

Physico-Chemical Status of Various Borewell Water from Latur District, Maharashtra, India

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Abstract: The present work is carried out to study the physico-chemical status of various bore well water from Latur District, Maharashtra, India. Different physico-chemical parameters were studied and analysed in the February 2016. The various parameters like pH, Dissolved solids, chlorides, O₂ and CO₂ were analysed.

Keywords: Physico-Chemical, Borewell, O₂, Co₂

1. Introduction

Latur is the South Central place of Maharashtra and borewell water is the source of drinking water for human and cattle. Water is the nature's free gift and available abundant in nature. All life on earth depends on water. The Greek philosopher Pinder said that "Water is the best of all things" water is the important requirement of human life. (Bhawankar A. S. *et al.*, 2011) Which man has exploited more than any other resources for the sustenance of life. It is essential for life, health, sanitation as well as for manufacturing of essential commodities.

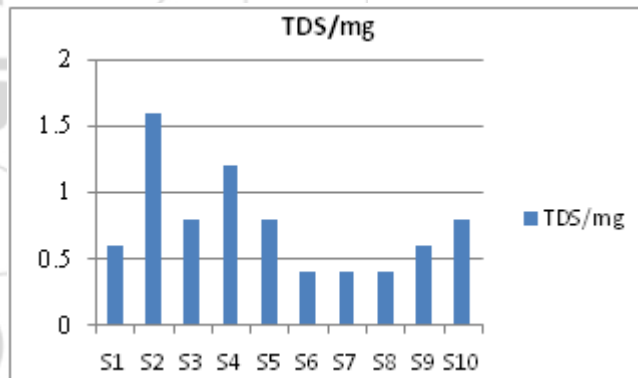
The health burden of poor water quality is enormous. It is estimated that around 37.7 million Indians are affected by waterborne diseases annually. 1.5 million children are estimated to die of diarrhea alone and 73 million working days are lost due to waterborne disease each year. The resulting economic burden is estimated at \$600 million a year. The problems of chemical contamination is also prevalent in India with 1,95,813 habitations in the country are affected by poor water quality. The major chemical parameters of concern are fluoride and arsenic. Iron is also emerging as a major problem with many habitations showing excess iron in the water samples.

2. Materials and Method

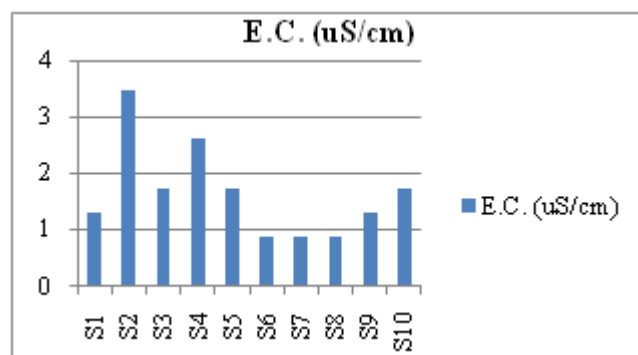
In the present investigation, the ten sampling stations were selected from Latur district. Borewell water samples were collected in good quality polythene bottles during a month February 2016. Sampling water was carried out without adding any preservatives in rinsed bottles directly for avoiding any contamination. The representative ground water samples were collected from Ambulga(S₁), Shirsi(S₂), Selu(S₃), Nalegoan(S₄), Chincholi(S₅), Ramegaon(S₆), Janwal(S₇), Shirur(S₈), Chakur(S₉), and Ashta(S₁₀). and analysed for various physical and chemical parameters by using standard methods APHA (1998), Trivedy and Goel (1981), IAAB (1998).

Table 1: Shows the physico-chemical parameters of Borewell waters from Latur District, Maharashtra

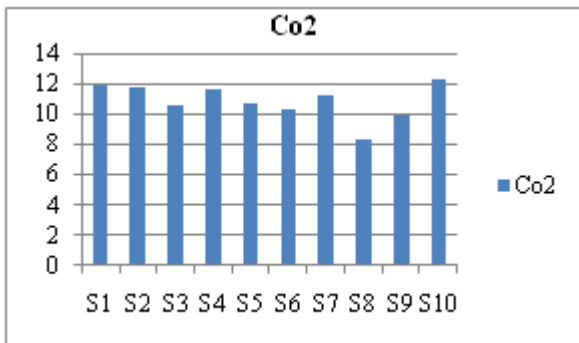
Sample	TDS(Mg/L)	E.C. (uS/cm)	Co ₂	O ₂	pH	Chlorides
S ₁	0.6	1.304	11.86	2.31	6.92	52
S ₂	1.6	3.478	11.80	2.30	7.81	180
S ₃	0.8	1.739	10.52	2.8	7.96	40
S ₄	1.2	2.608	11.64	3.92	7.18	135
S ₅	0.8	1.739	10.64	2.9	7.82	90
S ₆	0.4	0.869	10.30	1.68	6.94	50
S ₇	0.4	0.869	11.19	3.92	7.18	75
S ₈	0.4	0.869	8.28	2.1	6.26	30
S ₉	0.6	1.304	9.85	4.55	6.93	51
S ₁₀	0.8	1.739	12.31	3.92	6.85	120



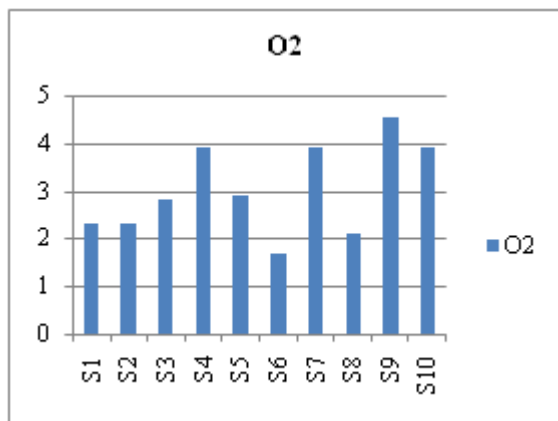
Graph 1: Variation of TDS in Borewell water



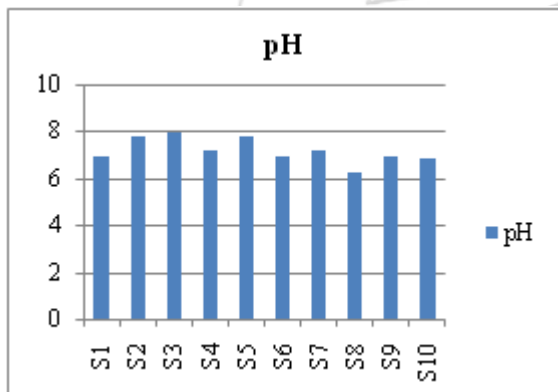
Graph 2: Variation of E. C. in Borewell water



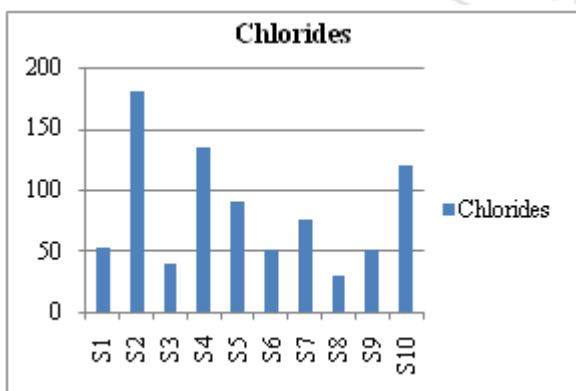
Graph 3: Variation of CO₂ in Borewell water



Graph 4: Variation of O₂ in Borewell water



Graph 5: Variation of pH in Borewell water



Graph 6: Variation of Chlorides in Borewell water

3. Result and Discussion

Total Dissolved Solids (TDS)

Total dissolved solids in the ten sampling ranged from 0.4 mg to 1.6 gm. The TDS value is low in Ramegaon (S₇), Shirur (S₈) and Janwal(S₉) water samples and high in Shirsi water (Delphine Rose *et al* 2005).

Electrical Conductivity (EC)

Electrical conductivity is ranged from 0.869 to 3.478. The electrical conductivity is less in three borewell i. e. Ramegaon (S₇), Shirur (S₈) and Janwal(S₉) and high in Shirsi water (Pondhe, *et. al.*, 2008).

Free Co₂

CO₂ in the water is mainly due to the diffusion from air from inflow ground water. Surface waters normally contain less than 10 mg free carbon dioxide per liter while some ground waters may easily exceed that concentration. APHA(1998) In this investigation CO₂ varies between 8.28 to 12.31 (Karadkhele S.V. *et. al.*, 2008).

Dissolved oxygen

DO concentration in a water indicate its ability to support to the organisms life. In the present study the DO level fluctuated between 1.68 mg /L to 3.92 mg /L. The sample 6 is minimum and sample 4 and sample 10 was maximum DO (Madhuri Pejaver and Minakshi Gurav 2003).

pH

Measurement of hydrogen ion concentration which is represented as pH. Value ranged between 6.26 to 7.96 with minimum value in sample 8. The pH values observed meets the quality of water required for drinking purposes (Ingole *et. al.*, 2009).

Chloride

Chloride in the form of Cl⁻ ion is one of the major inorganic anions in water. In potable water, the salty taste produced by chloride concentrations is variable and dependent on the chemical composition of water. In this investigation chlorides ranges between 30 mg/L to 180 mg/L minimum chloride was trace in sample 8 and maximum in sample 2 (Jeyaseeli *et al* 2007).

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