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Assesment of water quality in and around Perundurai town erode district

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Abstract- In this project we are considering an area of around 5kms in radius from our college. From this we are collecting water samples throughout the routes of water network for conducting various tests. To enhance water quality monitoring in a drinking water network sampling stations are installed along the route of water network. Water sampling stations are connected to next water main and have a little sink.

Water samples are analyzed for bacteria, chlorine level, pH organic and inorganic pollutants, turbidity, odour and many other water quality indicators.

I. INTRODUCTION

India is facing a serious problem of natural resource scarcity, especially that of water in view of population growth and economic development. Most of fresh water bodies all over the world are getting polluted, thus decreasing the portability of water. All life is depend on water and exists in nature in many forms like ocean, river, lake, clouds, rain, snow and fog etc. However, strictly speaking agriculture and industry, the quality of water can be quite flexible and water polluted up to certain extent in general sense can be regarded as pure. The health of lakes and their biological diversity are directly related to health of almost every component of the ecosystem. Lakes are also subjected to various natural processes taking place in the environment like the hydrologic cycle, with unprecedented development activities; human beings are responsible for choking several lakes to death. Storm water runoff and discharge of sewage into the lakes are few of the common causes where various nutrients enter the aquatic ecosystems resulting in their death. Of all the water quality issues facing lakes everywhere, eutrophication is of great concern. Eutrophication is a term used to describe the aging of a lake, resulting due to the accumulation of nutrients, sediments, silt and organic matter in the lake from the surrounding watershed. The role of vegetation and sediments as sources and sink of nutrients has been demonstrated. It describes the biological reaction of aquatic systems to nutrient enrichment, the eventual consequence of which is the development of primary production to nuisance proportions. The main cause is excessively adding of phosphorus and nitrogen resulting in high algal biomass, dominance by cyanobacteria and loss of macrophytes.

II. OBJECTIVES

It is important to test the suitability of your water quality for its intended purpose, whether it is livestock watering, irrigation, spraying, or drinking water. The purpose of this section of RWQIT is to provide water quality testing information that will assist rural residents using a private water supply.

III. TESTS OF WATER

PHYSICAL TEST

a) pH
b) Turbidity
c) Color

CHEMICAL TEST

a) Hardness
b) Acidity
c) Fluorides
d) Dissolved oxygen

BIOLOGICAL TEST

a) Coli form index

TESTS OF WATER	EQUIPMENTS USED
Physical tests	
a) Ph	pH measured scale
b) Turbidity	Turbidity meter
c) Color	Pipette, White porcelain evaporation dish
Chemical tests	
a) Hardness	EDTA Solution, Erlenmeyerflask, Burette
b) Fluoride	Expanded scale or Digital pH meter
c) Acidity	Non aluminium pan, Vinegar solution
d) Dissolved oxygen	LaMotte Dissolved Oxygen Test Kit
Biological test	
a) Coli form index	MPN - Most probable Number MF - Membrane Filter

PHYSICAL TESTS

TEST RESULTS FOR pH

The Physical test is mainly done to know the physical characteristics of water. This enables us to get a brief idea of the character of water available in different area. Mainly pure drinking water should have a pH of 7 (i.e. natural solution). But it may varies slightly according to the place at which it is supplied to the public. A water supply's pH level water's acidity or basicity. pH is measured on a standard 1 through 14 scale, with ideal, purely neutral water falling at 7. Values above 7 are considered or basic, and values below 7 are acidic.

Fig 3.1 pH measured scale

The normal range for pH if surface water systems is 6.5 to 8.5, and the PH range for ground water systems is between 6 to 8.5. Alkalinities is a measure of the capacity of the water to resist a change in pH that would tent to make the water more acidic. The measurement of alkalinity and pH is needed to determine the corrosiveness of the water. The primary way to treat the problem of low pH water is with the use of a neutralizer. The neutralizer feeds a solution into the water to prevent the water from reacting with the household plumbing or from contributing to electrolytic corrosion.

SAMPLES:

- A - 7.50
- B - 7.89
- C - 7.97
- D - 7.16
- E - 7.76
- F - 7.34
- G - 7.47
- H - 7.08
- I -7.28
- J- 7.65

OBSERVATIONS

- ✓ The limited value of pH is (6.5-8.5).
- ✓ A water supply's pH level indicates the water's acidity or basicity.
- ✓ Mainly pure drinking water should have a pH of 7.

All the water samples, i.e. A, B, C, D, E, F, G, H,I and J

TEST RESULTS FOR TURBIDITY TEST

The turbidity of a water sample is a measure of the extent to which the intensity of light passing through water is reduced by the suspended matter.

The turbidity of water is based upon a comparison of the amount of light passing through a given water sample with that passing through a standard sample.

Samples:

- A - Below 1 NTU
- B - Below 1 NTU
- C - Below 1 NTU
- D - Below 1 NTU
- E - Below 2 NTU
- F - Below 1 NTU
- G - Below 1 NTU
- H - Below 2 NTU
- I -Below 2 NTU
- J -Below 1 NTU

OBSERVATION

The limited value of turbidity is 10 NTU (Nephelometric Turbidity Unit).

TEST RESULTS FOR COLOR

Color in water is due to various materials in solution, although suspended turbidity occasionally adds an apparent color to water that may add to or disguise the true color.

Samples:

- A - <1 Hazen Unit
- B - <1 Hazen Unit
- C - <1 Hazen Unit
- D - <1 Hazen Unit
- E - <1 Hazen Unit
- F - <1 Hazen Unit
- G - <1 Hazen Unit
- H - <1 Hazen Unit

- I - <1Hazen Unit
- J - <1Hazen Unit

TEST RESULTS FOR HARDNESS

Hard water is water that has high mineral content (in contrast with "soft water"). Hard water is generally not harmful to one's health, but can pose serious problems in industrial settings, where water hardness is monitored to avoid costly breakdowns in boilers, calling towers, and other equipment that handles water.

Samples:

- A - 176 mg/L
- B - 136 mg/L
- C - 108 mg/L
- D - 334.8 mg/L
- E - 367.2 mg/L
- F - 270 mg/L
- G - 120 mg/L
- H - 288 mg/L
- I - 230mg/L
- J - 310mg/L

OBSERVATIONS

The limited value of the Hardness is 200mg/L

TEST RESULTS FOR FLUORIDE

Sources of fluorine/fluoride exposure include:

- Fluoridated toothpaste, and some pharmaceutical medications, some food/beverages.
- Military exposure to chemical weapons.
- Exposure to fluoride-containing fumigants and rodenticides, and cigarette smoke.
- Industrial exposure including aluminum smelting, glass etching, and some manufacturing processes.
- Fluoridated water including occupational exposure to sodium fluoride in water treatment, and overexposure to fluoridated water (such as soaking hot tubs, swimming, showers, drinking water, and food products using fluoridated water (such as fruit juices, infant formulas, otherbeverages).

Effects of chronic fluoride/fluorine exposure from ingestion, inhalation, or skin absorption, include:

- Weight loss, chronic fatigue not alleviated by rest, general weakness, depression.
- Fluorides can be stored in bones and teeth, and any tissues of the body.

Samples:

- A - 0.05 mg/L
- B - 0.05 mg/L
- C - 0.05 mg/L
- D - 0.60 mg/L
- E - 0.20 mg/L
- F - 0.20 mg/L
- G - 0.90 mg/L
- H - 0.50 mg/L
- I - 0.70 mg/L
- J -0.50 mg/L

OBSERVATIONS

- The limited value of the Fluoride is 1.0mg/L.
- The samples A, B, C, E, F and H are low in fluoride content.

And the remaining D and G are high in this content when compared with the other

TEST FOR ACIDITY

- Chop up some cabbage until you have about 2 cups.
- Place it in an non-aluminum pan and add enough water to cover the cabbage.
- Place it on the stove and boil it for about 10 minutes.
- Turn off the stove and let the water cool at room temperature strain out the cabbage and reserve the water samples.

Samples:

- A -Nil
- B - Nil
- C - Nil
- D - Nil
- E - Nil
- F - Nil
- G - Nil
- H – Nil
- I - Nil
- J - Nil

OBSERVATIONS

- All the samples taken for the test have no acidity.
- All are neutral solutions.

TEST RESULTS FOR DISSOLVED OXYGEN

1) The concentration of oxygen dissolved in water, expressed in mg/1 or as percent saturation, where saturation is the maximum amount of oxygen that can theoretically be dissolved in water at a given altitude and temperature.
2) The Winkler test is used to determine the concentration of dissolved oxygen in water samples. Dissolved oxygen (D.O.) is widely used in water quality studies and routine operation of water reclamation facilities.
3) An excess of manganese (II) salt, iodide (I) and hydroxide (OH^-) ions is added to a water sample

causing a white precipitate of Mn (OH) 2 to from.

This precipitate is then oxidized by the dissolved oxygen in the water sample into a brown manganese

Samples:

- A - 6.9 mg/l
- B - 5.2 mg/l
- C - 8.1 mg/l
- D - 4.8 mg/l
- E - 7.1 mg/l
- F - 4.1 mg/l
- G - 5.40 mg/l
- H - 5.35 mg/l
- I -5.1 mg/l
- J -4.6 mg/l

OBSERVATION

Less than 4mg/l	Bad
4mg/l-10mg/l	Good
More than 10mg/l	Excellent

All the samples are in the range of 4-9mg/l precipitate.

BIOLOGICAL TEST

TEST RESULTS FOR COLI FORM INDEX

Coli from index

- A rating of the purity of water based on a count of coli from bacteria.
- An index of the purity of water based on coli count.

Samples: (Coli form bacteria MPN index per 100ml)

- A - 18
- B - 14
- C - 11
- D - 33
- E - 41
- F - 22
- G -17
- H – 20
- I - 25
- J -17

OBSERVATION

- Coli form bacteria are mainly found in digestive tracks of animals and human begins.
- They are also been in plate's soil materials.
- The higher level seen in samples Will leads to damages to our digestive tracks and suffocation to the stomach in many ways.
- It can also lead to many intestinal issues to our organs.

IV CONCLUSION

Test of all the sample of water in the following test are safe there are no change in the water quality test ,there fore all the area of water will be suitable for drinking purpose.

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