Desalination and Water Treatment
www.deswater.com

doi: 10.5004/dwt.2020.26375

207 (2020) 137–150
December

Influence of aerators installation angles on process performance of an activated sludge in a full scale wastewater treatment plant, Kermanshah, Iran

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Received 16 December 2019; Accepted 23 July 2020

ABSTRACT

Biological reactors are the most energy-consuming facilities of conventional wastewater treatment plant (WWTP). Therefore, adjustment of aerators installation angles inside the aeration tank seems to be an effective way to ensure efficient biological performance. In this work, the biological treatment performance of Kermanshah's municipal WWTP (Kermanshah, Iran) was surveyed via varying angles of the aerators installation relative to the perpendicular. Two different aeration configurations in terms of installation angles of aerators, 30° and 45°, were considered. Effect of the aerators installation angles on variations of some operating and process parameters such as dissolved oxygen (DO), oxidation reduction potential (ORP), nitrogenous compounds, and phosphorus were pursued. From results, more DO and ORP amounts were found at the 30° angle compared to the 45° angle. However, changes trends in the DO and ORP amounts were similar at both angles. As the main conclusion, no prominent effect on remediation of carbon, nitrogenous compounds, and phosphorus was reported in these two angles. These results were justified by low influent organic loading, and also not to have appropriate conditions for nitrogen and phosphorus removal. In addition, in this study kinetic evaluation was conducted, and obtained findings were in a good agreement with literature.

Keywords: Biological treatment; Activated sludge process; Aeration system; Installation angle of aerators

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