IMPACT: International Journal of Research in Engineering & Technology (IMPACT: IJRET)
ISSN(E): 2321-8843; ISSN(P): 2347-4599
Vol. 2, Issue 7, Jul 2014, 33-40

INDUSTRIAL WASTEWATER MANAGEMENT: THE WATER PINCH ANALYSIS APPROACH

OLAKUNLE, M. S[1] & ITYOKUMBUL, M. T[2]

[1]Department of Chemical Engineering, Ahmadu Bello University, Zaria, Kaduna, Nigeria

[2]Department of Energy and Mineral Processing, Penn State University, Pennsylvania, U.S.A

ABSTRACT

Water, a necessary and important resource for the process industry is growing in demand every year as the result of the booming world population. Wastewater generation in industrial operations and consequent harsh environmental disposal regulations calls for intensive '*in si-tu*' wastewater management. This paper describes how the water pinch analysis (WPA) technique, based on the pinch technique, wasadapted to establish the reduction of freshwater demand for a typical Nigerian brewery. TheWPA is a graphical methodology for freshwater and wastewater minimization. The results obtained showed that applying the reuse approach of the WPA to brewery operation could lead to a reduction in freshwater demand of 17.08% with a freshwater pinch of 1570.00 ppm and an outlet average concentration reduced from 9684.00 ppm to 8507.70 ppm. The WPA technique can rapidly yield accurate minimumwater targets, pinch-point locations and water allocation targets for a brewery water network which could be very useful in management decisions.

KEYWORDS: Freshwater Demand, Pinch Point, Wastewater Generation, Wastewater Management, Water Pinch Analysis