VMVV SANGHA'S

VMKSR VASTRAD ARTS SCIENCE & V S BELLIHAL COMMERCE COLLEGE, HUNGUND

BROCHURE

A FIELD VISIT TO TOWN MUNICIPAL WATER PURIFIER, HUNGUND

DATE: 22/07/2023 **TIME: 11:00 AM**

VENUE: TOWN MUNICIPAL WATER PURIFIER PLANT HUNGUND

Dr. S. R. GOLAGOND	Smt.S B AMALIKOPPA & Mr.SHRINIDHI R A	Smt. S. K. MATH
IQAC CO-ORDINATOR	PROGRAM CO-ORDINATORS	PRINCIPAL

ALL ARE CORDIALLY INVITED

V.M.V.V Sangha's

V.M.K.S.R.Vastrad Art's, Science & V.S. Bellihal Commerce College, Hungund

Organized by Science, Women Empowerment & the Bharat Scout's and Guide's Forum

The Science forum and Women's forum of our college organised a field visit to Munciple corporation water purification plant Hungund on 22-07-2023

With the permission of munciple corporation water purification unit all the B.Sc and the Bharat Scout's and Guide's students with college staff get information about water purification and also know about the supply of drinking water in city.

The engineer and co-worker explain the steps of purification of drinking water and it includes such as water filteration, chemical mixing, and chlorination. And testing of water and also told about the how waste water is managed in the water purification unit and students get all the information about water purification and water supply to city.

This programme was conducted under the guidance of Prof.S.B.Amalikoppa the convenor of science forum of 2022-23 and Prof. Kavita Hulageri the convenor, prof.Dr.S.R.Nagannavar the convenor of the Bharat Scout's and Guide's, prof.Shrinidhi Department of Chemistry.

Dr.S.R.Golagond	Smt.S.B.Amalikoppa	Smt.S.K.Math
IQAC coordinator	program coordinator	Principal


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V. M.V.V. SANGH'S

Vijay Mahantesh Krupaposhit

S. R. Vastrad Arts, science &

Vijay Shankarappa Bellihal Commerce College Hungund

Topic On: A Review on Domestic Water Pollution Treatment In Hungund.

Submitted By:

Mahantesh Andanagouda Bellihal

Class: BSc Second Year (IV semester)

Register No: U15IY21S0021

Submitted To:

Prof Shrinidhi R A

Department of Chemistry

V M K S R Vastrad College Hungund.

Report Writing:

Introduction: What is Water pollution?

A practical definition of water pollution is: "Water pollution is the addition of substances or energy forms that directly or indirectly alter the nature of the water body in such a manner that negatively affects its legitimate uses". Water is typically referred to as polluted when it is impaired by anthropogenic contaminants. Due to these contaminants, it either no longer supports a certain human use, such as drinking water, or undergoes a marked shift in its ability to support its biotic communities, such as fish.

Water pollution (or aquatic pollution) is the contamination of water bodies, usually as a result of human activities, so that it negatively affects its uses. Water bodies include lakes, rivers, oceans, aquifers, reservoirs and groundwater. Water pollution results when contaminants mix with these water bodies.

Contaminants can come from one of four main sources: sewage discharges, industrial activities, agricultural activities, and urban runoff including storm water. Water pollution is either surface water pollution or groundwater pollution. This form of pollution can lead to many problems, such as the degradation of aquatic ecosystems or spreading water-borne diseases when people use polluted water for drinking or irrigation. Another problem is that water pollution reduces the ecosystem services (such as providing drinking water) that the water resource would otherwise provide.

Steps involved in water pollution:

There are mainly three steps involved in Water pollution.

- Primary treatment
- Secondary treatment
- Tertiary treatment

- **Primary treatment:**

  Primary treatment of wastewater involves sedimentation of solid waste within the water. This is done after filtering out larger contaminants within the water. Wastewater is passed through several tanks and filters that separate water from contaminants. The resulting "sludge" is then fed into a digester, in which further processing takes place. This primary batch of sludge contains nearly 50% of suspended solids within wastewater

- **Secondary Treatment:**

Secondary treatment of wastewater makes use of oxidation to further purify wastewater. This can be done in one of three ways:

Biofiltration

This method of secondary treatment of wastewater employs sand filters, contact filters, or trickling filters to ensure that additional sediment is removed from wastewater. Of the three filters, trickling filters are typically the most effective for small-batch wastewater treatment.

Aeration is a long, but effective process that entails mixing wastewater with a solution of

microorganisms. The resulting mixture is then aerated for up to 30 hours at a time to ensure results.

Alum mixing.

One of the first of the several steps that municipal water suppliers use to prepare water for distribution is getting it as clear and as particulate-free as possible. To accomplish this, the water is treated with aluminum sulfate,

commonly called alum, which serves as a flocculant.

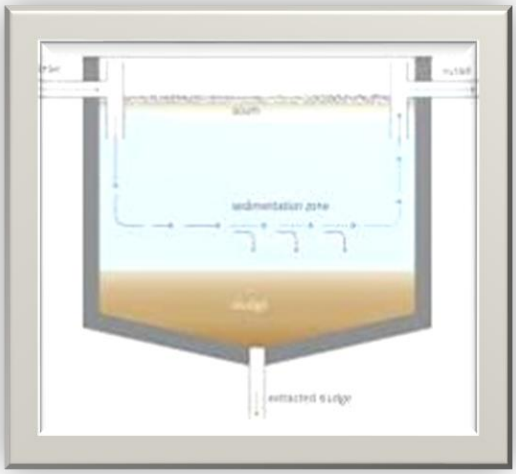
➢Claryfactor :

Drinking water, water being purified for human consumption, is treated with flocculation reagents, then sent to the clarifier where removal of the flocculated coagulate occurs producing clarified water.

The clarifier works by permitting the heavier and larger particles to settle to the bottom of the clarifier. The particles then form a bottom layer of sludge requiring regular removal and disposal. Clarified

water then proceeds through several more steps before being sent for storage and use.

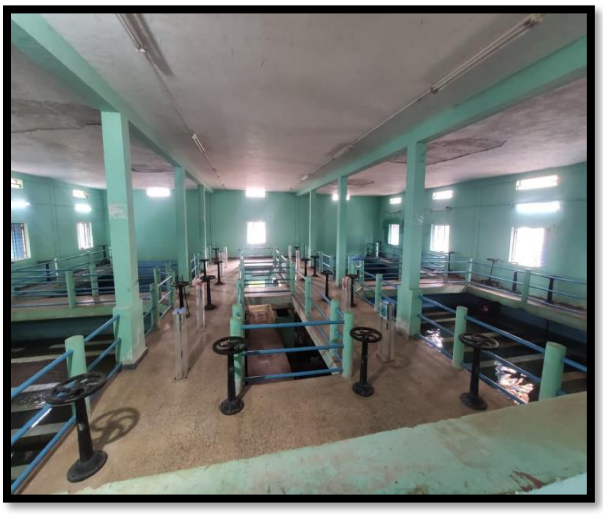
➢ Sedimentation :



Sedimentation is a physical water treatment process using gravity to remove suspended solids from water. Solid particles entrained by the turbulence of moving water may be removed naturally by sedimentation in the still water of lakes and oceans.

Settling basins are ponds constructed for the purpose of removing entrained solids by sedimentation. Clarifiers are tanks built with mechanical means for continuous removal of solids being deposited by sedimentation. Clarification does not remove dissolved species. Sedimentation is the act of depositing sediment.

➢ Filtration by using charcoal, sand and stones.



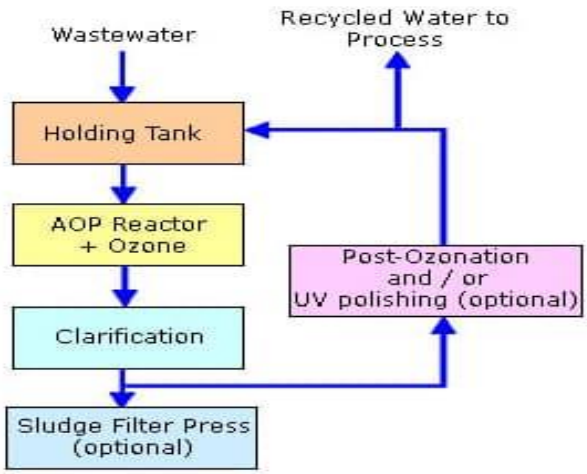
Sand filters are used as a step in the water treatment process of purification. There are three main types; rapid (gravity) sand filters, upward flow sand filters and slow sand filters. All three methods are used extensively in the water industry throughout the world. The first two require the use of flocculent chemicals to work effectively while slow sand filters can produce very high quality water with pathogens removal from 90% to >99% (depending on the strains), taste and odour without the need for chemical aids. Sand filters can, apart from being used in water treatment plants, be used for water purification in singular households as they use materials which are available for most people.

➢Chlorination :

Water chlorination is the process of adding chlorine or chlorine compounds such as sodium hypochlorite to water.

This method is used to kill bacteria, viruses and other microbes in water. In particular, chlorination is used to prevent the spread of waterborne diseases such as cholera, dysentery, and typhoid.

➢Oxidation :



Based on oxidation and reduction reactions, chemical oxidation technology is used to remove color, odor, organic compounds, and inorganic compounds from produced water by applying a series of oxidants and catalysts. The commonly used oxidants include chlorine, ozone, oxygen, peroxide, permanganate, and others.

➢ Tertiary Treatment :

Tertiary treatment, also known as polishing, disinfects water to the highest standards. This stage is necessary to produce water to specification, such as technical waters, and to treat wastewater for public water systems.

Tertiary treatment methods include:

- UV disinfection
- Chemical disinfection

UV disinfection requires no chemicals, and it can be used in place of chemicals. This means no extra filtering stage for additives. UV does not affect the pH, appearance, taste or smell of water, but it does destroy microorganisms.

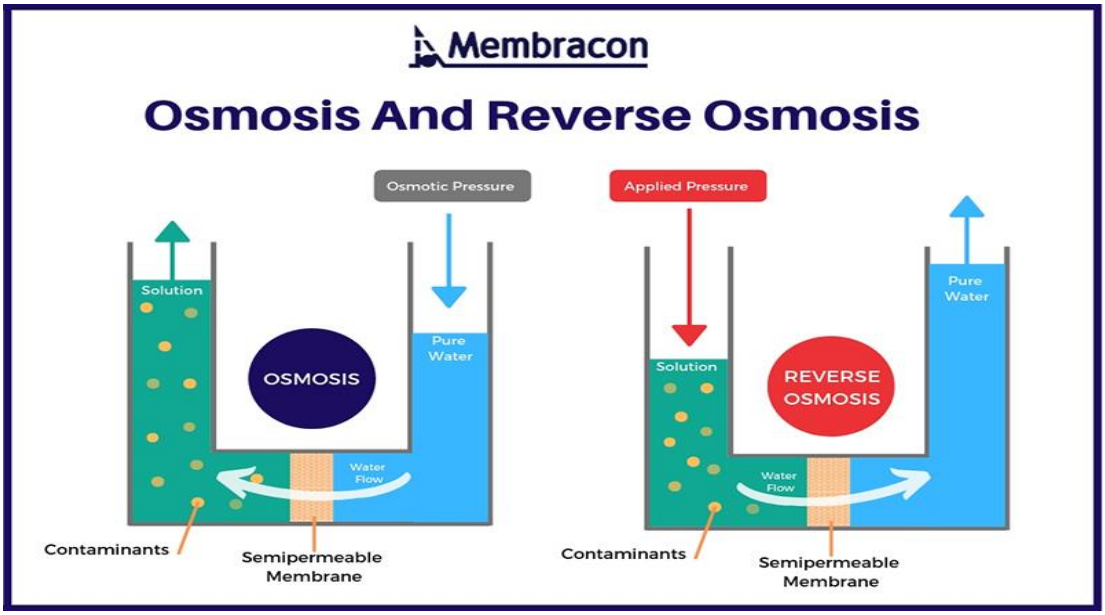
UV light wastewater treatment is typically used for bacterial control, ensuring organisms are unable to replicate. It can also remove chlorine, chloramines, ozone, and bromine, making it ideal for producing extremely pure technical waters.

Chemical disinfection requires adding a chemical to the water. The most common is chlorine. Chlorination kills bacteria and viruses, but this treatment has the disadvantage of requiring a stage for dichlorination before discharge into the environment.

Another chemical used to disinfect water is iodine. This is equally as effective as chlorine at killing viruses and bacteria.

All things being equal, the best water disinfection technique is Ultraviolet Disinfection. A correctly sized UV system can be used to de-chlorinate or de-ozonate process water and it can control microorganisms equal to chemicals.

➢ Osmosis and reverse osmosis :



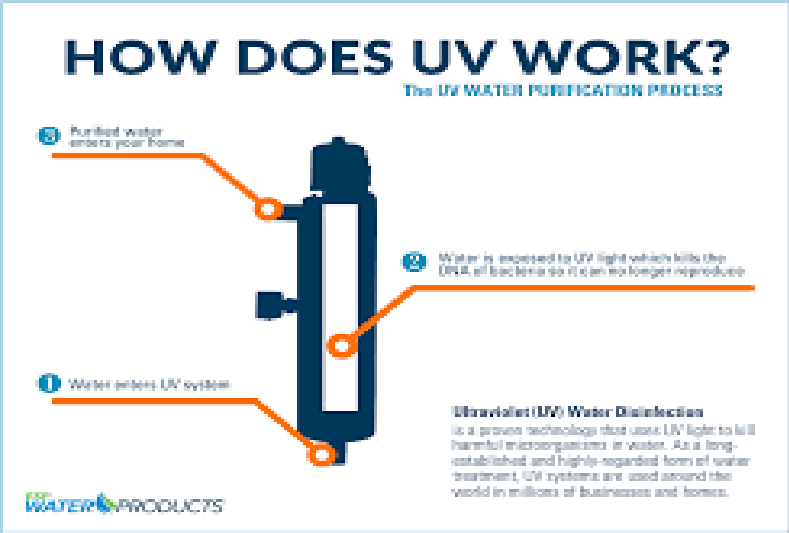
➢ Osmosis :

In (forward) osmosis, the solvent moves from an area of low solute concentration (high water potential), through a membrane, to an area of high solute concentration (low water potential). The driving force for the movement of the solvent is the reduction in the Gibbs free energy of the system in which the difference in solvent concentration between the sides of a membrane is reduced. This is called osmotic pressure. It reduces as the solvent moves into the more concentrated solution. Applying an external pressure to reverse the natural flow of pure solvent, thus, is reverse osmosis. The process is similar to other membrane technology applications.

➢ Reverse osmosis :

Reverse osmosis (**RO**) is a water purification process that uses a semi-permeable membrane to separate water molecules from other substances. RO applies pressure to overcome osmotic pressure that favors even distributions. RO can remove dissolved or suspended chemical species as well as biological substances (principally bacteria), and is used in industrial processes and the production of potable water. RO retains the solute on the pressurized side of the membrane and the purified solvent passes to the other side. It relies on the relative sizes of the various molecules to decide what passes through. "Selective" membranes reject large molecules, while accepting smaller molecules (such as solvent molecules, e.g., water).

➢ Ultra violet :



A UV water purifier treats micro-biologically unsafe water with germicidal ultraviolet light. The UV wavelength scrambles the DNA of living organisms in the water so that they can no longer reproduce and make you sick. If you drink bacteria-infested water, the organisms can embed in your digestive tract and replicate.

UV sanitization is useful in almost any application where microbial-free, safe and pure water is required; and where there is a chance of the water being contaminated before it reaches the final point of use.

➢TDS :

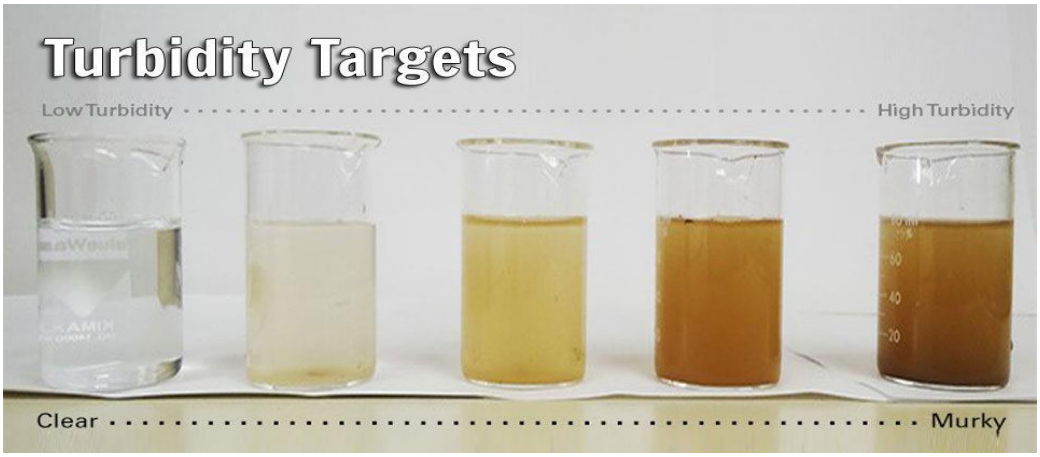
TDS stands for total dissolved solids, and represents the total concentration of dissolved substances in water. TDS is made up of inorganic salts, as well as a small amount of organic matter. Common inorganic salts that can be found in water include calcium, magnesium, potassium and sodium, which are all cations, and carbonates, nitrates, bicarbonates, chlorides and sulfates, which are all anions. Cations are positively charged ions and anions are negatively charged ions

Level of TDS (milligrams per litre)	Rating
Less than 300	Excellent
300 - 600	Good
600 - 900	Fair
900 - 1,200	Poor
Above 1,200	Unacceptable

➢ pH :

The normal pH range of drinking water is 6 – 8.5. The pH is mostly a result of natural geological conditions at the site and the type of minerals found in the local rock. The pH can also be affected by acid rain. Water with a pH value less than 7 is acidic and tends to be corrosive.

➢ Turbidity:



Turbidty in wastewater treatment describes the clarity or haziness of a wastewater sample. The level of cloudiness or the presence of suspended particles in the wastewater sample is usually measured in FTU. FTU stands for Formazin Turbidity Unit.

CONCLUSION :

Water purification can reduce the concentration of particulate matter including suspended particles, parasites, bacteria, algae, viruses, and fungi as well as reduce the concentration of a range of dissolved and particulate matter.

Water purification and disinfection is crucial as it ensures that every family lead a good and a healthy life, free from dangers posed by consumption of contaminated water.

However, some methods in current use are not environment friendly. They lead to wastage of resources like water and electricity. Methods like bio-filters should be popularized among the masses.

Field Visit To Water Purification Plant,

In Association with Department Of Water Supply & Municipal Authorities, Hungund. 22/07/2023

Sl No	Name Of the Students	Class	Signature
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5)	Irayya. S. pujari	BA IV	
6)	Aftab J. Kalburgi	B.A IV	
7)	Praveen L. Hiremani	B.A II	
8)	Chidananda.S. Madiwalar	B.A IV	
9)	Chandankumar. H. Goudar	B.Sc VI	C.H. Goudar
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13)	Ashawini. Hiremath	"	
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16)	Pooja. Ilakal	"	
17)	Priyanka. Hiremath	"	P. A. Hiremath
18)	Shweta. Patil.	"	
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24)	Aishwarya. Patil	B.Sc I st	
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28)	Nagamma Bevoor	B.Sc II	
29)	Kaveri L. Bevinakatti	B.Sc VI	
30)	Amruta B. Daragad	B.Sc VI	
31)	Savita B. Gaded	B.Sc VI	S. B. Gaded
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48	Sharanabasava. S. Sunkad	BSC IV sem	
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50	Vijaykumar. P. C	BSC IV Sem	
51	Madhu. Gachchinamath	BSc IV sem	
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55	Mahantesh. M. Hoolageri	B. Sc VI	
56	Anand. B. K	B.Sc VI	
57	Arjun. S. Choori	B.Sc VI	Choori
58	Mahammad Ali. Nadaf	B.Sc VI	
59	Sagar. Chandragiri	B.Sc IV	
60	Hanamesh R. Menasagen	B.Sc IV	
61	Praveenkumar. G. Agasimundin	B.Sc IV	
62	Ramesh. Badiger	B.Sc IV	
63	Abhishek. Dulebhanjan	BSc II	
64	Abhishek. Mudapaladinni	BSc II	
65	Ramanyouda goudar	BSc II	R.S Goudar
66	Mutturaj R	BSc II	Mutturaj. R
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