Physicochemical Analysis of Water Near Rudrapur Areas in Uttarakhand

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Abstract

Water is one of the abundantly available substance in nature, which is essential for plant and animal life. Sea water, rain water and ground water are main source of universe. Water is mostly used for industrial, municipal and agricultural purpose. There are many factors which can be considered for supply of water such as ground water and surface water which in form in lake, pond, artificial lakes, well, deep well, dug well, etc. Water also act as a solvent because it has high dielectric constant, hydrogen bond and polarity with dipole moment. The water samples were tested for physicochemical parameter at five different locations at Rudrapur-Uttarakhand followed with standard method and procedures. The comparison of observed and reference values with BIS- 10500:2012.

Keywords: *Physiochemical, water, analysis, Rudrapur.*

1. Introduction

The modern civilization , urbanization , industrialization and increased population lead to fast degradation of our environment , water is a prime resource . A basic human need and a previous natural asset. It is needed for producing food, industrial activities, environment , life and health . Its use in irrigation, industries and domestic usage continues increase where perennial surface water sources are decreasing day by day[1]. It is well known fact that potable water is absolutely essential for healthy living. Good quality of water will ensure the sustainability of socio – economic development as the government priority is shifted to other sectors of the economy .Adequate supply of fresh and safe water is a basic need of all living things on the earth. The problem of drinking water contamination, conservation and water quality management has assumed a very complex shape. Attention on water contamination and its management has become a need of the hour because of far reaching impact on human health .In many developing countries safe water of pathogen and other contaminants is unavailable too much of the population and water contamination remain a concern even for developed countries with good water supplies and advanced treatment systems. Alarming situation at Bhimtal lake[3] and SIDCUL[4] area indicate ,monitoring of water is necessary.

2. Material and Methodology.

The water samples are collected as per standard procedure in the month of June from the selected sites in the Rudrapur areas. They are analyzed immediately for various parameters as preserved safely by taking care with suitable standard precautionary methods to avoid deterioration. All the water samples are collected in sample containers. The list of sample collection areas in Rudrapur are given in Table1 based APHA[2] methods by lab technician.

Table.1 List of sample collection in Rudrapur areas.

S.No.	Location	Source
1	Jal Sansthan(JSDW)	Drinking Water
2	Teen paani (TPRW)	River Water
3	Teen paani (TPGW)	Tube Well
4	Ganga Tat (GTRW)	Running Water
5	Kalyani View(KVRW)	River Water

(USA) with fluoride sensitive electrode are used to analyze for various constituents present in water sample at Whaters-Throcare Lab, Navi-Mumbai.

Instruments Used.
The following instruments like fully automated ICP spectrophotometer ,digital ph meter , Nefleometer , Digital conduct meter , Micro processor based bunch pH/Ion meter ,cyber scan 2100 , Eutech instruments'

3. Results and Discussion:

Table No.2: Physico chemical analysis of Water samples

Sr. No	Physical and Chemical Test	Sample 1 TWGW	Sample 2 GTRW	Sample 3 KVRW	Sample 4 JSDW	Sample 5 TPRW	Max. Acept. BIS-10500:2012
1	Alkalinity	70.299mg/l	<62.5 mg/l	67.881 mg/l	<62.5 mg/l	79.5 mg/l	200
2	Anionic detergent As MBAS	<0.063 mg/l	<0.063 mg/l	<0.063 mg/l	<0.063 mg/l	<0.063 mg/l	0.2
3	Chloride	<62.5 mg/l	<62.5 mg/l	<62.5 mg/l	<62.5	67 mg/l	250
4	Colour	>15 Hazen	>15 Hazen	>15 Hazen	>20 Hazen	>20 Hazen	5
5	Cyanide	<0.025 mg/l	<0.025 mg/l	<0.025 mg/l	<0.025 mg/l	<0.025 mg/l	0.05
6	Fluoride	<0.125 mg/l	<0.025 mg/l	<0.125	<0.125 mg/l	<0.125 mg/l	1
7	Free Chlorine	<0.125 mg/l	<0.125 mg/l	<0.125	<0.125 mg/l	<0.125 mg/l	0.2
8	Nitrate	<12.5 mg/l	<12.5 mg/l	<12.5 mg/l	<12.5 mg/l	<12.5 mg/l	45
9	PH	6.28 mg/l	6.32 mg/l	6.66 mg/l	5.66 mg/l	5.88 mg/l	6.5-8.5
10	Penolic compound as c_6H_5OH	<0.001 mg/l	<0.001 mg/l	<0.0001 mg/l	<0.001 mg/l	<0.001 mg/l	0.001
11	Sulphate	<62.5 mg/l	<62.5 mg/l	<62.5	<62.5 mg/l	<62.5 mg/l	200
12	Sulphide	<0.025 mg/l	<0.0025 mg/l	<0.025 mg/l	<0.025 mg/l	<0.025 mg/l	0.05
13	Total Dissolved solid	274 mg/l	231	224 mg/l	45.29 mg/l	197.25 mg/l	500
14	Total Hardness	397 mg/l	307	346 mg/l	57.32 mg/l	85.81 mg/l	200
15	Turbidity	<0.312 NTV	<0.312 NTV	<0.312 NTV	<0.312 NTV	<0.312 NTV	1

4. Conclusion
On the bases of this data we find that alkalinity, chloride, fluoride etc. values are very small than the max. acceptable value, while colour is very dark than the max. acceptable values. pH is in the range of max. acceptable values and phenolic compounds is same as the max. acceptable values. The results reveals that the ground water quality is contaminated in Rudrapur area mainly by the low concentration of alkalinity, chlorides cyanide , free chlorine mean value of these parameters have been found less than the permissible limit of drinking water .The source of ground water contamination in the study area are mainly due to discharge in industrial commercial and household effluent in open channels , which further lead to ground water contamination in Rudrapur areas . The results reveals that proper attention is needed to avoid ground water contaminations otherwise all WQI score will keep on decreasing due to step of newly integrated industrial estate in the rudrapur areas of district Udham Singh Nagar, Uttrakhand.

References
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