

**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 – Carl Robert Hanson**

INTRODUCTION

1. The following table (Table 1) sets out the relationship between the matters considered in my original s42A report (dated 21 September 2009) and those of which I make comment on in my Addendum report (dated 11 January 2010)
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 – 13	Background, Qualifications and Scope of Report	Same as s42A report
14 - 22	Summary of the applicants proposal	Background information – no outstanding issues
23 – 25	N loading to streams calculated as annual sub-catchment average; agree with applicant for the most part	Statement modified per comment by Peter Callander (my addendum report paragraphs 48 – 51)
26	No analysis of low-flow periods when stream flow dominated by groundwater recharge	Unresolved – see paragraphs 52 – 56 of my addendum report
27 - 30	Risk of short-term exceedence of nitrate MAV in groundwater, even if average nitrate concentration stays below MAV	Unresolved
31 - 32	Lack of detail in groundwater quality data presented	Unresolved, but not a major issue
33	I accepted 1 mg/L threshold for nitrate-N in groundwater	No outstanding issues
34 - 35	General comment on lack of information in the cumulative effects assessment	Largely unresolved – though some new information has been provided, I still cannot trace raw data to conclusions
36	The area of each land use in each sub-catchment	Resolved – I have received this information
37	Details of how the AgResearch model results were incorporated into the calculations of sub-catchment nitrate-N loading	Unresolved: I have received this information, but with no sensitivity analysis; see paragraphs 39 and following in my addendum report

38	The areas of all combinations of irrigation, rainfall, and soil pore-available water (PAW) for which Aqualinc (2008) modelled soil drainage rates	Resolved – I have received this information
39 - 43	Details of groundwater flow calculations, including river losses, highland recharge, deep groundwater flow, and sub-catchment water balances; also details of nitrate attenuation through denitrification	Unresolved: this information may be in the spreadsheet toolkit provided in Dr Doug Mzila's evidence, but I cannot follow it or assess its significance
44 – 49	Details of phosphorus calculations	Partially resolved: Tom Heller (see his addendum report, paragraphs 6 – 13) is satisfied with P mass balance loading to stream nodes and Lake Benmore, but I have seen no further information on the mechanisms of P transport or discrepancies between modelled and measured P concentrations in streams.
50	Microbiological contaminants	No outstanding issues
51 - 52	Monitoring	Unresolved
53 - 56	Mitigation	Deferred to Dr Brent Clothier and Mr Darren McNae
57	Conclusions	Summary only
58 - 62	References	No outstanding issues

Signed:



Carl Robert Hanson
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Environment Canterbury

Date: 3 February 2010