 3 years following the dates by which a Farm Environment Plan must~~

~~be provided to the Council, or in any case no later than 1 July 2026.~~[50]

Analysis and comment

37. I do not seek to comment on the planning aspects of the proposed amendments but rather wish to comment on the environmental science and farming practice issues which are relevant to the provisions.

38. I support a tailored approach for each farm using FEPs. However, as I have explained above, I am concerned that the requirement to "reduce" means that in sub-catchments where the 80-year attributes are already met will still have to reduce even though they are at target values.

39. I support the change in the methodology to introduce the concept of a Good Farming Practice ("GFP") approach. This has been done in other regions and means that learnings can be leveraged from those regions. In my experience, such an approach means that a farm adopts GFP which is outlined in its FEP. The FEP is then audited against standards for compliance.

40. I note that, in my opinion, the GFP approach is relevant to farms that have been already applying recognised "good farming practices" for all four contaminants, minimising losses and are in sub-catchments

that have met the 80-year attribute targets, but may still have a NRP that is above the 75th percentile. It follows that the use of the 75th percentile will potentially "penalise" those farmers, even though they implement "best practice" and will be required ensure that this continues under the GFP approach (and may indeed continue to make improvements as the FEP is a "living document"). On that basis, I reserve my position on the use of the 75th percentile as I do not believe it will have the outcome of achieving the objectives of PC1.

41. The change in approach to implement GFP will impact those businesses that already have FEP's in place. These will have to be reframed into a GFP approach and this may incur a cost to do this. In my opinion, Waikato Regional Council should provide guidance on how this could be achieved with minimum changes to the existing FEPs, alongside the other guidance it intends to provide to farmers who will be required to implement PC1.

42. Acknowledging that the concept of the "Enterprise" is yet to be addressed by the s42A author, the use of FEPs and GFP as part of those is relevant to the discussion on the "Enterprise" approach. For example, where there are multiple farms owned by one entity, under an Enterprise approach, there is the option of managing diffuse losses through shared mitigations across properties and managing farming operations to the farm strengths. Assuming that is the case, FEPs will need to be designed to target the best options for the best results in the context of managing at an Enterprise scale.

43. These issues are also relevant to sector schemes and a sub-catchment approach. For example, sector schemes could consist of suppliers to a milk supply company but could equally apply to a sector group outside of this – for example in a Dairy operation only sub-catchment group. There may be opportunities to manage mitigation and share responsibility across properties within a scheme or sub-catchment group. As such, for FEP design and implementation the scale and potential of mitigation approaches needs to be known so that groups at all levels (enterprise to scheme) can plan for the most effective options.

Proposed amendments to rules which refer to FEPs

44. For completeness, I note that the proposed amended rules as set out in the Block 2 s42A report rely on the use of FEPs for all farming activities greater than medium intensity. I have not repeated the proposed amendments here (I understand that the rules have been set out in an attachment to Mr Chrisp's evidence).

45. Again, while I understand that FEP content is yet to be fully addressed and other related matters are to be the subject of Block 3, I wish to make some preliminary comments which are referred to in the proposed rules. Specifically, I note that the rules will have an impact on the content of FEPs due to the requirement that diffuse discharges be "reduced" and not having the option to "maintain".

46. For the same reasons I have explained above, I have a concern about the requirement to "reduce" in those sub-catchments where the attribute targets are already met. The links between FEPs and Table 3.11-1 values and how these are to be met have not been explained in the s42A reports to date. I anticipate that this will be made clear through Block 3 and over the course of the hearing.

Land Use Change rule (now amended)

47. Mr Chrisp addresses the planning aspects of the proposed amendments to what was Rule 3.11.7. I am concerned at the use of the proxy of 4.1ha of "change" as this could capture many changes that currently happen on farm as part of environmental protection, paddock and pasture renovation. Such changes can improve soil structure, thereby increasing or enhancing the desirable characteristics of the soil which in turn decrease nutrient loss and increase production. For example, where a farm has poor soil structure and therefore poor pasture and animal performance, a crop like maize might rotate through this area to improve soil structure and decrease pest burden and it is ultimately put back into permanent pasture. It appears counter-intuitive for such activity to be a Non-complying Activity, given the dynamic nature of farming and on farm management systems.

48. Furthermore, the change of land use within an enterprise may decrease the contaminant loss from that enterprise. For example, taking pasture out of production on steeper land into forestry but putting a similar amount of land into pasture on the flat area where the pasture was – this would decrease three of the contaminant risks and may also decrease N loss – yet this could be a Non-complying Activity if the 4.1ha "trigger" is passed.

49. Yet another example is changing to a productive land use on land that is currently growing gorse could decrease the contaminant losses. Gorse is a legume and in pure stands can leach up to 64 kg N/ha/year – many farming operations can operate lower than this level. Letting any area of land regenerate usually means that the land will be overtaken by gorse and that this will lead to increased leaching in the first 20 years or so. Again, this appears to be counter-intuitive.

50. I understand that Mr Chrisp has outlined the changes to the proposed drafting which are considered appropriate to address these issues.

Sub-catchment and enterprise approaches

51. Again, while these are the subject of future s42A reporting, the inclusion of rules in Block 2 which refer to the concepts has prompted me to provide some preliminary comment on the topics. As such, what I discuss here may be of more relevance to Block 3 but I wish to make the comments at this point for completeness.

52. The definition and use of the term "Enterprise" is crucial to the options available to farms to decrease overall property losses of the four contaminants. The ability to "offset" within an enterprise is one of the few tools that may be available to some operations and will allow the most appropriate land uses to occur within that Enterprise. If each property is the unit for regulation, then mitigations might not be possible or if they are, they might not be the most appropriate from a farm business or environmental perspective. This approach would give far less choice for mitigations that could be employed.

53. Sub-catchment approaches are one of the most effective ways to implement change – small groups that are vested in their own communities will drive greater change than trying to have such large

"chunk" initiatives which will seem to have little relevance at an individual level. Any "practice change" must happen at the ground level to effect change further up. If everyone is involved and enabled, then greater gains are likely. Sub-catchment groups give ownership to the participants and gives effect to the "tailored" approach at a larger scale. FEPs within a sub-catchment could potentially be plans for the sub-catchment also at this scale.

54. I reserve my position on these matters for the purpose of the future hearing Block evidence.

…….
Dr D. A. Care

8 May 2019