

IN THE MATTER of the Resource Management Act 1991
AND
IN THE MATTER of the hearing of submissions on
Proposed Plan Change 3 to the Land and
Water Regional Plan

BY **OTAIO WATER USERS GROUP**
Submitters

TO **CANTERBURY REGIONAL COUNCIL**
Local Authority

BRIEF OF EVIDENCE OF HAIDEE JANE MCCABE

Dated: 10 November 2015

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INTRODUCTION

Qualifications and experience

1. My full name is Haidee Jane McCabe.
2. I hold a Bachelor of Resource Studies from Lincoln University. I have 17 years' experience in water and irrigation related resource management.
3. As a graduate I worked for Attewell Irrigation Consultants for 5 years working on resource management for large irrigation schemes and individual farms. I also spent a year in Western Australia working for an agribusiness company managing carrot/onion farms and vineyards dealing with irrigation, environmental and farm management issues. On my return to NZ, I spent two years designing and selling on-farm irrigation systems.
4. In 2005 I established my own consultancy, mainly preparing irrigation resource consents and project managing farmer groups dealing with water quality and water quantity matters.
5. Since 2010, I have been a director and principal of Irricon Resource Solutions Limited, a resource management and environmental engineering consultancy, working extensively in the field of water resources management for both water quantity and water quality.
6. In August 2013 I was engaged by Otaio Water Users Group (OWUG which I will refer to when reading this evidence at the "Otaio Group") to assist them to participate in the development of Plan Change 3.
7. The purpose of this evidence is to provide some background to the Plan development and the concerns of Otaio Water Users Group. I am giving this evidence as their representative and not as an expert witness in this instance.

Plan Development Process

8. OWUG has been an active group for a number of years, managing flow sharing during times of low flows in the Otaio Catchment. It has also participated in the consenting process for the renewal of 10 of 12 consents held in this catchment, and the issue of 2 further consents. This will be outlined further by OWUG Chairman, Gary Johnston. Attached at Appendix 1 is a map highlighting the locations of the land owned by OWUG members.
9. When the development of Plan Change 3 began a number of technical reports were being released by Environment Canterbury (ECan) and large public meetings were held. OWUG had concerns with what was being proposed to reduce allocation and impose minimum flows on the Otaio River. The key concern for the group was water quantity, but water quality also needed to be addressed.
10. At that time I had just completed working with the Orari Water Society which had been actively involved in a collaborative process with ECan and stakeholders during the development of the water quantity plan under the LWRP Variation 2, Chapter 14. This had resulted in a very successful outcome for all parties involved with the notified plan largely supported by stakeholders.
11. A key lesson from the Orari process was the difficulty formulating a plan based on limited data and information about the catchment. Relying on modelling, rather than actual data and ground-truthing for complex river and groundwater systems is risky, not only for the irrigators but also the environment. If the Plan developed on this modelling proves to be wrong, this could be disastrous for water users, the environment or both.
12. In August 2013, I was contracted by OWUG to assist Richard de Joux who had already been involved with the group as a hydrologist and through the historic resource consenting processes. OWUG were keen to take the same approach as the Orari Group. My role was to engage with ECan and stakeholders, project manage, and provide input into the development of the Plan.

13. Disappointingly the same process for the Orari catchment was not being implemented for the development of this plan, primarily because of the scale of the catchment and short timeframes set to get the Plan notified. My challenge became getting ECan away from just holding large public meetings where they presented highly technical information to farmers, stakeholders and the community in the hope that this would be sufficient to get feedback from them to aid the development of the Plan. In my opinion, given the technical nature and complexity of the information and data, this does not work. This approach makes it very difficult for farmers to understand what the implications are for their property let alone the catchment, nor what the Plan should look like to allow them to continue to farm whilst providing for the needs of the environment.
14. Given this OWUG made an excellent decision to proactively participate in the Plan's development stages and engage expert support to assist them in making informed decisions. The key focus for irrigators was to maintain current levels of reliability of supply. Notwithstanding that OWUG understood that some change was inevitable.
15. As a result of this OWUG requested and organised a meeting with ECan including technical experts, on the 27th September 2013. The purpose of this meeting was to get agreement that the parties could and would work together in relation to the development of the Plan for the Otaio catchment. It was also acknowledged at this meeting that the environment had changed and consideration of what actually existed was needed. The consented allocation was large and thought needed to be given to what values needed protection and where. The key was what data needed to be gathered during the coming irrigation season to assist with the process. ECan were receptive to this and the process from this point was more collaborative. The parties have worked together with the objective of ensuring robust data was available for the formulation of the Plan.

16. Key topics/issues discussed at this meeting were:
 - a. The concept of swapping shallow/surface water to deep groundwater to reduce the shallow/surface water allocation.
 - b. Consequences of this and the need for more deep ground allocation to be made available.
 - c. Gravel accumulation and the effect this has had on the Otaio River, reducing wetted flow in the lower reaches
 - d. Agreement that the Gorge was the correct location for any minimum flow but the relationship with the lower catchment needed to be understood including when takes are self-limited, where the river goes dry, flow gain/loss stretches and contributions by spring fed streams. This became the Summer Monitoring Programme.
 - e. Discussion on what values needed to be protected given the river goes dry. ECan identified that the Plan must achieve the NPS. This also led to the involvement of F&G, DOC and Iwi representatives.
 - f. There was a need to understand existing water quality given limits were likely to be set in the Plan
 - g. Over allocation was discussed given the starting position from Ecan was that huge reductions in allocation were required (400l/s to 32 l/s) and the implementation of a minimum flow in the order of 96l/s when currently there was none.
 - h. Discussion was also had regarding maximum versus average rates of take
17. The Summer Monitoring Programme developed following the meeting was implemented during the irrigation season of 2013/2014 and focused on abstractors recording information on their water use and when self-limitation occurred. Photographs of the river were also taken to show how it actually behaved while irrigation was occurring and under irrigation restrictions.
18. Water quality sampling was incorporated into ECan's sampling programme. They monitored where the Otaio River was dry, flowing,

or pooling as well as monitoring groundwater levels. Whilst the work was carried out by ECan, the laboratory charges were paid for collectively by OWUG and Bluecliffs Station, a dry-land farm who was also collaborating with the group.

19. The next stage of the process was the notification of the ZIP Addendum. Prior to notification of this, OWUG provided input and gave a presentation to the Zone Committee. OWUG then submitted on this formally. The main points covered in the submission were:
 - a. Opposing the minimum flow of 96l/s (90% of MALF) and allocation of 32 l/s proposed from 2025 with the current allocation identified at 436l/s.
 - b. The need to base the flow regime on summer monitoring programme that recognises the physical characteristics of the river and what actually needs protecting.
 - c. The need for a B Block allocation to provide for reliability of supply and an alternative supply for existing users.
 - d. The need for more deep groundwater allocation to be made available to allow transfers from surface water to deep water to reduce surface water allocation
 - e. Options must be available for existing irrigators rather than being forced to surrender consents or onto schemes that are not considered viable.
 - f. Aim to reach agreement with Ecan and stakeholders during the development of the Plan as to the flow regime
 - g. Concern whether the 90% toxicity level for water quality can be achieved in conjunction with development of Hunter Downs Irrigation and associated increase in irrigation within the catchment. OWUG was concerned about the ability to meet the standards on an ongoing basis and the uncertainty around those issues. Can the N loads protect these water quality standards?
 - h. What happens if these water quality levels start being breached, how will this be managed especially if new irrigators have come into play with HDI.

20. From here OWUG continued to engage, participating in several more meetings with ECan and stakeholders prior to the Plan being drafted. Key outcomes from these meetings are summarised as follows.
21. On the 4th February 2014, a meeting was held with ECan , Fish and Game and Zone Committee representatives. An update of the Summer Monitoring Programme was presented by ECan identifying that the wet summer had not being ideal but lag times in the system were an important consideration. The core issues highlighted already would continue to be worked through. The Zone Committee supported the concept of transferring surface water to deep groundwater. A further outcome from this was the need for DOC and Iwi to be present along with dry-land farmers in this process.
22. In October 2014 OWUG put some draft ideas together for the allocation plan, as this had not been forthcoming from ECan. Time was ticking on the Plan being notified and OWUG did not have confidence that the flow regime would address issues of concern to OWUG.
23. During November 2014, OWUG circulated a detailed Draft Proposed Flow Regime taking into account the Otaio River characteristics. This was similar to what has been notified in the Plan. The key differences between what was notified and what OWUG proposed are as follows:
 - a. How annual volumes for the transfer of surface water to deep groundwater were to be calculated (actual use versus reasonable use).
 - b. The inclusion of stockwater in the allocation limits.
24. A further meeting was held on 25th November 2014 with ECan, Fish and Game, and representatives of Bluecliffs Station, where the surface water allocation was agreed. It is important to note that the allocation table in the meeting minutes is based on **irrigation consents only**, with draft figures of 408 l/s maximum rate for surface water and an annual volume of 4.6 M m³ for deep groundwater to be

approved by ECan. There was never any discussion about the inclusion of stockwater and a decision was made to specifically exclude the Waimate District Council consent from the allocation. The suggestion in the section 42A report that allocation volumes include stock drinking water was a surprise.

25. A key tool for OWUG is the ability to self manage flow restrictions on 7 day volumes. Maintaining the high flowrate is essential for OWUG but not for a continuous period over a week, with some requiring water for only a day or two. This was a key outcome from the results of the Summer Monitoring Programme and the collaborative process.
26. Deep groundwater allocation requirements were worked through. It became clear that for deep groundwater to be viable it needed to enable an improvement in reliability to offset the increased costs. Therefore strict reliance on 'actual use' in determining the volume to be transferred was not going to be acceptable.
27. There was still concern around the ecological values, minimum flow and reliability of supply and what self-limiting meant. Late in the process ECan were still having the reliability of supply analysis completed by Aqualinc. For OWUG reliability of supply is the most critical factor in the whole plan, as that is what affects the bottom line for each farm. This late information in the process was a major concern and impediment particularly when the economic consequences were still to be reported by Simon Harris. Furthermore the implications on the ecology as a result of the minimum flow and lower minimum flows scenarios were yet to be provided in a report by ECan (Graeme Clarke).
28. Consequently many decisions were being made without the final technical reports needed to support these decisions. This was far from ideal and ECan staff were doing their best, however the pressure was on to get the Plan notified and the process could not be slowed down to ensure robust collaborative decisions were made. As a result OWUG has doubts and on hearing the farmer evidence if not regrets, agreeing to the minimum flow of 90l/s when the reliability of

supply and economic analyses shows that it has a major impact on their businesses.

29. The B block allocation was still be finalised with some seeking a larger block of water than was being considered for new users and those where supply from Hunter Downs Irrigation Scheme was less likely and far too expensive. It was then decided to split the B allocation block between existing and new users but provide for a larger allocation block overall. In addition to this, for the B block takes, a groundwater trigger level was also needed to protect aquifer recharge and take into account the time-lag effect.
30. The final meeting was held on 5th December 2015. During this meeting the key parameters of the flow regime were finalised and agreed. An ecological report was produced by ECan that considered the following scenarios:
 - a. No minimum flow;
 - b. Minimum flow of 75 l/s; or
 - c. Minimum flow of 90 l/s.
31. The 90 l/s flow was considered necessary to minimise the river disconnect and protect the refuge habitat at the Mouth.
32. OWUG still had major concerns regarding the reliability of supply and the economic consequences of this. At this late point, ECan engaged Simon Harris to assess the effects of the minimum flow of 90l/s and an alternative scenario that would allow 50 l/s be taken by OWUG to protect critical crops between 90 l/s and 75 l/s. A larger B allocation block was still being considered and it was agreed further work could be submitted prior to the close of 1st Schedule Consultation.
33. This demonstrates the fact that time was certainly against us and the finalising of some critical matters particularly the minimum flow, reliability of supply, economic impacts and the size of the B allocation block could have benefitted from further discussions.

34. OWUG worked with Simon Harris to understand the implications of a lower minimum flow of 75l/s (note sometimes this has been referred to as 70l/), rather than the 90l/s being considered. Whilst economically this lower minimum flow was justified, further consultation with Fish and Game and DOC meant that support could not be obtained from these stakeholders. It simply was too late in the process to work with ECan whom were now in 1st Schedule Consultation with the draft plan. Therefore OWUG conceded that they would not pursue a lower minimum flow from the 90l/s agreed during the consultation phase developing the Plan, even though it was becoming clearer that the reliability of supply and economic impact on the farmers was considerable.
35. OWUG commented on the 1st Schedule Consultation Plan through Federated Farmers for ECan consideration of the final plan to be notified.
36. The plan was notified in April 2015 and it was from this point on that OWUG started to have input to the nutrient matters facing the catchment. To date, they had been reliant on the NARG group. OWUG ended up submitting on these matters when the draft plan was notified to support the NARG position. However during a Primary Industry meeting it became apparent that OWUG needed to be actively involved in nutrient matters at an expert level during the hearing process given the potential implication of the Plan on OWUG members and wider users within the community.
37. I have spent considerable time outlining the extent of the consultation and involvement of OWUG through the development of the Plan. I consider it is important to understand the level of commitment and contribution OWUG have made in developing the Plan working with ECan and ensuring robust data was collected rather than just relying on modelling. OWUG hoped this would lead to preparation of a Plan that achieved acceptable outcomes for OWUG and other stakeholders. Had this not occurred, the Plan would have been developed based on the limited information available at the time,

some modelling and input (or lack of) from the large community meetings.

MAIN OWUG ISSUES

Flow Regime:

38. It became apparent that a minimum flow was inevitable despite the physical characteristics of the river and that the majority of the abstractions are from shallow groundwater and not directly from surface water. The reliability of supply without a minimum flow is already low, being in the order of 65%. However most farmers have developed and adapted their operations to manage within these constraints. With a minimum flow of 90l/s, reliability decreases to 51% and hence why OWUG pursued various options for a small amount of water to be taken at a lower minimum flow of 75l/s.
39. It was proposed to allow 50l/s to be shared by OWUG with a minimum flow of 75l/s. This was considered particularly important for users who had no other source of water to offset reduced reliability of supply. Reduced reliability will have a significant effect on their ability to finish high value crops that are grown within the catchment. However from discussions at the stakeholder meetings it was apparent that other parties would not support this approach so OWUG did not pursue this matter.
40. The reason for raising this is so the implications of the flow regime in this Plan are clearly understood. It will result in serious financial consequences and farmers must now look for alternatives to sustain irrigation. Options have been built into this plan package but as shown in farmer evidence, this comes at a significant cost. Dr Ryder outlines, that the benefit to instream ecology from the minimum flow is not considered significant. When the minimum flow was agreed to, this was not the understanding of OWUG.
41. The Plan is considered acceptable as a “package”. The alternative sources of supply discussed in the following sections are crucial for it

to be workable for OWUG considering the implications of the 90l/s minimum flow.

7 Day Volumes

42. A key tool for OWUG is the ability to self-manage flow restrictions on 7 day volumes, rather than the typical pro-rata or stepped reduction by flow rate. Maintaining the high flowrate is essential for OWUG but it is not required for a continuous period over a week, with some requiring water for only a day or two. This reflects the hydrological character of the catchment discussed by Mr de Joux and how the catchment is currently constrained with self-limitation and through management by OWUG.

Transfers

43. Any increased usage of consented allocation is of considerable concern to OWUG. Currently the self-limiting nature of the catchment means that consented takes are generally unable to be fully utilised from year to year. Transferring some of that consented allocation to new land will inevitably increase the utilisation. This is not appropriate given the over allocated status of the catchment. Such transfers must only be allowed if usage is not going to increase or if allocation is freed up due to consent holders choosing to utilise alternative sources. Those who are using existing consents have invested significant capital in infrastructure and the entire farming operation is reliant on the limited water available. Reliability of supply will already be compromised by the minimum flow so allowing transfers that increase usage means decreased reliability to those actually irrigating already.
44. Furthermore this is why OWUG pursued relief that non-water user group abstractors faced much harsher restrictions than currently proposed by the Plan, to encourage membership of OWUG, to allow more integrated management of the available water.

A permits to storage

45. Given the reduced reliability of supply caused by the proposed flow regime and the need to decrease the allocation from surface water

over time, it was imperative that existing irrigators had various options available to maintain profitability. With many not being able to access deep groundwater or the HDI scheme, storage was considered a key factor in making this package acceptable to irrigators in the mid to upper catchment.

46. Considering the effect on reliability of supply, I expect that all properties without an alternative water supply will need to develop some level of on farm storage. This was worked through during the Plan development phase. and what the effect would be of taking A water into storage during the winter. This discussion resulted in a higher minimum flow of 350 l/s during May to September inclusive to 350l/s to provide for spawning and aquifer recharge.
47. The ability to put water into storage during winter is considered to be a win for both the irrigators and the environment. Water is stored in winter meaning it is available during the summer irrigation season when low flows mean water may not be able to be taken. Because the same annual volume applies to the relevant take, no more water in total is taken. But water is taken during the winter when the Otaio river catchment is not under pressure and less water is then taken during the summer when demand is high and river flows are low.

B permits

48. When determining the B permit regime, the key was to ensure existing A permit users were not adversely affected. Another key consideration for the Otaio catchment was the recharge of the shallow groundwater aquifer that supplies the existing A Block irrigators. It was on that basis that not only a minimum flow be established for the B permit allocation but also a corresponding groundwater recharge level monitored by a bore at McAlwee's Crossing and a limit to the size of the B block allocation. The Plan currently has this regime reflected in policy only and it is essential this is carried through into the rules.
49. The conclusion of the experts was a minimum flow for B permits of 780l/s combined with a groundwater recharge level on Bore J39/0255

with a level of - 3mtrs to ensure the aquifer was adequately recharged before B permit allocation could be taken. A total allocation block of 1,000l/s was determined appropriate for users and the mouth openings. This block is split to allow 500l/s for new users and 500l/s for existing users. If the 500 l/s for existing users is not taken up within 5 years, it is available to any person.

50. An essential part of the B allocation is that there is to be **no stacking** of the allocation on the minimum flow. If this occurs this erodes the reliability of supply and gives priority to the first consent granted. This is not the intention of the minimum flow and must be reflected in the Plan rules that become operative. This has been achieved by pro rata reductions in take rates tied to flow levels.

Transfer to Deep Groundwater

51. Given the proposed reduction in surface water allocation, part of the regime negotiations was to allow surface water allocation to be “transferred” to deep groundwater. At the same time, this potentially has environmental benefit with dry river reaches not being prolonged or extended. The volume required was calculated by Ms Johnston to be 4.61 million m³/year. ECan had proposed a higher volume in the Plan but have subsequently changed it to reflect Ms Johnston’s calculations.
52. The cost to transfer to deep groundwater is substantial as explained in evidence from OWUG members. However, it does achieve two things. Firstly, it frees up surface allocation for those users who do not have access to alternative sources and provides increased reliability to those who use it. So this means a real benefit to the other users continuing to taking surface water and for those transferring to deep groundwater, the assurance of reliable water.
53. Given the costs to set up the infrastructure to transfer to deep groundwater, it is essential the volume of water is able to be applied for is sufficient to encourage farmers to make the switch. During the development of the Plan this was discussed at length with ECan. Many old A permits have system capacity issues, whereby the

flowrate is unable to deliver the technical annual volume for the irrigation area. However to date farmers have just made do with what they had. Mr de Joux's evidence explains the process and concerns with the concept of 'demonstrated use' (versus reasonable use) included within the Plan. This was not a concept that was discussed during consultation. For a farmer to spend the amount of money required to drill and change their infrastructure the key driver is ensuring reliable water for the currently consented irrigation area. Considering historical usage would mean no improvement in reliability but increased costs. It does not incentivise transfers which was the point.

54. From reviewing the minutes from the meetings with ECan and stakeholders as outlined above, it was always discussed and understood the transfer would be based on accepted methodology to determine an annual volume based on the hectares consented, i.e. reasonable use.
55. The policies and rules must be amended in the Plan as proposed by Ms Johnston to address this.

Stockwater

56. Stock and domestic water was not included in the discussions during the development of the Plan. All allocations are based on irrigation only, as recorded by the table during the meeting on the 25th November 2014, where all the irrigation consents and allocation was set out. Never was there any reference to stock or domestic water being included in the allocation. It was understood that the LWRP could be relied on for this or as permitted activities under the RMA. The plan currently makes consenting of stock water prohibited because the catchment is fully allocated. This must be changed as this was never the intention.
57. The Waimate District Council community consent had been included in the allocation but was agreed this should be removed as it was not going to be subject to the minimum flows imposed and takes precedence under the RMA.

Nutrients

58. There is considerable debate around Overseer, changing versions and how this should be managed. Along with the effect on loads set and the limits/targets set on streams. OWUG have done so much hard work on the water quantity plan it would be naive to not sort out the water quality part of the Plan. If this is not addressed, the efforts relating to water quantity could become fruitless.
59. The key perspective of OWUG is that the Plan must be robust and allow for updates in Overseer versions within the rule framework for not just the catchment loads but at a farming level. There must be links between the Plan's load limits and the Overseer versions.
60. Consideration must also be had to whether these catchment loads means water quality limits/targets can be achieved with new irrigation within these catchments. What happens if water quality levels degrade, is it the new users who must alter their operations to address cumulative effects? Has this really been thought about in the development of the Plan and does the Plan provide a framework to manage this?
61. These issues become particularly acute with changes in the versions of Overseer which have consequences for compliance with the rules despite no change to on farm management. An existing farmer may go from permitted one day to needing consent the next, or having to reduce to comply with max caps set. This level of uncertainty is hugely problematic.
62. Another point of this plan is nutrient management is based on soil types, which are allocated different N limits. Many farms will span across several soil types. Generally farmers will talk about their Overseer number, which is a whole farm number. By setting limits based on soil type, this will require a farmer to actually look at Overseer on a block level, not at whole farm level. This adds another layer of complexity for a farmer to understand and comply with, but also affects decision making on farm. Farmers run farms, not blocks.

Water Quality

63. OWUG had the foresight to recognise in stream water quality limits would be set in this Plan that could impact their farming operations as much as the allocation of water does. The Otaio River Summer Monitoring programme therefore included water quality sampling throughout the two irrigation seasons within the catchment to at least get some form of baseline information.
64. The ZIP Addendum and notified plan proposes that water quality will be protected by setting a nitrate toxicity level of 90% and periphyton levels along with standard water quality parameters. Through this process OWUG have been asking if the parameters to be measured are appropriate, and the levels achievable with GMP considering the nutrient loads being set and the current state of the Otaio River. As a result Dr Greg Ryder was engaged to assist the OWUG.
65. A number of recommendations and clarifications have been made in Dr Ryders evidence.
66. It is concerning that limits in Table 15 c) are already being exceeded. However, it is expected that implementation of GMP and a minimum flow will help achieve these levels. What remains unclear is the consequence of expanded irrigation (particularly HDI) within the catchment and how this will affect water quality.

Summary

67. The OWUG has been extensively involved in the development of the Plan and has continued this into the expert evidence and legal submissions presented today. The package of options for the catchment are critical for OWUG to allow an acceptable level of reliability to be maintained.
68. The nutrient rules must allow for changes in Overseer at both farm and catchment load level. Then how this relates to the actual water quality limits must be robust to ensure that new irrigation

development does not give rise to cumulative effects that compromise the operations of existing farmers.

69. Finally, I would like to take this opportunity to thank the ECan team and other stakeholders, who worked with us during the Plan development process, making the time for the meetings under the tight timeframes and the Summer Monitoring Programme.

Haidee Jane McCabe

10 November 2015

OWUG – Otaio Catchment Farm Locations

