

**BEFORE THE CANTERBURY REGIONAL COUNCIL**

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

**And**

**In the matter** a submission by **Barrhill Chertsey Irrigation Limited** in relation to proposed Variation 2 of the proposed Canterbury Land & Water Regional Plan

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**STATEMENT OF EVIDENCE OF NEIL THOMAS**

**15 MAY 2015**

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## **INTRODUCTION**

1. My name is Neil Thomas.
2. I have been a Senior Hydrogeologist with Pattle Delamore Partners Limited (PDP) since 2011. I hold the qualifications of Bachelor of Sciences (Hons) in Geological Sciences from the University of Leeds (UK) and Master of Science in Hydrogeology from the University of Leeds (UK). I am a member of the New Zealand Hydrological Society and the Geological Society (UK). I have over 8 years of experience as an environmental scientist specialising in groundwater. Prior to my employment at PDP, I had been employed for 5 years by Entec UK Ltd (Now AMEC).
3. I have particular experience in the management of water resources. This has included work on numerous projects where I have modelled and advised on the management of water quality impacts associated with irrigation for agriculture and wastewater disposal - including work for the Hurunui Water Project, Environment Southland, Horizons Regional Council, Kapiti Coast District Council, Otago Regional Council and Dairy NZ.
4. I provide the following statement of evidence regarding the submission lodged by Barrhill Chertsey Irrigation Limited (BCIL) for proposed Variation 2 of the proposed Canterbury Land and Water Regional Plan. I have read the Code of Conduct contained in the Environment Court's Practice Notes for Expert Witnesses and agree to comply with it.

## **SUMMARY**

5. BCIL operates a modern efficient spray irrigation system across a range of properties between the Rakaia and Rangitata Rivers. It holds consent to irrigate land and use it for farming on 40,000 ha. Its land use consent, CRC147697 authorises the discharge of 1,232 tonnes of nitrogen per year. As at 31 March 2015 it had water supply agreements in place to irrigate 24,903 ha.

6. BCIL wants to ensure that Variation 2 to the proposed Land and Water Regional Plan allows effective irrigation to occur, as authorised by the BCIL consent in an economically feasible manner, whilst also seeking improvements to water quality.
7. If the Hearing Commissioners wish to specify a nitrogen leaching load specific to the BCIL scheme in the Hinds/Hekeao Plains then a load of 490 tonnes of nitrogen per year would appropriately recognise the existing consented BCIL authorisation while still being generally consistent with the wider aspirations of Variation 2.

#### **SCOPE OF EVIDENCE**

8. In my evidence I will provide the following:
  - 8.1 a description of the BCIL consented activities; and
  - 8.2 general comment on what BCIL hopes can be achieved by Variation 2.

#### **BCIL CONSENTED ACTIVITIES**

9. BCIL hold consent CRC143165 to take up to 17 cumecs of water from the Rakaia River. They also have a 'water swap' agreement with Rangitata Diversion Race Management Ltd (RDRML) to take up to 10 cumecs from the RDR (with the default assumption being that BCIL would make up any shortfall to RDR from their Rakaia River abstraction). According to condition 11 of consent CRC143165 water may only be used to:
  - a) irrigate up to 40,000 hectares of land:
    - i) within Areas 1 to 8, shown on the attached plan (CRC990088.3 which forms part of this consent); and/or
    - ii) on any land between the Rakaia and Rangitata Rivers covered by a separate consent to use water (if required); and
  - b) to fill on-farm storage reservoirs; and
  - c) to generate electricity.

**Figure 1** shows Areas 1 to 8 of the BCI Scheme and is attached to my evidence. It includes much of the Hinds Plains catchment. The BCI resource consents do not include any restriction on where, or the amount of water, that can be used in any of areas 1 to 8.

10. BCIL also hold consent CRC147697, which authorises the use of land for farming and the discharge of nutrients to water arising from that farming activity. This consent was granted in September 2013 and at that time BCIL had irrigation supply agreements in place to supply water to 17,604 ha of land (the location of these properties is shown by the grey shaded areas in **Figure 2** attached to my evidence – around 4629 ha being located in Hinds Plains). In order for this consent application to be processed in a non-notified manner, ECan determined that it would only be granted for a 5 year term, on the basis that the future planning requirements for nutrient management were uncertain in 2013, but would be confirmed through the Land and Water Management Plan process within a 5 year period (at which point it would be appropriate for a new consent application to be lodged assuming it was required under the plan).
11. Consent CRC147697 requires BCIL farmers to prepare Farm Environment Plans to a standard consistent with the proposed Land and Water Regional Plan and to operate an audit system to ensure the integrity of these plans. Each farm that utilises the BCIL supply must also maintain detailed records of all the on-farm inputs required by the OVERSEER nutrient budgeting model, which must be available to ECan on request.
12. Consent CRC147697 specifies a nitrogen leaching limit of 1,232 tonnes per year (based on OVERSEER version 6.02), which is an overall average rate of 31 kg N/ha/yr. That was made up of an average rate of 38 kg N/ha/yr from existing operators and an expected rate of 25 kg N/ha/yr for future irrigators supplied by BCIL. This load is the total load applying to all of areas 1 to 8 (there is no further restriction on where the load may be applied).
13. BCIL has serious concerns about whether a rate of 25 kg N/ha/yr is feasible for the range of farming activities and soil types that they may

supply water to. This is particularly so given that much of the BCIL command area comprises light soils having low to medium profile available water (PAW), as shown in **Figure 2** attached to my evidence. However at the time the consent was granted the ECan officers view was that for the application to be processed in a non-notifiable manner then the average nitrogen leaching loss from those future supplied properties must comply with that limit. This was considered a very conservative interim constraint for a short term consent recognising that the Variation 2 process of the proposed Land and Water Regional Plan would develop a more realistic and reasonable approach to irrigation development which could be adopted when

14. BCIL will seeks to replace consent CRC147697 when it expires in 2018 however in the interim the rate of 25 kg N/ha/yr is still workable for BCIL given that the scheme is still in the development phase. In practice, BCIL could continue its development with the overall consented cap for the 5 year term.
15. In terms of the general nature of the BCI scheme it is also noted that it is a very new irrigation supply scheme it is supplying water to irrigators who generally utilise modern efficient systems. Coupled with the implementation of Farm Environment Plans and OVERSEER budgeting, BCIL represents a scheme operating at Good Management Practice as it is currently understood.

#### **GENERAL COMMENTS ON VARIATION 2**

16. BCIL's main issue around Variation 2 is to ensure that it allows for its already consented irrigation (both implemented and unimplemented but reasonably contemplated) to occur. Therefore the allowance for extra irrigation area is supported. It is also important that the proposed future constraints on irrigation are feasible to implement and allow irrigation to occur in an economically viable manner. BCIL seeks that this feasibility is taken into account in regard to both the limits that are set and the time frames over which they are to be implemented.
17. It is however recognised that the Hinds catchment has experienced a decline in groundwater quality and the quality of lowland streams due to historical agricultural practices. So there is a balance to be struck

between further expansion, efficiencies in irrigation practice (to ensure that irrigation remains viable) and environmental improvement.

18. On the basis that it is being covered in a comprehensive manner by a number of other submitters I have not considered the detailed catchment modelling and water quality/quantity work that has been undertaken in preparing Variation 2. I nevertheless note that the quantification of nitrogen leaching limits to achieve particular water quality targets is not a precise science. It would be unfortunate to impose severe restrictions on efficient irrigation schemes if they were later to be found unnecessary. In this regard it is pleasing to see that Variation 2 promotes the use of Managed Aquifer Recharge and Targeted Stream Augmentation which are effective tools to address water quality issues whilst allowing for efficient irrigation activities to continue.
19. Variation 2 clearly contemplates further irrigation occurring and BCIL is well placed, with existing consents in hand and modern, high efficiency irrigation systems (along with existing farm management plan and nutrient management regimes) to deliver irrigation that meets that sought outcome.
20. In their consideration of Variation 1 of the pLWRP, the Hearing Commissioners (as comprised in respect of that hearing) included Table 11(j) to define irrigation scheme nitrogen leaching limits. If such an approach is to be used for Variation 2, then the nitrogen leaching load for the BCIL scheme activities in the Hinds/ Hekeao Plains should amount to a total of **490 tonnes** of nitrogen per year.
21. This corresponds to existing N use by BCI Scheme members within the Hinds Plains area (over what was occurring at the time the land use consent CRC147697 was granted) of around 240 tonnes and an additional increase of 250 tonnes N/year.
22. I understand that this is consistent with the N load limit which has been put forward for the BCI Scheme as a part of discussions among other primary sector submitters (in terms of what might be reasonable in light

of the various interests and is consistent with the nutrient assessment work that was being undertaken by other submitters).

23. In terms of the wider BCI Scheme, limiting it to a total load of 490 tonnes would mean (on the basis of a very rough assessment assuming 27 kg N/ha/yr) approximately a third of BCIL's consented 40,000 hectares could occur in the Hinds Plains area. If regard is had to Figure 1 and Areas 1 to 8, the Hinds Plains area similarly represents around a third of the total area that is able to be irrigated by BCIL.
24. Were the Hearing Panel minded to provide a specific load for the BCI Scheme, such an approach would be consistent with the main thrust of BCIL's submission, which is to request that Variation 2 allows a reasonable level of constraint on irrigation to ensure that schemes such as BCIL can operate in a practical and economically viable manner, whilst also seeking the desired improvements in water quality.

## **CONCLUSION**

25. BCIL operate a modern efficient irrigation scheme. It currently has agreements in place to supply irrigation water to 24,903 ha (across the wider Ashburton District) and is consented to irrigate up to 40,000 ha. It would like to ensure that Variation 2 accommodates increased irrigation in a practical, economically and environmentally feasible manner.
26. For the BCI Scheme, it is prepared to accept that its irrigation development in the Hinds/ Heheao Plains be limited to a total of 490 tonnes N/year in the interests of assisting in the achievement of the water quality outcomes sought by Variation 2.

Dated 15 May 2015

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Neil Thomas



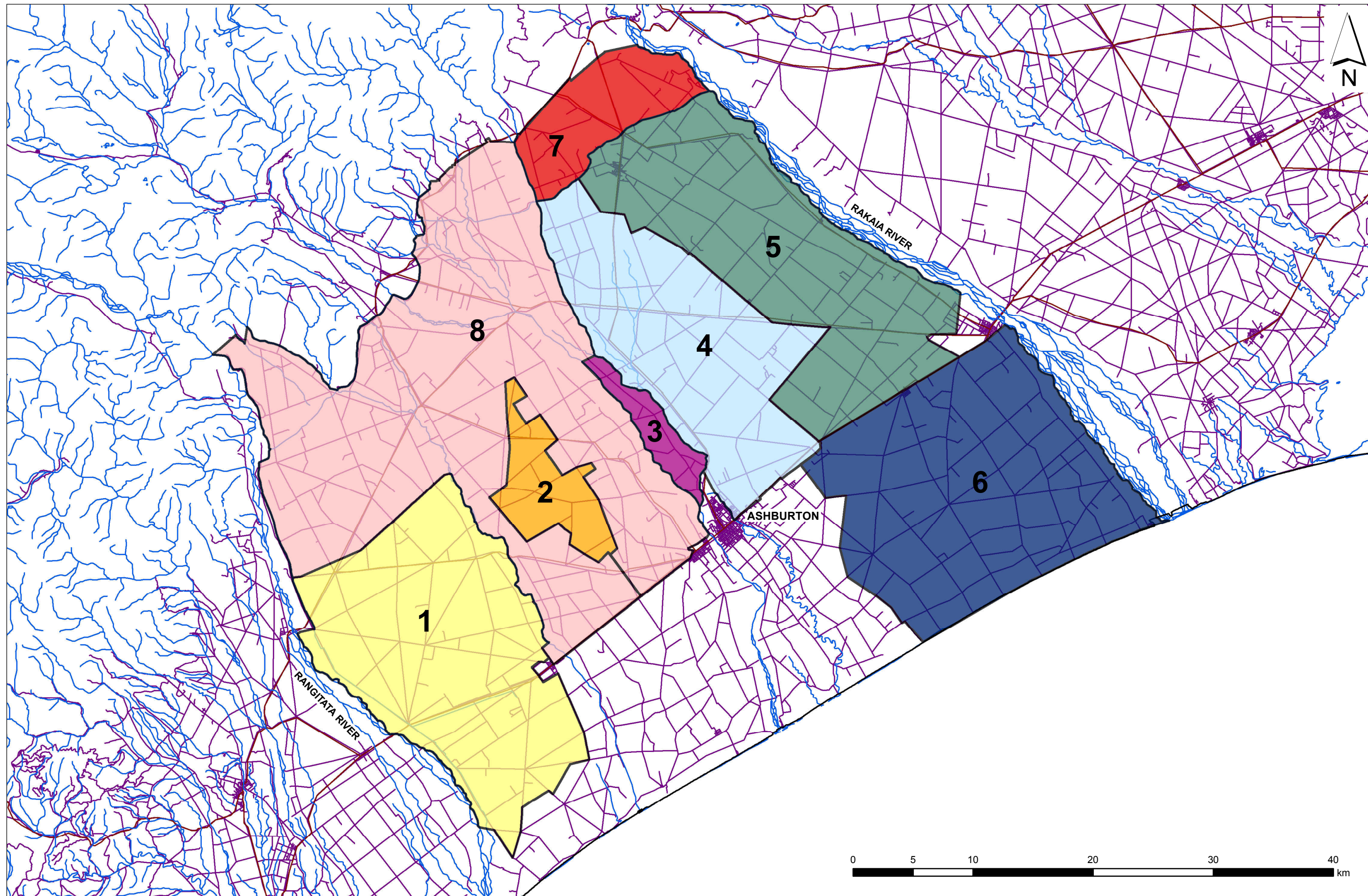


Figure 1 : Irrigation Areas





Figure 2: Detailed Soils Showing Average Profile Available Water (PAW)