

## Water renovation Kynastteich, Berlin, Germany



**Bezirksamt Tempelhof-Schöneberg von Berlin  
Sachgebiet Bodenschutz  
<http://www.berlin.de/ba-tempelhof-schoeneberg/>**

**Operation  
1 Park ring pond 3000 m<sup>3</sup> with  
OLOID Type 400**

**Period  
Since 08/2015**

**Success  
Reliable odour elimination**

**Improved oxygenation**

**Ice prevention**

### Progress for causing the water renovation

In recent years there has been in the area of Kynast pond in the park ring Neu-Tempelhof in late summer and fall regularly lack of oxygen, discoloration and odour. This resulted in 2015 in an action requirement that the overturning of the water should be prevented.

### Water description

The area has been designated as part of the Park ring Neu-Tempelhof as a garden monument.

The Kynast pond was newly created as part of the Park ring Neu-Tempelhof around 1910 as an artificial water without natural inflow. The water is surrounded by dense riparian vegetation / reeds, and partially surrounded by overhanging old trees. The geometry of the water results in an unfavourable ratio of surface to edge vegetation. Under the surface a dense growth of submerged vegetation can be seen.

The Kynast pond was desilted in 1999 for eliminating odours and deepened to 2.5 to 3 m. the historic river bed has been damaged by this recess. An artificial base sealing was necessary by means of a plastic film with a layer of gravel. The film application was carried out on the entire bottom surface of the body of water, with the exception of the basin lying at the Löwenhardt dam. In this context, the existing fence was created to protect the body of water. Water is filled in via a deep well, which is controllable via a timer.

### Measures

Before OLOID installation an additional water entry between 05/20/2015 and 07/15/2015 of approximately 1.176m<sup>3</sup> was done to raise the water level. On 08/03/2015 an OLOID Type 400 was installed. During a 4-month period (until week 50) weekly visual water inspection and oxygen measurements were carried out (results are in the graph on page 3).



## Presentation of results of the action

### Visual Evaluation:

At the inspections, it was found that the surface flow captures approximately  $\frac{3}{4}$  of the water. Limits of the activity were assessed visually by pulse movements in the water and leaves arrangement on the water about 10 meters behind the OLOID to Löwenhardt dam to about 20 m before the end of the parking ring bridge. It was also recognized by the monitoring that the OLOID affected the water physically by its flow.

The odour was reduced significantly after installing the OLOID device, but selectively foul odour was seen, especially when dipping the oxygen probe in the sediment almost over the entire period of the water inspection. The water transparency increased after installing the OLOID.

### Empirical Evaluation:

The oxygen measurements show that with initiation of the OLOID, oxygenation takes place. The oxygen content tends to decrease with depth which is typical for standing waters. Here it can be seen that the OLOID initiated oxygenation. Until the middle / end of October 2015 it can be seen that a good to very good saturation is documented of oxygen in water. The end of October / November 2015 lower oxygen levels were measured, this is likely to be linked to the death of aquatic plants and the high foliage entry and thereby initiated ablation process. Mid-December 2015 were again higher oxygen contents and a nearly oxygen saturation measured. Reasons for this are in addition to the operation of the OLOID also in the temperature dependence of both the solubility of oxygen in the water and the microorganisms activity on the other.

The analysis results on 10/23/2015 show seasonally typical a lower oxygen content and an increase in the content of ammonium (max. 3.1 mg/l). One reason for this is probably the increased foliage entry from adjacent aquatic vegetation.

The environmental agency has at other locations 17 ammonium readings on hand. Minimal were 0 mg/l and max. 2.4 mg/l measured. The median is 0.6 mg/l. The contents found on Kynast pond correspond to this level.

The analysis results on 12/18/2015 show an increase of nitrate content (max. 3.2 mg/l), the striking ammonium content from October has not been verified, but is back to inconspicuous (0.06 mg/l). Because of adequate oxygen in the water, the ammonium may have been converted via nitrite to nitrate immediately. The environmental agency has at other locations 23 nitrate levels on hand. Minimal were 0 mg/l and max. 25 mg/l measured. The median is 0.5 mg/l. The contents found on Kynast pond correspond to this level.

Requirements for action due to the analytical results have not occurred.

## Conclusion

Based on local location and design of artificial water body, for the Kynast pond arises a problematic starting situation. The high entry of biomass leads to eutrophication and subsequently induced oxygen consumption and the occurrence of putrefaction gas. Despite the unusual weather this year that occurred in October with still relatively high temperatures, critical water condition was not documented. Subjectively, the water condition is more positive than in the previous year claimed by the citizens' initiative.

The use of an OLOID system can be seen as a positive supportive waterbody maintenance element. In public, the upgrading action was taken both by the citizens' initiative as well as by neighbouring residents as positive. As sole measure without green areas - but management of use is insufficient. Particularly needed is a regular pruning of riparian vegetation to reduce the entry of biomass to relieve the water.

## Outlook

Beginning in January 2016 the temperatures in Berlin fell to  $-8^{\circ}\text{C}$ . Despite the weather conditions the OLOID was in operation without interruptions and Kynast pond could be kept free of ice.

