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Pollution Abatement of District Hospital Ganderbal

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ABSTRACT- Ganderbal town having a population of 28233 as per census 2011 is situated 18 Km north east of Srinagar city. There is no existing sewerage system in the city.Ganderbal District Hospital is under construction at Duderhama, Ganderbal. The total capacity of this hospital is 200 beds but presently working 100 beds only. Ganderbal District hospital has three story building and there are three blocks emergency, labs & OPD. The total area of hospital is 135601 Sq.ft. Nearby this hospital a two storied building nursing college and a mental hospital which are also under constructed.

The sanitation system not only deals with environmental issues but here also links to religious activities throughout the town, many religious activities are carried out in the Manasbal Lake area. The rehabilitation of the river will make a positive impact on attracting tourists with a comfortable and sensible culture at the same time. It is not at all easy to evaluate the benefits of providing a proper sanitation system and waste disposal systems in public health, the importance of which is well known. Where wastewater management is inadequate, the cost of healthcare-associated with water-borne diseases is a challenge for public economic resources.

KEYWORDS- Water Quality, Water Quality Analysis, Ganderbal, Kashmir.

I. INTRODUCTION

Water is the maximum treasured aid within the international, and is now under risk due to human population and technical development. seeing that water is under demand by the human race, it has for used efficiently [1]. Ganderbal town having a population of 28233 as per the census 2011 is situated 18 Km north east of Srinagar city. There is no existing sewerage system in the city. One area of the world's population is affected by way of monetary water shortage. due to the growth of population, the consumption of water resources is extra and availability is less, so the call for water is increasing [2]. Wastewater treatment is a process of in-depth use of sources, particularly strength, which accounts for 15 to 40% of the working fees in conventional wastewater treatment systems. With the expected demographic growth and the restrictive fashion in exceptional requirements for effluent discharge, the power intake tends to grow similarly if there are no changes in the tactics[3].

Wastewater is liquid waste discharged through domestic houses, commercial homes, industry, and agriculture, which regularly incorporates some contaminants that result from mixing wastewater from extraordinary sources [4]. The water discharged is observed pretty organic in nature with high COD together with effortlessly biodegradable sugars, soluble starch, ethanol, and risky fatty acids [5]. diverse styles of reactors are in use for the remedy of wastewater resources. The fluidized bed Biofilm Reactor (FBBR) is one of the latest strategies used in this area [6]. thinking about the elevated milk call, the dairy enterprise in India is predicted to grow swiftly and have a waste era, and related environmental issues have also assumed accelerated significance [7].

Ganderbal District Hospital is under construction at Duderhama, Ganderbal. The total capacity of this hospital is 200 beds but presently working with 100 beds only. Ganderbal District Hospital has three three-story buildings and there are three blocks of emergency, labs& OPD. The total area of the hospital is 135601 Sq.ft. Nearby this hospital a two-storied building nursing college and a mental hospital which are also under construction.The existing sewerage disposal, as aimed with the introduction of septic tanks, has turned defunct/Inadequate due to the reasons of time-to-time random developments as well as theseptic tanks being damaged/ boiled with reasons the sewage flowing over the surroundings within &outside the Hospital premises creating a nuisance and endangering the lives.

II. WASTE WATER TREATMENT

Within the take, a look at place water pollutants triggered especially from home and agriculture in preference to the enterprise. Wastewater treatment is a manner that gets rid of and gets rid of contaminants from wastewater and converts this into an effluent that can be returned to the water cycle. Once lowered back into the water cycle, the effluent creates an appropriate effect on the environment or is reused for various functions (called water reclamation). The remedy manner takes place in a wastewater treatment plant. There are numerous types of wastewater that are dealt with at the right sort of wastewater remedy plant. For home wastewater (additionally called municipal wastewater or sewage), the treatment plant is called a Sewage treatment. For industrial wastewater, the remedy either takes area in a separate industrial wastewater treatment or in a sewage treatment plant (normally after a few forms of pre-remedy). The primary purpose of wastewater treatment is for the treated wastewater so that it can be disposed of or reused accurately. however, earlier than it's far handled, the alternatives for disposal or reuse ought to be considered so the proper remedy system is used on the waste water

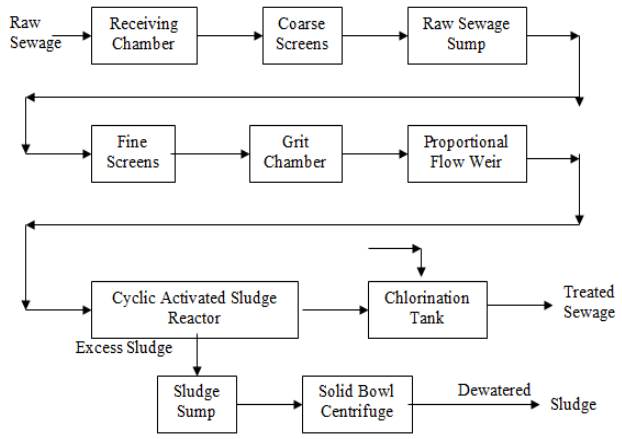

Figure 1: STP Flow Plant

In a sewage treatment plant, sewage water is first allowed to pass through screens or grit chamber where large solids are removed. This step is followed by aeration/mixing in a tank and then primary sedimentation where suspended solids settle down. Then this step is followed by Secondary Settling where lagre cicular tanks called secondary clarifiers allow the treated wastewater to separate from the bilogy/activated sludge from the aeration tanks, then this step is followed by Sludge treatment where sludge is pumped from the bottom of the primary clarifiers with the continuous flow of waste activated sludge from the aeration/ activated sludge process.

III. WATER QUALITY PARAMETERS

Based mostly on its supply, water may be divided into groundwater and floor water [5]. both sorts of water can be uncovered to infection risks from agricultural, business, and domestic sports, which also can embody many types of pollutants inclusive of heavy metals, insecticides, fertilizers, unstable chemical substances, and oils [6]. Water can be labeled into 4 kinds—potable water, palatable water, infected (polluted) water, and infected water [7].

IV. NECESSITY OF PROJECT

The existing system of sewerage disposal is a septic tank provided by Ganderbal District Hospital, There is no planned sewerage system in the area. In many places, septic tanks are not functioning well and effluent from septic tanks is discharged directly into the nearby Sindh River or open field. During the survey, it was found that trees lying en route have gone dead, and drains carrying the undigested sewage flow ultimately find their way into the streams and pollute the main source of water, which is highly objectionable. The environment of the area is getting polluted. Supreme Court has also passed an order that no construction activity shall be allowed unless the ecological balance is restored.

The present system is very unsatisfactory, unhygienic, and most obnoxious from an aesthetic point of view. The above grave situation fully justifies and establishes the immediate need to provide a sewerage system and an effective sewage treatment plant.

Sewerage is the core element of physical infrastructure that determines the environmental status of any settlement. The development of an appropriate sewage carriage system with efficient treatment is the key element, which acts as a prerequisite for facilitating the balanced and harmonized development of the town. Augmentation of existing inadequate systems/treatment facilities as well as adoption of new technologies of waste treatment requires continuous effort.

A clean environment is a basic need for life. A clean and hygienic environment leads to good health and well-being of the people. It is imperative to provide clean environment facilities to the surrounding people on a top priority basis, where they are living.

As per Govt. Guidelines and Pollution Control Board It is mandatory to construct ETP for every hospital.

V. WATER CONSUMPTION AND EFFLUENT GENERATION FROM HOSPITAL

Hospitals around the globe require massive quantities of water for his or her right functioning for diverse fitness care facilities. HWW, amongst all different healthcare waste, imposes a grave danger to human health and the surroundings because of their functionality to go into watersheds, and pollute floor and groundwater, when inappropriately handled and disposed of hydrosphere Hospitals around the world require huge quantities of water for their proper functioning for diverse fitness care centers. HWW, amongst all other healthcare waste, poses a grave danger to human health and the environment because of its functionality to enter watersheds, and pollute surface and groundwater, while inappropriately dealing with and disposing to hydrosphere[8]. According to the World Health Employer (WHO) guidelines for the right functioning of healthcare centers, 40–60 L/day of water is required for each inpatient. Working theatres require around 100 L/intervention. The quantity of water required for patients managing an excessive acute respiratory syndrome or viral hemorrhagic fever is around 100–400L/patient/day. This consumption of water by means of the hospitals results in the technology of huge volumes of wastewater [9]. The amount of wastewater generated from the medical institution depends on the capability or the number of beds available within the medical institution, the type and size of the healthcare facility, technical facilities available, offerings furnished (laundry, kitchen, air-conditioning), in-house wastewater control centers, and so forth[10]. Commonly, sanatorium effluents are discharged into the sewer structures before they're dealt with with municipal sewage remedy flora [11]. However, maximum of the sewage remedy flowers aren't designed to address bio-clinical waste and continual organic compounds, which include PhACs, private care merchandise, and so on[12][13].

VI. RESULTS AND DISCUSSION

The flow process of a Sewage treatment Plant (STP) includes several levels to deal with and purify wastewater. here's a simplified review of the everyday manner:

A. Inflow

Wastewater from families, industries, and other resources is accumulated and transported to the STP via a community of sewers and pipes.

B. Screening

Within the first degree, huge items like debris, sticks, and leaves are eliminated from the wastewater the usage of screens and bar racks.

C. Primary Treatment

On this step, the wastewater is allowed to settle in big tanks. solid particles, like sludge, settle to the bottom, while greases and oils glide to the surface. those materials are then removed.

D. Secondary Remedy

The partially handled wastewater is transferred to aeration tanks. useful microorganisms are added, which destroy down natural count number in the water. This technique can be aerobic (the use of oxygen) or anaerobic (without oxygen), relying on the layout of the STP.

E. Clarification

After the secondary treatment, the water is left to settle again. The closing solids and microorganisms settle out, forming a sludge layer at the lowest.

F. Tertiary Treatment (non-compulsory)

Some STPs consist of extra remedy steps to in addition purify the water. this may contain superior filtration, chemical treatment, or UV disinfection to dispose of any final impurities.

G. Discharge or Reuse

The dealt with water is now of a first-class that can be competently discharged into rivers or oceans or used for various non-potable functions like irrigation, business strategies, or even direct potable water reuse in some advanced systems.

H. Sludge Control

The sludge amassed for the duration of primary and secondary remedy is regularly further handled or dewatered to lessen extent. it can be incinerated, composted, or despatched to a landfill, depending at the guidelines and the remedy plant's competencies.

I. Monitoring and Maintenance

Regular monitoring and renovation of the STP ensure that it operates efficaciously and complies with environmental guidelines. Calculations for dissolved oxygen content is showing in table 1.

Table 1: Calculations for Dissolved Oxygen

S.No.	Volume of Sample	Burette Readings		Conc. Of Water Sample	Average Conc. Of water sample (V1)
		Initial	Final		
1	50 ml	0.0	1.1	1.1	0.96
2	50 ml	0.0	1.0	1.0	
3	50 ml	0.0	1.0	1.0	

Calculations:

N1V1= N2V2

N/40 ×0.96=N2 ×50

N2= 1/40 ×0.96/50×8

N2= 0.025×0.0192×8

N2 =0.0384×103=3.84 ppm or 3.84 mg/l

DO= 3.84 mg/l or 3.84 ppm

Where,

N1=Normality of NA2SO3

N2= Dissolved oxygen content

V1= Conc of Sample

V2= Volume of sample

Where,

N1=Normality of NA2SO3

N2= Dissolved oxygen content

V1= Conc of Sample

V2= Volume of sample

The content material of DO in recorded wastewater is located to be of low cost because of the presence of excessive natural depend as well as extra BOD and COD. This increase in BOD and COD values suggests a bad nature of discharge. High amounts of inorganic vitamins consisting of nitrogen and phosphorus were determined in contaminated water.

VII. CONCLUSION

A sewage treatment plant (STP) is an essential thing of any health facility constructing, serving a pivotal function in coping with the full-size extent of wastewater generated inside the facility. Hospitals produce a numerous variety of waste, along with sewage from patient care, sanitation, and other activities, frequently containing contaminants, pathogens, and chemical compounds. without proper remedy, this sewage poses sizeable fitness and environmental dangers. An STP ensures that sanatorium wastewater undergoes thorough remedy, reducing the content material of dangerous pathogens, natural be counted, and pollutants to tiers compliant with neighborhood regulations. It safeguards public fitness by means of stopping the unfold of waterborne diseases and minimizes the environmental impact by way of reducing the discharge of pollution into the sewage gadget. A properly-designed STP also promotes responsible water use, probably enabling water reuse for non-potable applications. In summary, an STP in a health center constructing is an important feature to make certain protection, hygiene, regulatory compliance, and environmental responsibility. The existing sewerage disposal, as aimed with the introduction of septic tanks, have turned defunct/ In-adequate due to the reasons of time to time random developments as well the septic tanks being damaged/ boiled with reasons the sewage flowing over the surroundings within &outside the Hospital premises creating nuisance endangering the lives.Absence of proper drainage system in the hospital premises is the reason for impounding/inundation of rainwater during heavy rains, thereby hampering the hospital activities and causing inconvenience to public. As such provision of proper drainage and sewerage system are envisaged.It is hardly possible to evaluate the benefit of providing proper sewerage system and waste disposal arrangements on the health of community,

through the importance is clearly recognized. Where the waste water management is improper, the cost of health care associated with water borne diseases is an added drain on the economic resources of the community. Keeping the area clean by providing regular sewerage system with effective treatment works becomes all the more important to support tourism.

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