

**Before the commissioners appointed by the  
Canterbury Regional Council**

**In the matter of** The Resource Management Act  
1991

**and**

**In the matter of** 60 water permit applications to  
take and use water, 29 land use  
consent applications and 21  
discharge permit applications, for  
agricultural and horticultural  
activities in the upper Waitaki  
catchment

**Section 42A Report – Cumulative Water Quality Assessment**

**Date of hearing: September 2009 – February 2010**

**Clarification of the Relationship between Original and Addendum s42A  
Reports - Marc Schallenberg**

**INTRODUCTION**

1. The following table (Table 1) sets out the relationship between the matters considered in my original s42A report and those of which I make comment on in my Addendum report.
2. This information is provided to the commissioners to enable an improved understanding of the original audit issues that remain unresolved, are referred to in other reporting officer's evidence, or that have been addressed in Addendum evidence.
3. The issues highlighted in **bold** (in Table 1) indicate those which remain unresolved.

**Table 1 Relationship between Original and Addendum s42A Reports**

Original s42A report paragraph number	Issue	Status
1 - 3	Background and Qualifications.	Same as s42A report
4 - 8	Scope of the Report.	Includes new information from NIWA's Lake Benmore modeling report and other expert evidence.
9	Limitations of the calculated nutrient loading rates.	Background information - no outstanding issues.
10	Periphyton and organic nutrient inputs to Lake Benmore.	Addressed by Dr Gamage.
11	<b>Inadequacy of modeled estimates of nutrient inputs to Lake Benmore as a result of floods.</b>	<b>Unresolved - referred to in NIWA's Lake Benmore Report and Dr. Gamage's and Ms Sutherland's evidence. Discussed in my addendum report (paragraphs 20-23, 33, 34).</b>
12	<b>Inadequacy of estimated N removed in catchment due to denitrification.</b>	<b>Unresolved.</b>
13	<b>Accounting for time lags of nutrient fluxes through catchment (i.e. agricultural N already in groundwater system).</b>	<b>Unresolved – referred to in the evidence of Ms. Sutherland and Mr. Callendar.</b>
14 - 15	<b>Inadequate consideration of potential impacts on Lake Benmore (e.g. limited to only TLI based on TN and TP concentrations in Lake Benmore).</b>	<b>Unresolved - however addressed in NIWA's Lake Benmore Report. Discussed in my addendum report (paragraphs 11-19, 37).</b>
16	<b>Simplistic, "bucket" approach to predicting Lake Benmore nutrient concentrations under scenarios.</b>	<b>Unresolved - however addressed in NIWA's Lake Benmore Report. Discussed in my addendum report (paragraphs 25-32).</b>
17	<b>Reliance on only annual means for assessing</b>	<b>Unresolved - referred to by Dr. Gamage. Discussed in</b>

	loadings to, and impacts on, Lake Benmore.	my addendum report (paragraphs 11-12).
18	Calculations of loadings to and estimations of impacts on Lake Benmore ignore ecological variability in time (e.g., floods, risk of seasonal algal blooms).	Unresolved - however addressed in NIWA's Lake Benmore Report. Discussed in my addendum report (paragraphs 11, 12, 33, 34).
19	Assessment of impacts on Lake Benmore ignores potential impacts of climate change/variability.	Unresolved.
20	High degree of uncertainty. Lack of background data. Risk analysis approaches needed.	Unresolved. Discussed in my addendum report (paragraphs 10, 12, 33, 34).
21	Lack of precautionary adaptive management approach.	Unresolved. Discussed in my addendum report (paragraphs 36, 37).

Signed:

  
 Marc Schallenberg  
 University of Otago

Date:

29 January 2010