CTENVIRONMENTAL
ECOSYSTEM MANAGEMENT AND MONITORING

February 2024 Monthly Aquatic Ecosystem Monitoring Report

Liverpool City Council

February 2024

Project	**Liverpool City Council Aquatic Ecosystem Monitoring 2024**
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Aquatic Ecosystem Monitoring Monthly Progress Report - February 2024

Monthly aquatic ecosystem monitoring of the Georges River and South Creek catchments was undertaken on February 01, 2024.

This report provides a summary of recreation water quality indicators (Cyanobacteria, *Faecal coliforms* and *Enterococci*) at Georges River recreation monitoring sites and observations from freshwater monitoring sites.

Badgerys Creek weather monitoring station is expected to be representative of weather conditions in the Kemps Creek catchment and Holsworthy Aerodrome station is expected to be representative of conditions in the locale of the Georges River monitoring sites.

Weather conditions during February sampling were warm to hot with 3.4 mm of rain recorded at Badgerys Creek AWS (Table 1) and 2 mm recorded at Holsworthy Aerodrome (Table 2) in the week prior to sampling.

Table 1: Weather observations for Badgerys Creek AWS, NSW (BOM 2024).

Date	Temp min (°C)	Temp max (°C)	Rainfall (mm)
26/01/2024	20.5	30.8	0.2
27/01/2024	--	--	0
28/01/2024	--	--	0
29/01/2024	--	33.1	0
30/01/2024	22.9	27.0	0.2
31/01/2024	20.9	26	2.4
01/02/2024	19.0	31.0	0.6

Table 2: Weather observations for Holsworthy Aerodrome (BOM 2024).

Date	Temp min (°C)	Temp max (°C)	Rainfall (mm)
26/01/2024	21.4	39.2	0
27/01/2024	19.2	22.7	0.2
28/01/2024	15.3	--	1.4
29/01/2024	18.8	31.1	--
30/01/2024	23.0	28.2	0.2
31/01/2024	21.0	28.2	0.2
01/02/2024	20.3	32.0	0

*-- indicates Missing data from BOM

Blue Green Algae (Cyanobacteria) monitoring at recreation sites in the Georges River was undertaken on February 02, 2024, during the high tide.

Results show that potentially toxic cyanobacteria were detected at four of the Georges River sites during sampling (GR1, GR1.5, GR2, and GR3). Biovolume calculations indicate that NHMRC (2008) Green Level Surveillance mode was triggered at four of the Georges River recreation monitoring sites (GR1, GR1.5, GR2, GR4) and NHMRC (2008) Amber Level Alert Mode was triggered at one of the Georges River recreation monitoring sites (GR3) (Table 3).

Table 3: Results summary for recreation monitoring sites, February 2024.

Site	Sampled	Potentially Toxic Blue Green Algae	NHMRC Alert Level	Safety Issues
GR1	Yes	Detected	Green	None
GR1.5	Yes	Detected	Green	None
GR2	Yes	Detected	Green	None
GR3	Yes	Detected	Amber	None
GR4	Yes	Not detected	Green	None
GR5	Yes	Not detected	N/A	None

Results show that GR1 recorded five species of cyanobacteria which included *Aphanocapsa spp., Cyanogranis libera, Microcystis aeruginosa, Pseudanabaena spp.* and *Romeria spp.* The Biovolume of these species were low, although they were detected at concentrations high enough to trigger the NHMRC (2008) Green Level Surveillance Mode.

GR1.5 recorded eight species which included *Aphanocapsa spp., Cyanogranis libera, Geitlerinema splendidum, Merismopedia spp*., *Microcystis aeruginosa, Phormidium spp., and Pseudanabaena spp.* and *Romeria spp.* Although only low concentrations were found, the biovolume of these species were high enough to trigger the NHMRC (2008) Green Level Surveillance Mode.

Six species (*Aphanocapsa spp., Cyanogranis libera, Cyanonephron spp., Merismopedia spp., Microcystis aeruginosa,* and *Romeria spp.)* were recorded at GR2 at concentrations which were high enough to trigger the NHMRC (2008) Green Level Surveillance Mode.

At GR3, seven species of cyanobacteria were recorded which included *Aphanocapsa spp., Cyanogranis libera., Cyanonephron spp., Merismopedia spp., Microcystis aeruginosa, Pseudanabaena spp., and Romeria spp.* The Biovolume of these species were detected at concentrations high enough to trigger the NHMRC (2008) Amber Level Alert Mode.

Results for GR4 recorded six species of cyanobacteria (*Aphanocapsa spp., Cyanogranis libera., Merismopedia spp*., Planktothrix spp., *Pseudanabaena spp.,* and *Romeria spp.*). Because of the biovolume of these species, NHMRC (2008) Green level Surveillance mode was triggered.

Two species were recorded at GR5 which *Cyanogranis libera.,* and Other Nostocales. The biovolume of these species were not high enough to trigger a NHMRC mode.

Due to the persistence of cyanobacteria, there is potential for future blooms to occur. NHMRC (2008) recommends weekly or fortnightly monitoring if the 'Green' mode is triggered (Table 4).

Table 4: Recommended monitoring actions and corresponding NHMRC Alert Levels.

Blue Green Algae Alert Level	Recommended Actions
Surveillance Mode **(Green Level)**	• Weekly sampling and cell counts at representative locations in the water body where known toxigenic species are present. • Fortnightly for other types including regular visual inspection of water surface for scums.
Alert Mode **(Amber Level)**	• Increase sampling frequency to twice weekly at representative locations in the water body where toxigenic species are dominant within the alert level definition (i.e. total biovolume) to establish population growth and spatial variability in the water body. • Monitor weekly or fortnightly where other types are dominant. • Make regular visual inspections of water surface for scums. • Decide on requirement for toxicity assessment or toxin monitoring.
Action Mode **(Red Level)**	• Continue monitoring as for alert mode. • Immediately notify health authorities for advice on health risk. • Make toxicity assessment or toxin measurement of water if this has not already been done. • Health authorities warn of risk to public health (ie the authorities make a health risk assessment considering toxin monitoring data, sample type and variability).

Results of bacteria monitoring at recreation sites in February 2024 show that the ANZECC Secondary Contact Guideline for *Faecal coliforms* was not exceeded at any of the Georges River recreational sites, and the Primary Contact Guideline for *Faecal coliforms* was exceeded at GR1.5, GR2, GR3.

The ANZECC Secondary Contact Guidelines for *Enterococci* was exceeded only at GR1.5, GR3, while all other sites did not exceed the ANZECC Primary or Secondary Contact Guidelines for *Enterococci*.

Table 5. Summary of conditions observed/recorded at each site during February 2024 monitoring. Orange indicates exceedance of the primary contact guideline; red indicates exceedance of the secondary contact guideline.

	Recreation sites					
SITE	**Sampled**	**Tide**	***Faecal coliforms*** **CFU/100 mL**	***Enterococci*** **CFU/100 mL**	**Safety Issues**	**Observations**
GR1	Yes	N/A	69	17	None	Clear
GR1.5	Yes	N/A	710	330	None	Clear
GR2	Yes	N/A	230	13	None	Clear
GR3	Yes	High	730	32	None	Clear
GR4	Yes	High	120	20	None	Clear
GR5	Yes	High	40	30	None	Clear
Primary Contact	-	-	150	35	-	-

Secondary Contact	-	-	1000	230	-	-

Surface water samples were collected at all freshwater monitoring sites in February 2024, except for KC11 (due to construction of a pipeline).

Table 6. Summary of conditions observed/recorded at each site during February 2024 monitoring.

Site	Water quality	Aquatic Macroinvertebrates	Benthic Diatoms	Flow	Observations	Safety Issues
MC1	Yes	No	Yes	Normal	Clear	None
AC1	Yes	No	Yes	Normal	Clear	None
KC1	Yes	No	Yes	Normal	Turbid	None
KC2	Yes	No	Yes	Normal	Clear	None
KC3	Yes	No	Yes	Normal	Clear	None
KC5	Yes	No	Yes	Normal	Turbid	None
KC6	Yes	No	Yes	Normal	Turbid	None
KC8	Yes	No	Yes	Normal	Turbid	None
KC10	Yes	No	Yes	Normal	Turbid	None
KC11	No	No	Yes	-	-	No access due to construction
KC12	Yes	No	Yes	Normal	Turbid	None
SC1	Yes	No	Yes	Normal	Turbid	None
SC2	Yes	No	Yes	Normal	Clear	None
BC1	Yes	No	Yes	Normal	Turbid	None
WG	Yes	No	Yes	Normal	Clear	None
HC	Yes	No	Yes	Normal	Clear	None

All data has been supplied in an Excel spreadsheet separate to this report and no safety issues were recorded/observed during monitoring.

Statistical analysis of data collected by the monitoring program will be undertaken and presented in the annual report and program recommendations will be made.

The data from this report is reflected in the web reported supplied to Liverpool council.

If you have any questions, please get in touch.

Kind regards,

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References

ANZECC & ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Canberra.

BOM (2024) www.bom.gov.au (accessed February 28, 2024).

NHMRC (2008) Guidelines for Managing Risks in Recreational Water