

WASTEWATER TREATMENT SYSTEM FOR MAHADEVAPURA LAKE, BANGALORE

PROJECT BRIEF

Mahadevapura Lake is a 26 acre lake located along the Outer Ring Road, adjacent to The Bagmane Tech Park, Bangalore.

In 2016, an effort to rejuvenate the lake, The Bruhat Bengaluru Mahanagara Palike (BBMP) built necessary hydraulic structures to divert wastewater entering to the lake. To take these efforts further, United Way of Bangalore brought together tech firms, to fund a wastewater treatment plant for the lake, as part of their CSR. They selected CDD Society to design and implement a solution that would treat wastewater and replenish the lake by mitigating further pollution.

PROJECT OUTCOMES

- Ensure the lake receives water throughout the year by treating the wastewater inflow from the one of the inlets and discharging the treated effluent into the lake
- Aid in ground water recharge
- Enhance micro-climate benefits in the area
- Improve urban aesthetics

SALIENT FEATURES

- Source: Open Channel Flow
- Design Capacity: 1 MLD
- Influent Quality: BOD-200 mg/l & COD-400 mg/l
- Expected Effluent Quality: BOD 30-20 mg/l

SYSTEM IN BRIEF

The wastewater treatment includes primary, secondary and tertiary treatment process, chosen and combined in order to handle the pollution load entering through the selected inlet drain. It also has designed with aim of very low Operation and Maintenance requirements.

- Preliminary treatment- Screen with grit collection structure with gate for wastewater diversion
- Primary treatment- Diversion channel with two stages of screening, sedimentation basin and balancing tank
- Secondary treatment – Integrated Anaerobic Baffle Reactor with Anaerobic filters
- Tertiary treatment- Combination of gabions followed by floating wetlands

PROJECT SPECIFICATIONS

Funding: CSR Funds

Construction Period: 12 months

Total Cost of the plant: Rs.2.01 Crore

Start of Operation: March 2019

MODULES ADOPTED

Earthen Drain: length 85 meters

Upstream Diversion Structure

Bar Screen: 4.7m*0.4m [Pore size - 100mm]

Box Screen: Opening size - 75mm*50mm

Diversion Channel

Area: 20 sq.m.

Screen: 2 nos. of dimension 1m*1.5m

30mm pore size & 15mm pore size

Sedimentation Tank

Area of Construction: 40 sq.m.

Volume: 34 cum

Balancing Tank with pumping

Area of construction: 105 sq.m.

Volume: 135 cum

Two pumps of 3HP capacity

Pumping duration 16 Hours

Integrated Anaerobic Baffle Reactor (ABR) with Anaerobic Filter (AF)

Area of construction: 550 sq.m.

Volume: 1,437 cum

No. of Chambers: 3 ABR + 3 AF in 5 streets

Gabions – 2 Nos

Dimensions of each gabion: 26m*1m

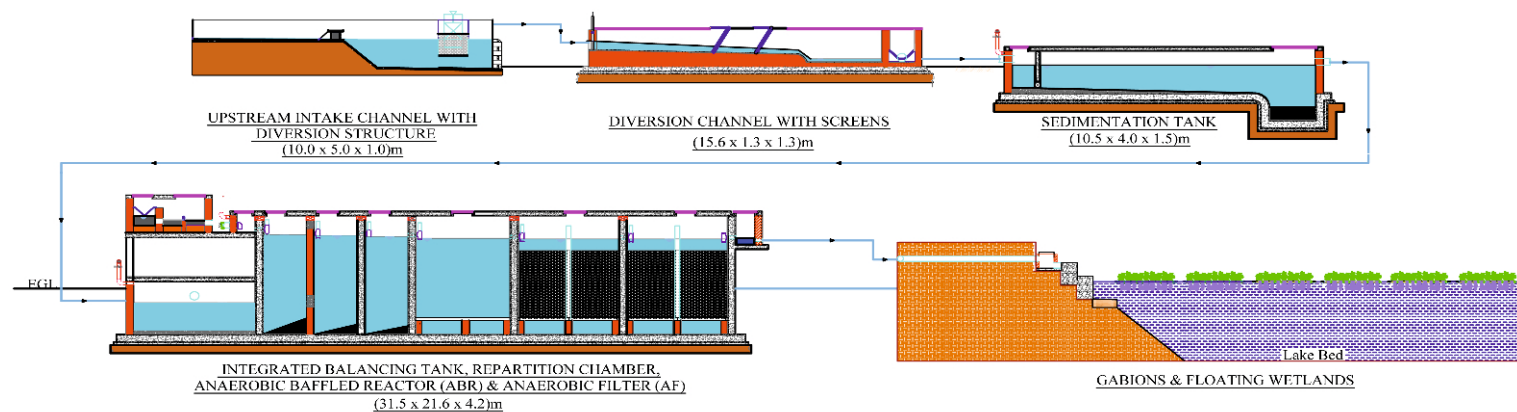
Area: 52 sq.m.

Floating Treatment Wetland - 20 Nos

Sizes of each wetland: 5*2m

Area: 200 sq.m.

Plants used: *Canna indica*, *Cyperus papyrus*, *Vetiver*



Hydraulic Profile of Treatment Module

OPERATION AND MAINTENANCE (O&M)

The wastewater treatment plant is operated and maintained by CDD Society through a separate O&M contract for two years.

Regular O&M

- Checking for free flow of water in all modules
- Cleaning and clearing solid waste from screens
- Regular pumping of wastewater from Balancing Tank
- Trimming plants in Floating Wetlands (once in 6 months)

Periodical O&M

- Removing sludge in Sedimentation Tank, Balancing Tank and ABR Chambers (once in two to three years)
- Replacement of filter media (once in five years or depending on filter media condition)
- Cleaning of media once in Floating Wetlands

REUSE OPTIONS

- The treated wastewater is used for replenishing the lake body.

PHOTOS OF TREATMENT PLANT MODULES AT MAHADEVAPURA



Diversion Structure with sedimentation tank

Integrated ABR with AF

Gabions with Floating Wetlands

Custodian



Implementing Partners



Design Partner & Consultant



Construction Partner



Funding Partners

