

# Bega / Brogo Operations Plan

February 2019

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# 1. Highlights

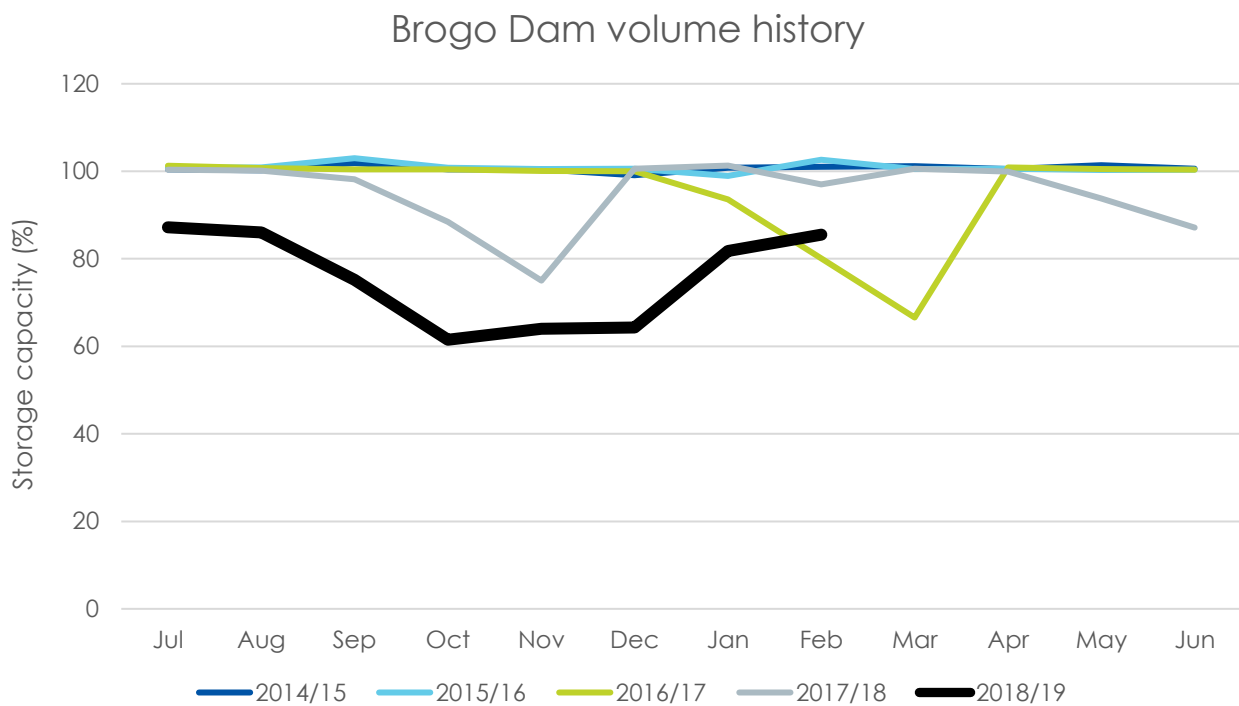
- It is planned to deliver up to 6.2 GL of general security allocation under dry conditions in 2018-19.
- Demand has been consistent and with low inflows, dam releases have continued.
- While the dam remains below 100%, releases will be managed efficiently; high enough to maintain supplies to customers, while being as low as possible.



## 2. Dam storage

### 2.1 Brogo Dam storage

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



The dam was 100% full at the start of last water year (2017 -18) and by the end of November 2018, it was around 59% full. Since then small rain events have led to uncontrolled/supplementary access and inflows into Brogo Dam, with the storage volume at the end of January 2019 around 85%.

## 3. Supplementary access

### 3.1 Commentary

Section 2 (Bega River from the Brogo River junction to the end of the regulated river) has had access to uncontrolled flows four times this year and period of supplementary access.

Period	Section 1A		Section 1B		Section 1C		Section 2	
	Uncontrolled	Supplementary	Uncontrolled	Supplementary	Uncontrolled	Supplementary	Uncontrolled	Supplementary
22/10/18 to 24/10/18	No	No	No	No	No	No	Yes	No
3/12/18 to 5/12/18	No	No	No	No	Yes	No	Yes	No
17/12/18 to 18/12/18	No	No	No	No	No	No	Yes	Yes
18/12/18 to 28/12/18	No	No	No	No	No	No	Yes	No
1/2/19 to 5/2/19	No	No	No	No	Yes	No	Yes	No

### 3.2 Explanation

In the Brogo River taking of water under the supplementary water and uncontrolled flow access licenses is only permitted when flow thresholds are met over the last 24 hours as per the following table:

River reach	River reach definition	Flow reference location	Flow threshold (in excess of) supplementary	Flow threshold (in excess of) uncontrolled
1A	Brogo River from the upper reaches of Brogo Dam to the North Brogo gauge (219025).	Discharge over the Brogo Dam spillway	100 ML/d	50 ML/d rising 20 ML/d falling
1B	Brogo River from the North Brogo gauge to the Angledale gauge (219025)	North Brogo gauge (219013)	100 ML/d	50 ML/d rising 20 ML/d falling
1C	Brogo River from the Angledale gauge to the Bega River junction.	Angledale gauge (219025)	100 ML/d	50 ML/d rising 20 ML/d falling
2	Bega River from the Brogo River junction to the end of the regulated river	Angledale gauge (219025)	100 ML/d	50 ML/d rising

		or Kanoona gauge (219032)	160 ML/d	20 ML/d falling  65 ML/d
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## 4. Water availability

### 4.1 2018/2019 water availability for Brogo

This information was current as 1 February 2019

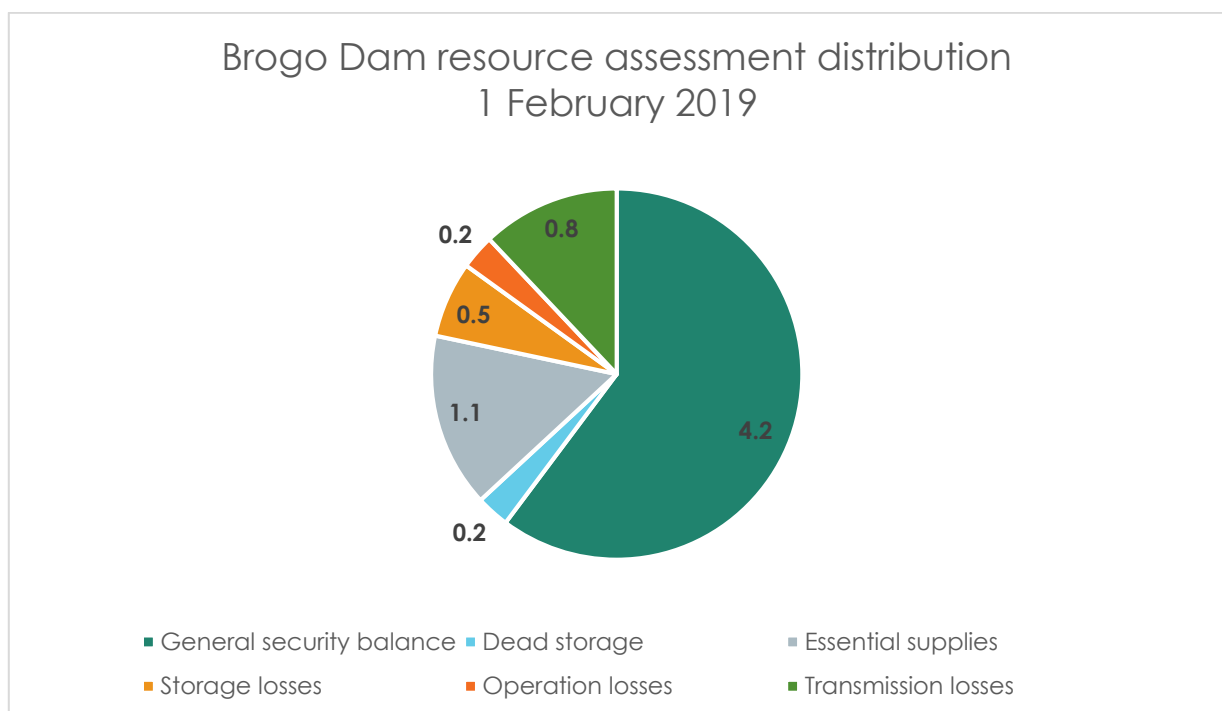
Licence category	Share component	AWD volume	Usage	Balance
Domestic and stock	32	32	6	26
Domestic and stock (domestic)	17	17	3	14
Domestic and stock (stock)	5	5	5	0
Regulated river (general security)	13,946	6,276	2,072	4,204
Regulated river (high security)	422	422	158	264
Regulated river (high security – town water supply)	700	700	195	505
Supplementary water	1,300	1,300	0	1,300
<b>Grand total</b>	<b>16,422</b>	<b>8,752</b>	<b>2,439</b>	<b>6,313</b>

### General security available water determination

Date	AWD (ML/share)	Total
1-Jul-18	0.3	30%
20-Dec-18	0.05	35%
16-Jan-19	0.1	45%

In this current water year, 30% Available Water Determination (AWD) has been announced on 1 July 2018 for General Security (GS). For other water users (e.g. High Security and Town Water Supply), the AWD is 100%. Further increments of 5% and 10% in AWD for GS were received on the 20 December and the 16 January. Total allocation for General security up to 1 February is 45%. No carryover applies in the Brogo/Bega River Valley. The sum of account balance refers the amount of water available to the account of the users after usage. For example, High Security has 264 ML in their account, after an initial AWD of 422 ML and use of 158 ML of water so far in this water year. To the end of January, the total amount of GS water usage is 2,072 ML.

#### 4.2 Resource assessment



Resource Assessment	Feb 2019	Jan 2019	Dec 2018	Nov 2018	Oct 2018
Storage Volume	7.68	7.33	5.774	5.7	5.5
Plus minimum inflows	0.4	0.9	1.7	1.7	1.8
Less dead storage	0.2	0.2	0.2	0.2	0.2
Less storage & operation loss	0.667	0.8	0.933	1.1	1.2

Less essential supplies	1.052	1.262	1.473	2.0	2.2
Less transmission loss	0.833	1.0	1.7	1.3	1.5
Less General Security	4.165	3.55	2.9	3.3	3.3
Allocation	45%	45%	35%	30%	30%

#### 4.2.1 Significance of this resource assessment

The resource assessment at 1<sup>st</sup> February 2019 reflects the inflows that have led to an increase in allocation by 10%, making it total 45%. Minimum inflows are expected to be 0.4 GL till June 2019.

Transmission losses are the conservative estimate of the volume required to run the river under dry conditions through to June 2019 to meet all demands, which is estimated at 0.833 GL for the remaining months in the current water year. This mostly comprises natural transmission losses as water evaporates and soaks into the river bed.

As at 1 February 2018, essential supplies are estimated at 1.052 GL for the remainder of the current water year, which includes town water, high security licenses, environmental water allowance and S&D. Storage and operation losses are estimated at 0.667 GL for the rest of the year.

#### 4.2.2 Resource assessment process

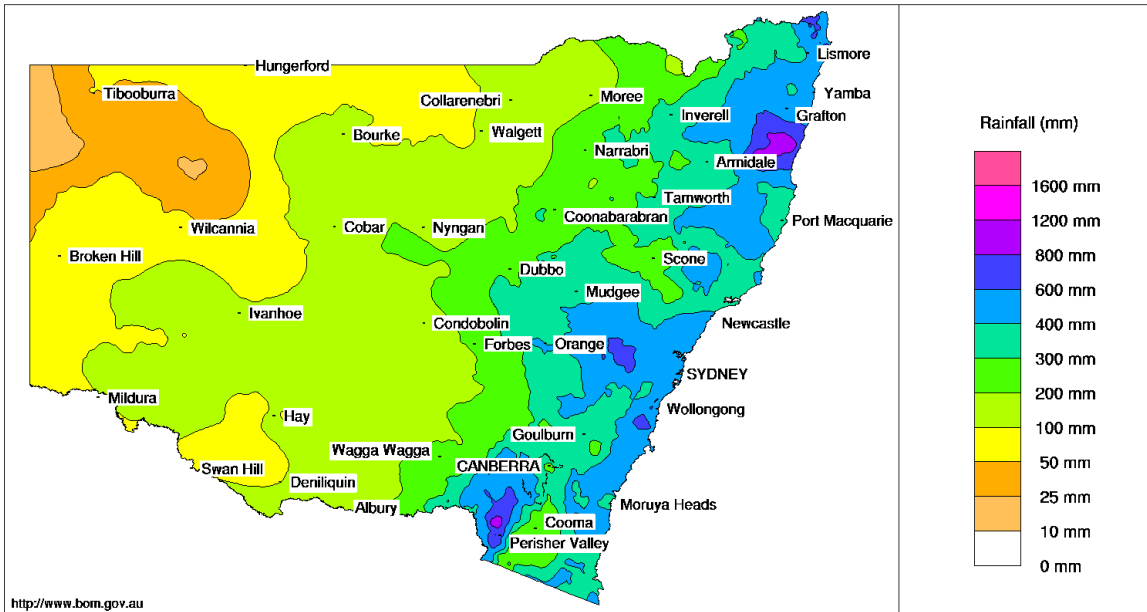
Resource assessment is the process of calculating how much water resource is available based on the rules of the Water Sharing Plan (WSP). This is reviewed periodically during the year, typically at the end of the month and when any significant inflow event happens. The above resource assessment table is for the planning horizon from 1 January 2019 to 30 June 2019.



# 5. Rainfall

## 5.1 6-month rainfall

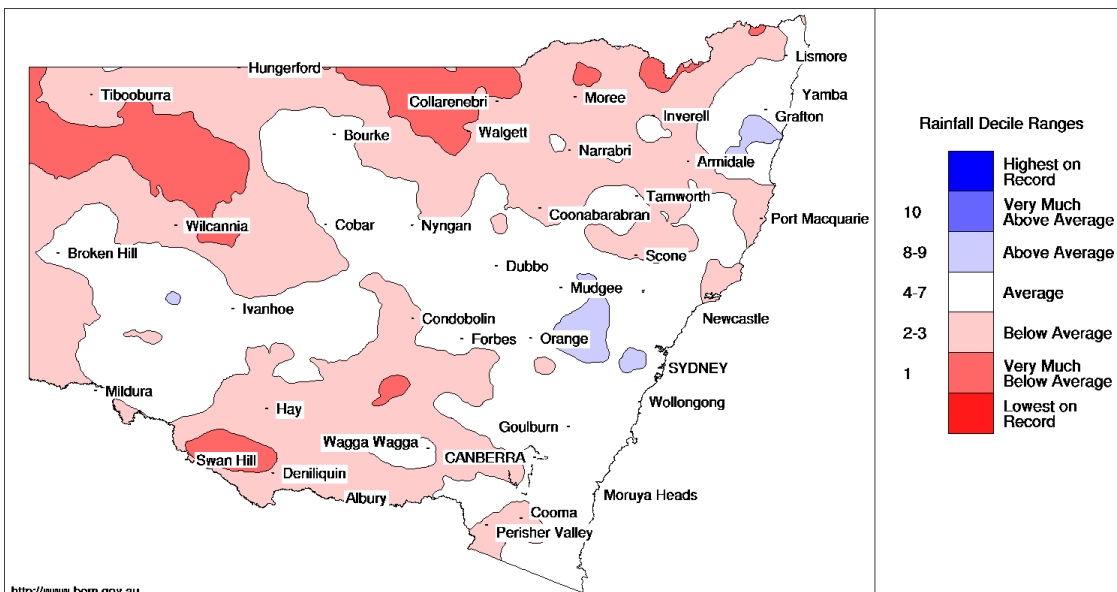
New South Wales Rainfall totals (mm) 1 August 2018 to 31 January 2019  
Australian Bureau of Meteorology



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New South Wales Rainfall Deciles 1 August 2018 to 31 January 2019  
Distribution Based on Gridded Data  
Australian Bureau of Meteorology



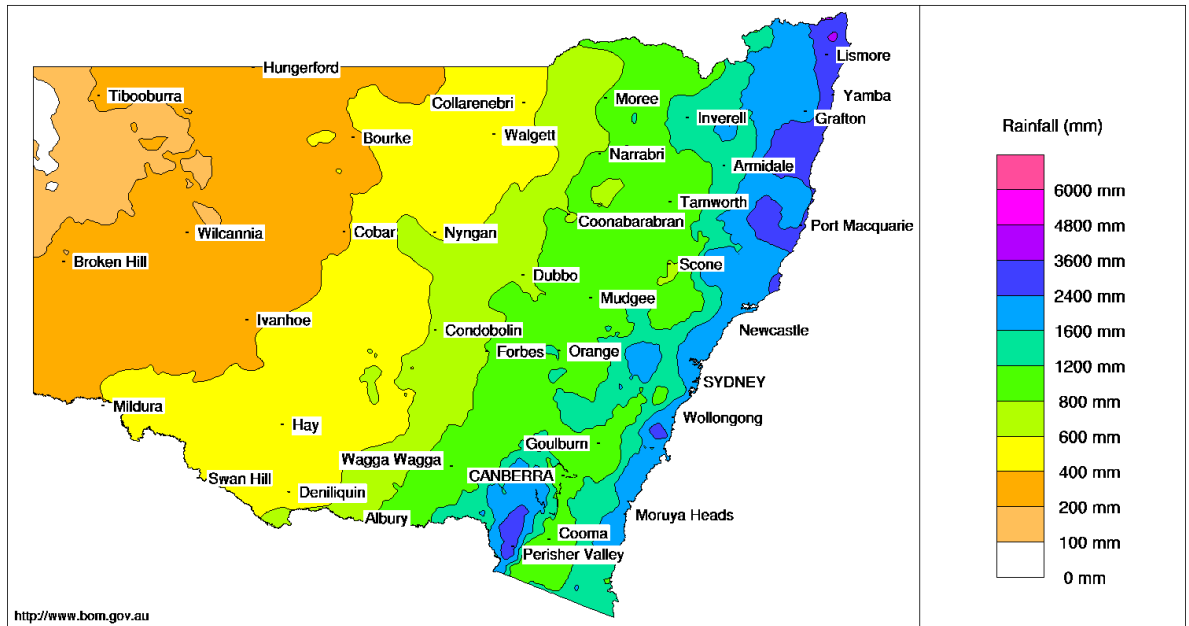
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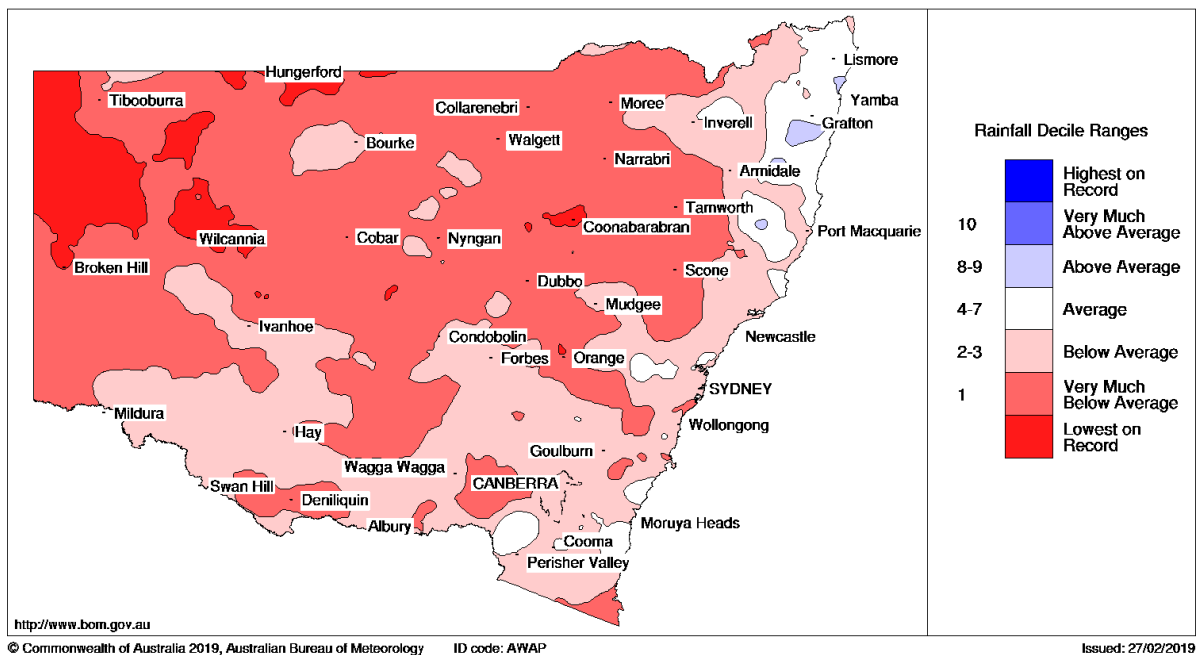
As indicated in the above figures the last 6-month total rainfall lies in the range of 400 to 600 mm, which is approaching average rainfall (average 6-month total rainfall is around 600 mm).

### 5.2 24-month rainfall

New South Wales Rainfall totals (mm) 1 February 2017 to 31 January 2019  
Australian Bureau of Meteorology



New South Wales Rainfall Deciles 1 February 2017 to 31 January 2019  
Distribution Based on Gridded Data  
Australian Bureau of Meteorology

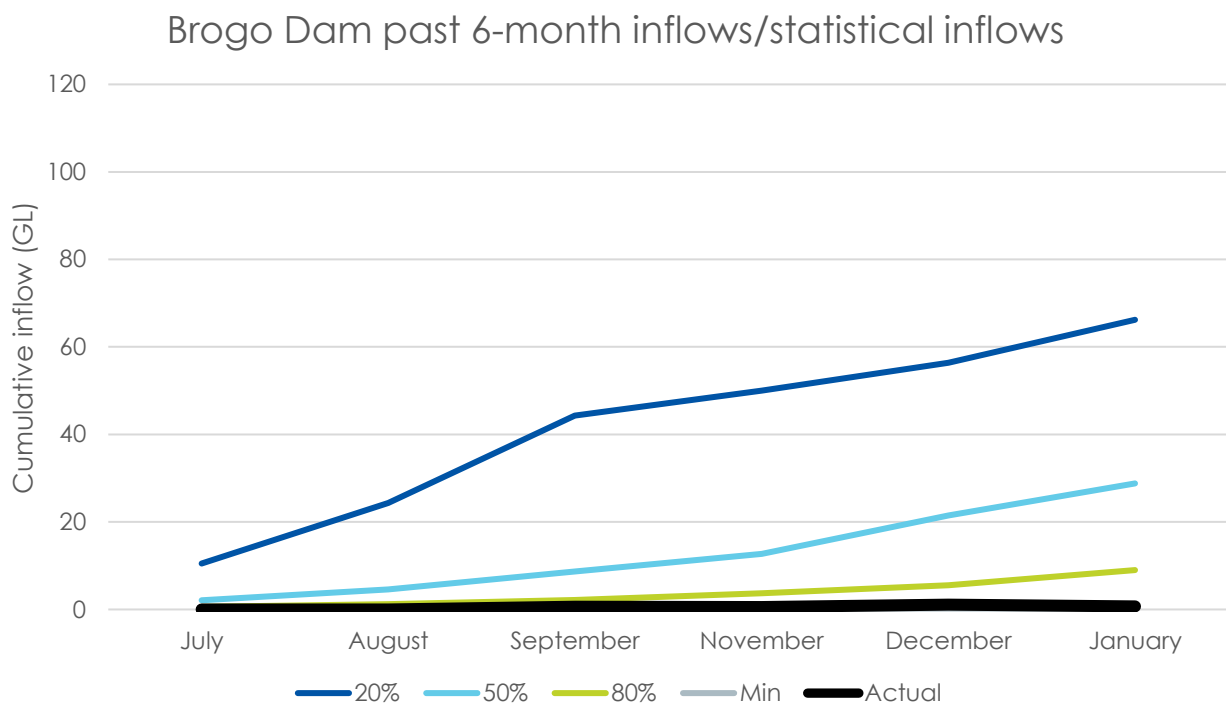


Rainfall in the last 24-months lies in the range of 1800 to 2400mm, which is below average.

## 6. Inflows

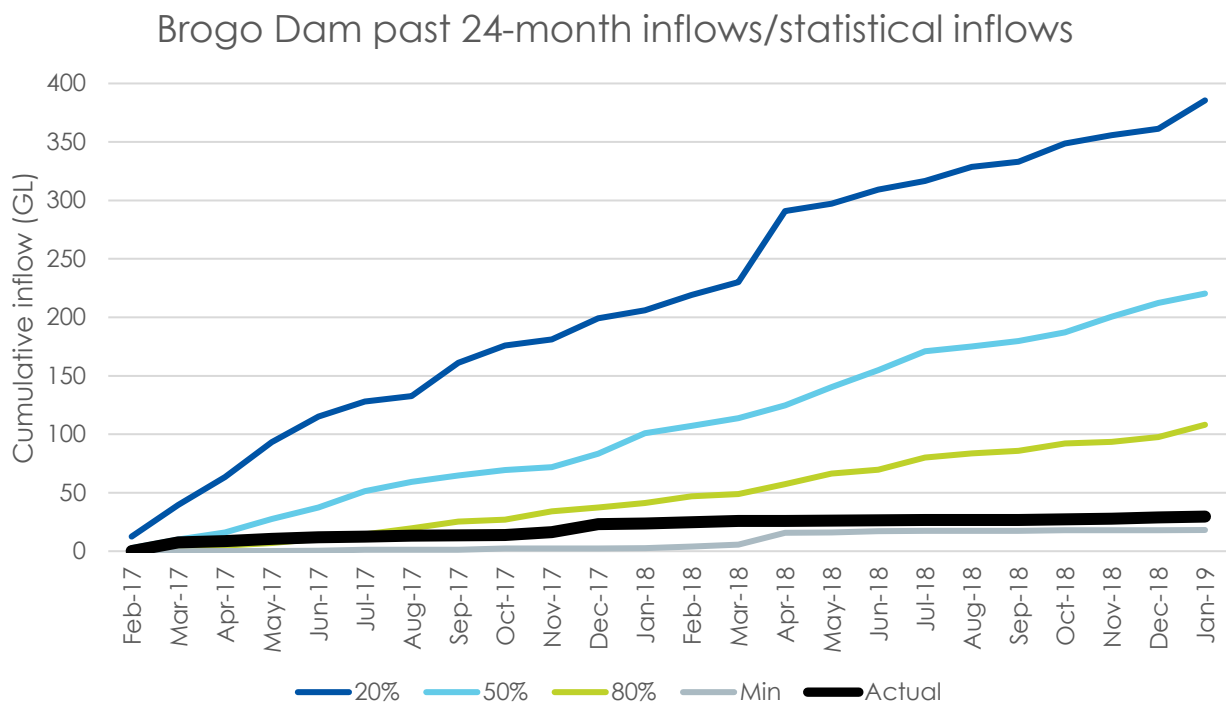
### 6.1 Brogo Dam inflows

#### 6.1.1 Brogo past 6-month inflows/statistical inflows



Inflows are consistent with rainfall over the past 6 months period. Actual inflows for last 6 months were only around 3 GL which is around the minimum observed/historical inflow.

### 6.1.2 Brogo past 24-month inflows/statistical inflows



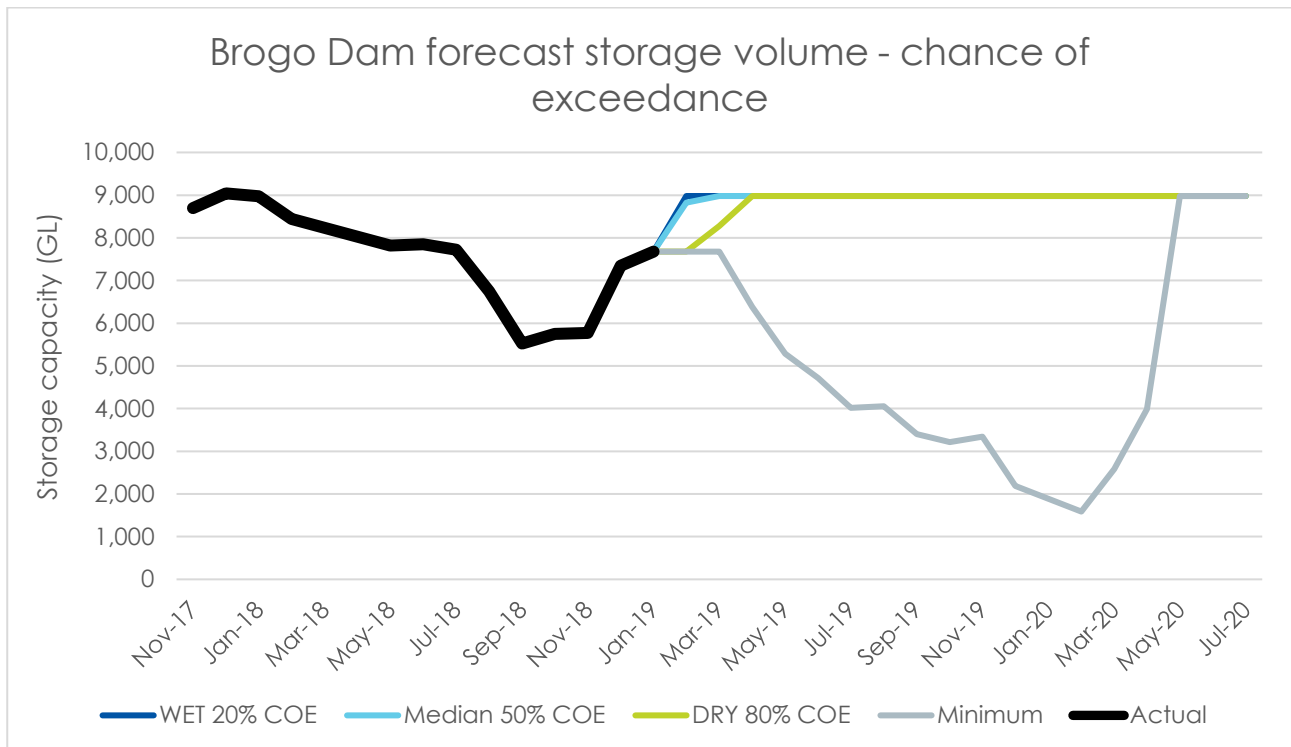
Inflows are consistent with rainfall over the past 24 months period. Due to dry conditions in the last 24 months only around 28 GL of inflows were recorded which is following minimum inflow conditions.

### 6.2 Downstream tributary inflows

There are no significant downstream tributary inflows in this current water year (2018-19). Small flows in Eden Creek have allowed the announcement of access to uncontrolled and Supplementary flow extractions.

## 7. Storage forecast

### 7.1 Brogo storage forecast



Above figure demonstrates the possible scenarios of Brogo Dam until June 2020. The scenarios are based on different expected inflow conditions. For example, with 20<sup>th</sup> percentile inflow the dam may be full (100%) all the time.

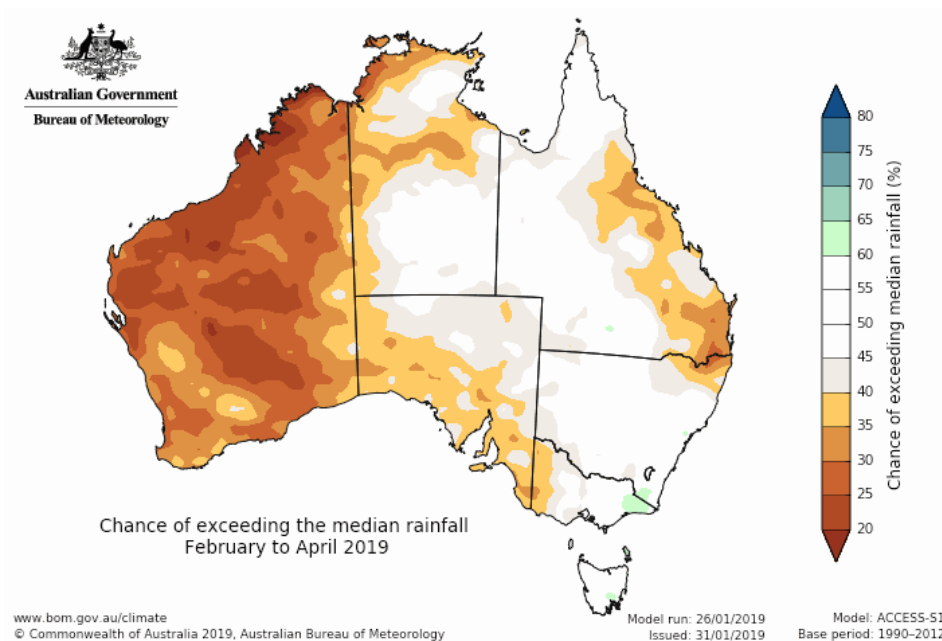
The Chance of Exceedance (COE) in the figure refers to the chance of exceeding inflows and storage levels in the time frame. For example, Wet 20% COE indicate that there is only a 20% of chance that the dam volume will be greater than the projected level, and there is 80% chance that the dam volume will be less than the projected level.

## 8. Outage planning

At this time there are no planned outages that will affect the delivery of water to customers.

## 9. Prognosis

To be updated:



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