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# Investigation of the presence and control of cyanobacteria in paper mill wastewaters

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## RESEARCH OBJECTIVE

To identify the basis for the occurrences of cyanobacteria to bloom proportions within the ponds of an Aerated Stabilisation Basin (ASB) for treatment of wastewaters from a paper mill (PML), and to develop potential control methods to reduce the levels of cyanobacteria within the ASB.

## RESEARCH QUESTIONS

1. Do PML processes alone lead to wastewaters of qualities that will typically support the seasonal and extensive growth (to blooms) of cyanobacteria in ASBs?
2. Are the incidences of cyanobacteria in ASBs treating PML wastewaters based on factors external to the paper processing (e.g. remnant nutrients in pond sludge from other or previous pulp processing)?
3. What weather/environmental conditions might contribute to the proliferation of cyanobacteria in PML ASBs? And can these conditions, with wastewater quality data and ASB infrastructure and operational data, allow risk determination and prediction of cyanobacterial occurrences?
4. What are the levels of bioavailable nitrogen and phosphorus in the ASB treatment system, and will these levels support the ongoing development of cyanobacteria?
5. What are potential strategies for the control of cyanobacteria present in ASBs treating PML wastewaters?

## FINDINGS

The study identified the primary factors leading to cyanobacterial occurrences in PML ASBs and may be of benefit for other waters, such as lakes and rivers where cyanobacterial blooms occur.

The findings of this research include water quality parameters, water quantities, sludge levels, algae analyses and weather conditions at the PML and identified the factors leading to the occurance of cyanobacteria.

The residual phosphorus levels of PML wastewaters following coagulation and flocculation with aluminium, titanium and zirconium coagulants, indicated these levels could be reduced to levels that do not support the growth of cyanobacteria.

Zinc was trialled as a cyanobacterial control agent and was found to be effective for suppression of cyanobacteria at concentrations that are reported to be less harmful to other aquatic organisms, in comparison to established algaecides.

## REFERENCES

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