Desalination and Water Treatment
www.deswater.com

doi:10.5004/dwt.2017.20341

68 (2017) 170–176
March

Temporal and spatial variation of chemical parameter concentration in drinking water resources of Bandar-e Gaz City using Geographic Information System

Ali Akbar Mohammadi[a,b], Kamyar Yaghmaeian[b], Faraji Hossein[c], Ramin Nabizadeh[b], Mohammad Hadi Dehghani[b,d,*], Jafar Khail Khaili[e], Amir Hossein Mahvi[b,d]

[a]*Department of Environmental Health Engineering, Neyshabur University of Medical Sciences, Neyshabur, Iran, Tel. +98 9127764238, Fax +98 5143336610, email: Mohammadi.eng73@gmail.com (A.A. Mohammadi)*
[b]*Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical Science, Tehran, Iran, Tel. +98 9123311992, Fax +98 2188954914, email: K_yaghmaeian@yahoo.com (K. Yaghmaeian), Tel: +98 21 88954914, Fax +98 21 66462267, email: rnabizadeh@tums.ac.ir (R. Nabizadeh), Tel. +98 9124242522, Fax 88950188, email: hdehghani@sina.tums.ac.ir (M.H. Dehghani)*
[c]*Hamadan University of Medical Sciences, Hamadan, Iran, Tel. +98 91118114438, Fax +98 2188954914, email: faraji_hoseyn@yahoo.com (H. Faraji)*
[d]*Center for Solid Waste Research, Institute for Environmental Research, Tehran University of Medical Science, Tehran, Iran, Tel. +98 9123211827, Fax +98 2188950188, email: ahmahvi@yahoo.com (A.H. Mahvi)*
[e]*Golestan University of Medical Sciences, Gorgan, Iran, Tel. +9817322 41150-4, Fax +9817 32230102, email: amohamady58@yahoo.com (J.K. Khaili)*

Received 9 April 2016; Accepted 9 November 2016

ABSTRACT

One of the serious challenges in ensuring and promoting community health is gradual increase in contamination levels of drinking water of communities across the world. The purposes of this study were (1) to evaluate the chemical quality of groundwater in the Bandar-e Gaz city and (2) to determine spatial distribution of groundwater quality parameters (total hardness (TH), chloride, nitrate and fluoride concentrations, and (3) mapping the quality of groundwater using Geographical Information System (GIS) software. In this study 20 groundwater samples were collected from 5 wells in two successive 2010–2011, in the rainy and dry seasons. Sample preparation and analysis, according to standard methods were done. Based on the findings of this study, it can be expressed that the average concentration chloride and nitrate parameters in Bandar-e Gaz drinking water is within the 1053 standard limit in Iran, except fluoride content is lower than the standard and hardness was high in majority of water sample groundwater. According to the zoning maps of groundwater, in the dry season's nitrate and hardness concentration is greater than rainy seasonal. The data showed falling and rising trend in CL concentrations, respectively. This study indicated that all parameter within the standard except fluoride then, its necessity to addition fluoride in that's regions population food chain and drinking water. Management of the utilization and protection greed underground waters should be as a basic principle in the planning Bandar-e Gaz city.

Keywords: Groundwater; Chemical parameters; Spatial changes; ArcGIS; Bandar-e Gaz

*Corresponding author.