

**A SURVEY OF THE ALGAL FLORA AND  
ITS EFFECT IN AN OPEN RECIRCULATING COOLING WATER  
SYSTEM (JANUARY 1981 - JUNE 1981)**

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A major problem in the operation of an open recirculating cooling water system is the fouling of the water by microorganisms. A study was therefore undertaken to investigate the fouling of cooling water by algae, at the State Fertilizer Manufacturing Corporation, Sapugaskande.

Three sampling sites were chosen: site 1—after water clarification, site 2—top of the cooling tower and site 3—at the foot of the cooling tower.

Results indicated fouling by algae within the cooling water system and cooling tower. Growth was facilitated by high phosphate and nitrate levels. Phosphate replenishment was inevitable since sodium hexametaphosphate was added as an anticorrosive substance. Nitrate replenishment could have occurred as a by-product since the factory produces urea. Bacterial activity too could have been a contributory factor.

Silicate levels were low at sites 2 and 3, and high at site 1, since it was just after water clarification.

Algal counts ranging from  $2.84 \times 10^4$ – $16.42 \times 10^4$  cells/l at site 1, were low, indicating efficiency of sand filters, but were high at sites 2 and 3 (i.e.  $18.2 \times 10^4$  –  $133 \times 10^4$  cells/l and  $8.77 \times 10^4$  –  $146.32 \times 10^4$  cells/l, respectively).

*Navicula* sp and *Anabaena* sp indicators of thermal pollution were recorded at site 2, when temperatures ranged from 38° – 41°C. However species diversity was marked at site 3, which recorded temperatures of 26° – 33°C, following cooling, within the cooling tower.

Fouling could be avoided by ensuring efficiency of sand filters, proper maintenance of underground pipelines (eliminating contamination), biologically—by covering the tower decks with tarpaulin, wood or black polythene, using an alternative anticorrosive substance to sodium hexametaphosphate and by using an effective microbicide.