

**ORARI-TEMUKA-OPIHI-PAREORA ZONE WATER MANAGEMENT COMMITTEE
FOR THE MEETING OF 17th JULY 2017**

Prepared by Louise Holmes on behalf of The Above Dam Irrigators Group

1. PURPOSE OF THE REPORT

The Above Dam Irrigators Group (ADIG) have asked to present to the Orari-Temuka-Opihi-Pareora Zone Committee's (ZC) 17th July Meeting to present our concerns around the economic impacts of the review of Tributary minimum flows that we understand could potentially occur as part of the OTOP sub-regional planning process. Above Dam Irrigators all take from the upper tributaries of the Opihi, namely, the North & South Opuha & the Upper Opihi.

We are currently in the difficult position awaiting the Ecological flow report from ECAN before we know what the likely effects, if any, will be from the review of tributary minimum flows.. Given the current timeframes have the ZC confirming the draft recommendations in September, and given we have not been consulted on the review of minimum flows, we felt we had no choice but to start investigation possible implications ourselves.

In the absence of ECAN ecological flow recommendations we only have the Proposed National Environmental Standard on Ecological Flows and Water Levels (NES 2008 - currently on hold) to project the worst case scenarios for us as irrigators.

There is concern amongst irrigators that no economic report has been commissioned by ECAN into the effects of any changes to the upper tributary minimum flows & allocations. We understand that significant ECAN funded economic studies have been undertaken in other zones.

We believe that any reduced irrigation capacity will have significant economic and social impacts for the Fairlie basin, and this needs to be fully assessed and considered in decision making. We would ask that you consider the possible impacts alongside any recommended changes to minimum flows/ allocations of the North & South Opuha & Upper Opihi.

This report provides an insight into the magnitude of the economic & social impacts on both the Fairlie Basin farmers and the Fairlie community if new limits result in reduced irrigation in the area.

Through the collation of;

- (a) actual farm economic figures from the Ashwick Area in gross income/kg DM grown verified by industry accepted benchmarks for various farm types, &
- (b) actual Pasture Growth rate data from an Ashwick monitor farm with both dryland and irrigated blocks managed under the same system,

we have been able to project the potential economic impacts in a simple way without complicated modelling based on assumptions.

The figures are in gross income as this removes the assumptions around the various farm operating costs that are specific to individual operators.

This is real data, collated and presented by the very farmers who will be impacted by these potential rule changes.

2. RECOMMENDATIONS SOUGHT

- That the OTOZ Zone Committee give consideration to the significant economic impact that any reduction increase in minimum flows or reduction in allocations could cause to the Above Dam Irrigators affected and the wider Fairlie community.
- That the OTOZ Zone Committee give consideration to the above dam tributaries needing to sit outside the National Environmental Standards Proposed Interim Limits for rivers and streams due to being tributaries of an augmented main stem river.
- That the Above Dam Irrigators Group is provided with further opportunity to engage with the OTOZ Zone Committee as the Ecological report information becomes available and the tributary minimum flows & allocations are reviewed.

3. INTRODUCTION TO THE ABOVE DAM IRRIGATORS GROUP (ADIG)

The ADIG consists of 22 shareholders (approx 2800 shares) in Opuha Water Limited (OWL) that draw their water directly from either North or South Opuha Rivers, or the Upper Opihi (above the confluence). Consents are tied to both the tributary minimum flows and the Opuha Dam lake level. While not directly augmented by water released from the Opuha Dam, these takes are "affiliated" to the Scheme because OWL is required to "offset" their takes from the tributaries, through releases down the main stem.

Reliability is considerably lower for above dam irrigators than those below. Tributary min flows are triggered well before the Opuha Dam level becomes limiting. It is not normal for especially South Opuha Irrigators, to be able extract their consented annual volume due to river flow restrictions over the Jan - March period. However, on-farm storage is starting to be used by some farms to increase reliability and enable harvesting of a greater percentage of this consented volume.

Flow sharing has been voluntarily practised for some 15 years by farmers taking from the South Opuha in order to better manage low flow periods from an ecological point of view. This is a much better outcome for irrigators and the river alike as it prevents yo-yo-ing of the flow caused by full irrigation one day followed by 100% restrictions triggered for the next day. One farmer on each take (Morris Road & Cascade Creek) rosters the water use to ensure fairness between farmers and an extraction rate that maintains river flow above minimum flow.

Farm types taking water from the North Opuha are predominantly sheep/ beef/ deer. From the South Opuha land use is approx 62% Dairy, 15% Arable, 13% Sheep & Beef, 8% Deer/ Beef/ Dairy support. From the Upper Opihi land use is approx. 76% Dairy, 24% Sheep/ Beef.

Fully shared farms (1 share per ha) enables a potential take for 157 days of 3.5mm/ha/day. Several farms in the area spread this water over more hectares than they hold shares for resulting in a reduced irrigation capacity of around 2.4mm/ha/d. Irrigation type is 100% spray.

4. PROPOSED INTERIM LIMITS FOR RIVERS AND STREAMS

The NES sets out the following interim limits for rivers and streams (Table 1).

Table 1. NES Interim limits

	Mean Flow < or = 5m ³ /sec	Mean Flow > 5m ³ /sec
Minimum Flow	90% MALF*	80% MALF
Allocation	30% MALF	50% MALF

*MALF is defined as the Mean annual low flow. This is 7 day MALF calculated using the lowest consecutive 7 day flow for each year then averaging these over the whole period of record.

The following Table 2 has been calculated with the expertise of Richard de Joux, for the ADIG.

Table 2. Minimum Flows and Allocation limits (l/s) based on NES recommendations as calculated by Richard de Joux.

	MALF Minimum	MALF Allocation	Naturalised MALF Minimum**	Naturalised MALF Allocation	Existing Plan Minimum	Existing Plan Allocation
Opihi (Rockwood)	965	603	1037	648	1280/790 @Rockwood	485
South Opuha (Stoneleigh)	916	305	923	308	800/500 @ Clayton Rd Bridge	642 irrig 97 stock
North Opuha	739	246	762	254	1000/850 @Clayton Rd Bridge	255

**Naturalised MALF is the MALF with the surface water and hydraulically connected abstractions "added back" to the flow record.

5. ISSUES

5.1 Minimum Flows

Table 2 indicates potentially significant implications for the Upper Opihi Irrigators in particular, should the NES recommended ecological flow be adopted.

Increases in minimum flows from the current limits will mean that on farm storage will be needed to maintain reliability. Lined ponds are an efficient option but come at a cost of approx \$9 per m³ storage. Pond depth is a major variable in the capital cost of storage ponds with shallow water tables in the area posing challenges for ponds deeper than 4 - 4.5m.

Currently there seems to be synergy between flow requirements for in-stream demands and irrigators peak flow months. Shoulder irrigation months where demand is commonly lower, coincide with periods when introduced sport fish species require higher minimum flows for spawning & juvenile migration. A move to increased on farm storage would likely see farmers wanting to use the shoulder irrigation months as an opportune time to fill ponds. This will cause conflicts between stakeholder groups.

5.2 Allocation

Table 2 also illustrates that the South Opuha allocation under the NES example is severely reduced and it is essential to understand the effect of this.

This section therefore concentrates on the effect on South Opuha irrigators who are consented under Cascade Irrigation Race Ltd (CRC 060099.2) and draw from either the Morris Road or Cascade Race intake.

Decreases in allocations will result in less pasture grown for every pastoral farm type and restricts arable farmers to lower value or autumn sown crops. All livestock farmers are in the

business of growing pasture and feeding to stock to generate an income. Reduced pasture grown ultimately means an increased amount of bought in feed or a reduction in stock numbers and productivity.

A reduced allocation provides farmers with two choices - less water per ha or less ha irrigated. Both produce a similar effect but in favourable rainfall years less water per ha may deliver the better outcome. Less ha irrigated means systems will need to leverage off the higher pasture yields on the irrigated areas. Several under-shared farms are already operating in this leveraging position now.

6. EFFECT ON PASTURE GROWTH RATES

Willowbrook was converted from Arable to Dairy in 2013/14 season. It is 213 ha effective bounded by the South Opuha River and Ashwick Flat Road. 87 ha is irrigated by pivot at 2.45mm/day (59 shares irrigating 87ha), 42ha receives dairy shed effluent and the remainder is dryland. Pasture growth is monitored weekly from August to May and monthly in June & July using a CDAX pasture meter. Records are kept for pasture growth rates from the different blocks which provides unique data for the area from dryland and irrigated pastures farmed under the same system by the same operators. Soil type is similar over both blocks, being Balmoral & Eyre stoney silt loams, characterised by very large stones with good amounts of soil between.

Four years of pasture growth rate data is available. The 14/15 season was extremely dry with severe irrigation restrictions and low rainfall resulting in cows being dried off in early March. I have excluded this year from my average difference in pasture growth under irrigation in Table 3 below.

Table 3. Willowbrook - Annual pasture drymatter yields from dryland and irrigated blocks

Season	RF mm	Dryland	Irigated @ 2.45mm/d	% difference without Irrigation
2013/14	887	11036	15271	-28%
2014/15	383	6000	11000	-45%
2015/16	568	7896	14179	-44%
2016/17	743	8852	13605	-35%

The average difference in annual pasture yield under irrigation, and excluding the 14/15 drought year, has been 36%. This figure agrees with the " gut feel" numbers expressed by multi-generational farmers in the area.

Average irrigated pasture yield at Willowbrook has been 14,351kgDM/ha compared to 16,000kgDM/ha plus routinely measured on farms under a full 3.5mm/day allocation.

If the 36% difference is applied to a farm growing 16,000kgDM/ha that equals a loss in pasture yield of 5.7T/ha/yr for non-irrigated land areas (Table 4).

Table 4. Fully shared OWL farm with 3.5mm/day irrigation capacity for 157 days growing 16Tdm/ha/year

Allocation Change	Drop in Irrigated area	Loss in DM/ha without irrigation	Average drop in Pasture Grown/ha over whole farm
-30%	30%	5760	1728
-50%	50%	5760	2880

A calculated 2880kgDM/ha is the whole farm average reduction in pasture grown from a 50% cut in allocation. To put this into perspective, this is 8 Freeman (6 string squares) bales Baleage/ha or 48 Truckloads for a 200 ha farm.



7. EFFECT ON GROSS INCOME PER KG DRYMATTER (kgDM)

The gross income figures used are a combination of Industry accepted benchmarks for the area and actual figures for the drystock and arable farms that are irrigated by South Opuha water. In the case of Dairy, I have used a \$6.00 payout plus 30 c/kgMilksolids dividend and 40 c/kgMS stock income. Drymatter to milksolids conversion used is 13:1. (Willowbrook average 12.8:1)

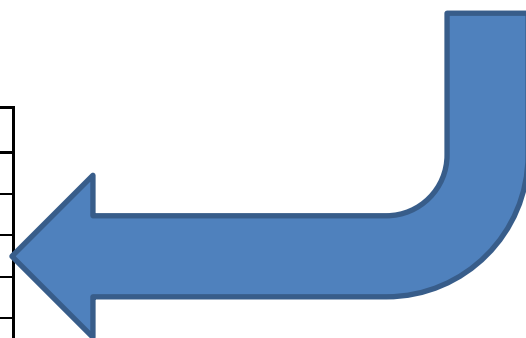
While the per ha economic losses may not look that significant they are equal to typical per ha interest payments for most of the farm types. When they are expressed as the gross income loss to a 200 ha farm they are substantial numbers. Across the current land uses on a 200 ha property they range from \$160,000 for Sheep & Beef to \$300,000 for Dairy.

Farm Type	Gross Income c/kgDM	Effect on gross Income/ha at different Allocation cuts	
		-30%	-50%
Dairy	52	-\$ 898.56	-\$ 1,497.60
Dairy Support	23	-\$ 397.00	-\$ 662.40
Sheep (breeding/ finishing)	18	-\$ 311.04	-\$ 518.40
Deer (breeding/ finishing)	23	-\$ 397.44	-\$ 662.40
Sheep/Beef	28	-\$ 483.84	-\$ 806.40
Deer/ Dairy support/ Beef	37	-\$ 552.96	-\$ 921.60

For a 200 ha property


Dairy
Dairy Support
Sheep
Deer
Sheep/ Beef
Deer/ Beef/ Dairy Support

-50% Allocation
-\$ 299,520.00
-\$ 132,480.00
-\$ 103,680.00
-\$ 132,480.00
-\$ 161,280.00
-\$ 184,320.00



8. DISTRICT WIDE EFFECT

Farm Type	South Opuha Approx Land Use	Effect on farm gross Income at different Allocation cuts	
		-30%	-50%
Dairy Platform	1349		
Sheep/ Beef	300		(Actual breakdown per farm type not shown to prevent individual farms being identifiable)
Arable	330		
Deer/Dairy Support/ Beef	180		

Cumulative effect @ 50%  **-\$2,758,070**

A 50% cut in allocation for the South Opuha which could potentially occur following the implementation of the National Environmental standards proposed interim limits for rivers and streams would reduce the income of the group of farmers affected by some \$2.7 million per annum. Given that debt on infrastructure has already been occurred this would place significant pressures on farmers. It would not be the difference between accumulating wealth from farming or not, but rather the ability to survive at all. Land valuations would without doubt, decrease, resulting in significant loss of equity to landowners.

The Mackenzie District Council's income from rates has risen on the back of property value increases in the catchment from the influence of irrigation on productivity and land use options.

Rural growth has brought with it increased employment, attracting new young families into the area & creating jobs to retain the districts youth. Profitability provides increased options for farm succession.

Employment opportunities in farming would be cut and the spin off to Fairlie business's significant. Since the growth of irrigation in the Fairlie Basin the town has undergone sustained growth. Small businesses, schools and sports clubs are all thriving. They are well supported by the farming community who have a strong culture of supporting local.

CONCLUSION

The Above Dam Irrigators wish to thank the OTOZ zone committee for the opportunity to express our concerns relating to the review of tributary minimum flows. We fully realise that we are somewhat putting the cart before the horse on this matter, but so strong is the concern amongst farmers that we seek to be proactive rather than reactive.

We as irrigators, seek to continue to be involved in consultation through the Sub-Regional Plan process, and to assist in the development of a solutions package of recommend actions and tactics. We support the development of a sub-regional plan, with the best environmental, economic, cultural and social outcomes that give consideration to, and balance the interests of, all water stakeholders in the zone.