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The Evaluation of Underground Water Recourses' Boron Concentration and Variation Pattern

M Malakootian, A Hasibi, A Zeinadini

Abstract:

Background: Rafsanjan -Noogh- Anar's plain (54°, 52'- 56°, 34' longitudinally & 29°, 51'- 31°, 31' latitudinally) is one of the Iran's plains located in sub- basin of Daranjir desert. Anar's plain is located at the lowest part of Rafsanjan -Noogh- Anar's plain. According to the geological and field studies of the area, the presence of west and east mounts and deposits resulting from evaporation in lower parts of the area are indicative of boron contamination of Anar underground water.

Methods: In the present study, 50 deep wells covering Anar plain were selected based on statistical methods. Boron concentration in each well was measured by Azomethine- H method in the middle of each season, from 2003 to 2007.



Results: Comparing the obtained boron concentrations with WHO guidelines, Anar underground water is not safe for drinking (mean= 8.88 mg/L). In major part of the plain, the quality of water is not suitable for the growth of plants that are sensitive and unresisting to boron. Only in 17.1% of the samples boron concentration was between 0.7-3 mg/L that based on the guidelines of Food and Agriculture Organization is suitable for some types of plants. Field studies about the area flora confirm the obtained results too. Changes in the quality of underground water during the years of study, showed a worsening process over time.

Conclusion: To solve the problem, mixing of the water of low boron wells with high boron wells is recommended.

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