

## Development of an Environmental Plan for Restoration of Rosetta Branch in the Nile Delta

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Population increase, urbanization and industrialization expansion has put significant pressures and challenges to water resources management in Egypt. Reuse of treated wastewater in agriculture has become a critical issue for decision makers in Egypt. Nitrogen discharges from untreated wastewater increase phytoplankton production which is associated with serious surface water quality problems. An assessment of the Nitrogen discharges to the Nile River at Rosetta branch is presented to describe the status and trends of water quality and the Nitrogen parameter along the branch. The different Nitrogen forms were simulated using QUAL2K water quality model.

Two different scenarios were proposed and assessed to avoid the deterioration in the Rosetta branch water quality during the low demand period. The first is based on a dilution approach to dilute the organic loads and to achieve the local guidelines regarding Ammonia and organic-Nitrogen. The second scenario is to divert the wastewater from Abo Rawash Wastewater treatment Plant (WWTP) to desert lagoons and reuse it for wooden trees (afforestation). It is concluded that the second scenario reduced the concentrations of Ammonia and organic-Nitrogen and made it to comply with the Egyptian guidelines at the water supply intakes. This scenario could be considered as the best and sound solution from an environmental and economic perspective. This indicates that the reuse of wastewater from Abo Rawash WWTP in irrigation can solve the high ammonia concentration problem, which arises every year, and also can save about 0.9 billion m<sup>3</sup> per month in the low demand period and improve the Nile River water quality.