Studying water Quality of Tigris River within Baghdad City

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ABSTRACT

Tigris River is considered one of the most important sources of surface water in Iraq. Tigris with Euphrates together forms life and stabilization in Iraq. In order to keep these sources in use for more and more generations we must continually study its water and make sure it is free from all types of pollutants. This research aims to study a part of Tigris River in Baghdad, about 37km length, and test the levels of Alkalinity, Hardness, Calcium and Magnesium and see if they are within limitations. Most of obtained results were within limits. Extra safety for Tigris river is obtained by observing all industrial activities and making sure that there is a waste water treatment plant in each industry.

Keywords: Tigris River, stabilization, agricultural, World Health Organization

I. INTRODUCTION

Extraction of water for domestic and agricultural use, mining, industrial production, power generation and external practices could lead to a deterioration in water quality and quantity that not only affect the aquatic ecosystem, but also the availability of drinking water [1]. It is therefore essential to pay serious attention to the improvement and maintenance of the quality and quantity of water resources [2]. It is necessary to properly evaluate the water quality in rivers, which is influenced by multiple factors. The variation of water quality was recognized as a continuous process [3].

Drinking water in Iraq comes from rivers, lakes, wells and springs. These sources are exposed to a variety of pollutants caused by the diffusion from nonpoint and point sources which are difficult to control, monitor, and evaluate, such as sewage, agricultural and industrial wastes (Ahuja, 2003).

This study aimed to take a part of Tigris River from north to south of Baghdad, Iraq and study the spread of Alkalinity, Hardness, Calcium and Magnesium during 2 years (2016-2017) from eight monitoring stations. The result was compared with the standard values for surface water.

II. METHODS AND MATERIAL

Study area
The present study has been carried out for a part of the Tigris river flowing through Baghdad city, Iraq, about 37 Km in length, from north to south of Baghdad. For this reach of Tigris River, eight water treatment plants were distributed along, these water treatment are:

- Shark dijlah, Al-kadhimiyah, Al-karama, Al-wathba, Al-qadisiyah, Al-doura, Al-wahda, Al-rasheed from north to south respectively. The intake of these water treatment plants will be considered as monitoring stations for water quality of Tigris River.
as shown in Figure (1). The data used for this study spreads from January 2016 to December 2017.

Figure 1: Sampling sites of Tigris River in present study.

III. RESULTS AND DISCUSSION

Figure 2 represent the distribution of alkalinity and hardness along Tigris River passing through Baghdad city for the period from Jan.2016 to Dec.2017 for the eight monitoring stations.

Figure 2: Variation of alkalinity and hardness of Tigris River

Figure (2) also shows the concentration of hardness during the study period of eight monitoring stations. Noted from the figure that the level of total hardness in the Tigris River was less than the maximum allowed by the standard of the Iraqi standard and specification of the World Health Organization (WHO), where don’t exceed values barrier (500 mg/L) recommended by the two specifications. While the Environmental Protection Agency recommended the values don’t exceeded the barrier of (250 mg/L). The highest value of alkalinity and hardness was observed at stations 5 and 6 which can be attributed to the exsistence of Aldoura refinery and other industrial activities in these areas.

Figure (3) shows the variation of calcium and magnesium ions concentration along Tigris River for
the period from Jan. 2016 to Dec. 2017 for the eight monitoring stations.

The amounts of Calcium and Magnesium affects the results of hardness, because they are the main reason of hardness, and from this figure one can see the same pattern of hardness. The limits of Calcium and Magnesium are 200 and 150 mg/L respectively and all results are within the required range.

![Figure 3: Variation of Calcium and Magnesium ions in Tigris River](image)

IV. CONCLUSION

The present study is carried out to study the spread of Alkalinity, Hardness, Calcium and Magnesium in a part of river Tigris in Baghdad for the period Jan. 2016 to Dec. 2017. It is observed that most of the results were within the limitation.

V. REFERENCES


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