

**BEFORE COMMISSIONERS APPOINTED
BY THE WAIKATO REGIONAL COUNCIL**

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of the First Schedule to the Act

AND

IN THE MATTER of Waikato Regional Plan Change 1- Waikato
and Waipā River Catchments and Variation 1
to Plan Change 1

AND

IN THE MATTER of submissions under clause 6 First Schedule

BY **BEEF + LAMB NEW ZEALAND LIMITED**
Submitter

**SUBMISSIONS OF COUNSEL FOR BEEF+LAMB NZ LTD FOR HEARING
STREAM 3
13 August 2019**

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MAY IT PLEASE THE COMMISSIONERS

Introduction

1. B+LNZ have made submissions on all parts of PC1 seeking amendments that, in my submission, give effect to the superior statutory documents and enable performance of Council's functions under the Act while achieving its purpose.
2. Previous submissions have been intended to be comprehensive and fully set out B+LNZ's position on PC1. It is not intended to repeat those matters here and these submissions instead focus on certain legal issues and setting out B+LNZ's concerns about some recommendations in the Expert Witness Conferencing Statement (EWCS).
3. Ultimately B+LNZ is concerned that the expert witnesses have reached conclusions that may not be supportable in a planning sense because they do not provide clarity as to how the EWCS recommendations can be incorporated into Table 3.11-1, set limits and freshwater objectives that do not give effect to and implement the various plans and fail to contemplate the relationship between attributes.

Scope for Additional Attributes

4. Mercury NZ Limited have raised the issue of scope in respect of the inclusion of additional attributes in PC1. It argues the additional attributes some parties have sought by way of submission are out of scope and the only way to include additional attributes in PC1 is by way of a plan change.
5. At HS1 Counsel indicated that B+LNZ did not agree with Mercury and would formalise its position. It had been intended to file the submissions as part of a closing, but at the time of drafting these submissions it is not known whether B+LNZ will take up that opportunity. To that end it is addressed now.

6. The High Court has taken a cautious approach to finding jurisdictional bars in respect of plan changes under the RMA¹. The Courts have concluded that an overly legalistic approach is not appropriate, and fairness is a key consideration.
7. While others have already set the law out as to scope, I nonetheless record, the test for whether a submission can be regarded to be “on” a plan change was established in *Clearwater Resort Ltd v Christchurch City Council*² and is known as the bipartite approach. The test is as follows:
 - (a) A submission can only fairly be regarded as “on” a variation if it is addressed to the extent to which the variation changes the pre-existing status quo;
 - (b) But if the effect of regarding a submission as “on” a variation would be to permit the planning instrument to be appreciably amended without real opportunity for participation by those potentially affected, this is a powerful consideration against any argument that the submission is truly “on” the variation.
8. *Palmerston North City Council v Motor Machinists Ltd*³ followed *Clearwater*, providing a fuller explanation of the bipartite test. Kós J noted the purpose of the RMA is to promote sustainable management of natural and physical resources. He said that inherent in the sustainable management of natural and physical resources are two fundamentals:
 - (a) An appropriately thorough analysis of the effects of a proposed plan or activity; and
 - (b) Informed and notified public participation.

¹ *Westfield (NZ) Ltd v Hamilton City Council* [2004] NZRMA 556, *General Distributors Ltd v Waipa District Council* (2008) 15 ELRNZ 59 and *Power v Whakatane District Council* HC Tauranga CIV 2008-470-456, 30 October 2009 Allan J, all cited in *Bluehaven Management Ltd v Western Bay of Plenty Regional Council* [2016] NZEnvC 191.

² *Clearwater Resort Ltd v Christchurch City Council* High Court Christchurch, 14 March 2003, AP34/02.

³ [2013] NZHC 1290.

9. The first limb of *Clearwater* is described as a “*filter based on direct connection between the submission and the degree of notified change proposed to the extant plan*”⁴. The High Court goes on to say the “*breadth of alteration to the status quo entailed in the proposed plan change and whether the submission then addresses that alteration*” is the dominant consideration⁵.

10. The Court held that the submissions must reasonably be said to fall within the ambit of the plan change:

One way of analysing that is to ask whether the submission raises matters that should have been addressed in the s 32 evaluation and report. If so, the submission is unlikely to fall within the ambit of the plan change. Another is to ask whether the management regime in a district plan for a particular resource (such as a particular lot) is altered by the plan change. If it is not, then a submission seeking a new management regime for that resource is unlikely to be “on” the plan change.⁶

11. The first limb is then subject to the second limb: whether there is a real risk that persons directly or potentially directly affected by the additional changes proposed in the submission have been denied an effective response to those additional changes in the plan change process⁷. Where the proposition advanced is so “out of left field” that there would be little or no real scope for public participation, the Court may be more likely to find that a submission is not on a plan change⁸.

12. The Court held that there is less risk of offending the second limb if the change is merely consequential or incidental, and adequately addressed in the existing s 32 analysis.⁹

13. The statement quoted at paragraph 10 above, about the change to the management regime for a particular resource is also apposite to regional plans. For PC1 it is readily illustrated by those matters this

⁴ My emphasis.

⁵ At [80].

⁶ At [81].

⁷ At [82].

⁸ *Clearwater* at [69]; *Solid Energy Ltd v Central Otago District Council* [2012] NZEnvC 173 at [22]-[23].

⁹ *Motor Machinists* at [83].

hearing has been grappling with. There has been significant discussion and debate about the direction that has been provided in the NPSFM and Vision and Strategy. B+LNZ have submitted that the Vision and Strategy is an expression of s 5 to be applied to, what is a reimagining of the management framework to provide for the health and wellbeing of the Waikato River, including the management of diffuse discharges of nutrients. It is submitted that when viewed through this lens the status quo that is to be changed by PC1 is broad indeed. It is difficult to see how that task can be completed in a way that achieves the purpose of the Act and gives effect to the superior strategic plans without carefully considering whether the attributes proposed in the notified PC1 cover the field.

14. It is submitted that other parties have become distracted by focussing on the s 32 evaluation. However, reference to the s 32 evaluation and report is not the only way to determine whether a submission is “on” a plan change. As confirmed by the High Court in *Mackenzie v Tasman District Council*¹⁰, the s 32 evaluation is not a test in its own right, but rather a means of analysing the status quo at issue¹¹. In this instance it is submitted the nature of PC1 as a, more or less, total rethink of the management of diffuse discharges should be the dominant consideration when addressing the issues of scope.
15. Turning to the second limb, it cannot be said, in the context of the NPSFM's attribute tables and the approach in PC1 there is anything novel about submitters seeking additional attributes be included¹². In fact, it could be said that it is entirely expected.

Current State and s 69

16. At the HS2 hearing you asked me about s 69(3). I agreed with Commissioner Robinson's proposition that a rule that allows a degradation in water quality from its state at the time of public

¹⁰ [2018] NZHC 2304.

¹¹ *Mackenzie v Tasman District Council* [2018] NZHC 2304 at [100].

¹² See William Young J's warning in *Clearwater* at [89].

notification of the plan would be impermissible. I maintain that view and have given it further thought since then.

17. The section provides:
 - (3) Subject to the need to allow for reasonable mixing of a discharged contaminant or water, a regional council shall not set standards in a plan which result, or may result, in a reduction of the quality of the water in any waters at the time of the public notification of the proposed plan unless it is consistent with the purpose of this Act to do so.
18. The time of public notification is the benchmark for the purpose of s 69(3). PC1 was notified in October 2016 and Variation 1 April 2018.
19. The EWCS has determined the current state, for instance of TN, based on the 2010-2014 data provided by Dr Scarsbrook¹³. However, for the purpose of s 69(3) it is October 2016 data that should be used. For the areas that Variation 1 bought back into the plan change, April 2018 data should be used.
20. Therefore, the current state data in Attachment 2 EWCS can be compared with Dr Scarsbrook's Table 3A, which provides for values for 2014-2018. It shows for TN:
 - (a) 720 mg/m³ (0.72mg/L) at Huntley-Tainui Bridge;
 - (b) 740mg/m³ (0.74 mg/L) at Mercer Bridge; and
 - (c) 720mg/m³ (0.72 mg/L) at Tuakau Bridge.
21. We can proceed to an even finer grain if we look at Dr Cox's Figures 1a – 1c from his HS2 evidence.
22. Attached as Appendix 1 to the submissions are Attachment 1, Table 3A and Dr Cox's figures for the purpose of comparison.

¹³ See paragraph 9 and attachment 1 Dr Scarsbrook's Evidence – Responding to Hearing Panel's Questions to Council, prepared for WRC as proponent (day 1, item 6).

23. What this demonstrates is that the current state used in the EWCS does not provide a legal bar, in the context of s 69, for setting freshwater objectives or limits in PC1. Ultimately what this means for TN is that it is open to you to decide the numerical parameter or state to give effect to the superior planning instruments¹⁴ may not be the same as shown in the EWCS.
24. The issue is repeated for TP, but of less significance here because the trend is improvement.
25. The requirement to provide for ecological health is synonymous in a number of ways, in B+LNZ's view¹⁵, with the requirement in the Vision and Strategy to protect and restore the health and wellbeing of the River as set out at in the vision at 1(2). You may, as has been submitted by B+LNZ set freshwater objectives, limits and targets in a way that better accounts for the relationships land users have with the catchment, while still achieving that vision and providing for ecological health as a key value.

Expert Witness Conferencing Statement

26. The ecological experts have identified the four contaminants of concern proposed to be managed through PC1 are inadequate by themselves to give effect to the Vision and Strategy, namely the restoration and protection of the health and wellbeing of the Waikato River. The Vision and Strategy requires a more holistic approach to provide for the sustainable management of the River and its catchments.
27. As such, a number of the experts propose additional freshwater objectives or monitoring tools be included in PC1. These include macroinvertebrate health metrics, deposited sediment, nutrient outcomes for the tributaries based on ecological health, and attributes related to the form and function of the River and its tributaries. I note cultural health is not something those experts could address, although some in evidence have acknowledged its importance¹⁶. B+LNZ support

¹⁴ That is, restore and protect and maintain and enhance for instance.

¹⁵ See HS1 evidence.

¹⁶ See Dr Mueller for B+LNZ.

the incorporation of a wider suite of freshwater objectives in order to provide for the health and wellbeing of the Waikato River, including a cultural health index as part of PC1.

28. As set out in B+LNZ's HS1 evidence¹⁷, ecological health as a value is crucial to give effect to the Vision and Strategy, and the NPSFM. Ecological health is not defined by a specific number, it is an overall state of being, and as such is not necessarily tied to a point in time¹⁸. As comprehensively addressed in its HS1 evidence, B+LNZ remains of the view that there is no requirement to seek improvements in water quality metrics everywhere, or to rewind the water quality of the River back to a certain state at a certain time (subject to s 69). Nutrients are only important to the extent they provide a measurable metric to, in turn, provide for the health and wellbeing of the River. B+LNZ agree with the experts that ecological health goes beyond the four contaminants and, as such, additional attributes are required in PC1 to manage this value¹⁹ as intended by the superior strategic plans.
29. B+LNZ recognise the challenge the experts have faced addressing the multitude of issues that present in Table 3.11-1. Assessing the limits, targets and freshwater objectives in Table 3.11-1 on a technical basis only, and without the context of a planning evaluation, presents challenges that has led, in some instances, to outcomes that B+LNZ submit need to be re-examined by the Hearing Panel. At least some of these relate to the fact that a consensus view has not been reached between the experts, which I am told became apparent at the EWC hearing, but not all of them.
30. B+LNZ is content with the majority of attributes that have been identified. For those attributes that are over-allocated, the 80 year freshwater objective is a target, within the context of the limits of the freshwater objectives²⁰.

¹⁷ See Dr Mueller, Mr Kessels and Ms Jordan.

¹⁸ For instance, modelled water quality numerics from the 1860s.

¹⁹ See p 3.

²⁰ See definitions of "*freshwater objective*", "*limit*" and "*target*" in the NPSFM.

31. It is thought that a number of the attributes, for instance riparian planting, fit well with the FEP framework that is being promoted by B+LNZ. The use of MCI and other biological indicators is an effective and efficient way to achieve ecological health values. However, the objectives of PC1 (as notified and amended by B+LNZ and others) are wider than the ecological focus of the EWCS outcomes. What still needs to be done is an analysis of how the attributes are intended to work together to ultimately achieve the outcomes sought in the objectives of PC1²¹. That is the role of expert planner caucusing, which, in B+LNZ's view, would have merit to help you pull it all together.

Nutrient Attributes – Attachment 2

32. B+LNZ:
- (a) Are concerned that the chl-a attribute from the notified PC1 has been accepted without further analysis;
 - (b) Consider approach 1²² (the use of the attribute state bands from the NPSFM) is inappropriate for TN. This is because the NPSFM attribute bands are based on lakes, not rivers;
 - (c) Is unclear how the TP freshwater objective can be met given the lack of consensus between the experts;
 - (d) Agree there is a need to manage N as a freshwater objective and, in some places a target, for ecological health²³. However, it does not agree with the numerical freshwater objective for N, particularly for the Lower Waikato River;
33. Dealing first with subparagraph (b), I cannot see how the majority of the Experts can have recommended approach 1c for TN targets, but approach 2c for TP. This is because approach 1 by definition requires the three identified attributes to be treated equally as indicators of

²¹ See for instance, B+LNZ's proposed objective 1B, protecting or restoring water quality at levels sufficient to support the section 3.11.1 values.

²² Refer p 21 EWCS.

²³ See EWCS at p 20.

trophic state²⁴. In the written material I have been unable to determine how those two approaches can co-exist in Table 3.11-1.

34. In any case, B+LNZ considers the use of the current attribute bands from the NPSFM is not appropriate because option 1c requires the Lower Waikato to be treated like a lake. B+LNZ continues to favour the value setting approach it has proposed and discussed in its HS1 evidence. It is thought that under such an approach a freshwater objective for the lower catchment could support TN up to around 0.8 mg/l to provide for ecological health^{25,26} subject to current state.
35. The upcoming Essential Freshwater Program report may be illuminating, which is due to be released later this month. B+LNZ understand changes to the NPSFM attribute states for N and P to provide for instream values for ecological health are likely.

Nutrient Attributes – Chlorophyll a

36. Turning to chl-a, the experts have adopted the phytoplankton attributes as proposed in PC1²⁷.
37. The experts identify the lack of a direct relationship between limiting phytoplankton and how that will be achieved through the management of nutrients (either TN or TP)²⁸. There appears to have been no expert consensus around the need to manage N and P to manage phytoplankton.
38. However, there is fundamental issue that they do not tackle first. The chl-a freshwater objective accepted by the experts was based on the phytoplankton attribute state in the NPSFM, which, in turn is based on

²⁴ Nutrient and algae levels.

²⁵ Suggested concentrations of <0.11 mg/L (A band<), >0.58 mg/L (B band) and <1.66 mg/l (C band) for nitrate as discussed in Death, R. G., Canning, A., Magierowski, R. and Tonkin, J., 2018. Why aren't we managing water quality to protect ecological health? In: Farm environmental planning – Science, policy and practice. (Eds L. D. Currie and C. L. Christensen). <http://flrc.massey.ac.nz/publications.html>. Occasional Report No. 31. Fertilizer and Lime Research Centre, Massey University, Palmerston North, New Zealand, cited by Dr Mueller at footnote 62.

²⁶ See Ms Jordan's Statement of Evidence for HS1 dated 15 February 2019 paragraphs 171 - 172.

²⁷ See EWCS at p 18 (fourth paragraph) and 6(2) at p 34.

²⁸ See EWCS Attachment 2 section 2.1 at p 20.

lake systems. The experts have undertaken no analysis of the applicability of the chl-a freshwater objective to a riverine system, in particular for the lower river, nor the appropriateness of applying a single attribute number of 5 mg/m³ across the entire River. This means the appropriateness of the phytoplankton freshwater objective and its numerical state, in relation to providing for the River's ecological health, and values is uncertain.

39. Chl-a and macroinvertebrate health are integrated measures of ecosystem health. Nutrients then relate to ecological health through their influence on macroinvertebrate communities and phytoplankton²⁹. If you do not know whether the chl-a measure you are adopting is providing for ecological health, it means the other freshwater objectives that cascade from it are called into question too.

Nutrient Attributes – TN

40. The TN under approach 1c of 0.3 and 0.5 TN mg/L for the upper and mid-River are accepted by B+LNZ, as they are consistent with Dr Cox's HS2 evidence³⁰.
41. For the Lower Waikato River, the EWCS has, at Table 2, identified an 80 year freshwater objective of c. 0.5 TN mg/L³¹. B+LNZ have some concerns about how the expert conferencing reached that 80 year target when assessed against the body of the evidence and the decision to include additional attributes in PC1³², given the lack of evidence about the relationship between N and phytoplankton for the health of the River, as discussed above.
42. It is important to note that the P range provided by the experts of 0.025 mg/L (upper FMU), 0.031 mg/L (middle FMU), and 0.038 mg/L (lower FMU), falls within the range of 0.019 – 0.038 mg/L put forward by Dr Canning, and which is supported by the same Death and Canning paper cited by Dr Mueller. The range for N cited by Dr Canning which

²⁹ Measured by chl-a.

³⁰ See Table 2, p 12.

³¹ That is, 500 mg/m³ B+LNZ's evidence has used the mg/l metric to date, and as such these submissions convert the mg/m³ metric in the EWCS.

³² See EWC outcome that additional attributes are necessary to manage for ecological health rather than just water quality.

correlates to this P range is 0.46 mg/L – 0.74 mg/L. Given the experts have broadly acknowledged that P is the stronger driver of algal biomass in the Waikato River, the setting of TN for the lower river at 0.5 mg/L, would appear unnecessary constraining as a starting point for your analysis and ultimately application of the obligations to restore and protect. It remains B+LNZ's position that this obligation is an expression of s 5 and does not require restoration where the health and wellbeing of the River is not compromised.

43. While recognising the complimentary nature of water quality and MCI³³, the ecologists at the expert conferencing have overlooked a “cross check” between attributes to ensure the nutrient is being managed for ecological health. This may be partially explained by the introductory comment that the additional attributes (i.e. here MCI) were not as fully developed as the so-called “core” Table 3.11-1 attributes, but it casts serious doubt as to the usefulness of telling us additional attributes are necessary when we don't know if the outcomes presented are “final”.
44. In my submission the failure to properly assess the link between these two matters casts real doubt on the appropriateness of 0.5 TN mg/L as an 80 year target in the lower catchment. The effect of limit setting at 0.5 TN mg/L is managing the catchment to a state that is inconsistent with the Vision and Strategy's recognition that there will be some anthropogenic impact on the River. This has been the case ever since there have been humans in the Waikato and unless you remove them it will continue.

Nutrient Attributes – TP

45. B+LNZ have submitted that the appropriate approach to management of P is through the identification of CSA and on-farm management through FEP, based on LUC to address (particularly, but not exclusively) overland contaminants of concern. It is worth noting that overland flow is of particular concern to the sheep and beef sector.
46. B+LNZ agree that both P and N should be managed to provide for ecological health. However, the approach adopted by the ecology

³³ See Attachment 7 at p 74 – point 9.

experts in setting instream N and P freshwater objectives for the value of ecological health, appears flawed. The experts have adopted a lake phytoplankton freshwater objective of 5 mg/m³ (corresponding to B Band in the NPSFM) and the corresponding N attribute of between 0.3 mg/L and 0.5 mg/L. They have then adopted a different methodology for setting instream P freshwater objective, resulting in values between 10 – 38 mg/m³. The NPSFM lake TP attribute state is between 0.010 – 0.020 mg/L³⁴.

47. Given some experts see P as the primary limiting factor for algal biomass, it is unclear why the N instream freshwater objective has been set at such a stringent level. The experts have used the chl-a thresholds, and then set instream N and P freshwater objectives without the analysis identified above³⁵.
48. The multiple lines of evidence approach for setting TN and TP instream outcomes, in the same Death and Canning paper cited by Dr Mueller, provides P concentrations identified for the provision of ecological health in rivers (c.f. lakes as in the NPSFM) of 0.019 – 0.038 mg/L, which falls within the range provided by the ecology experts³⁶. The concern of B+LNZ is therefore not with the freshwater objectives for P proposed by the ecology experts, which B+LNZ supports as it would appear to support the value of ecological health, but with the corresponding N and algal biomass freshwater objectives.

Nutrient Attributes – Conclusion

49. The issues raised above then lead to a need to re-examine the approach to sub-catchments and tributaries at section 5 of the attachment.
50. There has been a failure in the expert witness conferencing process to stand back and see the forest for the trees. This has regrettably led to an outcome that is uncertain and one you need to take real care with because it flies in the face of those parts of the Vision and Strategy, NPSFM, RPS and RMA that acknowledge the relationship between

³⁴ 10 – 20 mg/m³.

³⁵ See p 23 – 24.

³⁶ Upper FMU 0.025mg/L, Middle FMU 0.031mg/L, Lower FMU 0.038mg/L.

people and their environments and the provision for social and cultural wellbeing.

51. The lack of agreement between the experts demonstrates the challenge in determining numeric attribute states, particularly over the long term. For my part I am not much clearer as to what Table 3.11-1 should look like, especially in the context of the short term outcomes. This could be remedied by planning caucusing.

E.coli - Attachment 3

52. Turning to E.coli, it is submitted that the EWCS is regrettably unclear as to what outcome the experts are recommending for E.coli as a measure of pathogenic risk in Table 3.11-1.
53. It is clear from the “runsheet” prepared by Dr Dada that he has some concerns about the approach in Table 3.11-1. He says, and the majority agree, E.coli as a measure of risk is unreliable, but does have its place.
54. Best I can tell there is remains uncertainty around the freshwater objectives in Table 3.11-1, which is made apparent by Dr Dada’s run sheet³⁷. There is no ability for you to account for the fluctuations in E.coli concentrations based on flow³⁸. It is submitted that the only safe way to address this issue is to remove E.coli from Table 3.11-1 and provide narrative attribute states in a new and discreet table that accounts for the discrepancies identified noted by Dr Dada and shown in his table³⁹. The form and content of this table will require planning input⁴⁰ and may benefit from planning expert conferencing.

³⁷ I note that Dr Dada states that he was the only practicing microbiologist at the conferencing. As such it is submitted his views should be given weight, particularly the need for corrections to account for flow³⁷.

³⁸ See Dr Dada’s run sheet at p 148.

³⁹ See p 152.

⁴⁰ For instance, the use of guidance notes as a method to address the issues raised by Dr Dada.

Sediment & Clarity – Attachments 4 & 5

55. The experts have agreed sediment (suspended and deposited) is important to provide for the ecosystem health value. B+LNZ support the Table 1 approach to deposited sediment in the EWCS.
56. Suspended sediment is linked to water clarity, but the experts have told us that there is insufficient evidence to establish a “robust” attribute⁴¹. That seems to leave us relying on clarity.
57. The clarity attribute discussion does not directly address the issue with suspended sediment⁴². This is reflected in the proposal to base the clarity attribute on black disc viewing distance to achieve the value of swimmability. B+LNZ is content with that approach to clarity as an attribute, but notes the experts very much sit on the fence and the best that can be said is that the approach proposed in PC1 has a slim majority, but the degree of disagreement is so great as to make that outcome of limited use⁴³. B+LNZ support the Table 1 approach based on median flows where samples collected in the upper decile of flows have been removed, and where water quality is sought to be improved where the bottom line of 1m for swimmability is not achieved.
58. Unfortunately, there is no obvious link between the attribute table (Table 1) and Table 3.11-1. It is not clear to me how the proposed attribute-state approach is meant to assist the population or de-population of Table 3.11-1. B+LNZ is left in a difficult position where it cannot determine how what is proposed as an alternative to the notified approach would fit into the Plan’s freshwater objective framework.
59. In the absence of further directions specifically addressing this issue, it is submitted that a new table for deposited sediment, based on Table 1, is included in the Plan as a monitoring requirement for the Regional Council. That monitoring could be supported by a method that requires

⁴¹ See p 56.

⁴² See page 56.

⁴³ See Joint Witness Statement (JWS) Expert Conferencing Table 3.11-1 Water clarity: Attachment 5 presentation 18 July 2018, fifth slide.

it to be undertaken over the life of the Plan and once a more reliable data set has been obtained a freshwater objective would be determined.

Macroinvertebrate Index – Attachment 7

60. B+LNZ agree with the inclusion of a macroinvertebrate attribute within Table 3.11-1, but would prefer it to be based on the approach set out in Table 1, rather than the percentage of stream length approach. B+LNZ consider it would be more workable and notes that this method would be consistent with the approach taken by other regional councils in setting MCI as a freshwater objective.
61. While B+LNZ does not object in principle to the use of the Collier macroinvertebrate attribute table, or its QMCI equivalent, it does note Mr Kessels' reservations about the individual characteristics of wadeable streams effecting the appropriateness of 80 MCI as a bottom-line⁴⁴.

Evidence – HS3

62. B+LNZ will be calling three witnesses on the HS3 topics:
 - (a) Mr R Parkes - – environment capability manager B+LNZ;
 - (b) Dr M Whatley – ecologist and sustainable rural land management consultant;
 - (c) Ms C Jordan – planner.



C P Thomsen
Counsel for Beef + Lamb New Zealand Ltd
13 August 2019

⁴⁴ See Mr Kessels comments at p 172 of Attachment 17.

Appendix 1

Attachment 1 Revised table of current state values (2010–14).

Attachment 1: Current state water quality variables for the Waikato and Waipa River catchment, 2010–14, as revised by Waikato Regional Council staff, March 2019. Note that where possible, *E. coli* results obtained in 2009 were included to help ensure a sample size of 60; even so, in many cases the sample size was lower than this (in the range 22–39); these values are shown in brackets. Note also that water clarity results obtained at river flows higher than the 90-percentile flow were ignored. Note ammonia is pH-adjusted to pH 8 as specified in the National Objectives Framework and the ammonia maximum is the average of 5 annual maxima. "Med", median; "Max", maximum; "95%ile", 95-percentile; "N", nitrogen; "P", phosphorus.

	Med Chla (mg/m ³)	Max Chla (mg/m ³)	Med total N (mg/m ³)	Med total P (mg/m ³)	Med nitrate (mg/L)	95%ile nitrate (mg/L)	Med ammonia (mg/L)	Max ammonia (mg/L)	95%ile <i>E. coli</i> (/100 mL)	Med clarity (m)
Upper Waikato FMU										
Waikato River Ohaaki Br	1.5	13	134	10	0.039	0.076	0.002	0.013	80	3.80
Waikato River Ohakuri Tailrace Br	3.1	11	216	17	0.086	0.177	0.003	0.017	16	2.25
Waikato River Whakamaru Tailrace			271	20	0.101	0.251	0.003	0.010	60	1.87
Waikato River Waipapa Tailrace	4.0	25	336	25	0.164	0.320	0.007	0.016	140	1.86
Pueto Stm Broadlands Rd Br			540	83	0.450	0.536	0.003	0.009	(92)	1.64
Torepatutahi Stm Vaile Rd Br			625	96	0.500	0.825	0.002	0.011	(215)	
Waiotapu Stm Homestead Rd Br			1860	100	1.285	1.665	0.121	0.190	(280)	
Mangakara Stm (Reporoa) SH5			1580	74	1.300	1.675	0.008	0.063	(1700)	0.86
Kawaunui Stm SH5 Br			2890	82	2.600	3.100	0.006	0.083	(2535)	1.33
Waioitapu Stm Campbell Rd Br			1955	72	0.915	1.135	0.301	0.349	(18)	1.17
Otamakokore Stm Hossack Rd			990	144	0.740	1.360	0.006	0.025	(696)	1.10
Whirinaki Stm Corbett Rd			810	62	0.770	0.885	0.002	0.013	(98)	
Tahunaatara Stm Ohakuri Rd			780	44	0.555	0.845	0.003	0.015	(810)	1.25
Mangaharakeke Stm SH30			685	48	0.525	0.795	0.003	0.015	(700)	1.02
Waipapa Stm (Mikoi) Tirohanga Rd			1355	95	1.210	1.555	0.003	0.005	(1215)	1.11
Mangakino Stm Sandel Rd			760	47	0.650	0.875	0.003	0.012	(250)	1.63
Whakauru Stm SH1 Br			470	42	0.260	0.461	0.003	0.033	(2280)	0.75
Mangamingi Stm Paraonui Rd			3495	325	2.800	3.400	0.098	0.323	(2330)	0.82
Pokaiwhenua Stm Arapuni - Putaruru			2010	106	1.755	2.200	0.002	0.020	(1455)	1.26
Little Waipa Stm Arapuni - Putaruru			1780	68	1.580	2.150	0.002	0.089	(1470)	1.53
Middle Waikato FMU										
Waikato River Narrows Boat Ramp	5.5	23	410	28	0.235	0.545	0.010	0.018	265	1.60
Waikato River Horotiu Br	6.0	23	441	36	0.260	0.550	0.007	0.029	650	1.35
Karapiro Stm Hickey Rd Bridge			860	86	0.520	1.760	0.008	0.031	(4960)	0.93
Mangawhero Stm Cambridge-Ohaupo			2930	163	2.100	2.720	0.042	0.074	(3185)	0.26
Mangaonua Stm Hoeka Rd			1905	52	1.505	2.100	0.037	0.051	(7020)	0.91

Mangaone Stm Annebrooke Rd Br				3060	118	2,600	3,200	0.009	0.020	(2220)	0.95
Mangakokutuku Stm Peacockes Rd				1875	415	0.800	2,350	0.082	0.141	(12600)	0.41
Waitawhiriwhiri Stm Edgcombe Street				2110	91	0.880	1,265	0.258	0.346	(6520)	0.38
Kirikiroa Stm Tauhara Dr				1490	63	0.815	1,975	0.104	0.198	(3620)	0.40
Lower Waikato FMU											
Waikato River Huntly-Tainui Br	6.0	19		585	45	0.365	1,010	0.005	0.015	2000	0.87
Waikato River Mercer Br	10.5	30		662	52	0.365	0,895	0.003	0.011	1550	
Waikato River Tuakau Br	12.0	38		595	52	0.325	0,890	0.003	0.008	1600	0.61
Komakorau Stm Henry Rd				2900	90	1.310	5,300	0.251	0.421	(3800)	0.17
Mangawara Stm Rutherford Rd Br				1890	210	0.765	3,350	0.111	0.185	(5445)	0.25
Awaroa Stm (Rotowaro) Sansons Br				990	12	0.700	1,390	0.024	0.093	(1940)	0.84
Matahuru Stm Waiterimu Road				1310	98	0.715	1,905	0.017	0.060	(6770)	0.31
Whangape Stm Rangiriri-Glen Murray Rd				2116	122	0.004	0.795	0.008	0.143	(588)	0.17
Waerenga Stm SH2 Maramarua				1115	46	0.820	1,420	0.005	0.023	(5605)	0.83
Whangamarino River Jefferies Rd Br				1085	88	0.625	2,500	0.011	0.055	(5175)	0.49
Mangatalangi River SH2 Maramarua				493	72	0.110	1,290	0.006	0.038	(6125)	0.54
Mangatawhiri River Lyons Rd Buckingham Br				181	23	0.013	0.400	0.003	0.011	(5615)	1.63
Whangamarino River Island Block Rd				1831	152	0.075	0.865	0.013	0.158	(667)	0.20
Whakapipi Stm SH22 Br				3875	51	3.500	5,350	0.006	0.084	(1910)	1.10
Chaeoroa Stm SH22 Br				1825	26	1.525	1,915	0.003	0.015	(5125)	0.81
Opuatia Stm Ponganui Rd				1070	31	0.740	1,081	0.005	0.016	(3160)	0.53
Awaroa River (Waiuku) Otaua Rd Br Moseley				2095	46	1.410	2,500	0.022	0.144	(1070)	0.37
Waipa River FMU											
Waipa River Mangaokewa Rd				585	16	0.380	0.710	0.003	0.017	(2625)	1.51
Waipa River at Otewa						0.228	0.504	0.003	0.008	2203	2.13
Waipa River SH3 Otorohanga				600	22	0.370	1,150	0.004	0.020	(3595)	1.11
Waipa River Pirongia-Ngutu Rd br				860	48	0.565	1,535	0.008	0.023	(4875)	0.63
Waipa River at Whatawhata Bridge						0.673	1,587	0.009	0.026	4003	0.63
Onote Stm Whatawhata/Horotiu Rd				1320	76	0.495	1,385	0.023	0.054	(2320)	0.55
Kaniwhaniwha Stm Wright Rd				590	29	0.350	0.995	0.007	0.022	(2070)	0.87
Mangapiko Bowman Rd Stm				2095	240	1.410	2,650	0.022	0.078	(7800)	0.61
Mangaohoi Stm South Branch Maru Rd				365	52	0.230	0.415	0.003	0.008	(987)	1.58
Mangaohoi Stm Te Awamutu Borough W/S				275	8	0.210	0.286	0.002	0.003	(1060)	3.60
Punui River Bartons Corner Rd Br				910	48	0.650	1,305	0.007	0.029	(3040)	0.94
Mangatutu Stm Walker Rd Br				510	20	0.380	0.908	0.003	0.012	(780)	1.53
Waitomo Stm SH31 Otorohanga				755	30	0.520	0.925	0.008	0.026	(1555)	0.59
Mangapu River Otorohanga				1240	60	0.860	1,428	0.016	0.064	(4700)	0.61
Waitomo Stm Tumutumu Rd				765	22	0.630	0.825	0.004	0.013	(2430)	0.95
Mangaokewa Stm Lawrence Street Br				775	36	0.525	1,060	0.005	0.014	(6855)	1.10

Table 3A: Short-term and 80-year targets from Table 3.11.1, plus current state values for 2014–18 (including NOF bands). Chlorophyll a, total nitrogen and total phosphorus at the main-stem Waikato River sites.

	Median chlorophyll (mg/m ³)			Maximum chlorophyll (mg/m ³)			Median total nitrogen (mg/m ³)			Median total phosphorus (mg/m ³)		
	current	short term	80 year	current	short term	80 year	current	short term	80 year	current	short term	80 year
Upper Waikato River FMU												
Waikato River Ohaaki Br	1.5 (A)	1.5	1.5	1.5 (A)	13	13	127 (A)	134	134	10 (A)	10	10
Waikato River Ohakuri Tailrace Br	4 (B)	3.2	3.2	25 (B)	11	11	216 (A)	206	160	18 (B)	17	17
Waikato River Whakamaru Tailrace			5			25	266 (A)	260	160	22 (C)	20	20
Waikato River Waipapa Tailrace	5 (B)	4.1	4.1	18 (B)	25	25	350 (B)	318	160	26 (C)	25	20
Middle Waikato River FMU												
Waikato River Narrows Boat Ramp	5 (B)	5.5	5	83 (D)	23	23	515 (C)	404	350	29 (C)	28	20
Waikato River Horotiu Br	5.5 (C)	6.1	5	24 (B)	23	23	535 (C)	432	350	35 (C)	34	20
Lower Waikato River FMU												
Waikato River Huntly-Tainui Br	5.5 (C)	5.9	5	20 (B)	19	19	720 (C)	562	350	43 (C)	43	20
Waikato River Mercer Br	7.5 (C)	10	5	37 (C)	30	25	740 (C)	631	350	48 (C)	49	20
Waikato River Tuakau Br	9 (C)	11.3	5	45 (C)	37	25	720 (C)	571	350	50 (C)	50	20

Figure 1a: Measured Nitrogen Concentrations, Waikato River at Ohakuri, 2013 – 2018

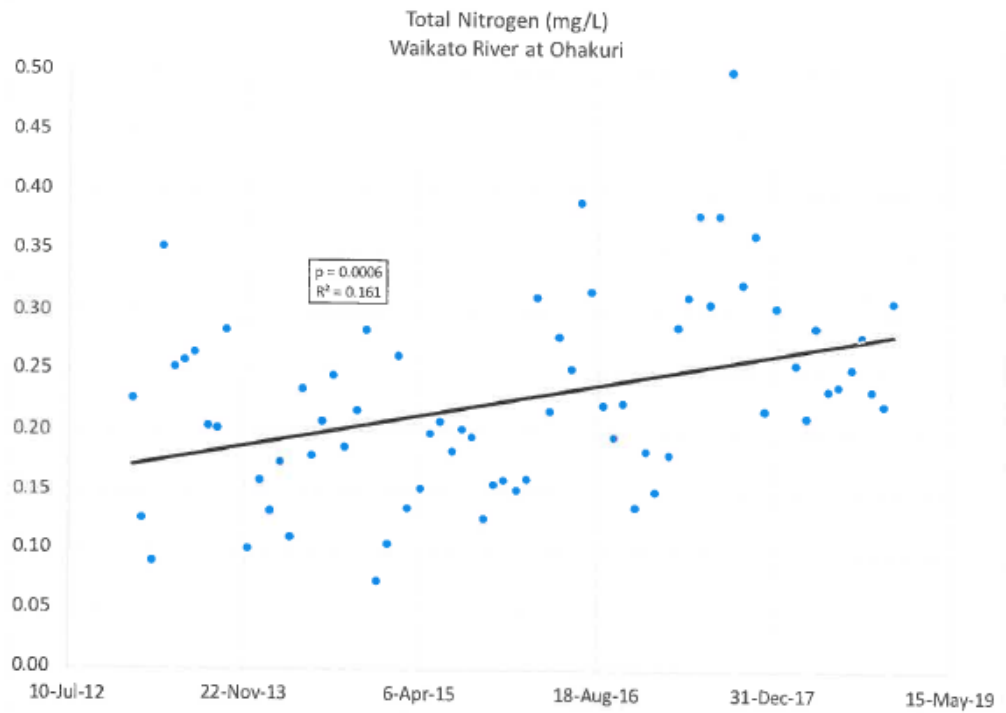


Figure 1b: Measured Nitrogen Concentrations, Waikato River at Narrows Bridge, 2013 – 2018

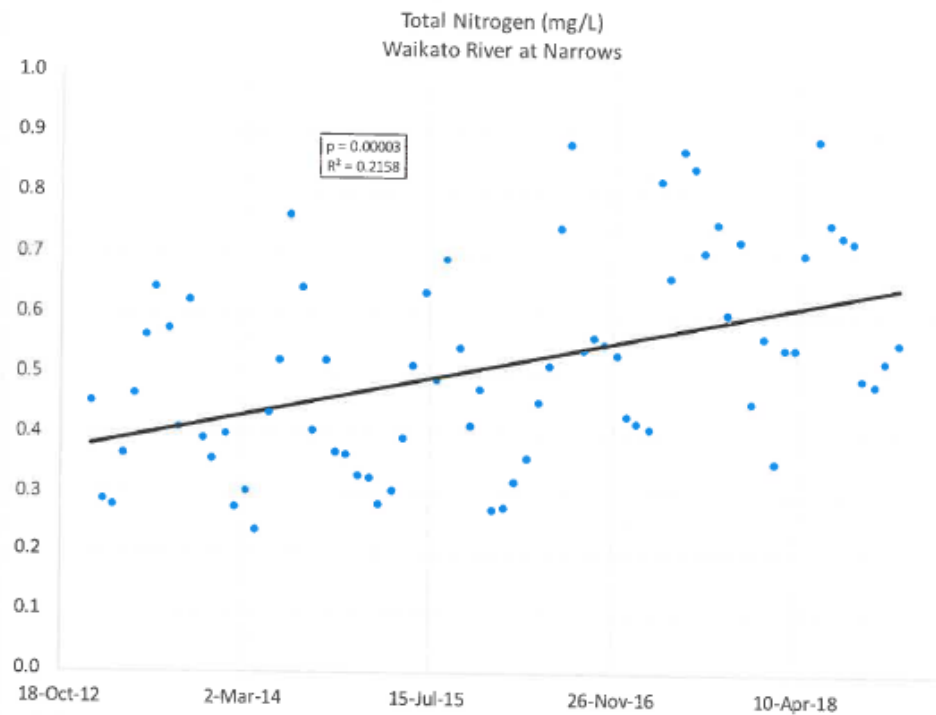


Figure 1c: Measured Nitrogen Concentrations, Waikato River at Tuakau, 2013 - 2018

