



STUDY ON QUALITY OF UNDERGROUND WATER IN AND AROUND AMRAVATI, MAHARASHTRA, INDIA

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ABSTRACT

The suitability of water for drinking and irrigational purposes is studied by collecting 20 samples. All these 20 samples are from bore wells located in and around Amravati. Samples were analyzed for water quality Parameter such as pH, electrical conductivity, total hardness, chloride, Dissolved Oxygen and total dissolved solids (TDS)

Key words: Borewell water, Water quality parameters.

INTRODUCTION

Water is an important resource for mankind's livelihood and economic development. Drinking water should be free from colour and turbidity. As water is an essential component of life on this planet, water resources have been a decisive factor in the growth and development of human civilizations throughout history (Sinha, 1995), with increase in the hardness of water (Ca, mg) its suitability decreases with respect to cooking cleaning and laundry Jobs. Surface water is available only for limited period of time in these areas around four months in a year. For the remaining days underground water is the only resource for drinking and agricultural purposes in this region.

EXPERIMENTAL

Samples of drinking water from all the available sources of selected areas were collected in high density polythene bottles. The total number of water samples collected from all these areas put together is about 20. The level of water in bore well in these area is about 70 to 150 m in depth. All the 20 water samples collected were analyzed for various water quality parameters pH, Electrical conductivity, dissolved oxygen and TDS were determined by water and soil analysis kit model 1022-G. Total hardness was determined by complexometric method and chloride was estimated by argentometric titration method.

Table 1: Analysis of physio-chemical parameter in drinking water

Area	Sample number	pH	Electrical conductivity ($\mu\text{m MHOS}$)	Chloride (ppm)	Total hardness (ppm)	Dissolved oxygen	Total dissolved solids
Bore water from rajapeth	1	10.1	1.7	182.3	1300	8.5	164
Bore water from nawathe	2	6.5	0.9	125.8	1040	8.4	153
Bore water from shrikrishnapeth	3	7.44	0.7	51.3	460	8.1	114.6
Bore water from Arjun nagar	4	9.1	0.7	89.9	840	8	188.9
Bore water fromcamp	5	8.2	0.5	38.53	600	8.7	128.8
Bore water fromshankar nagar	6	7.9	0.8	102.75	840	8.5	132.4
Bore water from Varun nagar	7	8.7	0.5	53.94	700	8.2	142
Bore water from badnera	8	7.2	0.8	107.89	710	8	127.4
Bore water from sainagar	9	6.49	0.7	106	756	7.1	155.9
Bore water from shiv mandir	10	8.31	1.3	190	1220	9.3	144
Bore water from school	11	7.9	1.0	92.4	980	8.4	158
Bore water from khaparde bagicha 7.8	12	10.8	1.0	166.97	1246	9.7	129.5
Bore water from kawar nagar	13	8.6	1.5	85	386	7.8	154
Bore water from bus stand	14	9.8	2.0	259.45	1748	8.6	148.9
Bore water from shegaon naka	15	7.82	1.0	218	1000	8.5	110
Bore water from railway station	16	9.2	1.3	200	1000	8.4	141.1
Bore water from akoli road	17	9.22	0.9	215	986	7.9	136
Bore water fromshriram nagar	18	8.8	1.0	230	916	9.8	153
Bore water from masjid	19	8.1	0.8	202	800	9.2	
Bore water from gopal nagar	20	5.8	0.3	251	220		

RESULTS AND DISCUSSION

Table 1, Reports the finding of the concentration of pH, electrical conductivity in $\mu\text{m Mho/cm}$, chloride, total hardness, Dissolved oxygen and total dissolved solids in the samples of bore water. The hydrogen ion concentration is represented by the pH value. In the values of all the underground water in samples were ranging between 7.1 to 10.8.

In the present study most of the surface samples reveal higher pH than that of their prescribed limit i.e. for drinking water a pH of 6.5 for 8.5 recommended while for irrigation the range can be slightly wider viz. 6.0 to 9.0 Hence pH value of 7 considered to be advisable and most ideal one.

The electrical conductance of underground water ranged from 0.5 to 2 $\mu\text{m mho/cm}$ Actually conductivity values are indicative of solute content of water and general nature of Soil quality. In all the samples of water the values of chloride ranged from 51.3 mg/L to 259.4 mg/L

The total dissolved solids TDS values should be ranged 500 mg/L all the values of samples of water are within the prescribed limits.

The commonly indicated quality parameter is its hardness, due to the presence of calcium and magnesium in combination with anions such as carbonate and sulphate. The presence of these two divalent cations is essential for ensuring soil permeability as well as for the growth of crops. The total hardness values ranged from 160 to 1750 mg/L. Some water sample whose values are greater than 300 mg/L which is not suitable for drinking purpose.

Dissolved oxygen (DO) should be in range of 5 but all the water samples shows the exceeding values in range of 7.1 to 9.8.

CONCLUSION

On experimental analysis, it is found that the underground water samples show some parameters in prescribed limit and some are exceeding. Drinking water is an important basic need. Hence people should consume protected water containing mineral elements within the prescribed limits. If not, they will be affected by water & water causing diseases.

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