

## Memo

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Date	10 <sup>th</sup> July 2019
To	Maureen Whalen, Al Picken
CC	
From	Mark Megaughin

## Estimate of surface water allocation and minimum flow conditions resulting from the Waimakariri ZIPA recommendations

### Summary

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We used the recommendations of the Waimakariri Zone Implementation Programme Addendum (ZIPA) to recalculate the existing allocated surface water resource in the Waimakariri Zone, provided in Vattala (2018). The recalculation was required to account for recommended changes to the stream depletion methodology and to account for all consents ultimately aligning with the ZIPA recommendations. Our work assumed that all ZIPA recommendations are adopted in the final version of the plan.

The outcome was that most allocation totals increased beyond those stated in Vattala (2018). Allocation totals increased to a greater extent in the Northern Waimakariri Tributaries FMU (Freshwater Management Unit) because the ZIPA recommended a change to the methodology used to estimate and classify the stream depleting effect of groundwater takes. In the Ashley River FMU the allocation totals did not change significantly because the stream depletion approach is not changing, however the number of consents which included conditions tying takes to minimum flows and being subject to partial restriction regimes increased. This was not specifically because of the ZIPA recommendations but rather because of poor alignment with the existing regional plan.

Our revised allocation totals have been used to set new allocation limits for some Surface Water Allocation Zone (SWAZ). Because the allocation total was estimated using conservative desk-based approach it is likely to overestimate the allocation total. When using these allocation totals as a limit there is a risk that allocation may be released back into the allocation block as site-specific assessments are undertaken. It was not the intention of the Zone Committee that new consents be issued for this water, until such time as the outcomes for the SWAZ are met.

### Introduction

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This memorandum summarises our recalculation of the Resource Consent Inventory allocation totals to take into account the surface water management recommendation made in the ZIPA by the Waimakariri Water Zone Committee.

We undertook this work to assess the effects of the ZIPA recommendations on total allocation, and on the number of takes which are controlled by minimum flow conditions, and by partial restrictions.

In line with the Options and Solution Assessment (Megaughin and Lintott 2019) we have compared our reassessment to the Current Pathway, rather than the Current State. Although, as per the Options and Solutions Assessment, we also provide the numbers for the Current State to demonstrate the full scale of change between Current State and ZIPA recommendations (the Solution Assessment).

This is because Current Pathway represents where the current plan takes all current water users, and in lieu of any further plan changes all users would eventually comply with the current plan as their consents expire and they apply for new consents. Current Pathway is the baseline against which all options and solutions are assessed.

Notwithstanding this there is a lack of alignment between current consents and the current plan, particularly in the Ashley River FMU. This means that water users in this area will need to take two steps to reach the propose plan rules and showing only the step required directly as part of the ZIPA does not give the full picture.

## **Methodology**

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Our recalculation of the RCI follows the same methodology as used in Vattala (2018), and uses the consent list in that document as a starting point.

A recalculation was required for the following reasons:

- The ZIPA recommends that the method used to estimate and classify stream depletion effects in the Northern Waimakariri Tributaries FMU be changed. This will increase the component of allocation associated with stream-depleting groundwater takes. It will also increase the number of stream-depleting groundwater takes which are included in the allocation calculation, require minimum flow conditions and partial restriction regimes. To assess how stream-depleting groundwater takes contribute to allocation totals we have used the Theis method and applied Schedule 9 of the Land and Water Regional Plan.
- Many of the consents to take surface water and stream-depleting groundwater in the Ashley River FMU do not currently align with the current plan (LWRP) rules. Aligning these consents with the current plan rules, and subsequently the ZIPA recommendations, will result in small changes to the allocation totals. It will, however, result in more significant increases in the number of consents which are managed by minimum flows and partial restriction regimes.
- We have addressed consents which have been granted, terminated, transferred or amended since the consent list used in Vattala (2018) was exported from the consents database.

## Revised Allocation Totals

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Following the methodology described above we recalculated the total amount of surface water allocation in each SWAZ. This include the consents which have been granted on modified since the original RCI (Vattala 2018) were derived.

**Table 1 – Ashley River FMU allocation totals**

SWAZ	Allocation (L/s)		
	SW allocation (L/s)	SD allocation (L/s)	Total allocation (L/s)
Ashley River/Rakahuri (A)	712	386	1098
Ashley River/Rakahuri (B)	119	17	135
Ashley River/Rakahuri (C)	474	20	494
Saltwater Creek (Ashley)	304	225	529
Taranaki Creek	183	99	282
Waikuku Stream (A)	864	152	1016
Little Ashley Creek	28	15	43

**Table 2 – Northern Waimakariri Tributaries FMU allocation totals**

SWAZ	Allocation (L/s)		
	SW allocation (L/s)	SD allocation (L/s)	Total allocation (L/s)
Cam River	204	146	350
North Brook	64	138	202
Middle Brook	29	2	31
South Brook	0	38	38
Cust River (A)	234	160	394
Cust River (B)	131	0	131
Cust Main Drain	544	543	1087
No.7 Drain	54	42	96
Ohoka Stream	20	521	541
Silverstream	92	499	591
Courtenay Stream	23	120	143
Greigs Drain	46	6	52
Eyre River (Aggregate)	0	1596	1596
Upper Eyre River	67	22.5	89.5
McIntosh/Kairaki	0	54.6	54.6

## Revised Consent Conditions

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In addition to the increases in allocation total provided above the ZIPA recommendations also result in addition consents requiring minimum flow conditions (Table 3). The requirement for minimum flow conditions is accompanied by a requirement to use partial restrictions (Table 4), to ensure that the take does not breach the minimum flow during periods of low river flow. Minimum flows and partial restrictions have an effect on the proportion of consent water which is available to the water user.

## Implications for ongoing management

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The Zone Committee set their surface water allocation limit recommendations using two principals:

1. Where the total allocation as assessed in this document was below the existing LWRP or WRRP allocation limit, then the new allocation limit will be set at the total allocation.
2. Where the total allocation, as assessed in this document, was equal to or greater than the existing LWRP or WRRP allocation limit, then the existing allocation limit will be retained.

The use of allocation totals from this memo in these ways have important implications for the ongoing management of surface waters. Because the allocation totals are conservative, their use in setting allocation limits could result in allocation being made available once site-specific assessments of stream depletion have been undertaken by water users applying for new consents. It was not the intention of the Zone Committee that additional consents be granted, unless it can be demonstrated that the outcomes for the waterways are being met.

## References

1. Vattala D (2018) Resource Consent Inventory For Waimakariri Land and Water Solutions Programme. Environment Canterbury.
2. Megaughin M and Lintott C (2019) Waimakariri Land and Water Solutions Programme. Options and Solutions Assessment. Surface Water Quality. R19/75. Environment Canterbury.

**Attachments:**

**File reference:**

**Table 3 – Minimum flow conditions**

	No. of <u>stream depleting</u> takes with minimum flow condition			No. of <u>surface water</u> takes with a minimum flow condition		
	Current State <sup>1</sup>	Current Pathway <sup>2</sup>	Solution Assessment <sup>3</sup>	Current State <sup>1</sup>	Current Pathway <sup>2</sup>	Solution Assessment <sup>3</sup>
Ashley River	15	23	28	10	14	14
Saltwater Creek (Ashley)	6	13	14	9	12	12
Taranaki Creek	0	5	5	7	7	7
Waikuku Stream	1	6	6	9	9	9
Little Ashley Creek	0	1	1	1	1	1
<b>FMU sub-total</b>	<b>22</b>	<b>48</b>	<b>54</b>	<b>36</b>	<b>43</b>	<b>43</b>
Cam River	5	5	8	3	5	6
North Brook	7	7	7	5	3	3
Middle Brook	0	0	0	1	1	1
South Brook	1	1	4	0	0	0
Cust River	6	6	11	11	11	11
Cust Main Drain	13	13	33	13	13	13
No. 7 Drain	1	1	1	5	5	5
Ohoka Stream	16	16	29	1	1	1
Silverstream, <i>formerly Kaiapoi River</i>	16	16	37	4	5	5
Courtenay Stream	0	0	5	2	2	2
Greigs Drain	0	0	1	2	2	2
Bennetts Creek <sup>7</sup>	0	0	-	0	0	-
Burgess Creek <sup>7</sup>	0	0	-	0	0	-
Waimakariri Water Race <sup>7</sup>	0	0	-	0	0	-
Old Bed Eyre River <sup>7</sup>	0	0	-	0	0	-
Eyre River <sup>7</sup>	0	0	-	0	0	-
Eyre River SWAZ (new)	-	-	0	-	-	0
Saltwater Creek (Waimakariri)	0	0	-	0	0	-
Kairaki / McIntosh Creek	-	-	0	-	-	0
Coopers Creek <sup>8</sup>	0	0	-	0	0	-
Washpen Creek <sup>8</sup>	0	0	-	1	1	-
Upper Eyre River	-	-	0	-	-	1
Viewhill Creek	0	0	0	0	1	1
<b>FMU sub-total</b>	<b>65</b>	<b>65</b>	<b>136</b>	<b>48</b>	<b>50</b>	<b>51</b>
<b>Total</b>	<b>87</b>	<b>113</b>	<b>190</b>	<b>84</b>	<b>93</b>	<b>94</b>

**Table 4 – Partial restriction conditions**

No. of takes with partial restriction conditions (Total)			
	Current State	Current Pathway	Solution Assessment
Ashley River	12	37	42
Saltwater Creek (Ashley)	1	25	26
Taranaki Creek	6	12	12
Waikuku Stream	12	15	15
Little Ashley Creek	0	2	2
<b>FMU sub-total</b>	<b>31</b>	<b>91</b>	<b>97</b>
Cam River	6	10	14
North Brook	6	10	10
Middle Brook	1	1	1
South Brook	3	1	4
Cust River	11	17	22
Cust Main Drain	20	26	46
No. 7 Drain	7	6	6
Ohoka Stream	17	17	30
Silverstream, formerly Kaiapoi River	14	21	42
Courtenay Stream	2	2	7
Greigs Drain	0	2	3
<i>Bennetts Creek<sup>7</sup></i>	0	0	-
<i>Burgess Creek<sup>7</sup></i>	0	0	-
<i>Waimakariri Water Race<sup>7</sup></i>	0	0	-
<i>Old Bed Eyre River<sup>7</sup></i>	0	1	-
<i>Eyre River<sup>7</sup></i>	0	0	-
Eyre River SWAZ (new)	-	-	0
<i>Saltwater Creek (Waimakariri)</i>	0	1	-
Kairaki / McIntosh Creek	-	-	0
<i>Coopers Creek<sup>8</sup></i>	0	0	-
<i>Washpen Creek<sup>8</sup></i>	0	1	-
Upper Eyre River	-	-	1
Viewhill Creek	0	1	1
<b>FMU sub-total</b>	<b>87</b>	<b>117</b>	<b>187</b>
<b>TOTAL</b>	<b>118</b>	<b>208</b>	<b>284</b>