

## Drinking Water Quality Analysis of Water Samples Collected From Manora Region, Dist. Washim

S. D. Bhagat\*<sup>1</sup>, S. D. Ingole<sup>1</sup>, N. S. Thakare<sup>1</sup>, C. U. Dhanwad<sup>1</sup>

<sup>1</sup>Department of Chemistry, M.S.P. Arts, Science & K.P.T. Commerce College, Manora, Dist Washim, Maharashtra, India

### ABSTRACT

For the drinking water quality analysis, the samples were collected from the different regions of Manora which includes Tap water, Tub well, and Well water for observation of Physico-chemical analysis. The in-vitro test of the collected water samples was performed for analysis of different parameters such as water temperature, pH, dissolved oxygen, total dissolved solids, Conductance, Chlorides, and Phosphates. The obtained data were compared with the standard unit given by BIS. The results of this study tell that physico-chemical parameters are within maximum permissible limit of WHO and BIS. Therefore, water is safe and suitable for domestic and drinking purposes after some treatment.

**Keywords:** Physico-chemical analysis, Manora region & Drinking water standards.

### I. INTRODUCTION

The quality of Drinking water plays a very important role because it is directly related to human health [1, 2]. Today, the quality of water which we drinking is getting affected by the different activates of a human being. The availability of drinking water through surface and groundwater resources has become a very critical day-to-day life. Only 1% part is available on the land for drinking, domestic, agriculture, power generation, for industries and waste disposal [3].

Water sources are polluted by domestic wastage in rural areas whereas industrial wastage discharges into natural water sources in urban areas. Industrialization without provision of proper treatment of wastage and effluents as well as excessive applications of fertilizers and pesticides for agriculture purposes [4]. Due to the use of contaminated drinking water, the human population suffers from varied of water borne diseases. The increased use of metal based fertilizer in the agricultural revolution of the government could rise in the concentration of metal pollutants in the freshwater reservoirs due to water runoff [5].

The WHO suggests that 75% of all diseases in developing countries occur from polluted drinking water [6]. As a result, concerns about water quality are frequently the most critical factor in determining access to better water sources. Acceptable quality shows the safety of drinking water in terms of its physical, chemical, and bacteriological parameters [7]. International National and local agencies have established parameters to determine the biological and physicochemical quality of drinking water [8, 9].

The present work was carried out in the Manora region to study the Drinking water quality. Manora is located in the Washim district of Maharashtra in the Amravati division. It is located between 20.2161°N & 77.5591°E coordinates.



## II. METHODS AND MATERIAL

Water samples were collected in pre-cleaned polypropylene bottles with necessary precaution from different locations. Various physico-chemical parameters were analysed as given in standard manual of water and waste water analysis [10]. Selections of seven different stations were identified and water samples were collected at sites and assigned as S1, S2, S3, S4, S5, S6, S7, S8, S9 and S10.

The main aim of the study was to investigate the physico-chemical characteristics of drinking water samples in Manora Region. Samples were collected from the sites in between 09:00 a.m. to 10:00 a.m. The sample for dissolved oxygen analysis was collected gently just below the water surface in a BOD bottle (250 ml) to avoid any air bubbles entering the bottle. The parameters like temperature, pH, dissolved oxygen, total solids, Conductance are analysed by using water analysis kit [11,12], Hardness is analysed as Calcium EDTA titration, Chloride by titration and Phosphate is analyzed by Calorimeter.

The reagents employed in this study were of the A.R./G.R. grade, and distilled water was utilised to make the various solutions. All reagents and calorimetric solution were produced and purified using a standard procedure for water analysis.

### III. RESULTS AND DISCUSSION

The values of physico-chemicals parameters of Manora region are given in Table 1.

#### Temperature

Water temperature is one of the most important ecological factor which controls the physiological behavior of aquatic systems and hence the quality of water. In the present investigation, the water temperature ranged between 23°C to 28°C. The highest temperature of 28°C was obtained at Site S6.

#### pH

It is nothing but the measure of the concentration of hydrogen ions, which provides the range of the acidity or alkalinity of a solution. In this study the pH ranges 7.2 to 8.2.

**Table 1: Values of physico-chemicals parameters of Manora region.**

Location	Temp.	PH.	DO	EC	TDS	TH	Chloride	Phosphate
S1	25.3	7.5	6.6	0.4	450	321.5	52.4	0.673
S2	26.3	7.64	6.3	0.4	479	423.8	47.8	0.993
S3	25.4	7.32	5.6	0.5	570	256.2	60.3	0.865
S4	25.5	7.23	5.7	0.3	367	254.3	29.5	0.785
S5	23.6	8.25	7.9	0.3	283	364.5	43.6	0.918
S6	28.7	7.63	6.2	0.2	423	470.4	62.4	0.341
S7	25.5	7.21	7.3	0.4	630	260.6	56.9	0.092
S8	25.6	7.57	8.2	0.5	439	180.6	32.6	0.862
S9	24.5	8.15	7.8	0.3	520	210.3	29.8	0.093
S10	24.7	7.35	6.9	0.3	630	287.2	39.5	0.742

#### Dissolved Oxygen (DO)

It is the amount of gaseous oxygen (O<sub>2</sub>) dissolved in the water. DO is very important parameter in concern with the water quality. It reflects the physical and biological present in the water. Oxygen enters the water by direct absorption from the atmosphere, by rapid movement, or as a waste product of plant photosynthesis. Water temperature and the volume of moving water can affect dissolved oxygen levels. Dissolved oxygen content indicates the health and ability of water body to purify itself through biochemical processes. During this study DO varies in the range of 5.6 to 8.2

#### Electrical Conductivity (EC)

EC is a measure of water's capability to pass electrical current. This ability is directly related to the concentration of ions in the water. The EC in present study for various samples is in the range of 0.3 to 0.5 M mhos.

#### Total dissolved solids (TDS)

TDS refer to matter suspended and dissolved in water. Waters with high total solids generally are of poorer palatability and may induce an unfavorable physiological reaction in the transient consumer. In this study the TDS was found in the range of 367mg/L to 630 mg/L. The highest TDS was observed at site S7 & S10 which is 630 mg/L.

#### Total Hardness (TH)

The total Hardness of water is mainly due to the presence of Calcium and Magnesium ions which apart from Sulphate, Chloride and Nitrates are found in combination with carbonates and bicarbonates. In this study the total hardness were found to be 180.6 to 470.4 mg/L.

#### **Chloride**

The Chloride are found in partially in all natural waters. Chlorides are the most common inorganic ions present in the water. In this study the values for Chlorides are found in the range of 29.5 to 62.4 mg/L.

#### **Phosphate**

Phosphate leads to eutrophication which could also leads to unpleasant taste and odour of the water. The Phosphate content in the selected water sample were found in the range of 0.092 to 0.993 mg/L.

### **IV. CONCLUSION**

By comparing the different values obtained in the present study with the permissible limits given by BIS and WHO, it can be conclude that most of the values are well within the permissible limits. The result of study reveals that the quality of drinking water is though fit for domestic as well as for drinking purpose after some treatment.

### **V. REFERENCES**

- [1] . Sayyed.J.A and A.B. Bhosle, The study of Zinc metal concentration by spectrophotometric method from Godavari River at Nanded, Maharashtra, Der Chemica Sinica, (2010), 1(2), 104-109.
- [2] . Ogbonna O, Jimoh W.L, Awagu E. F. and Bamishaiye E.I.(2011), Determination of some trace elements in water samples within Kano metropolis. Advances in Applied Science Research, 2 (2), 62 -68.
- [3] . S. Julie Rane and S. Vasantha (2010), Physicochemical analysis of bore well water samples of anaiyur area in Madurai district, Tamilnadu, India, J. Curr. Sci. 15 (2) : 403 – 408.
- [4] . Dhake R.B, R. P. Phalak and G. P. Waghulde (2008), Seasonal variation in ground water quality of south zone of Bhusawal Taluka Dist- Jalgaon (M.S.) India, AJCER, 1(1), 43-48.
- [5] . Adefemi S. O. and E. E. Awokunmi (2010), Determination of physico-chemical parameters and heavy metals in water samples from Itaogbolu area of Ondo-State, Nigeria, Africa Journal of Environmental Science and Technology, 4(3), pp 145-148.
- [6] . WHO (2006) In Water, Sanitation and Health World Health Organization.
- [7] . WHO (2000) Disinfectants and disinfectant by products. Environmental health criteria 216, Geneva: world health organization.
- [8] . WHO (2004) Guidelines for Drinking-water Quality, Geneva: World Health Organization.
- [9] . BIS (2012), Indian Standard Drinking Water Specification.
- [10] . APHA. Standard Methods for the Examination of Water and Wastewater, 18th Edition.
- [11] . N.S.Thakare, S.D.Bhagat. (2015), Determination of Physicochemical Properties and Organochlorine pesticide residues in water from Adan dam reservoir of Karanja Tahesil, Multilogics in Science, Volume IV, issue XI, 27-30.
- [12] . Tathe, V.W., Deshmukh, A. Y. & Bhagat, S.D. (2018), Analysis of Drinking Water Quality of Karanja Tehsil, Dist. Washim, Aayushi International Interdisciplinary Research Journal (AIIRJ), Special Issue No. ,1370-1372.