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## **WASTEWATER TREATMENT IN A CONSTRUCTED WETLAND FOLLOWED BY AN OXIDATION POND IN A RURAL AREA OF CHINA**

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### **Abstract**

The aim of this study was to examine the pollutant removal performance of a combined process using horizontal subsurface flow constructed wetland (HFCW) and an oxidation pond (OP) in the treatment of a decentralized domestic wastewater. Waters along the water flow and at different depths of the wetland substrate were sampled and analyzed during continuous operation. It was found that the HFCW-OP combined system presented good organic matter and phosphorus removal capacity. In the first year, COD and TP outputs were 30.0 and 0.5 mg/L, respectively. The concentrations of NH<sub>3</sub>-N and TN decreased notably from 6.3 and 16.5 mg/L to approximately 0.2 and 5.0 mg/L after 120 days of operation. This decrease was mainly achieved due to the formation of an anoxic environment in the wetland substrate. After 3 years of operation, however, the wetland showed different degrees of substrate clogging and pollutant accumulation. Although the removal of NH<sub>3</sub>-N and TN were 88% and 90%, respectively, COD removal decreased from 90% to 78%. By replacing the substrate and vegetation in the last two stages of the wetland and increasing the depth of the oxidation pond from 1.2 to 1.5 m could improve the COD and TP removal capacity of the HFCW-OP system effectively.

*Key words:* constructed wetland, decentralized wastewater, oxidation pond, rural areas

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