

# **Examination of Floating Mass in Pond Water**

September, 2005

submitted to  
**TRC Solutions**



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## **Type of Algae**

The predominant type of algae appears to be Spirulina. This is a filamentous cyanobacterium commonly grown for use in human health food products.

## **Anaerobic Biomass**

Masses of this filamentous algae appear to have aggregated, and, in the absence of aeration or flow through the stagnant pond, have, with the help of anaerobic bacteria, begun to decompose. It also appears that portions of the algal mass, which may cover the bottom of the pond, have become buoyant from the microbial production of gas and floated to the surface.

## **Sulfate Reduction: Short-term Control**

Judging from the sample odor, sulfate-reducing bacteria are producing hydrogen sulfide. This is most likely the cause of the complaints of foul, septic odors. We had initially suggested the application of sodium nitrate to suppress this odor in the short term as anaerobic bacteria will utilize nitrate preferentially to sulfate as an oxygen source. However, in retrospect, the mass of the benthic accumulation may be so great that the benefit of this procedure may be very short-lived.

## **Potential Long-term Solutions**

Alternately, if feasible and permissible, the draining of the pond and the removal of the benthic accumulations may be an effective, long-term solution.

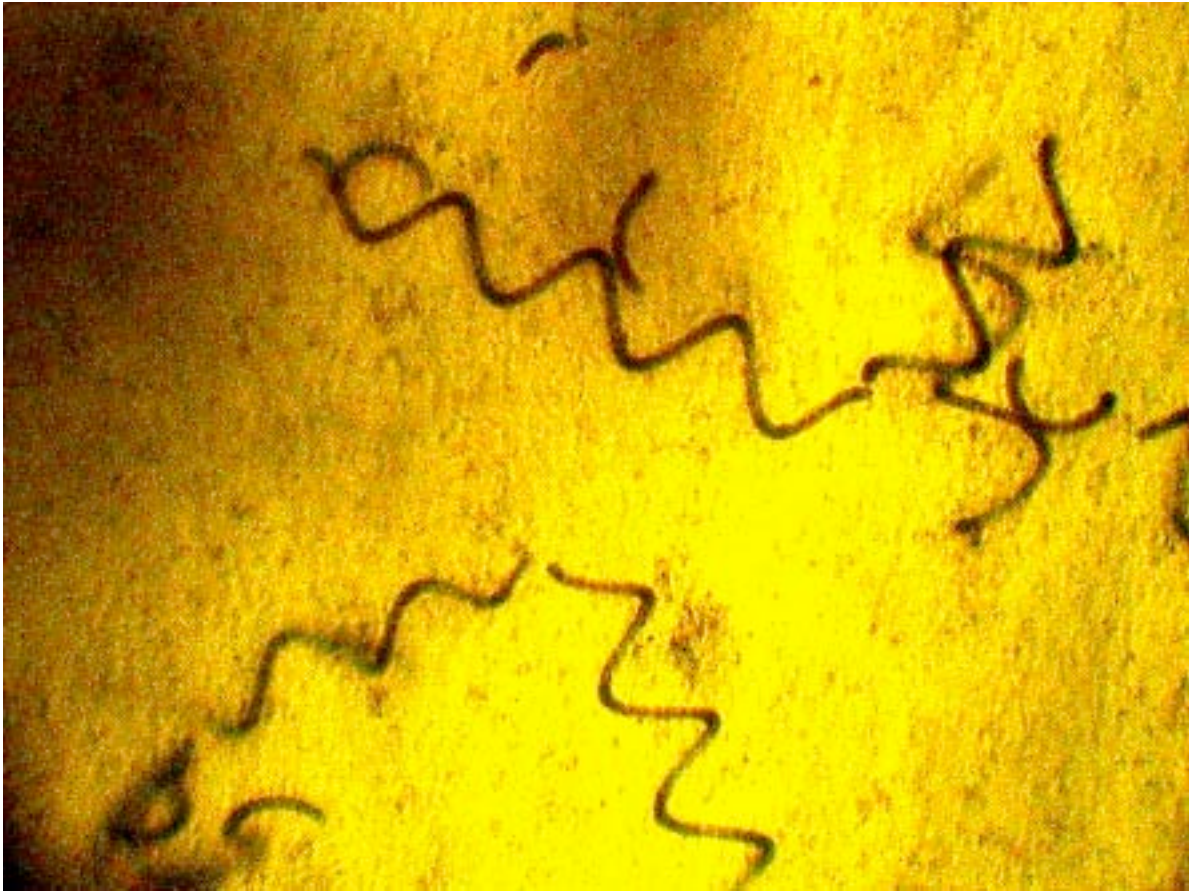
If discharge of the pond water is not feasible, harvesting the filamentous algae might serve as a means for removing a portion of the nutrients which are supporting the continuous regeneration of the algal mass.

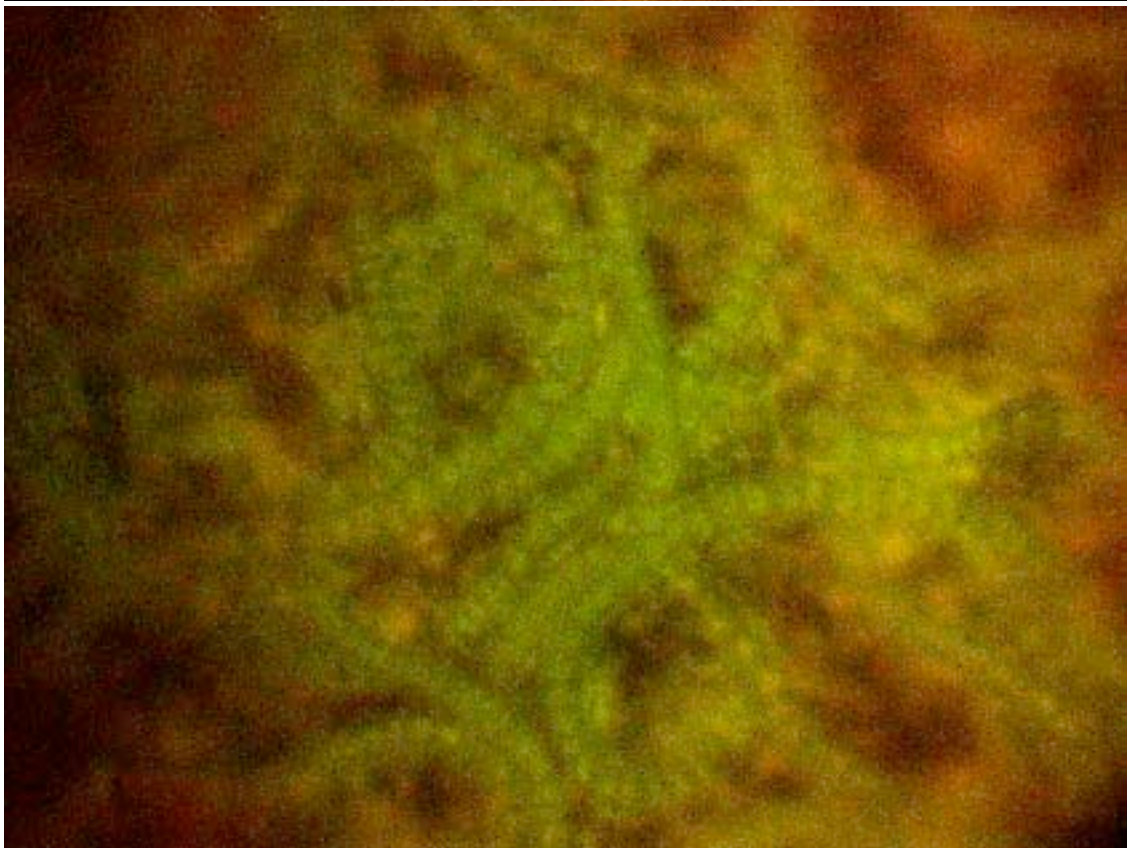
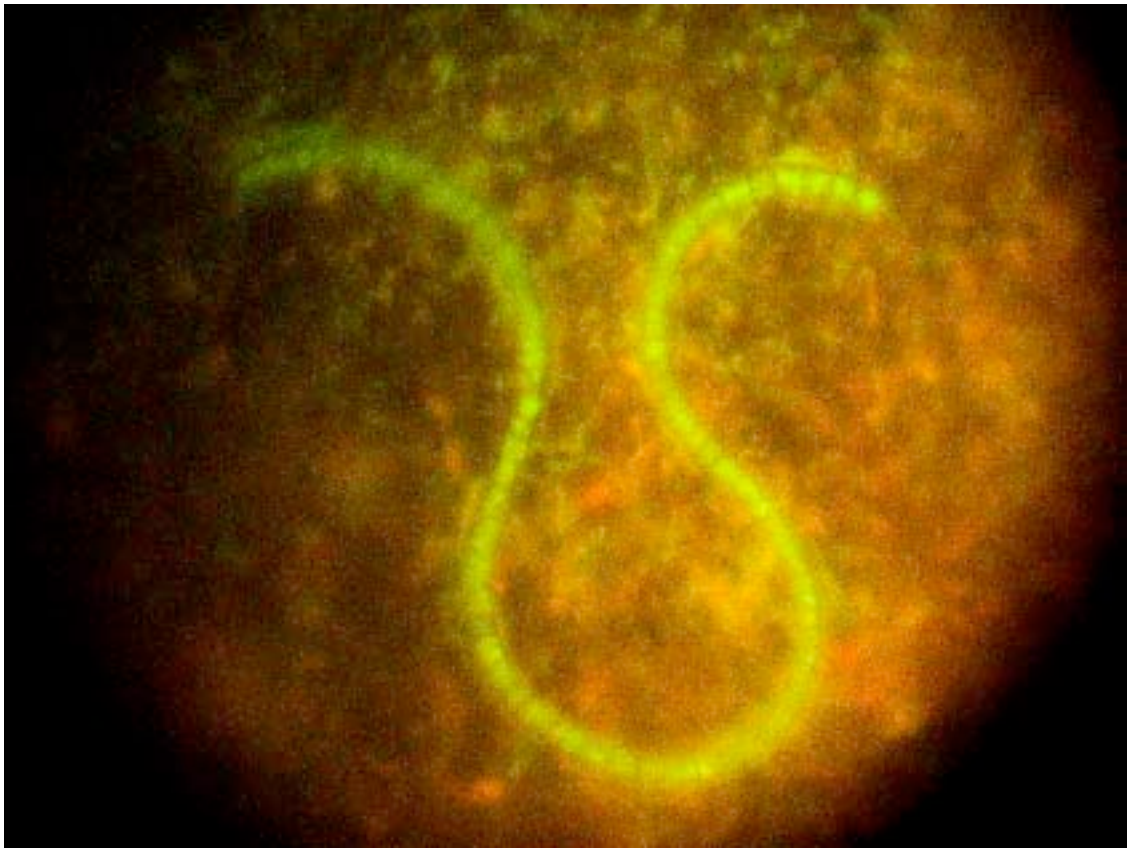
Installation of a aerator/destratifier to maintain aerobic conditions and minimize growth of cyanobacteria should be considered.

## **Remediation**

We would be happy to develop and implement a long-term solution if you would like.

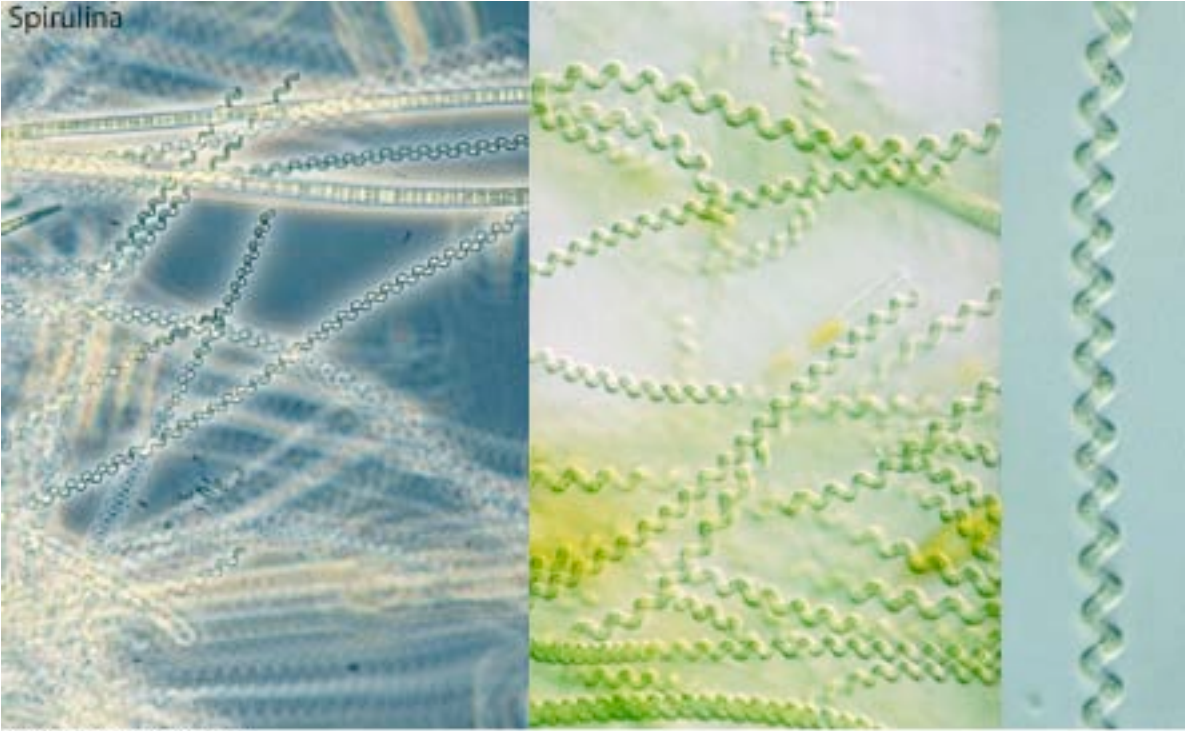
I took 44 micrographs which show the abundance of the algal growth. Some filaments appear to have lysed and are being decomposed by surrounding masses of bacteria. Hence, the anaerobic conditions.





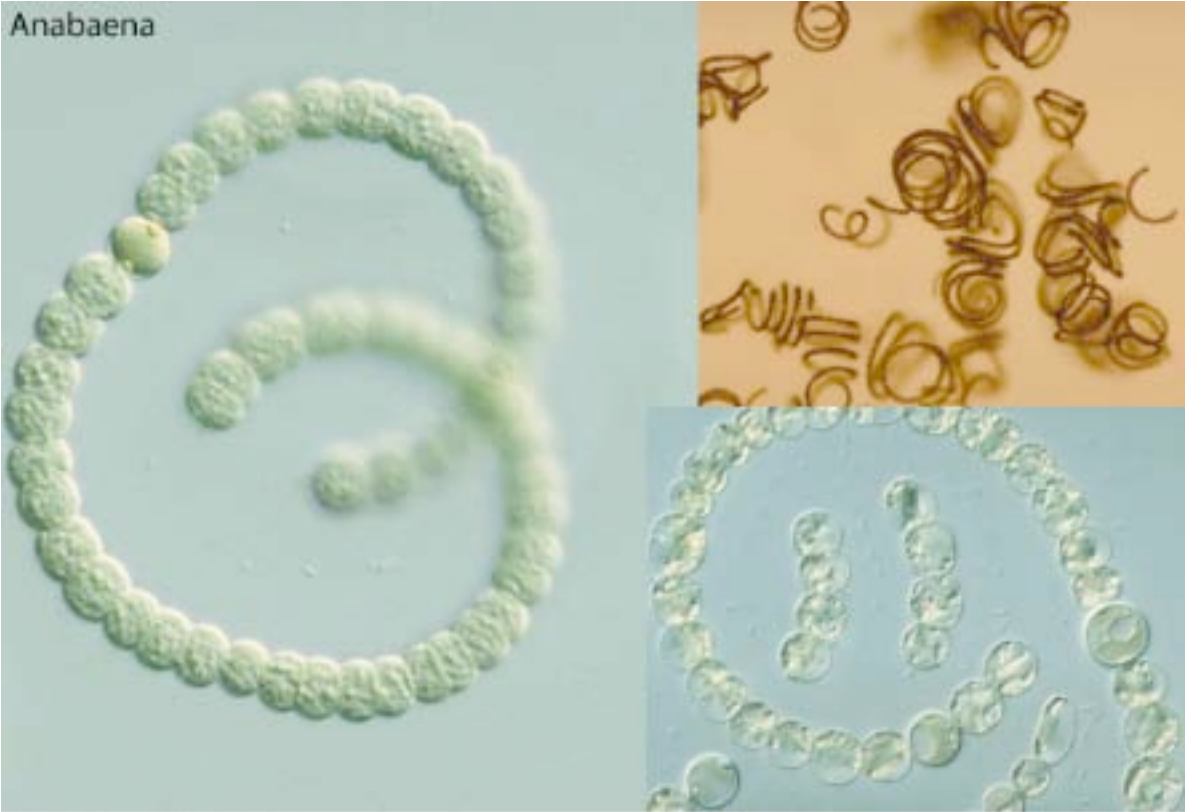
## Candidate Algae

Spirulina



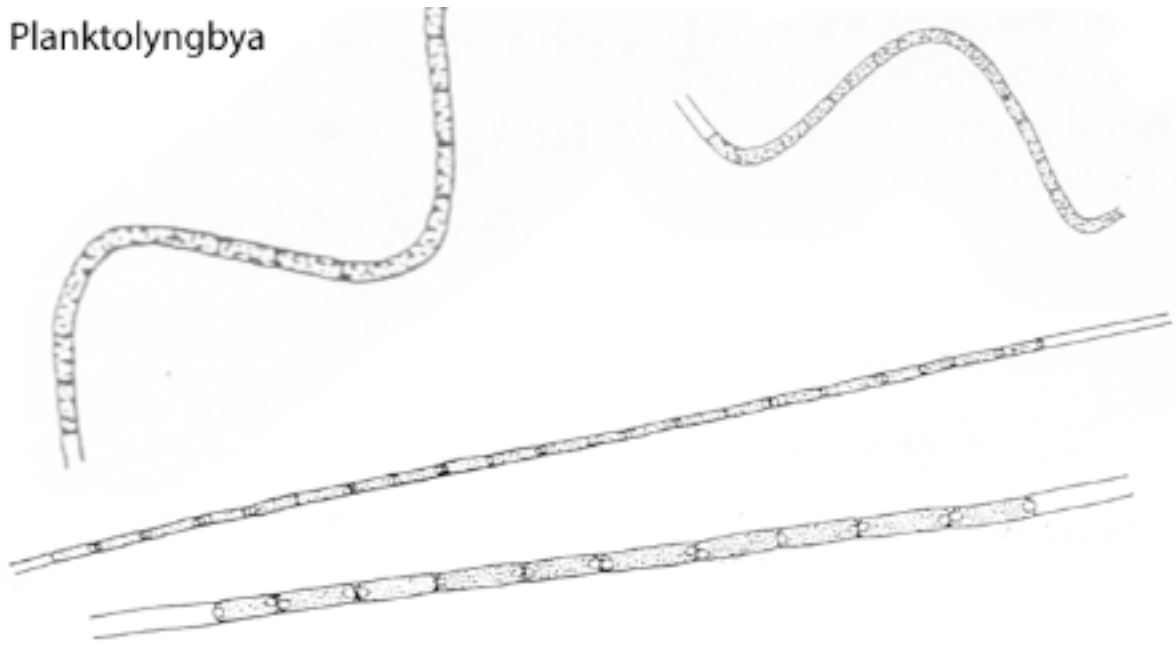
All after Entwisle et al. (1997)

Anabaena



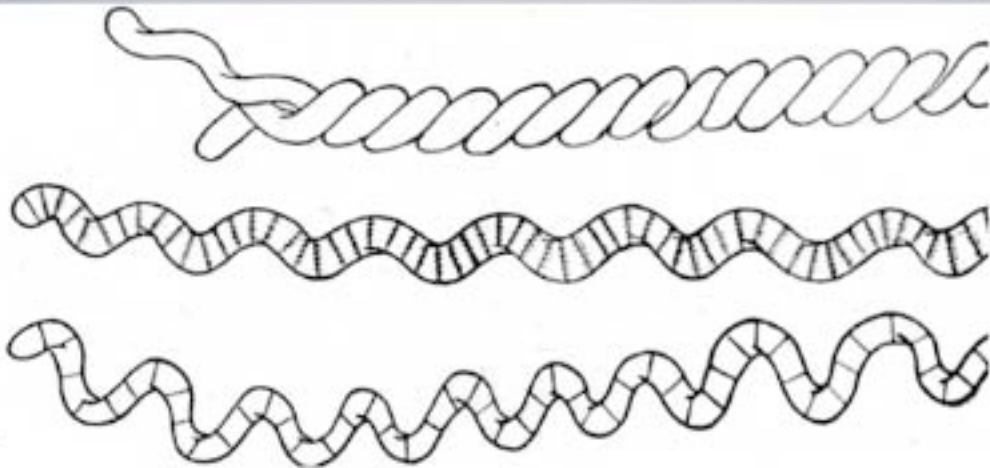
All after Entwisle et al. (1997)

## Planktolyngbya



Baker et al. (1999)

## Arthrospira



B

A after Entwisle et al. (1997)

B after Prescott (1951)

## Cylindrospermopsis



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## Rhaphidiopsis



After Smith (1950)