

Murrumbidgee River Operations Plan

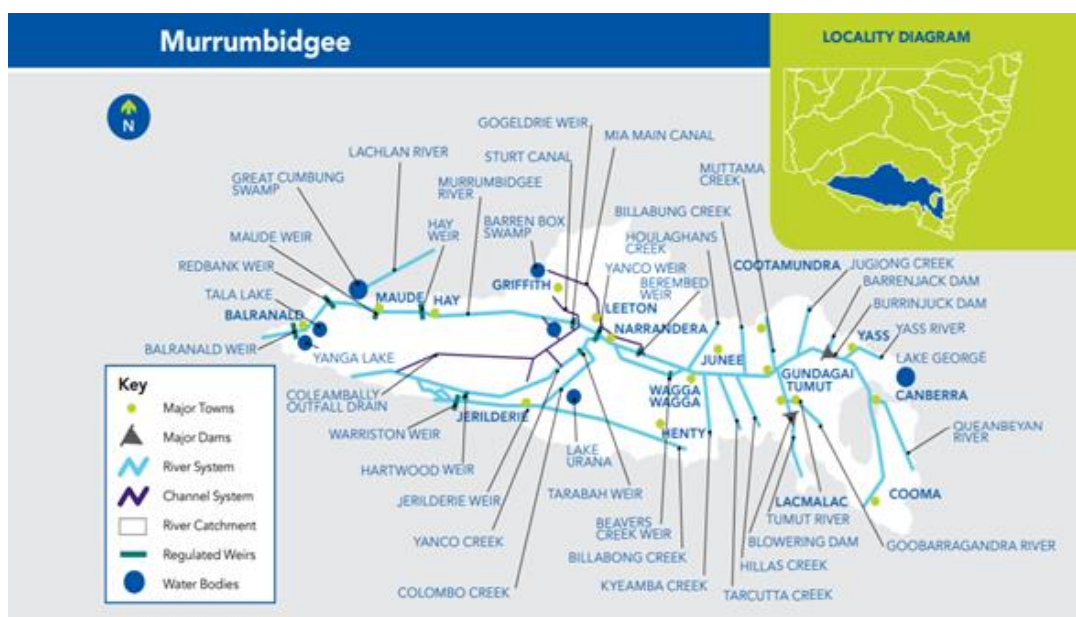
July 2019

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1. Highlights

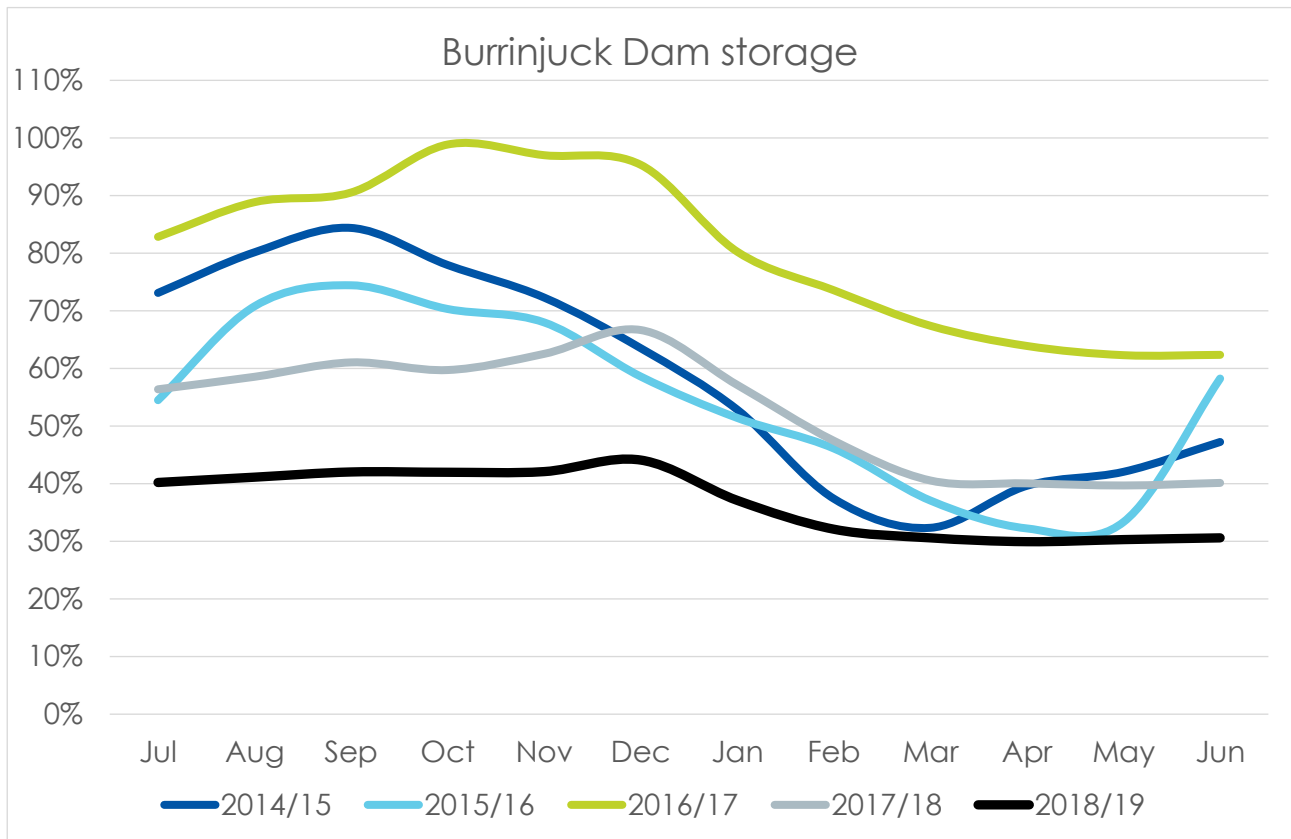
- The Murrumbidgee Valley regulated river water source is in Stage 2 drought criticality. Accordingly, a Critical Water Advisory Panel will soon be formed for southern valleys to advise on drought management options.
- The current Available Water Determinations (AWD) are 100% for towns and 95% for high security, and nil for general security. Average carryover from last year into 2019-20 is estimated to be about 8% of general security share components.
- BOM Climate outlook indicates that large parts of Australia including most of NSW in the August to October period is likely to be drier than average conditions. Warmer than average daytime temperature is likely. Climate models suggest that a likely positive Indian Ocean Dipole is likely with El Niño-Southern Oscillation at neutral.
- Water account balances on 15th July 2019 consist of the following components:
 - Total Licensed water is about 836GL (allocation plus carryover minus usage to date).
 - Planned Environmental water - Discretionary component is 13GL.
 - Planned Environmental water - End of system flows of about 199GL.
 - Operational losses, including transmission loss and operational surplus of about 507GL.
 - IVT balance is remaining positive at present (about 24GL).



2. Dam storage

2.1 Burrinjuck Dam storage

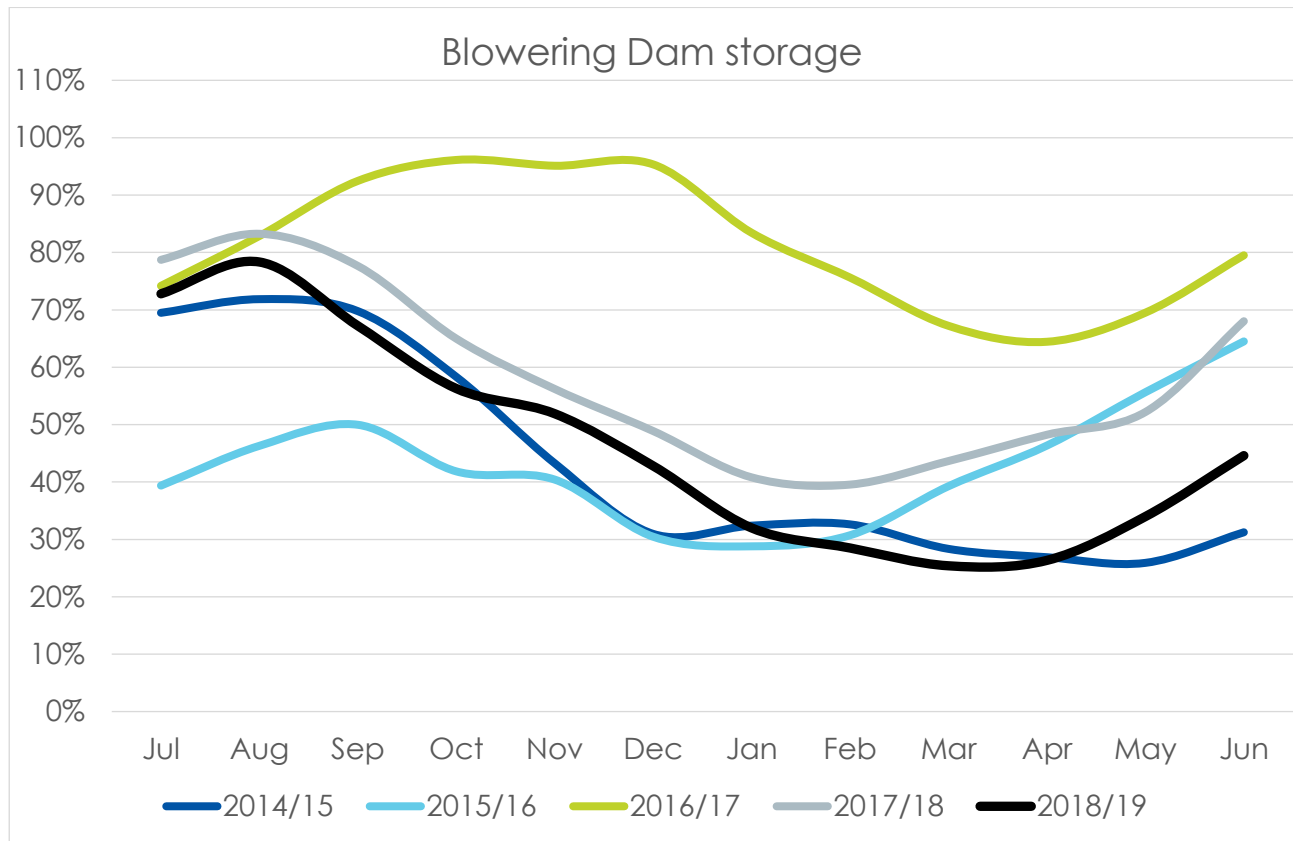
The figure below shows the Burrinjuck Dam storage behaviour for the water year (2018-19) and for the last four water years.



Burrinjuck in 2018/19 year remains below the levels of the previous four years. Burrinjuck Dam was around 40% full at the start of last water year. The storage at the start of current water year is about 31%.

2.2 Blowering Dam storage

The below figure shows the Blowering Dam behaviour for the 2018-19 water year compared to the last four water years.



Blowering Dam volume was around 73% at the start of the last water year and has fallen to about 26% at the end of March 2019. The higher initial inflows from Snowy Hydro have been subsequently offset by significant releases made from Blowering Dam for irrigation and environmental watering. The storage volume in current water year is 47%. The increase is primarily due to part of the Required Annual Release made by Snowy Hydro.

3. Supplementary access

3.1 Commentary

No supplementary event has been triggered so far in 2018-19. There have been very small tributary inflows in to the system that was insufficient to share the volumes equitably and in a productive manner.

3.2 Explanation

Supplementary water, formerly known as off-allocation water, is surplus flow that cannot be captured or re-regulated in storages. When rain events result in flows that cannot be captured (regulated) in storage structures such as dams or weirs for future use, and the water is not needed to meet current demands or commitments, then supplementary access may be announced. Supplementary flow events can occur at any time and therefore access is purely opportunistic.

Supplementary access is made available when flows are more than those needed for; environmental water rules, domestic stock and native title rights, and water orders for other licence categories. Supplementary access announcements also consider the water required to fill Lake Victoria when Murrumbidgee general security Available Water Determinations (AWD) are above 70% and the NSW Murray valley's AWD plus carryover is less than 60%.

3.3 Uncontrolled flow access to general security licences

During announced supplementary events, those holding General Security Water Access Licences may also pump water 'without debit' during these periods under the following circumstances.

Whenever the effective available water for general security is less than or equal to 0.7 ML/unit of share component, and until the total amount extracted without debit, plus the effective available water is less than 0.85 ML/unit of share component.

NOTE: The effective available water for the general security is defined as AWD plus "the maximum of zero or the average carryover from the previous water year less 0.15 ML per unit share".

$$\text{Average Carryover} = \frac{\text{Volume of water carried over by all general security licences as of 1 July}}{\text{Total share entitlements of general security category}}$$

4. Water availability

4.1 2018/19 water availability for Murrumbidgee at 30th June 2019

Licence category	Share component	AWD Volume	Carryover In*	Allocation assignments in	Allocation assignments out	Usage	Account Balance
Coleambally irrigation (conveyance)	130,000	111,605	4,557	20	9,178	103,203	3,801
Domestic and stock	20,985	20,985	-1	0	0	15,781	5,203
Domestic and stock [domestic]	271	271	-20	0	0	76	176
Domestic and stock [stock]	12,883	12,883	0	0	0	11,084	1,799
Local water utility	23,816	23,816	0	146	500	9,107	14,356
Murrumbidgee irrigation (conveyance)	243,000	154,111	7,376	0	18,461	128,458	14,568
Regulated river (conveyance)	2,968	208	79	0	217	0	70
Regulated river (general security)	1,891,995	132,433	407,062**	345,446	317,511	409,822	157,608**
Regulated river (high security)	360,298	342,284	-2	15,696	52,323	302,841	2,814
Regulated river (high security) [Aboriginal cultural]	2,150	2,150	0	0	0	500	1,651
Regulated river (high security) [research]	300	300	0	0	0	300	0
Regulated river (high security) [town water supply]	19,769	19,769	0	0	0	19,769	0
Supplementary water	198,780	198,300	0	26,806	26,496	0	198,610
Supplementary water (Lowbidgee)	747,000	747,000	0	393,117	393,117	0	747,000
Grand total	3,654,214	1,766,115	419,051	781,231	817,803	1,000,939	1,147,655

* Subject to change on final meter reading updates and water order reconciliation for 2018-19

**This includes water carried over by licences for Snowy river savings and usages during the year.

4.2 Current year's (2019/20) water availability for Murrumbidgee at 15th July 2019

Licence category	Share component	AWD Volume	Carryover In*	Allocation assignments in	Allocation assignments out	Usage	Account Balance
COLEAMBALLY IRRIGATION (CONVEYANCE)	130,000	111,605	0	0	0	0	111,605
DOMESTIC AND STOCK	19,841	19,703	0	0	0	62	19,641
DOMESTIC AND STOCK [DOMESTIC]	271	271	-16	0	0	0	255
DOMESTIC AND STOCK [STOCK]	10,626	10,515	0	0	0	0	10,515
LOCAL WATER UTILITY	23,816	23,816	0	0	0	163	23,653
MURRUMBIDGEE IRRIGATION (CONVEYANCE)	243,000	150,247	1	0	0	0	150,247
REGULATED RIVER (CONVEYANCE)	2,968	0	0	0	0	0	0
REGULATED RIVER (GENERAL SECURITY)	1,891,995	0	151,122	17,805	17,271	712	150,945
REGULATED RIVER (HIGH SECURITY)	360,298	342,284	-5	358	7,257	579	334,802
REGULATED RIVER (HIGH SECURITY) [ABORIGINAL CULTURAL]	2,150	2,150	0	0	0	0	2,150
REGULATED RIVER (HIGH SECURITY) [ENVIRONMENTAL]	3,401	3,401	0	0	0	0	3,401
REGULATED RIVER (HIGH SECURITY) [RESEARCH]	300	300	0	0	0	0	300
REGULATED RIVER (HIGH SECURITY) [TOWN WATER SUPPLY]	19,769	19,769	0	0	0	0	19,769
SUPPLEMENTARY WATER	198,780	197,969	0	0	0	0	197,969
SUPPLEMENTARY WATER (LOWBIDGEE)	747,000	747,000	0	0	0	0	747,000
Grand total	3,654,215	1,629,031	151,102	18,163	24,528	1,516	1,772,252

* Subject to change on final meter reading updates and water order reconciliation for 2018-19

General security available water determination

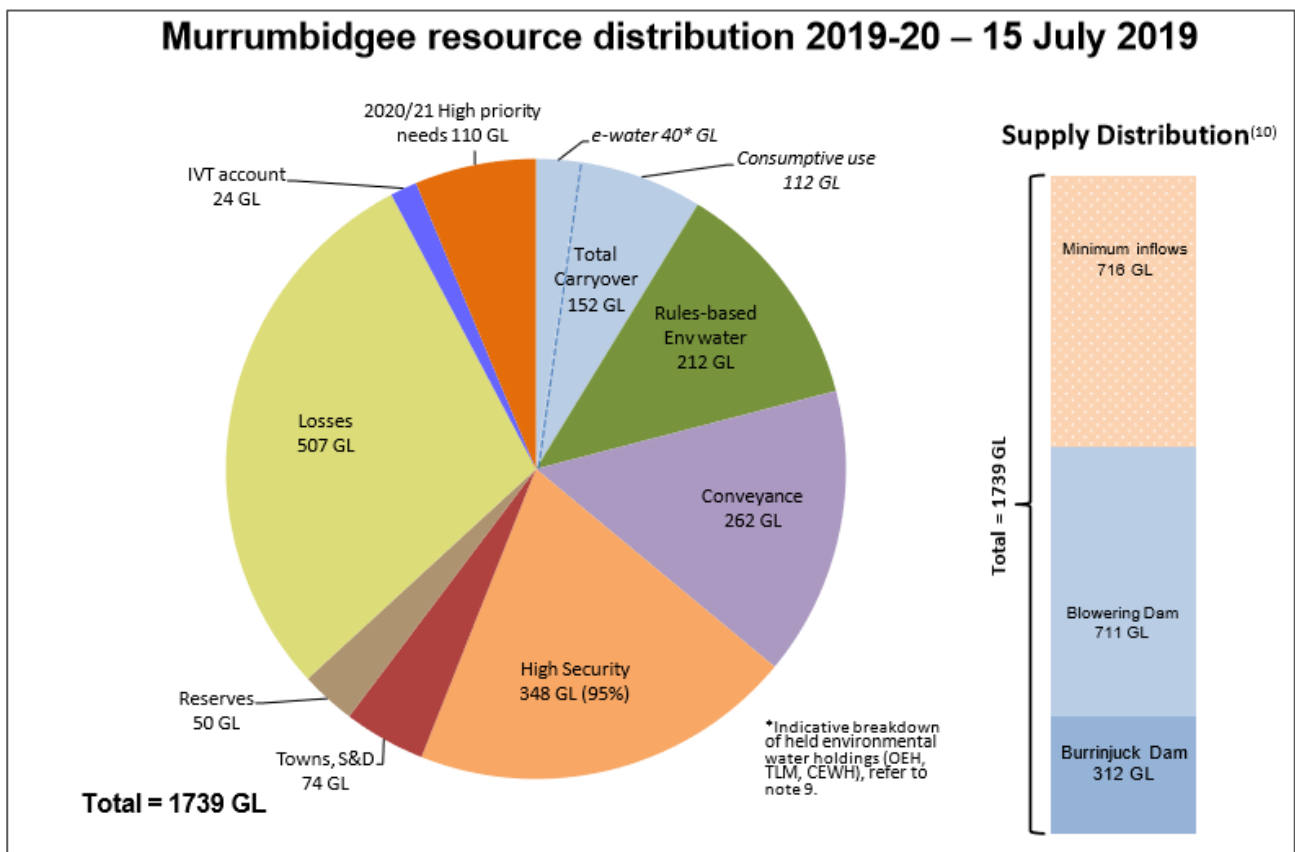
Date	AWD (ML/share)	Total %
1-Jul-19	0.0	0%

In the current water year, 0% of general security Available Water Determinations (AWD) has been announced. For High Security licenses the AWD is 95%, while all higher categories; Domestic and Stock, Local Water Utility, and other high security sub-categories' AWD is 100%.

Conveyance AWDs are about 86% for Coleambally, about 62% for Murrumbidgee Irrigation and 0% for Regulated River Conveyance.

The total share component of regulated licenses is 2,708,435ML (excluding supplementary categories) and the sum of AWD volume is about 684,062ML. The sum of account balance refers to the amount of water available in the license accounts after adjusting for trade and usages. As of 15th July 2019, a total volume (excluding supplementary categories) of 827,283ML remained in account balances, including carryover from last water year.

4.3 Resource assessment



Note: Volumes in the pie chart are in Gigalitres. General Security volumes represent 100% carryover balance. Source: industry.nsw.gov.au/__data/assets/pdf_file/0013/236101/was-murrumbidgee-190715.pdf

4.3.1 Significance of this resource assessment

The Water Allocation Statement published on 15th July 2019 indicated that there was no increase in AWD. At this early stage next year's (i.e. 2020-21) high priority needs have also been met meaning that currently there is no deficit to be met before allocation can accrue to general security entitlement holders. However, a new deficit could grow if inflows are poor. The future inflows of 716GL include estimated minimum natural inflows to dams and downstream tributaries. Burrinjuck and Blowering storages hold about 312 GL and 711 GL respectively at the time of assessment.

4.3.2 Resource assessment process

Resource Assessment is the process of calculating how much water resource is available in the valley based on the rules of the Water Sharing Plan. The above resource assessment chart (Section 4.2) depicts the latest resource assessment done on 15th July 2019. The planning horizon for this resource assessment is from August 2019 to June 2021.

The essential components of the assessment are:

- Calculation of the water currently available, including active water in storage, minimum inflows and the Snowy Hydro Required Annual Release (RAR) into Blowering Dam (subject to Dry Inflow Sequence Volume) and partly to Burrinjuck Dam as Montane flows.
- Volumes remaining in licence accounts, planned environmental water, undelivered inter-valley trades and allowances for transmission and storage evaporation losses.
- Typically, the resource assessment is undertaken twice every calendar month from late June until there are full allocations.

The main feature in the assessment process is that at no point of time in the forecast period do Burrinjuck or Blowering Dam fall below the dead storage level before the end of the assessment period (i.e. before the 2nd winter inflows).

The resource assessment data is communicated by WaterNSW to the Department to allow the Available Water Determination on the first business day on/after the 1st and 15th of each month. On receipt of the AWD Order WaterNSW makes the necessary changes to the license accounts in the Water Accounting System and disseminates the information to the customers through customer notices and weekly report.

4.4 Prognosis

The chances of improved General Security Allocation based on various possible inflow scenarios:

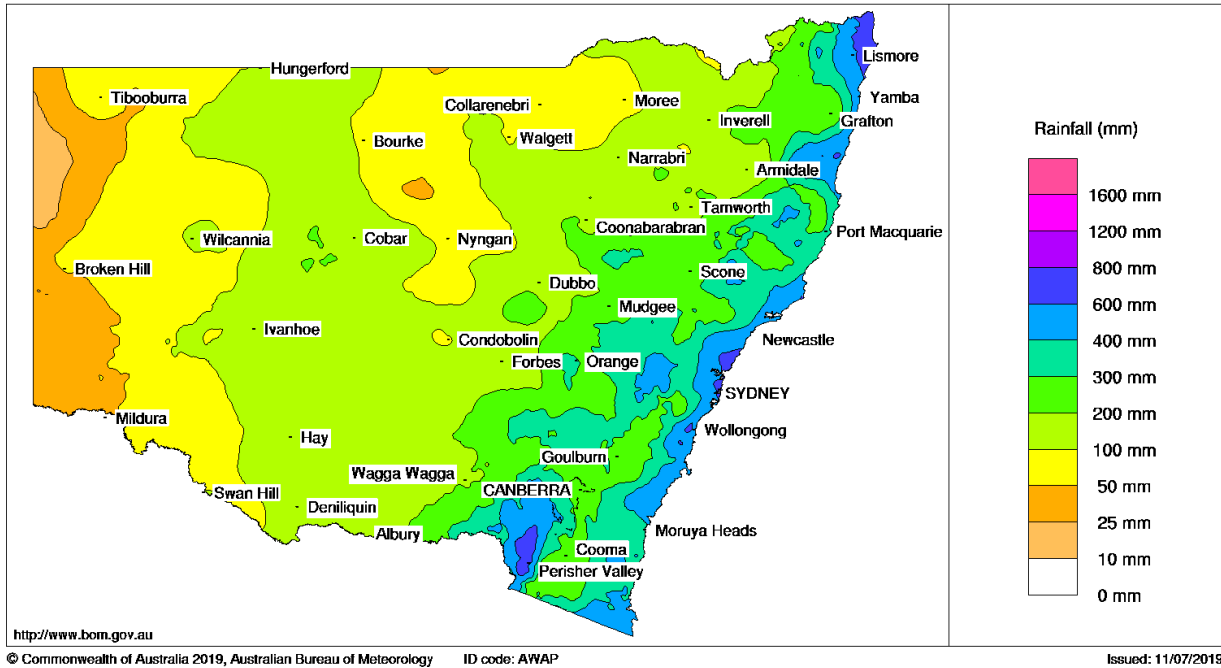
Potential inflows conditions	Probability	2019/20 Allocation by start of September 2019 for assessment carried out mid July 2019	2019/20 Allocation by start of November 2019 for assessment carried out mid July 2019
Droughts (99)	99th percentile inflows 99 chances in 100	0%	0%
Very dry (90)	90th percentile inflows 9 chances in 10	0%	0%
Dry (75)	75th percentile inflows 3 chances in 4	0%	10%
Median (50)	50th percentile inflows 1 chance in 2	5%	25%

The probability quoted for each allocation is the likelihood of that allocation being reached or exceeded by the start of months indicated. These allocations are in addition to remaining carryover from previous seasons. The estimated average carryover from last water year into 2019-20 is about 8%.

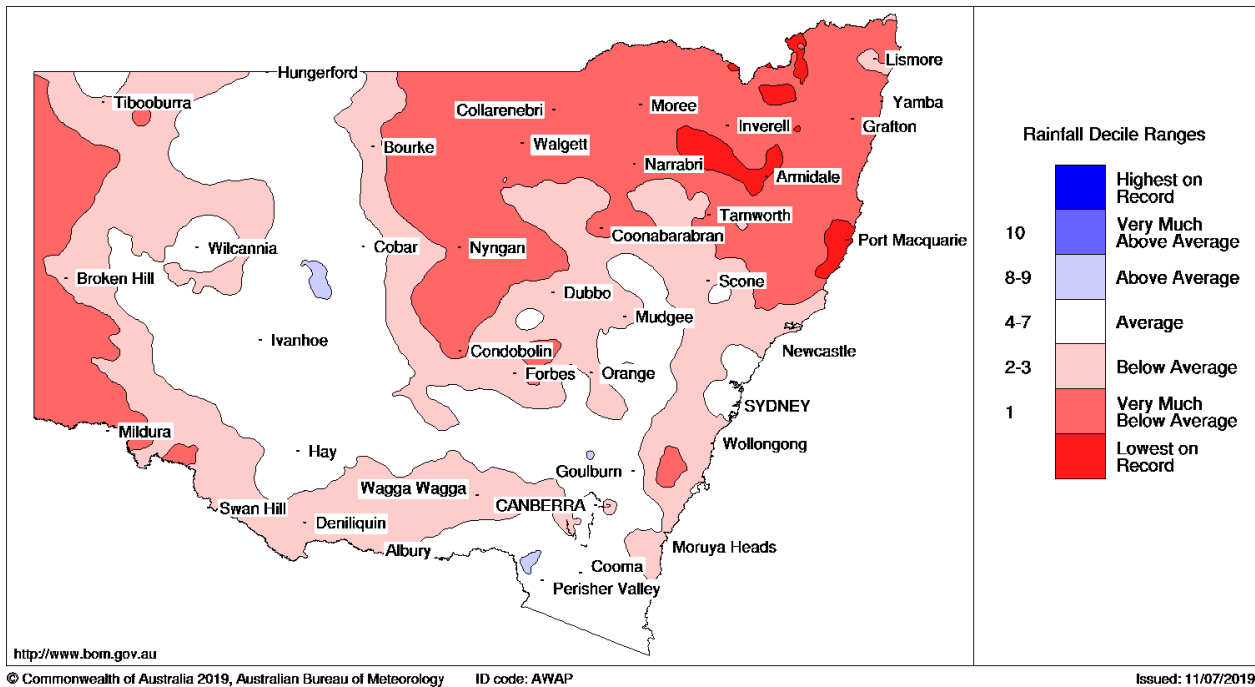
5. Rainfall

5.1 6-month rainfall

New South Wales Rainfall totals (mm) 1 January to 30 June 2019
Australian Bureau of Meteorology



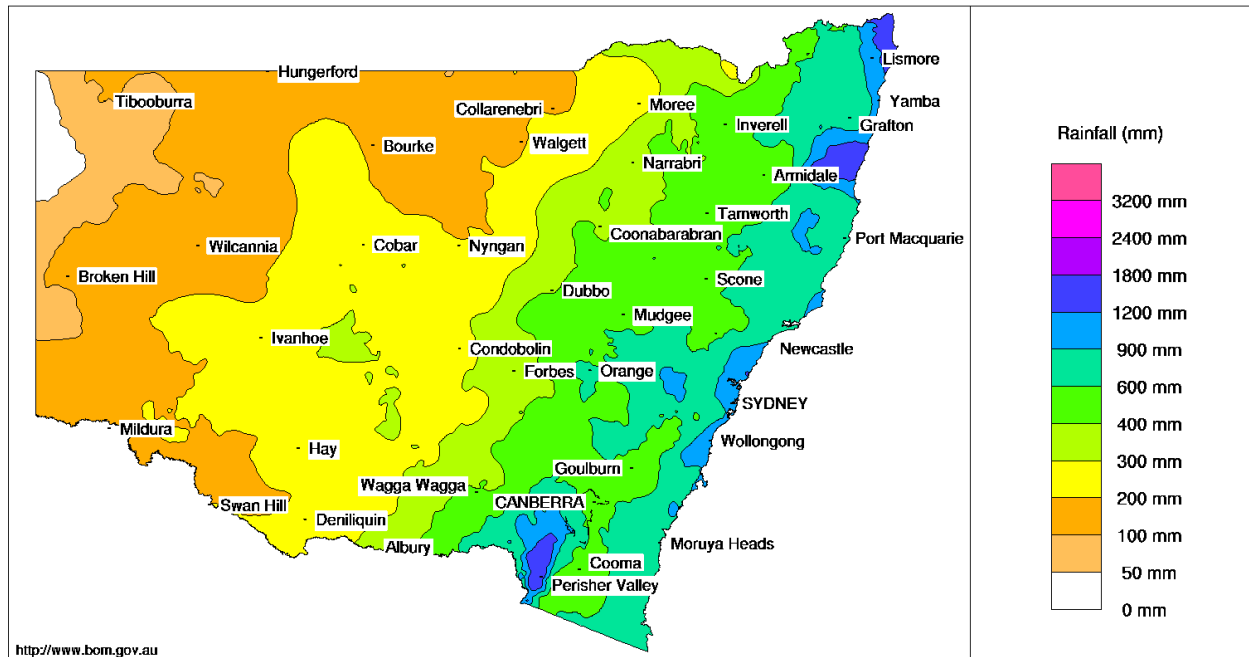
New South Wales Rainfall Deciles 1 January to 30 June 2019
Distribution Based on Gridded Data
Australian Bureau of Meteorology



Above figures indicate that rainfall varies across the catchment. During the last 6-months, total rainfall lies in the range of 100 to 400mm which is average to below average.

5.2 12-month rainfall

New South Wales Rainfall totals (mm) 1 July 2018 to 30 June 2019
Australian Bureau of Meteorology

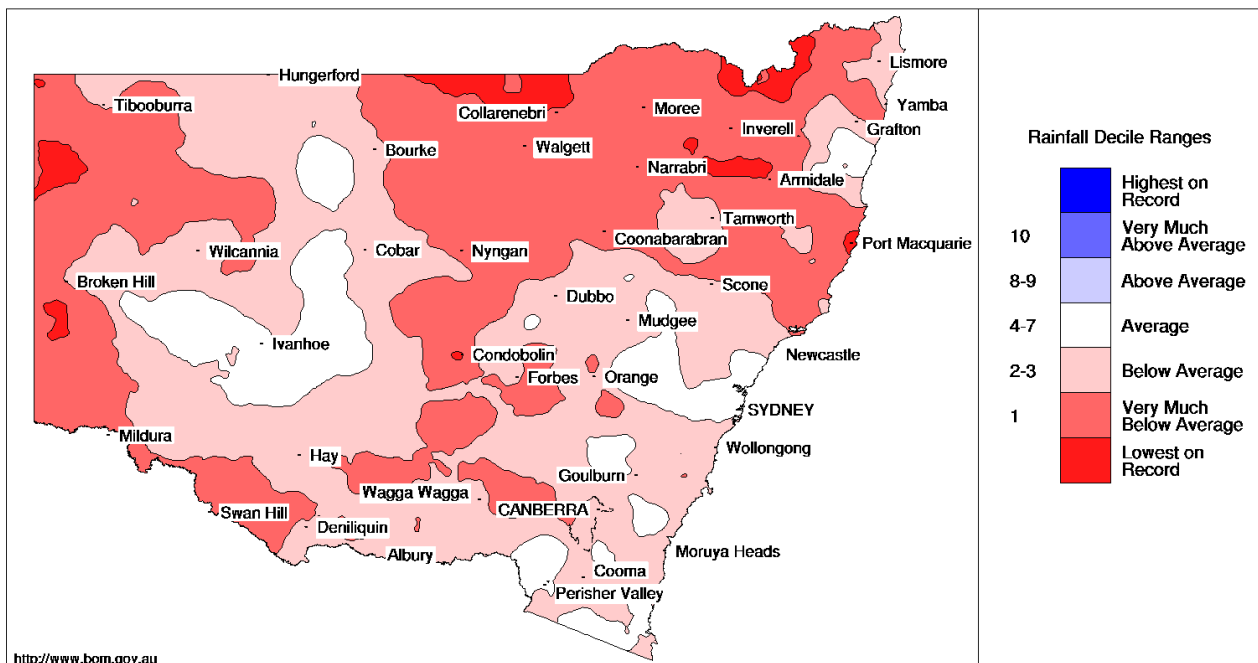


<http://www.bom.gov.au>

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New South Wales Rainfall Deciles 1 July 2018 to 30 June 2019
Distribution Based on Gridded Data
Australian Bureau of Meteorology



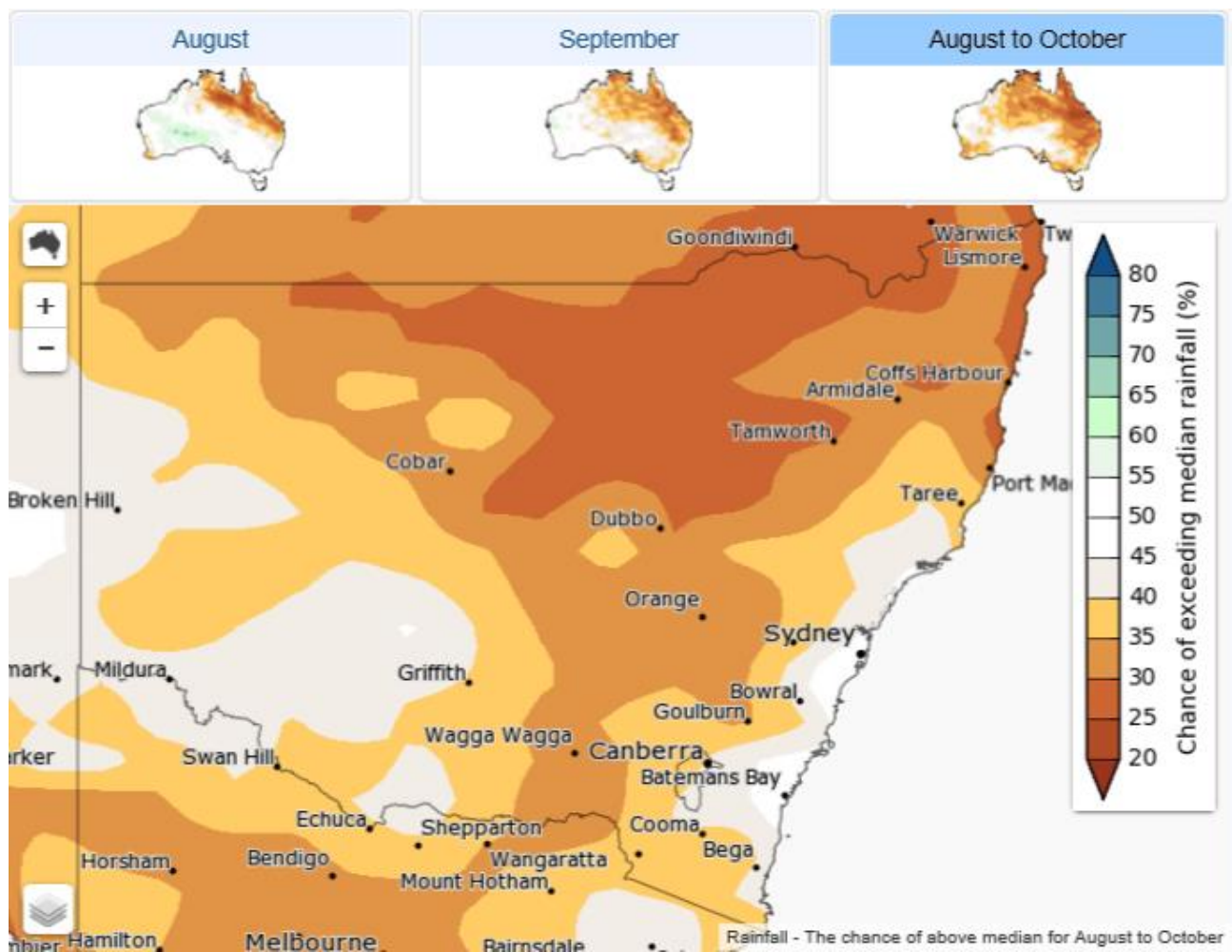
<http://www.bom.gov.au>

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Above figures indicate that 12 month rainfall varies across the catchment with total rainfall in the range of 200mm to 400mm in western part and 400mm to 900mm in the eastern part of the catchment. 12-month statistics indicate that Murrumbidgee catchment remained below average conditions.

5.3 Next 3 months scenario based on BOM forecast

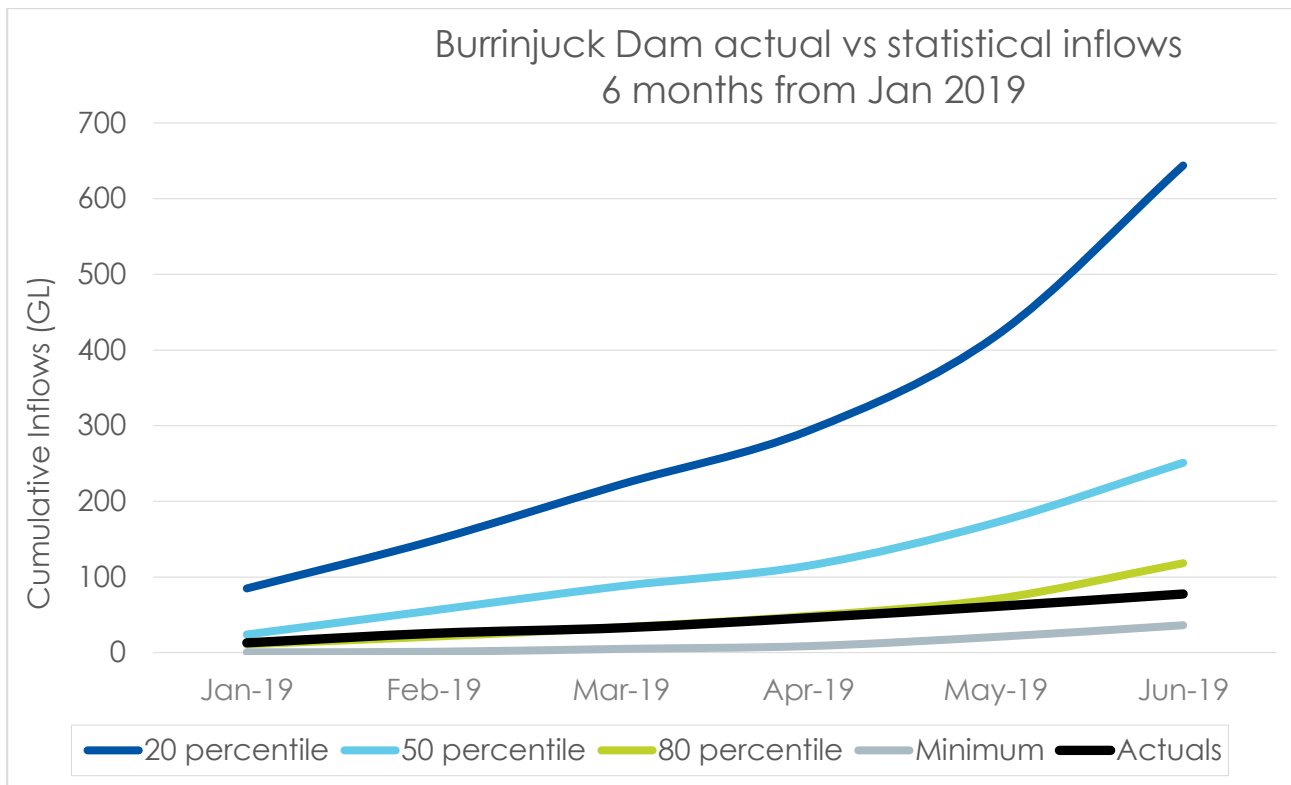


The above figure shows seasonal rainfall forecast over the next three months (August to October). The forecast rainfall is likely to be drier than median in the catchment.

6. Inflows

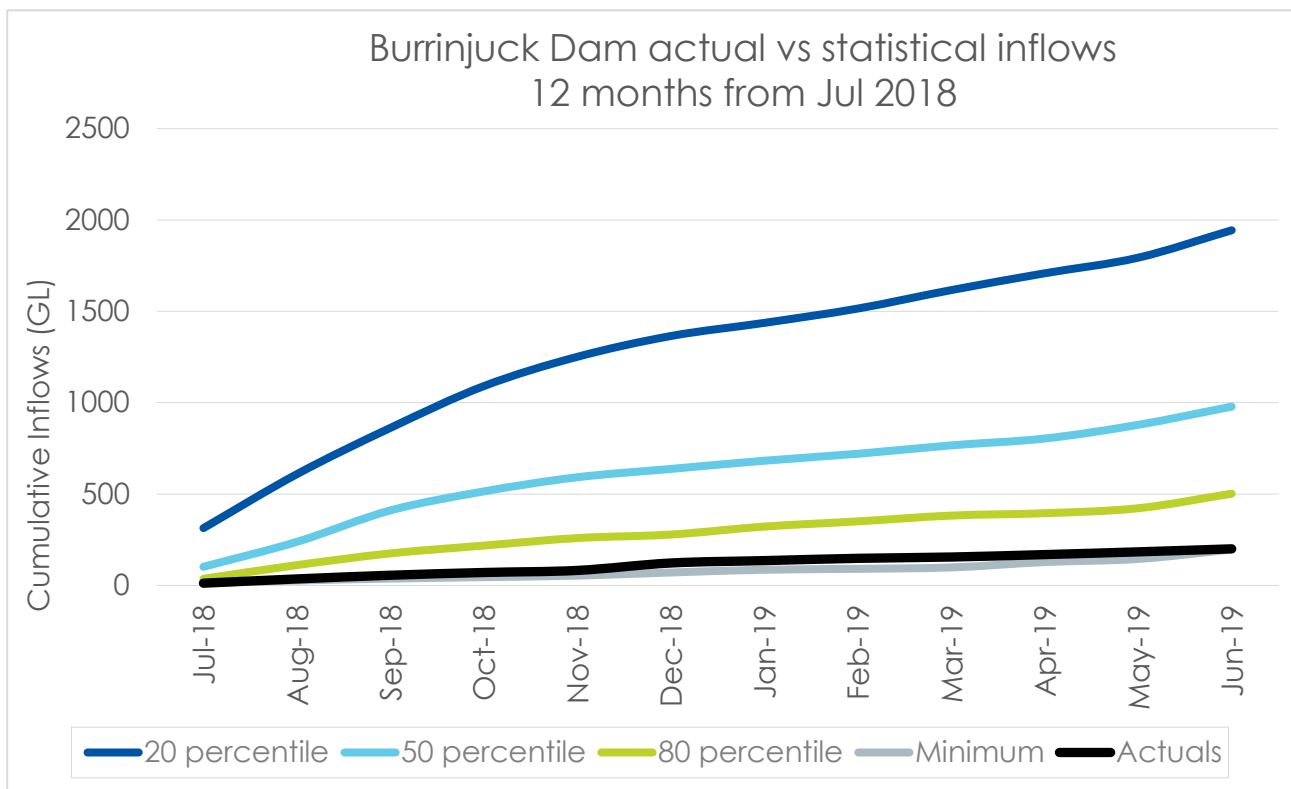
6.1 Burrinjuck Dam inflows

6.1.1 Burrinjuck past 6-month inflows - actual vs statistical



Inflows are consistent with rainfall over the past 6 months. Actual inflow for the 6 months is 78 GL in line with about 89 percentile inflows; while the minimum is 36 GL.

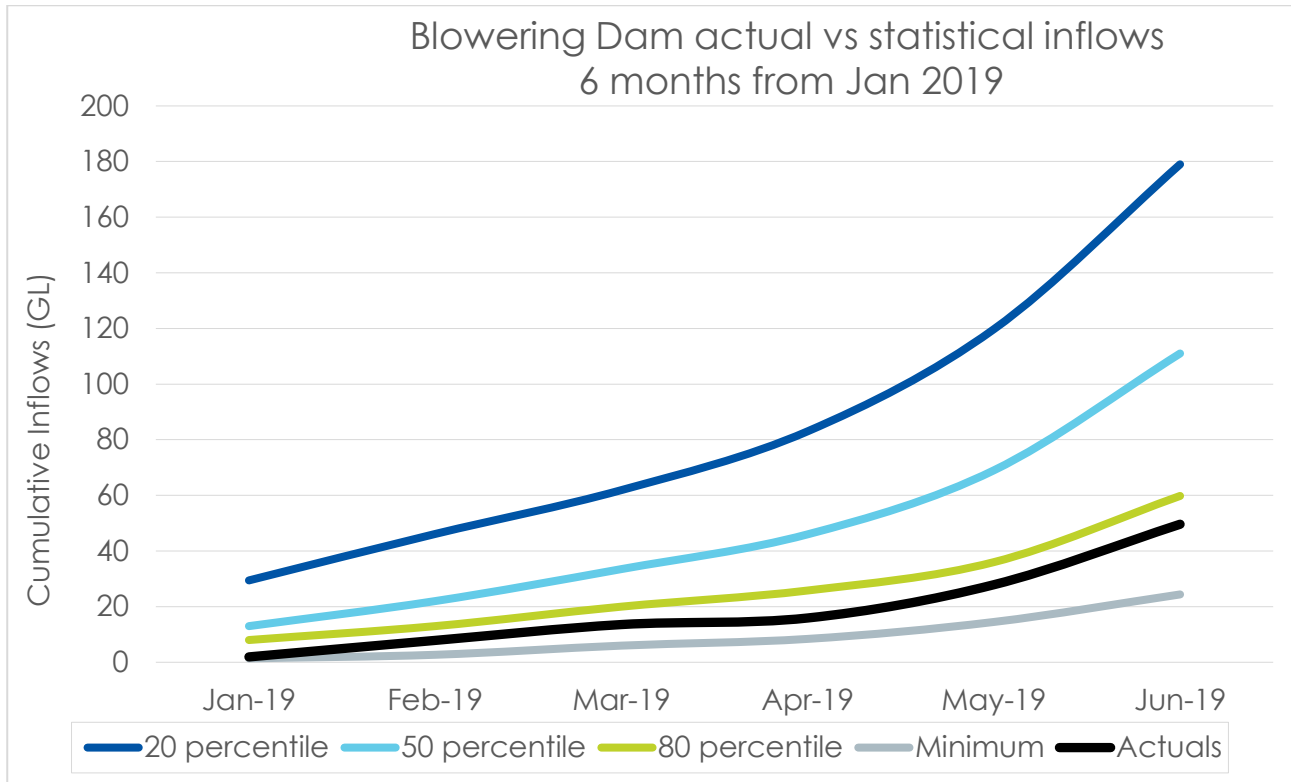
6.2.2 Burrinjuck past 12-month inflows – actual vs statistical



Inflows are consistent with rainfall over the past 12 months. Actual inflow for the 12 months is 200 GL in line with about 99 percentiles; while the minimum is 197 GL.

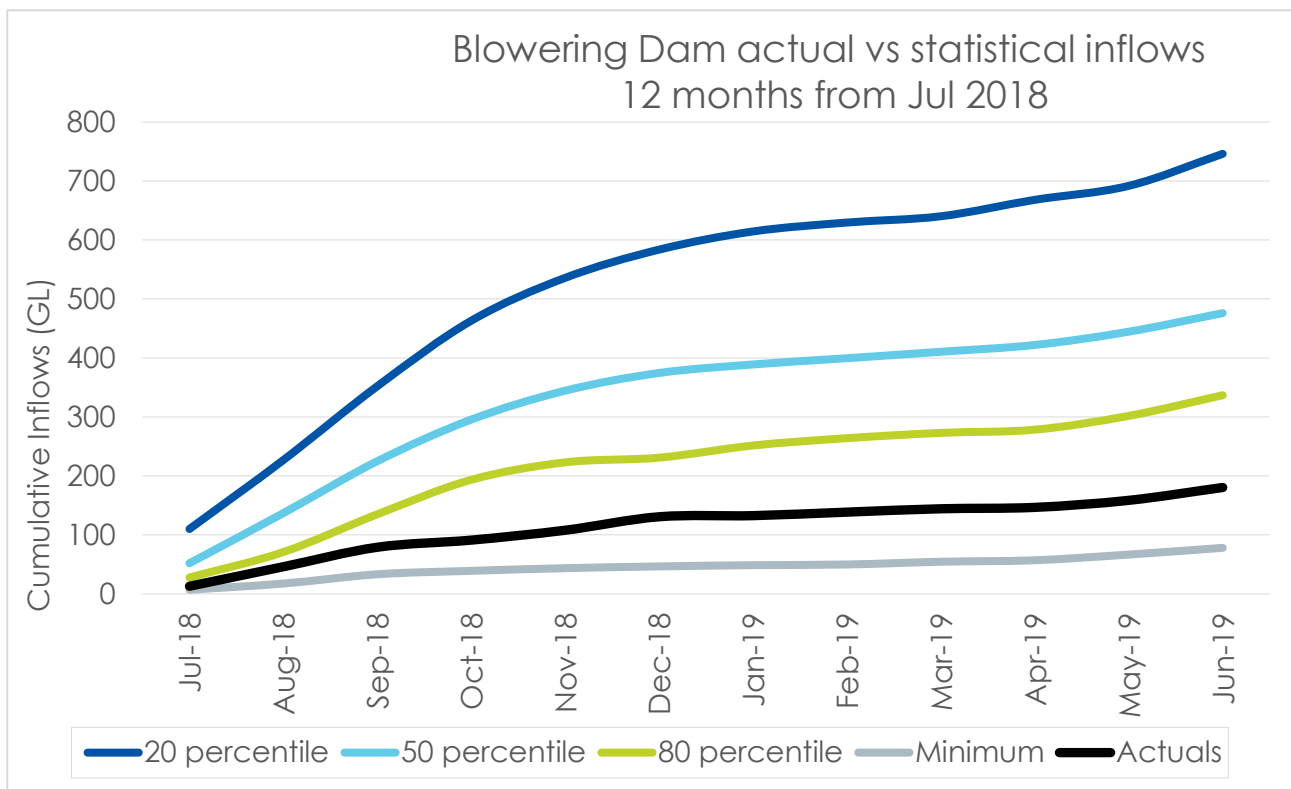
6.2 Blowering Dam inflows

6.2.1 Blowering past 6-month inflows – actual vs statistical



These inflows are exclusive of Snowy Hydro's Required Annual Release volumes. Inflows are consistent with rainfall over the past 6 months. Actual inflow for the 6 months is 50 GL in line with about 85 percentile inflows; while the minimum is 24 GL.

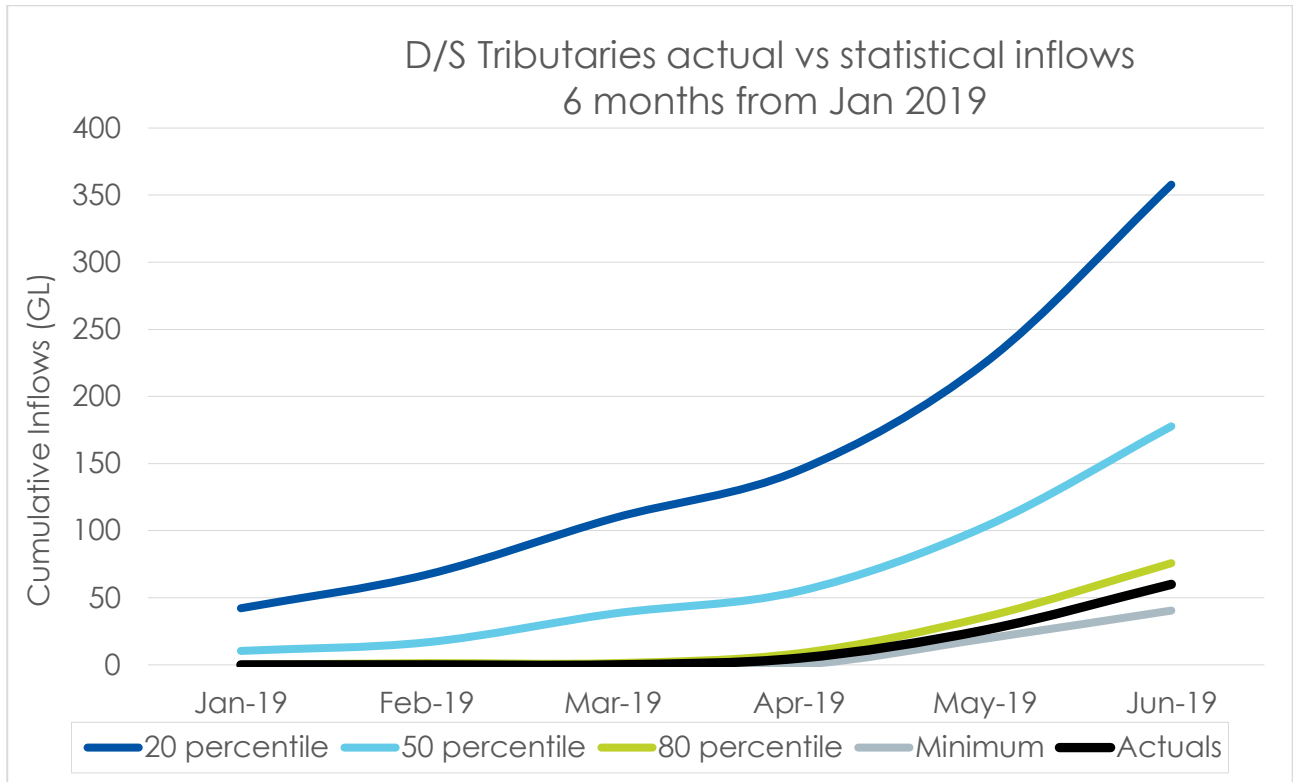
6.2.2 Blowering past 12-month inflows – actual vs statistical



Inflows are consistent with rainfall over the past 12 months. Actual inflow for the 12 months is 180 GL in line with about 91 percentile inflows; while the minimum is 78 GL.

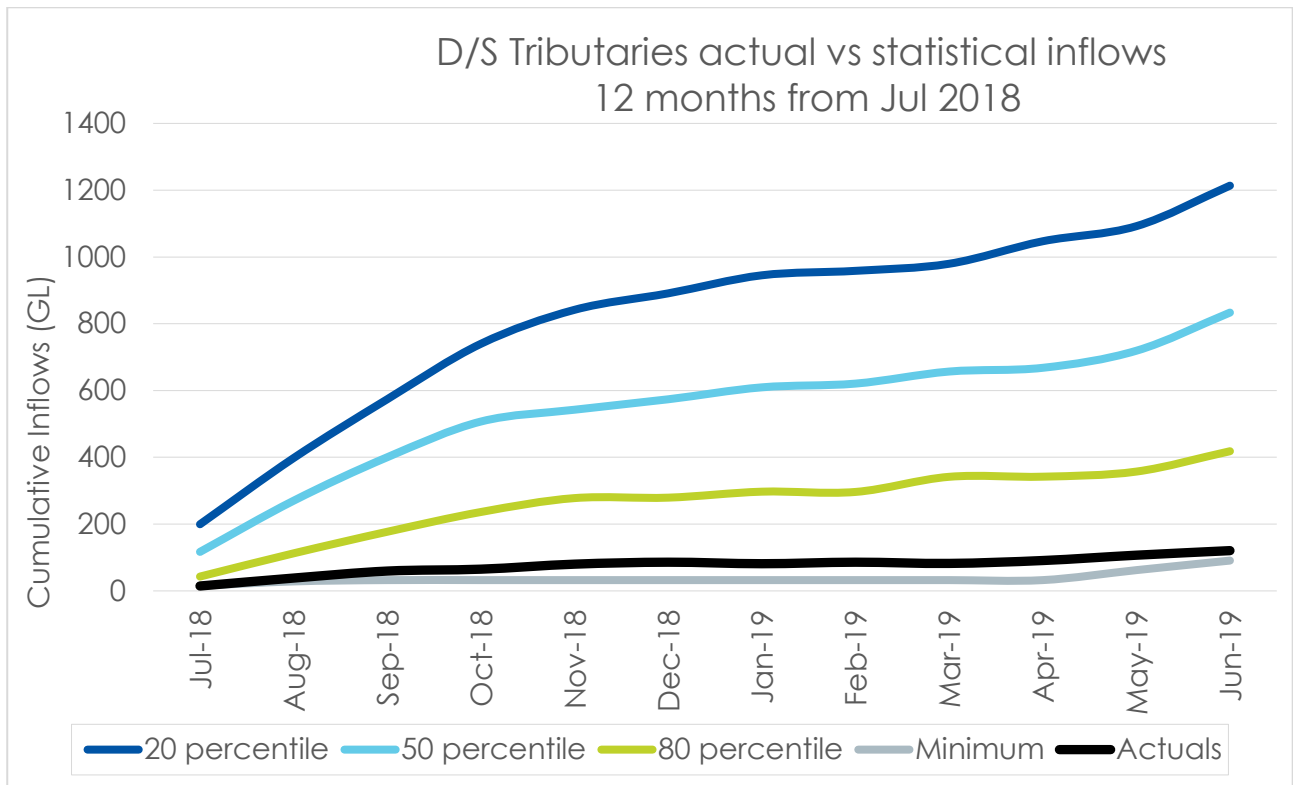
6.3 Downstream tributary inflows

6.3.1 Downstream tributary past 6-month inflows – actual vs statistical



Inflows are consistent with rainfall over the past 6 months. Actual inflow for the 6 months is 60 GL in line with about 88 percentile inflows; while the minimum is 40 GL.

6.3.2 Downstream tributary past 12-month inflows – actual vs statistical



Inflows are consistent with rainfall over the past 12 months. Actual inflow for the 12 months is 121 GL which is following 97 percentile inflow condition; while the minimum is 90 GL.

7. Inter valley transfer (IVT)

The trading of allocated water is allowed in accordance with the Water Sharing Plans between the regulated Murrumbidgee River and Murray River, Lower Darling River and Snowy River catchments. The Murrumbidgee inter-valley transfer (IVT) account keeps track of net allocation trade to and from the Murrumbidgee valley, and the delivery of that water to the Murray. A positive IVT account balance means there is currently net trade out of the valley that has not been delivered to the Murray. Trade into the Murrumbidgee can only occur as a back-trade of water that has been traded out but not yet delivered to the Murray. A negative value would mean net trade into the valley from downstream which cannot be physically delivered from the Murray to the Murrumbidgee valley. A negative balance means further trade into the valley is not allowed as this water cannot be physically delivered upstream.

7.1 Tagged licences

An entitlement can be 'tagged' on a register, allowing the water to be taken at the different location in another hydraulically connected valley. Like other water licenses, the tagged licenses are also subject to water ordering conditions. The license holder should place a valid water order with WaterNSW before water is extracted. The approval of such water orders is subject to prevailing IVT trade conditions.

7.2 Current status

The 2019-20 IVT opening balance was about 24 GL.

- As at 15 July the IVT trade into Murrumbidgee is open.
- As at 15 July the IVT trade out of Murrumbidgee is open.

For most recent update refer to [Murrumbidgee IVT Account](#). Customers can subscribe to IVT email at waterNSW.com.au/customer-service/news/subscribe.

8 Operational surplus

8.1 Operational surplus to date

Operational surplus is water released from storage above that which could reasonably be expected to pass the last extraction point on each given river/creek. Two main causes of operational surplus are over ordering, and rain rejection during the irrigation season when the river flow is being controlled to meet consumptive demands and environmental flow requirements to minimise surpluses.

The operational surplus is deemed as nil when the system spills due to tributary inflows under wet conditions, and when the dams are on minimum release.

Operational surpluses are a significant concern in the regulated system because lost water may not be providing significant environmental benefits and it compromises the long-term water security in the valley.

In the Murrumbidgee River system, the operational surplus is measured at Balranald and Darlot. However, at times operational surplus is also noted at Bundidgerry Escape and Warriston Weir. The following chart provides the operational surplus in the valley. The chart also shows the operational surplus as a percentage of diversions in the valley (regulated sales, planned and discretionary environmental flows, and IVT delivery). WaterNSW targets the operational surplus to be less than 5%. In the Murrumbidgee Valley, delivery of IVT assists in minimising the operational surplus as the IVT delivery rates and pattern is negotiated with MDBA so that during a period of IVT delivery the operational surplus is minimal.

Operations surplus for 2019/20 in the Murrumbidgee valley is forecast to be about 45GL (upper bound).

Murrumbidgee River - Water Delivery Operational Surplus Vs Sales - 2018-19 Cumulative %

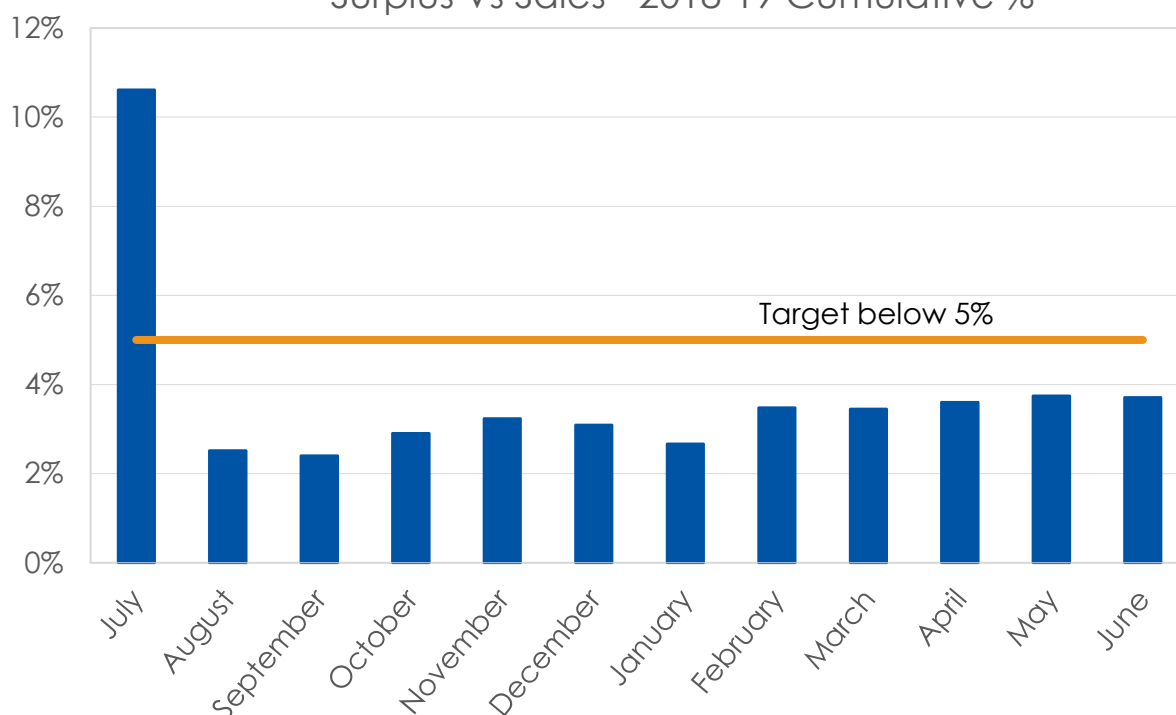


Table below shows last water year's (2018-19) sales & environmental delivery (1,331GL) and operational surplus(49GL).

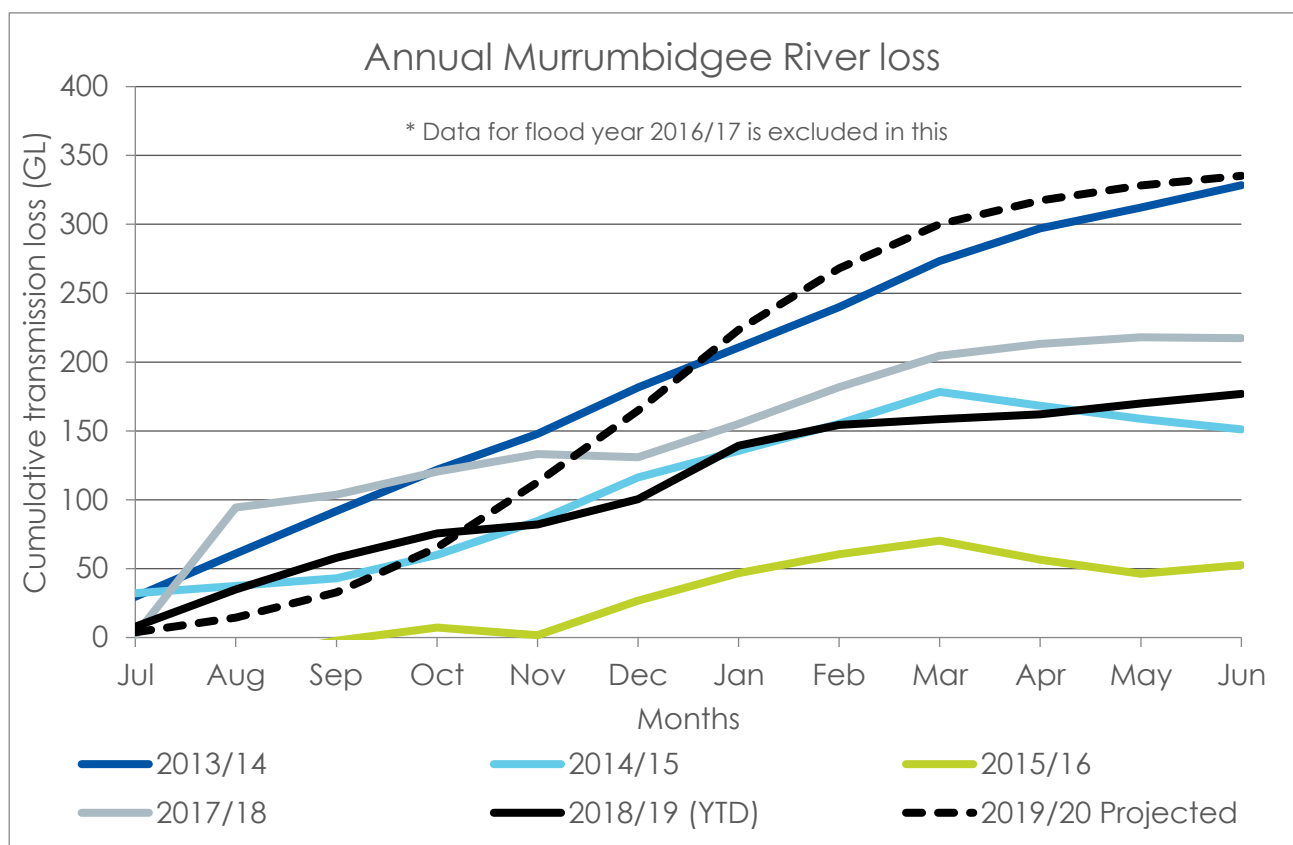
Murrumbidgee cumulative totals GL (2018-19 water year)

Dates	Sales + environmental delivery	Operational surplus	Actual	Target
July	36	4	11%	5%
July-Aug	162	4	3%	5%
July-Sep	327	8	2%	5%
July-Oct	523	15	3%	5%
July-Nov	645	21	3%	5%
July-Dec	790	24	3%	5%
July-Jan	998	27	3%	5%
July-Feb	1,163	40	3%	5%
July-Mar	1,248	43	3%	5%
July-Apr	1,298	47	4%	5%
July-May	1,319	49	4%	5%
July-Jun	1,331	49	4%	5%

9 Transmission Losses

The transmission loss is a major part of the essential requirements to run the river. The transmission loss includes but not limited to Basic Landholder Rights (BLR), channel net evaporation, potential evapotranspiration along river banks, groundwater seepage, losses to floodplain or effluent streams, or during overbank flows, gauging and metering errors. The transmission loss for the Murrumbidgee River system and the Yanco – Colombo - Billabong systems are treated separately.

The transmission loss for Murrumbidgee River is calculated from the water balance between Wagga Wagga and Balranald, considering diversions by the licenced customers, diversions into Yanco Creek and Lowbidgee channels, and net difference in the re-regulation storages and channel storages. The following chart shows the estimated annual transmission losses for Murrumbidgee River over last five years 2013/14 excluding the flood year 2016/17.



In the above chart the transmission loss in 2015/16 was very low because of the wet conditions both at the start and end of the year.

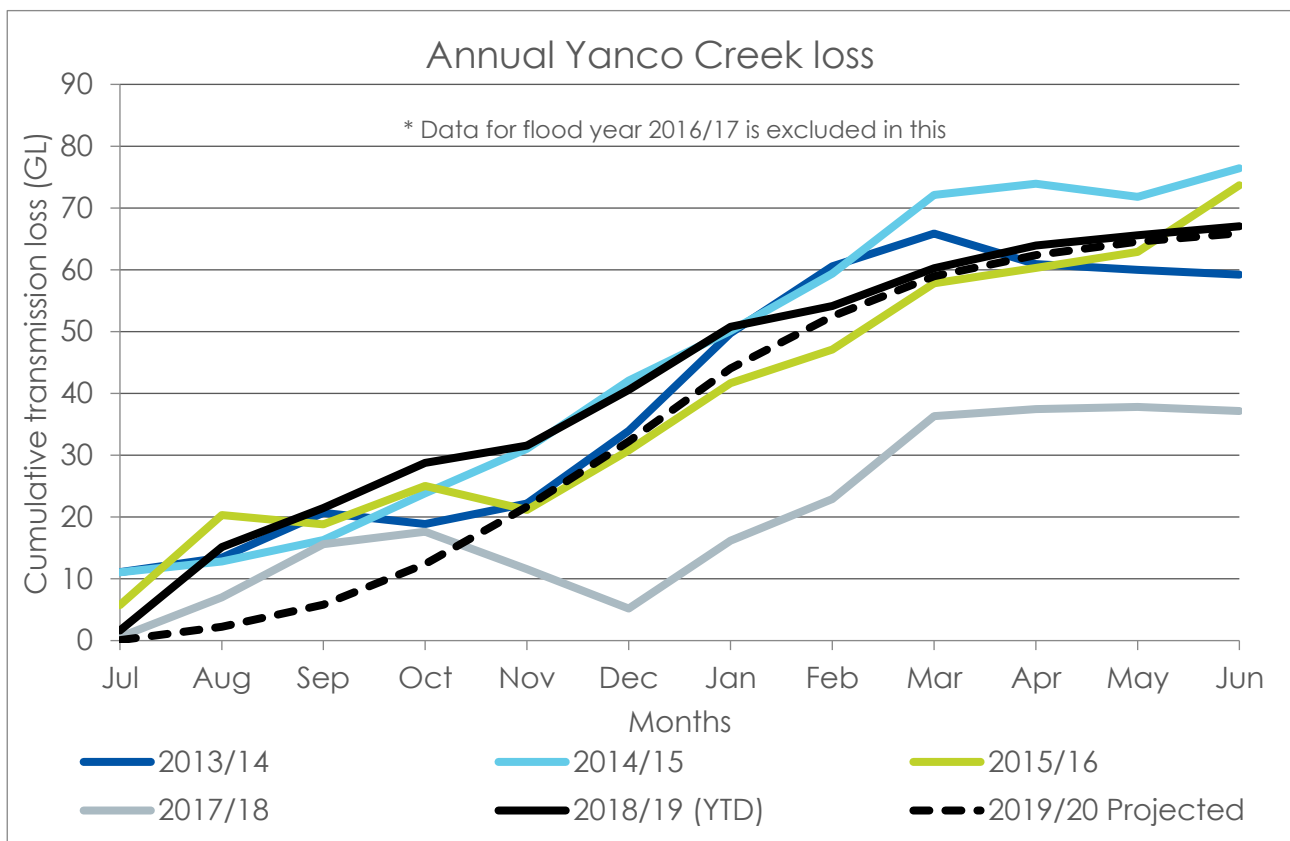
The approach adopted to forecast the river transmission loss under the resource assessment process is based on the total forecast regulated sales in the valley. Based on the historic relationship between

these two parameters an envelope curve has been adopted that is governed by the following equation:

$$Loss (ML) = 0.03 * Regulated Sale (ML) + 310,000$$

Where, regulated sale is the forecast on-allocation diversions by the licenced customers. However, the budget is continually reviewed at each month to adjust for increased or decreased system losses. The above chart also shows how the the initial budget made at the start of the current water year (2019/20) in this month.

The transmission loss in Yanco Creek is estimated as the water balance between the total inflows into the system including Offtake flows, unregulated inflows from Billabong Creek measured at Cocketgedong, regulated inflows from the escapes from irrigation corporations and metered / assessed extractions in the creek system and the end of system flows at Darlot and Warriston weir. The following chart shows estimated transmission losses for Yanco Creek over the last five years excluding the flood year 2016/17.



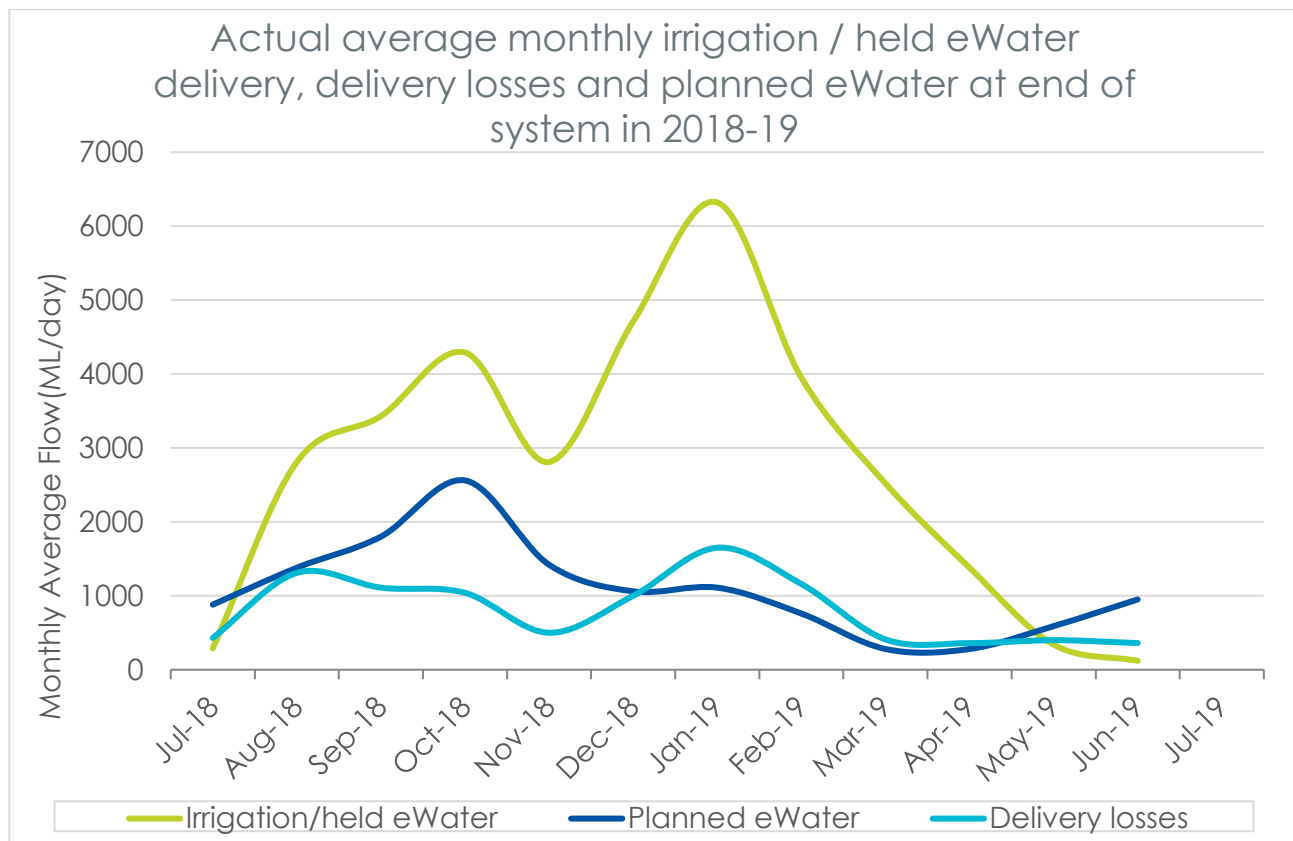
The average annual transmission loss in the Yanco – Colombo – Billabong system has a fixed budget of about 70GL. This is based on the historic data available with WaterNSW. However, the budget is continually reviewed at each month to adjust for increased or decreased system losses. The chart also shows the current initial budget made at the start of the water year (2019/20) in this month.

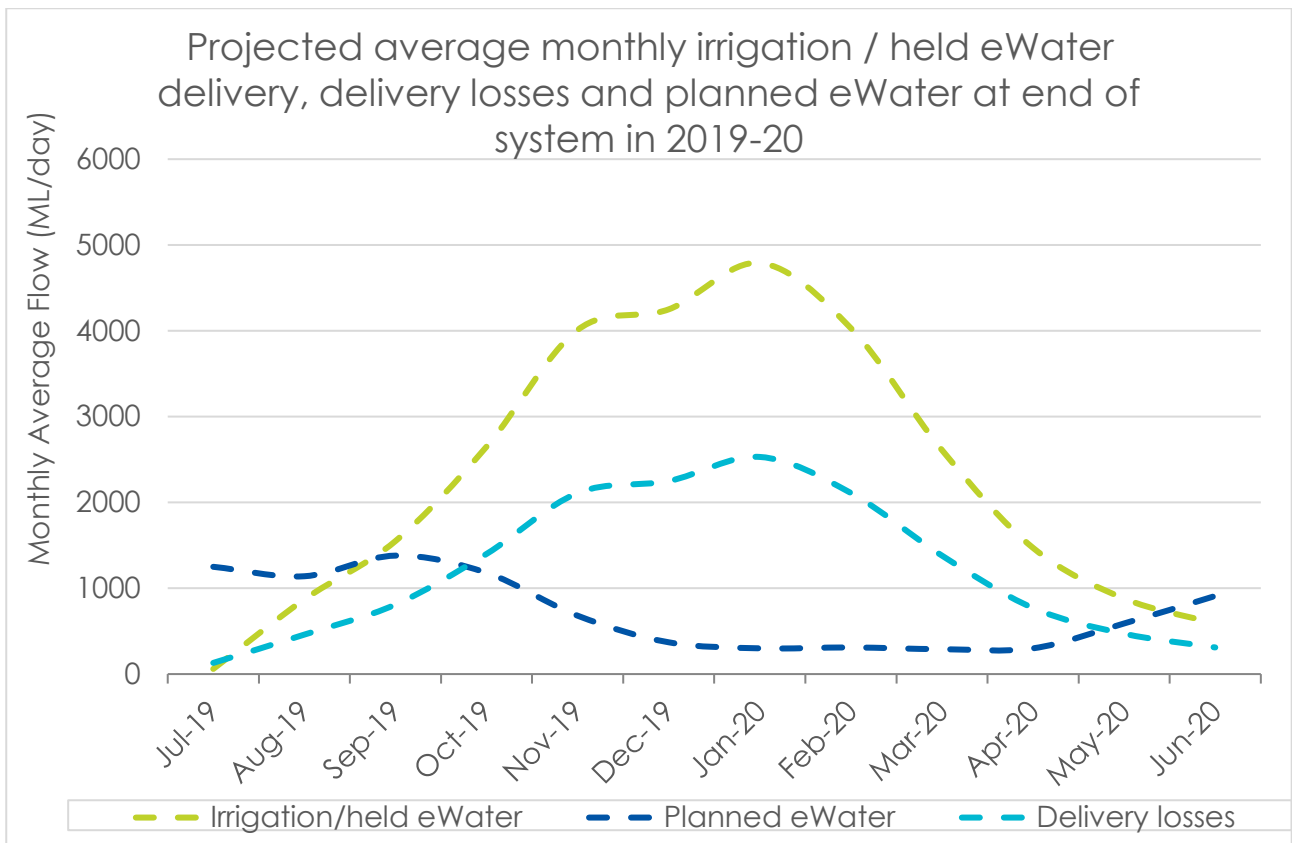
10 Storage forecast

The system demands are met from the following sources:

- Blowering Dam
- Burrinjuck Dam
- Downstream tributaries

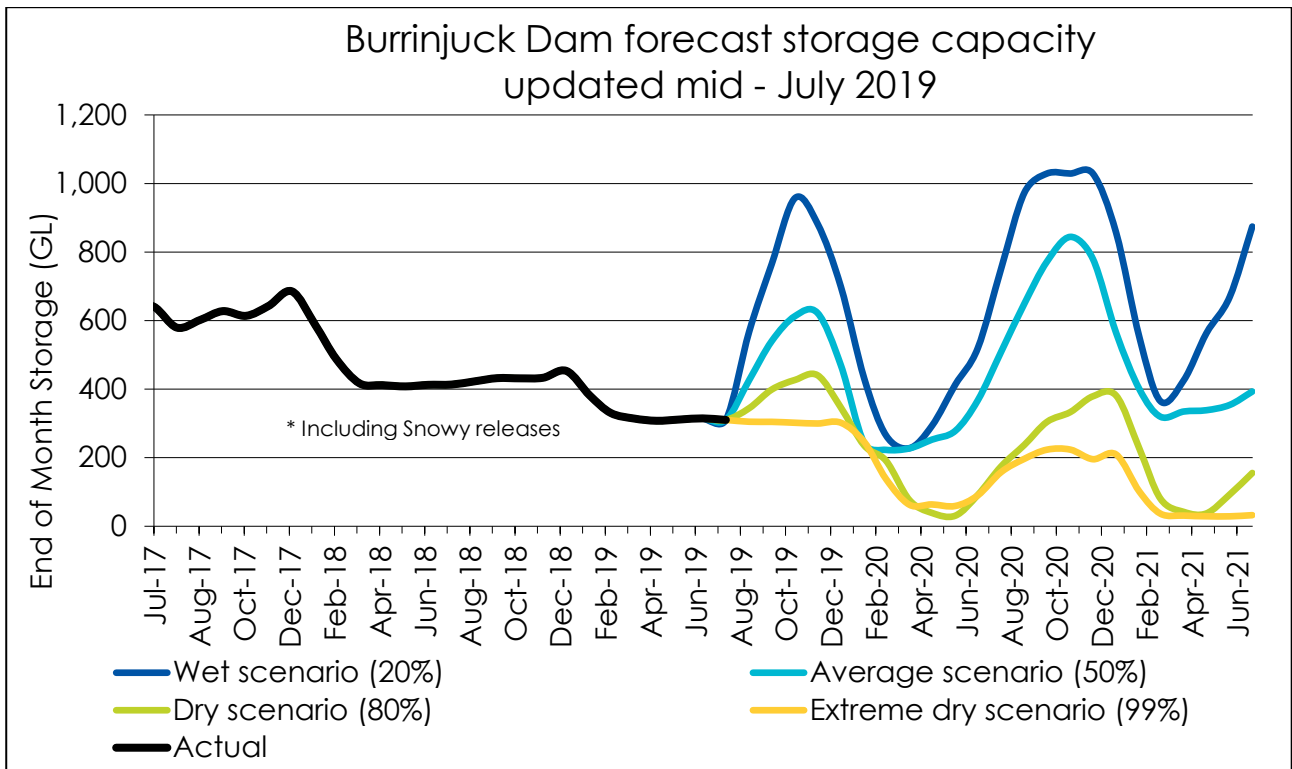
The operational procedures are intended to maximise the conservation of water resources so the demands downstream of Gundagai are firstly met from tributary flows and minimum planned environmental releases from Blowering and Burrinjuck Dams. Additional system demands are next met from Blowering and Burrinjuck Dams in proportions that balance the chances of emptying or spilling both storages in the forecast period, subject to the Tumut River channel constraints. The figures below indicate the actual and projected daily average delivery to licensed customers, Planned Environmental Water (including end of system flows at Balranald and Darlot) and transmission losses over 2018-19 and 2019-20 respectively.



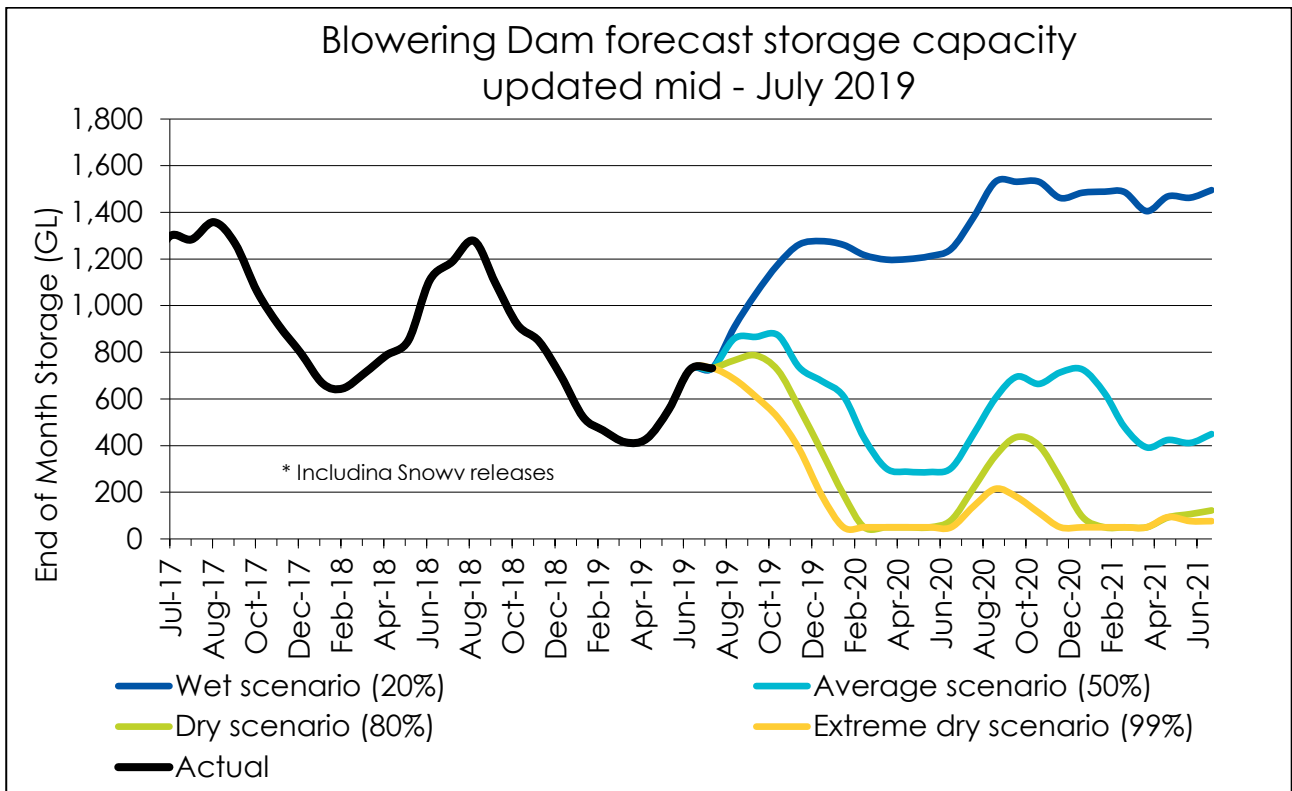


The following two figures demonstrate the behaviour of Burrinjuck and Blowering Dams under various inflow conditions until June 2021. For example, under wet inflow sequence (20th percentile) Burrinjuck dam may fill and spill (100%) at the end of Aug 2020. Chances of Exceedance (COE) in the figures indicates the possibility of that storage level being exceeded by these dates.

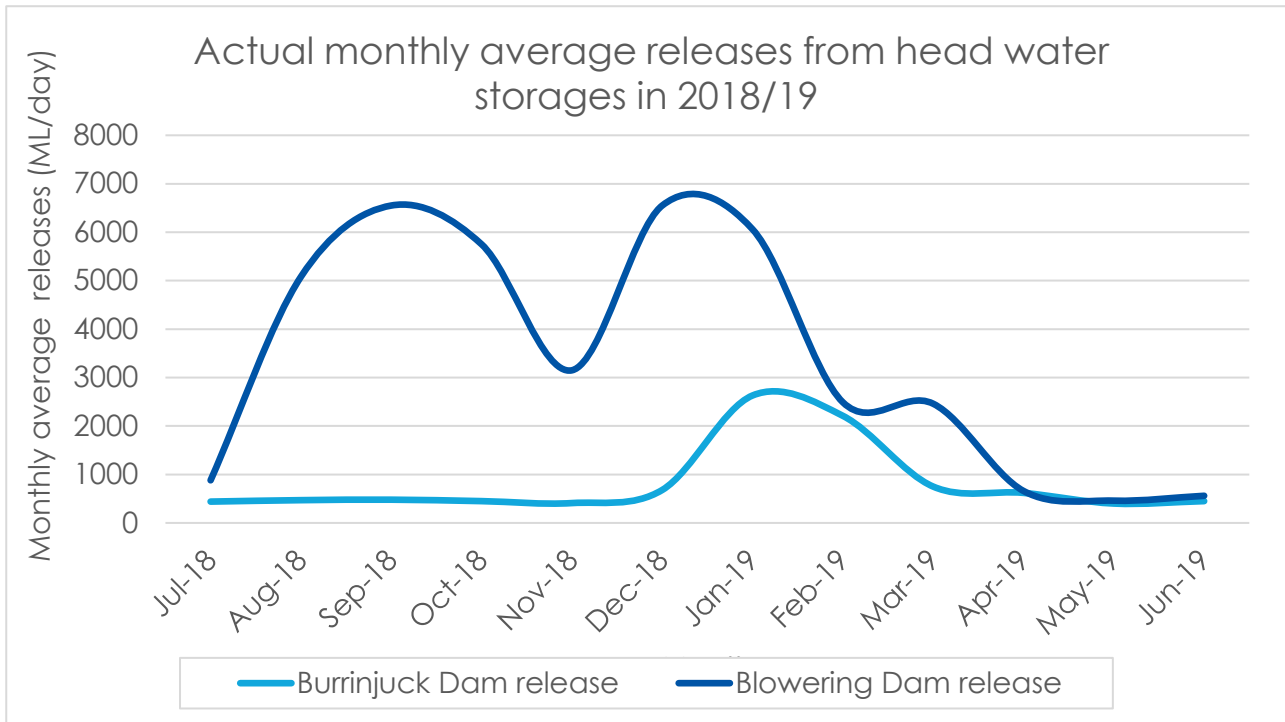
10.1 Burrinjuck storage forecast



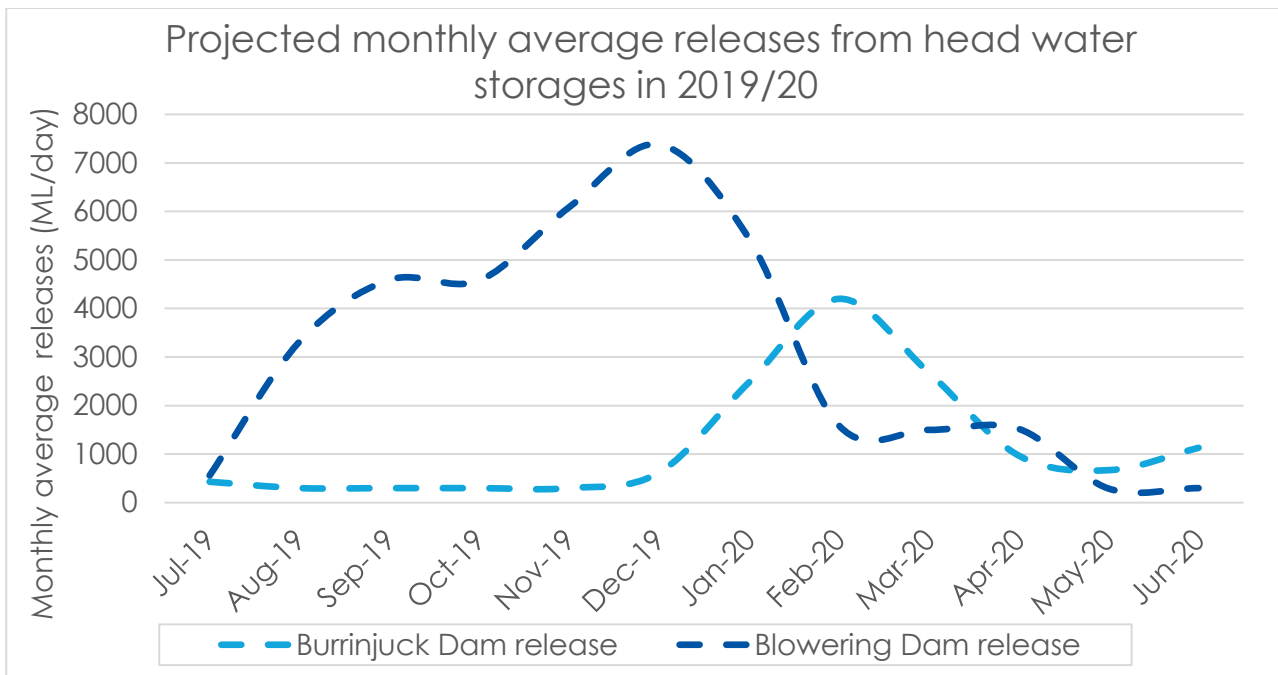
10.2 Blowering storage forecast



10.3 Actual and Planned releases



The above Figure shows the actual monthly average releases from Burrinjuck and Blowering dams over the period of 2018/19 under a continuation of dry conditions.



The above Figure shows the planned monthly average releases from Burrinjuck and Blowering dams over the next 12-months period under a continuation of dry conditions.

11 Outage planning

Most routine maintenance work on the water infrastructure in the Murrumbidgee valley is undertaken during the winter period. Maintenance work on the following structures are withheld / in progress for want of suitable flow conditions. They will be completed at the earliest opportunities.

Item	Time	Status	Description
Berembed Weir and offtake	June to July 2019	In progress	The planned coating works of gates and annual winter maintenance
Gogeldrie Weir	June to July 2019	Nearing completion	Winter maintenance works and gearbox replacement
Maude Weir	Aug 2019	Planning underway	Annual winter maintenance
Nimmie Creek regulator	May to August 2019	In progress	Replace actuators and upgrade solar power supply
Redbank Weir	June to Aug 2019	In progress	Planned winter maintenance works, coating of gates
Tarabah Weir	Apr to July 2019	In progress	Replace gates with lay flats and Upgrade solar power supply.
Tombullen inlet regulator	June to Aug 2019	In progress	Replace actuators and upgrade solar power supply
Yanga and Waugorah regulators	June to Aug 2019	Planning underway	Gate replacement

12 Recreational events

Several community recreational events are organised along the Murrumbidgee river system. For the safety, economic, social, and cultural benefit of the community, additional service may be provided by WaterNSW by maintaining a suitable flow level, subject to prevailing irrigation / environmental demands. In other words, the supply of water and conservation of water takes priority when operational decisions are made. Where possible WaterNSW will schedule operations to assist these events when this will not compromise efficient operations.

Month	Location	Recreation event	Specific requirement
Jan	General	Australia Day	High weir pool levels
Feb	Hay	Fishing Classic	High weir pool
Feb	Wagga	Gumi race	Lower river levels
Feb	Darlington Point	Fishing Classic	Steady, higher flow levels at Darlington Point
Mar	Leeton	Bidgee Classic	Steady, higher levels at Gogeldrie Weir
Mar	Balranald	Fishing classic	Higher flows at Balranald
Apr	General	Easter Weekend	High weir pool levels
May	Tumut	Fly fishing	Low river levels
Oct	Tumut	Trout fishing	Moderate river levels

13 Flow targets

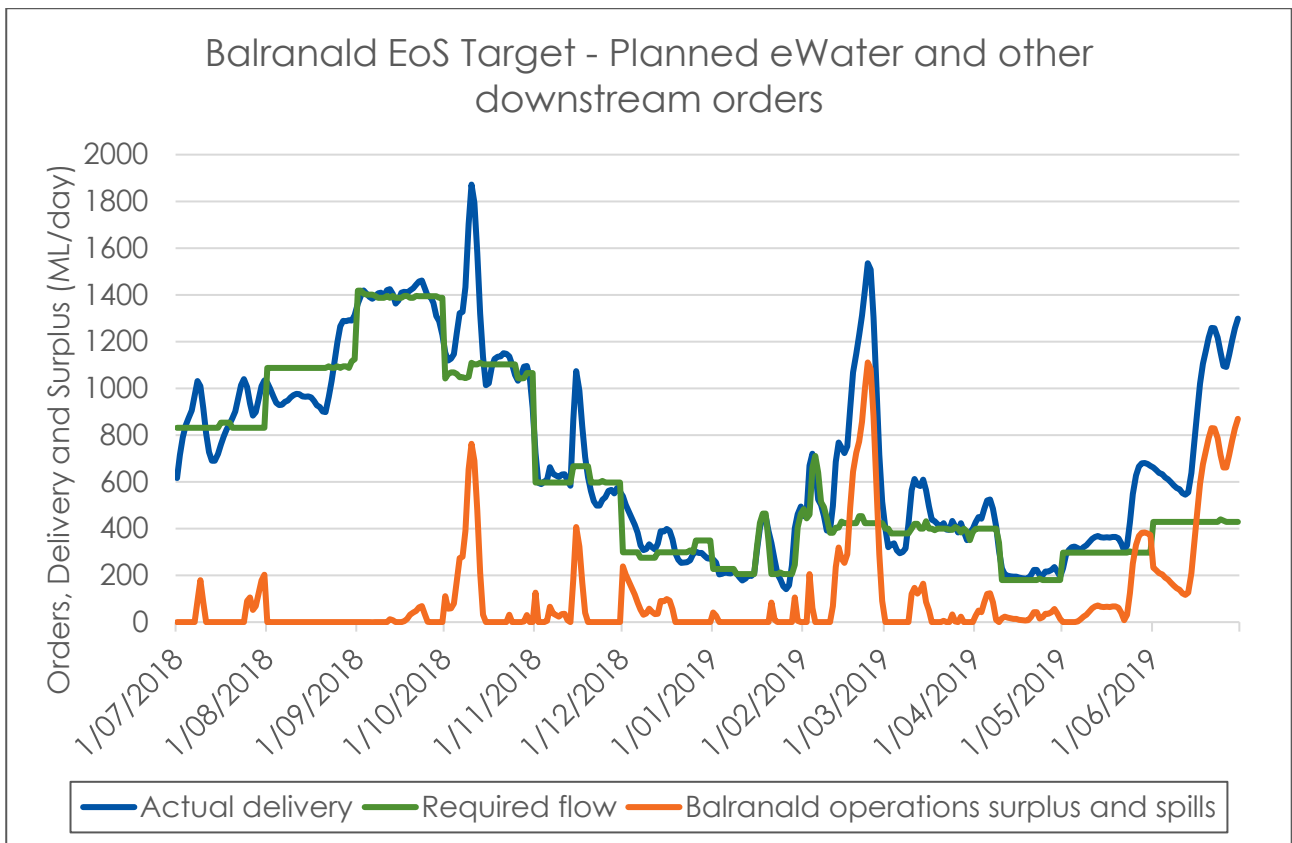
13.1 Minimum flow at Balranald

WaterNSW targets minimum daily flows in the Murrumbidgee River at D/S Balranald gauging site throughout a water year. The minimum daily flow cannot be used to meet access licence water requirements or bulk water transfer requirements (Inter-valley Transfers to the Murray Regulated River system etc.) below Balranald.

Month	Minimum daily flows at Balranald (ML/day)
January	186
February	180
March	180
April	180
May	297
June	429
July	829
August	1,087
September	1,330
October	1,030
November	568
December	254

The supply of the above minimum flows is subject to the following conditions

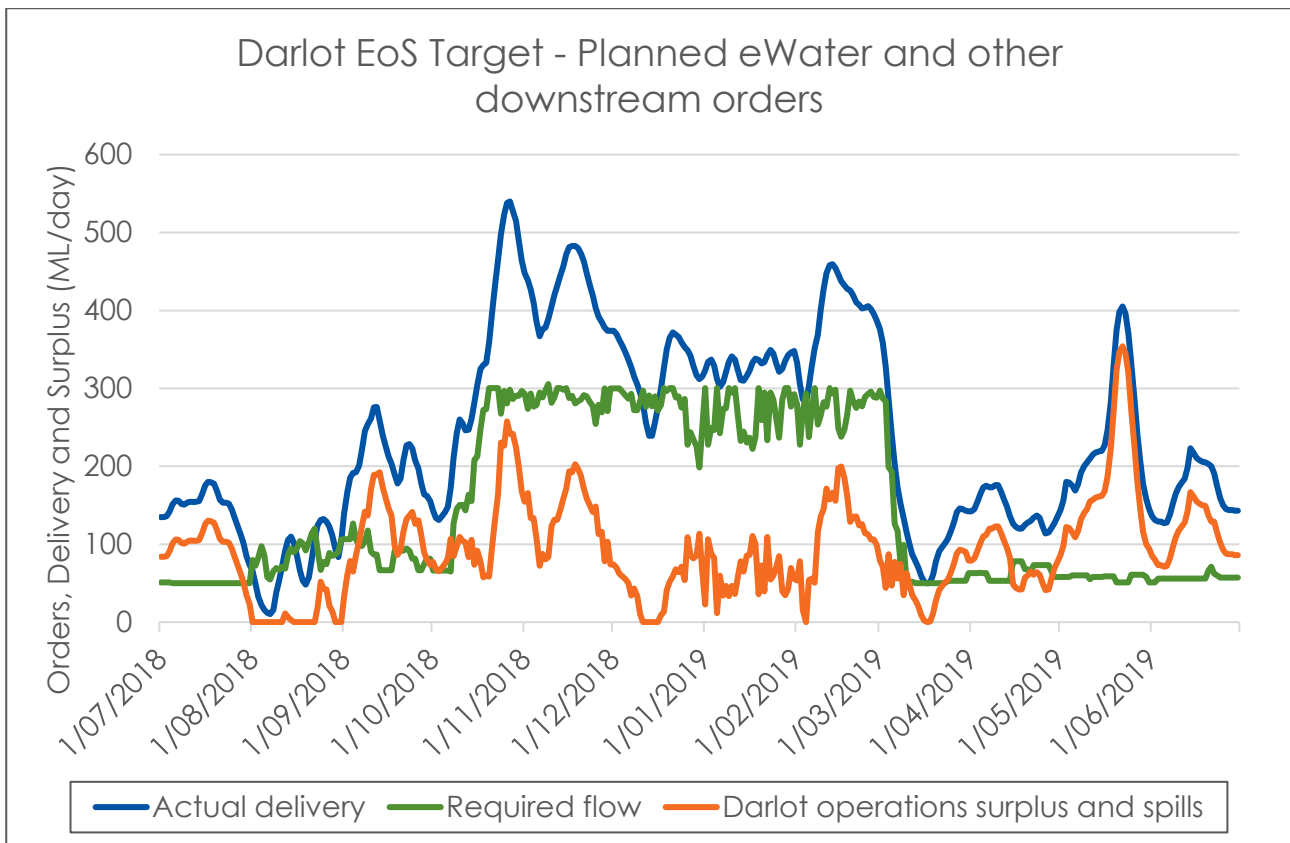
- The average daily flow for each month, measured at Balranald, is maintained at the target minimum environmental flow;
- A variability of 25% below the target is not exceeded for a period greater than seven (7) consecutive days and/or ten (10) days per month;
- Exceedance of the target by up to 25% is used to offset existing shortfalls; and
- The cumulative shortfall in daily target flows for any month is distributed evenly to the daily target for the next month's minimum flow.
- Exceedance of environmental water releases cannot be used as a credit against future shortfalls.



The above Figure shows the Balranald end of system (EoS) actual delivery, required flow and operational surplus. The end of system target includes planned environmental water, irrigation orders below Balranald and any IVT or other operational orders by MDBA. Towards the end of the water year 2018-19, both the dams were on minimum environmental releases and all the re-regulation weirs were either full or under maintenance. Hence, the excess water recorded at Balranald is treated as system spill and not as operational surplus. For details on total operational loss, refer to section 8.1.

13.2 Minimum flow at Darlot

WaterNSW has a minimum daily flow target of 50ML/day in the Billabong Creek at Darlot gauging site throughout a water year. The minimum daily flow cannot be used to meet bulk water transfer requirements (Inter-valley Transfers to the Murray Regulated River system etc.) below Darlot. The supply of the above minimum flows at Darlot is subject to similar conditions as at Balranald (Section 12.1)



The above figure shows the Darlot end of system (EoS) actual delivery, required flow and operational surplus. The end of system target includes planned environmental water, irrigation orders below Darlot and any IVT or other operational orders by MDBA. In the above chart, the required flows are higher from early October 2018 to early March 2019 as MDBA called water through the Finley Escape to partly address the Barmah Choke constraint in the Murray River. Towards the end of the water year 2018-19, both the dams were on minimum environmental releases and all the re-regulation weirs were either full or under maintenance. Hence, the excess water recorded at Darlot is treated as system spill and not as operational surplus. For details on total operational loss, refer to section 8.1.

13.3 Seasonally varied flow targets in the Old Man Creek

After meeting all consumptive demands during non-supplementary periods, the following end of system flow targets are maintained at Kywong (Old Man Creek):

- a) The average September flow – at least 600ML/day
- b) The average October flow – at least 400ML/day
- c) The average November flow – at least 100ML/day

- d) From December to April a minimum flow of 60ML/day
- e) Between May and August, the Beavers Creek Offtake regulator gates remain fully open.

The above flow conditions are to be met only when possible with existing river levels in the Murrumbidgee River, without additional releases from the head water storages.

13.4 In-stream operational targets

- Minimum instream flows at the following locations are targeted for operational purposes, when possible:
 - Yanco Creek @ Downstream Tarabah Weir – 60ML/day
 - Yanco Creek @ Morundah – 65ML/day (to be revised based on maintenance work)
 - Yanco Creek @ Wiraki – Up to 70ML/day
 - Billabong Creek @ Downstream Hartwood Weir – 25ML/day
 - Tumut River @ Oddy's bridge 100ML/day
 - Tumut River @ Tumut 500ML/day
 - Murrumbidgee River @ D/S Gogeldrie Weir 200 ML/day
 - Murrumbidgee River @ D/S Maude Weir 100 ML/day
- An operational stream flow target of 800ML/day (=1.0m) at Murrumbidgee R @ Darlington Point to supply customers in the Uri Creek when there are no third-party impacts.
- Maximum flow targets at the following locations to minimise transmission losses:
 - Colombo Creek @ Morundah - 600ML/day

More information

Subscribe to our customer information (weekly water availability reports, e-newsletters, etc.) at waternsw.com.au/subscribe.