

## **Characteristics of pollution of the Chaoyangxi river to groundwater in Nanning of Guangxi, China**

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Rivers in urban and suburban areas, which often become sewage ditches, are the key reason of the deterioration of urban water environment and ecosystem. The Chaoyangxi river, which located in the north of Nanning City, has long used as a waste receptor without timely treatment, large amount of heavy metals and organic sludges are suspended in the water and deposited on channel bed. This river, with water characterised by black color, very unfavorable odor and high phosphorus and high heavy metal contents, is one of the most seriously polluted inland rivers and the famous stinking ditch in Nanning. There are a lot of sewage outlets in the upper reaches and surrounding areas of the river. The discharge of urban sewage and wastewater is the main artificial recharge and pollution source. The continuous discharge and fast infiltration of the sewage water into the aquifer has caused to severe pollution of the shallow groundwater. 5 boreholes and 3 wells water samples were analyzed with a main focus on the organic substances such as three major nitrogenous compounds, PAHs and organochlorine. The results show that the sewage ditches produces obvious pollution to the shallow groundwater where the ammonia nitrogen concentration of the river water reaches 42.05 mg/L. Meanwhile, 6 samples have an ammonia nitrogen level in excess of the groundwater quality standard by 65.75 times. The degree of groundwater pollution in industrial area is lower than that of agricultural and wasteland area. The pollution degree gradually decreases along with the increasing distance from the contaminated groundwater body; and it fluctuates seasonally. In high-water period, the pollution degree is significantly lower than that of low-water period. The major sources of ammonia nitrogen are the domestic and livestock waste directly discharged into the Chaoyangxi river. The main pollution sources of PAHs are from the combustion of grass, wood and coal. DDT pollution is derived from historical pesticide residue and the presence of BHCs can be attributed to the use of lindane in the upstream and remote atmospheric drop.