

RIVER MURRAY FLOW REPORT and WATER RESOURCES UPDATE

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Report #3/2016

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This supersedes the previous flow report issued by the Department of Environment, Water and Natural Resources (DEWNR) on 15 January 2016. The next flow report will be provided on Friday, 29 January 2016.

In this report, for ease of representation, large volumes of water are expressed in gigalitres (GL), while smaller volumes are expressed in megalitres (ML). One GL is equal to 1 000 ML.

WATER RESOURCES UPDATE

During December 2015, the total River Murray System inflow was approximately 100 GL, which is less than a quarter of the December long-term average of 460 GL. Inflow to Menindee Lakes (from the Darling System) during December 2015 was approximately 0 GL, which is well below the December long-term average of 120 GL.

The flow to South Australia during December 2015 was approximately 202 GL, which is about a third of the December long-term average of approximately 690 GL. The flow was comprised of 217 GL December Entitlement Flow less 15 GL of deferred Entitlement Flow. South Australia received approximately 19 GL of environmental water from the Commonwealth Environmental Water Holder (CEWH) and the Murray-Darling Basin Authority's *The Living Murray* (TLM). As this water is held on South Australian licences it is included in Entitlement Flow, therefore there was no net increase to flow to South Australia in December.

STORAGE VOLUMES

Murray-Darling Basin storage volumes at 20 January 2016 and 20 January 2015

Storage	Full Supply Volume (GL)	20-01-2016 (GL)	20-01-2015 (GL)	Long-term average (end of Jan)
Dartmouth	3 856	1 846 (48%)	3 158 (82%)	
Hume	3 003	1 126 (37%)	1 537 (51%)	
Lake Victoria	677	453 (67%)	465 (69%)	
Menindee Lakes	1 731*	**85 (5%)	159 (9%)	
TOTAL	9 267	3 510 (38%)	5 319 (57%)	6 343 (68%)

*Menindee Lakes can be surcharged to 2 015 GL

**Menindee Lakes are under New South Wales control

MENINDEE LAKES

Under the Murray-Darling Basin Agreement, the Murray-Darling Basin Authority controls the Menindee Lakes until the stored water volume decreases to 480 GL. The New South Wales Government assumes control of the storage at 480 GL and maintains control until the volume in storage exceeds 640 GL. On 18 February 2014, the volume in the Menindee Lakes dropped to below 480 GL and control switched to the New South Wales Government.



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Given that the Menindee Lakes remain under New South Wales control, there is less flexibility in the way water can be delivered to South Australia in 2015, unless the storage position improves significantly.

RAINFALL AND TEMPERATURE OUTLOOK

The latest Bureau of Meteorology weather outlook for January to March 2016 indicates average to below average rainfall is likely across the Murray-Darling Basin with temperatures higher than average in the north and east of the Basin and average to cooler than average in the central and south west of the Basin. The outlook is influenced by a warm Indian Ocean and El Niño (which has peaked) in the Pacific Ocean.

For the latest forecast on El Niño please refer to the following website:

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

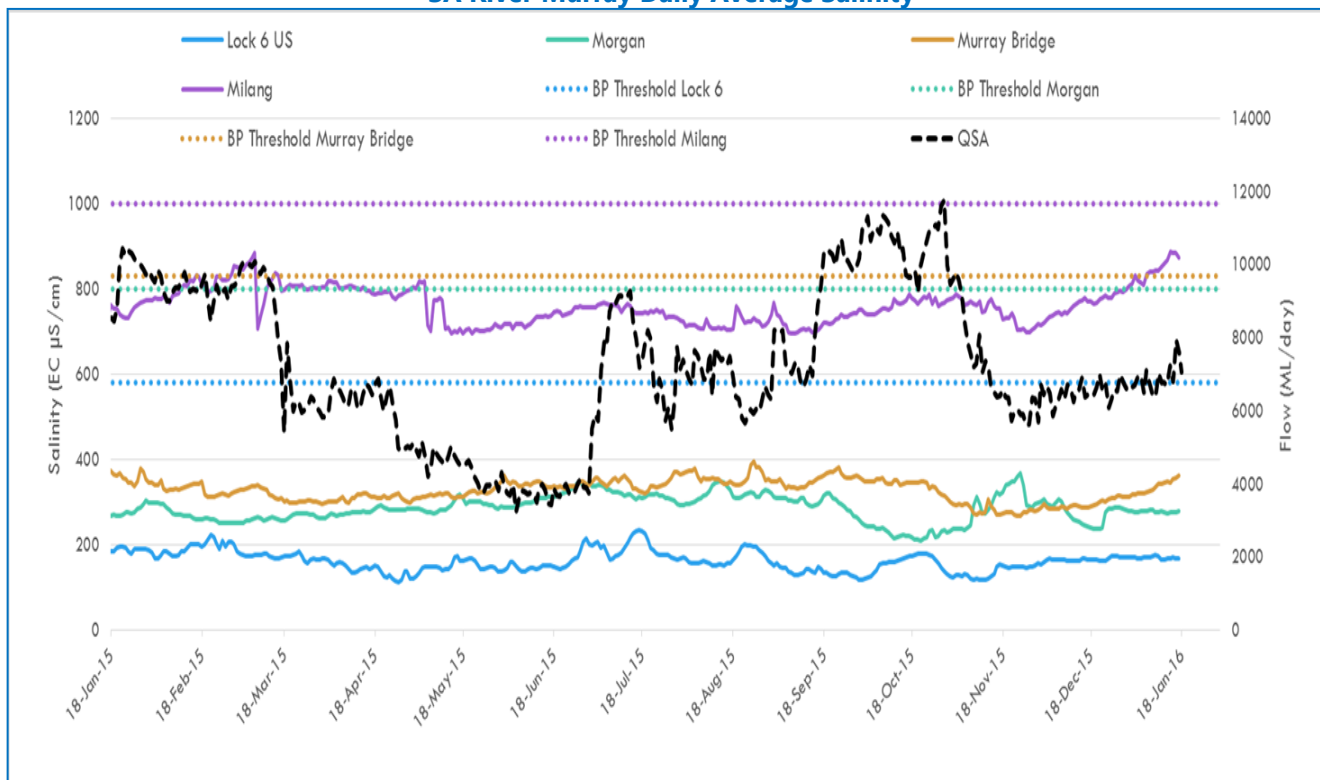
WATER QUALITY - Salinity

A number of targets are identified under the Basin Plan, which all Basin States must have regard to in managing River Murray flows. The targets for real-time salinity are identified below. Salinity must not exceed these values for 95 per cent of the time:

- 580 EC at Lock 6
- 800 EC at Morgan
- 830 EC at Murray Bridge
- 1 000 EC at Milang

The following graph shows the salinity at these locations and the flow to South Australia (QSA) from January 2015 to January 2016. The dashed-lines identify the Basin Plan (BP) thresholds for the corresponding colour coded location. It confirms that salinity has not exceeded the threshold at any of these four locations during this period.

SA River Murray Daily Average Salinity



Note: Estimates have been used for missing Milang salinity readings from 10-17 March and 3-8 May 2015.

FLOW OUTLOOK

The flow at the South Australian border is approximately 7.2 GL/day and will remain around this rate during the coming week. It comprises the normal January Entitlement Flow of 7 GL/day less deferred Entitlement Flow plus environmental water. Most of the environmental water that South Australia is receiving in January is held on South Australian Licences and included in South Australia's Entitlement Flow.

The flow over Lock 1 is approximately 4.0 GL/day and will decrease to around 3.8 GL/day during the coming week, depending on weather conditions and extractions.

It is important to note that flow forecasts in this advice are based on the information available at the time of preparation. They may change as new gauging information becomes available, or due to rainfall events or changed operations upstream. Flow forecasts are dependent on predictions made by the Bureau of Meteorology, Murray-Darling Basin Authority and water management agencies in upstream jurisdictions. The forecasts will be revised as new information becomes available.

ENVIRONMENTAL WATER

During January 2016, the Commonwealth Environmental Water Holder (CEWH) and the Murray-Darling Basin Authority's *The Living Murray* are providing environmental water to South Australia. The environmental water will provide in-channel, Lower Lakes and Coorong environmental and water quality benefits.

South Australia and the CEWH have agreed on an environmental watering schedule to deliver environmental water to the Lower Lakes, Coorong and Murray Mouth in 2015–16. The bulk of the environmental water has already been delivered with lower volumes expected to be delivered over the summer months. This is in part due to upstream delivery constraints.

MANAGEMENT OF SOUTH AUSTRALIA'S DEFERRED WATER

The Murray-Darling Basin Authority confirmed that on 1 January 2016, South Australia had 132.5 GL of deferred water in storage. Of this total, 77.4 GL is stored for critical human water needs and 55.1 GL for private carryover use in future dry years. Volumes stored are adjusted for net evaporation losses until delivered to South Australia.

DEWNR will continue to pursue opportunities to defer additional Entitlement Flow during 2015–16. Opportunities to defer and store water are considered on the basis of how Entitlement Flow is managed, plus operational flow objectives for water quality and weather conditions.

MURRAY MOUTH

Dredging operations at the Murray Mouth commenced on 9 January 2015 to maintain connectivity (exchange of water) between the Coorong and the Southern Ocean. At 17 January 2016, approximately 981 000 cubic metres of sand had been removed. Routine monitoring confirms an improvement in the condition of both channels as a result of dredging.

Mariners are reminded that navigation through the Murray Mouth is only permitted during daylight hours and that Exclusion Zones established around the dredging operations remain in place to ensure public safety. For more information refer to the Notice to Mariners at:

http://webapps.transportsa.com.au/news/templates/dtei_template2010.aspx?articleid=2865&zoneid=15

There is also a partial park closure in place for the northern tip of the Coorong National Park. For more information refer to the following:

http://www.environment.sa.gov.au/parks/Safety/Park_closures/141219-coorong-national-park

Signage has been installed at appropriate locations and flyers distributed advising of Exclusion Zones.

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Any boats navigating through the Murray Mouth area should proceed with caution due to sandbars being present at shallow depth. Boats equipped with 'echo sounders' are strongly encouraged to regularly check depths and avoid travelling at low tide.

BARRAGE OPERATIONS AND WATER LEVELS IN THE LOWER LAKES

The water level in Lake Alexandrina is approximately 0.57 m AHD and approximately 0.55 m AHD in Lake Albert. The difference in water levels is due to wind effects. During the week ending 19 January 2016, total barrage releases were approximately 0.1 GL. On 25 November 2015, barrage releases were reduced to a minimum. Under minimum release conditions, all barrage gates are closed. All fishways remained open until 7 January 2016 when the Tauwichee rock ramp fishway was closed due to inefficiencies at lower water levels. Fishways provide a critical connection for fish passage between Lake Alexandrina and the Coorong. The reason for reducing barrage releases is to maintain water levels in the Lower Lakes above 0.4 m AHD during summer and autumn.

Water levels and barrage operations are monitored closely by South Australian Government agencies, the Murray-Darling Basin Authority and Commonwealth Environmental Water Office.

WEIR POOL OPERATIONS

The Lock 1 weir pool remains approximately 0.1 m below the normal pool level of 3.2 m AHD to enable engineering investigations to be undertaken at the weir.

NAVIGATION ISSUES

Sandbars in the vicinity of the Murray Mouth may cause navigation hazards. Mariners are advised to navigate with caution when operating in the area. Sandbars are also present along sections of the River Murray, downstream of Locks 7 and 8 and in South Australia. All watercraft users should be aware of the risk of submerged navigation hazards, and should regularly check river depth.

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RIVER MURRAY WATER LEVELS

Below is a table of River Murray water levels at a number of locations from Lock 10 (near Wentworth) to Murray Bridge.

River Murray Water Levels on 20 January 2016

Location	River km	Normal Pool Level	Current Level (m AHD)	1974 Flood Level (m AHD)	1993 Flood Level (m AHD)	2011 High Water Level (m AHD)
Lock 10	825.0	30.80	30.90	33.81	33.32	32.28
Lock 9 Kulnine	764.8	27.40	27.31	30.03	29.44	28.80
Lock 8 Wangumma	725.7	24.60	23.92	27.60	27.19	26.79
Lock 7 Rufus River	696.6	22.10	21.63	25.70	25.24	24.92
Lock 6 Murtho	619.8	19.25	19.28	21.03	20.50	20.11
Renmark	567.4	-	-	18.54	18.04	17.38
Lock 5	562.4	16.30	16.32	18.07	17.50	17.05
Lyrup	537.8	-	13.25	16.85	16.26	15.68
Berri	525.9	-	13.20	15.81	15.74	15.16
Lock 4	516.2	13.20	13.22	15.65	15.08	14.75
Loxton	489.9	-	10.07	15.05	14.12	13.42
Cobdogla	446.9	-	9.85	13.44	12.38	11.52
Lock 3	431.4	9.80	9.84	13.16	12.02	10.93
Overland Corner	425.9	-	6.22	12.73	11.58	10.27
Waikerie	383.6	-	6.26	11.26	10.24	9.06
Lock 2	362.1	6.10	6.14	10.28	9.30	8.25
Cadell	332.6	-	3.20	9.17	8.08	6.82
Morgan	321.7	-	3.17	8.85	7.65	6.20
Lock 1 Blanchetown	274.2	3.20	3.11	6.81	5.38	4.42
Swan Reach	245.0	0.75	-	6.06	4.51	3.09
Mannum PS	149.8	0.75	0.58	3.15	1.90	1.46
Murray Bridge	115.3	0.75	0.52	2.06	1.26	1.21

Note that the above water levels may be affected by local wind conditions.

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FURTHER INFORMATION

The WaterConnect website is South Australia's comprehensive water information portal and can be accessed at: <http://www.waterconnect.sa.gov.au>

Up-to-date River Murray salinity, flow and water level information can be accessed at the Department of Environment, Water and Natural Resources, SA Water and Murray-Darling Basin Authority websites:

<https://www.waterconnect.sa.gov.au/Systems/RTWD/Pages/Default.aspx>
<http://www.sawater.com.au/SAWater/Environment/WaterProofingAdelaide/TheRiverMurray/RMOU/Dailyflow.htm>
<http://livedata.mdba.gov.au/>

The Department of Environment, Water and Natural Resources has published a series of inundation maps for the River Murray. They are available at:

<https://www.waterconnect.sa.gov.au/Systems/RMIM/SitePages/Home.aspx>

Information on the management of acid drainage water in the Lower River Murray can be accessed at:

http://www.epa.sa.gov.au/environmental_info/water_quality/programs/acid_sulfate_soils/lower_river_murray_reclaimed_irrigation_area_lmria

Details of river height and rainfall information in the River Murray within Victoria and New South Wales are available at the Bureau of Meteorology website: <http://www.bom.gov.au/vic/flood>

Information provided by the Commonwealth Environmental Water Office can be accessed at:

www.environment.gov.au/ewater/southern/murray/lower-murray.html

Information on The Living Murray can be accessed at:

<http://www.mdba.gov.au/about-basin/environmental-sites>

Department of Environment, Water and Natural Resources

<http://www.environment.sa.gov.au/Home>

Basin Salinity Management 2030 can be accessed at:

<http://www.mdba.gov.au/media-pubs/publications/basin-salinity-management-2030>

Information provided by the Department of Transport, Energy and Infrastructure on boat licences, registering motor boats, owning and operating water craft, and boat and marine safety can be accessed at:

www.sa.gov.au/boatingmarine

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