

**IN THE MATTER OF** the Resource Management Act  
1991

**AND**

**IN THE MATTER OF** various applications by the Central  
Plains Water Trust to the  
Canterbury Regional Council.

## **Report of Anna Marthine Veltman**

**Date of Hearing: 12 – 16 October 2009**

1. My full name is Anna Marthine Veltman. I am a Senior Resource Management Planner at Environment Canterbury with 10 years experience in water resource planning and regional policy development in Canterbury. I hold a Masters in Ecological Agriculture (Wageningen, The Netherlands) and a Post Graduate Diploma in Resource and Environmental Planning (Waikato).
2. Over the ten year period with Environment Canterbury, I have been involved in auditing resource consent applications for both ground and surface water, as well as some coastal activities. In the latter six years, I have been involved in the preparation of Chapter 5 of the proposed Natural Resources Regional Plan (NRRP) which addresses water quantity issues. This project has included the preparation of policy options and policy development, policy advice to Council, public consultation, analysis of submissions and plan hearings.
3. I have more recently been involved in the development and preparation of Plan Change 1 to the Waimakariri River Regional Plan (WRRP).
4. I acknowledge that I have read the code of conduct for expert witnesses contained in the Environment Court's Practice Note dated 31 March 2005. I have complied with it when preparing my written statement of evidence and I agree to comply with it when I give this oral evidence.

### **Scope of evidence**

5. I have been asked by Mr Leo Fietje, Principal Consents Advisor at Environment Canterbury, to provide information for the hearing commissioners on the background to, and development and notification of the WRRP Proposed Plan Change 1.

6. I have provided comment on:

- the background to the development of WRRP Proposed Plan Change 1;
- an overview of the matters addressed in Proposed Plan Change 1;
- the technical information and analyses used to inform the development of Proposed Plan Change 1;
- a summary of the flow and allocation regime options for the Waimakariri River ~~below~~ Woodstock+ B Block considered by Council in the development of Proposed Plan Change 1; and
- the proposed timetable for progressing WRRP Proposed Plan Change 1.

7. Evidence on submissions received and matters to be considered in determining any weight to be given to Plan Change 1 is covered in evidence by Matthew McCallum-Clark.

### **Background to WRRP Plan Change 1**

8. The need for a plan change to the WRRP was first identified in 2007 as more pressure was being placed on accessing large quantities of water from the mainstem of the Waimakariri River ~~below~~ Woodstock+ for both large and small-scale developments. It was generally recognised that the existing plan provisions for B allocation were developed at a time when there was relatively modest additional demand and large scale run-of-river irrigation was considered unlikely because of the low reliability of supply. The CPW proposal and other abstraction possibilities raised concerns about the potential instream effects of having an uncapped B Block available immediately above the A Block, with no gap between the A and B Blocks or other form of flow sharing, or provision for freshes. In addition, there has been some historical ambiguity and difficulty in interpretation of some of the WRRP provisions, and it was considered there was a need to amend some of these.

9. Council approval was sought and obtained in November 2007 for the commencement of a project to prepare a plan change to the WRRP to address the matter of the Waimakariri River ~~below~~ Woodstock+ B allocation, and any other changes considered necessary to clarify and improve implementation of plan provisions for the allocation of water above minimum flows. At that time, it was identified further hydrological analyses were needed to determine an appropriate size for the B Block,

and whether additional flow regime provisions were needed to manage adverse effects.

10. In early 2008, Environment Canterbury commissioned NIWA to undertake technical assessment work to:
  - identify flows at which different sediment sizes mobilise in the Waimakariri River, and
  - determine the flow regime requirements needed to minimise the effects on in-stream values of different sized B allocation blocks, including consideration of flow sharing.
11. In March 2009, a presentation of the two technical reports<sup>1</sup> from NIWA was made to a Council workshop. A draft plan change document was prepared, largely on the basis of the recommendations provided by NIWA. Approval was sought and obtained from the Regional Planning Committee in April 2009 to use that draft plan change document as the basis to commence public consultation under Clause 3 of the First Schedule to the RMA 1991.
12. Public consultation with interested and affected parties commenced in May 2009, and was on-going until the time of the final Council resolution to approve WRRP Propose Plan Change 1 and the accompanying s32 Report on 30 July 2009.
13. Additional technical analysis was undertaken in the period April . June 2009. This was in response to specific requests from Councillors to report on the advantages and disadvantages of a %B+ Block of 40 cumecs compared to a %B+ Block of 20 cumecs in terms of meeting Objective 5.1 of the WRRP, as well as matters raised by parties to the consultation including further consideration of a 1:1 flow sharing regime.
14. WRRP Proposed Plan Change 1 was publicly notified on 8 August 2009 and submissions closed on 11 September 2009. It is a Council initiated plan change prepared under the First Schedule of the Act; and by definition a proposed plan change under s2 of the Act.

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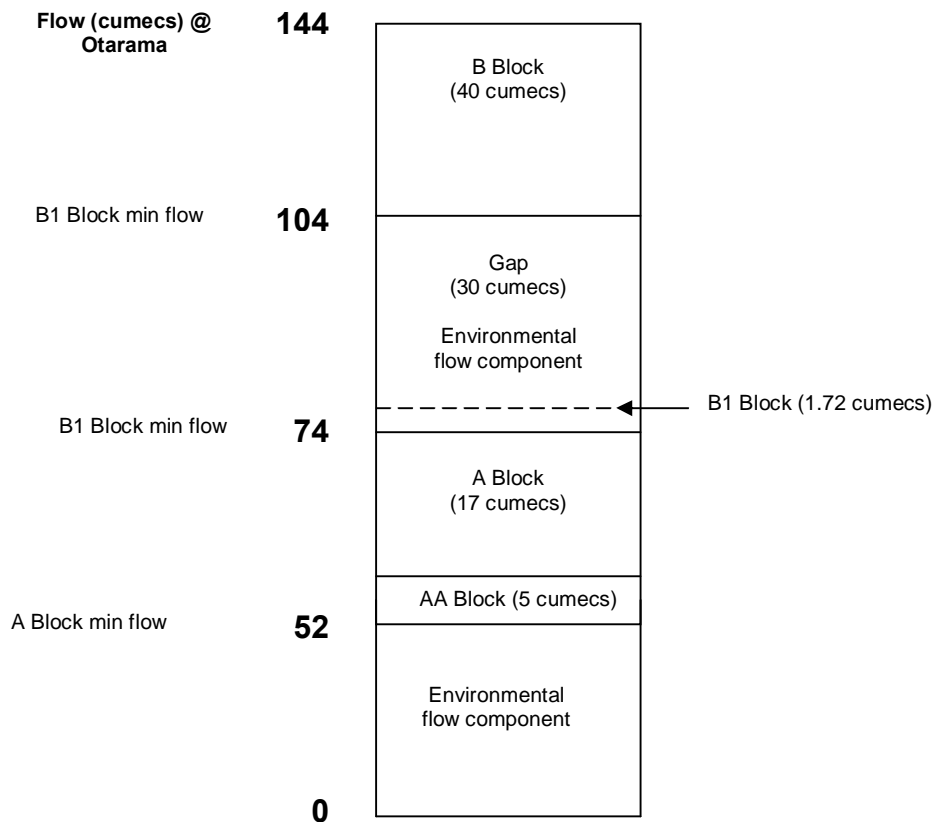
<sup>1</sup> Duncan, M. and Bind, J., Waimakariri River Bed Sediment Movement for Ecological Resetting, Environment Canterbury Report No R08/94  
Duncan, M., Waimakariri River: B/C Block Allocation Review, Environment Canterbury Report No 08/67.

## Overview of WRRP Proposed Plan Change 1

15. The major components of WRRP Proposed Plan Change 1 relating to the flow and allocation regime for the Waimakariri River below Woodstock include:

- a new 5 cumec A+ Block allocating water for community and stock water requirements that will incorporate existing A+ Block allocation for those uses. As a consequence of this, the existing A+ Block is reduced from 22 to 17 cumecs;
- a new B1+ Block of 1.72 cumecs, to recognise two existing B+ Block consents. This block is to commence immediately on top of the A+ Block, subject to being able to exercise the consents;
- a gap of 30 cumecs immediately above the A/B1+ Blocks, within which the taking of any water shall be a prohibited activity, unless there are exceptional circumstances;
- an allocation limit placed on the Waimakariri River below Woodstock B+ Block of 40 cumecs, with the taking of water above this B+ Block limit being a non-complying activity;
- a shift of the site where minimum flow [is] assessed from Old Highway Bridge to Otarama. Because of flow losses to groundwater in the middle reach, the flow at Otarama needed to deliver the required minimum flow at the Old Highway Bridge has been increased by 11 cumecs. Thus the minimum flow for the A+ Block of 41 cumecs at Old Highway Bridge becomes 52 cumecs at Otarama, and other flow triggers are adjusted accordingly. The correlation of the flows between Old Highway Bridge and Otarama are still being finalised, and the plan change provides a minimum timeframe of at least two years from Plan Change 1 being notified before giving notice of an intention to review consent conditions to change the site where minimum flow [is] assessed to Otarama;
- requiring temporary restrictions on the taking of water from A+, B1+ and B+ Blocks to allow freshes and floods to pass without take, after a period of 21 days where flow has been less than 130 cumecs.

**Schematic representation of flow and allocation regime for the Waimakariri River  
“below Woodstock”**



16. Other changes have also been included to better clarify and improve implementation of plan provisions for the allocation and management of water above minimum flows. These changes include:

- adding a new Policy 5.1(2) to:
  - prevent the taking of water below a minimum flow or in a gap unless there are exceptional circumstances; and
  - prevent any taking of water above the B-Block set in Table 2 unless the instream values identified in Objective 5.1 are maintained, and the reliability of supply of existing abstractors is not adversely affected;
- deleting the term “unmodified flow” in Rule 5.1 Standards and Terms (d) and in the Interpretation of the Standards and Terms, as the term has been problematic to interpret and enforce, and the movement of the site where minimum flow [is] assessed to Otarama makes the term redundant;
- adding to Rule 5.1 Standards and Terms monitoring requirements for all takes to be continuously measured, and data made available to Environment Canterbury via telemetry. This is to ensure the flow regimes, including restriction requirements, are able to be monitored effectively, and to be consistent with draft NES and NRRP requirements;

- deleting in Rule 5.1 Matters restricting exercise of discretion (d) the restriction of discretion to considering only the effects near the point of take. to improve the ability to consider cumulative or widespread effects;
- amending Method 5.3.3 Investigations to include environmental monitoring of the river, in order to assist in determining the effectiveness of the flow regime;
- amending Rules 5.3 and 5.4 to clarify that the status for activities that otherwise do not meet Rule 5.1 are non-complying or prohibited activities;
- deleting Planning Map 1 Sheets 1-3 on pages 103-106 inclusive and replacing these with new maps that correctly show catchment boundaries of the below Woodstock area.

### **Technical information used to address issues relating to maintaining instream values**

17. The two technical reports prepared for Environment Canterbury by NIWA (see para. 10 above) on bed sediment movement and the Block regime formed the basis of the initial draft plan change amendments that were presented to the Regional Planning Committee meeting in April 2009.
18. The second of these reports, Report No R08/67, identified the critical instream and out-of-stream values of concern to the community and which are considered important to protect to ensure Objective 5.1 of the WRRP is met. The primary information source for identifying the flow range required for key instream values was the evidence presented to this hearing on the CPW application. The key instream values identified include invertebrate production, river bird nesting, salmon passage and migration, salmon angling, and flows favoured for kayaking and jet boating (summarised in Figure 1 in Report R08/67).
19. Out-of-stream values were analysed in terms of the potential abstraction volumes and reliability of supply for the different scenarios.
20. In addition, the report identified that flows capable of flushing periphyton and fine sediment need protection to ensure the ecological health of the river is maintained. The report recommended that after more than 21 days of flatlining at low flows, there should be no Block takes during freshes or floods until the measured flow exceeds 130 cumecs, or has persisted for two days if the peak flow rate does not reach 130 cumecs.
21. The report considered the effects of allocation mechanisms such as abstraction limits, flow sharing and gaps between allocation blocks on the critical instream and out-of-

stream values, using simulations carried out on a naturalised record to quantify effects. The simulations include scenarios of %B+ Block allocations of 20/40/60 cumecs; 1:1 sharing from a minimum of 63 cumecs; gaps between the %A+Block and %B+Block of 7/17/27/37/47 cumecs.

22. As a result of this analysis, Report R08/67 concluded that allocation block limits and gaps between allocation blocks were the most useful mechanisms, with a gap between the %A+Block and %B+Block of 27 cumecs having a marked advantage over smaller gaps (including no gap) or 1:1 sharing. A %B+Block size of 40 cumecs was recommended, in combination with the gap of 27 cumecs, as this combination prolongs the time within the preferred flow range for all of the instream values, compared to the other options, while still providing a greater volume for out-of-stream use than a smaller %B+Block. Report R08/67 recommended that the gap could be suspended in the winter as critical values such as riverbed bird breeding and salmon angling were not considered likely to be compromised by this. However, Environment Canterbury scientists raised concerns about loss of flushing to remove build up of toxic phormidium growths, and the plan change was notified without any suspension of the gap (see para. 25 . 28 inclusive).

23. Additional analyses were carried out by Environment Canterbury technical staff to consider questions and issues raised by both Councillors, and stakeholders and affected parties, during consultation. The particular issues raised included:

- the potential effects on recharge to Christchurch aquifers;
- further review and identification of key values and critical ecological flow requirements;
- further consideration of possible effects on in and out-of-stream values resulting from different flow and allocation regimes based on both a gap versus 1:1 sharing for the %B+Block, and different sized %B+Blocks.

Four additional technical memoranda<sup>2</sup> summarise the results of those additional analyses.

24. The additional analyses used the same data series as used by NIWA, which is based on the mean daily flow series produced by Richard De Joux<sup>3</sup>. In total, 25 separate

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<sup>2</sup> Meredith . Waimakariri River B Block Allocation/Plan Change (6 July 2009)

Scott . Wamakariri River Allocation Options . Implications for Groundwater Recharge (18 June 2009)

Leftley . Waimakariri Plan Review . B Allocation (29 June 2009)

Leftley and Martin . Flow Relationship between the Waimakariri at Otarama and the Waimakariri at Old Highway Bridge (20 July 2009)

<sup>3</sup> Naturalised Waimakariri at Old Highway Bridge (site number 66401) flow as used by all parties in the CPW hearing

flow and allocation scenarios were analysed, with only the preferred four options reported in detail as they were considered to represent the most balanced scenarios in terms of in-stream and out-of-stream values.

25. There is one important difference in the assumptions used in the simulations undertaken by Environment Canterbury, compared to those undertaken by Duncan of NIWA. Duncan assumed that the %A+Block would only be utilised during the period 1st October to 31st April. However, Environment Canterbury assumed a fully utilised %A+Block (that 22 cumecs was taken out of the river every day of the year for the full flow record, except during periods of partial and full restrictions). This assumption was considered to more closely reflect the current allocation provisions provided in the WRRP for the %A+Block. I agree it is important to incorporate this assumption into any simulations considering the effects of additional abstraction above that provided for in the existing %A+Block allocation. This acknowledges that while the %A+Block may currently be fully allocated, it is not yet fully utilised, and that all year round use of the %A+Block will occur in time.
26. As part of the review of the key values for ecological flow requirements, Meredith reviewed NIWA National Rivers Water Quality Network (NRWQN) data for the presence of detrimental black/brown algal mats in the Waimakariri River, to identify the fresh threshold most likely to perform significant or effective flushing. The analysis indicated that the lower fresh threshold of 80 cumecs identified by Duncan (Report R08/94) did not appear to have a significant influence on preventing mat formation, or ensuring mat removal. The analysis did indicate however that the recommended trigger of 130 cumecs does appear to control mat presence or persistence.
27. The analysis of the NIWA NRWQN data also clearly showed that detrimental Phormidium mats occur and develop at any time of the year, and frequently in autumn/winter/spring. Based on this, and the fact that:
  - winter can be a period of low stable flows;
  - while high value communities (breeding birds, salmon fishery) are strongly seasonal, their habitat requirements can be influenced by preceding conditions in late winter;
  - other ecological communities persist in the river all year round; and
  - it cannot be assumed that the %A+Block will continue to only be abstracted in the summer irrigation season;

Meredith considered that suspension of a gap or any flow sharing requirements in the winter would not be appropriate if the instream values are to be protected.

28. In addition, Meredith considered that any rule to protect flow variability by imposing restrictions on takes to allow a fresh to pass through, would need to apply to both %A+ and %B+ allocation blocks and to be triggered in real time, to effectively allow the flood peak to be identified and protected.

### **Flow and allocation regime options considered by Council**

29. While a large number of flow and allocation scenarios were modelled by both Duncan and Leftley to assist consultation and decision-making on the draft plan change, a smaller number of the most likely regimes were analysed in more detail. All of the four options were considered to better provide for the values identified in WRRP Objective 5.1, than the existing plan provisions for the %B+ Block. The four preferred regimes identified were:

- A gap of 30 cumecs all year, and a %B+ Block of 20 cumecs;
- A gap of 30 cumecs all year, and a %B+ Block of 40 cumecs;
- 1:1 flow sharing, and a %B+ Block of 20 cumecs;
- 1:1 flow sharing, and a %B+ Block of 40 cumecs.

30. Following consultation, and the further analyses undertaken to address questions and issues raised (described in para. 23 above), the four preferred options were assessed as to how well they meet various criteria (see table overpage), and that assessment is included in the s32 Report accompanying the plan change.

31. The evaluation criteria relating to Part II matters are based on the technical analyses carried out to support the proposed plan change. The other criteria included the general support or otherwise for the various options from parties involved in the consultation.

32. As can be seen from the table below, no one option scores consistently as the highest in meeting the criteria identified. This means that each of the options represents some form of compromise between instream protection and out-of-stream use. Council adopted the second option in the table below . that of a gap of 30 cumecs between the %A+ and %B+ Blocks, and a %B+ Block allocation of 40 cumecs, as best meeting Objective 5.1. This is on the basis that a gap provides more benefits for

instream values than 1:1 flow sharing from above the %A+Block. The larger %B+Block provides for larger volumes of water to be accessed for out-of-stream use, and when combined with a gap of 30 cumecs, provides an enhancement to flows in the value range 50 . 100 cumecs, compared to a smaller allocation block.

OPTIONS	EVALUATION CRITERIA					
	Part 2 RMA					Other matters
	Life supporting capacity	Flow variability	Instream values (recreational uses, birds, fish etc)	GW recharge and spring-fed stream flow	Reliability B Block for abstractors (for individuals) <b>Total volume</b>	Consultation
<b>30 / 20</b> (GAP/B BLOCK )	Highest	Highest	Medium	Neutral	Med./Low Lowest	High
<b>30 / 40</b> (GAP/B BLOCK )	Medium	Lowest	Highest	Neutral	Lowest Med/High	Medium
<b>1:1 / 20</b> (B BLOCK / 1:1 SHARING)	Lowest	Medium	Lowest	Potential negative impact	Highest Medium	Medium
<b>1:1 / 40</b> (B BLOCK / 1:1 SHARING)	Lowest	Lowest	Lowest	Potential negative impact	Medium Highest	High

### Timetable for progressing WRRP Plan Change 1

33. WRRP Plan Change 1 was publically notified on Saturday 8 August 2009 and submissions closed on Friday 11 September 2009.
34. Hearings are scheduled for early 2010.

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Anna Marthine Veltman

17 September 2009