

How water is shared in the regulated Murrumbidgee Valley

October 2015

Introduction

DPI Water is responsible for sharing water between consumptive users and the environment throughout NSW.

Within NSW, the sharing arrangements are typically undertaken in accordance with the statutory water sharing plan for the respective water source. In some valleys, including the NSW Murray, Murrumbidgee and Lower Darling Rivers, DPI Water must also consider interstate water sharing arrangements and the operations of the Snowy Hydro Scheme.

During severe water shortages, a statutory water sharing plan – or parts of the plan - may be suspended, during which time the priorities for water sharing are undertaken in accordance with the *Water Management Act 2000* and the Basin Plan.

While the process for determining water availability and announcing available water determinations (typically referred to as allocation) is relatively straight forward, catchment conditions, climate variability, seasonal circumstances and a number of operational considerations can make it difficult to understand how increases in water availability are made.

This factsheet provides an overview of how water availability is determined in the Murrumbidgee Valley and how water is shared in line with the water sharing plan.

Determining starting allocations at the beginning of the year

Immediately prior to the new water year commencement on 1 July, DPI Water calculates the minimum assured volume of water that will be available for allocation during the coming year.

This includes:

- How much water is available in the storages, plus
- A minimum natural inflow into storages expected during the year that can be allocated for regulated use, plus
- Required annual releases by Snowy Hydro Limited into Blowering Dam, minus
- The volume required to run the river, including end of system flows, transmission losses and evaporation losses, minus
- Other water sharing plan requirements, including storage reserves and credits to environmental water allowances, minus
- The forecast volume of carryover in general security and conveyance accounts.

The opening allocation announced on 1 July each year is therefore based on the minimum volume of water that can be confidently made available and delivered across the entire year to licensed users.

The determination of water availability is deliberately very conservative, but there are a number of variables that can affect, and in some cases, reduce allocations, including:

- The experience of a new 'worst-drought', as was the case in 2006/07, where inflows were below the previously recorded minimums.
- The volume needed to run the river, which may exceed historical requirements during extended dry periods due to rising transmission and evaporation losses.
- The timing of releases from Snowy Hydro Limited (SHL), which is not known to DPI Water in advance. Arrangements under the Snowy Water Licence also enable SHL the flexibility to deliver greater than their Required Annual Release (RAR) in any year – this is reduced from their RAR in the following year.

From the remaining water available, DPI Water then:

- Reduces available water by the volume of any outstanding inter-valley transfers into the Murray Valley, that have not been delivered in the previous year, then
- Sets aside town and domestic and stock water, then
- Progressively allocates water to high security licence holders and begins allocations to the conveyance licence category, then
- Allocates any remaining water to general security accounts, including incremental improvements to conveyance.

Typically, the volume of water available for allocation to general security use at the beginning of the water year on 1 July is low. This will increase throughout the year as inflows into the storages, higher than forecast minimums, occur.

In the Murrumbidgee Valley it is only in very dry years that water availability for high security users is less than 95 per cent of entitlement at the commencement of the year.

By comparison, there will never be enough water available at the commencement of the year to provide 100 per cent water availability to general security users. Increases in general security allocation always depend somewhat on conditions during the year.

When there is sufficient water to announce 95 per cent for general security users, then further improvements are allocated equally to high security and general security entitlement holders until both reach the maximum 100 per cent.

Increasing allocations

As the year progresses, regular assessments of water availability are undertaken. Improvements, usually from greater than minimum inflows and less than forecast transmission losses, allow for allocations to be increased incrementally and volumes credited to access licences.

DPI Water undertakes monthly assessments and announcements are made mid-month which are available on the DPI water website. During critical times of the year or after significant rainfall events, more frequent assessments and announcements can be made, typically the beginning of the month, until full allocations are reached.

DPI Water will continue to increase allocations for general security entitlement holders until 100 per cent of entitlement is reached. However, when allocation plus average carryover exceeds 80 per cent of entitlement, water is proportionally set aside for commencing allocations the following year.

Why can't there be 100 per cent water availability if the dams are full?

In the Murrumbidgee Valley the sum of high and general security entitlements is approximately 2,700 gigalitres (GL). Almost 1,200 GL is required to run the system to deliver water for the whole year and to maintain a minimum reserve.

The total active volume of Blowering and Burrinjuck Dams is about 2,650 GL.

Therefore, even if the dams were full at the start of the year there is insufficient water to announce full general security allocation at the beginning of the year. Increases in general security allocation, particularly to 100 per cent, relies on some release from storage for water usage followed by subsequent inflows to backfill the storage.

Why doesn't allocation increase much, or at all, when the storages are full?

The water stored in Burrinjuck and Blowering dams at any time up to the end of summer is fully allocated to meet the volumes needed to run the river to the end of the year, meet all environmental requirements and already allocated water in high and general security accounts.

If the dams are full, any inflows cannot be stored for release later and so effectively pass straight through. This means that this water cannot contribute to meeting any additional future demand beyond what is already stored.

Flows that pass straight through will usually trigger periods of supplementary flow. Supplementary access licence holders may then divert water. General security water users may also extract 'without debit' during supplementary events if water availability is less than 60 per cent.

A proportion of supplementary flows typically includes downstream tributary contributions, reducing the call on stored water to run the river and allowing a small increase in allocation.

Offsetting this, however; is that DPI Water assumes a pattern of inflows of Required Annual Releases (RAR) from Snowy Hydro Limited into Blowering Dam as part of its minimum inflow sequence. If Snowy Hydro releases water into a full Blowering Dam, this water cannot be stored for later use and the assumed RAR benefit toward allocations is lost.

Often, when this happens for an extended period, as occurred in 2012/13, it is the result of wet climatic conditions and the wet weather flows compensate for the loss of RAR, meaning that allocations already announced should not have to be withdrawn.

In summary, when the dams are full early in the year it will usually require water to be released to meet downstream demand and then new inflows to be captured before allocations can be significantly increased.

What delivery constraints exist in the Murrumbidgee?

Constraints are physical or operational "blockages" that limit the volumes of water that can be delivered. Channel capacity constraints are outlined in the water sharing plan as follows:

- 9,000 ML/day in Tumut River at Oddys Bridge
- 9,300 ML/day in Tumut River at Tumut
- 32,000 ML/day in Murrumbidgee River at Gundagai
- 1,400 ML/day in Yanco Creek at the off-take.

If flow rates exceed the limits above, water will begin to break out of the main channels. This can impact public and private property and may significantly increase operational losses.

The Tumut River constraint is perhaps the most significant because it limits the rate at which water can be released from Blowering Dam.

Peak summer irrigation demand can be in excess of 20,000 ML/day, meaning that Burrinjuck Dam must supply more than half this daily requirement.

How do these constraints impact on allocation?

Burrinjuck Dam relies on **catchment rainfall**, and in a dry period after a season of very large demand, water levels in Burrinjuck storage are likely to be low and slow to recover. Conversely, Blowering Dam receives reliable annual releases from the Snowy scheme so the storage is topped up regularly. Blowering Dam storage may remain high because releases can only be made at rates up to the maximum channel capacity.

If this imbalance between storages is sufficiently large, some water in Blowering Dam may be inaccessible because it cannot be released fast enough to meet downstream demands.

Water may be available in Blowering Dam for an allocation increase, but it may not be deliverable until after the peak irrigation period has passed because of the Tumut River channel constraint.

The deliverability constraint can be eased with improvement in the volume stored in Burrinjuck Dam, or by water use outside of the period of peak summer demand.

Another instance of a deliverability constraint is due, not to storage imbalance, but to the timing of releases from Snowy Hydro. If a large proportion of the release arrives post-February and does not coincide with peak demands over summer, there may be a portion of that water that is not usable for regulated purposes. This cannot be considered as a usable resource in the current water year and is discounted as an unusable late-season inflow. DPI Water will only credit accounts with water that can be delivered with certainty, but will advise of any additional resource available for allocation as the deliverability constraint eases. In each instance, the unusable water will eventually become available, but may end up contributing to carryover, improved storage and associated improved allocations in the following water year.

How can I access more water if general security allocations are low?

Murrumbidgee general security licence holders can also access water through:

- **Without debit water** - general security licence holders may pump water 'without debit' during a period of announced Supplementary Access if general security allocations are less than or equal to 70 per cent, and if the sum of the licence holder's carryover plus general security allocation is less than 100 per cent.
- **Trade / Dealings** – the trading of water between licence holders is formally referred to as 'water dealings', commonly referred to as water trading.

To meet a short-term requirement, a licence holder may wish to purchase water available under this year's water allocation. This is referred to as a water allocation assignment dealing (also known as 'temporary trade').

A licence holder may also wish to purchase additional permanent shares to add to an existing licence. This is referred to as purchase of a share assignment (also known as 'permanent trade').

Water allocation assignment dealings in the Murrumbidgee are managed by Water NSW and share assignment dealings are managed by DPI Water. Refer to <http://www.water.nsw.gov.au/water-licensing/dealings-and-trade> for additional details.

What is the maximum volume of water I can use this season?

A licensed general security water user in the Murrumbidgee Valley can use up to **100 per cent**; namely 1.0 ML per share, of their licensed entitlement in any one water year, July to June. This is referred to as the account limit.

Water 'usage' includes water diverted for consumptive purposes **and any water traded out**.

Therefore, the maximum usage of 100 per cent of entitlement can be made up of carryover water and/or allocation water and/or supplementary water diverted under the 'without debit' provision and/or any water traded out.

How does carryover impact allocation announcements?

The maximum allowable carryover for general security and conveyance entitlement holders in the Murrumbidgee Valley is **30 per cent of entitlement**.

Under the Murrumbidgee water sharing plan, **water licence holders can use up to 100 per cent of entitlement each year (excludes water traded in)**. Usage can be made up of carryover, allocation, water traded out or, when water availability is less than 70 per cent, 'without debit' water during periods of declared supplementary flow. Total water use in a single year cannot exceed 100 per cent of entitlement unless additional water is purchased. As allocation is increased, **any carryover water that will cause a licensed water user's account to exceed 110 per cent of entitlement will be forfeited and replaced with allocation water**.

Carryover could be considered similar to insurance. This water is set aside first at the commencement of the water year on 1 July. Allocations are then made commensurate to water availability and in accordance with the water sharing plan. In dry years, when allocations are low and account limits are not reached, carryover can be very useful. In years of favourable water allocations when accounts would be full in any case, carryover is less useful.

For example if an individual irrigator has carried over 30 per cent of entitlement, that user cannot benefit from any allocation increases above 70 per cent because they have received their maximum account credit (100 per cent of entitlement). Available water will instead be distributed to users' accounts that are not yet full.

Glossary of commonly used terms

Access licence

Allows the licence holder a share of the available water in the water source in proportion to the number of shares (entitlement) held. An access licence is separate from the approvals to use the water or to construct and operate the works to extract the water (e.g. pump, dam). Access licences do not have to be renewed. Refer also to Water Access Licence (WAL).

Account limits

The limit placed on the crediting and debiting of water accounts in accordance with the water sharing plan (currently 100 per cent for general security accounts in the Murrumbidgee).

Allocation

This is the water volume declared by DPI Water to be available to a water user, normally expressed as a proportion or share of a licensed entitlement (percentage or volume (ML) per share). An analogy is that this is the amount of water to be placed in a water user's 'bucket'.

Available Water Determination (AWD)

Commonly known as an allocation announcement. These are made periodically by DPI Water after undertaking an assessment of available resources. It results in water accounts of associated water access licences being credited with a volume of water.

Carryover

That unused account water that is brought forward into the new water year, from 30 June to 1 July. Currently in the Murrumbidgee, a maximum of 30 per cent may be carried over.

Entitlement

The share of the water resource, and its associated volume, which a holder is authorised to take under a water licence. An analogy is that this is the size of the water user's 'bucket'.

General security licence

A licence for which the available water varies from year to year with climate (rainfall), normally used for irrigating annual crops.

Gigalitre (GL)

One thousand megalitres (ML) or one billion litres

High security licence

A licence for which allocation is provided before allocation is assigned to general security licences. High allocations are usual for this licence category, apart from exceptional (drought) circumstances. Usually used for high value crops, permanent plantings, industries and towns.

Megalitre (ML)

One million litres (about one Olympic sized swimming pool), or 1,000 cubic metres.

Supplementary water

Known as uncontrolled flow in the *Water Management Act 2000*, this is flow that cannot be regulated or stored for future use, and cannot be used to meet a particular entitlement or purpose (formerly referred to as off-allocation water). Once a supplementary event is declared by DPI Water, it becomes opportunistic water that can be diverted by supplementary licence holders and, under certain conditions, 'without debit' by general security licence holders.

Without debit water

Water diverted by general security entitlement holders during declared supplementary flow events. Up to 100 per cent of licensed entitlement can be taken as 'without debit' water. 'Without debit' water can convert to 'debit' water depending on carryover and subsequent allocation announcements during the year (due to the account limit). It can be considered 'an advance' on possible future allocation announcements.

More information

www.water.nsw.gov.au

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