Name=inam ul hassan

Id=7693

Paper=waste water

Teacher= Nadeem ullah

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QUESTION NO 1:

ANSWER:

WASTEWATER TREATMENT:

Wastewater treatment is a process used to remove contaminants from wastewater or sewage and convert it into an effluent that can be returned to the water cycle with minimum impact on the environment, or directly reused

IMPORTANCE of WASTEWATER TREATMENT:

Essential for life, clean water is one of the most important natural resources on the planet. Wastewater, which is basically used water, is also a valuable resource, especially with recurring droughts and water shortages in many areas of the world. However, wastewater contains many harmful substances and cannot be released back into the environment until it is treated. Thus, the importance of wastewater treatment is twofold: to restore

the water supply and to protect the planet from toxins.

RESTORING THE WATER SUPPLY:

Look at a global drought map and you will see that many areas of the world simply do not have enough water. All communities, especially areas with water scarcity, need to ensure they have good water treatment processes in place so that treated water can either be reused or returned to the water cycle, but never wasted.

PROTECTING THE PLANTS:

Wastewater can include contaminants from both residential and commercial use. Untreated, the chemical compounds and pathogens in wastewater can harm the health of animals, plants and birds that live in or near the water. It can also contaminate crops and drinking water, affecting human health. Wastewater treatment is fundamental to protect the health of many different ecosystems.

RECTANGULARS TANKS ARE PREFFERED BECAUSE:

It has low cost of maintenance

It is also suitable for large capacity of wastewater

QUESTION NO 2:

ANSWER:

DIFFERENCE BETWEEN ANAEROBIC AND AROBIC WATER TREATMENT

Anaerobic and aerobic systems are both forms of biological treatment that use microorganisms to break down and remove organic contaminants from wastewater. While both rely on a process of microbial decomposition to treat wastewater, the key difference between anaerobic and aerobic treatment is that aerobic systems require oxygen, while anaerobic systems do not.

Aerobic vs Anaerobic Wastewater Treatment	
Aerobic wastewater treatment is a biological wastewater treatment process which uses oxygen rich environment.	Anaerobic wastewater treatment is a process an where anaerobic organisms break down organic material in an oxygen absent environment.
Bacteria involved the aerobic wastewater treatment are aerobes.	Bacteria involved the anaerobic wastewater treatment are anaerobes.

Air Circulation Air is circulated in aerobic wastewater treatment tanks.	Air is not circulated in anaerobic wastewater treatment tanks.
Aerobic wastewater treatment does not produce methane and carbon dioxide	Anaerobic wastewater treatment produces methane and carbon dioxide.
Aerobic wastewater treatment requires energy Hence, they are less energy efficient.	Anaerobic wastewater treatment is an energy efficient process.

Activated Sludge

The process involves air or oxygen being introduced into a mixture of screened, and primary treated sewage or industrial wastewater (wastewater) combined with organisms to develop a biological floc which reduces the organic content of the sewage.

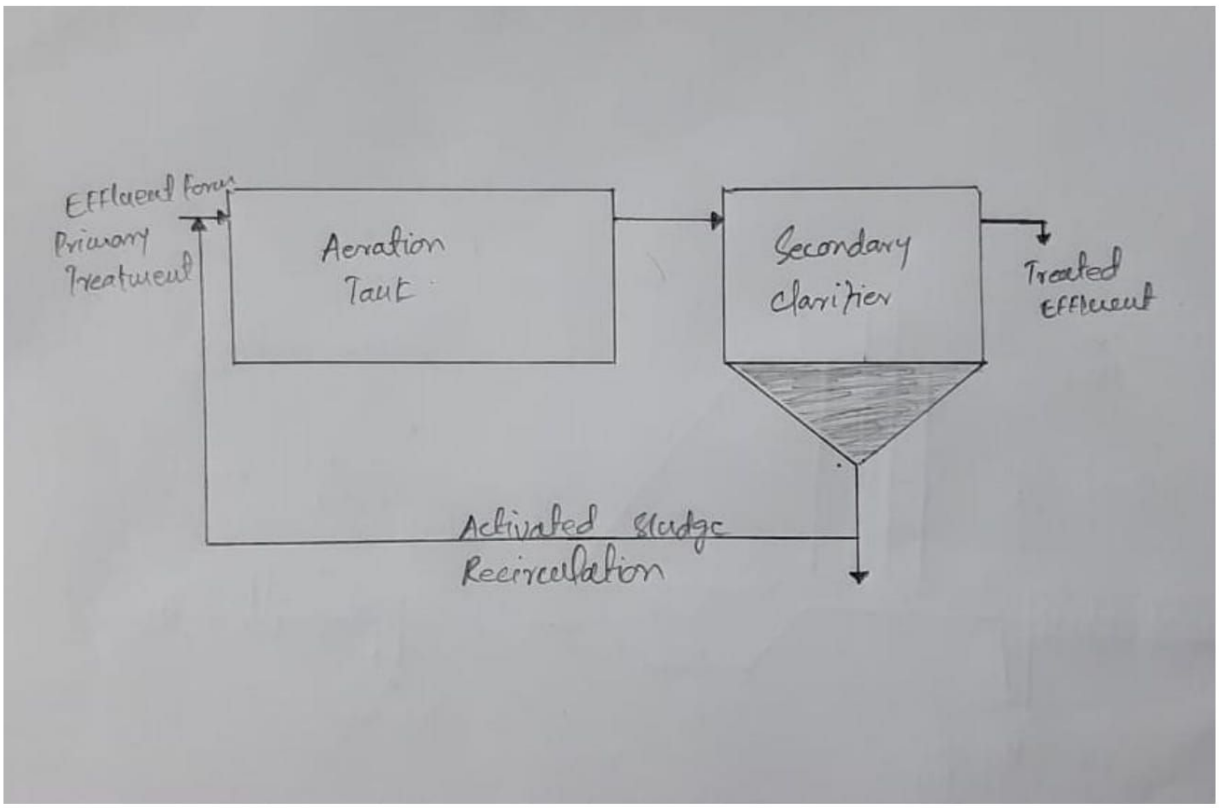
PROCESS:

The **activated sludge** process is a type of wastewater treatment process for treating sewage or industrial wastewaters using aeration and a biological floc composed of bacteria and protozoa.

The general arrangement of an activated sludge process for removing carbonaceous pollution includes the following items: An aeration tank where air (or oxygen) is injected in

the mixed liquor. This is followed by a settling tank (usually referred to as "final clarifier" or "secondary settling tank") to allow the biological flocs (the sludge blanket) to settle, thus separating the biological sludge from the clear treated water.

DIAGRAM:



QUESTION NO 3:

ANSWER:

Assimilative capacity

Assimilative capacity refers to the ability of a body of water to cleanse itself; its capacity to receive waste waters or toxic substances without deleterious effects and without damage to aquatic life or humans who consume the water. It is level to which water body or nature control the toxicity without affecting the aquatic life

Help of Assimilative Capacity:

A classic example of assimilative capacity is the ability of stream to accept modest amount of biodegrable waste.

Bacteria in a stream utilize oxygen to degrade the organic matter present in such a waste causing the level of dissolve oxygen on the stream to fall; but the decrease in dissolve oxygen causes additional

Oxygen to enter the stream to fall enter from atmosphere.

A stream can assimilate a certain amount of waste and still maintain a dissolved oxygen level high enough to support a healthy population of fish and other aquatic organisms.

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QUESTION NO 4:

ANSWER:

SLUDGE MANAGMENT

The residue that accumulates in sewage treatment plants is called sludge (or bio solids). Sewage sludge is the solid, semisolid, or slurry residual material that is produced as a by-product of wastewater treatment processes. This residue is commonly classified as primary and secondary sludge. Primary sludge is generated from chemical precipitation, sedimentation, and other primary processes, whereas secondary sludge is the activated waste biomass resulting from biological treatments. Some sewage plants also receive septage or septic tank solids from household on-site wastewater treatment systems.

ADVANTAGES:

Energy Generation:

Incineration, also called “mass burn,” utilizes a high temperature furnace that burns any waste. In large treatment plants, high quantities of sludge are used as a source of energy used to produce steam when fed through a turbine

Control the Spread of Diseases:

Residual wastes from hospitals, research facilities and other industries can be hazardous to our health and the environment. These harmful elements may require thermal treatment to control the spread of diseases or toxins. Sewage sludge incineration reduces volume (up to 90%) and weight (up to 75%) and breaks down dangerous substances such as pathogens and toxic chemicals.

Flue gases from exhaust pipes must be handled properly by utilizing a complex treatment system to prevent hazardous emissions and ashes from contaminating the environment.

Recovery of Precious Metals:

Significant quantities of precious metals may be recovered from urban waste after it goes through the sewage sludge incineration process. These metals can be recycled from sewage ash.

QUESTION NO 5:

ANSWER:

Definitions of EIA:

Environmental Impact Assessment is defined as an activity designed to identify the impact on the biogeophysical environment, on man and well-being of legislative proposals, projects, policies, operational procedures and to interpret and communicate information.

EIA is a systematic process of identifying future consequences of a current or proposed action.

PARAMETERS FOR NEW WASTEWATER TREATMENT PLANT:

- Water supply and quality
- Oxygen
- Nitrogenous compounds
- Ph.
- Environmental salinity
- Temp of water
- Density
- Noise, light and feeding etc.

➢ Phases are given below :

- Screening
- Scoping & consideration of alternatives
- Baseline data collection
- Impact Analysis
- Mitigation and Environmental Impact statement
- Public hearing
- Environmental Management Plan
- Decision Making
- Monitoring the Clearance Condition

Screening:

First stage of EIA, which determines whether the proposed project requires an EIA and if it requires EIA, then the level of assessment required.

Screening criteria for determining the level of review required are relatively well defined. Screening criteria are based upon:

- Scales of investment
- Type of development
- Location of development

Scoping:

This stage identifies key issues and impact that should be further investigated. This stage also defines the boundary and the time limit of the study.

It is done by consultant in consultation with the project proponent and guidance by the agency.

Quantifiable impacts are to be assessed on the basis of magnitude, prevalence frequency and duration and non quantifiable impact (aesthetic or recreational value). Significance is usually determined through the socio-economic criteria.

After the areas, where the project could have significant impact, are identified, the Baseline status of these should be monitored and then the likely changes in these on account of the construction and operation of the proposed project should be predicted.

Environmental Impact Assessment Report

For every project possible alternative should be identified and environmental attributes compared.

Alternatives for project location & process technologies

Alternative of 'no project' should also be considered.

Based on the best environmental option for optimum economic benefits to the community at large, alternatives should be ranked.

Mitigation plan for the selected option have to be drawn, and is supplemented with the Environmental Management Plan (EMP) to guide towards, Environmental Improvement.

EMP is critical for monitoring the clearance conditions, and henceforth details of monitoring should be included.

Public Hearing after EIA report is made public must be informed and consulted on the proposed development.

Summary of the EIA report have to be provided to the people affected due to the proposed project:

- Bonafied local resident
- Local associations
- Environmental groups active in the area
- Any other person located at the project site/sites of displacement

Decision Making

Consultation between the project proponent (assisted by a consultant) and the impact assessment authority (assisted by an expert group if necessary).

The decision on environmental clearance is arrived at through a number of steps including evaluation of EIA & EMP

Monitoring The Clearance Conditions:

- Monitoring should be done during both construction and operation phase of a project.
- This ensure that the commitments made are compiled and the if the prediction made in the EIA report are correct.
- Corrective actions should be taken if the impact exceeds the predicted levels.