

**Submission on Proposed Water Permits Plan Change (Plan Change 7)  
to the Regional Plan: Water for Otago**

*(Form 5, Clause 6 of the First Schedule, Resource Management Act 1991 – Submission on Publicly  
Notified Proposal for Policy Statement or Plan)*

To: Otago Regional Council  
policy@orc.govt.nz

Name of submitter: **Omakau Area Irrigation Company Limited (“OAIC”)**

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I **wish / do not wish** (*circle preference*) to be heard in support of my further submission.


If others made a similar submission, I **will** consider presenting a joint case with them at a hearing.  
*(Delete if you would not consider presenting a joint case)*

**Trade competitor’s declaration** (if applicable)

I ~~could~~ / could not (*circle one*) gain an advantage in trade competition from this submission

I am / ~~am not~~ (*circle one*) directly affected by an effect of the plan change that

- (a) Adversely affects the environment; and
- (b) Does not relate to trade competition or the effects of trade competition.

Signature of submitter:  ..... Date: 4/05/2020 .....

*(Or person authorised to sign on behalf of person making submission)*

**State what your submission relates to *and* if you support, oppose, or want it amended:**

*(e.g. support rule 'x', or amend policy 'y')*

OAIC opposes the whole of PC7, as detailed in the following pages.

**State what decision you want the Otago Regional Council to Make:**

*(e.g. amend policy 'y' to say...)*

The Omakau Area Irrigation Company Limited seek;

- (a) Reject PC7 entirely or:
  
- (b) OAIC seek the urgent and robust completion of the limit setting plan change for the Manuherikia Catchment, including both a minimum flow and allocation limit, based on robust hydrology, ecology information, analysis of reliability of supply, and completed cultural, economic and social impact assessments. This is a continuation of the existing work in the catchment prior to notification of PC7.
  
- (c) OAIC supports and adopts the submission of the Otago Water Resource Users Group, Falls Dam Company Limited and the Manuherikia Catchment Group on Proposed Plan Change 7, including the reasons for those submissions and the relief sought in those submissions.

**Give reasons for the decision you want made:**

*(e.g. I want policy 'y' changed because...)*

The reasons for the decisions sought by the OAIC are set out in the following pages.

## Summary of Submission on PC7

1. This submission relates to Plan Change 7 in its entirety.
2. Omakau Area Irrigation Company Limited (OAIC) opposes Plan Change 7 in its entirety.
3. The key reasons for our submission are;
  - a. Plan Change 7 is not required. The operative Otago Regional Council *Regional Plan: Water for Otago (RPW)* already provides a mechanism for the replacement of deemed permits in a way which ensures long term sustainable management of natural resources.
  - b. There are alternative methods, such as the Manuherikia Limit Setting plan change which would deliver better outcomes for both the environment and irrigators as opposed to adding a further period of 6 years of uncertainty for the catchment.
  - c. OAIC consider PC7 to be completely unnecessary and will create a significant cost burden for OAIC in having to proceed through two consenting processes within a 6 year timeframe, which is an inefficient use of resources, that could be better spent on scheme upgrades and environmental enhancement.
  - d. The objectives and policies of PC7 do not give effect to Part 2 Resource Management Act (RMA).
  - e. PC7 fails to give effect to the National Policy Statement Freshwater Management 2017 (NPSFW).
  - f. PC7 also fails to give effect to the Regional Policy Statement.

The reasons for submission outlined below are in addition to the reasons summarised above.

## Introduction

1. Omakau Area Irrigation Company Limited (the 'company') operates the Omakau Irrigation Scheme (the 'scheme') which services an area located along the Manuherikia valley generally from Cambrians to the Chatto Creek area, west of Alexandra.
2. The company holds a number of authorisations to take, use and discharge water for the purpose of irrigation, stock and domestic supply. These authorisations are a combination of deemed permits and water permits and are due to expire 1 October 2021, as set out in Table 1 below.

**Table 1: OAIC Summary of Permits**

| <b>Consent Number</b> | <b>Waterbody</b>  | <b>Purpose</b>   |
|-----------------------|-------------------|--|
| 2001.702              | Manuherikia River | To take and use up to 1981 L/s from the Manuherikia River for the purpose of irrigation and domestic supply            |
| 2001.706              | Thomsons Creek    | To take and use up to 424.5 L/s from Thomson Creek for the purpose of irrigation, stockwater and domestic supply       |
| 2001.708              | Dunstan Creek     | To take and use up to 424.5 L/s from Dunstan Creek for the purpose of irrigation and domestic supply                   |
| 2001.710              | Lauder Creek      | To take and use up to 424.5 L/s from Lauder Creek  |
| 2001.712.01           | Middle Creek      | To take and use up to 84.9 L/s from Middle Creek for the purpose of irrigation and domestic supply                     |
| 2001.713.01           | Middle Creek      | To take and use surface water as primary allocation from Middle Creek at the County Race for the purpose of irrigation |
| 2001.714.V1           | Coal Creek        | To take and use up to 28.3 L/s from Coal Creek for the purpose of irrigation and domestic supply                       |
| 2001.715.V1           | Scotts Creek      | To take and use up to 56.6 L/s from Scotts Creek   |
| 2001.716.V1           | Devonshire Creek  | To take and use up to 28.3 L/s from Devonshire Creek for the purpose of irrigation and domestic supply                 |
| 2001.716.V2           | Devonshire Creek  | To retake and use water from Devonshire Creek at the Devonshire Race being water                                       |

| Consent Number | Waterbody        | Purpose  |
|----------------|------------------|--|
|                |                  | that has been taken from Scotts Creek under Deemed Permit 2001.715 and Discharged to Devonshire Creek for retaking for the purpose of irrigation |
| 2001.718.V1    | Devonshire Creek | To take and use surface water as primary allocation from Devonshire Creek at the Devonshire race for the purpose of irrigation                   |
| 2001.719.V1    | Thomsons Creek   | To take and use up to 113.2 L/s from Thomsons Creek for the purpose of irrigation stockwater and domestic supply                                 |
| 2001.720.V1    | Thomsons Creek   | To take and use surface water as primary allocation from Thomsons Creek at the Clearwater Race for the purpose of irrigation                     |

3. OAIC have for the past five years been in the process of preparing applications to replace deemed permits that expire in 2021. This time has been spent obtaining detailed information to support an application, including technical work such as hydrology, and ecology assessments, water use efficiency upgrades, and catchment mapping.
4. In doing so the OAIC have been working alongside the other irrigators, and irrigation companies within the Manuherikia Catchment on the replacement of deemed permits, so that a catchment wide approach to water management will prevail.
5. OAIC are nearing completion of the application process and are expecting to lodge this application in the coming months so as to ensure the applications are filed in accordance with Section 124 RMA.
6. The preparation of the OAIC application must continue, irrespective of the notification of PC7, although now OAIC will be required to address both the operative RPW and PC7. This only serves to highlight that there is no value in proceeding with PC7, as it will be ineffective, and not result in better environmental outcomes compared to the status quo approach under the RPW.
7. OAIC have invested **significantly** in cost and time, and review of their existing scheme operations as part of preparing their application to date, and this is arguably the single greatest body of work the scheme has undertaken to date since the establishment of the scheme in the early 1900's.

8. OAIC is one of the largest (by area of land irrigated and area of farms/properties covered/supported, number of shareholders, current water allocation and existing demonstrated use of allocated water), companies in all of the Otago Region.
9. Water is sourced for the scheme from the Manuherikia River and several tributaries including, Dunstan Creek, Lauder Creek, Thomsons Creek, and the smaller (but not insignificant) tributaries of the Chatto Creek catchment including Devonshire, Scott's, Middle and Coal Creek.
10. Water is then conveyed through various water races to the shareholders irrigable areas and/or existing on farm water storage dams. Water taken for the OAIC Scheme is from the Manuherikia River and is firstly a 'run of the river' water scheme but secondly, water taken from Falls Dam, the largest reservoir in the catchment provides storage in times of low flows, when the continued abstraction of water from the river becomes unsuitable. It is important to note however, that the Manuherikia River is one of the primary conduits for distribution within the scheme, with the river augmented by release from Falls Dam.
11. The predominant land use within the OAIC command area is pastoral, with some other uses including the Omakau Golf Course, Omakau Domain and the Omakau Racecourse. Stockwater is also supplied by the scheme.
12. The scheme infrastructure is in good condition and water takes are metered, telemetered and controlled by automatic gates at multiple locations (agreed WEX sites) which have been operational for several years. The installation of automatic gates ensures the constant precision of water abstraction (to within a minor error of metering as is to be expected/allowed for).
13. The water taken by OAIC is used by approximately 70 shareholders and covers a command area of approximately 7,000 hectares. There are contracts in place for irrigation of 5,842 hectares of farmland, although water users tend to spread their water over a larger area, ensuring an efficient use of the water resource.
14. Significant investment has been made in the last decade to upgrade the Scheme's infrastructure, race networks, and water use efficiency for the shareholders in particular. Further operational efficiencies (in particular some further conversions from flood to spray irrigation) will enable additional irrigation within the existing allocation and command area amongst shareholders and they will benefit collectively from the group conversion to spray irrigation.
15. PC7 seeks to limit this approach to efficiency through Rule 10A.3.1.1 which seeks to limit the area of irrigation to that of the 2017-18 season. It does this without analysis of justification and shows an obvious lack of understanding of irrigation within the catchment.

16. Achieving greater water use efficiency requires significant and long-term capital investment. This includes existing efficiency gains that are already in place, and those proposed which are essentially awaiting the outcome of their consent application (subject to granting) which would then confirm further investment in spray irrigation.
17. OAIC have implored the Otago Regional Council to share the burden of information gathering required for the Manuherikia Catchment, that would both benefit the permit replacement application of the Scheme and for the Councils impending and eventual new Water Plan. To date this has occurred with limited success.
18. This catchment is arguably one of the most complicated in terms of taking and distribution of water throughout the catchment and the pre-take storage provided by Falls Dam that has resulted in major parts of the catchment no longer in 'natural state' (i.e. pre-water abstraction), albeit they have been in a modified state for close to 90 years, since the dam was constructed.
19. Most recently, additional flow monitoring sites have been installed in this catchment in order to gain a greater understanding of the existing flow regime, and freshwater fish surveys and flow habitat modelling has been undertaken at various reaches of the waterbodies within this catchment. Much of this work has been funded by the OAIC and its shareholders (alongside other irrigation companies) with this work also critical for limit setting in the Manuherikia Catchment and not just individual permit replacement applications.
20. The Company's main and only reservoir is Falls Dam. This dam has permits that are due to expire 1 October 2021. OAIC supports the submission by Falls Dam Company Limited.
21. During periods of extreme low flows when tributary inflows are minimal, all four shareholders (Omakau Irrigation Company (OIC), Blackstone Irrigation Company (BIC), Galloway Irrigation Society Incorporated (GISI), and Manuherikia Irrigation Co-operative Society (MIC)) of the dam are heavily reliant on both storage releases from Falls Dam and inflows into Falls Dam.
22. Stakeholders and owners of Falls Dam work collaboratively to manage water resources throughout the Manuherikia Valley, especially during periods of low flow.
23. The management of the Manuherikia River and its tributaries by the OAIC has resulted in the Manuherikia River being recognised as a regionally significant brown trout fishery, while Dunstan Creek is categorised as a backcountry fisher and contains both brown and rainbow trout.<sup>1</sup>

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<sup>1</sup> ORC, Management flows for aquatic ecosystems in the Manuherikia River and Dunstan Creek, February 2017

24. OAIC have acted in good faith and have been preparing for their renewal for some years, being mindful of the previously well signalled process and efficiencies that would be required to comply with the existing Aqualinc models and undertaking science work to understand the effects of their activities on the instream ecology and hydrology of the Manuherikia Catchment.
25. There is no need for PC7. The existing Regional Plan Water (RPW) is proving effective at retiring paper allocation for those schemes who have already completed the replacement of their permits. The perceived issues with the current RPW that have been identified in the s32 report are not overcome by PC7. Everything identified in PC7 can still be achieved under the existing RPW framework. More detail on this can be found in submissions made by others.
26. Great progress has already been made by many permit holders in improving their water use efficiency and environmental performance. Implementing PC7 will stop any progress to improve water use efficiency in its tracks as short duration permits will not enable investment in the required infrastructure or efficiency upgrades.
27. More specifically, a shareholder's ability to borrow money in order to finance improvements is unlikely where a short consent term creates unnecessary uncertainty surrounding the shareholders ability to continue to access the water source that would enable them to repay debt.
28. OAIC have detailed records of abstraction that reflect their actual use of water for the past 10 years. Actual use is less than the face value of the water permits held by the OAIC, which highlights the flaws in assuming that the Manuherikia Catchment is 'overallocated'.
29. Schedule10A.4 is fundamentally flawed and completely misunderstands irrigation. Seasons and crops do not have average years. Supply and demand are highly variable. Calculating actual usage should be just that – actual usage in every year where metering records and or other substantiated evidence has proved actual use (as Policy 6.4.2A and then 6.4.0A direct in the Otago Regional Plan for Water).
30. The method proposed within PC7 provides no flexibility or consideration of the individual situations and unfairly impacts on permit holders who have experienced metering issues or have incomplete abstraction records between 2012-2017 for reasons such as development to improve water use efficiency.
31. The s32 report prepared by ORC fails to account for the existing expenditure in preparing current applications (and that which is nearly complete!) when completing their basic cost/benefit analysis of the proposed rule framework. That cost cannot be 'recouped' by granting of short-term consents.



32. Those permit holders willing and able to lodge their replacement applications before October 2021 should not be prevented from seeking the long-term consents that they need, as many have done already, especially where an effects based planning framework is applied, and where an applicant can demonstrate that the effects can be avoided, remedied or mitigated.

## **Submission on Objective 10A.1**

33. OAIC oppose this objective.
34. This objective is unclear, and contradictory, and is inconsistent with the existing objectives of the RPW.
35. One of the reasons given by the ORC for the need for PC7 is that the current RPW does not give effect to the NPSFM<sup>2</sup>. OAIC do not consider this to be a valid reason for PC7. OAIC must (and have), in preparing their application for the replacement of their permits, give effect to the planning framework and all higher order planning documents, including the NPSFM, as required by Sec 104 (1) (b) RMA, irrespective of whether a regional plan implements the NPSFM.
36. Furthermore, proposed Objective 10A.1.1 is inconsistent with Policy 10A.2.2 and Rule 10A.3.1.1. The objective indicates that this shall be an interim framework until such time as the new water and land plan (LWRP) becomes operative, yet it is quite conceivable that the LWRP will not be operative by the end of the proposed 6 year term of consents, creating an extended period of uncertainty for water users, not greater certainty as promoted by the ORC<sup>3</sup>.

## **Submission on Policies**

37. OAIC oppose Policies 10A.2.1, 10A.2.2, and 10A.2.3.
38. The policies do not provide certainty around the outcome sought despite assertions from the ORC that they will. The approach creates far greater uncertainty than the current RPW framework, particularly for those who are having to fund two applications for consent in short succession, alongside the cost of participating in a slew of plan change processes at the same time.
39. The approach set out in PC7 is not an effects-based approach in accordance with the principals of the RMA and does not account for the adverse effects on aquatic values, economic and social wellbeing.

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<sup>2</sup> ORC Memo, Water Permits Plan Change, 1 March 2020, Paragraph 68.

<sup>3</sup> ORC Memo, Water Permits Plan Change, 1 March 2020, Paragraph 6.

40. The proposed term of consent set out in Policy 10A.2.2 is untenable.
41. This policy effectively rules out any upgrade or replacement of the scheme until such time as the LWRP is operative, which will have an adverse effect on people and their communities, including economic and social impacts, as well as potentially limiting environmental benefits that could arise from the upgrade of infrastructure, including the continued conversion to spray irrigation from flood irrigation methods.
42. The matters for exception under Policy 10A.2.3 would not likely be able to be met by the OAIC, as such they would fall as a non-complying activity. Part (e) of the policy directs that there shall be a reduction in the volume of water allocated for abstraction, however the policy fails to provide direction on understanding and accounting for irrigation demand and efficient use of water, both of which are also important considerations alongside allocation.
43. Policy 10A.2.3 does not provide any direction on why applications for non-complying activities that can pass the Sec 104D RMA Gateway Test should be limited to a term not exceeding 15 years. What purpose is served by a 15-year term over a 35-year term is not explained. This is an inefficient way to give effect to the RMA, and a matter of concern for the OAIC, who are not likely to meet the controlled activity rule provisions.
44. Policy 10A.2.3 effectively ceases all capital investment in the upgrades or new infrastructure for the next six years.

### **Submission on Rules 10A.3**

45. OAIC oppose Rule 10A.3.1.1 and Rule 10A.3.2.1.
46. The proposed rule framework is neither simple or cost effective, and would result in a range of detailed supporting and technical documents being required, which for the same or similar cost an applicant may very well choose to progress down the alternative non-complying path, where the opportunity to obtain a consent term greater than 6 years exists.
47. This rule contradicts the position promoted by the ORC, that the simple controlled activity framework would incentivise short duration consents where they fall as a controlled activity<sup>4</sup>. The matters for control that attach to Rule 10A.3.1.1 mean that a large number of deemed permit holders, (including OAIC) would be unable to meet these provisions, and automatically fall as a non-complying activity, which is neither simple or cost effective.

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<sup>4</sup> ORC Memo, Water Permits Plan Change, 1 March 2020, Paragraph 6.

48. There appears to be little justification within the Section 32 analysis for why a non-complying activity status is an appropriate tool for what is intended to be an interim planning process.
49. A non-complying activity status is overly restrictive, and is likely to capture a number of activities that do not meet one or more of the matters for control for Rule 10A.3.1.1, despite the effects of these activities remaining no more than minor.
50. PC7 does not give effect to the NPSFM. Proper consideration of in-stream ecological values will not occur for at least 6 years. Water demand needs are not considered at all in the methodologies contained in Schedule 10A.4, and while the word 'efficiency' appears in Rule 10A.3.1.1, the remainder of the Rule stops permit holders from making efficiency improvements (for example due to the 6 year term and the reduction in annual allocation via average maximums).
51. PC7 undermines the collective, collaborative approach undertaken by water users so far.
52. An application by OAIC to replace its consents would automatically fall as a non-complying activity under Rule 10A3.2.1 as the matters of control for a controlled activity are unable to be met, including that the area of irrigation not increase, and that there is a reduction in allocation.
53. The methodology used in Schedule 10A.4 which is based on the use of an average maximum is inconsistent with the ORC stated principle underpinning PC7 that "water allocation should be based on water use not paper allocation"<sup>5</sup>. An average maximum will result in a significant reduction below actual use, as is demonstrated in the calculations undertaken by the OAIC in trying to understand the impacts of PC7 (Appendix 1).
54. These calculations have been prepared to demonstrate the deficiencies in Schedule 10A.4 and should be used for illustrative purposes only.
55. Schedule 10A.4 is an attempt to 'claw back' or reduce allocation. Over-allocation has not yet been defined by the ORC in Otago in accordance with the NPSFM. While a reduction in actual water use may be appropriate and necessary in some circumstances, this should be based on a proper assessment of the activity and catchment, including efficiency of use and a comprehensive effects assessment rather than a generic formula with no link to effects or outcomes for a waterway. This should not occur during any 'interim planning framework'.

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<sup>5</sup> ORC Sec 32 Evaluation Report, 18 March 2020, Page 15.

56. The use of the water years (1 July to 30 June of the following year) 2012 to 2017 appears to be arbitrary, and no rationale is provided in the Section 32 Evaluation as to why this period was selected, and why up to date data cannot be considered.
57. OAIC have very detailed long-term records of use, and all of this data, including that for this season should be able to be used.
58. The current RPW requires an assessment of at least the last 5 years water data (Policy 6.4.2A). This is logical as it utilises the most recent data and if there are more than 5 years of data it allows a broader understanding of the water use situation on the property. It is on this basis that the OAIC have been preparing their applications for replacement consents.
59. The inclusion of limits on areas of irrigation within PC7 to the areas irrigated in 2017-2018 is an ill-conceived approach and fails to account for the ongoing efficiency upgrades that have been occurring in the Manuherikia Valley since the 2017-18 season. It is important to understand that an increase in irrigation area does not equate to an increase in water allocation. Expansion of irrigation areas is facilitated largely by efficiency upgrades.
60. The Section 32 Evaluation Report<sup>6</sup> notes that the current planning framework may not allow for adequate consideration of environment effects or drive efficient resource use. This is simply not the case, and the retention of the status quo planning framework will provide significantly better environmental outcomes than PC7.

## **Submission on Sec 32 Evaluation Report**

61. OAIC are concerned that the Sec 32 Report has failed to undertake a detailed cost benefit analysis of the proposed new policy and rule framework, and that this assessment has overplayed the inadequacies of the existing planning framework to deliver long term sustainable outcomes.
62. The Sec 32 evaluation also fails to adequately assess alternative options, instead it provides a summary of a few options, without detailed analysis or discussion. The best option for the OAIC and the Manuherikia Catchment is not the option presented in PC7.
63. The evaluation report concludes that there are no social costs compared to the status quo.<sup>7</sup> There is no evidence to support this conclusion, it is strongly refuted by the OAIC, whose shareholders, and communities will be significantly impacted as a result of PC7.

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<sup>6</sup> ORC Sec 32 Evaluation Report, 18 March 2020, Page 6.

<sup>7</sup> ORC Sec 32 Evaluation Report, 18 March 2020, Page 21.

## Other Matters

64. In the supporting papers to PC7<sup>8</sup> it notes in relation to the proposal to reduce the area under irrigation that the expansion of area of irrigation ignores the potential effects on water quality arising from a greater land area under irrigation.
65. No evidence has been provided by the ORC in respect to the issue of water quality, and its link to the proposed restriction on an increase in irrigation area. It appears as if this statement is predicated on assumption rather than fact.
66. In 2015 the Manuherikia Catchment Water Strategy Group (MCWSG), of which the OAIC was a member, and financial contributor, commissioned a report by AgResearch to look at the effects of increased irrigation area and land use intensification on water quality and nutrient losses throughout the Manuherikia Catchment.
67. The analysis of the individual case study farms showed that nutrient losses are strongly influenced by irrigation management practices and an efficient irrigation system can have lower nutrient losses than an inefficient irrigation system. However, the influence of irrigation management on nutrient loss needs to be assessed on a case by case basis as there is still a strong interaction between stock type, management and nutrient loss susceptibility (particularly nitrogen (N) leaching)<sup>9</sup>.
68. This report concludes that within the Manuherikia Catchment, there is a negligible decrease in N losses as we move from the current irrigation scenario to a future storage scenario.

Jan Manson  
Omakau Area Irrigation Company Ltd Chairman  
May 2020

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<sup>8</sup> ORC Memo, Water Permits Plan Change, 1 March 2020, Paragraph 31.

<sup>9</sup> AgResearch, Nutrient Losses within the Manuherikia Catchment, June 2015, Page 3.

**APPENDIX 1 – OAIC Allocation Project Memorandum**



# Project Memorandum

21 April 2020

Landpro Reference: 17282

**To:** Omakau Area Irrigation Company

**From:** Christina Bright, Environmental Scientist, Landpro Ltd

**Subject: Otago Regional Council Plan Change 7 – Water Permits Plan Change. Proposed Allocation Methods.**

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The following provides a summary of a data analysis exercise carried out to test the proposed methods for calculating allocation as proposed by the ORC's Plan Change 7 (PC7). The use of the method is outlined in Rule 10A.3.1.1(iv) of PC7 and Schedule 10A.4 describes the proposed method.

See Appendix A for our summary of the method. In addition to Schedule 10A.4 being used, the ORC subsequently has released a guidance document on the allocation method, this has also been followed.

Summary of permits subject to this assessment – Appendix B.

Please see Appendix C for complete summary tables for individual permits.

'Actual' abstraction described in the following sections refers to the actual abstraction calculated from the six most recent years of data. This is in line with the current Otago Regional Water Plan (RWP) and is generally the volume applied for under the RWP and in line with Policy 6.4.2A of the RWP. This is the six-year maximum of the recorded maximum rate (l/s) and maximum volume (m<sup>3</sup>) recorded in each irrigation season for 2013/2014 to 2018/2019 and relates here for OAIC to the period since 2013 when meters were upgraded. In this scenario, where abstraction exceeds the consented maximum, the proposed volume is the consent maximum. This process is reflected in the 'actuals' reported here.

This differs to the PC7 approach where substantial data grooming occurs prior to calculating the average of the maximum recorded in each season for rate, daily, and monthly allocations, and the average only for annual allocation. This is limited to the period 2012/2013 to 2016/2017.

General comments on allocation – total combined actual abstraction from 13 permits:

- The total combined actual instantaneous **rate of take** compared to the preliminary PC7 calculation completed here indicates a 5% reduction in total instantaneous abstraction.
- The total combined actual **daily** abstraction compared to the PC7 allocation indicates a 5% reduction in total daily abstraction.
- The total combined actual **monthly** abstraction compared to the PC7 allocation indicates a 10% reduction in total monthly abstraction.

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- The total combined **annual** abstraction compared to the PC7 allocation indicates a 12% reduction in total annual abstraction.

These percentage differences between the preliminary PC7 allocation, actual abstraction, and the consented on-paper allocation equates to volume (m<sup>3</sup>) differences as summarised in Table 1 below.

**Table 1: Total combined actual abstraction from 13 OAIC permits 2013-2019 – percentage and volume differences between actual and WPPC allocations. Consented is the on-paper consent maximums. (-) denotes a reduction.**

|                        | Actual     | Consented   | WPPC       | % Difference to Actual | Volume Difference to Actual |
|------------------------|------------|-------------|------------|------------------------|-----------------------------|
| Rate of Take l/s       | 3,853      | 3,960       | 3,670      | -5%                    | -183                        |
| Daily m <sup>3</sup>   | 323,797    | 342,181     | 306,738    | -5%                    | -17,059                     |
| Monthly m <sup>3</sup> | 9,287,668  | 10,406,610  | 8,361,234  | -10%                   | -926,434                    |
| Annual m <sup>3</sup>  | 51,330,859 | 119,424,049 | 45,244,428 | -12%                   | -6,086,432                  |

General comments – likely reductions:

- Instantaneous **rates of take** are likely to reduce on average by 8% across the all permits. Least affected are the Manuherikia (-1%), Thomson (2001.706 – the upper take) (-8%), Dunstan (0% change), Lauder takes (-1%), and Devonshire/Scotts (-2%), including also Coal Creek (0% change).  
Note that Coal Creek has only one partial complete season of data as the metering was upgraded in September 2019 to exclude Middle Creek abstraction. Also, Devonshire/Scotts is complicated due to Naylor’s abstraction and combined metering.  
Most affected are Middle Creek (-12%), and Thomsons (2001.719 & 2001.720) (-39%).
- Comparing the **daily** PC7 allocation to the consented paper allocation there is an average reduction of 7% across all permits. Those permits most affected reflect the reduction in instantaneous abstraction as described above.
- Comparing the **monthly** PC7 allocation to that consented, there is on average across all permits a reduction of 10%.
- Comparing the **annual** PC7 allocation to that consented, there is on average a reduction of 12%. On the annual timestep, all permits show a similar reduction.

These percentage differences between the preliminary PC7 allocation and the consented on-paper allocation equates to volume differences as summarised in Table 2 below. The maximum and minimum likely change is also described. For individual permits see Appendix B.



**Table 2: Total combined actual abstraction from 13 OAIC permits 2013-2019 – percentage and volume differences between actual and WPPC allocations. (-) denotes a reduction.**

| Percentage Difference | Rate of Take l/s | Daily m <sup>3</sup> | Monthly m <sup>3</sup> | Annual m <sup>3</sup> |
|-----------------------|------------------|----------------------|------------------------|-----------------------|
| Average               | -8%              | -7%                  | -10%                   | -12%                  |
| Maximum Change        | -39%             | -21%                 | -18%                   | -17%                  |
| Minimum Change        | 0%               | 0%                   | 0%                     | -6%                   |

| Volume Difference | Rate of Take l/s | Daily m <sup>3</sup> | Monthly m <sup>3</sup> | Annual m <sup>3</sup> |
|-------------------|------------------|----------------------|------------------------|-----------------------|
| Average           | -23              | -2,132               | -115,804               | -760,804              |
| Maximum Change    | -110             | -5,377               | -416,629               | -3,607,671            |
| Minimum Change    | 0                | 0                    | -165                   | -17,353               |

General comments – irrigation requirements:

Landpro during preparation of the OAIC application has carried out Aqualinc calculations for the Country, Dunstan, and Main Irrigation Schemes. These were completed in 2018. The annual allocations determined by the current assessment under PC7 versus the preliminary Aqualinc calculations are described below. This shows that under a PC7 scenario there is less opportunity to meet the modelled irrigation requirement.

- The OAIC Main Scheme fed by the Manuherikia permit (2001.702) under PC7 likely provides an annual allocation of 27,402,165m<sup>3</sup>/year. The 100%ile maximum annual water requirement for this scheme is 53,048,709 m<sup>3</sup>/year. Therefore, the PC7 allocation provides 52% of the modelled annual maximum. Actual abstraction provides 58% of the requirement.
- The OAIC Dunstan Scheme fed by the Dunstan Creek permit (2001.708) under PC7 likely provides 4,264,191 m<sup>3</sup>/year. The 100%ile maximum annual water requirement for this scheme is 16,036,087 m<sup>3</sup>/year. Therefore, the PC7 allocation provides 27% of the modelled annual maximum. Actual abstraction provides 32% of the requirement.
- The OAIC County Scheme fed by the permits in the Chatto Creek catchment under PC7 likely provides 2,619,500 m<sup>3</sup>/year. The 100%ile maximum annual water requirement for this scheme is 3,303,518 m<sup>3</sup>/year. Therefore, the PC7 allocation provides 77% of the modelled annual maximum. Actual abstraction provides 90% of the requirement.

**Table 3: Aqualinc determined annual volume (90%ile) for irrigation versus consent and WPPC-PC7 allocation.**

| Aqualinc water requirement calculations: |           |                                   |  |   | Allocation:                   |                                   |
|--|-----------|-----------------------------------|--|---|-------------------------------|-----------------------------------|
| Scheme                                   | Area (ha) | Monthly Maximum (m <sup>3</sup> ) | 90%ile annual volume (m <sup>3</sup> ) | Maximum annual Volume (100%ile) (m <sup>3</sup> ) | Actual (m <sup>3</sup> /year) | WPPC - PC7 (m <sup>3</sup> /year) |
| Main                                     | 6,176     | 9,055,792                         | 46,660,819                             | 53,048,709  | 31,009,836                    | 27,402,165                        |
| Dunstan                                  | 1,954     | 2,863,170                         | 14,167,913                             | 16,036,087  | 5,054,995                     | 4,261,191                         |
| County                                   | 416       | 571,821                           | 2,934,536                              | 3,303,518   | 2,985,037                     | 2,619,500                         |

These calculations are preliminary and likely require validation. In time it is recommended that this also be done for Thomsons and Lauder. There is no clear direction from PC7 that these efficiency calculations, e.g., Aqualinc, have any weighting under a PC7 scenario, and therefore the data provided here is the simplest representation of the likely allocations under PC7 versus the modelled irrigation water requirements. Once clearer direction is received from the ORC with regards to the demonstration of efficient water use, we recommend the analysis completed here and the preliminary annual allocations be compared to any water use/requirement and efficiency calculations.

Notes for consideration:

- The Devonshire/Scotts water meter measures a combined abstraction from permits 2001.716.V1 (retake of 2001.715 Scotts Creek), 2001.717.V1 and 2001.718.V1 and also measures Ross Naylor's RM15.127.01 permit. It is difficult to apportion what flow is abstracted under what permit in order to determine allocations on the individual permits.
- The Coal Creek meter has historically measured water also taken from Middle Creek via permits 2001.712 and 2001.213. In September 2019, a new meter set-up was completed so that the Coal Creek meter measures only abstraction from Coal Creek. Therefore, the PC7 allocation determined here is reliant on data collected for the 2019/2020 season only.

Conclusion

In conclusion, in comparison to the actual combined abstraction for 2013-2019, some of the OAIC permits will be less affected at an instantaneous/daily timestep, although all (except Dunstan and Coal Creek) are likely to experience some level of reduction. All permits are affected at a monthly and annual timestep. It is important that these reductions be compared to water efficiency calculations for irrigation requirements, to assess the reduction of the actual water abstracted to modelled water needs.

Please note, data could be subject to change depending on further guidance from ORC, or statistical software used, data conversion, and propagation of rounding errors. These would require confirmation by the Otago Regional Council.

Please do not hesitate to contact me, or Kate Scott, if any further questions.

Kind Regards



Christina Bright  
Environmental Scientist

## APPENDIX A

Expanded explanation of method:

1. Convert the instantaneous abstraction recorded to an equivalent l/s measurement if not already in l/s.
2. Filter abstraction record and remove any instantaneous abstraction of 0 l/s.
3. Filter data to assess records of instantaneous abstraction that exceed the authorised abstraction:
  - 3a) If the abstraction is less than the margin of error of either 5% or 10% the abstraction is rounded down to the consented maximum. i.e., if an instantaneous rate is within 5% or 10% margin of error it is given a value equivalent to the consented abstraction.
  - 3b) If the instantaneous abstraction is above the 5% or 10% margin of error, the data is removed entirely.
  - 3c) The uncertainty (margin of error) applied as either 5% or 10% is dependent on the most recent flow meter verification, any margin of error stated on a consent, or the margin of error specified by the meter's manufacturer. Where none of this is available, 5% is applied to any piped meter, and 10% to any open channel meter.
4. Ensure the appropriate margin of error has been applied and reserve the adjusted data set as the final instantaneous abstraction record for assessment of allocation.
5. **Rate of Take (l/s):** Compute the maximum rate (l/s) taken in each irrigation season and take the average of these maximums (2012-2017) to determine the rate of take (l/s) to be consented.
6. **Daily Volume (m<sup>3</sup>/day):** Using the daily volume record provided by ORC through their Hilltop database, the same filtering steps as above are applied. The maximum daily volume is computed for each irrigation season on record and the average of the daily maximums for the 2012-2017 period is taken as the daily volume allocation or limit.
7. **Monthly Volume (m<sup>3</sup>/month):** Using the m<sup>3</sup>/day filtered abstraction record from step 6, the daily volumes are summed across the respective calendar months to give m<sup>3</sup>/month. The maximum m<sup>3</sup>/month recorded in any irrigation season is computed. The average of the on record monthly maximum for each season with the period 2012-2017 is taken as the m<sup>3</sup>/month allocation or limit. Any monthly volume larger than the consented monthly allocation is removed entirely.
8. **Annual Volume (m<sup>3</sup>/year):** Using the m<sup>3</sup>/day filtered abstraction record, the daily volume is summed for each irrigation season on record, and the average of the 2012-2017 period is taken as the annual allocation or limit. Any annual volume larger than the consented annual allocation is removed entirely.

*Note: Where data is incomplete for the 2007-2012 period, any data within this period is used. If no data for this period exists, then all data available from all years is used.*

## APPENDIX B

**Table 4: Consents summary.**

| Consent Number | Waterbody                        | Water Meter   | Consent Limits  |
|----------------|----------------------------------|---|---|
| 2001.702       | Manuherikia River                | WM0122  | 1,981 l/s   |
| 2001.706       | Thomsons Creek                   | WM0104  | 424.5 l/s   |
| 2001.708       | Dunstan Creek                    | WM0105  | 424.5 l/s   |
| 2001.710       | Lauder Creek                     | WM0107  | 424.5 l/s   |
| 2001.712.01    | Middle Creek                     | WM0103<br>(combined with<br>2001.713.01 after 2013) | 84.9 l/s  |
| 2001.713.01    | Middle Creek                     | WM0108 (2007-2013)                                  | 56.6 l/s<br>4,890 m <sup>3</sup> /day<br>1,188,328 m <sup>3</sup> /year   |
| 2001.714.V1    | Coal Creek                       | WM0109  | 28.3 l/s  |
| 2001.715.V1    | Scotts Creek                     | WM0110 (2007-2013)<br>WM0686                        | 56.6 l/s  |
| 2001.717.V2    | Devonshire (Scotts Creek retake) | WM0686  | Retake 56.6 l/s   |
| 2001.716.V2    | Devonshire Creek                 | WM0687R (2007-2013)<br>WM0686                       | 28.3 l/s  |
| 2001.718.V1    | Devonshire Creek                 | WM0688 (2007-2013)<br>WM0686                        | 84.9 l/s<br>7,335 m <sup>3</sup> /day<br>1,782,492 m <sup>3</sup> /year   |
| 2001.719.V1    | Thomsons Creek                   | WM0689  | 113.2 l/s   |
| 2001.720.V1    | Thomsons Creek                   | WM0690 (2007-2013)                                  | 169.8 l/s<br>14,671 m <sup>3</sup> /day<br>3,565,053 m <sup>3</sup> /year |

## APPENDIX C

**Table 4: OAIC Company Permits - Summary data of the consented abstractions and the allocation calculated under Rule 10A.3.1.1(iv) of Otago Regional Council's Water Permits Plan Change (WPPC) Plan Change 7.**

| <b>Permit 2001.702 - WM0122 Manuherikia at Becks</b> |  |                            |                               |                                 |                                      |
|--|--|----------------------------|-------------------------------|---------------------------------|--------------------------------------|
| Verification:  | 5%   |                            |                               |                                 |                                      |
| Data record:   | 2012-2017; ORC data request dated 28 March 2020 c/o OAIC Secretary |                            |                               |                                 |                                      |
|  | <b>Actual<sup>1</sup></b>  | <b>Consent<sup>2</sup></b> | <b>WPPC - PC7<sup>3</sup></b> | <b>%_difference<sup>4</sup></b> | <b>Volume Difference<sup>4</sup></b> |
| Rate of Take l/s                                     | 1,981.0  | 1,981.0                    | 1,963.7                       | -1%                             | -17.3                                |
| Daily m <sup>3</sup>                                 | 171,158  | 171,158                    | 165,782                       | -3%                             | - 5,377                              |
| Monthly m <sup>3</sup>                               | 5,203,215  | 5,203,215                  | 4,786,586                     | -8%                             | - 416,629                            |
| Annual m <sup>3</sup>                                | 31,009,836   | 62,438,584                 | 27,402,165                    | -12%                            | - 3,607,671                          |
| <b>Permit 2001.706 - WM0104 Thomsons Creek</b>       |  |                            |                               |                                 |                                      |
| Verification:  | 5%   |                            |                               |                                 |                                      |
| Data record:   | 2012-2017; ORC data request dated 28 March 2020 c/o OAIC Secretary |                            |                               |                                 |                                      |
|  | <b>Actual<sup>1</sup></b>  | <b>Consent<sup>2</sup></b> | <b>WPPC - PC7<sup>3</sup></b> | <b>%_difference<sup>4</sup></b> | <b>Volume Difference<sup>4</sup></b> |
| Rate of Take l/s                                     | 424.5  | 424.5                      | 390.6                         | -8%                             | -33.9                                |
| Daily m <sup>3</sup>                                 | 36,677   | 36,677                     | 32,238                        | -12%                            | - 4,438                              |
| Monthly m <sup>3</sup>                               | 886,763.7  | 1,114,975                  | 745,946                       | -16%                            | - 140,818                            |
| Annual m <sup>3</sup>                                | 4,625,386.2  | 13,379,697                 | 4,329,383                     | -6%                             | - 296,003                            |
| <b>Permit 2001.708 - WM0105 Dunstan Creek</b>        |  |                            |                               |                                 |                                      |
| Verification:  | 5%   |                            |                               |                                 |                                      |
| Data record:   | 2012-2017; ORC data request dated 28 March 2020 c/o OAIC Secretary |                            |                               |                                 |                                      |
|  | <b>Actual<sup>1</sup></b>  | <b>Consent<sup>2</sup></b> | <b>WPPC - PC7<sup>3</sup></b> | <b>%_difference<sup>4</sup></b> | <b>Volume Difference<sup>4</sup></b> |
| Rate of Take l/s                                     | 424.5  | 424.5                      | 424.5                         | 0%                              | 0.0                                  |
| Daily m <sup>3</sup>                                 | 36,677   | 36,677                     | 35,691                        | -3%                             | - 986                                |
| Monthly m <sup>3</sup>                               | 1,114,975  | 1,114,975                  | 979,837                       | -12%                            | - 135,137                            |
| Annual m <sup>3</sup>                                | 5,054,995  | 13,379,697                 | 4,261,191                     | -16%                            | - 793,804                            |
| <b>Permit 2001.710 - WM0107 Lauder Creek</b>         |  |                            |                               |                                 |                                      |
| Verification:  | 10%  |                            |                               |                                 |                                      |
| Data record:   | 2012-2017; ORC data request dated 28 March 2020 c/o OAIC Secretary |                            |                               |                                 |                                      |
|  | <b>Actual<sup>1</sup></b>  | <b>Consent<sup>2</sup></b> | <b>WPPC - PC7<sup>3</sup></b> | <b>%_difference<sup>4</sup></b> | <b>Volume Difference<sup>4</sup></b> |
| Rate of Take l/s                                     | 424.5  | 424.5                      | 421.9                         | -1%                             | -2.6                                 |
| Daily m <sup>3</sup>                                 | 36,677   | 36,677                     | 36,157                        | -1%                             | -520                                 |
| Monthly m <sup>3</sup>                               | 1,075,821  | 1,114,975                  | 954,567                       | -11%                            | - 121,254                            |
| Annual m <sup>3</sup>                                | 5,868,841  | 13,379,697                 | 5,079,564                     | -13%                            | - 789,277                            |

| <b>Permits 2001.712.01 &amp; 2001.713.01 - WM0103 Middle Creek (WM0108 until 2013)</b>   |   |                            |                               |                                 |                                      |
|--|---|----------------------------|-------------------------------|---------------------------------|--------------------------------------|
| Verification:  | 5%  |                            |                               |                                 |                                      |
| Data record:   | 2012/2013 combined data multiple WMs; 2012-2017.<br>ORC data request dated 28 March 2020 c/o OAIC Secretary.                                |                            |                               |                                 |                                      |
|  | <b>Actual<sup>1</sup></b>   | <b>Consent<sup>2</sup></b> | <b>WPPC - PC7<sup>3</sup></b> | <b>%_difference<sup>4</sup></b> | <b>Volume Difference<sup>4</sup></b> |
| Rate of Take l/s   | 141.5   | 141.5                      | 124.2                         | -12%                            | -17.3                                |
| Daily m <sup>3</sup>   | 12,225  | 12,225                     | 10,420                        | -15%                            | -1,805                               |
| Monthly m <sup>3</sup>   | 333,251   | 371,651                    | 302,986                       | -9%                             | -30,266                              |
| Annual m <sup>3</sup>  | 1,711,922   | 3,864,267                  | 1,412,342                     | -17%                            | -299,579                             |
| <b>Permit 2001.714.V1 - WM0109 Coal Creek</b>  |   |                            |                               |                                 |                                      |
| <b>ORC did not provide data for this site. Landpro exported data from ORC's Hilltop database.</b>  |   |                            |                               |                                 |                                      |
| Verification:  | 5%  |                            |                               |                                 |                                      |
| Data record:   | 2019-2020; This period relates to new meter set-up so that only Coal Creek is measured. Data here applies to partial 2019/2020 season only. |                            |                               |                                 |                                      |
|  | <b>Actual<sup>1</sup></b>   | <b>Consent<sup>2</sup></b> | <b>WPPC - PC7<sup>3</sup></b> | <b>%_difference<sup>4</sup></b> | <b>Volume Difference<sup>4</sup></b> |
| Rate of Take l/s   | 28.3  | 28.3                       | 28.3                          | 0%                              | 0.0                                  |
| Daily m <sup>3</sup>   | 2,445   | 2,445                      | 2,445                         | 0%                              | -                                    |
| Monthly m <sup>3</sup>   | 50,361  | 74,332                     | 50,196                        | 0%                              | -165                                 |
| Annual m <sup>3</sup>  | 146,335   | 891,980                    | 128,981                       | -12%                            | -17,353                              |
| <b>Permit 2001.716.V1 &amp; 2001.717.V2 &amp; 2001.718.V1- WM0686 (combined) Devonshire Creek</b>  |   |                            |                               |                                 |                                      |
| <b>*Includes Naylor Permit - unaccounted for 2012/2013 season as missing any individual permit data for Naylor before combined take from 2013 onwards.</b> |   |                            |                               |                                 |                                      |
| <b>Consent maximums reflect OAIC + Naylor</b>  |   |                            |                               |                                 |                                      |
| Verification:  | 10%   |                            |                               |                                 |                                      |
| Data record:   | 2012/2013 combined data multiple WMs; 2012-2017.<br>ORC data request dated 28 March 2020 c/o OAIC Secretary.                                |                            |                               |                                 |                                      |
|  | <b>Actual<sup>1</sup></b>   | <b>Consent<sup>2</sup></b> | <b>WPPC - PC7<sup>3</sup></b> | <b>%_difference<sup>4</sup></b> | <b>Volume Difference<sup>4</sup></b> |
| Rate of Take l/s   | 146.0   | 253.1                      | 143.7                         | -2%                             | -2.3                                 |
| Daily m <sup>3</sup>   | 9,941   | 21,870                     | 9,710                         | -2%                             | - 232                                |
| Monthly m <sup>3</sup>   | 203,726   | 669,163                    | 195,942                       | -4%                             | - 7,784                              |
| Annual m <sup>3</sup>  | 1,126,781   | 4,957,156                  | 1,006,370                     | -11%                            | - 120,412                            |
| <b>Permit 2001.719.V1 &amp; 2001.720.V1 - WM0689 Thomsons Creek (WM0690 until 2013)</b>  |   |                            |                               |                                 |                                      |
| Verification:  | 5%  |                            |                               |                                 |                                      |
| Data record:   | 2012/2013 combined data multiple WMs; 2012-2017.<br>ORC data request dated 28 March 2020 c/o OAIC Secretary.                                |                            |                               |                                 |                                      |
|  | <b>Actual<sup>1</sup></b>   | <b>Consent<sup>2</sup></b> | <b>WPPC - PC7<sup>3</sup></b> | <b>%_difference<sup>4</sup></b> | <b>Volume Difference<sup>4</sup></b> |
| Rate of Take l/s   | 283.0   | 283.0                      | 173.4                         | -39%                            | -109.6                               |
| Daily m <sup>3</sup>   | 17,996  | 24,451                     | 14,296                        | -21%                            | - 3,701                              |
| Monthly m <sup>3</sup>   | 419,555   | 743,325                    | 345,174                       | -18%                            | - 74,381                             |
| Annual m <sup>3</sup>  | 1,786,765   | 7,132,972                  | 1,624,432                     | -9%                             | -162,333                             |

<sup>1</sup> Based on maximum actual recorded abstraction across 2013-2019 period. Applied Regional Water Plan policy.

<sup>2</sup> Consented maximums, i.e., the paper allocation.

<sup>3</sup> Volumes determined following method outlined in Plan Change 7 – Water Permits Plan Change (WPPC)

<sup>4</sup> Difference (% or m<sup>3</sup>) between WPPC allocation and the actual abstraction. (-) Denotes there would be a reduction in allocation.