1. How was the visit?

Ans:-> Our visit to Mithi River Sewage Treatment [illegible], in Krishna Nagar, Powai, provided an in-depth look at the process of treating contaminated water. Upon arrival, we were given a presentation about the Mithi River project, which aims to restore the river by treating domestic sewage and other pollutants. The project spans four phases, with this phase covering 17.4 kms of the river. The STP's primary goals is to make the Mithi River a provincial water body, treating water according to National Green Tribunal (NGT) Standards.

We were shown the plant's multi-step process. First, sewage is pumped to a retent for primary treatment, where large debris is removed. It then undergoes secondary treatment in Sequential Batch Reactors (SBRs), which break down organic matter. The water then moves to tertiary treatment, where fiber disc filters and UV lamps disinfect the water, ensuring it is safe to return to the river.

We visited the control room where the automated SCADA system monitors the entire treatment process. Finally, we observed the clear difference between untreated and treated water, and learned about the daily testing conducted to meet NGT standards. The treated water is returned to the river, while the sludge is processed into compost for farming.

Picture of the STP:-

2. Sources and Quantity of wastewater handled at STP:-

E) SOURCES AND QUANTITY OF WASTEWATER HADLED AT THE STP :->

→ Primary source of wastewater at the Mithi River STP is the overflow from Vihar lake. Other major contributed include domestic sewage from homes along the rivers banks, stormwater runoff that carries contaminants and debris during the monsoon season, and unathorized discharges from illegal encroachements.

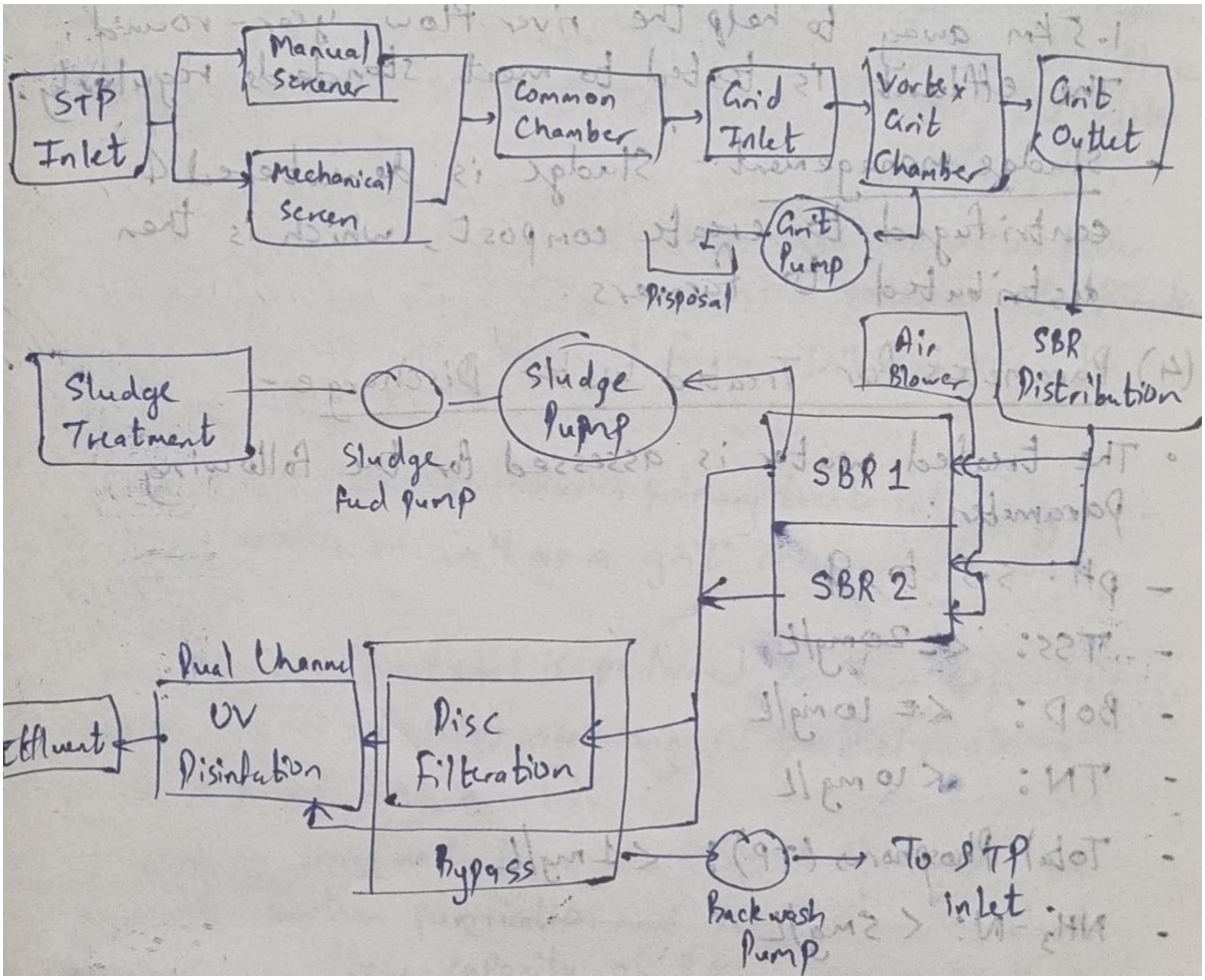
The STP handles 8 million litres per day of wastewater during the dry seasons and up to 24 MLD during the monsoon season, facilitated by four pumps, including one reserve

3. Purpose of Mithi River STP Project:-

F) PURPOSE OF MITHI RIVER STP PROJECT :->

The main purpose is to rejuvenate the rejuvenate the river and make it a perennial water body by treating the rivers contaminated water. The project aims to improve water quality and conserve the biodiversity around the river. TO achieve this, the STP uses Sequential Batch reactors (SBRs) for biological treatment, followed by UV lamps for disinfection, which removes pathogens before the treated water is returned to the river, about 1.5 km away.

4. Scheme of the STP:-



5. Pumping and Screening:-

PUMPING AND SCREENING :→ Initially, the sewage is pumped to a specific height, where it undergoes screening. Large debris like plastic bags and sticks are removed during this process.

6. Primary Treatment:-

(#) [SEDIMENTATION] :-> well. Heavy inorganic and organic particles settle at the bottom of the well, while lighter materials float on the surface. After this, the water proceeds to secondary treatment.

7. Secondary Treatment:-

(#) SECONDARY TREATMENT :-> This stage involves [illegible]
[Sequential Batch Reactors-SBR] SBRs operating in four stages: filling, aeration, settling, and decantation. First, the tanks are filled with water. Aeration then facilitates bacterial growth, which breaks down organic matter. The organic particles settle to the bottom, and the decanted water is moved to the next stage.

8. Other processes:-

(#) DISINFECTION :→ The treated water is then disinfected using UV lamps, which ensure a 3-log removal of 6 pathogens, making the water safe to release.

(#) EFFLUENT DISCHARGE :→ The final treated water is released into the Mithi River, 1.5 KM away from the STP site. Daily tests ensure the water meets discharge standards.

(#) SLUDGE MANAGEMENT :→ The sludge produced during treatment is dewatered and centrifuged to create compost, which is then sent to farmers for agricultural use.

PARAMETERS ASSESSED BEFORE DISCHARGING :-> TREATED WATER

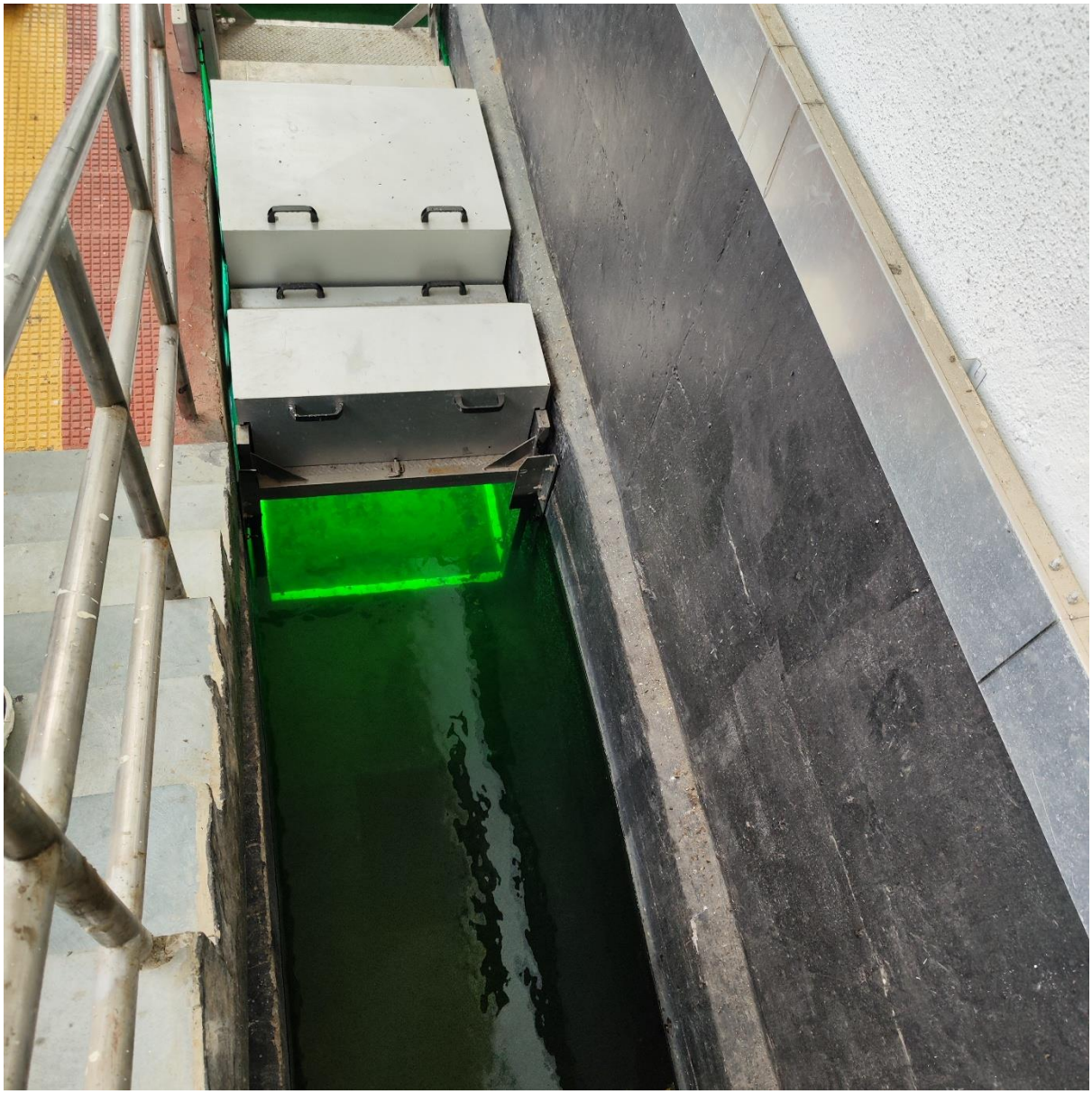
1. pH : 5.5 to 9
2. Total suspended solid (TSS) : ≤ 20 mg/L
3. Chemical Oxygen Demand (COD) : ≤ 50 mg/L
4. Biochemical Oxygen Demand (BOD) : ≤ 10 mg/L
5. Total Nitrogen (TN) ≤ 10 mg/L
6. Total Phosphorous (TP) < 1 mg/L
7. Ammonia Nitrogen (NH_3-N) < 5 mg/L

OBSERVATIONS TO IMPROVE EXISTING SYSTEM :->

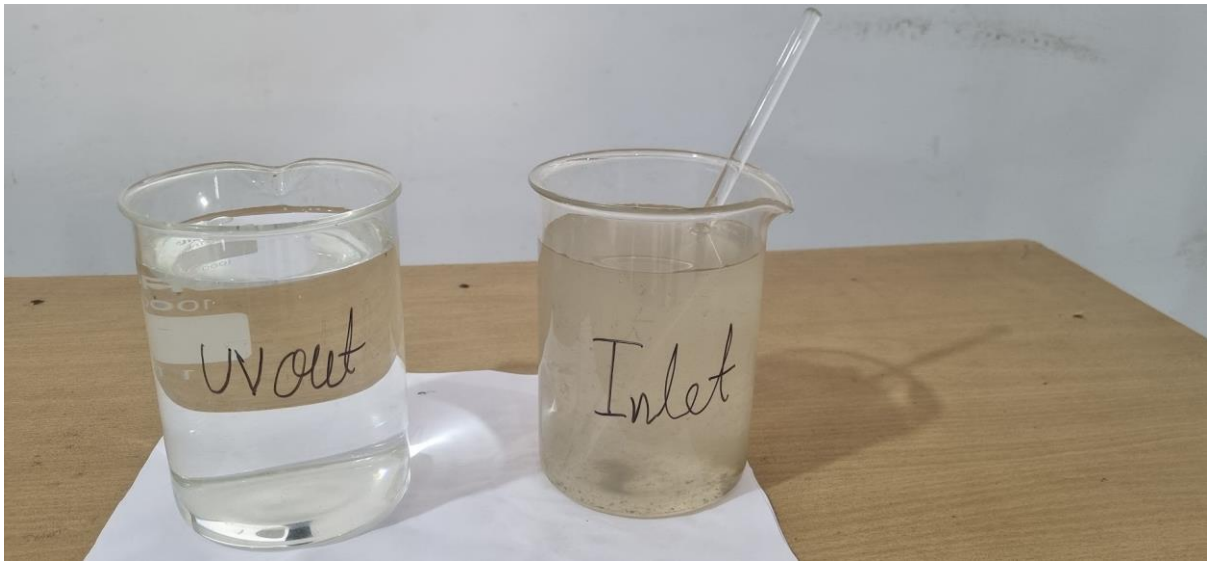
1. Energy efficiency measures :-> Installing solar panels or using other renewable energy sources to power the plant could reduce operational costs and carbon emissions. Incorporating energy-efficient machinery and optimizing energy consumption across processes would further enhance sustainability.

2. Enhanced Monitoring and Data analytics : Upgrading the monitoring systems with real-time sensors and using AI-driven analytics could help identify inefficiencies or operational issues more quickly. This would enable faster response times and improve the overall effectiveness

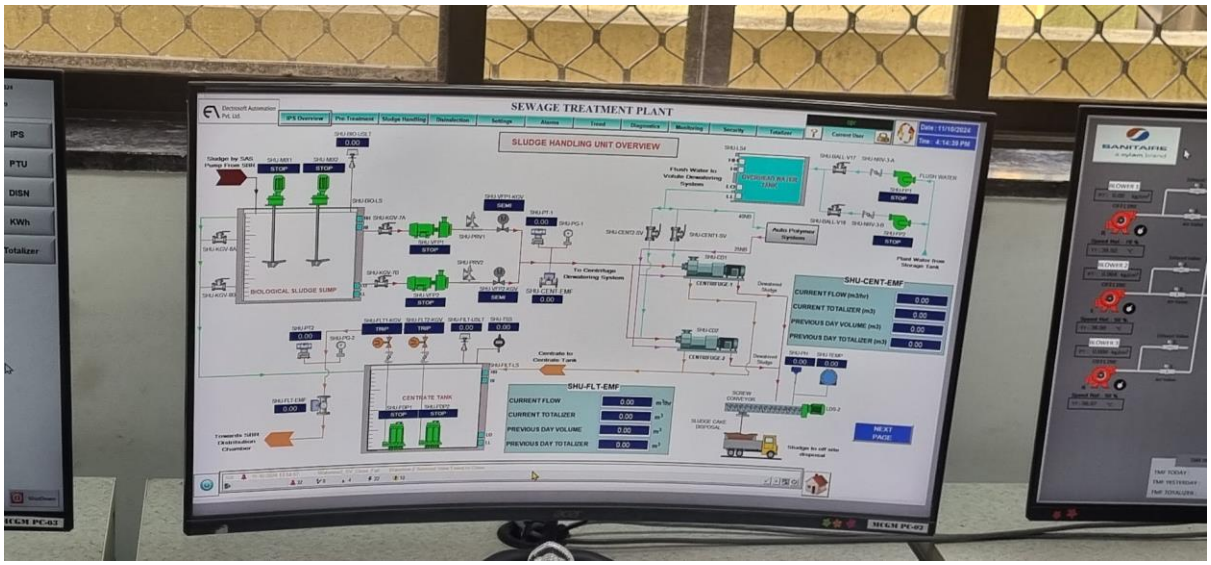
Pipe to Sludge Treatment Site



UV Lamp Disinfection



Inlet and Outlet Samples



SCADA Lab