

Impact of Biological Treatment Effluent on the Physico-Chemical Quality of a Receiving Stream in Ile-Ife, Southwest Nigeria

Authors : Asibor Godwin, Adeniyi Funsho

Abstract : This study was carried out to investigate the impact of biological treated effluent on the physico-chemical properties of receiving waterbodies and also to establish its suitability for other purposes. It focused on the changes of some physico-chemical variables as one move away from the point of discharge downstream of the waterbodies. Water samples were collected from 14 sampling stations made up of the untreated effluent, treated effluent and receiving streams (before and after treated effluent discharge) over a period of 6 months spanning the dry and rainy seasons. Analyses were carried out on the following: temperature, turbidity, pH, conductivity, major anions and cation, dissolved oxygen, percentage oxygen Saturation, biological oxygen demand (BOD), solids (total solids, suspended solids and dissolved solids), nitrates, phosphates, organic matter and flow discharge using standard analytical methods. The relationships between investigated sites with regards to their physico-chemical properties were analyzed using student-t statistics. Also changes in the treated effluent receiving streams after treated effluent outfall was discussed fully. The physico-chemical water quality of the receiving water bodies meets most of the general water requirements for both domestic and industrial uses. The untreated effluent quality was shown to be of biological origin based on the biological oxygen demand, chloride, dissolved oxygen, total solids, pH and organic matter. The treated effluent showed significant improvement over the raw untreated effluent based on most parameters assessed. There was a significant difference ($p < 0.05$) between the physico-chemical quality of untreated effluent and the treated effluent for the most of the investigated physico-chemical quality. The difference between the discharged treated effluent and the unimpacted section of the receiving waterbodies was also significant ($p < 0.05$) for the most of the physico-chemical parameters.

Keywords : effluent, Opa River, physico-chemical, waterbody

Conference Title : ICEPRM 2015 : International Conference on Environmental Pollution, Restoration and Management

Conference Location : Barcelona, Spain

Conference Dates : August 17-18, 2015