Macquarie Drought Operations update
30th October

Adrian Langdon
Executive Manager System Operation
36 Month Rainfall Deficiency

Australian Rainfall Deciles
1 October 2016 to 30 September 2019

Distribution Based on Gridded Data
Australian Bureau of Meteorology

http://www.bom.gov.au
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ID code: AWAP
Issued: 03/10/2019
NSW Temperatures

Maximum Temperature Anomaly (°C) 1 October 2018 to 30 September 2019

Australian Bureau of Meteorology

http://www.bom.gov.au
© Commonwealth of Australia 2019, Australian Bureau of Meteorology   ID code: AWAP
Issued: 03/10/2019
Soil moisture deficiencies
August 2019
System inflows & water allocations

Murrumbidgee + Murray Inflow vs Allocation (GL)

Last 10 year avg. inflow 8,636 GL
System inflows & water allocations

Northern Valleys Inflow vs Allocation (GL)

Last 10 year avg. inflow 3,435 GL
Water Availability

**Red Number** – water available in accounts

**Blue Number** – water available in storage

- **Macquarie River**
  - Red Number: 24.5
  - Blue Number: 24.5

- **Lachlan/Belubula**
  - Red Number: 149

- **Murrumbidgee**
  - Red Number: 654
  - Blue Number: 1,249

- **Murray**
  - Red Number: 662
  - Blue Number: 3,861
### Drought of Record – 24 Months

<table>
<thead>
<tr>
<th>Valley</th>
<th>Previous Drought of Record Inflows (GL)</th>
<th>Period</th>
<th>Last 24 months Inflows (GL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glen Lyon</td>
<td>7</td>
<td>1992-94</td>
<td>33</td>
</tr>
<tr>
<td>Pindari</td>
<td>45</td>
<td>1918-20</td>
<td>25</td>
</tr>
<tr>
<td>Copeton</td>
<td>53</td>
<td>1918-20</td>
<td>107</td>
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<tr>
<td>Keepit</td>
<td>57</td>
<td>2001-03</td>
<td>25</td>
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<tr>
<td>Split Rock</td>
<td>8</td>
<td>1956-58</td>
<td>7</td>
</tr>
<tr>
<td>Chaffey</td>
<td>13</td>
<td>1964-66</td>
<td>6</td>
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<tr>
<td><strong>Burrendong</strong></td>
<td><strong>169</strong></td>
<td><strong>1945-47</strong></td>
<td><strong>87</strong></td>
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<tr>
<td>Wyangala</td>
<td>138</td>
<td>2001-03</td>
<td>228</td>
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<tr>
<td>Burrinjuck</td>
<td>463</td>
<td>2008-10</td>
<td>571</td>
</tr>
<tr>
<td>Blowering</td>
<td>124</td>
<td>2006-08</td>
<td>421</td>
</tr>
</tbody>
</table>
## Drought of Record – 36 Months

<table>
<thead>
<tr>
<th>Valley</th>
<th>Previous Drought of Record Inflows (GL)</th>
<th>Drought Period (Yrs)</th>
<th>Current Drought Inflows (GL)</th>
<th>Current Drought Period Months (GL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glen Lyon</td>
<td>44</td>
<td>1992-95</td>
<td>32</td>
<td>30</td>
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<tr>
<td>Pindari</td>
<td>142</td>
<td>1992-95</td>
<td>82</td>
<td>29</td>
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<tr>
<td>Copeton</td>
<td>218</td>
<td>1992-95</td>
<td>209</td>
<td>29</td>
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<tr>
<td>Keepit</td>
<td>157</td>
<td>1992-95</td>
<td>100</td>
<td>34</td>
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<tr>
<td>Split Rock</td>
<td>22</td>
<td>1925-28</td>
<td>21</td>
<td>35</td>
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<tr>
<td>Chaffey</td>
<td>26</td>
<td>1964-67</td>
<td>19</td>
<td>35</td>
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<tr>
<td><strong>Burrendong</strong></td>
<td><strong>478</strong></td>
<td><strong>1936-39</strong></td>
<td><strong>157</strong></td>
<td><strong>33</strong></td>
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<tr>
<td>Wyangala</td>
<td>283</td>
<td>2002-05</td>
<td>315</td>
<td>34</td>
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<tr>
<td>Burrinjuck</td>
<td>756</td>
<td>2007-09</td>
<td>926</td>
<td>34</td>
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<tr>
<td>Blowering</td>
<td>240</td>
<td>2006-09</td>
<td>599</td>
<td>34</td>
</tr>
</tbody>
</table>
Comparison of Macquarie Drought of Record – 36 Months

- Dec 1906 - Jan 1910
- Dec 1937 - Jan 1941
- Dec 2006 - Jan 2010
- Dec 2012 - Jan 2016
- Current Drought Dec 2016 - July 2019

Cumulative Inflows in GL

No. of Months

Dec 1906 - Jan 1910
Dec 1937 - Jan 1941
Dec 2006 - Jan 2010
Dec 2012 - Jan 2016
Current Drought Dec 2016 - July 2019

WaterNSW
Macquarie Flows without Burrendong

May 2017 onwards, almost no inflow
No Burrendong Dam Situation

If there was no dam, trouble would have started early 2017 to meet critical needs, which is around 33 months.

Critical Human water needs is supplying towns, S&D, industry, Basic Landholder Rights and running river.
Macquarie Flows Comparison

End of Sept 2016, dam volume 1500 GL
An additional 6,000ML is required prior to making any new AWD
If it does not rain again and critical drought works are not completed – there could be a day zero for the region.

Measures being undertaken by WaterNSW in conjunction with Local Councils are planned extend supplies.
## DEPLETION FOR MACQUARIE

### under different drought conditions

**Base case option plus Gunningbar closure in Dec 19 - run river to Warren**

<table>
<thead>
<tr>
<th>Stage to supply from Burrendong Dam (Dubbo)</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Case - until cease to flow</td>
<td></td>
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<tr>
<td>Stage 1 - Raise Weir at Warren Weir</td>
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<tr>
<td>Impact of Stage 1 on cease to flow</td>
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<tr>
<td>Stage 2a - Transfer Volume from Windamere Dam</td>
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<tr>
<td>Stage 2b - Close off Gunningbar</td>
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<tr>
<td>Impact of Stage 2 and 2b on cease to flow</td>
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<tr>
<td>Stage 3 – Pump out Deep storage from Burrendong Dam</td>
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<tr>
<td>Impact of Stage 3 on cease to flow</td>
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</tr>
<tr>
<td>Alternatives for High security and BLR need in place</td>
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</tr>
</tbody>
</table>

### Acceptable Serviceability Criteria against lowest recorded inflow

- **2 years**
- **Current availability with approach against lowest recorded inflow**

<table>
<thead>
<tr>
<th>Macquarie Supply Risk</th>
<th>Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>High</td>
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</tbody>
</table>

**Key:**
- Zero inflow
- Recent observed inflow - past two years repeated (SDR 1)
- Drought of Record

6GL of dead storage in Burrendong is retained for water quality and fish refuge.

**Key risk is to ensure Dubbo has a resilient supply in place before planning cease to flow date. Ground water is available.**
Storage Depletion Curve
Based on End of July 2019 Assessment

Scenario 1.1

Macquarie Valley forecast storage volume

- July 2019: Nil access to GS & EWA
- LWU (80%), S&D (80%), HS (and mines) (70%)
- Operate river to Warren
- March 2020: Dead storage pumping
- May 2020: Cease to flow
- Dec 2019: Bulk water transfer

Dead storage (21 GL)
Drought Management Overview

1. Cease flows downstream of Warren Weir – September 2019
2. Cease flows in Gunningbar Creek – December 2019
3. Bulk Water Transfer form Windamere – December/January
5. Cease to flow from June 2020 downstream of Burrendong
Warren Weir temp works
Duck and Crooked Creek temp works
Burrendong Deep Storage Access
Principles for managing tributary flows

Distribution of tributary flows to downstream users will be managed as follows:

- Deliver current restricted regulated demands by reducing dam releases.
- Restore flows in regulated sections that are stopped to allow access to Basic Landholder Rights (BLR) and to meet the critical needs of the environment in those locations.
- Divert flows to ‘dam-supported’ Stock & Domestic (S&D) replenishments.
- Deliver supplementary events when triggered as per Water Sharing Plan rules after allowing for higher priority requirements.
To keep updated

Visit the website at:
waterNSW.com.au/drought

For information on the Macquarie Valley including water availability reports and drought reports go to:
waterNSW.com.au/supply/drought-information/regional-nsw/macquarie-valley

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