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Pre-monsoon Assessment of Ground Water Using Water Quality Index (WQI) of Shah Faisal Town, Malir River Basin, Karachi

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Abstract: Groundwater samples (n=15) were collected from various sites of Shah Faisal Town from a variable depth range (70-400 feet). The TDS varied from 766.08 to 5490.24 mg/L with a mean of 3128.16 mg/L. Circum-neutral pH (6.84-7.56) is evident within the WHO guidelines (6.5-8.5) for drinking. All the samples have objectionable (> 500 mg/L) level of hardness content where it shows a wide range (600-1800 mg/l; mean: 1200 mg/l). The samples' sodium content (Range: 200-1223; mean: 711.5 mg/L) exceeded WHO limit (200 mg/L). Calcium and magnesium concentrations varied between 40-240 and 92.34-340.2 mg/l with a mean of 220 mg/l and 216.27 mg/l, respectively. Both these elements exceed about 5 times the corresponding permissible limits set by WHO for drinking water. On the other hand, two third samples show elevated bicarbonate content (Range: 210-500; Mean: 355 mg/l). Similarly, nitrate varies between 3.758-14.2 mg/l with a mean of 8.97 mg/l. Fluoride concentration varies between 0.78-1.65 mg/L with a mean of 1.215 mg/L where only 2 samples exceed WHO limit (1.5 mg/L). The water quality index (WQI) is found to be 87.32 which suggests that the groundwater is very poor and only suitable for irrigation. It is concluded that about half of the samples failed to meet the water quality criteria set by WHO for drinking. The problem is aggravated due to anthropogenic activities mainly by sewage infiltration and water supply conditions.

Key words: Groundwater, Quality, Alluvial aquifers, Shah Faisal Town, Malir River.



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