



INFORMATION ON THE PROPOSED WATER TRADING MODEL



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Wrights Road storage will drive water use efficiency by providing each individual farmer with control of when, and how they wish to use their run-of-river and stored water allocation.

Storage and increased reliability will remove the current runof-river 'just in case' irrigation practise. Water storage means great certainty for the cooperative's Shareholders and benefits for all Shareholders.

Water trading means shareholders who need more water can buy it from other shareholders: while those who don't need to use their allocation can sell it to recover their investment in the storage ponds.

PDP and Water Strategies have identified there are willing sellers and willing buyers for trading WIL water.

To enable water trading we must put in place some mechanisms to manage scheme storage. The concepts are:

- Remove zoning
- Each share has equal entitlement to refill water
- Stored water can be traded

To help understand how scheme storage will drive water use efficiency, each of these subject matters is explained below in detail.

Where applicable we have used diagrams and examples to explain the concepts.

HOW THE PROPOSED MODEL WILL WORK

Remove Zoning

It is proposed that the zoning regime will be removed.

Currently when the river goes on restriction the scheme is required to move onto a roster. The scheme has been divided into four zones of approximately equal area and volume. This allows restrictions to be applied in increments of 25%.

- A 25% reduction in supply, for example, requires that each zone in turn would be without water for two days and receive water for the following six days.
- A 50% reduction requires four days with water followed by four days without.
- A 75% reduction gives a zone two days of water and six days without water.

This system is applied because most on-farm irrigation systems require 100% flow of their design capacity to operate, anything less i.e., 80% of design and the irrigator/s will shut down. By putting the scheme on a rostering regime, it means that when a zone is rostered-on, it will receive 100% of its allocation.

During restrictions (before and after), run-of-river rostering has the shortcoming of promoting 'just-in-case' and 'use-it or lose-it' irrigation practises. Even with the addition of scheme storage this phenomenon will still exist if rostering remains in place. Rostering is calendar driven and disregards soil moisture conditions and forecast weather. This means that a farmer will receive water when it is their 'turn' and not when it is required. Any opportunity for scheme members to meet future environmental reductions will be lost.

By removing rostering, each individual farmer will receive equal entitlement to the 'restriction flow', and have control of when, and how they choose to use that water. For example, if ECan have set the river at 40% of allocation, the farmer might wish to continue to irrigate topping-up the other 60% from their scheme storage entitlement

If there is no rain forecast for the plains or upper catchment, the farmer may choose to impose their own restriction regime knowing there will be a likely need to conserve water for the coming period. In the example used above, the farmer may instead choose to take their 40% run-of-river allocation to storage, and then use it at a later date.

The only time this scenario will disadvantage a farmer is if they have traded off all, or a large portion of their scheme storage, and they do not have their own on-farm storage or ground water to top-up to 100%.

A farmer in this situation will have calculated in advance that the financial gain they expect to receive from trading/selling their storage entitlement will exceed the production loss from not being able to irrigate during periods of restriction.

The removal of the zoning/rostering regime will drive water use efficiency. The concept is new to farmers and new to the scheme and it is expected it will take time for the parties to adjust to the change. Initially a degree of flexibility will be required, and it is quite possible the removal of rostering will be phased in stages as learnings are gained. The key principle is that each farmer will have control of when, and how they choose to use their allocation of water.

Each share has equal entitlement to refill water

Refill water is the excess water available from the river after water orders (including ordered water that has been nominated for refilling spare capacity in farmer's tanks) have been met. PDP have modelled that on average, the storage ponds will refill 1.5 times over a season. Previously, any water not required for irrigation remained in the river and ran out to sea.

Understanding the principle that each share has equal entitlement to refill water is very important. The principle is best explained using the irrigation season cycle as an example.

To start off, think of the ponds as being made up of a series of individual water tanks (or buckets), with each tank reflecting the size of the individual farmer's shareholding i.e., 20 shares equal a 20 unit tank and, 1500 shares equal a 1500 unit tank.

At the end of an irrigation season assume Wright's Road Ponds are empty. During the off-season the tanks all fill at an equal rate. Once the tanks are all full there is nowhere for the water to be stored, so it must remain in the river.

During the irrigation season the principle is exactly the same. The Scheme cannot magically create additional storage for refill water, therefore once all the tanks are full there is nowhere for the water to go other than remain in the river.

As storage is used, space becomes available in the tanks. How much space that is available for refill water is determined by how much stored water a farmer has used. However, it is really important to understand that when refill water does become available each share has equal entitlement to that water. But once an individual's tank is full there is no space for additional water.

As explained in the next section, trading does not change this principle. Each share will still have equal entitlement to the refill water, the only difference is that through a trade (depending on the mode) another farmer will have access to that water.

Some Shareholders have raised the concern that the concept of refill water is potentially inequitable. The reason being that if a farmer chooses to use more stored water than their neighbour, either through irrigation or a trade they will receive a greater portion of the refill water, thus gaining a greater benefit than the person who has chosen to conserve their water.

To counter these views there are two reasons why it is very unlikely that a farmer will use their stored water solely with the view that they might be able to 'game the system'. First, the farmer should not be irrigating if their IMS says not to. To irrigate would be pointless and counter all the efforts and gains that have been made to date to reduce leaching rates. Secondly, those farmers who have speculatively traded their irrigation water run the risk that there will be no refill water available for future irrigation when it is required. No water, no production.

Another concern raised is that Shareholders with on-farm storage (OFS) will be able to 'double dip' and fill their scheme storage at the same time they are filling their own storage. This statement is partially true, but no one has the ability to double dip. If a Shareholder owns 1,000 shares, they are entitled to 75lps. At any point in time that farmer can nominate what they want to do with that water, they can irrigate, send it to scheme storage or a combination of both. But they can't take more than their 75lps entitlement. Exactly the same flow limitation applies farmers with OFS, the only difference is that they have the added choice of being able to divert part or all to their own pond. The key message is that no shareholder can take more water than they are entitled to by the number of shares they own.

Water Trading

It is vital to the cooperative that farmers with on farm storage are provided with the opportunity to trade their storage entitlement in order for them to realise an economic return on their prior investment. This opportunity is not just limited to farmers with on-farm storage, the ability to trade stored water is equally important to all Shareholders.

There are some basic concepts that will make understanding trading easier:

- A trade requires a willing seller and a willing buyer (refer to the PDP and Water Strategies reports)
- A long-term trade will offer the seller and buyer 'certainty'
- A short-term trade will offer the seller and buyer 'opportunity'
- Trading is market driven, traditional supply and demand forces will apply
- The outcome of a trade is a water order (business as
- Pricing is based on what a willing buyer is prepared to pay to a willing seller. A shareholder can charge whatever price they like for a unit of water storage, but a potential buyers will decide whether to accept that price or not.

Farmers are well used to the concepts of trading. One mechanism used to facilitate a trade is to use an auction-based platform. The versions we are most familiar with are live auctions (e.g., stock yards) and on-line auctions such as TradeMe.

Trading of storage involves two components, the traded volume of water and the duration of the trade. This means a seller can nominate the number of stored units or the volume of their water tank they wish to trade, and for how long they would like the trade to apply (the trade period). Further details are provided later in the document.

QUESTIONS YOU MAY HAVE ABOUT WATER TRADING

Why are we talking about water trading?

Some shareholders have indicated they don't support the storage pond proposal because they have adequate water for their own needs. Water trading is a way to support other WIL shareholders in the cooperative while providing you with an opportunity to recover your own costs of supporting scheme storage.

Is this a new idea?

Leasing of shares already happens between WIL shareholders. Trading of storage water in New Zealand is not common, however is occurs in many other countries, including Australia.

How will I know who has water to sell or who wants to buy?

WIL's water trading will be run via an online easy to use trading platform (Trade Me or something similar) and will be accessible by mobile phone app for ease of use. We will provide training for these platforms if required.

How confident can I be of finding a buyer?

Modelling indicates that demand for stored water is likely to exceed the available supply, but there are many variables, including climate conditions, river flow, economics etc. There is more detail on this modelling in the PDP report. You can read this report and others at our closed Facebook group. You can join this group at https://www.facebook.com/ groups/860474851317048 or searching for WIL Storage Ponds on Facebook.

Who will manage the process?

A web based and/or mobile app will show each shareholder how much water they have available to use or trade. When a trade is completed a water order is automatically generated and the delivery of water to the purchaser's property is 'business as usual'.

Is there a template water trade agreement that I can use or do I need to get something drawn up by my lawyer?

The Water Supply Agreement will be updated to include a provision for water trading.

Are details of each trade recorded anywhere in case of future dispute between shareholders?

Yes, a record of all trades will be held by the site administrator.

Does water trading mean some shareholders have access to a greater share of refill water?

Refill water is not guaranteed, so anyone who trades their water can't assume that their storage will be topped up during the season by refill water.

Shareholders with on farm storage can fill their on-farm storage as well as their WIL storage tank - but they will still only have access to the volume of water determined by the number of shares they hold. 'Double-dipping' cannot occur.

Who sets the price for stored water?

You can charge whatever price you like, and potential buyers will decide whether to accept your offer.

Pricing is based on what a willing buyer is prepared to pay to a willing seller. A shareholder can charge whatever price they like for water, but a potential buyer will decide whether to accept that price or not.

How does the water get from seller to buyer?

When a trade is completed a water order is automatically generated and the delivery of water to the purchaser's property is 'business as usual'.

What if I sell my water, then find I need more?

If you sell your stored water and then find you need more water, you will need to buy water from another shareholder.

If I buy some water and then find I can't use it all, can I on sell the unused portion?

Yes

What if I don't want to trade water?

If you don't want to trade water, you don't need to do anything. Water trading offers you a way to recover your investment for any water you don't need but there is no obligation to trade.

What is the environmental impact of water trading - will it result in more water being taken or used?

Being able to trade surplus water means it is more likely to be sold to someone who needs it than to be used simply because it is available. Water trading will drive water use efficiency, this will generate an environmental and financial gain.

Can I sell my water to someone outside the WIL scheme?

There is no way to transfer water in or out of the WIL scheme, so you are limited to trading with other WIL shareholders.

What happens if there is not enough water to fill my storage tank and I have already traded its contents?

A farmer cannot enter into a trade unless they have water available in their tank, so by default this situation can't occur.

How confident can I be in the recording equipment that will measure the amount of water traded?

98% of water delivered on-farm is measured through offtake flowmeters. To ensure accuracy, the Scheme will be upgrading all off-take flowmeters during 2022. The distribution of water across the Scheme and the storage pond level measurement will be managed by NIWA's Sentinal system.

How long will it take to recover my share of the storage pond costs if I sell all my stored water?

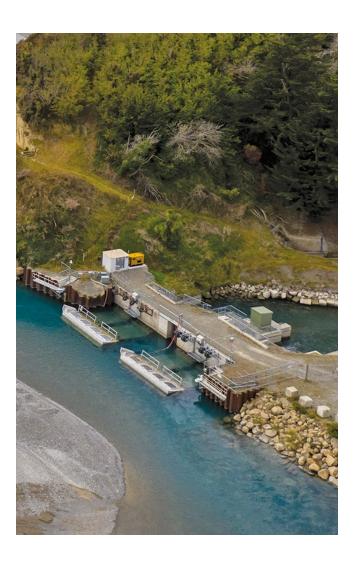
Water trading is based on supply and demand – which determines whether there are customers and how much they will pay. That is likely to change from month to month and year to year, making it too difficult to predict a breakeven point for the individual shareholders in the cooperative.

If I only hold a small parcel of shares, can I participate in water trading even though I don't have a flowmeter?

Yes, you will be able to participate in a full season longterm trade, but a flowmeter will be required if you want to participate in short-term spot market trading.

8,200,000m³ of storage divided by 133,213 shares equals 61.5m3 of stored water per share. How did the scheme determine that 10% would be required for race management thus reducing the allocation of stored water to 55m³ per share?

Current race losses are estimated at 10%, so it was logical to continue to apply the same value. The calculation is not too conservative nor is it particularly optimistic. 10% was considered a good starting point for PDP and Water Strategies to base their modelling on. The exact amount of water required for race management won't be known until the storage ponds have been in operation for several years.



WATER TRADING PRINCIPLES

Principle 1 **TECHNOLOGY IS AN ENABLER**

- P1.1 100% of the water flowing in and out of Wrights Road Storage Ponds (Wrights Road) will be metered. NIWA gauging will measure the amount of water in Wrights Road in real time.
- P1.2 Flow meters will accurately measure 98% of water delivered to farms.
- P1.3 A web-based and/or mobile application will show each individual farmer's real time flows and cumulative use. Using 'bank statement' type reporting, farmers will be able to view the amount of stored volume they have available for future irrigation or trading in real time.
- P1.4 Distribution of water around the scheme will be managed by NIWA's Sentinal system.
- P1.5 There will be increased automation within the scheme to allow the stored water to be equitably delivered in the correct quantities to the appropriate races.
- P1.6 Trading will be conducted and managed using an online trading platform (TradeMe or similar); it is intended this will also be available as a mobile application.
- P1.7 The 'Stockwater Swap' water balance model will manage storage entitlement and trading for Shareholder properties located on MR1 and R1.

Principle 2 EACH SHARE HAS EQUAL STORAGE **ENTITLEMENT**

- P2.1 820,000 m³ (10%) of storage at Wrights Road shall be set aside for race management, with the remaining storage (90%) distributed equitably amongst all shareholders.
- P2.2 Wrights Road is made up of a series of individual water tanks (or buckets), with each tank reflecting the size of the individual farmer's shareholding i.e., 20 shares equal a 20 unit tank and, 1500 shares equal a 1500 unit tank.
- P2.3 Each storage unit in a farmer's tank will be equivalent to 55 m³ of Wrights Road storage based on the current total shareholding of 133,213 shares and the volume set aside for race management.

$$\frac{8,200,000 \text{ m}^3 - 820,000 \text{ m}^3}{133,213 \text{ shares}} \approx 55 \frac{\text{m}^3}{\text{shares}}$$

Shareholder properties located on MR1 and R1 will P2.4 receive equal entitlement to storage (P2.1 and P2.2) using the 'Stockwater Swap' arrangement.

Principle 3 EACH FARMER HAS TOTAL CONTROL OVER THEIR WATER TANK

- P3.1 At the beginning of the irrigation season all tanks will start out full. The water in the tanks is referred to as 'stored units.'
- P3.2 Stored units can be used for irrigation or traded at the farmer's discretion at any time during the irrigation
- P3.3 Bank statement type reporting via the application will record the farmer's tank size and balance of stored units currently available for future irrigation requirements or trading.

Principle 4 WATER TANKS AND STORED UNITS CAN **BE TRADED**

- A farmer can choose to either trade their stored units or their tank. In both cases, the trade can be for all the farmer's stored units, their entire tank, or for a part thereof.
- P4.2 Trading involves two components the traded volume and the duration of the trade. This means a seller can nominate the number of stored units or the volume of their water tank they wish to trade, and for how long they would like the trade to apply (the trade period).
- P4.3 There are four potential modes of trading.

		TRADE VOLUME		
		Stored units	Tank	
TRADE	Less than one season	1	2	
	One season or more	3	4	

- 1. A farmer sells some or all of their **stored units** for **part** of the irrigation season. The buyer has the agreed trade period to use the stored units. Any refill that enters the tank over the trade period belongs to the seller and can be used or sold again at any time. If the buyer uses all the stored units before the end of the trade period, the trade period is effectively over. These trades can happen at any time.
- 2. A farmer sells some or all of their tank for part of the irrigation season. The buyer has use of the tank for the agreed trade period, after which the tank returns to the seller. Any refill that enters the tank over the trade period belongs to the buyer and can be used at any time during the trade period. The trade period cannot end early as the buyer has the right to any refill over the trade period. These trades can happen at any time.
- 3. A farmer sells some or all of their stored units for the entire irrigation season (or multiple seasons). This trading mode functions identically to trading mode 1, with the only difference being that this kind of trade would only happen once per year at the start of the irrigation season.

4. A farmer sells some or all of their tank for the entire irrigation season (or multiple seasons). This trading mode functions identically to trading mode 2, with the only difference being that this kind of trade would only happen once per year at the start of the irrigation season.

A farmer that does not require storage might chose to trade their tank for the entire season (or longer). Alternatively, another farmer might wish to retain a portion of their tank or storage units for their own use and choose to trade their remaining units on a much shorter term.

- P4.4 A trade requires a willing seller and a willing buyer. A long-term trade will offer the seller and buyer 'certainty'. A short-term trade will offer the seller and buyer 'opportunity'.
- P4.5 Pricing is market driven.



TRADING MODES AND REFILL EVENT

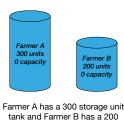
MODE 1 & 3: TRADING STORED UNITS stored units traded short-term (1) or for a season or more (3)



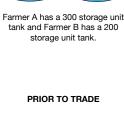


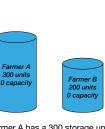
tank and Farmer B has a 200 storage unit tank.

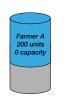
200 units



storage unit tank.



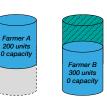




...... 300 units

Farmer A trades 100 stored units of volume to Farmer B for a fixed duration.

TRADE PERIOD START



Farmer A trades 100 units of capacity in their tank to Farmer B for a fixed duration.

200 units 50 capacit

Farmer B uses 50 units. As the water is used. Farmer A's tank capacity is restored.

250 units

0 capacity

IRRIGATION EVENT



Farmer B uses 50 units. As the water is used, Farmer B gains spare capacity.

Farmer B 250 units

50 capacity

Farmer A 250 units 0 capacity

Farmer A gets 50 stored units of refill while Farmer B receives none as his tank is still full.

Farmer B

250 units

0 capacity

Farmer B

300 units

REFILL EVENT



Farmer B gets 50 stored units of refill while Farmer A receives none as his tank is still full.



200 units

The 50 stored units Farmer B did not use return to Farmer A.

END OF TRADE PERIOD





The 100 stored units Farmer B did not use return to Farmer A with the tank.

LEGEND



own tank (full)



bought tank sold storage units (full) (unavailable)



bought storage units



own tank (empty)



bought tank (empty)



sold tank (unavailable)



Principle 5 TRADING REQUIRES RULES

Rule 1: Ordering water

- R1.1 Existing zoning and rostering will be removed. Any farmer in the scheme will be able to order water at any time provided they have sufficient storage units in Wrights Road or there is sufficient run-of-river flow.
- R1.2 All CRC16677 consented water drawn through Brown's Rock will be diverted to Wrights Road (except for those properties participating in the Stockwater Swap arrangement)
- R1.3 A farmer can place a water order for the following day along with a nominated flow rate. The order will be met first from their run-of-river allocation, and during periods of partial restriction the farmer may choose to top up the order using their stored units.

- R1.4 When the Scheme is on full restriction the farmer can order water using their stored units. Once a farmer has used all of their stored units and the scheme is on full restriction, they will no longer be able to order water from the Scheme.
- R1.5 Where a farmer has no remaining stored units (either fully used or traded) and the scheme is on a partial flow restriction, the farmer will be delivered a percentage of their full allocation as notified by ECan.
- R1.6 When a farmer places a water order, they can nominate some or all of their flow entitlement be used to fill their tank in Wrights Road for use at a later date provided their tank has spare capacity.



RUN-OF-RIVER AND STORAGE DISTRIBUTION

1. IRRIGATE FROM RIVER ONLY	2. IRRIGATE FROM RIVER + STORAGE	3. IRRIGATE FROM STORAGE	4. NOMINATE REFILL	5. IRRIGATE FROM RIVER + NOMINATE REFILL
NO RESTRICTION Full allocation for Farmer A			either into your paddock or on-farm storage Irrigation not critical, nominate 100 L/s refill	either into your paddock or on-farm storage Irrigate 50 L/s from river water and nominate 50 L/s refill
PARTIAL RESTRICTION 40% allocation for Farmer A (40 L/s) is available either into your paddock or on-farm storage Irrigate 40 L/s from river water	either into your paddock or on-farm storage Irrigate 40 L/s from river water and 60 L/s from storage		either into your paddock or on-farm storage Irrigation not critical, nominate 40 L/s refill	either into your paddock or on-farm storage Irrigate 20 L/s from river water and nominate 20 L/s refill
FULL RESTRICTION No allocation for Farmer A (0 L/s) is available		either into your paddock or on-farm storage Irrigate 100 L/s from stored units		



Rule 2: Farmers Retain Ownership of Their Tank

- R2.1 Each farmers' tank has a finite volume of storage units equal to their entitlement. At all times ownership of the tank remains with the farmer who owns the shareholding. Selling use of the tank for an agreed period does not transfer ownership of the tank.
- R2.2 As stored units are used, spare capacity will become available in farmer's tank. The tank owner retains the right to use this spare capacity, unless they have sold all or a part of their tank.
- R2.2 Farmers can trade part of or their full tank for multiple seasons if they wish to do so.

Rule 3: Each Share has Equal Entitlement to Refill Water

R3.1 Refill water is the excess water available from the river after water orders (including ordered water that has been nominated for refilling spare capacity in farmer's tanks) have been met.

Refill water = total inlet flow at Wrights Road - ordered water

Ordered water = irrigation demand + nominated tank refill

In simple terms, the ordered water allows farmers to decide whether they use their flow entitlement (based on the number of shares they hold) to either irrigate or fill their Wrights Road tank.

R3.2 Each farmer has equal entitlement to refill water up until the point their tank is full. The amount of refill water a farmer can receive will be limited to the spare capacity available in their tank at the time refill occurs. Once a farmer's tank is full there is no capacity to hold additional water.

Rule 4: A farmer can purchase stored units or tanks beyond their own entitlement

- R4.1 Purchasing additional tank capacity or storage units increases a farmer's own reliability but does not increase their flow entitlement as this is limited by the capacity of the water race.
- R4.2 Any current lease arrangements for temporary transfer of WIL shares will also include the associated storage entitlement.
- R4.3 When shares are sold the storage entitlement as at the date of sale transfers to the new owner.



