

## **ABSTRACT**

In recent years, freshwater bodies have experienced progressive pollution due to the presence of industrial and natural chemical compounds, in addition to the growing demand for water from the population and industry, which is why there is now a need to implement new treatment techniques in the purification of natural waters. This research aims to study the efficiency of granular filtration in reducing pollution. Physical-chemistry of the Ambato River waters, using two oxidic lithological materials (red and white) as filtration media, granular single-layer, and it was necessary to structure two-layer filters, analyzing turbidity and pH parameters, electrical conductivity, alkalinity, hardness, BOD, and COD of the percolated water aliquots. The results show that both oxidic materials show a reduction in the parameters evaluated. In addition, those filters with smaller particle sizes showed better efficiency, highlighting the FMB2 filter that allows obtaining the lowest turbidity in the treated water (7,12 NTU). In contrast, the two-layer tests showed that the FB4 filter provides the best yields with a reduction of 95 %, 86,08 % (BOD), and 78,93 % (COD). In addition, the filters evaluated initially show the adsorption of dissolved ions in the river water, which decreases during treatment due to the saturation of the granular beds. The findings show the capacity and applicability of filtration systems as an easy-to-use alternative technique for purifying natural waters.

**Keywords:** Filtration; Oxidic material; Granular medium; Ambato River.

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