

Comparison of chemical quality of water wells around the Mashhad's old landfill site in 2014

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Abstract

Background & Aim: Leachate and gas emissions from solid waste landfill are two causes of groundwater pollution. Leachate contains large quantities of organic and inorganic matters, and microorganisms which have high potential to contaminate groundwater. The aim of this study is the comparison of the chemical quality of water wells around the Mashhad's old landfill site in 2014.

Methods: This is a descriptive/cross-sectional study in which four wells (3 wells downstream and 1 well upstream the landfill) were selected. Groundwater samples were collected throughout a year in 2014. Samples were transferred to the laboratory and analyzed in terms of parameters including pH, Total Dissolved Solids (TDS), Electrical Conductivity (EC), chloride (Cl⁻), nitrate (NO₃⁻), hardness, alkalinity, turbidity, phosphates and Chemical Oxygen Demand (COD). The obtained data were compared with national standards for drinking water. Data were analyzed through SPSS software using T-test and Mann-Whitney.

Results: The results of this study showed that there is a significant difference between wells in terms of EC, hardness, chloride, TDS and NO₃⁻. However, in most cases, chemical parameters were in the allowable range comparing to the national standards.

Conclusion: Since most measured chemical parameters in water wells were within the allowable range, the water is potable in the studied area. However, continuous and systematic monitoring of groundwater in this area is necessary to prevent soil and water resources from contamination.

Keywords: Landfill, Chemical Quality, Groundwater