Murray and Sunraysia Combined Blue Green Algae Report

30 November 2023

Murray River
In Hume Dam, Heywoods Bay near Bethanga, Hume dam Resort and the Bowna arm are on **Amber** alert for blue-green algae.

The Murray River at Tooleybuck is on **Amber** alert.

BILLBONG CREEK, EDWARD & WAKOOL RIVERS
The Edward River at Deniliquin is on **Amber** alert for blue-green algae.

Darling River, Menindee Lakes and Darling Anabranch
Lake Tandure, the Darling River upstream of Pomona, Pomona Boat Ramp as well as the Great Darling Anabranch at the Silver City Highway crossing are on **Red** alert for blue-green algae.

Amber alerts for blue-green algae are current for the Darling River at Wilcannia, Lake Wetherell sites 1, 2, 3 and 4, Lake Pamamaroo inlet, centre and outlet, Copi Hollow, Lake Menindee, the Darling River at BHWB pump, Weir 32, Tolarno, Pooncarie, Burtundy, Ellerslie and Tapio.

Albury and Menindee, BOM 7-day weather forecast

Albury
Forecast updated at 8:41 am EDT on Thursday 30 November 2023.

	Thu. 30 Nov	Fri. 1 Dec	Sat. 2 Dec	Sun. 3 Dec	Mon. 4 Dec	Tue. 5 Dec	Wed. 6 Dec
	Cloudy.	Shower or two.	Shower or two. Possible storm.	Possible shower.	Mostly sunny.	Sunny.	Sunny.
Max. Temperature	24 °C	26 °C	24 °C	25 °C	28 °C	31 °C	32 °C
Min. Temperature		15 °C	15 °C	13 °C	12 °C	14 °C	17 °C

Menindee
Forecast updated at 8:41 am EDT on Thursday 30 November 2023. Detailed Menindee Forecast

	Thu. 30 Nov	Fri. 1 Dec	Sat. 2 Dec	Sun. 3 Dec	Mon. 4 Dec	Tue. 5 Dec	Wed. 6 Dec
	Partly cloudy.	Partly cloudy.	Mostly sunny.	Sunny.	Sunny.	Sunny.	Sunny.
Max. Temperature	26 °C	28 °C	29 °C	29 °C	33 °C	39 °C	37 °C
Min. Temperature		15 °C	15 °C	14 °C	15 °C	18 °C	20 °C

Blue-green algal outlook
In the upper reaches of the catchment, warm air temperatures on Tuesday and Wednesday should be beneficial for the promotion of algal growth.

The warm and sunny weather at Menindee, especially from Sunday onwards, is expected to give rise to good conditions for algal growth.

Table 1 Combined Murray and Sunraysia Alerts

Site	Description	Latest Sample Date	Cyanobacteria Total Count (cells/mL)	Cyanobacteria Biovolume (mm3/L)	Potentially Toxic Cyanobacterial Count (cells/mL)	Potentially Toxic Cyanobacterial Biovolume (mm3/L)	Current Status (based on Latest Sample)	Previous Status	Cyanobacteria dominant potentially toxic taxa	Cyanobacteria Comments
MURRAY RIVER SYSTEM										
	Manus Lake (SVC) Lake pontoon	20/11/2023	38,375	12.369	28375	12.291	RED	No Alert	*Dolichospermum sp.*	Potentially toxic, taste & odour
DLH003	Lake Hume, Ebden	20/11/2023	277	0.064	138	0.004	GREEN	GREEN	*Microcystis sp.*	Potentially toxic, taste & odour
DLH001	Lake Hume, Heywoods Bay nr Bethanga	20/11/2023	9,715	0.320	0	0.000	AMBER	AMBER		
DLH002	Lake Hume, Hume Dam Resort	20/11/2023	9,264	0.245	0	0.000	AMBER	AMBER		
DLH004	Lake Hume, Dam Wall	20/11/2023	10,319	0.283	0	0.000	GREEN	AMBER		
DLH010	Lake Hume, Bowna	20/11/2023	5,050	0.516	138	0.004	AMBER	AMBER	*Microcystis sp.*	Potentially toxic, taste & odour
N1000	Murray R. Union Bridge Albury	8/11/2023	659	0.004	0	0.000	No Alert	No Alert		
N1001	Murray R. Corowa	8/11/2023	1,106	0.002	0	0.000	No Alert	No Alert		
	Yarrawonga Weir (outlet) GMW	13/11/2023	6,746	0.180	0	0.000	GREEN	GREEN		
N1008	Mulwala Canal Offtake	8/11/2023	12,506	0.016	0	0.000	No Alert	No Alert		
N1007	Murray R. @ below Yarrawonga	8/11/2023	3,380	0.004	0	0.000	No Alert	GREEN		
N1051	Murray R. Cobram (Barooga)	8/11/2023	13,173	0.241	0	0.000	GREEN	No Alert		
	Cobram WTP, raw water (GVW)	27/11/2023	36,484	0.278	57	0.016	GREEN	No Alert	*Dolichospermum - coiled (≥6µm)*	Potentially toxic
N1013	Murray R. Tocumwal	8/11/2023	32,597	0.116	0	0.000	GREEN	No Alert		
N1052	Murray R. Picnic Point	6/11/2023	70,114	0.345	2,428	0.287	GREEN	GREEN	*Aphanizomenonaceae Unknown*	Potentially toxic, taste & odour
	Barmah WTP raw water (GVW)	27/11/2023	94,483	1.354	828	0.232	AMBER	GREEN	*Dolichospermum - coiled (≥6µm)*	Potentially toxic
N1050	Murray R. Moama (Echuca)	6/11/2023	12,444	0.017	0	0.000	No Alert	No Alert		
	Torrumbarry Weir GMW	13/11/2023	10,019	0.202	0.000	0.000	GREEN	GREEN		
N1003	Murray R. Barham (Koondrook)	7/11/2023	15,815	0.107	902	0.084	GREEN	GREEN	*Dolichospermum sp.*	Potentially toxic, taste & odour
N1054	Murray R. Murray Downs (Swan Hill)	7/11/2023	36,142	0.073	0	0.000	GREEN	GREEN		
	Murray River U/S Woorinen pumps GMW	1/11/2023	162,750	1.200	0	0.000	AMBER	0.000		
N1055	Murray R. Tooleybuc (Piangil)	7/11/2023	163,503	1.242	2,010	0.184	AMBER	GREEN	*Aphanizomenonaceae Unknown*	Potentially toxic, taste & odour
N1064	Lake Benanee Rec Area	7/11/2023	20,463	0.028	0	0.000	No Alert	GREEN		
N1028	Murray R. Euston (Robinvale)	7/11/2023	16,952	0.351	0	0.000	GREEN	GREEN		
N1065	Murray R. Mount Dispersion	7/11/2023	26,340	0.036	0	0.000	No Alert	GREEN		
N1062	Murray R. Buronga	6/11/2023	65,221	0.085	0	0.000	GREEN	AMBER		
N1027	414206 - Murray River at Merbein	7/11/2023	32,915	0.038	138	0.003	No Alert	AMBER	*Microcystis sp.*	Potentially toxic, taste & odour
N1063	Murray R. Curlwaa	6/11/2023	34,566	0.043	0	0.000	GREEN	AMBER		
N1066	Murray R. Fort Courage	6/11/2023	300,355	0.309	0	0.000	GREEN	AMBER		
N1077	Murray R. Lock 8	6/11/2023	34,360	0.088	2,255	0.052	GREEN	AMBER	*Microcystis sp.*	Potentially toxic, taste & odour
N1078	Lake Victoria Outlet Regulator	6/11/2023	47,121	0.066	0	0.000	GREEN	GREEN		

Table 1 Continued

BILLBONG CREEK, EDWARD & WAKOOL RIVERS										
N1020	Billabong Ck. Walbundrie	8/11/2023	0	0.000	0	0.000	No Alert	No Alert		
N1015	Billabong Ck. Jerilderie	6/11/2023	8,296	0.010	0	0.000	No Alert	No Alert		
N1006	Gulpa Ck. Mathoura	6/11/2023	18,211	0.030	0	0.000	No Alert	No Alert		
N1002	Edward R Deniliquin	6/11/2023	61,653	0.620	0	0.000	AMBER	GREEN		
N1053	Edward R. Old Morago	7/11/2023	15,383	0.030	0	0.000	No Alert	No Alert		
N1005	Edward R. Moulamein	7/11/2023	18,251	0.033	0	0.000	No Alert	GREEN		
N1010	Wakool R. Wakool-Barham Road	7/11/2023	72,867	0.059	0	0.000	GREEN	AMBER		
N1004	Wakool R. @ Stoney Crossing	7/11/2023	52,389	0.092	0	0.000	GREEN	GREEN		
N1009	Wakool R. Kyalite	7/11/2023	61,184	0.189	2,904	0.086	GREEN	AMBER	*Radiocystis sp.*	Potentially toxic
MENINDEE LAKE SYSTEM & LOWER DARLING RIVER										
N1042	Darling River at Wilcannia	6/11/2023	89,204	1.270	8,214	1.150	AMBER	AMBER	*Anabaenopsis sp.*	Potentially toxic
N1087	Lake Wetherell Site 1	23/10/2023	166,967	0.284	382	0.049	AMBER	AMBER	*Anabaenopsis sp.*	Potentially toxic
N1088	Lake Wetherell Site 2	23/10/2023	252,034	0.335	0	0.000	AMBER	AMBER		
N1089	Lake Wetherell Site 3	23/10/2023	514,462	0.826	0	0.000	AMBER	AMBER		
N1090	Lake Wetherell Site 4	23/10/2023	1,717,720	3.857	0	0.000	AMBER	AMBER		
N1091	Lake Tandure Site 8	23/10/2023	7,004,769	10.909	347	0.043	RED	AMBER	*Dolichospermum circinale*	Potentially toxic, taste & odour
N1092	Lake Pamamaroo Inlet (Site 9)	23/10/2023	4,748,921	7.785	0	0.000	AMBER	AMBER		
N1129	42510013 Centre Pamamaroo (Site 13)	24/10/2023	1,166,254	2.103	1,041	0.130	AMBER	AMBER	*Dolichospermum sp.*	Potentially toxic, taste & odour
N1093	Lake Pamamaroo Outlet (Site 10)	23/10/2023	1,517,460	3.079	6,244	0.779	AMBER	AMBER	*Dolichospermum sp.*	Potentially toxic, taste & odour
N1094	Menindee Lakes, Copi Hollow	24/10/2023	1,561,531	3.680	11,017	1.380	AMBER	AMBER	*Aphanizomenonaceae Unknown*	Potentially toxic, taste & odour
N1130	Lake Menindee Site 19	24/10/2023	462,386	1.399	6,103	0.761	AMBER	AMBER	*Dolichospermum sp.*	Potentially toxic, taste & odour
N1128	Lake Cawndilla Site 34 Outlet	24/10/2023	166,941	0.360	0	0.000	GREEN	AMBER		
N1095	Darling R. Menindee bhwb pump	24/10/2023	1,176,739	2.214	6,369	0.595	AMBER	AMBER	*Dolichospermum sp.*	Potentially toxic, taste & odour
N1086	Darling R u/s Weir 32	24/10/2023	446,556	1.064	2,997	0.280	AMBER	AMBER	*Dolichospermum sp.*	Potentially toxic, taste & odour
N1043	Darling R. Tolarno	13/11/2023	116,130	0.295	624	0.078	GREEN	AMBER	*Dolichospermum circinale*	Potentially toxic, taste & odour
N1040	Darling R. Pooncarie	13/11/2023	631,054	0.650	0	0.000	AMBER	AMBER		
N1041	Darling R. Burtundy	13/11/2023	533,464	1.693	4,718	0.441	AMBER	AMBER	*Dolichospermum sp.*	Potentially toxic, taste & odour
N1074	Darling R. Ellerslie	13/11/2023	941,815	2.193	3,473	0.442	AMBER	AMBER	*Dolichospermum circinale*	Potentially toxic, taste & odour
N1075	Darling R. Tapio	13/11/2023	435,931	2.573	20,896	1.592	AMBER	AMBER	*Dolichospermum sp.*	Potentially toxic, taste & odour
Non routine monitoring Wentworth Weir Pool										
N1365	US Pomona (13KM)	7/11/2023	323,416	6.856	43,117	6.030	RED	GREEN	*Dolichospermum circinale*	Potentially toxic, taste & odour
N1366	Pomona (@ Boat Ramp)	20/11/2023	15,503	0.205	1,613	0.145	RED	RED	*Dolichospermum circinale*	Potentially toxic, taste & odour
GREAT DARLING ANABRANCH										
N1350	Silver City Hwy	13/11/2023	4,100,830	6.145	8,296	0.212	RED	RED	*Microcystis sp.*	Potentially toxic, taste & odour

Alert Definitions for Recreational Waters

Alert Definitions as specified in The National Health and Medical Research Council (NHMRC) *Guidelines for Managing Risks in Recreational Water* 2008. The use of these guidelines is endorsed by the Scientific Subcommittee of the NSW Algal Advisory Group.

RED ALERT

These alert levels represent 'bloom' conditions. Water will appear green or discoloured and clumps or scums could be visible. It can also give off a strong musty or organic odour. Algae may be toxic to humans and animals. Contact with or use of water from red alert areas should be avoided due to the risk of eye and skin irritation. Drinking untreated or boiled water from these supplies can cause stomach upsets. Alternative water supplies should be sought or activated carbon treatment employed to remove toxins. People should not fish when an algal scum is present. Owners should keep dogs away from high alert areas and provide alternative watering points for stock.

AMBER ALERT

Blue-green algae may be multiplying, and the water may have a green tinge and musty or organic taste and odour. The water should be considered as unsuitable for potable use and alternative supplies or prior treatment of raw water for domestic purposes should be considered. The water may also be unsuitable for stock watering. Generally suitable for water sports, however people are advised to exercise caution in these areas, as blue-green algal concentrations can rise to red alert levels quickly under warm, calm weather conditions.

GREEN ALERT

Blue-green algae occur naturally at low numbers. At these concentrations, algae would not normally be visible, however some species may affect taste and odour of water even at low numbers and does not pose any problems for recreational, stock or household use.

Table 2 Description of the Alerts applied to Recreational Waters

Red Alert ≥ 50 000 cells/mL toxic *M. aeruginosa* OR biovolume equivalent of ≥4 mm^3/L for the combined total of all cyanobacteria where a known toxin producer is dominant OR The total biovolume of all cyanobacteria exceeds 10 mm^3/L OR Cyanobacterial blooms are consistently present	• High levels of Blue Green Algae detected • Indicates "bloom" conditions • Toxicity should be presumed • Water will appear green or brownish and may have a strong musty taste and odour • Surface scums could occur **Extreme care should be exercised, and contact with the water should be avoided** *Action* • Issue Media Release • Water supply authorities to increase filtering with activated carbon as appropriate Local authority and health authorities to warn the public that the water body is considered to be unsuitable for primary contact recreation
Amber Alert ≥5000 to <50 000 cells/mL *M. aeruginosa* OR biovolume equivalent of ≥ 0.4 to < 4 mm^3/L for the combined total of all cyanobacteria	• Indicates blue-green algae are multiplying • Water may have a green tinge and musty taste and odour *Action* • Water supply authorities to consider filtering with activated carbon Investigations into the causes of the elevated levels and increased sampling to enable the risks to recreational users to be more accurately assessed.
Green Alert > 500 to < 5000 cells/mL *M. aeruginosa* OR biovolume equivalent of > 0.04 to < 0.4 mm^3/L for the combined total of all cyanobacteria	• Low levels of potentially toxic species detected – suggesting base crop of blue green algae may be on the increase *Action* Continue/increase routine sampling to measure cyanobacterial levels

Livestock Drinking Water Guidelines Based on ARMCANZ (2000), Orr and Schneider (2006) and WQRA (2010)

This guideline should be used when water is used for livestock drinking water purposes.

- If visual scums are present, then a High alert should be declared. This would be applicable for both farm dams and publicly managed water bodies (streams, rivers). Such advice should also be given to farmers who phone the department seeking information on managing blooms in their dams.

- Where blooms dominated by ***Microcystis aeruginosa*** are present, then the ANZECC/ARMCANZ (2000) guideline of 11,500 cells/mL should be used. Excess of this cell count will constitute a High alert.

- Where blooms dominated by ***Dolichospermum circinale*** are present, then the Orr and Schneider (2006) guideline of 25,000 cells/mL should be used. Excess of this cell count will constitute a High alert.

- **Blooms of blue-green algae other** than *M. aeruginosa* and *D. circinale* are also common in NSW. These can be of either known potentially toxic species, or of species not considered to be toxin producers. When these blooms are present, a total blue-green algal biovolume in excess of 6 mm^3/L will constitute a High alert. (These are based on very high alert recommendations for raw water sourced for potable human supply published by WQRA (2010), in lieu of there being nothing else available).

Satellite imagery

The key to the approximate total algae (blue green and non-blue green) concentrations using the Custom Algae Script can be found in Table 3. The actual values can potentially vary by a significant margin due to the geology of the waterbody, species of algae, turbidity, aquatic plants, time of day of the image capture, aerosols in the atmosphere, etc. This variability is a result of the nature of satellite imagery being a large-scale remote sensing format and is not function of the technology or the script itself. For this reason, these colours and descriptors are not the official ***"Algae Alert Level"*** *but rather provides information on the* ***potential risk on algae formation.***

Table 3: Observed risk levels based on the estimated photosynthetic activity for Custom Algae Script

Map Colour	Risk Level -	Starting concentration guide range	RACC recreational alert values approx. equivalence
Blue	Very low	<0.05 mm3/L	No Alert
Green	Low	0.05 to 0.5 mm3/L	Green
Yellow	Medium	0.5 to 5.0 mm3/L	Amber
Red	High	5.0 to 20.0 mm3/L	Red
Dark red	Extreme	> 20 mm3/L	Red

Observations about the satellite images (Figures 1 & 2)

Figure 1 indicates that the Hume Dam was relatively free from elevated phytoplankton activity on 23/11/2023. Later satellite images of the Hume Dam are obscured by cloud cover.

As a result of cloud cover at the Menindee Lakes (Figure 2), the latest satellite image does not show much phytoplankton activity. However, on close observation, some phytoplankton activity can be noted in Lakes Wetherell, Tandure and Pamamaroo.

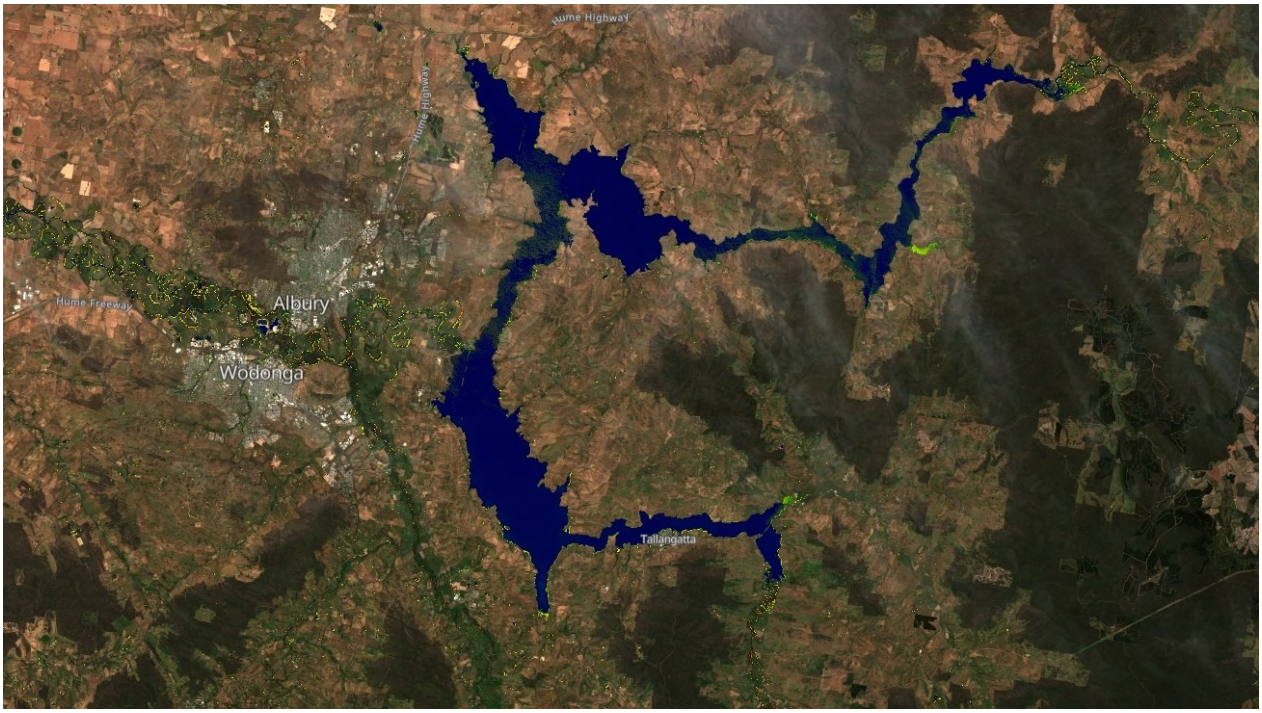

Figure 1: Hume Dame 23/11/2023 SentinelHub [CC BY-NC 4.0] NSW-Custom Algae Script - TF, WaterNSW

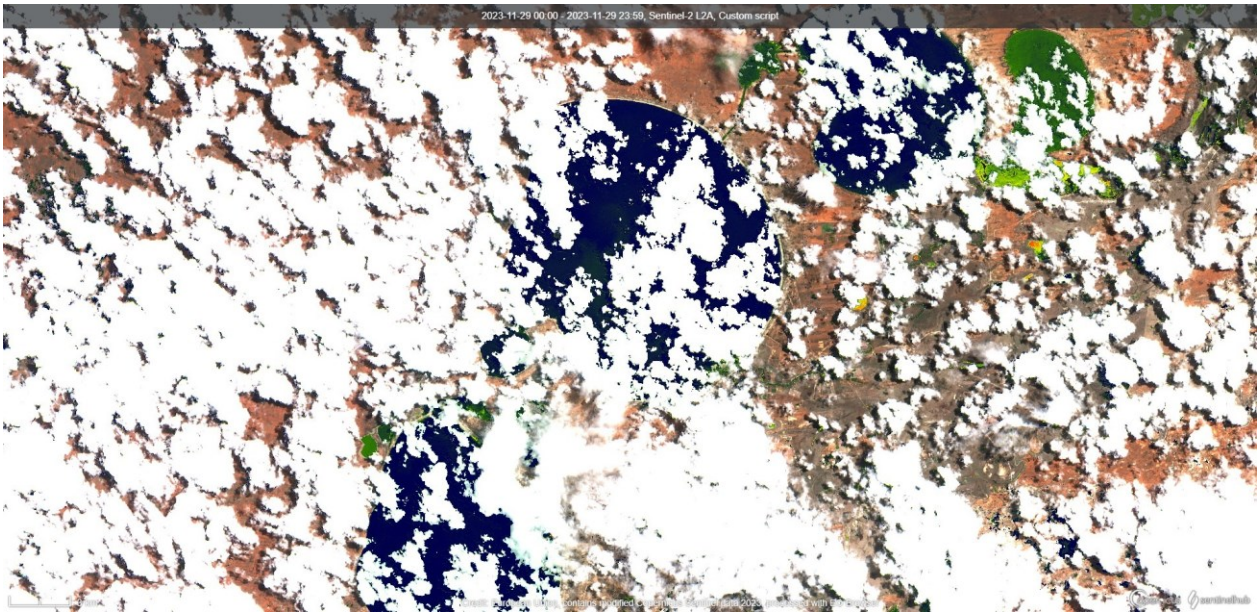

Figure 2: Menindee Lakes 29/11/2023 SentinelHub [CC BY-NC 4.0] NSW-Custom Algae Script - TF, WaterNSW

Further Information and Contacts

Links to websites of VIC agencies

Link to Snowy Valleys Council
Link to Goulburn-Murray Water blue-green algal alerts
Link to Goulburn Valley Water blue-green algal information
Link to Lower Murray Water blue-green algal alerts

Go to the WaterNSW Algal Website

www.waternsw.com.au/algae or at WaterInsights:

Murray regulated river - https://waterinsights.waternsw.com.au/11904-new-south-wales-murray-regulated-river/updates
Lower-Darling regulated river - https://waterinsights.waternsw.com.au/12104-lower-darling-regulated-river/updates

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