Welcome

Namoi Valley
Customer Advisory Group

14 March 2019
The Water System Operations Report is uploaded quarterly to the WaterNSW website.

www.waternsw.com.au
Operational Drought update

Adrian Langdon, Executive Manager,
System Operation
Extreme Events policy principles

Extreme Events Policy

Guiding principles

- The market will continue to operate for as long as possible during extreme events
- The local requirements for critical human water needs will be recognised and prioritised
- Licence holders within licence categories should be treated equally
- Certainty should be maximised

Every attempt will be made to maintain the operation of the statutory water sharing plans

Management strategies will be fit for purpose

Local stakeholder consultation should inform management responses so that they are fair

Learnings from previous extreme events will inform the development and implementation of IRGs

Connectivity of systems should be considered
## Extreme Events stages

The policy sets out the 4 stages for managing extreme events and the criteria.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Water quantity</th>
<th>Water quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal management</td>
<td>Continue to deliver water as normal</td>
<td>Raw water can be treated with usual methods</td>
</tr>
<tr>
<td>Stage 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emerging drought/water shortage</td>
<td>Restrictions on water for general security licences</td>
<td>Minor adjustments to treat raw water</td>
</tr>
<tr>
<td></td>
<td>Potential or actual impacts on groundwater users and groundwater dependent ecosystems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potential for aquifer subsidence</td>
<td></td>
</tr>
<tr>
<td>Stage 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe drought/water shortage</td>
<td>Restrictions on water for:</td>
<td>Major adjustments are needed to treat raw water</td>
</tr>
<tr>
<td></td>
<td>· High priority licences</td>
<td></td>
</tr>
<tr>
<td></td>
<td>· General security licences</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unacceptable groundwater impacts</td>
<td></td>
</tr>
<tr>
<td>Stage 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critical drought/water shortage</td>
<td>Water only available for critical human needs. Restrictions on:</td>
<td>Not possible to treat raw water with standard processes to meet health values and drinking guidelines</td>
</tr>
<tr>
<td></td>
<td>· Town water, stock and domestic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>· High priority licences</td>
<td></td>
</tr>
<tr>
<td></td>
<td>· General security licences</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Risk to long term availability of the groundwater resources</td>
<td>Raw water is likely to remain untreatable over the longer term</td>
</tr>
</tbody>
</table>
### Hierarchy of water priorities

<table>
<thead>
<tr>
<th>Priority</th>
<th>Take/type of use</th>
</tr>
</thead>
</table>
| 1        | • Critical human water needs:  
           - core human consumption requirements  
           - non-human consumption requirements that a failure to meet would cause prohibitively high social, economic or national security costs |
| 2        | • Needs of the environment |
| 3        | • Stock  
           • High security licences  
           • Commercial and industrial activities authorised by local water utility  
           • Water for electricity generation on a major utility licence  
           • Conveyance in supplying water for any of these needs in this paragraph |
| 4        | • General security & other |
## Water Sources – Drought Status Update

### Incident Response Guide: Drought stage

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>Normal operations</td>
</tr>
<tr>
<td>Stage 2</td>
<td>Emerging drought</td>
</tr>
<tr>
<td>Stage 3</td>
<td>Severe drought</td>
</tr>
<tr>
<td>Stage 4</td>
<td>Critical drought</td>
</tr>
</tbody>
</table>

[Map of Water Sources showing different stages of drought]
Current situation
Allocations to extractive users (GS and Supplementary) has been 16% of total inflows over this period.
Border Rivers System Inflows & Water Usage

Volume (ML)

09-10  10-11  11-12  12-13  13-14  14-15  15-16  16-17  17-18  18-19 up to 31 Dec

-500,000 - 500,000 1,000,000 1,500,000 2,000,000 2,500,000 3,000,000 3,500,000 4,000,000

Irrigation usages  Environmental usages  Suplimentary usages  River flows
Extractive users (GS and Supplementary) have taken 22% of total inflows over this period.
Macquarie system inflows and water allocations

Allocations to extractive users (GS and Supplementary) has been 17% of total inflows over this period

Macquarie-Cudgegong Water Sharing Plan limits long-term extractions to an estimated 391,900 megalitres per year or 27% of the long-term average annual flow 1,448,000 megalitres per year.
Balonne flows upstream of St George
Barwon Darling flows

Barwon Darling versus Menindee Lakes inflows

Flow per annum (GL)

Inflows
Minindee Lakes Inflows
Barwon-Darling Flows versus Extractions
Situation at Menindee?
Lower Darling Valley

Lower Darling

Key
- Major towns
- Major dams
- River system
- Channel system
- Lower darling river system
- River catchment
- Major weirs
- Water bodies

Map of Lower Darling Valley showing major towns, river systems, and other important features.
Northern Valley Storages

Storage levels of Northern Valley Storages

Storage Volume (GL)

Pindari  Copeton  Keepit  Burrendong  Menindee

Water losses
July 2016 – January 2019

Initial 2016 storage level = 133,899 ML
Total inflows from July 16 until Jan 19 = 2,097,991 ML

TOTAL WATER (storage + inflows) = 2,231,890 ML

MINUS

Total releases from July 16 until Jan 19 = 898,336 ML
(MDBA, Enviro, River Ops, Customers)

Total losses from July 16 to Jan 19 = 1,273,934

EQUALS

January 2019 storage level = 59,620 ML

TOTAL WATER – releases + actual storage = LOSSES
Menindee Lakes Storage Operations 2016-17

Darling River Flows and Menindee Storage Volume

- 28 Jul 2016 - Releases at Weir 32 re-commence. First pulse 14.4GL.
- 27 Aug - 16 Sept 2017 - 2nd pulse. Total release to date 31.6GL. E-water release from 17 Sept.
- 7 January - 24 April 2017 MOWA cfl - total 282 GL.
- Release rate managed with regard to Menindee Outlet capacity, storage surcharge and storage efficiency.
- E-water delivery Darling Animlanch 16Feb - 30 Jun 2017 - 180 GL.
- Weir 33 Release.
- Casamilla Release.
- Evaporation (30 day moving avg).
- Total System Storage Volume.
Darling River Flows and Menindee Storage Volume

Approaching 480GL negotiated lower rate of call for MDBA - extended time above 480 GL improving the ratio of water held in Wetherell + Pamamaroo against that held in Cawndilla + Menindee

E-water delivery continued at Weir 32 from 22 Nov to 15 Dec 2017

15 December 2017 - 480 GL total storage

15 December 2017 - Weir 32 reduced below WSP requirements

28 March 2018 - Cawndilla Outlet releases cease

1 July 2017 - e-water delivery continues at low rates

1 Oct - 21 Nov 2017 - MDBA call - 38 GL

Weir 32 Release
Cawndilla Release
Evaporation (30 day moving avg)
Total System Storage Volume
Menindee Lakes Storage Operations 2018-19

Darling River Flows and Menindee Storage Volume

- 19 July 2018 - increased release for filling of block banks
- 25 September 2018 - commenced pumping from Pamamaroo to Copi Hollow
- 20 November 2018 - increased release to 300 ML/day for bank filling
- 10 December 2018 - Pumping to Copi Hollow complete
- 5 January 2019 - Pamamaroo outlet capacity constrained
- 12 January 2019 - closed Weir 32 fishway and Wetherell outlet
- Weir 32 Release
- Cawndilla Release
- Evaporation (30-day moving avg)
- Total System Storage Volume
- Forecast Conditions - approximate only
Distribution of Water – July 2016 – January 2019

System loss including Evaporation, 58.6%

MDBA, 17.4%

OEH Environmental, 11.3%

River Operations, 8.5%

Lower Darling Customers, 4.1%
Why are we in this situation?
Maximum temperature
1 January 2017 – 31 December 2018

Distribution Based on Gridded Data
Australian Bureau of Meteorology

Temp. Decile Ranges

- Highest on Record
- Very Much Above Average
- Above Average
- Average
- Below Average
- Very Much Below Average
- Lowest on Record

http://www.bom.gov.au
© Commonwealth of Australia 2019, Australian Bureau of Meteorology
ID code: AWAP

Issued: 03/01/2019
Comparison of drought inflows – Keepit and Split Rock Dams

Drought inflows for 24 months starting in January

<table>
<thead>
<tr>
<th>Data Period</th>
<th>Graph Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 1918 - Dec 1919</td>
<td>Yellow</td>
</tr>
<tr>
<td>Jan 1939 - Dec 1940</td>
<td>Red</td>
</tr>
<tr>
<td>Jan 1993 - Dec 1994</td>
<td>Blue</td>
</tr>
<tr>
<td>Jan 2002 - Dec 2003</td>
<td>Green</td>
</tr>
<tr>
<td>Current Drought Jan 2017 - Dec 2018</td>
<td>Black</td>
</tr>
</tbody>
</table>

Water NSW © 2019 – Do not copy, cite or distribute without permission of Water NSW
Comparison of drought inflows – Pindari Dam

Drought inflows for 24 months starting in January

Cumulative inflows in GL

No of Months

Jan 1918 - Dec 1919
Jan 1979 - Dec 1980
Jan 1986 - Dec 1987
Jan 1993 - Dec 1994
Jan 2018 - Dec 2018
Comparison of drought inflows – Glenlyon Dam

Drought inflows for 24 months starting in January
Comparison of drought inflows – Copeton Dam

Drought inflows for 18 months starting in January

<table>
<thead>
<tr>
<th>Period</th>
<th>Graph Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 1918 - Dec 1919</td>
<td>Yellow</td>
</tr>
<tr>
<td>Jan 1993 - Dec 1994</td>
<td>Red</td>
</tr>
<tr>
<td>Jan 2008 - Dec 2009</td>
<td>Blue</td>
</tr>
<tr>
<td>Jan 2009 - Dec 2010</td>
<td>Green</td>
</tr>
<tr>
<td>Current Drought</td>
<td>Black</td>
</tr>
</tbody>
</table>

Cumulative Inflows in GL

No. of Months

Water NSW © 2019 – Do not copy, cite or distribute without permission of Water NSW
Comparison of drought inflows – Burrendong Dam

Drought inflows for 37 months starting in December
Chance of exceeding the median rainfall
March to May 2019