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Water Quality of Greater Faridabad Canal in Haryana

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Abstract- ***Greater Faridabad Canal is one of the main sources of water for domestic use in Greater Faridabad and other districts of Haryana. Water Quality test was carried out by finding the concentration of Chlorine, Ammonia, Dissolved Oxygen and the pH. Low values of BOD and high values of chlorine and ammonia show that the water is stagnant and industrial and domestic waste is constantly entering the canal.***

Index Terms- ***Water quality, Dissolved Oxygen, BOD, Chlorine, Ammonia, pH, Greater Faridabad Canal.***

I. INTRODUCTION

Greater Faridabad Canal serves as one of the primary sources of water for domestic use in Greater Faridabad and surrounding districts of Haryana. Monitoring the water quality of such a canal is essential to ensure public health and environmental safety. This study was undertaken to assess the current water quality of the canal by measuring key parameters including Chlorine, Ammonia, Dissolved Oxygen (as Biochemical Oxygen Demand, BOD), and pH.

Rising industrial activity and increasing domestic waste discharge into water bodies have become serious concerns across India. The Greater Faridabad Canal, being a critical water resource in the region, is susceptible to contamination from these sources. This paper presents experimental findings and compares them against established safe water standards from the CPCB and WHO.

II. SAMPLE AND METHOD OVERVIEW

Water samples were collected during the summer season along the Greater Faridabad Canal in Sector 81, Haryana. The samples were stored in high-density polyethylene (HDPE) containers at room temperature and analysed on the same day using standard methods.

Dissolved Oxygen was measured using the Winkler's titrimetric-azide modification method. Chlorine concentration was determined by the silver nitrate precipitation method. Ammonia was estimated by HCl titration method. pH was measured using a calibrated digital pH meter.

III. METHODOLOGY

3.1 Method for Dissolved Oxygen (BOD)
Materials Required: BOD Bottle, Concentrated HCl, Manganous Sulphate, Potassium Iodide, Potassium Hydroxide, Starch solution, Sodium Thiosulphate, Distilled water.

Procedure: The water sample was taken in a BOD bottle ensuring no air bubbles were present. 2 ml of KI and KOH solution (15 + 80 in 100 ml) was added, followed by 2 ml of Manganous Sulphate (0.29 M) and 2 ml of concentrated HCl. A 150 ml sample was then titrated with Sodium Thiosulphate (0.025 N). When the sample turned pale yellow, starch solution was added and titration continued until the dark blue colour faded.

Calculation: DO (mg/L) = $(V_1 \times N \times 8 \times 1000) / V_2$
Where V_1 = volume of $Na_2S_2O_3$ used (mL); N = normality of $Na_2S_2O_3$ (0.025 N); V_2 = volume of sample taken for titration (mL); 8 = equivalent weight of oxygen.

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3.2 Method for Chlorine

Materials Required: Concentrated Nitric Acid, Silver Nitrate (0.1 M), Burner, Filter paper, Distilled water. Procedure: 100 ml of the sample was taken and 3 ml of concentrated Nitric Acid was added. Using a burette, silver nitrate was added until precipitation stopped. The sample was heated to boiling to coagulate the precipitate, then cooled in a cold and dark area. The precipitate was filtered, washed with diluted nitric acid, and dried. The dry weight of the precipitate was recorded. Calculation: Cl (mg/L) = ((Dried Weight / 143.32) × 35.45) / 0.1

Where 143.32 = molar mass of AgCl; 35.45 = molar mass of Cl; 0.1 = factor to find concentration per litre. 3.3 Method for Ammonia

Materials Required: Methyl Orange indicator, HCl (0.1 M).

Procedure: 100 mL of the sample was taken and 2 drops of Methyl Orange indicator were added. The sample was then titrated with 0.1 M HCl.

Calculation: NH_3 (mg/L) = ((M × V) / 0.1) × 17.3
Where M= molarity of HCl; V= volume of HCl; 17.3 = conversion factor from mol/L to mg/L; 0.1 = factor to find concentration per litre.

IV. RESULTS AND OBSERVATION

Table 1. Observed values of Greater Faridabad Canal (in mg/L)

Parameter	Observed Values
pH	8
Temperature (°C)	24
BOD	3.21
Cl	1980
NH_4	4.25

Table 2. Observed values compared to safe water standards (in mg/L)

Parameters	Observed Values	Safe Water Limit
pH	8	6.5 – 8.5
Temperature (°C)	24	24
BOD	3.21	6+
Cl	1980	5
NH_4	4.25	1.5

The pH value of 8 falls within the permissible range of 6.5–8.5, indicating neutral to mildly alkaline water. The temperature recorded was 24°C, which is within normal limits. However, the Chlorine concentration of 1980 mg/L is drastically higher than the safe limit of 5 mg/L, suggesting significant industrial contamination. Ammonia at 4.25 mg/L exceeds the permissible level of 1.5 mg/L, indicating the presence of domestic sewage. BOD at 3.21 mg/L is lower than the threshold of 6 mg/L, which may indicate stagnant water conditions rather than active biological degradation.

V. DISCUSSION

The results clearly indicate severe contamination of the Greater Faridabad Canal, particularly with respect to Chlorine and Ammonia levels. The extremely elevated Chlorine concentration (1980 mg/L vs. safe limit of 5 mg/L) points to industrial effluent discharge into the canal. The elevated Ammonia further confirms the entry of untreated domestic wastewater.

The low BOD value, while seemingly positive, is consistent with stagnant water in which organic decomposition has slowed or the biological oxygen demand has been suppressed by high chemical pollutant concentrations. These findings suggest that the canal water is not suitable for domestic use in its current state and requires urgent remediation measures.

Regulatory bodies should enforce stricter industrial discharge norms and improve sewage treatment

infrastructure in the Greater Faridabad region. Regular monitoring of this canal is essential to track changes over time and ensure water safety for the local population.

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