

Phoslock Application Cases in Brazil

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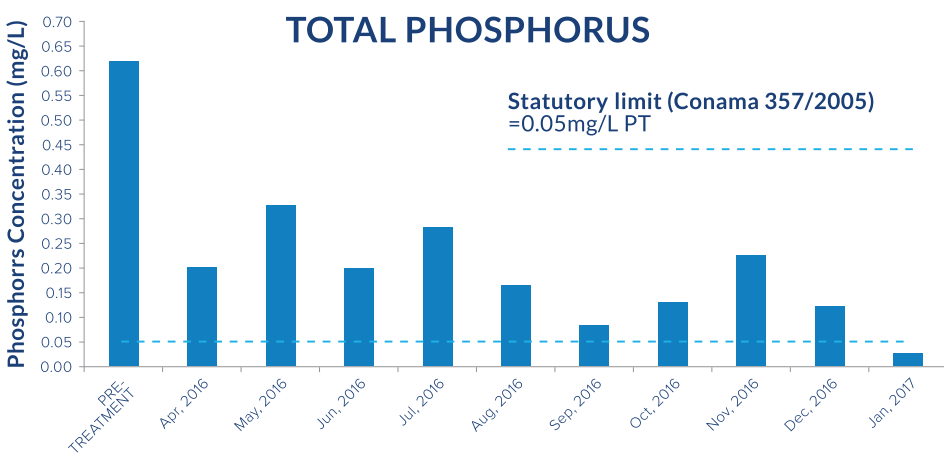


FIGURE 1 / Mean Total Phosphorus (TP) concentrations measured from 6 sampling points in Lake Pampulha. The data are from April 2016 (before the application) to January 2017.

Pampulha Lake

Lake Pampulha is a hypertrophic lake in Belo Horizonte, Brazil which was constructed for flood mitigation and potable water supply purposes. The lake became eutrophic after receiving organic loads from river systems for many years.

Prior to the application of Phoslock, the lake was classified as hypertrophic with the mean concentration of Total Phosphorus (TP) of 0.70 mg/L. Phoslock applications commenced in April 2016 and, within 10 months, a significant reduction in all eutrophication indicator variables had been observed. The reduction in Total Phosphorus is shown below in Figure 1. The lake is now classified as a Class 3 Lake in accordance with CONAMA 357/05 (Statutory Classification of the Brazilian National Council of Environment”).

The water quality in Lake Pampulha has improved significantly since the application. The results of monitoring show that TP levels have decreased by 92%. This decrease has led to a 96% reduction in chlorophyll-a and an 87% reduction in cyanobacteria. Since the restoration of the lake and catchment took place, the lake and its surroundings have been awarded a UNESCO World Heritage title.



FIGURE 2 / Phoslock being applied to Lake Pampulha

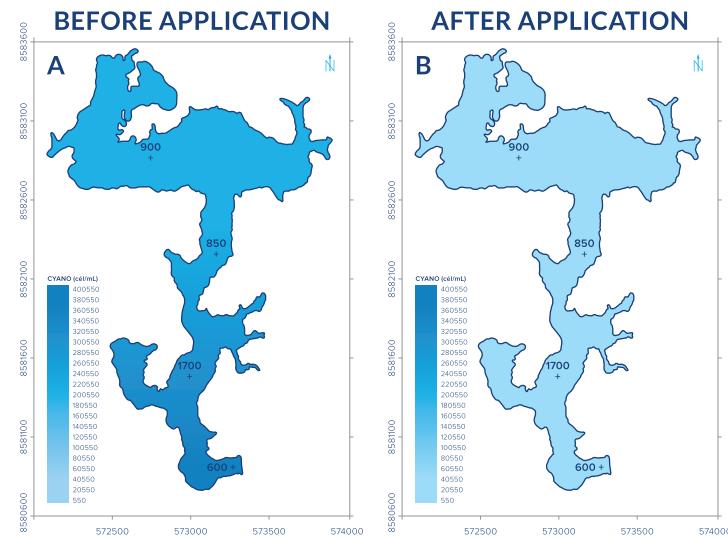


FIGURE 3 / Change in cyanobacteria density over time in the EMBASA Reservoir. J1 to J4 are sample locations in the reservoir.

EMBASA Reservoir (Joanes I)

EMBASA (Joanes I) Reservoir is a drinking water reservoir located in Salvador, Brazil. Salvador is the largest city in the north eastern part of Brazil and has a population of almost 3 million. The reservoir supplies potable water to 40% of Salvador inhabitants.

The Reservoir is heavily enriched with phosphorus which has led to a high incidence of cyanobacterial (blue green algal) blooms and prolific macrophyte growth.

The reservoir was treated with 125 tonnes of Phoslock, applied quarterly between December 2015 and March 2017. Monitoring has shown that TP concentrations have been reduced by 86% in the eighteen months since the application (Figure 5).

The trophic state of the reservoir has switched from hypereutrophic to mesotrophic, leading to a significant reduction in cyanobacteria (95%) (Figure 3). Since May 2017, maintenance applications have been undertaken to immobilize high phosphorus loads from the catchment. In total, 300 tonnes have been applied until March 2018.



FIGURE 4 / Photograph from the first Phoslock application to EMBASA Reservoir.

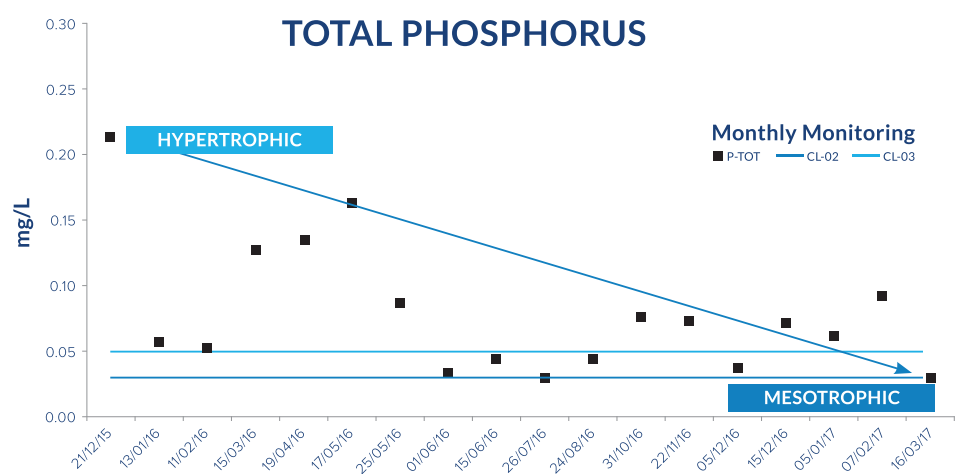


FIGURE 5 / Change in total phosphorus over time in the EMBASA Reservoir.