



University of Zabol

Graduate School

Faculty of Water and Soil

Department of Range and Watershed Management

**The Thesis Submitted for the Degree of M. Sc
In the field of Watershed Management**

**Study of the Quantity and Quality of Khash Aquifer
Groundwater Using Geographical in Formation System**

Supervisor:

Dr. A. Dehvari

Advisors:

MSc. S. Kherad Narooei

MSc. M.R. Hashemi

By:

H. Khammar

September 2020

Abstract:

In recent years, in Iran, and especially in arid and semi-arid regions, due to natural and human factors, the water level of groundwater aquifers has been observed, which has affected the water quality in terms of its usability. This study was conducted to investigate the quantity and quality of groundwater in Khash plain. Khash plain aquifer is located in Khash city of Sistan and Baluchestan province. This plain is a part of Khash watershed that is surrounded by the southern slope of Taftan volcano with an approximate length of 50 km. From the geological point of view, this plain is located in a part of the folded-Faulted and severely broken Nehbandan-Khash belt. To investigate the changes of water level in the aquifer, the water level data from 18 piezometric wells located in the plain during the statistical period from 2002 to 1397 was used. To achieve these changes, using the capabilities of the Arc GIS 10.4.1 software, the field typical hydrograph was mapped using the Thiessen method and the static surface changes were calculated. Also, to evaluate the changes in aquifer water quality, the values of SAR, EC, TH, PH, TDS, Na^+ , Mg^{++} , M4^+ , So_4^- , Cl^- and Ca parameters of 14 quality observation wells were used during the statistical period from 2002 to 2017. The zoning of qualitative changes in groundwater parameters was performed in Arc GIS 10.4.1 software. Also, in order to investigate the ability to use groundwater in the plain in terms of drinking and agriculture, Schuler and Wilcox charts were used, respectively, with the help of Macro-Chemistry. The results showed that the amount of drop in aquifer level during the statistical period was 0.35 on average. An examination of the best way to estimate the qualitative parameters of groundwater for zoning of each of the qualitative parameters showed the superiority of the spherical model over other models for most of the qualitative parameters of groundwater. Temporal and spatial monitoring of quality data (quality zoning maps) showed that the number of qualitative parameters increased during the statistical period. Also, the study of water quality in terms of drinking and agricultural uses using Schuler and Wilcox charts showed a decrease in water quality at the end of the statistical period.

Key words: Groundwater Aquifer, Scholler, Wilcox, GIS, Khash Plain Aquifer