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To: [Plan Hearings](#)
Subject: Orakipaoa Water Users - Plan Change 7 Hearing Evidence
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Please find this attached.

Kind regards,

Keri



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**BEFORE THE COMMISSIONERS APPOINTED BY
THE CANTERBURY REGIONAL COUNCIL**

IN THE MATTER

of Proposed Plan Change 7 to the
Canterbury Land and Water
Regional Plan

SUBMITTERS

**ORAKIPAOA WATER USERS
(SUBMITTER NUMBER PC7-165)**

And

**TEMUKA CATCHMENT CATCHMENT
GORUP
(SUBMITTER NUMBER PC7-319)**

STATEMENT OF EVIDENCE OF KERI JOHNSTON

INTRODUCTION

1. My full name is Keri Joy Johnston. I am a director and principal of Irricon Resource Solutions Limited (**Irricon**), a role I have been in since 2007. Irricon is a resource management and environmental engineering consultancy, working extensively in the field of water resources management.
2. Prior to this, I worked for RJ Hall Civil and Environmental Consulting Limited as an Environmental Engineering Consultant, Environment Canterbury as a Consents Planner and Environmental Management Systems Engineer, and Meridian Energy Limited as a Graduate Civil Engineer.
3. I have 20 years' experience as a Natural Resources Engineer. My expertise is in managing water resources (quantity and quality) from all aspects including design of flow and allocation regimes, planning and consenting, hydrology, farm environment planning, and modelling.

Qualifications and experience

4. I hold a Bachelor of Engineering in Natural Resources Engineering from the University of Canterbury. I am a Professional Member of Engineering New Zealand and a Chartered Professional Engineer (CMEngNZ).
5. I also hold a National Certificate (Level 4) in Irrigation Evaluation, a certificate in the design and management of farm dairy effluent systems, and I am an accredited RMA Decision Maker.
6. Since 2019, I have been the chair of Irrigation New Zealand.

Background

7. I was engaged by the Temuka Catchment Group Incorporated (**TCGI**) in mid-2018 in an advisory capacity to assist in its work with the Temuka Catchment Working Party (**TCWP**) in developing a package of recommendations for the Temuka Catchment for consideration by the OTOP Zone Committee and inclusion in its Zone Implementation

Programme Addendum. My involvement was primarily to provide advice on aspects of the TCWP's package relating to surface water and groundwater hydrology and consenting.

8. I am familiar with the provisions of Proposed Plan Change 7 (**PC7**) to which these proceedings relate. In preparing my evidence, I have reviewed the relevant parts of the section 32 Report and the section 42A Report in respect of the Orakipaoa Water Users (**OWU**) and TCGI (together **the Submitters**) submissions, together with related aspects of the Officer's Response to the Questions of the Hearings Commissioners dated 28 May and 16 June.

Code of Conduct

9. I have been given a copy of the Environment Courts code of conduct for expert witnesses. I have reviewed that document and confirm that this evidence has been prepared in accordance with it and that all opinions that I offer in this evidence are within my expertise. I have not omitted to refer to any relevant document or evidence except as expressly stated. I agree to comply with the code and in particular to assist the Commissions in resolving matters that are within my expertise.

Scope of Evidence

10. I have been asked by the Submitters to provide this brief of evidence in relation to their submissions on PC7 concerning groundwater allocation in the Orari-Opihi Groundwater Allocation Zone.
11. My evidence addresses:
 - Background to the proposed T allocation block in the Orari-Opihi Groundwater Allocation Zone;
 - How groundwater allocation has been calculated;
 - Resource consenting in the current planning environment; and

- Comments on the Section 42 Report in relation to the proposed T allocation block for deep for the Orari-Opihi Groundwater Allocation Zone.

BACKGROUND

12. The Orari-Opihi Groundwater Allocation Zone (Orari-Opihi GAZ) has an allocation limit in Section 14 of the Land and Water Regional Plan (LWRP) of 71.1 million cubic metres per year.
13. In its recommendations to the OTOP Zone Committee, the TCWP's 'solutions' package for the Temuka catchment included the proposed creation of a T allocation block for this zone only as is this the groundwater allocation zone in which the entire Temuka Catchment is located. The TCWP recognised that the Temuka Catchment was considered over-allocated and had proposed to reduce the allocation over time.
14. Therefore, the purpose of the T allocation block was, even though the Orari-Opihi GAZ was not considered to be fully allocated, to carve off a piece of the remaining allocation of the GAZ for Temuka Catchment surface water and hydraulically connected groundwater consent holders; the intention being that they would be able to transfer their existing consented takes to deep groundwater, helping to alleviate the over-allocation in the Temuka Catchment and meet the allocation reduction targets proposed by the TCWP (and subsequently incorporated into PC7).
15. In my opinion, this was a good solution as the Orari-Opihi GAZ was not fully allocated, and therefore, the T allocation block could be created without creating an over-allocation problem elsewhere in the catchment.
16. You may be asking why, when the Orari-Opihi GAZ was not fully allocated, a T allocation block considered necessary? The short answer is that it provided a safeguard for those in the Temuka Catchment. Transferring to deep groundwater was not going to be a viable alternative for all of the existing consent holders in the Temuka

Catchment, but it meant access to deep groundwater for those for whom it was an option without competing for allocation in the “general pool”.

17. This view is reiterated in the Section 42 report at paragraph 11.105 where it states (emphasis added):

We note that T Allocation blocks have only been provided where a surface water allocation block within that GAZ is over-allocated and the proposed A Allocation block limit is below the current operative CLWRP limit. These factors only exist in the Orari-Opihi GAZ.

18. At the time that the TCWP was developing its ‘solutions’ package, the TCWP was advised by ECan staff that the current level of allocation within the Orari-Opihi GAZ, while still to be finalised, was in the order of 43 million cubic metres per year. The TCWP therefore sought a T allocation block in the order of 10 million cubic metres per year¹ leaving the balance of allocation in the zone of approximately 18.1 cubic metres per year available for others in the GAZ who might also seek to transfer surface water or hydraulically connected groundwater to deep groundwater.
19. Table 14(zb) in the notified version of PC7 was subsequently notified with an A allocation limit for the Orari-Opihi GAZ of 43.8 million cubic metres per year, with a T allocation of 27.3 million cubic metres per year. The total allocation between the two blocks is 71.1 million cubic metres per year (being the allocation limit set for the zone in Section 14 of the LWRP presently).

GROUNDWATER ALLOCATION

20. Section 6.2 of the ECan Report *Resource Consent Inventory for the Orari-Temuka-Opihi-Pareora Canterbury Water Management Strategy Zone* states that the allocation for the Orari-Opihi GAZ is ranging from approximately 84.52 million cubic metres per year to 41.79 million cubic metres per year.

¹ PC7-318.61

21. This is a rather large range and the difference between the two figures needs to be understood as it has been mis-interpreted in the Section 42 report.
22. The figure of 84.52 million cubic metres per year is the sum of the annual volume (consented or attributed) of every resource consent to take and use groundwater in the Orari-Opihi GAZ.
23. However, within the zone, there are takes from hydraulically connected groundwater. Schedule 9 of the LWRP provides a methodology for determining how much groundwater (annual volume) is to be attributed to a GAZ for these consents. In summary, this is as follows:

| Degree of Hydraulic Connection | Percentage of Annual Volume to be Attributed to the Groundwater Allocation Zone (%) |
|--------------------------------|---|
| Direct | 0 |
| High | 25 |
| Moderate | 50 |
| Low | 100 |

24. Where an aquifer test or step test has been undertaken on a bore, this was used to determine the degree of hydraulic connection. This is known as a site-specific stream depletion assessment.
25. Where this has not been done, the test data that was available is able to be extrapolated to estimate the degree of hydraulic connection for the other bores in a GAZ.
26. Schedule 9 is then applied to all hydraulically connected groundwater takes using either the modelled or site -specific assessment, and an appropriate annual volume for inclusion within a GAZ calculated.
27. For those takes that are not considered hydraulically connected, the full annual volume for that consent is maintained in the allocation.

28. For the Orari-Opihi GAZ, this results in an allocation of 41.79 million cubic metres per year.

RESOURCE CONSENTING

29. It would be fair to say that the difference in figures for the allocation of the Orari-Opihi GAZ is resulting in confusion for all parties involved in resource consenting processes at the current time.
30. There are 249 resource consents listed in Table GW2 of the *Resource Consent Inventory* report, of which 185 are considered to be hydraulically connected groundwater takes. This is 74% of the takes in the GAZ.
31. ECan consents staff have taken the view that until such time as a test is done on a bore(s) to verify the degree of hydraulic connection, the precautionary approach is to include 100% of the allocation in the GAZ. Testing of a bore(s) normally occurs upon renewal of a consent, and therefore, this approach means that the allocation for the zone will not be known until 2044 (this is the year in which the last groundwater consent in the zone expires). I note that this view has been incorporated into PC7 by way of a footnote in Schedules 9 and 13 (which relates to the requirements for implementation of water allocation regimes). The footnote states:

A reduction in the annual volume allocated from the groundwater block will only be applied where site-specific stream depletion assessments have been carried out.

32. What cannot be determined from the *Resource Consent Inventory* report is whether the degree of connection for each consent is estimated (no test on the bore(s) has been done), or actual (a test on the bore(s) has been done).
33. Testing has been carried out on a large number of bores in the Orari-Opihi GAZ and this has not been reflected in any of the allocation figures presented to the Commissioners. Taking all of this into account, the

allocation figure of 84.52 million cubic metres per year, even without applying Schedule 9, is incorrect and is mis-leading.

34. This approach also creates a false over-allocation now, and that has implications for consenting such as the requirement to surrender water upon transfer for example (Proposed Rule 14.5.12 in PC7).
35. Conversely, the same approach is not being replicated in the determination of the surface water allocation limits. Schedule 9 of the LWRP also determines what rate of take is to be included in the surface water allocation limits for hydraulically connected groundwater takes. The surface water allocation limits in PC7 have been determined using the method described in Paragraphs 23 and 24 of my evidence.
36. If the same precautionary approach were to be taken in regard to surface water allocation, then the maximum rate of take should be included in the surface water allocation block until such time as site-specific stream depletion assessments have been carried out.
37. In my opinion, there must be consistency in how allocation is calculated, and the same method must be applied at planning level as well as at consenting level to provide certainty for both the plan implementers and plan users. In this regard, I note in the evidence of the OWU, Mr David Lister describes the frustrations he is currently experiencing in this regard for a consent that he is seeking to take deep groundwater in the Orari-Opihi GAZ.
38. In my view, Schedule 9 of the LWRP sets out a methodology for calculating the allocation for both surface water and groundwater, and this must be used for both – not just surface water as it is now. Therefore, the footnote in Schedules 9 and 13 needs to be deleted.
39. Will applying Schedule 9 result in over-allocation of the Orari-Opihi GAZ? The short answer is no. There will be differences in modelled hydraulic connection versus actual hydraulic connection. However, there are also differences often arising upon renewal of consents when a consent without an annual volume requires one to renew the consent.

An equally common situation is that the bore(s) cannot sustainably yield the consented rate of take, and therefore, upon renewal, the rate of take and corresponding annual volume is adjusted downwards accordingly.

40. All of these scenarios result in “under’s and over’s” when it comes to the actual allocation at any given point in time, but generally speaking, it all balances out.
41. And in the case of the Orari-Opihi GAZ, the difference in allocation in applying Schedule 9 is significant being 43.63 million cubic metres per year. This is allocation that can address over-allocation of the Temuka River Catchment, and still be much less than the LWRP allocation limit for the zone of 71.1 million cubic metres per year. This is discussed further in the following section of my evidence.

THE SECTION 42 REPORT

42. At paragraph 11.12 of the Section 42 report, it states:

In Table 16 of the operative CLWRP, the existing A Allocation limit for the Orari-Opihi GAZ is 71.1 million m³/yr. However, this GAZ is presently over-allocated with approximately 85.2 million m³/yr consented to be abstracted. From the Resource Consent Inventory, it is estimated that 41.4 million m³/yr of this current allocation can be attributed to takes that are stream depleting. The remaining volume of 43.8 million m³/yr is attributed to takes that are solely from groundwater (i.e. categorised as having a low stream depletion effect in Schedule 9 of the CLWRP).

43. The report writer has mis-interpreted the allocation figure of 41.4 million cubic metres per year for the Orari-Opihi GAZ from the *Resource Consent Inventory* report (and it is noted that the figure in the report is actually 41.79 million cubic metres per year). This is not the sum that is attributed to the stream depleting takes, leaving 43.8 million cubic metres per year attributed to takes that are solely from groundwater. The figure of 41.79 million cubic metres per year is the total of both the takes that are attributed solely to groundwater plus the Schedule 9 annual volume applied to each stream depleting take.

44. The basis of the proposed limit in Table 14(zb) of PC7 of 43.8 million cubic metres per year for the A allocation block of the Orari-Opihi GAZ was because, at the time of plan drafting, that was thought to be the current consented limit determined using Schedule 9 of the LWRP. The *Resource Consent Inventory* report later revised that to 41.79 million cubic metres per year.
45. Therefore, the proposed A and T allocation blocks for the Orari-Opihi GAZ would not exceed the existing LWRP limits and do allow further groundwater allocation (contrary to the report writers view in paragraph 11.13 of the Section 42 report).
46. Because of this mis-interpretation, the report writers have recommended that the T allocation block be removed from Table 14(zb), as well as the corresponding policies and rules, and that that allocation limit for the zone remain at 71.1 million cubic metres per year (to lessen the extent of over-allocation from the proposed A allocation limit of 43.8 million cubic metres per year).
47. However, the recommended removal of the T allocation block for the Orari-Opihi GAZ has been over-looked later in the Section 42 report. At paragraph 14.26, the report writer states, in response to the takes in a High Naturalness Waterbody, that:

...Within the Orari-Opihi groundwater allocation zone, there is groundwater available in the T block which is intended to be used by people surrendering surface water or stream depleting groundwater takes. This groundwater availability will help ensure that landowners who rely on surface water takes, will still be able to continue to irrigate their properties. We are therefore confident that the availability of deep groundwater may be a suitable and viable alternative water source for those landowners affected by the High Naturalness classification of the water body.

48. The inconsistency between this response and that at para 14.26 above has been identified by the Hearings Commissioners in their questions of 28 May 2020. The Officers' response is as follows:

Yes, the analysis is incorrect, as this section had been prepared prior to the T block analysis, and not reconsidered – we apologise for that oversight.

Under Rule 14.5.5, the replacement of these surface water takes would be non-complying activities, and Policy 4.6 would be a significant hurdle. Policy 4.6 reads:

In high naturalness water bodies listed in Sections 6 to 15, the damming, diverting or taking of water is limited to that for individual or community stock or drinking-water and water for the operation and maintenance of existing infrastructure.

We are of the view that the High Naturalness classification of these waterbodies ought to remain, along with the existing non-complying activity status for new takes. We are conscious of the significant difficulty that these existing abstractors would face if the T block is not available.

Upon reconsideration, we recommend that if the T block is removed, then the ability for this small number of abstraction points to move to groundwater that is not hydraulically connected to these surface waterbodies, potentially through a bespoke rule limited to replacement of surface water abstractions affected by new High Naturalness classifications. If the Hearing Panel were minded to delete the T block and grant this subsequent relief, we could provide such a rule to the Hearing Panel.

49. The Officer's response still fails to see the bigger picture. The T allocation block was proposed to address the over-allocation of the Temuka River Catchment.
50. It also assumes that deep groundwater is a viable alternative for all existing water users from High Naturalness Waterbodies. It is not. There are takes from the Upper Orari River where deep groundwater does not exist. The evidence of Mr Lister highlights that transferring to deep groundwater is not a simple solution.
51. For existing takes from a High Naturalness Waterbody, any relief needs to recognise that there are existing takes, and implement the recommendation in the ZIPA that the policy and rule framework for High Naturalness Waterbodies recognises the value of, and investment in, existing irrigation infrastructure when considering resource consent applications that will replace an existing resource consent for the same activity on essentially the same terms and conditions.

CONCLUSIONS

52. Schedule 9 of the LWRP is a plan defined method which must be applied to calculating current allocation for both surface water and groundwater allocation zones.
53. Therefore, the proposed footnote at the end of Schedules 9 and 13 should be deleted.
54. The creation of the 10 million cubic metres per year T allocation block in the Orari-Opihi GAZ requested by the Submitters will not result in over allocation of the zone as the actual allocation is only 41.79 million cubic metres per year when Schedule 9 of the LWRP is applied correctly, and this is significantly less than the LWRP limit of 71.1 million cubic metres per year.
55. Relief needs to be provided for the renewal of water takes from High Naturalness Waterbodies, implementing the recommendation in the ZIPA that the policy and rule framework for High Naturalness Waterbodies recognises the value of, and investment in, existing irrigation infrastructure when considering resource consent applications that will replace an existing resource consent for the same activity on essentially the same terms and conditions.

Dated 17 July 2020

Keri Johnston