

## Supplementary Questions from Hearing Commissioners Week 1: Proposed Southland Water and Land Plan hearing

---

*Respondents – RH = Roger Hodson; BH = Brydon Hughes; GM= Gary Morgan; MMC = Matthew McCallum- Clark*

**Monday 22 and Tuesday 23 May**

### **Questions from during the hearing**

***Question 1: Can the water quality trends pre 2000 be provided ? Particularly, can we see information relating to the New River estuary site, along with relevant references and page numbers ?***

*Response : RH*

In response, I will refer to three primary sources of information.

1. Southland's State of the Environment Report for water – October 2000
2. Hamill K. D. and McBride, G. B. 2003. River water quality trends and increased dairying in Southland, New Zealand. New Zealand Journal of Marine and Freshwater Research, 37:2,323-332
3. Robertson, B.M., Steven & L.M., Dudley, B. (In Press). New River Estuary - review of water quality data in relation to eutrophication 1991-2015. Report prepared by NIWA and Wriggle Coastal Management for Environment Southland. 32p.

[In Southland's State of the Environment Report for water – October 2000](#), water quality state and trend were assessed using data sets available from as early as the 1970s. The authors do not state the specific site by parameter time periods included, however do refer to trends or changes having occurred since the 1970s and trends continuing since 1989 (coincidental to the NIWA operated national water quality network sites being opened in Southland) as well as to 5 and 10 year periods of analysis. The key findings are summarised as quoted text below and referenced to the page number of text within the original report.

#### Faecal bacteria

p.31: *“Faecal contamination has worsened in the Mataura River (at Otamita) since 1975 and sampling near Gore since 1994 has confirmed this deterioration.”*

*“The headwaters of the Oreti and Aparima rivers have excellent water quality, but faecal contamination causes a health risk to bathing the in the lower reaches. Faecal contamination has not changed in either river since 1994, but there has been an improvement in the Oreti River since 1977 and early records suggest a deterioration in the Aparima river.”*

*“The Fiordland lakes and most of the Waiau River have excellent water quality. At Tuatapere faecal contamination has increased since 1979 and the health risk is now border-line. No change has occurred since 1994.”*

Figure 19 on p.32 illustrates 2 of 12 sites with deteriorating levels of faecal bacteria.

#### Harmful substances

p.32: *“Records from the last 10 years show a continued trend towards less BOD in the major catchments (where monitored) (see Figure 20).”*

*“Ammonia levels have decreased over the last 20 years in the Mataura, Oreti and Waiau rivers. This improving trend has continued since 1989 in the Oreti and Waiau rivers (see Figure 21). However, a deterioration has occurred in the Waituna Creek, and there has been no recent (5 year) improvement in the Makarewa River (at Taramoa) which still rates poorly.”*

Figure 20 on p.33 illustrates 7 of 10 sites to have an improvement in levels of Biological Oxygen Demand (BOD)

Figure 21 on p.33 illustrates 4 of 17 sites to have improving levels of Ammonia, and 1 site to have a deterioration in Ammonia.

#### Nutrients

p.34: *“Nitrogen concentrations have increased in all of the major catchments in the last two decades, with degradation being particularly rapid in the last decade. Only the Otautau Stream, a tributary of the Aparima River, has shown any improvement in nitrogen levels.”*

*“increasing phosphorus concentrations have been recorded in all the major catchments. No sites are showing an improvement.”*

Figure 22 on p.35 illustrates 7 of 16 sites with a deterioration in nitrogen level, 1 with an improving level.

Figure 23 on p.35 illustrates 8 of 16 sites with a deterioration in phosphorus level.

Hamill and McBride 2003 analysed six water quality variables from 29 sites in Southland for the time period July 1995 – June 2001. *“Results indicate that increased dairy farming has been associated with increasing concentrations of dissolved reactive phosphorus. There has been a worsening in other water quality variables (oxidised nitrogen, dissolved oxygen) but these also occurred in non-dairying catchments. An improvement in observed water clarity disappeared after flow adjustment”*

Robertson et al (in press) have assessed water quality data collected by the Invercargill city council between 1991 and 2015 from eight shallow sites within the estuary and one site on Oreti Beach. The relevant sections of this report are provided in the Memo attached.

With the exception of the site named the “Tip Outlet” all sites revealed a deterioration in nitrate (NO<sub>3</sub><sup>-</sup>-N), dissolved inorganic Nitrogen and Total Phosphorus. The “Tip Outlet” site illustrated a deterioration in Total Phosphorus but an improvement in dissolved inorganic nitrogen and ammonia. There is evidence that the nitrogen load leaching from the Tip Outlet may be decreasing while nutrient concentrations in other parts of the estuary continue to increase.

### References

Southland’s State of the Environment Report for Water – October 2000, Southland Regional Council Publication Number 2000-21. ISBN Number 0-909043-16-7. Available online at:

<http://www.es.govt.nz/Document%20Library/Research%20and%20reports/SOE%20reports/state-of-the-environment-freshwater.pdf>

Hamill K. D. and McBride, G. B. 2003. River water quality trends and increased dairying in Southland, New Zealand. New Zealand Journal of Marine and Freshwater Research, 37:2,323-332. Available online at:

<http://www.tandfonline.com/doi/pdf/10.1080/00288330.2003.9517170?needAccess=true>

Robertson, B.M., Steven & L.M., Dudley, B. (In Press). New River Estuary - review of water quality data in relation to eutrophication 1991-2015. Report prepared by NIWA and Wriggle Coastal Management for Environment Southland. 32p.

### ***Question 2: Where groundwater exceeds the Drinking Water Standards for E.coli is it because of well head contamination or aquifer contamination?***

*Response : RH*

In the time available we are unable to assess individual bores likely mechanism of contamination as being from poor well head protection vs aquifer contamination. However, in the validation of the physiographics work. Ton Snelder identified that the Central Plains PZ had the highest incidence of GW *E.coli* contamination. We think this reflects the role of by-pass through the soil zone and or down the annulus of the well. As you might expect, desiccation (and cracking/shrinking) of the soil adjacent to a well head could promote bypass.

### ***Question 3: Can you provide the nutrient budget that was referred to in question 8.52 of the pre provided questions ?***

*Response : BH*

The nutrient budget is now tabled. Note this forms part of a further information request associated with a resource consent application lodged with Environment Southland.

### ***Question 4: Can Mr Morgan please read the evidence from Beef + Lamb NZ and consider their definition of Critical Source Area . Can you advise the Panel if you think this definition is, in your opinion, a more practicable and easily understood definition for famers compared to the definition currently in Appendix N?***

Response : GM

Yes, to both questions. In my opinion the definition is both more practicable, and more easily understood.

The definition of CSAs in the glossary of the pSWLP, from Dairy NZ documents, is

*Areas of enriched nutrient or sediment sources and hydrological activity that occur in small parts of a catchment or farm, but contribute a disproportionately large amount of nutrient or sediment to the environment (e.g. steep hills, gullies or swales)*

The suggested definition from B+LNZ is:

*A critical source area is a landscape feature like a gully, swale or depression that accumulates runoff from adjacent flats and slopes, and delivers it to surface waterways such as rivers and lakes, artificial waterways and field tiles;*

and

*areas which arise through land use activities and management approaches such as cultivation and winter grazing which result in contaminants being discharged from the activity and being delivered to surface waterways*

My view is that the B+LNZ definition helps farmers to link CSA's to receiving water bodies and enables them to critically assess those CSA's and develop appropriate mitigations.

The only suggestion I would have, to improve the definition, is to insert the words 'sediment and nutrients' into the first section of the definition, after the word runoff.

I have also revisited the Environment Southland Factsheet on Critical Source Areas, which uses the first part of the B + L definition. This factsheet is widely distributed throughout Southlands' farming community.

*A critical source area is a landscape feature like a gully, swale or depression that accumulates runoff (sediment and nutrients) from adjacent flats and slopes, and delivers it to surface waterways such as rivers and lakes, artificial waterways and field tiles*

**Question 5: With respect to Rule 73(a)(ii), do we need to refer to "Q95", or is "stay out of the water" sufficient?**

Response: MMC

The requirement to remain outside the area below the Q95 level should be deleted from the rule.

**Question 6: When looking at the risk assessment in Ms Wilson's slides, Old Mataura, Oxidising and Riverine physiographic zones all have the same risk assessment, so are they treated the same in the pSWLP? If not, why not?**

Response: MMC

The science analysis would suggest that various combinations of physiographic zones should be treated in the same way, depending on the issues being considered. The Council arrived at a position regarding the treatment of combinations of the physiographic zones at the stage of notification of the plan, and assessed this as being the most appropriate in the Section 32 Report, at pages 109-110. The Section 42A Report reconsidered this issue, in light of the wide range of submissions on the topic. Due to the wide range of opinions, and the evidence to come, a recommendation on the activity status for new or expanded dairying and intensive winter grazing in each of the physiographic zones has not been made.

***Question 7: Many submitters have suggested that physiographic units should sit outside the pSWLP as guidance rather than within the Plan. Can you please provide a response to this issue?***

*Response: MMC*

In my opinion, the physiographic zoning concept is a very useful tool to manage diffuse discharges of contaminants, and enables targeted, rather than ‘blanket’, solutions. Relegating them to guidance material would remove the ability to target activity status, or compliance with performance standards at particular physiographic zones.

***Question 8: Many submitters have questioned the physiographic units on their particular property, how can that be/is that reassessed if they think the classification is incorrect?***

*Response: MMC*

That would need to be achieved as a part of an application for resource consent. Recommended new Policy x is intended to facilitate this reassessment.

***Question 9: Can you provide a revised Policy 15?***

*Response: MMC*

The following, substantial revision, into two policies, is suggested:

*15A Maintain water quality where water quality standards are met by:*

- 1. avoiding, remedying or mitigating the adverse effects of new discharges, so that surface waterbodies, beyond the zone of reasonable mixing, continue to meet the Appendix E “Water Quality Standards” and the ANZECC sediment guidelines (as shown in Appendix C of this Plan), and groundwater continues to meet drinking water standards; and*
- 2. requiring that any application that is for the replacement of an expiring discharge permit, to demonstrate how the adverse effects are avoided, remedied or mitigated, so that for surface waterbodies the receiving waterbody, beyond the zone of reasonable mixing, continues to meet the Appendix E “Water Quality Standards” and the ANZECC sediment guidelines (as shown in Appendix C of this Plan), and groundwater continues to meet drinking water standards;*

*15B Maintain and improve water quality where water quality standards are not met by:*

1. *avoiding the adverse effects of new discharges to surface waterbodies where the surface waterbody does not meet the Appendix E “Water Quality Standards” or the ANZECC sediment guidelines (as shown in Appendix C of this Plan); and*
2. *avoiding, remedying or mitigating the adverse effects of new discharges to land so that there is no further degradation of groundwater quality, where groundwater does not meet drinking water standards; and*
3. *requiring that any application that is for the replacement of an expiring discharge permit, to demonstrate how the adverse effects are avoided, remedied or mitigated, so that for surface waterbodies the receiving waterbody, beyond the zone of reasonable mixing, will be improved, to meet the Appendix E “Water Quality Standards” and the ANZECC sediment guidelines (as shown in Appendix C of this Plan) or groundwater quality will be improved, to meet drinking water standards, and set out the time frame over which it will occur.*

**Question 10: Can you provide a new version of Map 24 please?**

*Response: MMC*

The map will be provided in the folder of material to be provided on Wednesday morning.

**Question 11: Can you provide a revised tracked changes version of the pSWLP which includes s42A recommendations and further recommendations resulting from days 1 and 2 of the hearing?**

*Response: MMC*

This revised pSWLP will be available on Wednesday morning.

**Questions from overnight – Chairman Rob van Voorthuysen**

**Question 12: Rule 21(b)(iv) – when does the FEMP have to be prepared by?**

*Response: MMC*

Within six months of the pSWLP becoming operative.

**Question 13: Rule 21(c)(i) - when does the FEMP have to be prepared by?**

*Response: MMC*

Within six months of the pSWLP becoming operative.

**Question 14: Rule 21(c)(i) – why is the wording of this condition different to that in Rule 21(b)(iv)?**

*Response: MMC*

This rule uses wording from Rule 20. Rule 21(b)(iv) should be revised to be consistent, by deleting the words: “including the mitigations relevant to the farming type being undertaken and relevant physiographic zone.”.

***Question 15: Rules 21(d) and 21(e) – do we need to include a reference to 21(b)(ii) because if 21(b)(i) is not met then 21(b)(ii) is moot?***

*Response: MMC*

Yes, as the conditions are separate – a farmer could have a resource consent for say 200 cows (Rule 21(b)(i)), but be increasing to 300 cows (Rule 21(b)(ii)).

***Question 16: Rules 21(d) and 21(e) – alternatively, if reference to 21(b)(ii) is recommended to be retained should the clause read “21(b)(i) and 21(b)(ii) ....”***

*Response: MMC*

Yes.

***Question 17: Rule 21(d)(i) – why are the words relating to mitigations deleted here, but not in 21(b)(iv)?***

*Response: MMC*

These should also be deleted in Rule 21(b)(iv).

***Questions 18: Rules 21(d) and 21(e) – should Rule 21(b)(iii) be referred to because that condition is not linked to having an effluent discharge consent at 1 May 2016, it is a stand-alone condition?***

*Response: MMC*

No, not meeting Rule 21(b)(iii), it is covered by Rule 21(c).

***Question 18(a): Rule 21(h) – what is the reference or baseline date for “new”?***

***Question 18(b): Rule 21(h) – how does this Rule work. It starts with the words “Despite Rule 21(e) ...” and then refers to “... the resource consent application ...”. What Rule is that consent application lodged under as it can’t be Rule 12(e) given the wording at the start of Rule 21(h)?***

***Question 18(c): Would it be clearer if Rule 21(e) referred to an area of land exceeding 50ha and Rule 21(h) referred to an area of land not exceeding 50ha and Rule 21(h) was relocated to be after Rule 21(e)?***

*Response: MMC*

The answer to the final question is yes which makes the earlier questions obsolete.

***Question 19: Given the numbering convention in the answer at paragraph 7.653 today is the numbering of the component parts of Rule 21 correct?***

*Response: MMC*

No.

***Question 20: Rule 23(b)(vii) – is the term “river” intended to include permanent, intermittent and ephemeral water bodies?***

*Response: MMC*

No, the rule should exclude ephemeral waterbodies, as should Rule 70(c).

***Question 21: Rule 23(b)(vii)(1) and (2) – what happens you have an existing permanent fence on land steeper than 9 degrees?***

*Response: MMC*

Then other stock exclusion will be required to meet the set back distances.

***Question 22: Rule 23(b)(vii)(1) – if a permanent fence is already in place why does it have to be located 3 metres from the bed? Wouldn't a fence located say only 1 metre from the bed still exclude stock?***

*Response: MMC*

This 3 metres distance was included as the existing winter grazing rule in the RWP also requires 3 metres. Some farmers may have already established permanent fencing at this distance, and requiring it be shifted to 5 metres may be inefficient.

***Question 23: Rule 23(b1)(ii) – is it intended that the FEMP requires that (1) occur and sets out how (2) will be achieved? If so can the provision be more explicit?***

*Response: MMC*

No, as explained in questions yesterday to Mr Morgan, some critical source areas are within a paddock and well separated from a waterbody. In those situations, sediment retention may be more appropriate.

***Question 24: Rule 23(b1)(ii) – should clauses (1) and (2) be separated by an “or” or an “and”?***

*Response: MMC*

“or”.

***Question 25: Rule 23(c)(ii) – are the cross-references correct?***

*Response: MMC*

Yes. Condition (ii) is addressed in Rule 23(f) and condition (iv) is addressed in the header of Rules 23(c) and (d).

***Question 26: Rule 23(d) – are the cross-references correct?***



*Response: MMC*

No. The correct references are condition (iv) to (vii) of Rule 23(b) or conditions (i) to (iii) of Rule 23(c).

**Question 27: Should Rule 23(d) and 23(f1) both refer to Central Plains?**

*Response: MMC*

No. In advance of a recommendation being made, Central Plains should be deleted from Rule 23(f1).

**Question 28: Rule 23(e) – is this rule worded correctly as Rule 23(c) now no longer refers to Old Matura or Peat Wetlands?**

*Response: MMC*

Rule 23(e) is correct, but the problem is caused by the inclusion of Riverine, Gleyed, Bedrock/Hillcountry, Oxidsing, Central Plains or Lignite/Marine Terraces physiographic zones in Rule 23(c).

**Question 29: Rule 23(e) – what is the situation if the grazing does meet the conditions referred to?**

*Response: MMC*

The activity has a non-complying activity status.

**Question 30: Rule 23(e) – is the grazing activity referred to already permitted under Rule 23(b), since Rule 23(c) no longer refers to Old Matura or Peat Wetlands? If so does that make Rule 23(e) moot?**

*Response: MMC*

Only up to 50 hectares is permitted under Rule 23(b). The correct condition references in this rule should be “condition (iv) to (vii) of Rule 23(b) or conditions (i) to (iii) of Rule 23(c).”

**Question 30(a): Rule 23(f1) - what is the reference or baseline date for “new”?**  
**Question 30(b): Rule 23(f1) – should this rule be limited to a landholding?**

*Response: MMC*

This rule is intended to relate to condition (i) of Rule 23(c) and to apply to properties with mixed physiographic zones. Refinement and clarification is required, but will require further consideration to ensure it does not have unintended consequences for the operation of the dairying or intensive winter grazing rules.

**Question 31: Rule 25(b) – should this also refer to 25(a)(ii) and (iii)?**

*Response: MMC*

No, these are addressed by other rules.

**Question 32: Rule 25(c) – should this also refer to 25(a)(ii)?**

*Response: MMC*

No, this should be included in 25(d).

**Question 33(a): Rule 25(d) – does this overlap with new Rule 25(c) given that 25(d) refers to all of 25(a) and all of 25(b)?**

**Question 33(b): Rule 25(c) – where do activities that don't meet the conditions of Rule 25(c) default to?**

*Response: MMC*

Rule 25(d) should read: “25(a)(ii), 25(b) or 25(c)”

**Question 34: Rule 70 – The S42A report at 10.326 recommends the adoption of Fonterra's definition of active bed. However, the concept of an active bed does not feature in Rule 70 (or anywhere else in the plan). Why is that?**

*Response: MMC*

I apologise, that paragraph was prepared before the draft national standards on stock exclusion were released, and is now inconsistent with the analysis and recommendations on Rule 70. Accordingly, that paragraph should be deleted.

**Question 35: As currently worded Rule 70(a) permits stock access to the beds of water bodies except for (a)(i), (ii) and (iii). There are no other conditions. This creates the impression that stock access is permitted for all time other than in those three cases. Rule 70(b) is not assigned a consent activity class – however it does not appear to be suited to a controlled, restricted discretionary, discretionary or non-complying activity status as it seeks the exclusion of stock from the waterbodies by the dates listed.**

***So, would it be more certain if:***

- *the access of stock into the areas listed in (a)(i) and (ii) were and (b) [subject to the geographic distinctions and timeframes] was prohibited, and*
- *stock crossings (Rule 70(a)(iii)) remained a permitted activity subject to conditions 1 and 2, and*
- *Rule 70(d) was recast as a prohibited activity?*

*Response: MMC*

Yes, that would be more certain. However, I consider that prohibited activity status would possibly be inappropriate, as:

1. “(b) [subject to the geographic distinctions and timeframes]” would not enable flexibility for high country and low stocking rate properties.

2. Some wetlands and waterbodies covered by Rule 70(d) are extensive in area, and may not be significantly affected by managed grazing with light stock, such as sheep.

On this basis, recommended Rule 70(e) establishes a discretionary activity status, with a FEMP.

**Question 36: Does Rule 70(c) duplicate the intensive winter grazing rules?**

*Response: MMC*

It does in part – the rule also addresses winter break feeding of pasture and cereal crops, for all stock types.

**Question 37(a): Is enabling consent applications under Rules 70(e) and 70(f) an effective and efficient way of ensuring that stock is excluded from the water bodies addressed in (a) to (d)?**

**Question 37(b): Realistically, would consent ever be granted to allow stock into the areas referred to in Rule 70(a)(i) and (ii) and 70(d)?**

*Response: MMC*

Possibly not for Rule 70(a)(i) and (ii), but, as outlined above, potentially for Rule 70(d).

**Questions from overnight – Chairman Rob van Voorthuysen**

**Question 38: Policy 28 effect 13 – Landscape should be in lower case**

*Response: MMC*

Noted, and that will be corrected in the revised tracked changes version.

**Question 39: Rule 32(c) MOD 5 – the words “that will enter” are unclear as to their meaning. Can this be improved?**

*Response: MMC*

More certainty would be added by changing this to: “that will enter the effluent storage facility”.

**Question 40: Rule 57 onwards the note on heritage miss-spells Poutere – it should be Pouhere**

*Response: MMC*

Noted, and that will be corrected in the revised.

Wednesday 24 May

***Question 41: Can we have some suggested changes relating to the third paragraph on page 33 (requirement for nutrient budgets in Appendix N)?***

*Response: MMC*

Option 1 – Rely on targeted approaches from Land Sustainability and industry groups

Under this option, there would be no further changes to this part of Appendix N.

Option 2 – Further adjust to require nutrient budgets for sheep and beef in areas more likely to have intensive sheep and beef farming.

Under this option, the further changes to this part of Appendix N are:

4. Nutrient Budget

A nutrient budget based on soil nutrient tests has been prepared, using the latest version of the OVERSEER model, in accordance with the latest version of the OVERSEER Best Practice Data Input Standards, or an equivalent model approved by the Chief Executive of Southland Regional Council, for all farming activities except sheep, beef and deer farming where:

- a. there is no dairy support occurring and no more than 20 ha of intensive winter grazing on the landholding; and
- b. no part of the landholding is in the Peat Wetlands or Oxidising physiographic zones;

and:

***Question 42: Can we have some analysis of intensive winter grazing limits of 50 hectares for properties up to 500 hectares, then 10% of land area for properties over 500 hectares?***

*Response: MMC*

This option is included in Attachment 1 – Additional Winter Grazing Analysis. It is labelled as Scenario 12.

***Question 43: With respect to additional wetlands potentially to be added to Appendix A, is Council undertaking the additional steps required to enable listing of these wetlands?***

*Response: MMC*

Mr James Dare, an Environmental Scientist with Environment Southland advises me that no, there is no any planned work within the science team to on-site validate wetlands identified in the Wetland Inventory Project, in conjunction with the landowner. He advises that while Land Sustainability officers identify wetlands as part of farm plan exercises, farm plan information is not available for other purposes, without the consent of the landowner, as explained to you in answers to questions from Mr Morgan.

In my experience, on-site wetland identification and subsequent mapping and listing needs to be planned and managed very carefully, or there is a significant potential, as has been seen in other parts of the country, for relationships with the Council to be eroded.