A study of ground water qualtiy with references to the human health of pichhore town, Dabra, Gwalior M.P. (India)

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ABSTRACT

Groundwater is the most important source of water supply for irrigation, industries and for drinking purposes. The natural quality of groundwater tends to be degraded by human activities. The Physical and chemical quality of ground water is affected by industrial activities and human activities .06 water samples are collected from Pichhore, Dabra Gwalior (M.P.) for winter season (Jan 2008). The ionic concentration is Expressed in mg/L.

Key words: Drinking Water, Chemical parameters and Pichhore town.

INTRODUCTION

Water is most essential to life next to air only. The two main sources of natural water are underground and surface water. Ground is essential for health, society and sustainable developments. The natural quality of groundwater tends to be degraded by human activities. Pollution is one of the major problems of the environment today almost every aspect of life poses healthy risks introduction of massive quantities of waste materials at any point in the biosphere may overload it disrupting the natural recycling mechanism thus the air we breath, the water we drink the drugs we user and the places where we live and work may be contaminated by toxic substances. We get concerned about the quality of water, when in its physical chemical and biological characteristics or it quality deteriorates and become harmful to man, his domestic needs or other aquatic life such a situation is referred to as aquatic pollution. Different parameter of water has been analyzed and assessed the suitability of Drinking water in public hygiene scenario. Some parameters are prescribed by ISI and WHO while other are beyond the limits. Nature mainly consists of air, water, soil; unbalancing of any three causes major problems in natural process.

MATERIAL AND MATHODS

The samples were collected during the month Jan 2008. Samples for analysis were collected in sterilized bottles (plastic with acid washed). pH values of the ground water samples under investigation were measured using systronic pH meter, type 361. The pH was standardized buffer solution of 4.0pH and 9.2pH. Total Alkality of the ground water samples were determined by titrating With N/50 H_2SO_4 using phenolphthalein and methyl orange in indicator. The total hardness of the water samples were determined by complexometric titration with EDTA using eriochrome black-T as an indicator. Calcium-EDTA Titrimetric method, the estimation of chloride ions is generally determined by titrating the water sample against a standard solution of silver nitrate using potassium chromate as an indicator. Sodium and potassium were estimated using flame photometer

(128) technique. NO_3^{2-}, SO_4^{2-} were estimated using UV-visible spectrophotometer. EC values of the ground water samples under investigation were measured using systronic EC meter.

RESULT AND DISCUSSION

The pH of the water body indicates the degree of deterioration of water quality. The desirable pH range necessary for drinking water is from 6.5 to 8.5. The pH value of water sample in the study area ranged from 8.0 to 8.6. The desirable limit for total alkalinity is 200mg/L. The value of ground water samples were varied from 312 mg/L to 542 mg/L. The desirable limit for Total hardness in drinking water according to I.S.I. and ICMR is 300 mg/L. Its values in Ground-water samples varied from 208 mg/L to 503 mg/L. calcium in the ground water is 100 ppm[4]. In the present investigation calcium content ranged from 44 mg/L to 82 mg/L. Ground water pollution by sodium salt is an unavoidable phenomenon caused form the return flow of irrigation and disposal of industrial and urban wastes. In large concentration it may affect a person with cardiac diffencies . Sodium values in ground water samples varied from 186 mg/L to 301 mg/L. Potassium is an essential nutrient for plants Potassium values in ground water samples

Table 1:

S.N.	Location	pH	T.A.	T.H.	Ca^{++}	Na^{+}	K^{+}	Cl^{-}	SO$_4^{2-}$	NO$_3^{-}$	E.C.	T.D.S.
1	A$_1$(H)	8.3	370	420	48	201	3.22	312	16	7.26	1727	1104
2	A$_2$(H)	8.2	410	471	64	186	3.24	319	0.0	7.51	1752	1121
3	A$_3$(H)	8.6	542	503	82	218	98.8	378	11	5.00	2200	1408
4	A$_4$(H)	8.2	332	342	58	210	3.52	294	09	9.81	1595	1022
5	A$_5$(H)	8.4	312	264	44	195	3.01	252	11	2.80	1370	876
6	A$_6$(H)	8.0	352	208	64	301	126.3	461	04	2.85	2051	1313

All the value are expressed in mg/L except pH, electrical conductivity Electrical conductivity is expressed in micromhos/cm at 25[0]C T.A. = total alkalinity, T.H. = total hardness, H=Hand pump A$_1$ = Dabra Road A$_2$=New Bus Stand, A$_3$= Near Hospital A$_4$= Near Maa Kalindree Mandir A$_5$= Police Station , A$_6$= Bazaar

varied from 3.01 mg/L to 126.3 mg/L.. The chloride is troublesome in irrigation water and harmful for aquatic life. Chloride values in ground water samples varied from 252 mg/L to 461 mg/L.

Sulphate content more than 200 ppm is objectionable for domestic purpose, as water having more than 500 ppm taste bitter and beyond 1000ppm has purgative effect[5,6,7]. Sulphate values in surveyed area varied from 0.0 mg/L to 16 mg/L. Excessive concentrations of nitrate[12] in drinking water may cause methemoglobinemia in small children. Nitrate is good for plant nutrient. Its values in ground water samples varied from 2.8 mg/L to 9.81 mg/L E.C. values are responsible to make the criteria of ground water. The Electrical conductivity values of water sample in the study area ranged from 1370 to 2200 micromhos/cm at 25[0]C. Total dissolved solids is an important parameter for drinking water and water to used for other purposes .The permissible limit of TDS suitable for drinking is 500 mg/L. Its values in ground water samples varied from 876 mg/L to 1408 mg/L.

ACKNOWLEDGMENTS

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