

Swan Lake, Markham, Ontario, Canada

Application dates: April 29th – May 1st 2013

Summary

Aim: To significantly reduce the concentration of dissolved phosphorus in the lake and stop the reoccurrence of cyanobacterial blooms.

Description: Hyper-eutrophied manmade lake

Size (ha): 5.5

Maximum depth (m): 4.4

Dosage to date (tonnes): 25.2

The Lake



Figure 1: Swan Lake, Canada (image from Google Earth Pro, 2017)

Swan Lake is located in a park-like area in the City of Markham, Greater Toronto, Ontario. It was a former gravel pit where construction material was deposited when backfilling was carried out on the site. The pit was filled with water in 1980. Over time the pit has turned into a highly eutrophic, hard water lake with a history of cyanobacterial blooms.

Background

Phoslock Water Solutions of Sydney, Australia, was commissioned by the City of Markham to supply 25.2 tonnes of Phoslock to reduce phosphorus concentrations in Swan Lake. The application of the product was undertaken by ODS Marine of Ottawa, ON, under the technical supervision of Phoslock Water Solutions. The decision to apply Phoslock and the dosage of 25.2 tonnes was based on recommendations made in a report compiled by Dr Gertrud Nürnberg and Dr Bruce LaZerte of Freshwater Research for the City of Markham in August 2012.



Figure 2 : Application of Phoslock to Swan Lake.

Monitoring

Phoslock Water Solutions (PWS) took surface water samples from the middle of the lake (near the deepest point) prior to the commencement of the application on the 29th of April. As the Toronto Conservation Authority were unable to take pre-treatment samples from the lake as requested by the City of Markham and the City had therefore no samples to send to its contracted laboratories for analysis, PWS agreed to supply the City with the samples that it had collected, rather than send these to Germany as originally intended for testing at the company's

affiliated laboratory. The total amount of 25.2 tonnes (= 24 pallets) was applied across the surface of the water body, using a GPS tracking system to ensure that all areas of the lake were adequately covered. Relatively more product was applied to the deeper area of Zone 3 as well as Zone 4 which was observed to have a relatively higher occurrence of algal scum originating from the small inlet near the bridge. The GPS data that were recorded during all the applications are provided in the following section.

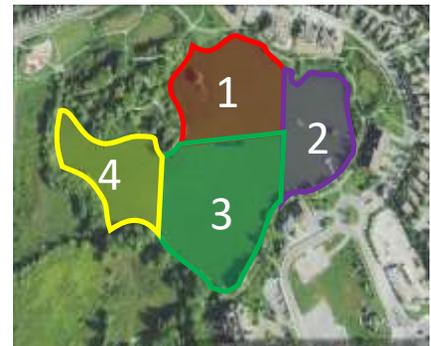


Figure 3: The lake was split into 4 zones and differing amounts of Phoslock was added based on water chemistry results.

Conclusion

The application of Phoslock proved to be successful in reducing the concentration of total phosphorus by 60%. A summary of the Phoslock application was published in a scientific journal. The reference is Nurnberg, G. and LaZerte, B. 2016. Trophic state decrease after lanthanum-modified bentonite (Phoslock) application to a hyper-eutrophic polymictic urban lake frequented by Canada geese (*Branta canadensis*) Lake and Reservoir Management, 32:74–88.

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Additional information can be provided on request.