

By email to: rochelle.lord@orc.govt.nz



Ideas for sustainable
futures

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Dear Rochelle

This letter provides a concise response to Minute 3 - Directions of the Commissioner.

Question for Matt Hickey:

Para 43(b). Can you please outline the basis for your opinion that “5 l/s will provide adequate habitat for the freshwater ecological values present in that perennial gaining reach”.

Response from Matt Hickey:

Residual flows are normally applied at the point of take for ecological values. But due to the concern raised by LOFTS water users that the proposed takes could dry the Royal Burn at their point of take, an additional flow that essentially prioritizes the LOFTS take over the applicants' upstream North Branch irrigation takes was proposed to ensure that if flows reduce to very low levels at the proposed monitoring point, the applicants' North Branch irrigation takes will cease.

I was asked whether I thought this flow would also provide for the ecological values in the perennial reach. In making my assessment I considered the following:

- a. During our fish survey of the Royal Burn we electric fished a section of the Royal Burn at the top of the Perennial Reach within the piggery paddock (Figure 2 of my Fish Survey Memo). At the time of this survey, I had estimated the flow to be ~5 l/s. We caught brown trout and observed numerous invertebrates. This flow was clearly supporting brown trout and macroinvertebrates at this point, with obvious gains occurring with distance downstream.
- b. My expectation is that there will be further gains from groundwater below the point proposed for monitoring, thus with distance downstream of the monitoring point I expect flows greater than 5 l/s. I would estimate flows could be at least 10 to 20 l/s at the Crown Range Road Bridge when flows at the monitoring point are 5 l/s.

- c. When considering residual flows it is important to consider the frequency of low flows and in this case the source of the flow being groundwater in the perennial reach is noteworthy.
- d. My understanding of the hydrology of the Arrow Catchment is that low flows approaching the 5 l/s cutoff are likely to be infrequent and probably only in very dry seasons. This coupled with the fact that during low flows the flows observed in the perennial reach have come from groundwater, these flows are likely to be cool thus low flows are in my opinion of less ecological risk.
- e. If similar residual/low flow cut-off flows are set in future consenting processes for the replacement of deemed permits on the South Branch of the Royal Burn (acknowledging they are not part of this hearing), I would expect that the frequency of flows approaching the 5 l/s cutoff would be reduced further.

Question for Hilary Lennox:

For the lower RBNB Ms Miller recommended a “50:50 flow sharing” regime because on her site visit she observed that the flow at that intake was spilt by a large rock at and 50% of the flow was abstracted and 50% carried on downstream. Does the applicant have a view on that particular recommendation?

My response:

My views on Ms Miller’s assessments is discussed in my evidence. In short, I have concerns that Ms Millers recommendations are based on very little information or data about the expected benefits for instream values. Our photos and videos show multiple occasions where a lot more than 50% of the flow was left in the creek, but those flows still went to ground before Glencoe Road. I do not, therefore, see how Ms Miller’s proposed regime would add any more value than RSU’s in terms of allowing existing instream values to persist. This sentiment is echoed in the evidence of Dr Ryder and Mr Hickey.

I also have a concern about technical compliance. Although I accept that the existing structure will achieve a rough 50/50 split most of the time, I cannot be certain that compliance can be achieved all of the time, or how that can practically be measured without substantial cost in new equipment, effectively two flow gauages would be required (one each either side of the split) to directly measure the split in real time.

Question for Hilary Lennox:

Para 101. You say that “I note that there is no take of water for domestic use proposed as part of this application ...”. Can you explain what you mean by that since I understand the BSTGT application to replace its deemed permits includes the use of water for domestic purposes?

My response:

Water taken is not used for domestic purposes. The references to domestic use in the original application are incorrect.

Question for Hilary Lennox:

Para 109. I assume that the 38,989 m³/yr does not the K-line irrigation for the turf growing operation because at para 112 you say that is included in the 139.2 ha of irrigable land. Is that correct?

My response:

Yes, that is correct.

Question for Hilary Lennox:

Para 116. Can you direct me to any regional plan in the country that includes a policy (or rule) provision that provides for irrigation water to be allocated for a 100 percentile demand (namely a 10 in 10 year reliability of supply).

My response:

I have not examined other regional plans recently to understand how they determine 'efficient' allocation. However, I am also not aware of anything in the RPW or PC7 stating that the efficiency of a proposed take in Otago must be assessed based on the annual irrigation volume for 90 percent (9 in 10 year) reliability. Instead, I have explored the origins of Policy 6.4.0A to try and understand what it hopes to achieve.

Issue 6.2.3 of the RPW states:

Opportunities for the wider use of available water resources are constrained by:

(a) Inefficient or inappropriate practices; and

(b) Consent holders retaining authorisation for more water than is actually required for their purpose of use.

In other words, unfair allocation and inefficient practices can limit the use of available water elsewhere. The reference to 'available water' here is important to note.

The RPW addresses this issue through Objectives 6.2.3 and 6.3.3:

Objective 6.3.3 - To minimise conflict among those taking water.

Objective 6.3.4 - To maximise the opportunity for diverse consumptive uses of water which is available for taking.

The principle reasons for adopted these objectives are:

- to ensure continued access for the taking of water. This recognises the investment that Otago's people and communities have made in resources to take and utilise water, and the need to avoid wastage of these resource (i.e. don't take more water than required for the intended use); and

- to enable Otago’s people and communities to benefit from the consumptive use of water that is available for taking. Again, the reference to ‘water which is available for taking’ is important to note here.

Neither of these objectives have been adopted for the purpose of minimising environmental impact. There are other objectives and policies in the RPW regarding allocation (based on maximum instantaneous rate of take), residual flows and minimum flows that restrict consumptive taking for that purpose.

Due to Policy 6.4.2, reducing the applicant’s annual abstraction to less than that applied for would not increase the availability of allocation for others. There would be no new ‘available water’ or ‘water which is available for taking’.

Nonetheless, it is still worth assessing the proposal against Policy 6.4.0A, which flows down from Issue 6.2.3 and Objectives 6.3.3 & 6.3.4.

Policy 6.4.0A: To ensure that the quantity of water granted to take is no more than that required for the purpose of use taking into account:

- (a) How local climate, soil, crop or pasture type and water availability affect the quantity of water required; and*
- (b) The efficiency of the proposed water transport, storage and application system.*

As mentioned in Ms King’s s42A report, the applicants transport, store and apply water in a manner that is consistent with clause (b). By using Aqualinc in the assessment of irrigation demand, clause (a) is also satisfied.

In the Royal Burn and New Chum catchements, it is highly unlikely that the annual volumes sought will be available in a 1:10 year drought situation in any event. The water is simply not that reliable, and allocation to other uses will also not be available. So constraining the applicant to a 90th percentile annual volume will simply constrain the applicant in years where water is plentiful.

In the case of this application, whether the 90th %ile or maximum demand figures are used is not a defining factor in the allocation sought because the annual volume sought is less than that taken historically according to ORC’s calculations, and is also less than what I have shown could be required for the specified purpose, as shown below:

Historic use according the ORC (m³/yr)	Annual demand calculated (m³/yr)	Applied for (m³/yr)
1,423,230	1,329,742	1,214,683

The annual volume applied for is 91.3% of the calaculated annual demand.

I conclude that the proposal:

- Is not inconsistent with Policy 6.4.0A; and

- Does not detract from achieving Objectives 6.3.3 and 6.3.4, and does not exacerbate Issue 6.2.3, because the water couldn't be allocated to others even if it wasn't allocated to the applicants.

Question for Hilary Lennox:

Para 112. I assume that stock drinking water is required each day of the year and so water will flow through the race system each day of the year. Can you further explain why a baseflow allocation is required over and above the 19.25 m³/day of stock drinking water that is now sought?

My response:

If the entire irrigation system relied on a pumped network that transported water directly from the source when it was required, then it would be simple to provide for stock water demand only. However, the scheme relies on gravity to transport water, and flows will need to be maintained in the races at all times to provide stock drinking water. Releasing 19.25 m³ into a race in any one day does not necessarily ensure that all of that water will be taken up by stock because it's impossible to require stock to drink from the race at a certain time.

There will be other times when stock are not in the paddocks through which the races run, and they're drinking from troughs in other paddocks instead. During these times, the base flow may not be necessary at all. However, the variability is impossible to predict and so in my calculations of how much water is required for the intended purpose, I've allowed for maximum that might be needed. This is not to say that it will all be needed every year.

As noted above, this approach does not result in the proposal being contrary to the relevant policies. Furthermore, my assessment of what might be needed is not necessarily critical in this situation because the volume applied for is less than this.

Ngā mihi nui



Hilary Lennox