A study of ground water quality of Tekanpur and some near by village Gwalior, (M.P.)

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ABSTRACT

The present study deals with the investigation of ground water quality of sample collected from different areas from Tekanpur and some near by villages. Eight (08) sampling point were selected on the basis of their importance. Some parameters are within the permissible limits as prescribed by ISI and W.H.O. while other are beyond the limits.

Key words: Chemical Analysis and Ground water quality.

Water is a basic need of each living organism. It is almost impossible to imagine life without water. Fresh water provides life to thirsty cities, comes mostly in the form of seasonal rains. Water pollution means contamination of water due to presence of solid, liquid or gaseous substance in such concentration that it alters the physical, chemical and biological properties of water so that it becomes injurious and dangerous to human and other living beings. Consumption of polluted water causes different type of diseases. More than 100 different types of bacteria and viruses are known to be present in human refuse. They can survive for months in water soil. A number of diseases like malaria filarial; Kalajhar, Jaundice, Gastroenteritis and Cholera are caused by contaminated water. Now day's underground water has become the main source of drinking water supply in almost all villages and town and in number of cities A network of tube wells and hand pumps has been spread in most of the cities of M.P. and their number is much more higher in northern part of Madhya Pradesh. The water level of under ground water has been full down to 30 to 40 meters in most of areas.

The samples were collected in sterilized bottles (plastic with acid washed). pH –systronic pH meter Type 361, Total Alkality of the ground water samples were determined by titrating With N/50 H_2SO_4 using phenolphthalein and methyl orange as an 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, Magnesium-Calculation from total hardness and calcium method, Chloride-Argentometric titration Sodium and potassium - flame photometer (128) technique., NO_3^-- UV-visible spectrophotometer. T.D.S.- Gravimetric, EC - systronic EC meter

The pH of the water body indicates the degree of deterioration of water quality[2]. 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 7.6 to 8.6.The desirable limit for total alkalinity is 200mg/L.The value of ground water samples were varied from 100 mg/L to 370 mg/L.The desirable limit for Total hardness in drinking water according to I.S.I. is 300mg/L. Its values in Ground-water samples varied from 120 mg/L to 380 mg/L. The drinking water containing high magnesium contents may be cathartic and diuretic[3,4]. Magnesium values varied between 15.6 mg/L to 40.8 mg/L.WHO permissible limit of calcium in the ground water is 100 ppm[1]. In the present investigation calcium content ranged from 20 mg/L to 84 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[6]. Sodium values in ground water samples varied from 62.1 mg/L to 257.6 mg/L.

Table 1:

S. No.	Sample point	pH	T.A.	Mg^{++}	Ca^{++}	T.H.	Na^+	K^+	Cl^-	NO_3^-	EC	TDS
1.	P_1	7.7	215	34.8	38	240	87.4	7.8	138.4	12.4	880	563.2
2.	P_2	7.7	150	18	34	160	85.79	3.9	127.8	6.51	703	449.9
3.	P_3 (v)	8.2	230	31.46	44	240	115	3.9	170	5.58	990	633.6
4.	P_4(v)	8.1	190	20.4	48	205	65	2.1	88.7	9.3	693	443.5
5.	P_5(v)	7.8	135	15.6	32	145	62.1	13.26	102.9	6.2	594	380.16
6.	P_6	8.6	370	40.8	84	380	257.6	1.9	386	6.2	1880	1203
7.	P_7	7.6	100	16.8	20	120	66.7	11.7	113.6	4.6	560	358.4
8.	P_8	7.7	170	21.6	34	175	89.7	3.9	131.3	4.65	750	480

Potassium is an essential nutrient for plants Potassium values in ground water samples varied from 1.9 mg/L to 13.26 mg/LThe salty tasted produced by chloride concentrations is variable and dependent on the chemical composition of water. Water containing 250mg chloride per liter may have a detectable salty taste. The values of chloride in ground water samples were varied from 88.7 mg/L to 386 mg/L. The chloride is troublesome in irrigation water and harmful for aquatic life. Excessive concentrations of nitrate in drinking water may cause blue baby syndrome in small children.Nitrate is good for plant nutrient. Its values in ground water samples varied from 4.6 mg/L to 12.4 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 560 to 1880 micromhos/cm at 25°C.Total dissolved solids are an important parameter for drinking water and water to use for other purposes. The permissible limit of TDS suitable for drinking is 500 mg/L (W.H.O.) the total dissolved solids values of water sample in the study area ranged from 358.4 mg/L to 1203 mg/L.

All the value are expressed in mg/L except pH, electrical conductivity Electrical conductivity is expressed in micromhos/cm at 25°C T.A. = total alkalinity, T.H. = total hardness,v= village P_1= Randhawapuram colony(H), P_2= Baraghard Colony(H), P_3= Balipura(w) P_4= Makora(H) P_5= Chiruly (H), P_6 = Tekanpur(bazaar), P_7 = T.C.P. Get B.S.F. (H), P_8 = Garwal Colony (H).

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