

Evaluation and treatment of waste water effect on groundwater quality (the University of Anbar area as a case study)

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Abstract

This research focuses on studying the impact of different sources of wastewater, such as domestic, industrial, agricultural, etc. upon groundwater. The swamp of contaminated water collection within the Al-Anbar University area was taken as a case study for this research. This swamp has a pond that works as a collection basin for different sources of wastewater mainly domestic waste coming from leakage of contaminated water from the septic-tank of the residential complex of students. This contaminated water will leak over time within the folds of soil due to permeability and the effect of land attraction and reach the levels of groundwater. The presence of polluted water near groundwater is an environmental hazard and harmful because this leakage water has different diseases and germs, which could pose a danger to human health. Different samples of these sources were taken from different places at different times and some physical, chemical, and biological tests were then conducted. Wastewaters characterization was also investigated in this study to make an assessment for water quality and find out a proper treatment method. Data obtained from this study show different levels of pollutants, which could highly affect groundwater quality. A proper and advanced treatment method was also proposed in this study, depending on the wastewater characterization results. The purpose of this research is wastewater treatment using the physical method with coagulation and Flocculation processes with local coagulants to reduce pollutants impact on groundwater. The results showed the addition of alum at 35 mg/l increased the removal efficiency by 80.7% at the settling time of 60 min, and the addition of 35 mg/l of the lime increased the removal efficiency by 63.9% at the same settling time. It has been proven that the use of alum is more effective than lime for sedimentation suspended matter. The optimum dosage and settling time are 20 mg/l and 60 min respectively.