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*in the matter of:* the Resource Management Act 1991

*and:* submissions and further submissions in relation to  
proposed variation 1 to the proposed Canterbury Land  
and Water Regional Plan

*and:* **Central Plains Water Limited**  
*Submitter*

Rebuttal evidence of Ian McIndoe (hydrology and water demand)

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Dated: 8 September 2014

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REFERENCE: JM Appleyard (jo.appleyard@chapmantripp.com)  
BG Williams (ben.williams@chapmantripp.com)

**Chapman Tripp**  
T: +64 3 353 4130  
F: +64 3 365 4587

245 Blenheim Road  
PO Box 2510, Christchurch 8140  
New Zealand

www.chapmantripp.com  
Auckland, Wellington,  
Christchurch



## **REBUTTAL EVIDENCE OF IAN MCINDOE**

### **INTRODUCTION**

- 1 My name is Ian McIndoe.
- 2 My qualifications and experience are set out in my statement of evidence (*EIC*) dated 29 August 2014.

### **SCOPE OF EVIDENCE**

- 3 I have been asked by Central Plains Water Limited (*CPWL*) to provide rebuttal in relation to proposed Variation 1 to the proposed Canterbury Land & Water Regional Plan (*Variation 1*).
- 4 The scope of my rebuttal is limited to matters related to water quantity.
- 5 In preparing this rebuttal I have responded to comments in evidence of the following witnesses, as it relates to my CPWL main evidence:
  - 5.1 Cathy Begley for Ngai Tahu.
  - 5.2 Bruce Stansfield for Forest & Bird.
  - 5.3 Alistair McKerchar for Ngai Tahu.
  - 5.4 G Dreavoll for DOC.
- 6 As with my EIC, I confirm that I have read the Environment Court practice note and have complied with it in preparing this rebuttal evidence.

### **CATHY BEGLEY**

- 7 Cathy Begley (para 44) raises concern about the uncertainty of whether development of the CPWL Scheme will result in increases in lowland stream flows as expected. My response is that the Scheme will definitely increase flows in lowland streams. My greatest concern is in fact whether the additional recharge will create issues with high water tables in the lower catchment in wet winters.
- 8 Ms Begley (para 45) states that implicit within using alpine water as envisaged by CPW is a requirement to monitor the effectiveness of the introduction of water into the catchment.
- 9 CPWL will certainly result in a substantial increase in groundwater flowing through the catchment, and resulting from that, stream

flows will be increased. How the increase distributes itself across all streams cannot be determined exactly, but the overall position that increases will occur in all streams appears clear.

- 10 How the increase is monitored is another issue. In my view, measurements over time (several years) will be needed to show whether increases have occurred. Over a short timeframe, climatic variation will make that difficult, and we will need to rely on groundwater modelling (using the Aqualinc groundwater model for example) to make those assessments.
- 11 I note that Ms Begley is proposing an alternative method for increasing lowland stream flows should implementation of the CPWL Scheme not result in increased stream flows. This appears to be a primary and secondary allocation approach, with the secondary allocation unable to be transferred.
- 12 As I understand it, the Ngai Tahu Policy 12 (a) refers to the Proposed Canterbury LWRP Policy 14, which leads to Schedule 10, which provides the methodology for determining reasonable use. There is no reference to a primary and secondary allocation in the policy and schedule, as the reasonable use test in Schedule 10 establishes the allocation.
- 13 Ngai Tahu Policy 12 (b) refers to the need to include groundwater trigger levels on all consents. Although I proposed the concept of dynamic allocation in my supplementary evidence for the Proposed Canterbury LWRP in April 2013, I think it will be unnecessary in the short-term in the Selwyn Te Waihora zone, because there will be sufficient groundwater in the aquifers to supply immediate needs and to enhance lowland stream flows.

#### **BRUCE STANSFIELD**

- 14 Mr Stanfield (para 72(4)) states "*Approximately half (14) of the low flow sites have particularly poor flow correlations with recorder sites (Clark, 2001). More gaugings are needed at these sites to improve the R<sup>2</sup> value of the relationship with the recorder sites.*"
- 15 I support the need for improving flow measurements in the lowland streams. Without better data, the response of stream flows to increased CPWL recharge will be difficult to assess.

#### **ALISTAIR MCKERCHAR**

- 16 Alistair McKerchar (para 4) has concluded that if enhanced recharge occurs due to irrigation with water from the Central Plains Irrigation Scheme, low flows in the lower Selwyn/Waikirikiri may be enhanced.

- 17 It is a cautiously worded statement, but I agree with his general conclusions. Flows in the lower Selwyn/Waikirikiriri River will increase. Although we don't know what the increase will be with absolute certainty, we can predict the likely increase using models such as the Aqualinc groundwater model.

**GEOFFREY DEAVOLL**

- 18 Mr Deavoll supports making damming of the Selwyn mainstem and the Wainiwaniwa main stem as a prohibited activity.
- 19 In my evidence in chief, I pointed out that storage is a requirement for CPWL to be able to meet its scheme reliability targets. I showed that there is an established need for irrigation water and that for run-of-river supplies, storage of significant quantities of water is required to provide a reliable supply.
- 20 CPWL will have to consider options to provide the necessary storage, and it would be helpful if the Plan allowed for a range of options.

Dated: 8 September 2014



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Ian McIndoe