

Memo

Date	15 September 2018
To	OTOP Zone Committee
CC	
From	Dan Clark

Evaluation of the FAWP B block proposal for the Opihi Catchment

Purpose

The purpose of this paper is to inform the Zone Committee on the implications of adopting the FAWP proposal for B block flow regimes and provide an evaluation of the A block flow regime recommendations made on 10 September 2018

Background,

On the 5th of September 2018 the Opihi Flow and Allocation Working Party (FAWP) provided a proposed flow regime to the Orari, Temuka, Opihi and Pareora (OTOP) Zone Committee. This proposal included both A and B allocation block flow regimes. The Zone Committee has accepted the proposed flow and allocation regimes for A blocks to allow for further community consultation on these regimes and is currently considering the regimes as proposed for the B blocks. This paper evaluates the proposal as a package and includes both A and B allocation blocks in the assessments.

In this paper the B block refers to BN consents, which currently have a 15000 L/s minimum flow on the Opihi River at State Highway 1. Many of these consents also have the same tributary specific minimum flow as the A block takes (AA, BA and AN consents), however, some consents have been granted higher tributary specific minimum flows to reflect that they are takes to storage and these have been assigned on a case by case basis. Currently most BN consents are constrained by the SH1 minimum flow rather than the tributary minimum flow.

In all tributaries the FAWP proposal is to increase the size of the B allocation block, while setting a tributary specific minimum flow and either a mainstem of the Opihi minimum flow or Lake Opuha water level.

Most losses in A block availability will occur during the winter months as the proposed summer minimum flows do not increase significantly from current. In catchments where partial restrictions have been set to prevent the minimum flow from being breached by abstractors the flow increases have been greater and consequentially so have the losses in availability.

Due to Opuha Water Ltd releasing new information on 7 September 2018 regarding the share entitlement of its shareholders, the size of some allocation blocks have changed since the previous hydrology evaluations provided to the zone committee. This means that flows and availability are not directly comparable between this evaluation and those completed previously. For this reason, the current flow regime has been re-modelled to provide a baseline for comparing the FAWP proposal.

The modelling in this paper has been undertaken using the approach agreed with the FAWPs technical advisors and reflects the most recent information on allocation.

North Opuha

There is currently 32 L/s of BN allocation in the North Opuha. The FAWP proposal is to increase this to 500 L/s with a Clayton Rd minimum flow of 2300 L/s and a lake level restriction of 391.2 m asl. The proposed lake level trigger is more restrictive than the proposed 12000L/s at SH1 reducing the impact of BN takes on the inflows to Lake Opuha. During the winter months, when the lake is filling, the B block takes have very low availability as the lake level acts as the constraint.

The FAWP proposed regime results in an increase in availability for AA and BA consents (from 91% to 92%) and no change in AN availability (68%). The B block percent availability decreases (26% to 7%) but due to the increased size of the block the available volume increases fivefold.

Flows in the North Opuha at Clayton Rd are not modelled to change due to the abstraction occurring below the minimum flow site (Figure 1). As the total abstraction below the minimum flow site is able to be increased, it is expected that flows down catchment will decrease.

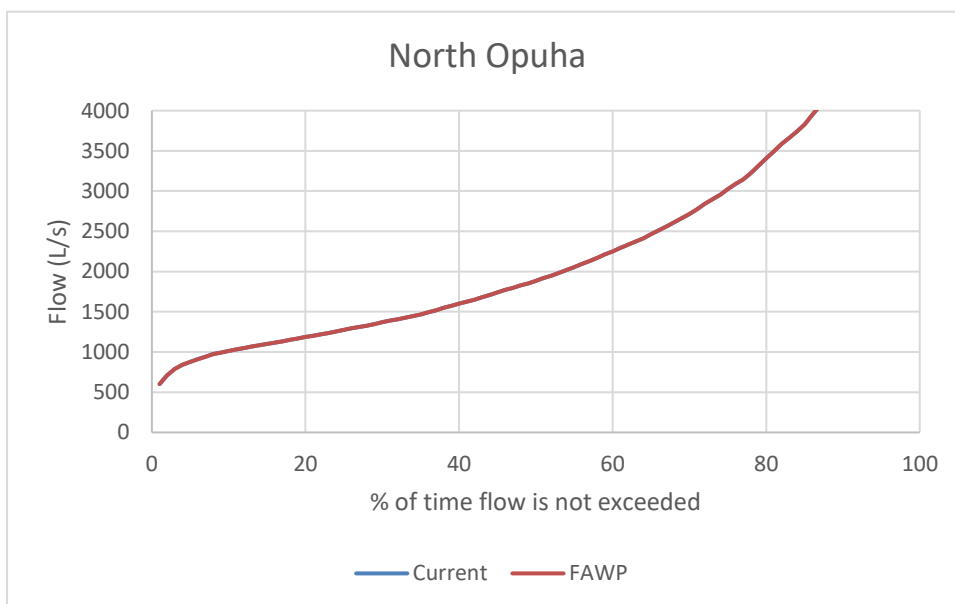


Figure 1 Flow duration curves for the North Opuha

South Opuha

There is currently 200 L/s of BN allocation in the South Opuha. The FAWP proposal is to increase this to 800 L/s, with a Monument Bridge minimum flow of 3000 L/s and a lake level restriction of 391.2 m asl. As in the North Opuha, the proposed lake level trigger is more restrictive than the proposed 12000 L/s at SH1. During the winter months, when the lake is filling, the B block takes have very low availability as the lake level acts as the constraint. This reduces the impact of BN takes on the inflows to Lake Opuha.

The FAWP A regime has been proposed to reflect the way the consent holders self-manage. While the modelling reflects a reduction in availability from the current regime to the FAWP proposal (80% to 63%) this may only be a theoretical change. The BN percent availability reduces in the FAWP proposal (25% to 4%). As with the North Opuha, this is due to a combination of the increased block size and the increased minimum flow and lake level. The greatest loss in B block availability occurs during the winter months.

Flows in the South Opuha are modelled to improve under the FAWP proposal compared to the current regime (Figure 2). This is due to the partial restrictions applying to the flow regime. While the modelling shows that there is an improvement in flows from current, the observed flows are likely to be similar to those occurring now due to the FAWP regime reflecting the current self-management of the South Opuha irrigators.

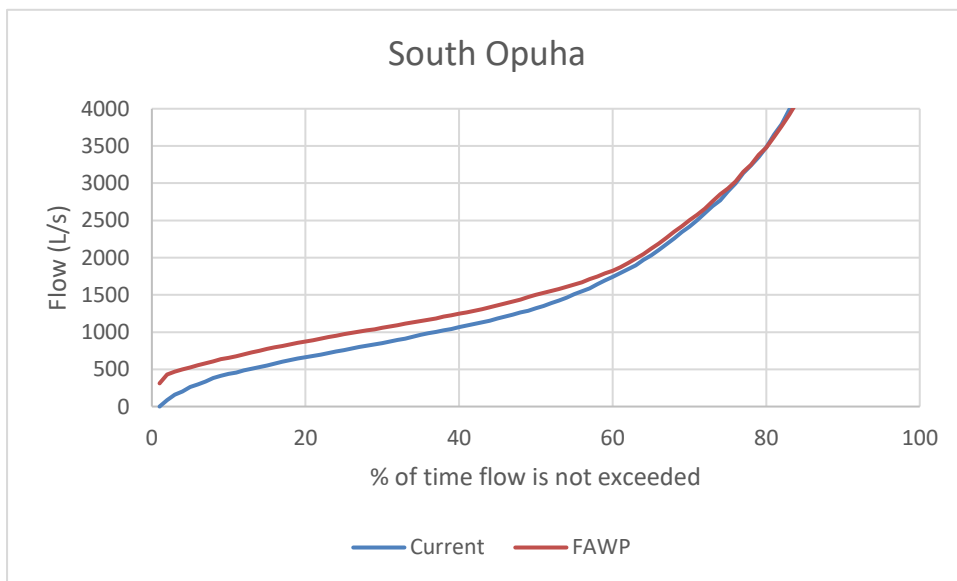


Figure 2 Flow duration curves for the South Opuha

Upper Opihi

There is currently 115 L/s of BN allocation in the Upper Opihi. The FAWP proposal is to increase this to 800 L/s with a Rockwood minimum flow of 4500 L/s and a SH 1 minimum flow of 12000 L/s.

The FAWP regime reduced the availability for BA and AN consents in the Upper Opihi (90% to 81% and 68% to 63% respectively). The proposed B block has a reduced percent availability (26% to 18%), but with the increased block size results in a fourfold increase in the volume able to be abstracted. The residual flows in the Upper Opihi (Figure 4) indicate that the lower

range flows are expected to have a small increase in the FAWP proposal when compared to current.

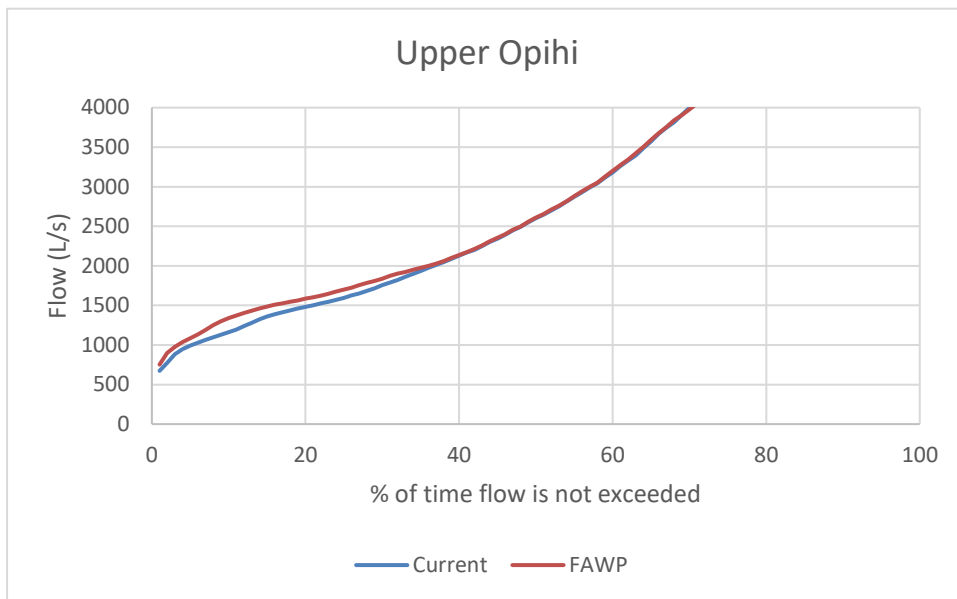


Figure 3 Flow duration curves for the Opihi at Rockwood

Te Ana Wai

There is currently 722 L/s of BN allocation in the Te Ana Wai. The FAWP proposal is to increase this to 800 L/s with a Cave minimum flow of 2500 L/s and a SH 1 minimum flow of 12000 L/s.

In the Te Ana Wai the difference between irrigation season availability and annual availability is the greatest, with the annual availability decreasing much more than the irrigation season availability (92% to 77% and 87% to 80% respectively). When the total volumes able to be abstracted under the full FAWP proposed regime are considered, more water can be taken from the Te Ana Wai under the proposed FAWP regime than under the current regime. Figure 4 shows the flow duration curve at Cave for both the FAWP regime and the current regime, this shows that there is a small increase in lower flows and a small decrease in higher flows. As discussed in previous workshops, much of the abstraction in the Te Ana Wai occurs below the minimum flow site. To give an indication of how the proposed regime impacts the reach below all takes the abstraction below the takes and estimated loss of 360 L/s (as used by the FAWP) have been subtracted from the Cave flow. Figure 5 shows the estimated flows in the downstream reach of the Te Ana Wai. Under the current regime this reach could be dry for 6% of the time, while under the FAWP regime this could be dry for 4% of the time.

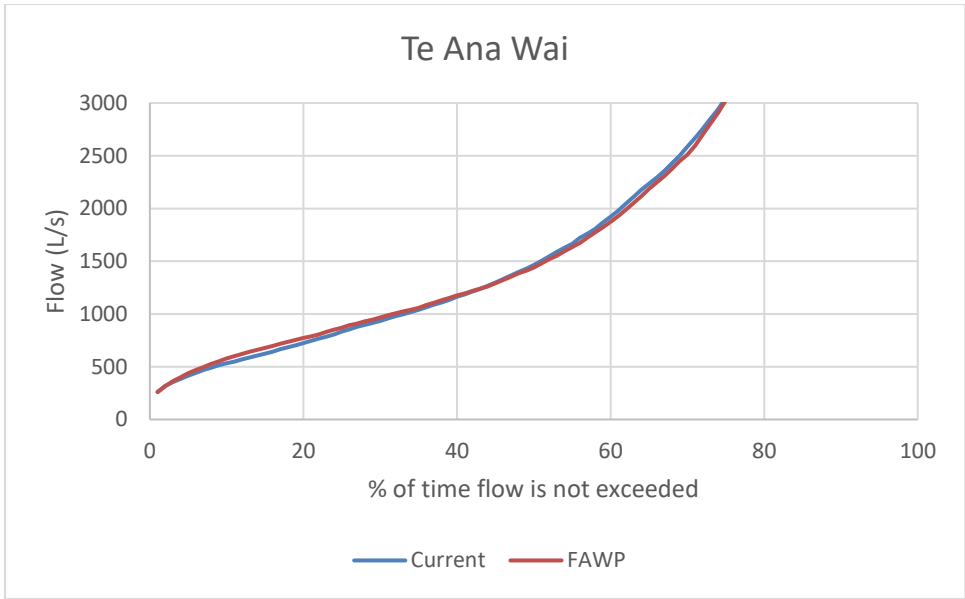


Figure 4 Flow duration curves for the Te Ana Wai at Cave

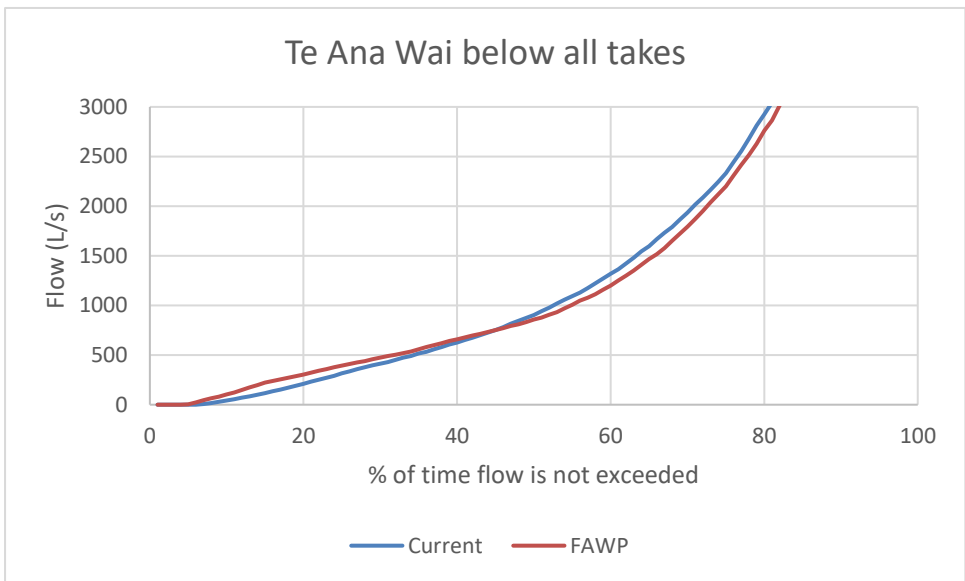


Figure 5 Flow duration curves for the Te Ana Wai below at abstractions and including average losses

Opihi Mainstem

Flows in the Opihi Mainstem are impacted by abstraction within the wider catchment. To estimate the effects of the FAWP proposal on the mainstem, changes in flows at Rockwood and the Te Ana Wai have been applied to the current flows in the Opihi at SH1, and the FAWP proposed B block has been applied to this time series. The FAWP proposal is for a 400 L/s B block with a minimum flow of 12000 L/s. Changes in abstraction in the North and South Opuha have not been factored into this modelled SH 1 flow as the effects of these changes will be buffered by the operation of Opuha Dam.

The flows at SH 1 under the FAWP proposal are expected to be fairly similar to those observed under the current regime. The flow duration curves in Figure 6 show that there are some periods of increased and decreased flows. This is due to the small gains occurring in the tributaries at different times. The example hydrograph in Figure 7 shows when these different periods of increased and decreased flows are likely to occur.

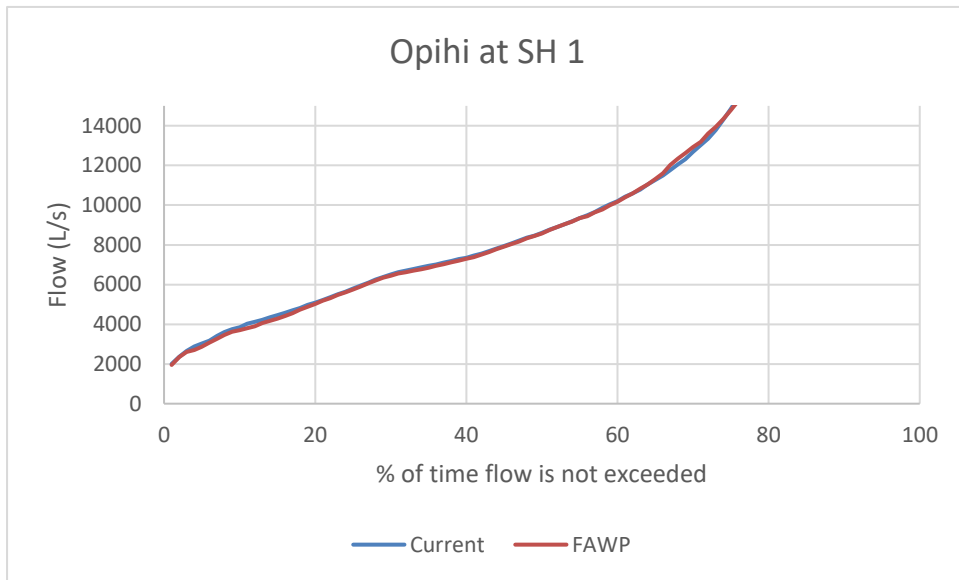


Figure 6 Flow duration curves for the Opihi at SH 1

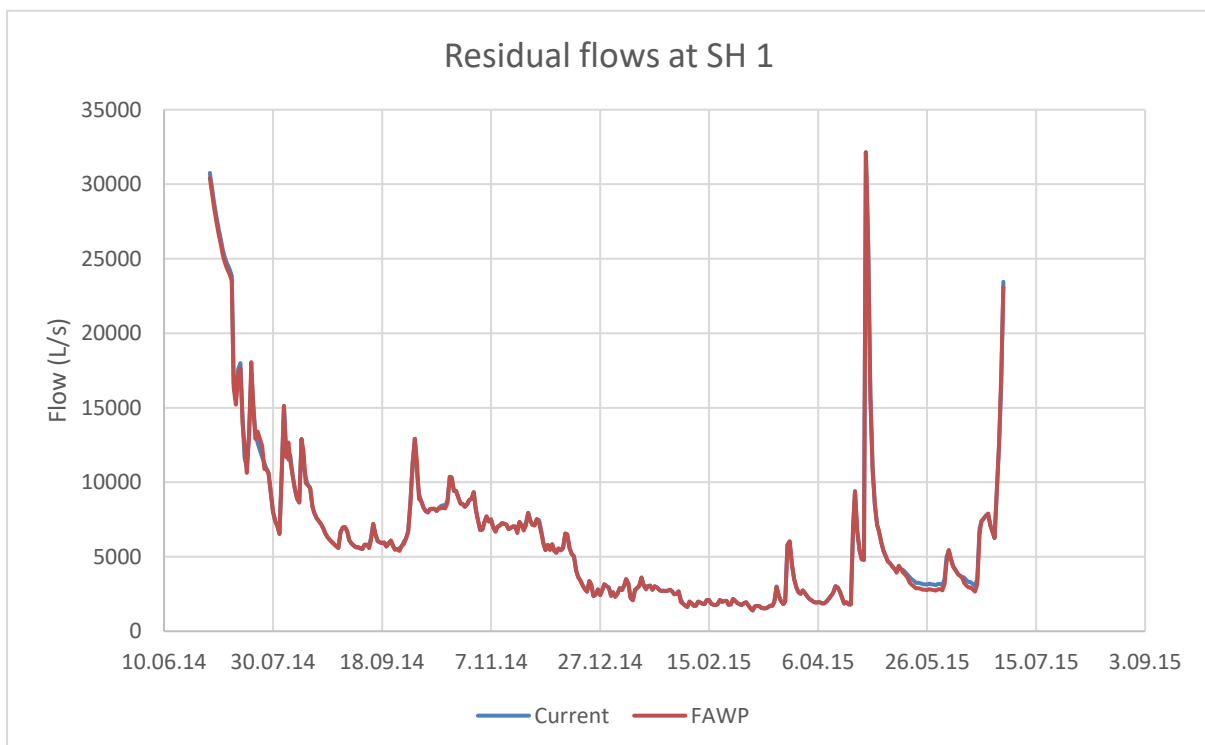


Figure 7 Example hydrograph of SH1 flow for the 2014-2015 water year

Summary

When the full FAWP proposal has been modelled there is a decrease of 3.3% in total annual abstraction when compared to the current ORRP regime. During the irrigation season however, the FAWP regime results in a 1.8% increase in volume able to be abstracted compared to the current regime. This indicates that the proposed B block is slightly larger than the lost availability in the catchment.

If the zone committee adopt the FAWP proposal they must be aware that this regime has the potential to increase the abstraction within the Opihi Catchment. There is also no guarantee that any new B block will be used to offset losses to existing irrigators, as the additional allocation could be applied for by anyone wishing to take water. This may lead to increased irrigation in some catchments.

Key decision area

The Zone Committee considers the proposed changes to B block regimes in the Opihi catchments and decides on a preferred regime for further consultation