



## GROUNDWATER QUALITY CHARACTERISTICS AT SIVALINGAMPILLAI LAYOUT, UDUMALPET, TAMIL NADU

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### ABSTRACT

To assess the physico-chemical characteristics for ground water quality, samples of bore-well water from houses in and around Sivalingampillai layout, Udumalpet, were collected and analysed during the period June and October 2005. The experimental values of various parameters were compared with standard values and the results clearly indicate that the quality of water from bore-wells is degraded in that period.

### INTRODUCTION

Water is essential for survival of any form of life. On an average, a human being consumes about 2 litres of water every day. Moreover, water has become an essential commodity for the development of industries and agriculture. Owing to increasing industrialization on one hand and exploding population on the other, the demand of water supply has been increasing tremendously. Moreover, sewage, industrial wastes and a wide array of synthetic chemicals pollute considerable part of this limited quantity of water.

In India, more than three million people get affected or die of enteric diseases every year. The menace of water-borne diseases and epidemics still threatens the well being of population particularly in underdeveloped and developing countries. Thus, the quality as well as the quantity of clean water supply is of vital significance for the welfare of mankind. It is, therefore, necessary that the quality of water should be monitored at regular intervals. Therefore, in the present study, an attempt has been made to evaluate physico-chemical characteristics of ground waters in and around Sivalingampillai layout, Udumalpet.

### MATERIALS AND METHODS

Ten water samples were collected from different bore wells and analysed for parameters namely pH, conductance, TDS, DO, chloride, hardness and turbidity using the water analysis "MAC" digital portable kit (MSW-551) and volumetrically. The experimental values were compared with the standard values and the results were drawn.

### RESULTS AND DISCUSSION

**pH:** A quick evaluation of acidic and alkaline nature of water can be done by the determination of pH which is an important parameter of water. The pH of the samples determined were well within the WHO standards for drinking water, i.e. within the safer limits of 7-8.5.

**Dissolved oxygen:** DO as a parameter is very useful for assessing the quality of water and providing a check on pollution. The DO level ranged from 6.0 to 8.2 mg/L which is within the permissible limit.

**Electrical conductivity:** The values of electrical conductivity ranges from 595 to 1818  $\mu$ mhos/cm. The variation in electrical conductivity could be explained to the natural concentration of ions present

Table 1: Physico-chemical characteristics of the ground water samples.

Sample No.	pH	Temperature °C	Conductivity $\mu$ mhos	TDS mg/L	DO mg/L	Turbidity NTU	Cl <sup>-</sup> mg/L	Hardness mg/L
1	8.11	28.5	648	418	6.2	5.0	42.6	268
2	7.4	27.8	933	595	6.0	3.0	95.14	326
3	7.5	26.3	1378	879	6.3	9.0	147.68	458
4	7.5	26.5	1248	776	6.9	1.0	113.6	400
5	7.84	27.6	1021	650	6.1	1.0	82.36	328
6	7.8	26.3	664	422	8.2	3.0	35.5	254
7	7.6	26.3	595	380	8.2	4.0	19.88	238
8	7.77	27.5	877	560	6.0	2.0	6.532	322
9	7.38	26.3	1078	687	6.9	6.0	92.3	564
10	7.44	27.6	1818	1160	5.7	5.0	197.38	790

in water (Kataria & Jain 1995). The higher values of conductance ( $>1000 \mu\text{mhos/cm}$ ) may be due to the difference in geographical features.

**TDS:** The TDS values ranged from 380 mg/L to 1160 mg/L. The samples  $S_1$ ,  $S_6$  and  $S_7$  are below 500 mg/L which can be used for drinking purpose. The other samples have TDS above 500 mg/L but below the maximum permissible limit of 1500 mg/L which can be used for domestic purposes. But if utilized for cooking purposes, the water has a salty taste and produces scales on cooking vessels.

**Turbidity:** The turbidity values ranged from 1 to 9 NTU. The BIS acceptable limit for turbidity is 25 NTU. All the samples analysed are well within the permissible limit.

**Chloride:** Chloride is one of the important parameters to know the quality of water. Concentration of chloride is high in ground water where the temperature is high and rainfall is less. High chloride content causes cardiovascular problems, gives a bitter taste to water, corrodes steel and affects the solidity and strength of concrete (Guru Prasad 2003). The study showed chloride values ranging from 6.532 to 197.38 mg/L. The values are within the permissible limit of 250 mg/L.

**Hardness:** Total hardness levels vary from 238 mg/L to 790 mg/L. The BIS acceptable limit for total hardness is 600 mg/L. The study reveals only one sample ( $S_{10}$ ) crosses the permissible limit stated by BIS drinking water standards. This may be due to the ground water receiving calcium and magnesium rich minerals leached from rocks and other deposits like limestone, gypsum and clay minerals. Sewage and domestic wastes are also important sources of total hardness in ground water (Mishra & Saxena 1989).

## CONCLUSION

Comparison of the parameters of all the samples, lead to the conclusion that the samples  $S_1$ ,  $S_6$  and  $S_7$  can be used for drinking and domestic purposes. All the other samples are not to be used for drinking purpose, but can be used for other domestic purposes. These samples can be used for drinking only after proper treatment.

## REFERENCES

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