

28 November 2023

This Blue-green algal (BGA) alert report is based on routine monitoring at sites in the Lachlan Algae Reporting Area. The sites are monitored by Water NSW and local councils. Satellite imagery may be used to supplement the monitoring data.

## Summary

**General comments:** The Wyangala Dam are currently free of alerts. Sampling indicates an increase algae concentration in Carcoar Downstream. The satellite imagery and laboratory analysis indicate an increased level of algae activity in Lake Brewster and, Lake Cargelligo. However, direct comparisons should be made with caution as the satellite data is from a later date. In addition, there is a delay in sampling results, and we need to wait for the updated results to be available.

### Alert status:

#### Red Alerts

- Lake Brewster Inflow wetland u/s eastern spillway
- Company Dam, Grenfell- For more information visit Weddin Shire Council

#### Amber Alerts

- Lake Cargelligo
- Lake Brewster Regulator C
- Lake Brewster Outlet Channel
- Lachlan River at Willandra Weir
- Lachlan River at Hillston
- Lachlan River at Booligal
- Lachlan River at Corrong

#### Green Alerts

- Carcoar Downstream (Belubula River)

**Satellite Imagery:** Based on the satellite imagery from 18/11 for Wyangala Dam, no algal activity across the reservoir. The imagery from the Carcoar Dam suggests that algae levels seem to be stable with low activity. The satellite imagery reveals heightened algae activity in the Lake Brewster Inflow wetland u/s eastern spillway, Lake Brewster Outlet Channel, and Lake Cargelligo Outlet @ Lake Creek. The most recent images are shown on pages 3-5 of this report. Lake Brewster Outlet Channel

**Weather Outlook:** For December, close to equal chance of above or below median rainfall is likely for central and western NSW. Maximum and minimum temperatures are likely (70% to 80% chance) to be above median.

<http://www.bom.gov.au/climate/outlooks/#/overview/summary>

**Algal Outlook:** Possible showers and continued warmer temperatures are forecast for much of the Lachlan area. Based on the forecast conditions, it is expected to create good conditions for algal growth

## Results Table

Site	Description	Latest Sample Date	BGA Biovolume (mm3/L)	Toxic BGA Biovolume (mm3/L)	Current Alert Status (based on latest sample)	Previous Alert Status	BGA dominant potentially toxic taxa	Comments
<b>Wyangala Dam</b>								
DWYA01	Wyangala Junction Lachlan & Abercrombie	7/11/2023	0.000	0.000	No Alert	No Alert		
DWYA02	Wyangala Junction Lachlan & Sandy Ck	7/11/2023	0.000	0.000	No Alert	No Alert		
DWYA05	Wyangala Abercrombie R	7/11/2023	0.009	0.008	No Alert	No Alert	<i>Microcystis sp.</i>	Potentially toxic, taste & odour
DWYA06	Wyangala Dam Inland Waters Park	7/11/2023	0.000	0.000	No Alert	No Alert		
DWYA08	Wyangala Dam Wall Station 1	7/11/2023	0.000	0.000	No Alert	No Alert		
DWYA04	Wyangala Dam Downstream	7/11/2023	0.000	0.000	No Alert	No Alert		
<b>Carcoar Dam</b>								
DCAR01	Carcoar Dam Station 1 (Dam Wall)	13/11/2023	0.000	0.000	No Alert	No Alert		
DCAR02	Carcoar Downstream (Belubula River)	13/11/2023	0.075	0.002	GREEN	No Alert	<i>Microcystis sp.</i>	Potentially toxic, taste & odour
<b>Lake Cargelligo</b>								
DCRG04	Lake Cargelligo Weir	13/11/2023	0.064	0.000	GREEN	No Alert		
DCRG06	Lachlan River downstream of Lake Cargelligo Weir	13/11/2023	0.039	0.000	No Alert	No Alert		
DCRG05	Lake Cargelligo intake downstream of Curlew Waters	13/11/2023	0.014	0.000	No Alert	GREEN		
DCRG02	Lake Cargelligo Town Water Supply 41210042	13/11/2023	0.191	0.083	AMBER	AMBER	<i>Microcystis Unknown 2</i>	Potentially toxic, taste & odour
DCRG03	Lake Cargelligo Boatshed	13/11/2023	0.075	0.000	AMBER	AMBER		
DCRG01	Lake Cargelligo Outlet @ Lake Creek	13/11/2023	0.656	0.011	AMBER	AMBER	<i>Phormidium Unknown</i>	Potentially toxic, taste & odour
<b>Lake Brewster</b>								
DBRW01	Lake Brewster Inflow 412102	13/11/2023	0.018	0.000	No Alert	AMBER		
DBRW02	Lake Brewster Inf wetland u/s eastern spillway	13/11/2023	14.931	14.065	RED	RED	<i>Dolichospermum circinale</i>	Potentially toxic, taste & odour
DBRW03	Lake Brewster Regulator C	13/11/2023	3.195	2.051	AMBER	AMBER	<i>Dolichospermum sp.</i>	Potentially toxic, taste & odour
DBRW04	Lake Brewster Outlet Channel 412108	13/11/2023	0.847	0.324	AMBER	AMBER	<i>Dolichospermum sp.</i>	Potentially toxic, taste & odour
<b>Lake Brewster</b>								
DLOS06	Lachlan River @ Willandra Weir	13/11/2023	0.165	0.032	AMBER	AMBER	<i>Dolichospermum sp.</i>	Potentially toxic, taste & odour
N1025	Lachlan River at Hillston	31/10/2023	0.472	0.405	AMBER	GREEN	<i>Dolichospermum sp.</i>	Potentially toxic, taste & odour
N1023	Lachlan River at Booligal	7/11/2023	5.114	3.829	AMBER	GREEN	<i>Dolichospermum circinale</i>	Potentially toxic, taste & odour
N1026	Lachlan River at Corrong	7/11/2023	1.656	1.358	AMBER	GREEN	<i>Dolichospermum circinale</i>	Potentially toxic, taste & odour

These alert levels apply to **non-consumptive or recreational contact**. Drinking water safety thresholds are much more stringent.

## Satellite imagery

The key to the approximate total algae (blue green and non-blue green) concentrations using the Custom Algae Script can be found Table 1. 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 1: 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 mm <sup>3</sup> /L	No Alert
Green	Low	0.05 to 0.5 mm <sup>3</sup> /L	Green
Yellow	Medium	0.5 to 5.0 mm <sup>3</sup> /L	Amber
Red	High	5.0 to 20.0 mm <sup>3</sup> /L	Red
Dark red	Extreme	> 20 mm <sup>3</sup> /L	Red

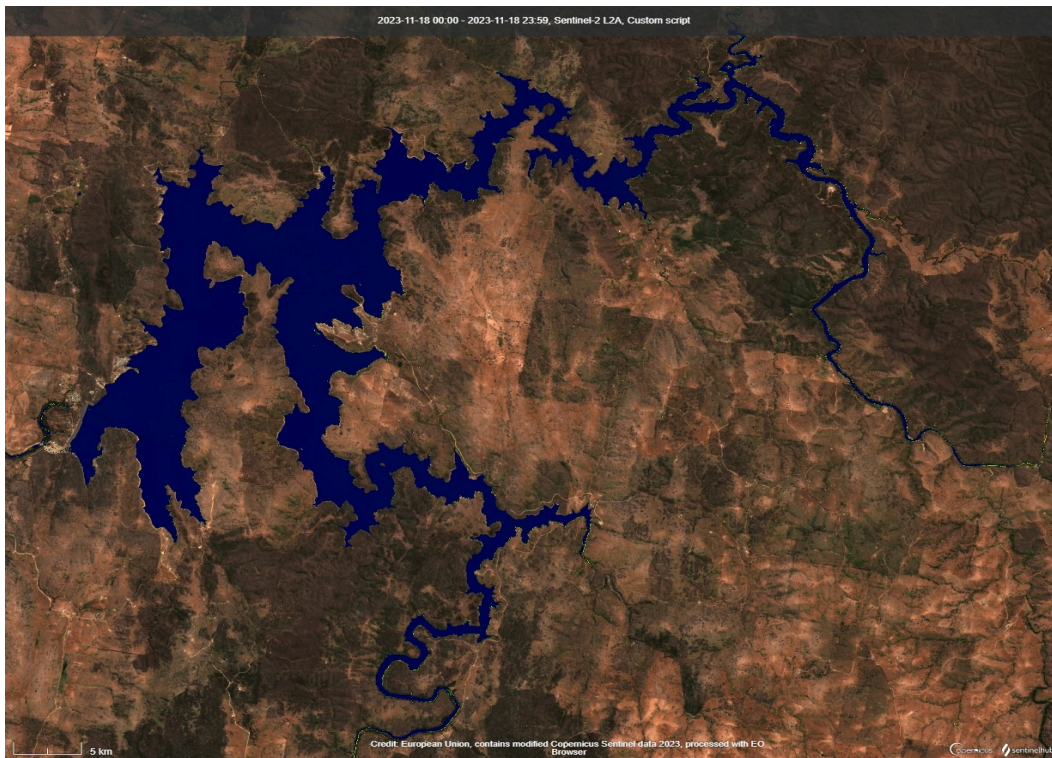


Figure 1: Wyangala Dam **18/11/2023** SentinelHub [CC BY-NC 4.0] NSW-Custom Algae Script - TF, WaterNSW



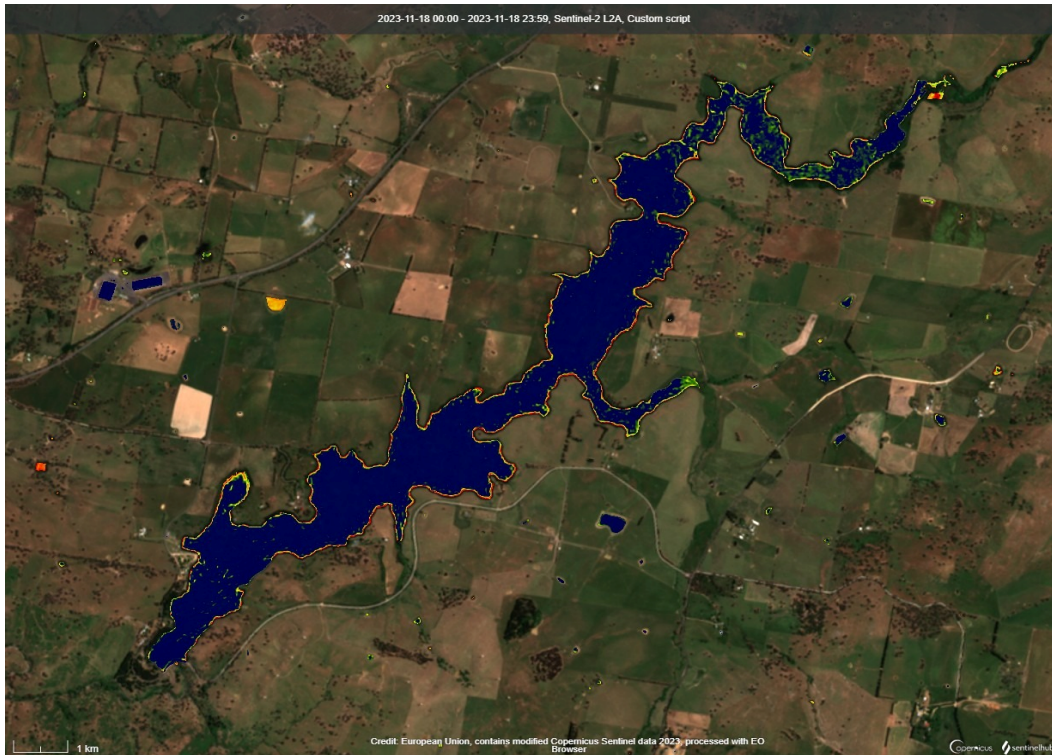


Figure 2: Carcoar Dam **18/11/2023** SentinelHub [CC BY-NC 4.0] NSW-Custom Algae Script - TF, WaterNSW

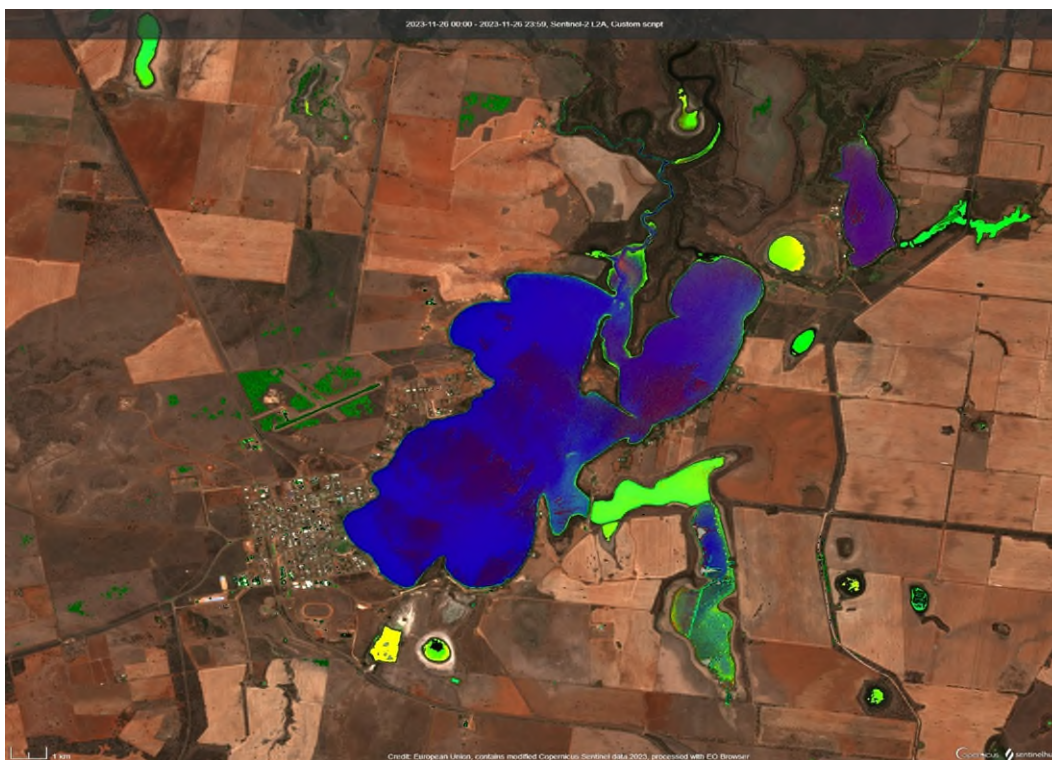


Figure 3: Lake Cargelligo **26/11/2023** SentinelHub [CC BY-NC 4.0] NSW-Custom Algae Script - TF, WaterNSW

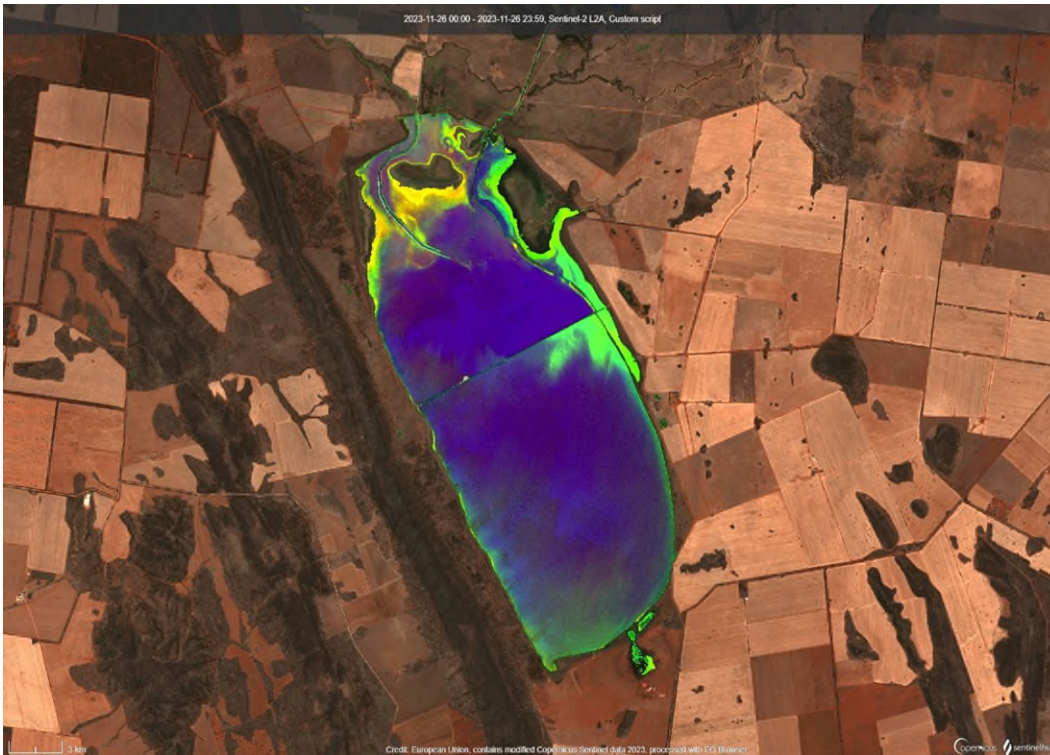


Figure 4: Lake Brewster 26/11/2023 SentinelHub [CC BY-NC 4.0] NSW-Custom Algae Script - TF, WaterNSW.

## 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 interim 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.



## Key to Alerts for Recreational Waters

<p><b>RED Alert</b></p> <p>≥ 50 000 cells/mL toxic <i>M. aeruginosa</i> OR biovolume equivalent of ≥4 mm<sup>3</sup>/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<sup>3</sup>/L OR Cyanobacterial blooms are consistently present</p>	<ul style="list-style-type: none"> <li>• High levels of Blue Green Algae detected</li> <li>• Indicates “bloom” conditions</li> <li>• Toxicity should be presumed</li> <li>• Water will appear green or brownish and may have a strong musty taste and odour</li> <li>• Surface scums could occur</li> <li>• <b>Extreme care should be exercised, and contact with the water should be avoided</b></li> </ul> <p><b>Action</b></p> <ul style="list-style-type: none"> <li>• Issue Media Release</li> <li>• Water supply authorities to increase filtering with activated carbon as appropriate</li> <li>• Local authority and health authorities to warn the public that the water body is unsuitable for primary contact recreation</li> </ul>
<p><b>AMBER Alert</b></p> <p>≥5000 to &lt;50 000 cells/mL <i>M. aeruginosa</i> OR biovolume equivalent of ≥ 0.4 to &lt; 4 mm<sup>3</sup>/L for the combined total of all cyanobacteria</p>	<ul style="list-style-type: none"> <li>• Indicates blue-green algae are multiplying</li> <li>• Water may have a green tinge and musty taste and odour</li> </ul> <p><b>Action</b></p> <ul style="list-style-type: none"> <li>• Water supply authorities to consider filtering with activated carbon</li> <li>• Investigations into the causes of the elevated levels and increased sampling to enable the risks to recreational users to be more accurately assessed.</li> </ul>
<p><b>GREEN Alert</b></p> <p>&gt; 500 to &lt; 5000 cells/mL <i>M. aeruginosa</i> OR biovolume equivalent of &gt; 0.04 to &lt; 0.4 mm<sup>3</sup>/L for the combined total of all cyanobacteria</p>	<ul style="list-style-type: none"> <li>• Low levels of potentially toxic species detected – suggesting base crop of blue green algae may be on the increase</li> </ul> <p><b>Action</b></p> <ul style="list-style-type: none"> <li>• Continue/increase routine sampling to measure cyanobacterial levels</li> </ul>

## 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, etc). 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<sup>3</sup>/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).

## Further Information and Contacts

Go to the Water NSW Algal Website

[www.waternsw.com.au/algae](http://www.waternsw.com.au/algae)

For more information on water quality and flows in the Lachlan Catchment

<https://waterinsights.waternsw.com.au/11983-lachlan-regulated-river/>

## Contacts

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