

Application of algaecide to a bloom in a drinking water storage

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8th ANZ Cyanobacteria workshop



Queensland
Government

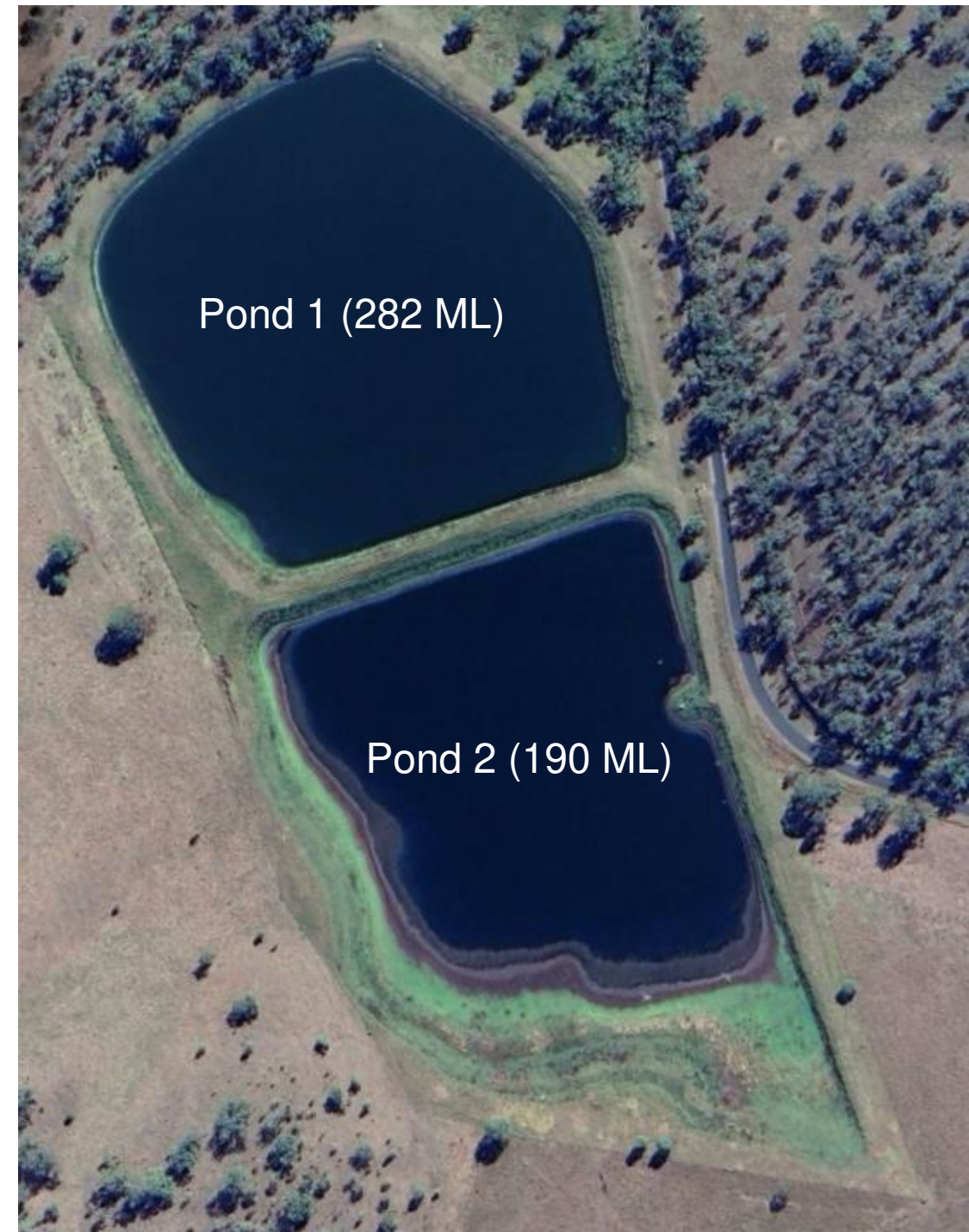
QUEENSLAND'S

Big Things



How it happened

- Notified of a bloom in February
 - ~30 mm³/L
 - ~600,000 cells/mL
- Bloom affecting the Kinbombi ponds (reservoirs)
- Reservoirs and WTP managed by Gympie Regional Council
- Bloom had been ongoing since 2022



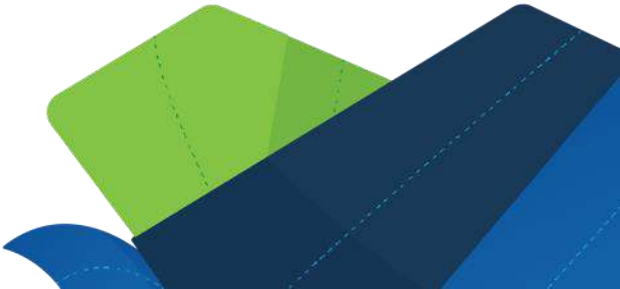
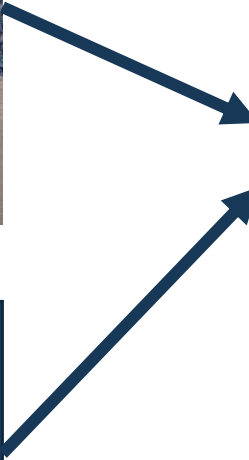
Overview of water treatment processes



Groundwater bores

Goomeri WTP
Coag & floc, sedimentation
Sand filtration
Ozonation
UV
BAC
Chlorination

Drinking water network

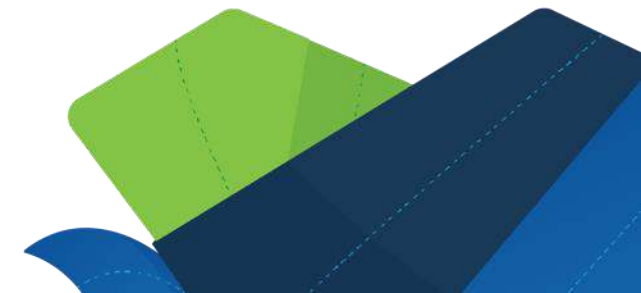


Regulator review

- Gympie Regional Council had conducted some studies, and proposed use of Earthtec®, a copper-based algaecide
- Copper algaecide suspected to have caused the 1979 “Palm Island disease” in Queensland
- Algaecide dosing began after regulators reviewed council’s risk assessment and other material

Algal toxins or copper poisoning — revisiting the Palm Island “epidemic”

Further, the copper sulfate was not distributed uniformly through the water in the dam: a local resident with a dinghy had been contracted and instructed to spread the bags of copper salt around the dam, but had instead dumped it all at one place — immediately over the outlet pipe which carried the island’s drinking water.



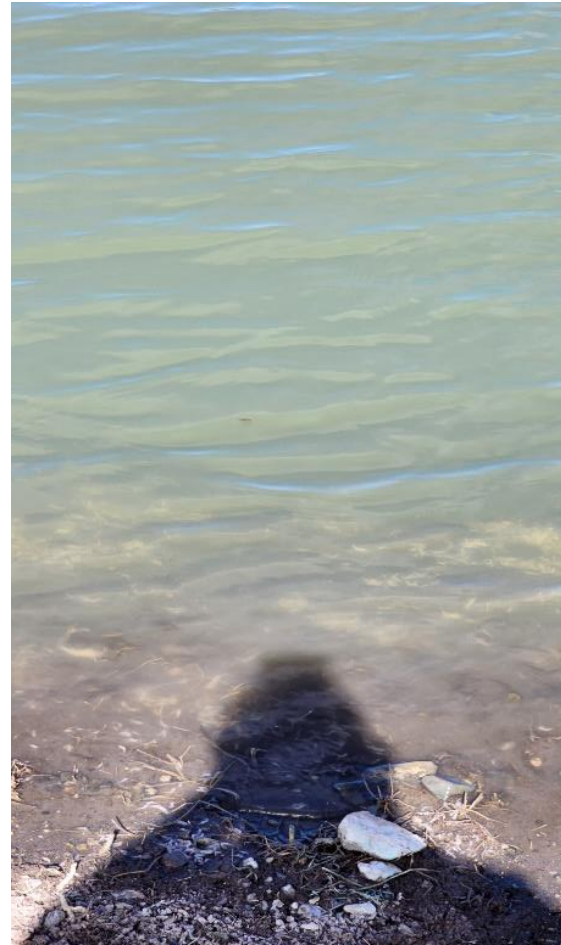
Day 0 (21/2/2023)



Day 1



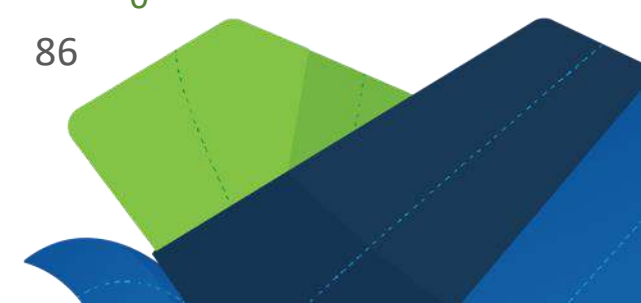
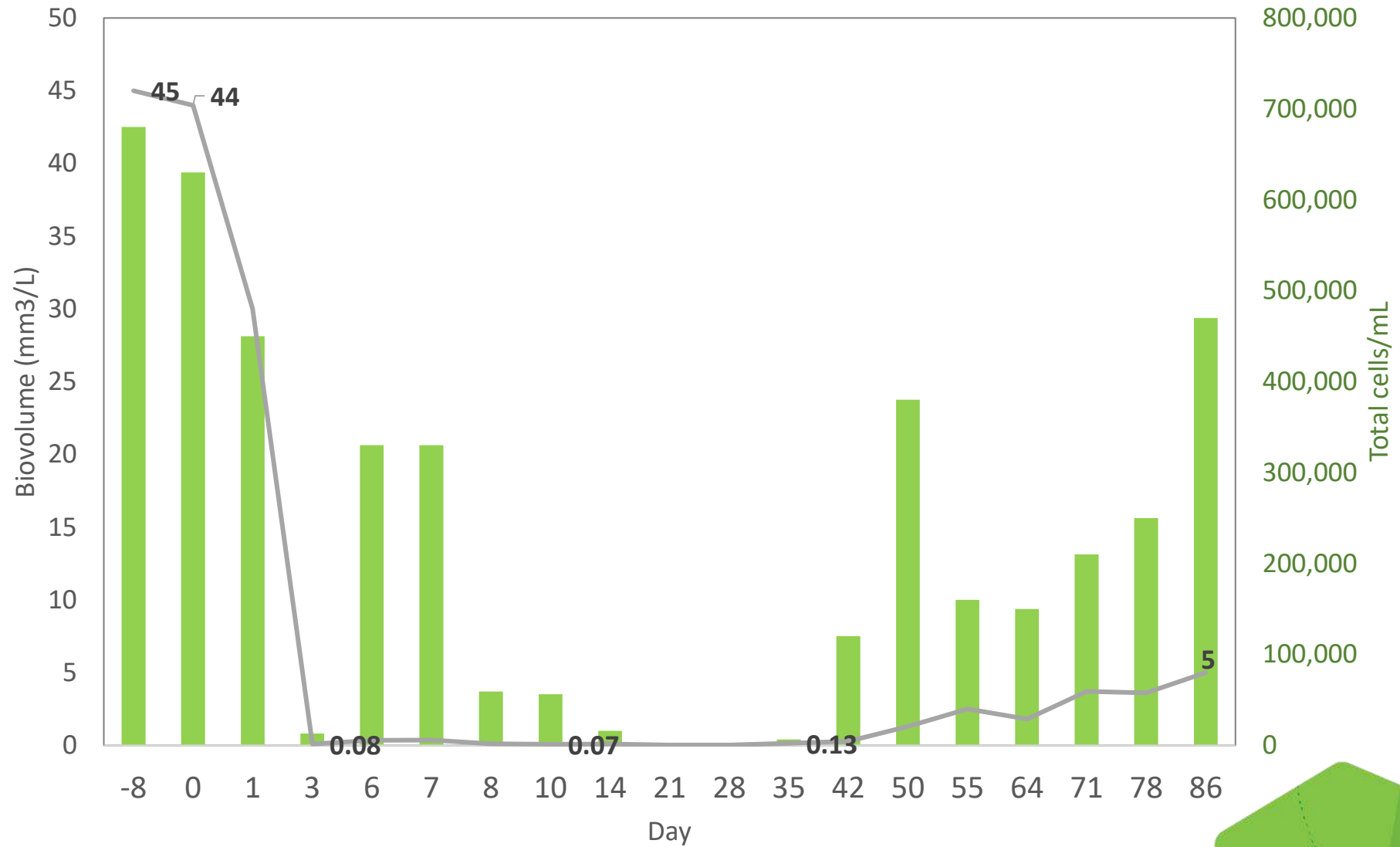
Day 3



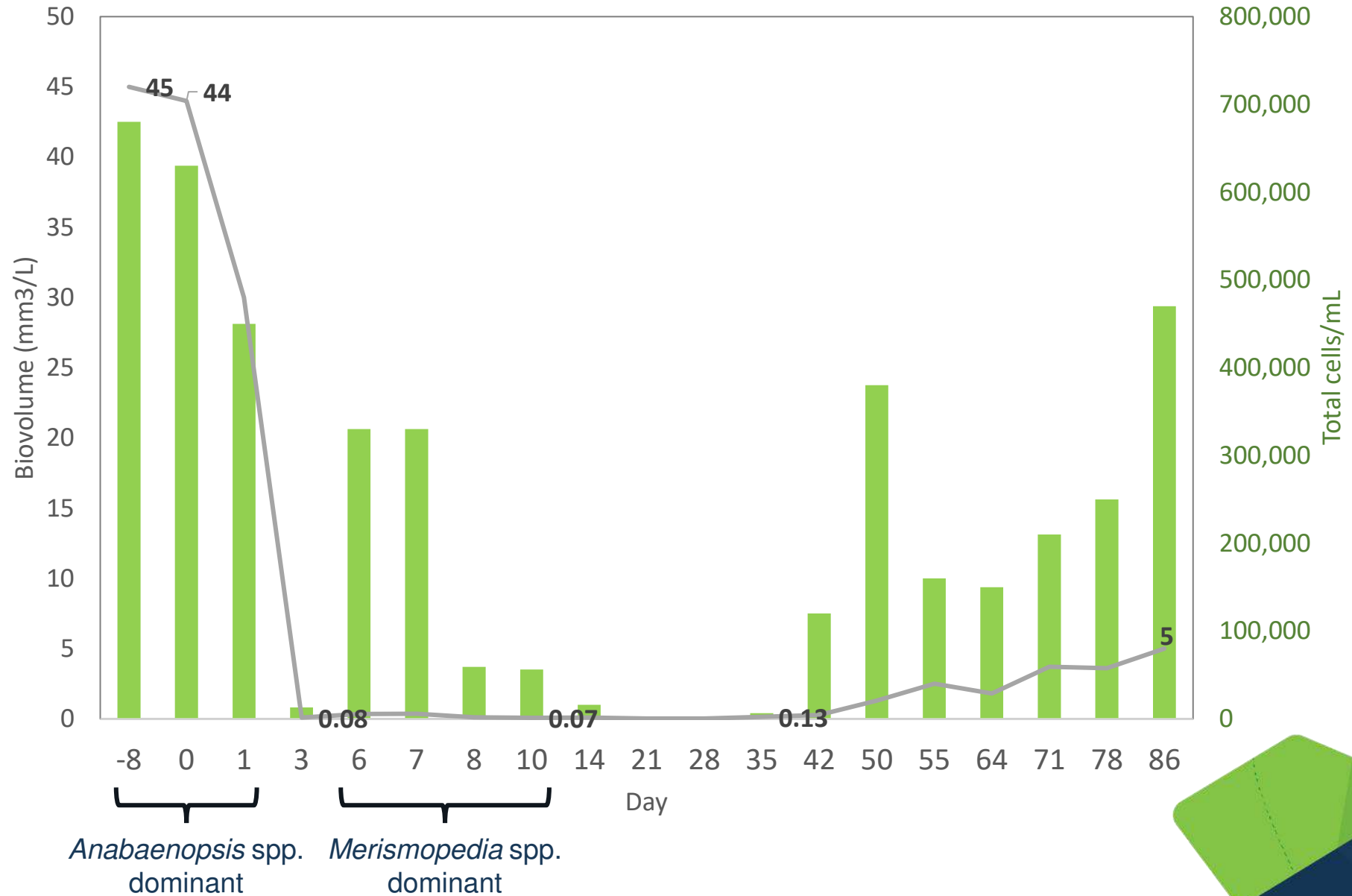
Day 8



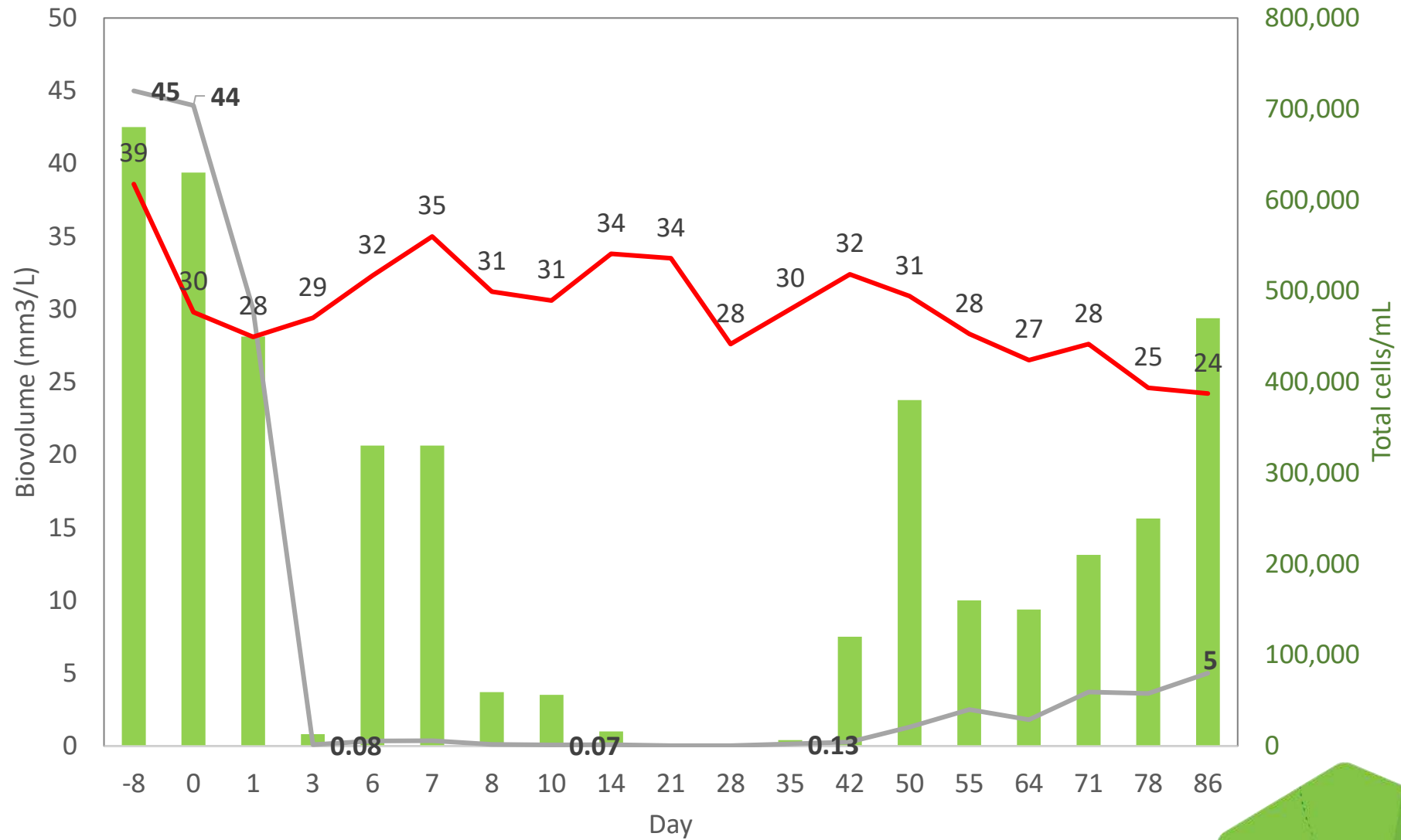
Biovolumes and cell counts



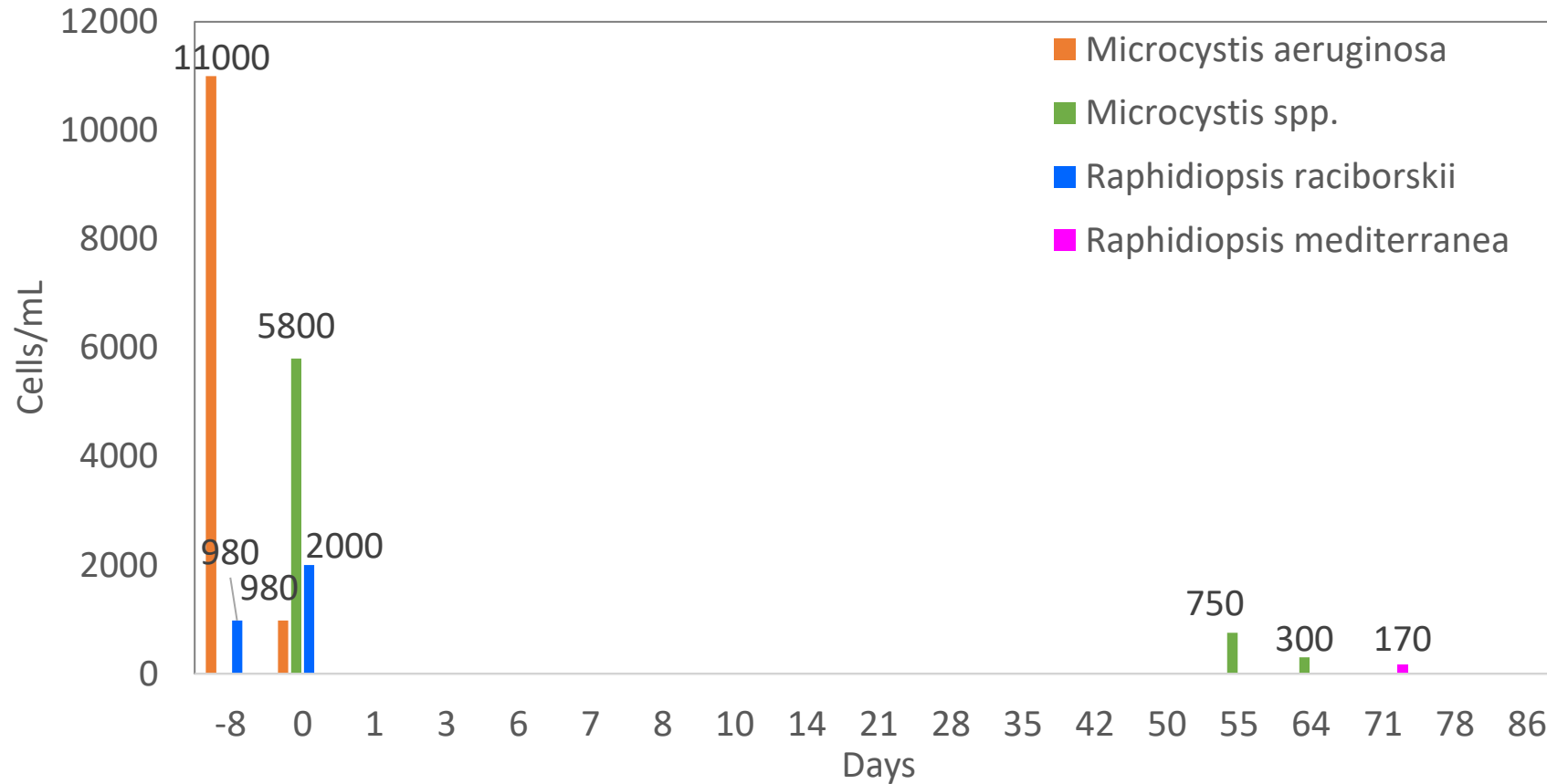
Biovolumes and cell counts



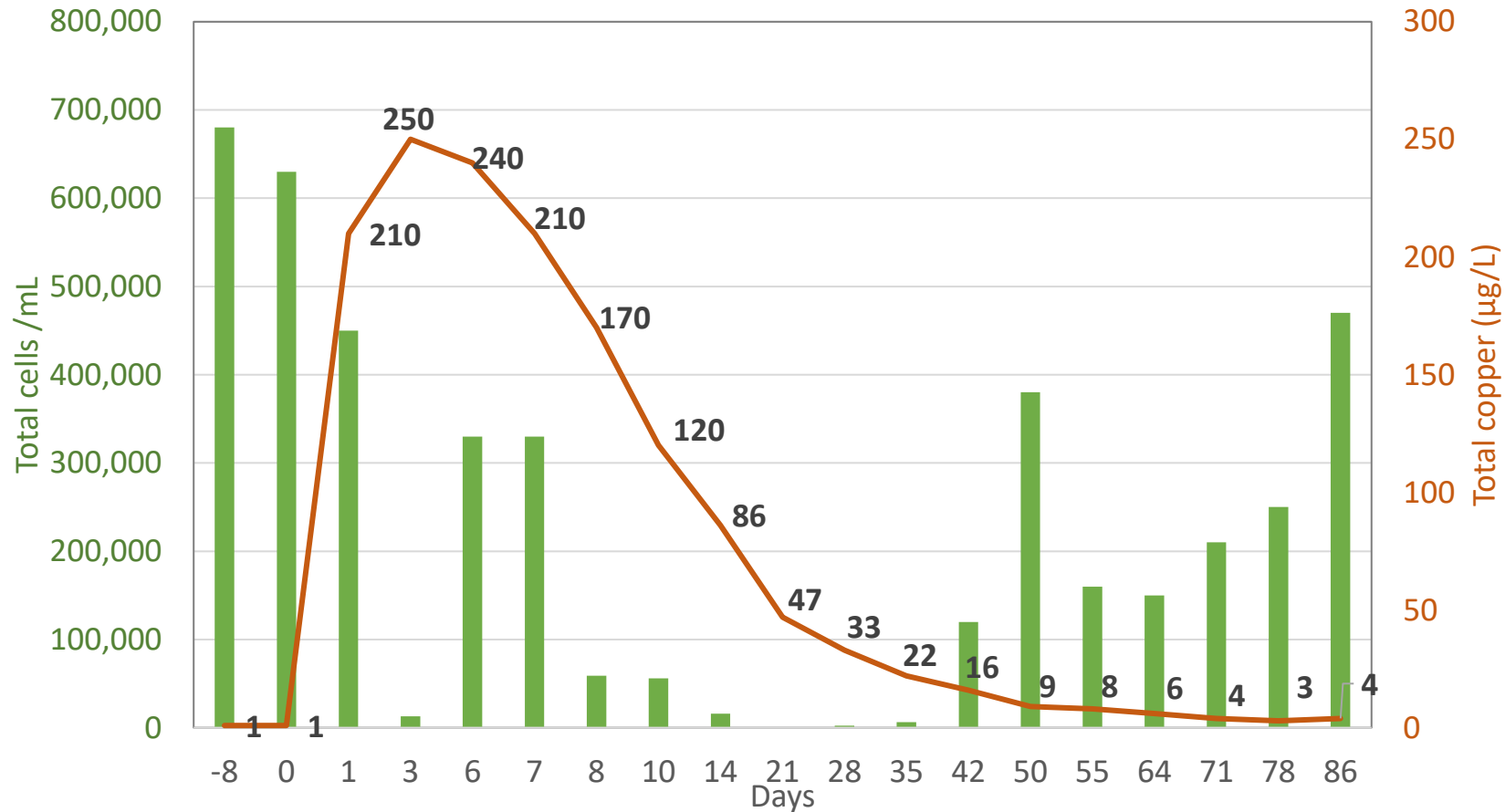
Temperature



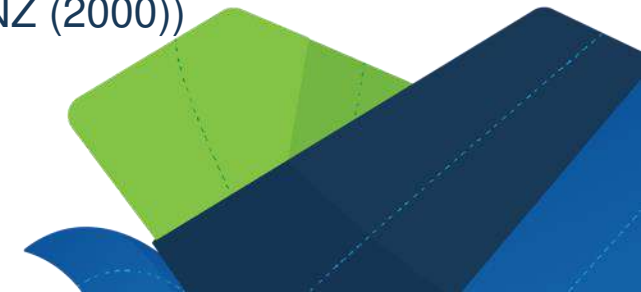
Detection of potentially toxic species

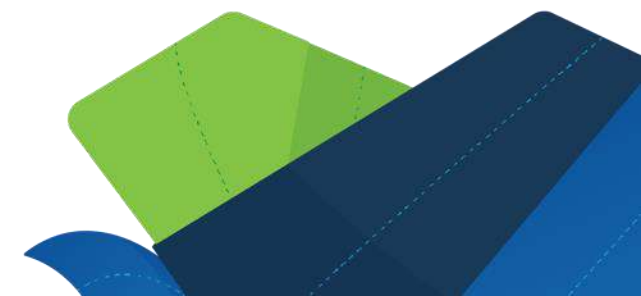
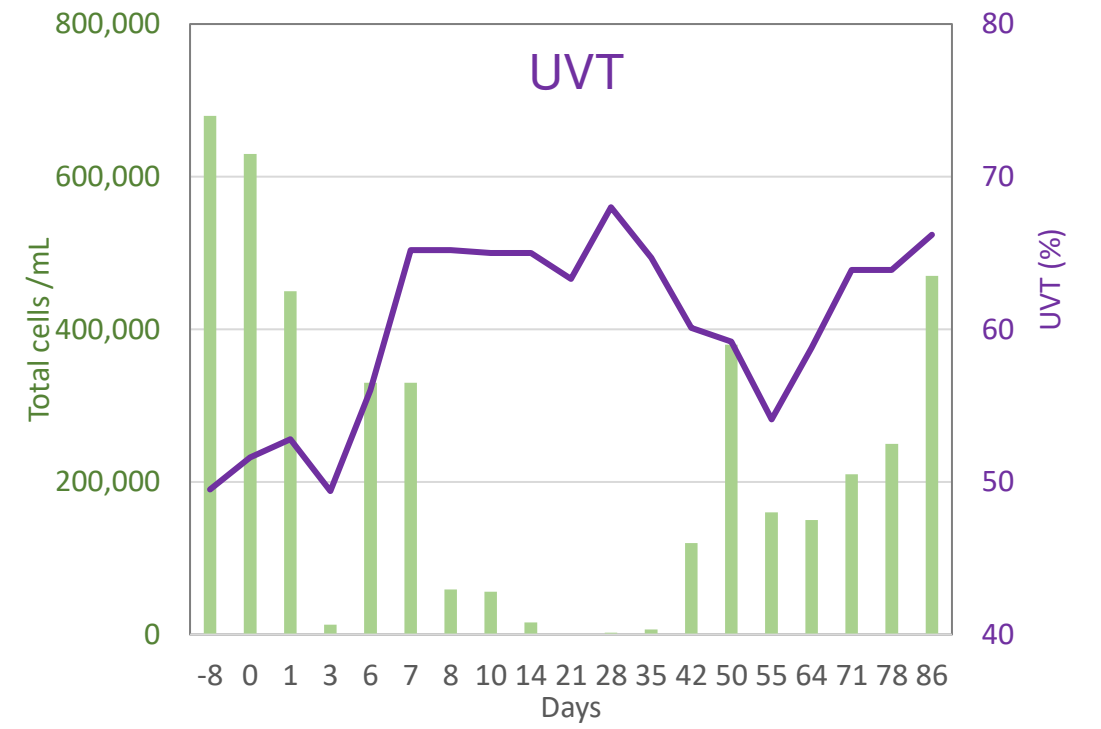
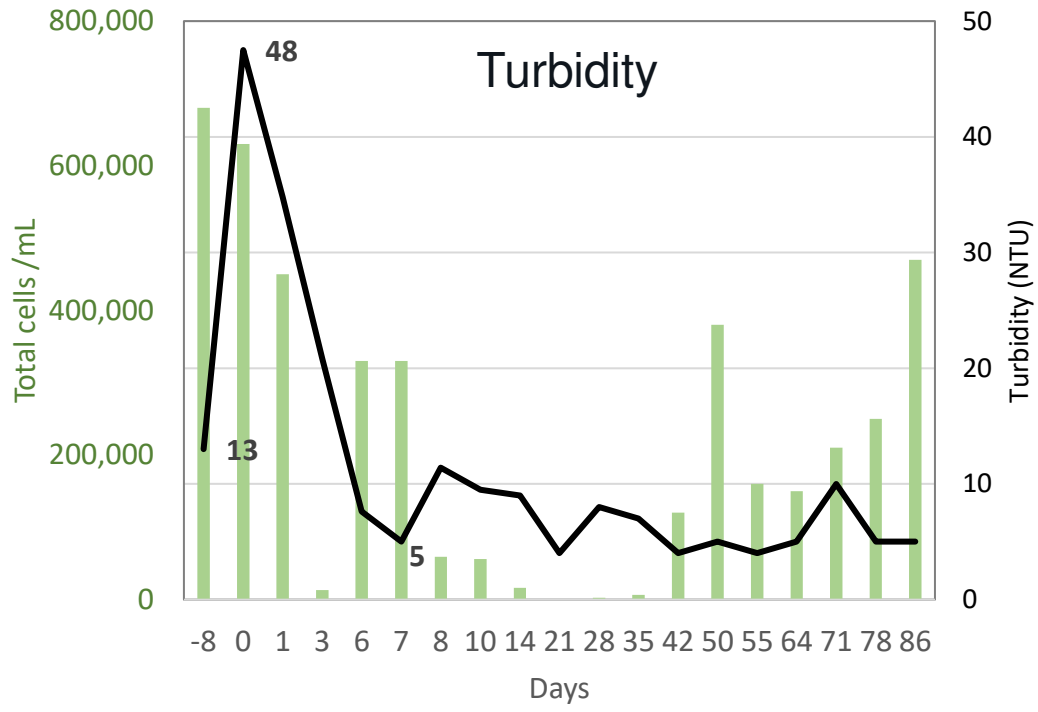


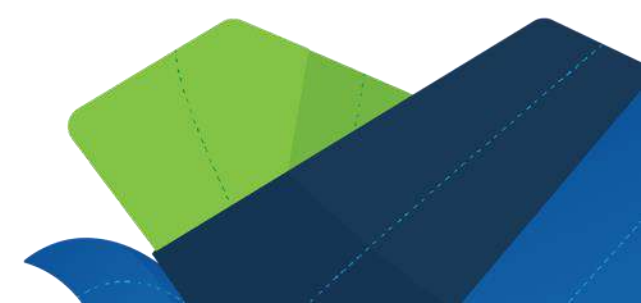
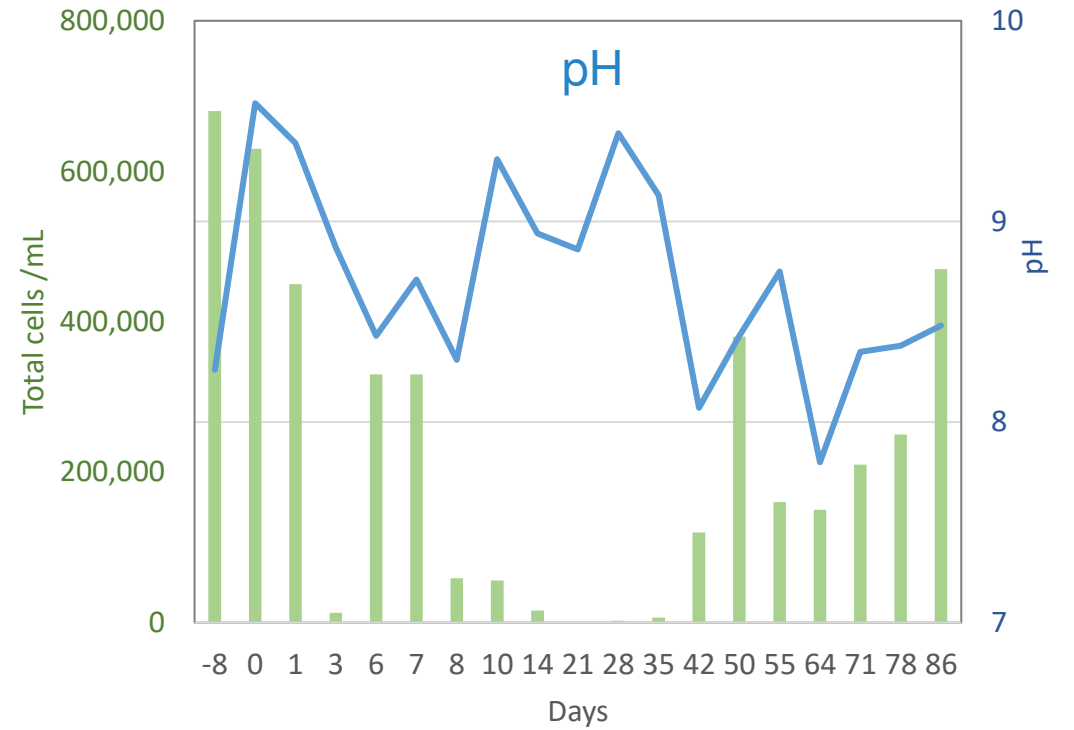
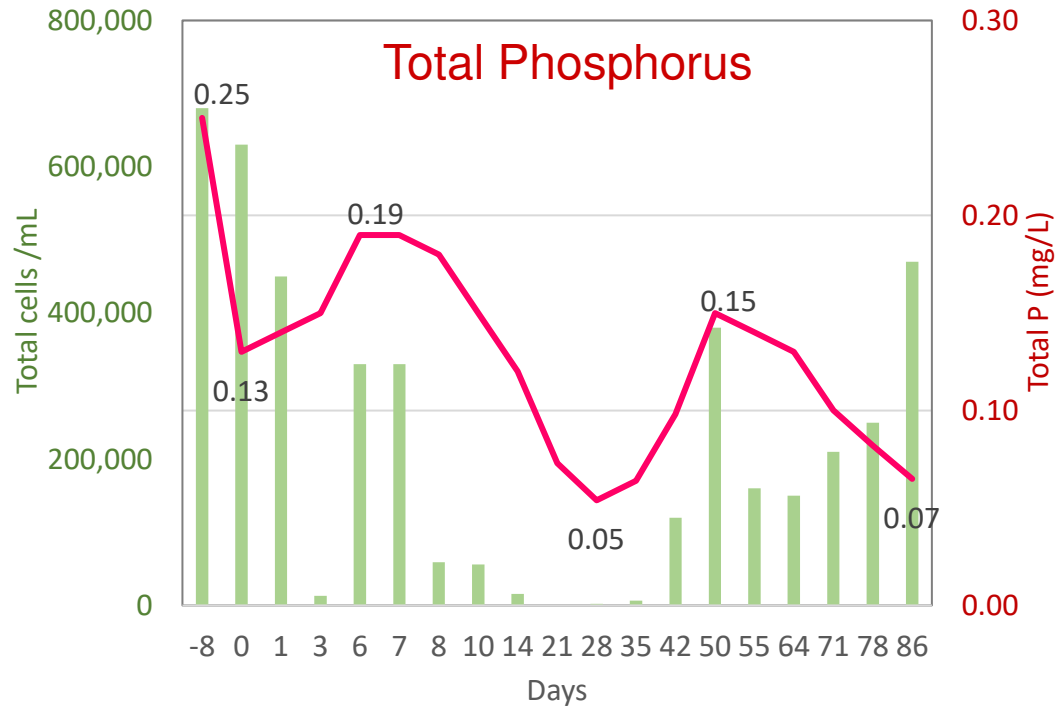
Total Copper



- 95% protection level is 1.4 µg/L (for hardness of 30 mg/L as CaCO₃, NZECC & ARMCANZ (2000))
- Hardness-modified trigger value for Kinbombi Dam 1 is 5.0 µg/L
- Increases in cell counts noticeable with copper concentrations at or below 16 µg/L

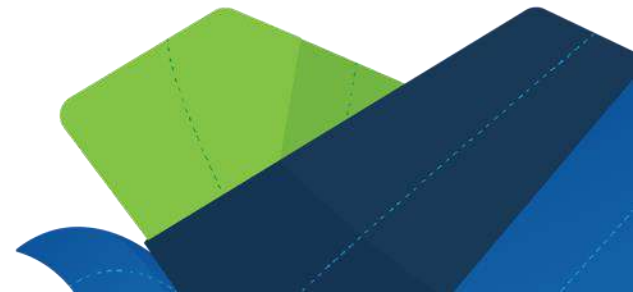






Outcomes

- Successful control of BGA in Kinbombi pond 1 using a copper based algaecide
- Better understanding of pond ecosystem
- Data and evidence produced for algae management plan
- We were lucky!



Cyanobacteria FAQ document in preparation

Queensland Health

FAQs – Harmful Algal Blooms (cyanobacteria)

What is a harmful algal bloom (HAB)?

A harmful algal bloom (HAB) is the excessive growth of algae and/or cyanobacteria in fresh or marine water. A bloom can contain multiple species of algae and cyanobacteria.

A HAB may discolour the water, form scums and produce unpleasant tastes and odours. A HAB can seriously impact water quality and its use for drinking water, recreation, irrigation, stock and domestic applications. Blooms may pose a direct threat to human and animal health, particularly when toxin-producing cyanobacteria are present.

Where and when do HABs occur?

HABs can occur in both fresh and marine water. Typically, they tend to occur in the warmer

Thank you

