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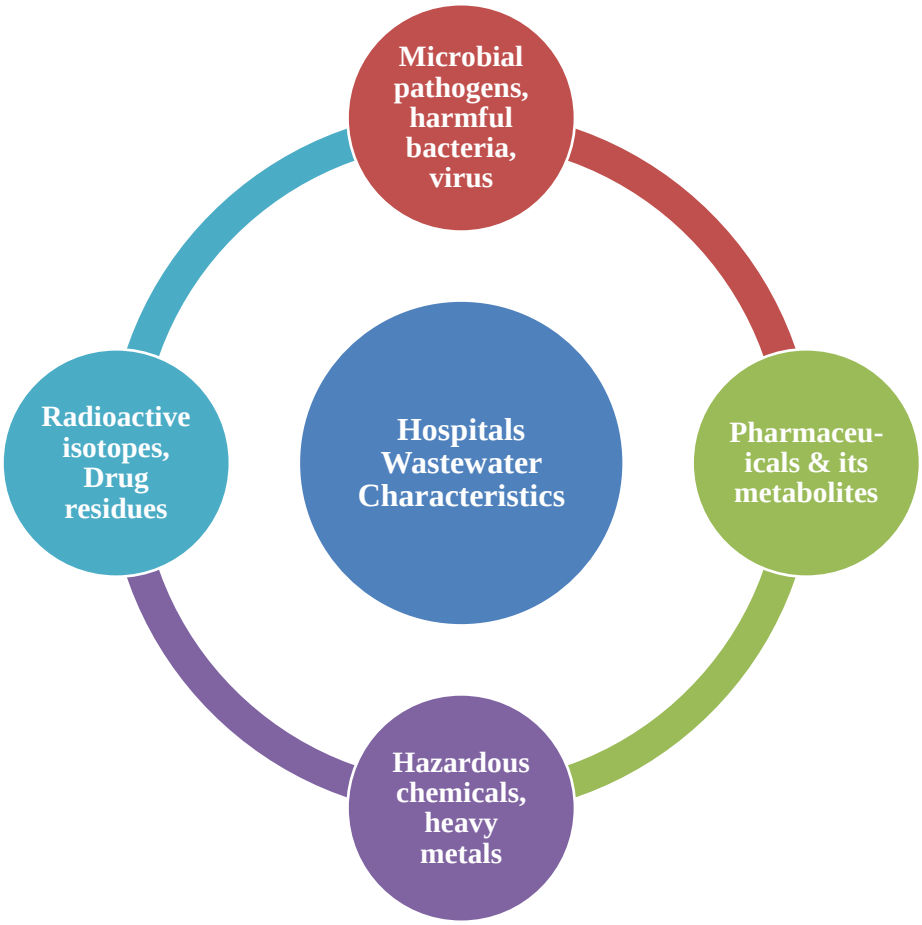
Hospital Wastewater Management

EnviroTech Consultants

Preserving Water Sustains Life

HOSPITAL WASTEWATER MANAGEMENT

EnviroTech Consultants offers end-to-end solutions, including design, engineering, construction, and commissioning of Sewage Treatment Plants (STPs), Effluent Treatment Plants (ETPs) & Common Effluent Treatment Plants (CETPs) for hospitals & medical colleges, covering mechanical, piping, electrical, and instrumentation work on turnkey basis.



Hospital wastewater is divided into the following categories:

- **Blackwater: It is highly polluted wastewater consists of fecal matter, urine, food residues, toxic chemicals etc.**
- **Greywater: It is low contaminated wastewater with residues from bathing, washing, laboratory processes and many such.**
- **Stormwater: Which consist of rainwater from roofs, grounds and other areas in hospitals.**

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Government Guidelines-

As per Guidelines for Management of Healthcare Waste as per Biomedical Waste Management Rules, 2016;

Effluent Treatment Plant should be provided in every Health Care Facility (HCF) to treat the wastewater generated from the hospital in order to comply with the effluent standards prescribed under the BMWM Rules, 2016. Sources of wastewater generation from the hospital are wards, laboratories, used disinfectants, floor washing, washing of patient's area, hand washing, laundry, discharge of accidental spillage, firefighting, bathroom/toilet etc. Liquid waste generated due to use of chemicals or discarded disinfectants, infected secretions, aspirated body fluids, liquid from laboratories and floor washings, cleaning, house-keeping and disinfecting activities should be collected separately and pre-treated prior to mixing with rest of the wastewater from Health Care Facility.

The combined wastewater should be treated in the ETP having three levels of treatment; primary, secondary and tertiary;

- **Primary Treatment: equalisation, neutralization, precipitation and clarification**
- **Secondary Treatment: High-rate aerobic biological treatment, secondary settling tank**
- **Tertiary Treatment: Pressure Filtration, Disinfection and disposal to drain/sewer**

Options for reuse of treated wastewater: Wastewater generated from the HCF is treated in the ETP and shall be disposed into drain / sewer or could be reused in: Flushing, Horticulture, and Scrubber.

ETP will be necessary if discharge from HCF is connected with City's/Town's public sewerage network not having any terminal sewage treatment plant or if the HCF is not connected to public sewerage network. Treated wastewater from healthcare facility should conform to the standards of liquid waste as listed in Schedule II of BMW Rules, 2016. Bedded HCFs with > 10 beds should establish suitable Effluent Treatment Facility with immediate effect, while HCFs with <10 beds, ETP should be installed by 31st December, 2019.

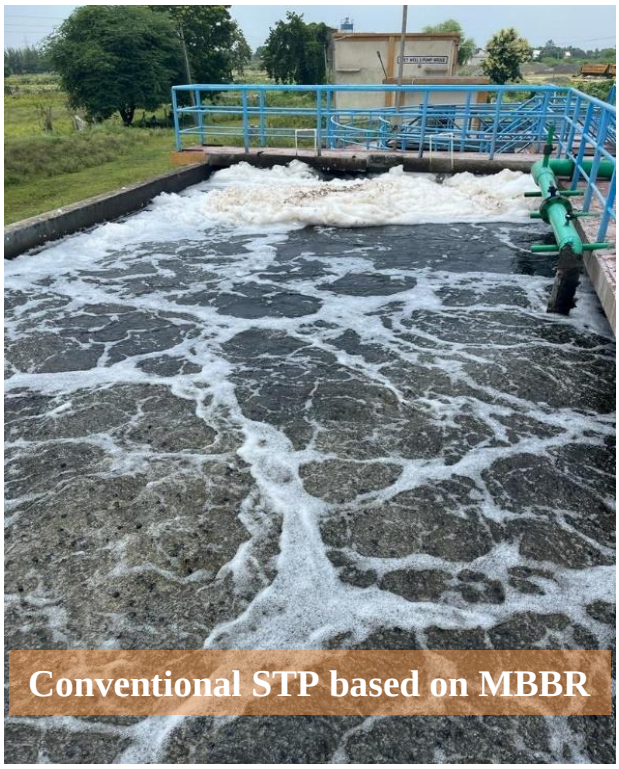
Type of Building	Litres per head per day
Hospitals (including laundry)	
No. of beds exceeding 100	450 per bed
No. of beds not exceeding 100	340 per bed
Nurses Homes and medical quarters	135

***Water demand for visitors, consumption of 15 litre per head per day may be taken.**

Why is wastewater management important for Hospitals?

Wastewater management is vital for hospitals to safeguard public health, comply with regulations, and minimize environmental impact. Proper treatment of hospital wastewater prevents the spread of infections, removes harmful contaminants, and ensures compliance with stringent standards. Additionally, it contributes to sustainable practices, conserves resources, and maintains positive community relations by demonstrating a commitment to environmental responsibility and corporate social responsibility. Effective wastewater management in hospitals is an integral part of ensuring operational efficiency and the well-being of both patients and the surrounding environment.

According to the Central Pollution Control Board (CPCB), proper wastewater management in hospitals is essential to safeguard the environment, public health, and legal compliance. Hospitals must treat their wastewater to prevent the release of contaminants, pathogens, and pharmaceutical residues into water bodies, ensuring water quality preservation. Adhering to CPCB regulations is crucial to avoid legal consequences and disruptions to hospital operations. Effective wastewater management also contributes to community health, resource conservation, and operational efficiency, aligning with principles of corporate social responsibility and promoting sustainable healthcare practices in India.



Conventional STP based on MBBR

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Sources of wastewater from Hospitals-

1. Patient Care Areas:

- **Patient Rooms: Wastewater from patient rooms includes sewage from sinks, toilets, and showers used by patients.**
- **Operating Rooms: Operating rooms produce wastewater from handwashing sinks, scrub sinks, and equipment cleaning.**
- **Labor and Delivery: Maternity units generate sewage from birthing rooms and postpartum care areas.**
- **Intensive Care Units (ICUs): ICUs produce wastewater from patient rooms, equipment cleaning, and handwashing.**

2. Clinical and Diagnostic Areas:

- **Laboratories: Clinical and research laboratories may discharge wastewater containing chemicals, reagents, and biological materials.**
- **Radiology: Radiology departments may produce wastewater containing contrast agents and chemicals used in imaging processes.**
- **Pharmacy: Hospital pharmacies generate wastewater when preparing and cleaning medications.**

3. Surgical and Procedural Areas:

- **Operating Rooms: Surgical procedures generate wastewater from equipment cleaning, handwashing, and the sterilization of instruments.**
- **Endoscopy Suites: Endoscopy units produce wastewater from cleaning endoscopes and associated equipment.**
- **Dental Clinics: Dental clinics within hospitals generate wastewater from patient treatment, including dental chair rinsing and instrument cleaning.**

4. Support Areas:

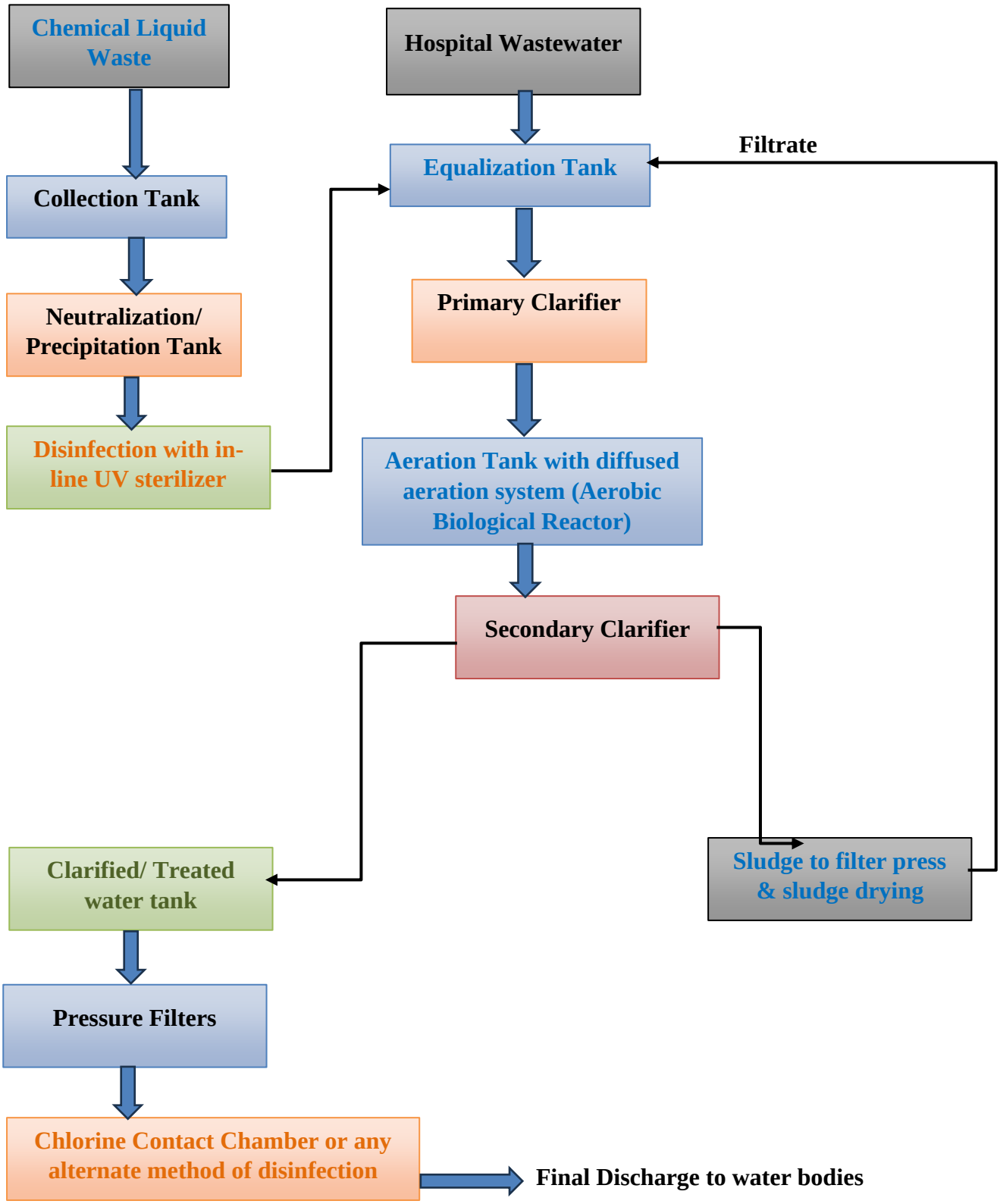
- **Kitchen and Cafeteria: Hospitals with food service facilities produce sewage from kitchen sinks, dishwashing, and food preparation.**
- **Laundry: On-site laundry facilities generate wastewater from washing linens and medical textiles.**

5. Staff and Visitor Areas:

- **Restrooms: Hospital restrooms for staff, visitors, and patients contribute to sewage generation.**
- **Cafeterias: Visitor and staff cafeterias produce wastewater from sinks and dishwashing.**

6. Research and Teaching Facilities: Hospitals associated with research and medical education may have additional sources of wastewater from laboratories, animal facilities, and teaching areas.

Treatment Scheme for Hospitals Wastewater- As per BMWM Rules, 2016



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"A Step Ahead to Maintain Environmental Balance for Betterment of Mankind."