BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL (SOUTHERN ZONE) CHENNAI

ORIGINAL APPLICATION NO. 111 OF 2020

IN THE MATTER OF

Tribunal on its own motion, a SUO MOTO … APPLICANT(S)

VERSUS

The Principal Secretary to Government, …RESPONDENTS
Public Works Department, Chennai & Ors.

INDEX

S Suresh

Place: Bengaluru **DEPONENT**

Date: 20.01.2022

S. SURESH
REGIONAL DIRECTOR
CENTRAL POLLUTION CONTROL BOARD
REGIONAL DIRECTORATE (SOUTH)
MIN. OF ENV, FORESTS & CC, GOVT. OF INDIA
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PROGRESS REPORT (TRIMONTHLY) ON–

"FROTHING OF CHEMICAL FOAM IN RIVER THENPENNAI"

in Compliance to
Directions of the Hon'ble Tribunal (SZ), Chennai
(in the matter of O. A. No. 111/2020)

January, 2022

CENTRAL POLLUTION CONTROL BOARD
Ministry of Environment, Forest and Climate Change
Govt. of India

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CHAPTER I

BACKGROUND

In the matter of O.A No. 111 of 2020 regarding "Frothing of Chemical Foam in the River Thenpennai", Hon'ble NGT, Southern Zone, Chennai vide its order dated 20.07.2020 constituted a joint committee comprising of Representatives of District Collectorate, Krishnagiri, Tamilnadu Pollution Control Board, District Collectorate, Bangalore (Urban), Superintending Engr. of PWD & WRDO and Senior Official, CPCB, RD, Bangalore. The joint committee investigated the matter in the light of directions of Hon'ble NGT in O.A No. 125/2017 and Hon'ble Supreme Court in O.S No. 02 of 2015. The causes and sources of pollution have been assessed by the joint committee based on the samples collected from 12 locations in River Thenpennai. It has been ascertained that, the water quality of River Thenpennai falls under the Category E (Irrigation, Industrial Cooling, Controlled Waste Disposal) of the Designated Best Use Criteria stipulated by CPCB. Therefore, an Action Plan (Long term and short term with timelines) for restoring the quality of River Thenpennai has been devised by the joint committee for compliance by the concerned departments in Government of Karnataka. The joint committee submitted final report on 'Frothing of Chemical Foam in River Thenpennai' in November, 2020.

Considering the Joint Committee Report, Hon'ble NGT in the Order dated 28.06.2021 recorded that, "*13. It is also not possible for the Tribunal to monitor, perpetually, the progress of the work of implementing the directions and also the progress of the work to be done by each department and the improvement happening on account of such implementation, which has to be done by regulators. So under such circumstances, we feel that the matter can be disposed of giving certain directions after accepting reports submitted by the Joint Committees including recommendations.*"

Therefore, Hon'ble NGT disposed of the application with following directions;

" i) The Joint Committee report dated 20.11.2020 and further report of November, 2020 and subsequent progress report of the Joint Committee dated 02.06.2021 which are extracted above are recorded and accepted. ii) The concerned Departments mentioned in the Joint Committee report are directed to implement

the directions issued by the Joint Committee, so as to resolve the issue permanently within a time frame provided by them. iii) Chairman, Karnataka Pollution Control Board and Chairman, Tamil Nadu Pollution Control Board are directed to monitor the implementation of the recommendations made by the Joint Committee by the respective Departments and also assess the improvement of the water quality in their respective areas and if any, further action is to be taken, they are directed to take further action against those who are not complying with the directions issued by the Joint Committee, which results in further pollution to the Thenpennai River and also the connecting rivers which reaches the Kelavarapalli reservoir from where the water is released to Thenpennai River from State of Karnataka.

iv) The Central Pollution Control Board, Regional Office, Bangalore as well as Regional Office Chennai are also directed to monitor the implementation of the recommendations made by the Joint Committee and if there is any violation or non-implementation of the directions, then they are also directed to issue necessary direction to the defaulting Department to comply with the same and on their failure, take appropriate action against them in accordance with law.

v) The Chief Secretary, State of Karnataka is directed to review the action taken by the respective department and if there is any gap found, then issue necessary direction to the concerned departments for implementing the directions within their State and if any support is required from the Government level then provide both technical as well as financial support in this regard.

vi) The Chief Secretary, State of Tamil Nadu is also directed to monitor the directions issued by the Joint Committee as far as State of Tamil Nadu is concerned and also the timeline provided by the Tamil Nadu Pollution Control Board in implementation of the Solid Waste Management Rules, 2016 in these areas which also causes some sort of pollution to water quality in Thenpennai River.

vii) The Chief Secretary, State of Karnataka, Chief Secretary, State of Tamil Nadu, Central Pollution Control Board, Regional Office, Bangalore and Chennai and respective Chairman of the Pollution Control Boards are directed to file periodical progress report to this Tribunal, once in three months along with the water quality analysis so as ascertain the improvement caused on account of the implementation of the recommendations made by the respective departments and if they found any gap in spite of the implementation of the recommendations, they are also directed to submit their further remedial measures to be taken by the respective department to resolve the issue permanently when they are filing their

progress report, once in three months. viii) The Registry is directed to communicate this order to the Chief Secretary, State of Karnataka, Chief Secretary, State of Tamil Nadu, Chairman of both the State Pollution Control Board and also to the Regional Directors of Central Pollution Control Board, Bangalore as well as Chennai for information and compliance of the directions as directed above. …"

In compliance to the Hon'ble NGT Order dated 28.06.2021, CPCB, Regional Directorate, Bengaluru prepared Joint Progress Report (Trimonthly) along with Regional Directorate, Chennai and submitted in September 2021. The same was also forwarded to the office of Chief Secretary, Karnataka and Tamilnadu and to other concerned departments for necessary compliance.

Hon'ble NGT heard the matter on 14.12.2021, wherein it was recorded that, *"… 7. Even recently, in some of the newspaper reports, it was reported that similar things are recurring in Thenpennai River when water is being released from Kelavarapalli reservoir."*

Therefore, Hon'ble NGT vide above said order directed that, "*we direct the above authorities to submit the compliance report and the action taken report, if there is any non-compliance by the respective departments on or before 11.01.2022 by e-filing …. If they did not submit the report as directed, then they are directed to appear before this Tribunal through Video Conference, to show cause as to why action should not be taken against them for non-compliance of the direction issued by this Tribunal as contemplated under Section 25 read with Section 26 & 28 of the National Green Tribunal Act 2010.*" Copy of the Hon'ble NGT Order dated 14.12.2021 is appended as ***Annexure I***.

CHAPTER II

MEETINGS AND DISCUSSIONS

In compliance with the NGT Order dated 28.06.2021, CPCB, Regional Directorates, Bengaluru & Chennai filed Joint Progress Report, September 2021 before Hon'ble National Green Tribunal, Southern Zone, Chennai through email dated 29.09.2021 based on the status of compliance reports received from concerned departments in Government of Karnataka.

CPCB, Regional Directorate, Bengaluru conducted a meeting on 02nd December, 2021 and 24th December, 2021 through video conferencing with the members of the joint committee and concerned departments. It was informed that the recommendations of the joint committee in the report to be executed by the concerned agencies be complied as per the specified timelines. Copy of email communications and letters addressed to concerned Departments of Government of Karnataka is appended as **Annexure II**.

Further it was emphasized that the Chief Secretary, State of Karnataka, Chief Secretary, State of Tamil Nadu and respective Chairman of the Pollution Control Boards are directed to file periodical progress report to this Tribunal, once in three months along with the water quality analysis so as ascertain the improvement caused on account of the implementation of the recommendations made by the respective departments and if they found any gap in spite of the implementation of the recommendations, they are also directed to submit their further remedial measures to be taken by the respective department to resolve the issue permanently when they are filing their progress report, once in three months. It was also informed that for the purpose of monitoring the progress of the improvement that happened on account of certain directions issued by the Committee which has to be carried out by the respective departments, the Chief Secretary, State of Karnataka should take a lead role for coordinating with the respective departments and monitor periodically the progress of the implementation of the recommendations given by the Joint Committee in the reports.

Upon detailed deliberation, the following points were discussed in the meeting, which were agreed upon by the concerned departments for necessary compliance;

(i) As directed by Hon'ble NGT, SZ, Chennai vide order dated 28.06.2021 BWSSB, KSPCB and Minor Irrigation were informed to comply with the Joint Committee recommendations related to flow measurement and water quality of major tanks/lakes associated with River Thenpennai. Lakes Department (BBMP) did not participate in the meeting.

(ii) Random verification of industries located near the river bed, environmental compensation and performance evaluation of STPs have to be addressed and updated by BWSSB, TNPCB and KSPCB periodically to comply with Hon'ble NGT Order dated 28.06.2021.

(iii) Hon'ble NGT order and directions were reiterated which is reproduced as, *"…. concerned Departments are directed to implement the directions issued by the Joint Committee, so as to resolve the issue permanently within a time frame…. Concerned departments are also directed by Hon'ble Tribunal to assess the improvement of the water quality in their respective areas and if any, further action is to be taken, they are directed to take further action against those who are not complying with the directions issued by the Joint Committee, which results in further pollution to the Thenpennai River and also the connecting rivers which reaches the Kelavarapalli reservoir from where the water is released to Thenpennai River from State of Karnataka …."*

Further, CPCB, RD, Bengaluru informed that Hon'ble Tribunal, SZ, Chennai vide order dated 14.12.2021 mentioned that, "*4. The Chief Secretary, State of Karnataka was directed to review the action taken by the respective department and if there is any gap found, then to issue necessary direction to the concerned departments for implementation of the directions within their state and if any action was required from the Government level then provide both technical as well as financial support in this regard."*

In this regard, BWSSB has been recommended to prepare time bound action plan for continuous monitoring of STPs to ensure long term compliance besides connecting online monitoring system of all STPs to CPCB server. CPCB, RD, Bengaluru has initiated action on KSPCB to ensure (a) illegal discharge of effluent from industries shall not be made into the river or any other recipient system; and (b) to carry out random inspection of the units in the periphery of River Thenpennai along with sampling of effluent and impose environmental compensation in case of defaulting units; (c) to assess the water quality of the treated sewage from STPs and impose environmental compensation in case of defaulting STPs.

CPCB, RD, Bengaluru again insisted KSPCB vide letter dated 10.01.2022 to ensure strict compliance of the directions of the aforesaid Hon'ble NGT Order dated 14.12.2021 and recommendations of the Joint Committee. In case of failing to comply, shall attract actions under Section 18(1)(b) of the Water (Prevention and Control of Pollution) Act, 1974.

CHAPTER III

STATUS OF COMPLIANCE AND PROGRESS MADE

In compliance to the Hon'ble NGT Orders dated 28.06.2021, CPCB, RD, Bengaluru and Chennai prepared joint progress report (trimonthly) based on the compliance status received from the concerned departments in Government of Karnataka, TNPCB and KSPCB. The joint progress report (trimonthly), September 2021 was filed before Hon'ble NGT, SZ, Chennai through email and post.

Reference is made to the joint committee Action Plan in its Report, November 2020 which comprises of 17 action points viz., (i) Estimation of flow of water in River Thenpennai; (ii) Study of Performance evaluation of Sewage Treatment Plants in Bangalore by engaging a CSIR institute; (iii) Random Verification of grossly polluting (water polluting) industries located in the River Basin and Assessment of wastewater management and discharge mode; (iv) Rejuvenation of lakes to remediate the pollution caused in River Thenpennai; (v) Environmental Compensation be imposed by SPCBs after evaluating performance of STPs and identification of defaulters upon Random Verification; (vi) Sewage and Solid Waste Management in the villages (13) adjoining River Thenpennai up till Kelavarapalli; (vii) Regular Water Quality Monitoring at important locations.

The number of action points pertaining to the concerned departments are enumerated as (i) BWSSB – 08; (ii) Minor Irrigation – 03; (iii) KSPCB – 06; (iv) TNPCB – 06; (v) BDA – 03; (vi) BBMP – 01; (vii) CPCB – 01.

The Compliance status of the recommendations made in the Progress Report, June 2021 subsequent to the Joint Progress Report (Trimonthly), September 2021 is provided below:

(1) With respect to flow measurements of major tanks, storm water drains and major confluence points on River Thenpennai, the same has not been carried out completely by BWSSB and Minor Irrigation. BWSSB and Minor Irrigation has informed the joint committee that flow measurements of tanks/lakes, storm water drains and major confluence points are not covered under the purview of their departments. Therefore, the joint committee requests Government of Karnataka to entrust the role and responsibilities to the concerned

department(s) and the duties for the same may be earmarked by the Government of Karnataka.

Lakes department under BBMP is responsible for implementation of various functions stipulated under the Karnataka Lake Conservation and Development Authority Act, 2014 including improving and monitoring water quality, conserving lake ecology on need basis and to protect them against domestic and industrial pollution.

The Karnataka Lake Conservation and Development Authority Act, 2014 stipulates function of the authority under Section 5, which is reproduced as:

"**5. Functions of the Authority**.- Subject to the provisions of this Act and the rules made thereunder, the functions of the Authority shall be,-

(1) to exercise regulatory control over all the lakes within its jurisdictions including prevention and removal of encroachment of lake;

(2) to protect, conserve, reclaim, regenerate and restore lakes to facilitate recharge of depleting ground water by promoting integrated approach with the assistance of concerned Government departments, local and other authorities;

(3) to take up environmental impact assessment studies for any or all lakes;

(4) to take up environmental planning and mapping of lakes and their surrounding areas with the help of geographical information system and prepare database and atlas of lakes and their catchments;

(5) to prepare a plan for integrated development of lakes;

(6) to improve and also create habitat (wet lands) for aquatic biodiversity, water birds and aquatic plants by reducing sullage and non-point sewage impacts;

(7) to facilitate for impounding storm water drainage system, reduce or remove siltation of lakes by taking up appropriate soil and water conservation measures including afforestation and to augment recharge of ground water aquifers and revive bore-wells;

(8) **to improve and monitor water quality, conserve lake ecology on need basis and to protect them against domestic and industrial pollution;**

(9) to utilize or allow to utilize the lakes for the purpose of drinking water, fishing, irrigation, education or tourism or any other purpose as the Authority may determine;

(10) to encourage participation of communities and voluntary agencies and to launch public awareness programmes for lake conservation, preservation and protection of lakes;

(11) to advise on any matter that may be referred to it by the Government or any institution.

(12) to promote integrated and co-ordinated applied research on all the relevant issues pertaining to lakes;

(13) **to do such other acts as the Authority may consider necessary, conducive or incidental, directly or indirectly, to achieve the object of this Act.**"

"Authority" is defined as Karnataka Lake Conservation and Development Authority constituted under Section 3.

"lake" means an inland water-body irrespective of whether it contains water or not, mentioned in revenue records as sarkari kere, kharab kere, kunte, katte or by any other name and includes the peripheral catchment areas, Rajakaluve main feeder, inlets, bunds, weir, sluices, draft channels, outlets and main channels of drainage to and fro.

In this regard, the action points with regard to flow measurements of major tanks, storm water drains and major confluence points on River Thenpennai is yet to be addressed by the departments under the guidance of the Chief Secretary, Government of Karnataka.

CPCB, RD Bengaluru conducted meetings with concerned departments viz., Bangalore Water Supply and Sewerage Board (BWSSB), Minor Irrigation and Ground Water Development (MI) and Karnataka State Pollution Control Board (KSPCB) on 02nd December, 2021 and 24th December, 2021 through video conferencing and discussed the status of compliance with regard to measurement of flow of major tanks, storm water drains and major confluence points on River Thenpennai along with details of measurement of water quality. Lakes Department under BBMP, Bruhat Bengaluru Mahanagara Palike (BBMP) did not participate in the above meetings.

CPCB, Regional Directorate, Bengaluru vide letter no Tech(39)/Legal(NGT)/RDS/2020-21/676 dated 27.12.2021 forwarded the directions in the Hon'ble NGT Order dated 14.12.2021 to concerned departments in Government of Karnataka including BWSSB, KSPCB and the Chief Secretary which is reproduced as below, "*Even recently, in some of the newspaper reports, it was reported that similar things are recurring in Thenpennai River when water is being released from Kelavarapalli reservoir ….*". Copy of the letter is appended as ***Annexure III***.

It is submitted that a time bound action plan to be devised by Lakes Department, BBMP, BDA, BWSSB and KSPCB under the chairmanship of the Chief Secretary, Government of Karnataka to comply with the action points and recommendations of the Joint Committee.

(2) With regard to Study of Performance evaluation of Sewage Treatment Plants in Bangalore, BWSSB may expedite the study awarded to IISC, Bangalore. The outcome of the study and the final report be shared with KSPCB for review before assessment of Environmental Compensation in case of non-compliances. The final report and outcome of the study has to be made online in public domain.

It was submitted to Hon'ble NGT that Bangalore Water Supply and Sewerage Board (BWSSB) has awarded a project on STP upgradation to IISC, Bangalore to inspect and recommend suitable modifications to the current treatment process to meet the required standards. The study was completed and the report was furnished to CPCB, RD, Bengaluru.

The study included technical visits to understand the process, detailed water quality analysis of samples taken from the STPs etc.

The Report envisages study of 17 STPs viz., 1. K & C valley (60 MLD), 2. Bellandur Amani kere (90 MLD), 3. Kadubeesanhalli phase -1 (50 MLD), 4. Kadugodi (6 MLD), 5. Halasuru (2 MLD), 6. Rajacanal phase -1 (40 MLD), 7. Rajacanal phase -2 (40 MLD), 8. Horamvu Agara (20 MLD), 9. K R Puram phase -1 (20 MLD), 10. Yelemallappa Chettikere (15 MLD), 11. Nagasandra phase -1 (20 MLD), 12. Nagasandra phase -2 (20 MLD), 13. Mallathahalli (5 MLD), 14. Chikkabanavara (5 MLD), 15. Mailasandra phase -1 (75 MLD), 16. Kempabudhi (1MLD), 17. Doddabele (20 MLD). It was informed that Madiwala STP was under maintenance and hence was not operational; similarly, V Valley STP is under up-gradation and hence not operating. Further, the team was informed that the

Kengeri STP was included in the list by mistake. Therefore, these three STP locations were not visited. Excerpts of the Report is provided below;

All STPs were visited and inspected. Water quality analysis was done for samples collected from STPs. Process modifications were suggested for STPs not meeting NGT standard. Out of 17, STPs studied, 6 STPs are meeting NGT-BNR standards. Out of these 6 STPs, 4 are working at maximum capacity and cannot be expected to take on more load. 2 STPs, namely Chikkabanavara and Nagasandra phase 2 can take on more load. Chikkabanavara is currently only using two of the three SBR basins available on site; with the used use of the third basin, it can take up more load. Nagasandra phase 2 is currently operating at half its capacity and therefore can take up an additional load till it meets its design capacity.

Out of the 17, STPs studied, 8 were marginally underperforming in terms of nutrient removal. Out of these 8, four were Extended aeration plants, and 4 were SBRs. Simultaneous nitrification and denitrification by creating aerated and unaerated zones in the aeration basin were suggested as modifications for the Extended aeration plants. The addition of an unaerated mixing stage after the aeration stage was suggested as a modification for the SBR plant.

Out of the 17 STPs studied, 3 were performing very poorly. 2 of these plants were Extended aeration plants, and the remaining one was a UASB plant. The main issue with Extended aeration plants were intermittent operations and insufficient aeration. Inspection and repair of all required equipment were recommended for these plants. Additionally, simultaneous nitrification denitrification by creating aerated and unaerated zones in the aeration basin were suggested as modifications for proper nutrient removal when the plants are operating continuously. The UASB plant maintenance modifications were suggested for the proper functioning of the technology. Further system modification was given to ensure proper nutrient removal.

Standards prescribed by Hon'ble NGT:

S.No	Parameters	Unit	Standard
1.	pH	-	5.5 – 9
2.	BOD	mg/L	10
3.	COD	mg/L	50

4.	TSS	mg/L	20
5.	Total Nitrogen	mg/L	10
6.	Total Phosphorus	mg/L	1
7.	Total Coliforms	MPN/100 ml	<100 desirable, <230 OK

The general recommendations of the study are given below;

i. Unclean chlorine contact tanks with settled sludge and algal growth are increasing the COD of effluent.

ii. Chlorine contact tanks should be thoroughly cleaned, tiled and painted with algae-resistant paint or coating, preferably in blue color.

iii. All plant equipment such as screens, grit scrappers, flow meters and aerators should be inspected and replaced wherever necessary.

iv. The extent of non-settled portion of sludge should be monitored and reported daily as part of routine SVI and SSI test. This will allow timely tweaking of the process through SCADA.

v. Chlorine dose should be given to the effluent at all locations to reduce the concentration of pathogenic microorganisms.

vi. Chlorine demand should be monitored and reported routinely to ensure satisfactory disinfection is being done.

vii. It is recommended that appropriate residual chlorine content is measured after at least 30 minutes after chlorine addition and needs to be measured before the discharge point.

It is recommended in the draft final IISC report that Continuous monitoring for 6 STPs meeting the NGT standards is necessary to ensure long term compliance with NGT standards. Similarly, continuous monitoring will be required for all other plants after given modifications are applied to ensure long term compliance. Therefore, a final report may be submitted by BWSSB with time bound action plans for meeting the standards in case of all STPs. The outcome and recommendations of the report may be reviewed by Karnataka

SPCB for technical inputs and improvement before implementation of the same. Final Draft Report on 'BWSSB STP upgradation project' prepared by IISC is attached as ***Annexure IV***.

(3) With regard to completion of sewerage network for the villages in Koramangla & Challaghatta and Hebbal Valleys (of 110 villages identified by BBMP) for tapping the sewage generated, and strengthening of STP conveyance system to improve sewage getting completely tapped and treated, BWSSB shall ensure no sewage is discharged into River Thenpennai through continuous monitoring on a regular basis and taking stringent actions on the defaulters.

With regard to completion of Sewerage network, Bangalore Water Supply and Sewerage Board (BWSSB) provided copy of letter of commencement of the work titled "Design, Engineering, Construction and Commissioning of Sewage Treatment Plants and Intermediate Sewage Pumping Stations with Operation & Maintenance thereof for Seven Years [Works A] and Procurement and Construction of Main Sewers including Manholes in Bytrayanapura Zone (Hebbal Catchment) [Works - B]" under JICA Loan ID - P266" awarded to M/s Passavant Energy & Environment India Pvt Ltd & M/s Passavant Energy & Environment GMBH (JV) Unit, Gurgaon, Haryana. As per the details furnished the work was to commence on 07.07.2021 and will be completed by 06.01.2024. The Operation & Maintenance of the Sewage Treatment Plants (STPs) and Intermediate Sewage Pumping Stations will commence on 08.01.2024 and complete by 07.01.2031.

Similarly, the work awarded to M/s Larsen & Tourbo Limited, Mumbai, Maharashtra for Mahadevapura and Bommanahalli Zones (K&C Valley Catchment) commenced on 02.07.2021 and will complete on 01.01.2024. The Operation and Maintenance of the same commenced on 02.01.2021 and will complete on 31.12.2030. Copy of the work orders awarded to the above firms were already submitted to Hon'ble NGT. The same may be monitored by BWSSB for compliance.

(4) With respect to Water Quality of the water flowing in River Thenpennai be maintained pristine and tested for its characteristics in the respective jurisdictions, the joint committee could not identify the departments in Karnataka responsible for maintaining/restoring the water quality in lakes/tanks. BWSSB, BBMP, BDA and Minor Irrigation have informed the joint committee that monitoring and restoration of water quality of tanks/lakes are not covered under their purview.

Therefore, it is submitted that the concerned department in Karnataka be identified by Government of Karnataka and ensure compliance accordingly.

CPCB, RD, Bengaluru interacted with concerned departments viz., Bangalore Water Supply and Sewerage Board (BWSSB), Minor Irrigation and Ground Water Development (MI) and Karnataka State Pollution Control Board (KSPCB) except Lakes Department (BBMP) in the meetings conducted on 02nd December, 2021 and 24th December, 2021 through video conferencing and discussed the status of compliance by each of the departments with respect to Water Quality of the water flowing in River Thenpennai be maintained pristine and tested for its characteristics in the respective jurisdictions.

In this regard, it was submitted before the Hon'ble Tribunal that the authority comprising of members viz., Forest, Ecology and Environment Department, Finance Department, Urban Development Department, Minor Irrigation Department, Animal Husbandry or Fisheries Department, Revenue Department, Karnataka State Pollution Control Board, Bengaluru, Bangalore Water Supply and Sewerage Board, Bengaluru, Bangalore Development Authority, Bengaluru, Bruhat Bangalore Mahanagara Palike, Bengaluru are duly responsible for the functions stipulated under the Karnataka Lake Conservation and Development Authority Act, 2014 for improving and monitoring water quality, conserving lake ecology on need basis and to protect them against domestic and industrial pollution.

It was informed by Lakes Department, BBMP that the water quality is being assessed and monitored by Karnataka State Pollution Control Board and the reports will be furnished to CPCB. However, the same is not provided despite reminders in the meetings conducted by CPCB, RD, Bengaluru.

Water Quality of outlet of the Sewage Treatment Plants (STPs) has been provided by BWSSB, which reveals that the parameters of the treated outlet is complying with the limits notified in General Standards for discharge of Environmental Pollutants. Water Quality Analysis report of STPs provided by BWSSB is appended as ***Annexure V.*** The treated water (11.138 TMC) is being pumped to 126 and 47 tanks of Kolar and Chikkaballapur respectively through Minor Irrigation which is higher as compared to the status provided in September 2021. Further, it has been informed that the number of tanks would be increased to 191 in Kolar and Chikkaballapur.

Water quality analysis result of Mugalur, Karnataka provided by Karnataka SPCB, which is important to ascertain the water quality at the exit

point of Inter State Border in Karnataka reveal that there is improvement of water quality in terms of dissolved oxygen reported in November, 2021.

Further, water quality analysis of River Thenpennai at the interstate location Sokkarasanapalli in Tamilnadu was provided by TNPCB. In sokkarasanapalli, Tamilnadu the water quality analysis results (as on December 2021) reveal that the water quality falls under Class E as per Designated Best Use Criteria. Improvement of water quality in terms of dissolved oxygen is reported in November, 2021.

Upon reviewing the reports of analysis of water quality of River Thenpennai, the water quality analysis results (as on December 2021) reveal that the water quality falls under Class E as per Designated Best Use Criteria.

Water Quality Analysis of River Thenpennai monitored by CPCB, TNPCB and KSPCB are provided as ***Annexure VI.***

It is observed that various agencies involved are not proactive in taking sustainable initiatives for monitoring water quality of major tanks/lakes associated with River Thenpennai.

KSPCB as a member of the Karnataka Lake Conservation and Development Authority constituted under Section 3 of the Karnataka Lake Conservation and Development Authority Act is required to take proactive measures to coordinate with Lakes Department, BBMP to comply with the Hon'ble NGT Order dated 28.06.2021 regarding flow measurements and monitoring of water quality in order to maintain/restore the water quality in lakes/tanks associated with River Thenpennai.

BWSSB to ensure continuous monitoring for STPs meeting the NGT standards that is necessary to ensure long term compliance as recommended in the IISc Report in consultation with KSPCB. Similarly, continuous monitoring will be required for all the plants after given modifications are applied to ensure long term compliance.

In view of above, CPCB, RD, Bengaluru again insisted KSPCB vide letter dated 10.01.2022 to ensure strict compliance of the directions of the aforesaid Hon'ble NGT Order dated 14.12.2021 and recommendations of the Joint Committee. In case of failing to comply, shall attract actions under Section 18(1)(b) of the Water (Prevention and Control of Pollution) Act, 1974.

(5) With respect to Random Verification of grossly polluting (water polluting) industries located in the River Basin and Assessment of

wastewater management and discharge mode, KSPCB and TNPCB may continue to do such random inspections regularly to curb the pollution caused to River Thenpennai and ensure no illegal activities are carried out thereof.

Regarding random verifications of industries discharging effluents into the storm water drains, KSPCB informed the committee that they would continue to inspect a minimum of 60 industries to ensure that the industries do not discharge the effluent into the storm water drain. On identifying such instances, action will be initiated under section 33A of Water Act.

Karnataka SPCB vide letter no. KSPCB/ SEO-INFRA/NGT-111/2020/2020-21/4590 dated 09.12.2021 informed that 12 marshals with Emergency Response Vehicles to identify illegal discharges and 04 vehicles have been purchased for the purpose. Copy of Action Taken Report provided by KSPCB is appended as ***Annexure VII.***

Further, TNPCB provided sampling and analysis of the industries located in the periphery and results. Whereas TNPCB has not found any defaulters up to December, 2021.

In view of above, CPCB, RD, Bengaluru again insisted KSPCB vide letter dated 10.01.2022 to ensure strict compliance of the directions of the aforesaid Hon'ble NGT Order dated 14.12.2021 and recommendations of the Joint Committee. In case of failing to comply, shall attract actions under Section 18(1)(b) of the Water (Prevention and Control of Pollution) Act, 1974.

(6) With regard to Environmental Compensation be imposed by SPCBs after evaluating performance of STPs and identification of defaulters upon Random Verification, EC has to be imposed on any defaulters or violators causing pollution into the River Thenpennai by KSPCB and TNPCB for the year 2021-22.

KSPCB has to provide updated information on the list of industries with amount of EC imposed, date of inspection / physical verification with sampling or analysis carried out for the year 2021-22.

Whereas TNPCB has not found any defaulters up to December, 2021.

It is informed that, BWSSB STPs upgradation project awarded to IISC is completed and the final draft report has been forwarded to KSPCB for providing

technical inputs and assessment of Environmental Compensation in case of defaulters.

In view of above, CPCB, RD, Bengaluru again insisted KSPCB vide letter dated 10.01.2022 to ensure strict compliance of the directions of the aforesaid Hon'ble NGT Order dated 14.12.2021 and recommendations of the Joint Committee. In case of failing to comply, shall attract actions under Section 18(1)(b) of the Water (Prevention and Control of Pollution) Act, 1974.

(7) With regard to Sewage and Solid Waste Management in the villages (13) adjoining River Thenpennai up till Kelavarapalli, Block Development Officer (monitored by TNPCB) may ensure the completion of the activities related to sewage and solid waste management as per timelines.

TNPCB has provided the same status of the Sewage and Solid Waste Management in the villages (13) adjoining River Thenpennai up till Kelavarapalli and informed that the same is under progress.

In view of above, the Regional Officer, Krishnagiri TNPCB requested member secretary, TNPCB vide letter dated 30.12.2021 that necessary directions may be issued to the Block Development Officer, Hosur Panchayat Union, Hosur, Krishnagiri to comply with the following;

i. The Hosur Panchayat Union shall comply with the provisions of Solid Waste Management Rules, 2016 and shall comply with the orders passed by the Hon'ble NGT, in O.A No. 606 of 2018 and Hon'ble NGT (SZ) in O.A No 111 of 2020 from time to time.

ii. The Hosur Panchayat Union shall ensure 100 % collection of solid waste being generated within its jurisdiction with proper segregation, door to door collection, processing and disposal by complying with the provisions of the Solid Waste Management Rules, 2016.

iii. The Hosur Panchayat Union shall operate and maintain the Micro Compost Centre (MCC) installed at Belathur and Bagalur village efficiently and continuously so as to ensure the processing and disposal of solid waste by complying with the Solid Waste Management Rules, 2016.

iv. The Hosur Panchayat Union shall expedite the installation of plastic shredding machine at Bagalur village on or before 31.01.2022 and the shredded plastics will be utilized for road laying works as reported.

v. The Hosur panchayat union shall expedite the construction of diversion channel with wetland system for the Sokkarasanapalli, Chennasadiram and Kanimangalam villages on or before 31.03.2022 for the treatment of sewage generated in the said villages as reported.

Copy of the Action Taken Report as on December, 2021 submitted by TNPCB is appended as ***Annexure VIII.***

(8) With regard to action point on monitoring trend of water quality and its improvement at major confluence points for the year 2021-22 on a monthly basis, water quality of major confluence points have to be monitored on a regular basis by KSPCB and TNPCB to ensure pollution is under check.

KSPCB has proposed to install online monitoring to monitor the key parameters at the river Thenpennai at the State border before it leaves Karnataka. These results will be synced with the Integrated Command Control Centre of KSPCB and made available online in the public domain. Periodically the result will be monitored and the graph will be plotted. This would help the KSPCB and CPCB to assess water quality and initiate action whenever there are violations.

Feasibility for installation of Continuous Online Water Quality Monitoring Station be worked out at the inter-state river boundary by KSPCB in Karnataka to ensure that improved quality of water reaches Tamilnadu.

After the waste water is treated by the primary STP's situated in the area under the jurisdiction of Bruhat Bengaluru Mahanagar Palike (BBMP), the water flows along various villages situated on the down stream before entering Tamilnadu. Therefore, it is opined that, a separate STP could be installed at a suitable location in Karnataka border, wherein waste water treated by the primary STP's will be treated once again before it flows to Tamilnadu.

Karnataka State Pollution has not informed any updated status or progress on installation of online monitoring system at the border of Karnataka & Tamilnadu for monitoring quality of water flowing in River Thenpennai. However, they informed that the same is proposed to be installed at the border of Karnataka and Tamilnadu.

Initiatives and tangible progress is required for installation of Continuous Online Water Quality Monitoring Station at the inter-state river boundary by KSPCB in Karnataka to ensure that improved quality of water reaches Tamilnadu.

(9) BBMP has not provided status of compliance and action taken report with respect to Water Quality of the water flowing in River Thenpennai be maintained pristine and tested for its characteristics in the respective jurisdictions.

Lakes Department, BBMP has not provided status of compliance and action taken report with respect to Water Quality of the water flowing in River Thenpennai be maintained pristine and tested for its characteristics in the respective jurisdictions and therefore not complied with the Hon'ble NGT Order dated 14.12.2021.

(10) With respect to construction of wetlands by Bangalore Development Authority (BDA), the activity needs to be completed within the stipulated timelines and the outcomes are to be provided to the Joint Committee.

The status of development of construction of wetlands provided by Bangalore Development Authority was submitted to Hon'ble NGT in the Joint Progress Report (Trimonthly), September 2021. It has been informed that the desilting work in Bellandur and Varthur lakes are underway and will be completed on 23.11.2022.

CHAPTER IV
CONCLUDING REMARKS

While reviewing the progress made on the recommendations of the Joint Committee Report, with regard to performance evaluation of STPs in Bengaluru BWSSB STPs upgradation project awarded to IISC is completed. The draft final IISC report is submitted with recommendations for Continuous monitoring of STPs necessary to ensure long term compliance with NGT standards. It is submitted that, a final report may be submitted by BWSSB with time bound action plans for meeting the standards in case of all STPs along with technical inputs of KSPCB before implementation. The final draft report has been forwarded to KSPCB for providing technical inputs and assessment of Environmental Compensation in case of defaulters.

With regard to flow measurements of major tanks, storm water drains, major confluence points on River Thenpennai and maintenance of Water Quality of the water flowing into River Thenpennai to be pristine and testing its characteristics in the respective jurisdictions no response is received from the Chief Secretary, Government of Karnataka. Despite letters and communications to the Chief Secretary, Government of Karnataka enclosing directions of Hon'ble NGT Order dated 14.12.2021 that *"the Chief Secretary, State of Karnataka is directed to review the action taken by the respective department and if there is any gap found, then issue necessary direction to the concerned departments for implementing the directions within their State and if any support is required from the Government level then provide both technical as well as financial support in this regard..."* no steps or actions appears to have been taken by the department in this regard.

In this regard, Chief Secretary, Government of Karnataka is required to take lead and hold responsibility to ensure compliance by the concerned departments as per the provisions of the Karnataka Lake Conservation and Development Authority Act, 2014 which stipulates function of the authority under Section 5.

Water quality analysis result of Mugalur, Karnataka provided by Karnataka SPCB, which is important to ascertain the water quality at the exit point of Inter State Border in Karnataka reveal that there is improvement of water quality in terms of dissolved oxygen is reported only in November, 2021.

Further, water quality analysis of River Thenpennai at the interstate location Sokkarasanapalli in Tamilnadu was provided by TNPCB. In sokkarasanapalli, Tamilnadu the water quality analysis results (as on

December 2021) reveal that the water quality falls under Class E as per Designated Best Use Criteria. However, improvement of water quality in terms of dissolved oxygen is reported only in November, 2021.

Upon reviewing the reports of analysis of water quality of River Thenpennai by CPCB, TNPCB and KSPCB, the water quality analysis results (as on December 2021) reveal that the water quality falls under Class E as per Designated Best Use Criteria.

In addition to above, initiatives and tangible progress are required for installation of Continuous Online Water Quality Monitoring Station at the inter-state river boundary by KSPCB in Karnataka to ensure that improved quality of water reaches Tamilnadu.

It is submitted that, with regard to Solid Waste Management, Regional Officer, Krishnagiri TNPCB requested member secretary, TNPCB vide letter dated 30.12.2021 that directions under Section 5 of Environment (Protection) Act, 1986 may be issued to the Block Development Officer, Hosur Panchayat Union, Hosur, Krishnagiri for necessary compliance.

It is humbly submitted that the matter require time bound action plan from Karnataka State Pollution Control Board and BWSSB for ensuring compliance under the guidance of the Chief Secretary, Government of Karnataka for providing a consolidated progress report (based on the individual progress reports of the concerned departments in Karnataka viz., BWSSB, BDA, BBMP, Minor Irrigation and KSPCB) on trimonthly basis to the Hon'ble Tribunal, Southern Zone, Chennai with a copy to Central Pollution Control Board, Regional Directorate, Bengaluru.

In view of no much progress from the concerned departments, Government of Karnataka including BWSSB and KSPCB, CPCB, RD Bengaluru has proposed to initiated action against BWSSB and KSPCB under Section 5 of Environment (Protection) Act, 1986 & Section 18(1)(b) of the Water (Prevention and Control of Pollution) Act, 1974 for treatment and utilization of sewage for restoration of water quality of River.

(Note: CPCB Joint Progress Report (Trimonthly) has been jointly prepared by RD, Bengaluru and RD, Chennai in compliance to the Hon'ble NGT Order dated 14.12.2021. Email concurrence has been obtained from RD, Chennai)

S Suresh

(S Suresh)

Item No.02:

BEFORE THE NATIONAL GREEN TRIBUNAL

SOUTHERN ZONE, CHENNAI

Original Application No.111 of 2020 (SZ)

(Through Video Conference)

IN THE MATTER OF:

Tribunal on its own motion SUO MOTU
Based on the News Item in Tamil Newspaper Dinamalar
Chennai Edition dated 13.07.2020, "Frothing of
Chemical foam in the River Thenpennai.

...Applicant(s)

Versus

The Principal Secretary to Government,
Public Works Department,
Secretariat, Fort St. George,
Chennai – 600 009 and others. ...Respondent(s)

Date of Hearing: 14.12.2021.

CORAM:

HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER

HON'BLE DR. SATYAGOPAL KORLAPATI, EXPERT MEMBER

For Applicant(s) By Court

For Respondent(s): Dr. D. Shanmuganathan for R1, R2, R4 & R7
Mr. S. Sai Sathya Jith for R5
Ms. Ojas Sivakumar represented
Mr. M.R. Gokul Krishnan for Karnataka State pollution Control Board.

ORDER

1. As per Judgment dated 28.06.2021, this Tribunal had disposed of the matter with following directions:-

i) "The Joint Committee report dated 20.11.2020 and further report of November, 2020 and subsequent progress report of the Joint Committee dated 02.06.2021 which are extracted above are recorded and accepted.

ii) *The concerned Departments mentioned in the Joint Committee report are directed to implement the directions issued by the Joint Committee, so as to resolve the issue permanently within a time frame provided by them.*

iii) *Chairman, Karnataka Pollution Control Board and Chairman, Tamil Nadu Pollution Control Board are directed to monitor the implementation of the recommendations made by the Joint Committee by the respective Departments and also assess the improvement of the water quality in their respective areas and if any, further action is to be taken, they are directed to take further action against those who are not complying with the directions issued by the Joint Committee, which results in further pollution to the Thenpennai River and also the connecting rivers which reaches the Kelavarapalli reservoir from where the water is released to Thenpennai River from State of Karnataka.*

iv) *The Central Pollution Control Board, Regional Office, Bangalore as well as Regional Office Chennai are also directed to monitor the implementation of the recommendations made by the Joint Committee and if there is any violation or non-implementation of the directions, then they are also directed to issue necessary direction to the defaulting Department to comply with the same and on their failure, take appropriate action against them in accordance with law.*

v) *The Chief Secretary, State of Karnataka is directed to review the action taken by the respective department and if there is any gap found, then issue necessary direction to the concerned departments for implementating the directions within their State and if any support is required from the Government level then provide both technical as well as financial support in this regard.*

vi) *The Chief Secretary, State of Tamil Nadu is also directed to monitor the directions issued by the Joint Committee as far as State of Tamil Nadu is concerned and also the timeline provided by the Tamil Nadu Pollution Control Board in implementation of the Solid Waste Management Rules, 2016 in these areas which also causes some sort of pollution to water quality in Thenpennai River.*

vii) *The Chief Secretary, State of Karnataka, Chief Secretary, State of Tamil Nadu, Central Pollution Control Board, Regional Office, Bangalore and Chennai and respective Chairman of the Pollution Control Boards are directed to file periodical progress report to this Tribunal, once in three months along with the water quality*

analysis so as ascertain the improvement caused on account of the implementation of the recommendations made by the respective departments and if they found any gap in spite of the implementation of the recommendations, they are also directed to submit their further remedial measures to be taken by the respective department to resolve the issue permanently when they are filing their progress report, once in three months.

viii) The Registry is directed to communicate this order to the Chief Secretary, State of Karnataka, Chief Secretary, State of Tamil Nadu, Chairman of both the State Pollution Control Board and also to the Regional Directors of Central Pollution Control Board, Bangalore as well as Chennai for information and compliance of the directions as directed above.

ix) The office is directed to place the reports as and when received before this Tribunal for consideration."

2. As per direction No. 3 the Chairman, Karnataka State Pollution Control Board (KASPCB) and Chairman, Tamil Nadu Pollution Control Board (TNPCB) were directed to monitor the implementation of the recommendations made by the Joint Committee by the respective Departments and also assess the improvement of the water quality in their respective areas and if any further action is to be taken, they were directed to take further action against those who are not complying with the recommendations made by the Joint Committee, which results in further pollution to the Thenpennai River and also the connecting rivers from State of Karnataka which reaches the Kelavarapalli reservoir from where the water is released to Thenpennai River.

3. As per condition No. 4 Central Pollution Control Board, Integrated Regional Office, Bangalore as well as Regional Office Chennai were also directed to monitor the implementation of the recommendations made by the Joint Committee and if there was any violation or non-implementation of the directions, then they were also directed to issue necessary direction to the defaulting Department to comply with the same and on their failure, take appropriate action against them in accordance with law.

4. The Chief Secretary, State of Karnataka was directed to review the action taken by the respective department and if there is any gap found, then to issue necessary direction to the concerned departments for implementation of the directions within their State and if any action was required from the Government level then provide both technical as well as financial support in this regard.

5. The Chief Secretary, State of Tamil Nadu was also directed to implement certain recommendations made by the Joint Committee as well as the Tamil Nadu Pollution Control Board (TNPCB) regarding implementation of the Solid Waste Management Rules, 2016 in these areas which also causes some sort of pollution to water quality in Thenpennai River.

6. The respondents were directed to submit the periodical reports once in three months. With the above observations and directions, the application is disposed of. Though above six months were over, no such reports have been received.

7. Even recently, in some of the newspaper reports, it was reported that similar things are recurring in Thenpennai River when water is being released from Kelavarapalli reservoir.

8. Under such circumstances, we direct the above authorities to submit the compliance report and the action taken report, if there is any non-compliance by the respective departments on or before ***11.01.2022*** by e-filing in the form of searchable PDF/OCR Supportable PDF and not in the form of Image PDF along with necessary hardcopies to be produced as per rules. If they did not submit the report as directed, then they are directed to appear before this Tribunal through Video Conference, to show cause as to why action should not be taken against them for non-compliance of the direction issued by this Tribunal as contemplated under Section 25 read with Section 26 & 28 of the National Green Tribunal Act, 2010.

9. The Registry is directed to communicate this order to the Chief Secretary, State of Karnataka, Chief Secretary, State of Tamil Nadu, Chairman of both the State Pollution Control Board and also to the Regional Directors of Central Pollution Control Board, Bangalore as well as Chennai along with the Judgment dated 28.06.2021 for their information, reference and compliance of the direction.

10. For consideration of compliance report, post on ***11.01.2022.***

.....J.M.
(Justice K. Ramakrishnan)

Sd

.....E.M.
(Dr. Satyagopal Korlapati)

O. A. No. 111/2020(SZ)
14.12.2021, Sr.

Annexure II

Gmail

PKSELVI SIVA <pkselvi.rdb@gmail.com>

Compliance of Hon'ble NGT Order dated 28.06.2021 in the matter of O.A No 111 of 2020 regarding River Thenpennai

PKSELVI SIVA <pkselvi.rdb@gmail.com> Wed, Dec 1, 2021 at 6:35 PM
To: sepbc52@yahoo.co.in, DURUGAPPA K <sebgl@kpwd.gov.in>, SEMIBNG <SEMIBNG@gmail.com>, senpcb@gmail.com, acbloresouth@gmail.com, navaneethmrit@gmail.com, Dhananjaya Karnam EE <danbwssb@gmail.com>, eewwm3@bwb.gov.in, navaneethmsrit <navaneethmsrit@gmail.com>, ee mdpura1 <ee.mdpura1@gmail.com>, mahadevagowda123 <mahadevagowda123@gmail.com>, DR H R Mahadev <commissioner-bda@ka.gov.in>, eeeasthr <eeeasthr@gmail.com>, eeeasthsr <eeeasthsr@gmail.com>, hindustani7707 <hindustani7707@gmail.com>, ravicpillappa@gmail.com, karthicpcb@gmail.com
Cc: ravicpillappa@gmail.com, SEMIBNG <SEMIBNG@gmail.com>, rdohosur@gmail.com, sepbc52@yahoo.co.in, senpcb@gmail.com, acbloresouth@gmail.com, navaneethmrit@gmail.com, Dhananjaya Karnam EE <danbwssb@gmail.com>, eewwm3@bwb.gov.in, deehosur <deehosur@gmail.com>, DURUGAPPA K <sebgl@kpwd.gov.in>, navaneethmsrit <navaneethmsrit@gmail.com>, ee mdpura1 <ee.mdpura1@gmail.com>, mahadevagowda123 <mahadevagowda123@gmail.com>, eeeasthsr <eeeasthsr@gmail.com>, eeeasthr <eeeasthr@gmail.com>, hindustani7707 <hindustani7707@gmail.com>, Suresh S <ssuresh.cpcb@nic.in>, Suresh satyanarayana <cpcbsuresh@gmail.com>

Sir/Madam,

This has reference to the trailing mail on the Hon'ble NGT Order dated **28.06.2021** in the matter of O.A No. 111 of 2020 on "Frothing of Chemical Foam in the River Thenpennai"for filing Status of Compliance once in three months.

In this regard, all the concerned are requested to attend the Video Conference scheduled tomorrow i.e. 02/12/2021 at 11:00 AM for updating the status of compliance on the Action points pertaining to the concerned department.

It is requested to submit the updated status of compliance in the format already circulated by CPCB on or before 15/12/2021 for filing the Compliance report before Hon'ble NGT.

With Warm Regards,

Selvi P K
Scientist D
Regional Directorate
CPCB, Bengaluru
9868166753

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Gmail PKSELVI SIVA <pkselvi.rdb@gmail.com>

Compliance of Hon'ble NGT Order dated 28.06.2021 in the matter of O.A No 111 of 2020 regarding River Thenpennai

PKSELVI SIVA <pkselvi.rdb@gmail.com> Thu, Dec 2, 2021 at 11:53 AM
To: sepbc52@yahoo.co.in, DURUGAPPA K <sebgl@kpwd.gov.in>, SEMIBNG <SEMIBNG@gmail.com>, senpcb@gmail.com, acbloresouth@gmail.com, navaneethmrit@gmail.com, Dhananjaya Karnam EE <danbwssb@gmail.com>, eewwm3@bwb.gov.in, navaneethmsrit <navaneethmsrit@gmail.com>, ee mdpura1 <ee.mdpura1@gmail.com>, mahadevagowda123 <mahadevagowda123@gmail.com>, DR H R Mahadev <commissioner-bda@ka.gov.in>, eeeasthr <eeeasthr@gmail.com>, eeeasthsr <eeeasthsr@gmail.com>, hindustani7707 <hindustani7707@gmail.com>, ravicpillappa@gmail.com, karthicpcb@gmail.com, cs <cs@karnataka.gov.in>, secyenv-fee@karnataka.gov.in, seacsec@gmail.com
Cc: ravicpillappa@gmail.com, SEMIBNG <SEMIBNG@gmail.com>, rdohosur@gmail.com, sepbc52@yahoo.co.in, senpcb@gmail.com, acbloresouth@gmail.com, navaneethmrit@gmail.com, Dhananjaya Karnam EE <danbwssb@gmail.com>, eewwm3@bwb.gov.in, deehosur <deehosur@gmail.com>, DURUGAPPA K <sebgl@kpwd.gov.in>, navaneethmsrit <navaneethmsrit@gmail.com>, ee mdpura1 <ee.mdpura1@gmail.com>, mahadevagowda123 <mahadevagowda123@gmail.com>, eeeasthsr <eeeasthsr@gmail.com>, eeeasthr <eeeasthr@gmail.com>, hindustani7707 <hindustani7707@gmail.com>, Suresh S <ssuresh.cpcb@nic.in>, Suresh satyanarayana <cpcbsuresh@gmail.com>

Sub: Hon'ble NGT, Southern Zone, Chennai order in the matter of O.A. 111 of 2020 (SZ) regarding "Frothing of Chemical Foam in the River Thenpennai" – Compliance

Ref: (i) Order of Hon'ble NGT, Southern Zone, Chennai dated 28.06.2021 (copy enclosed)

Sir,

In the matter of O.A 111 of 2020, a SuoMotu case registered by the Hon'ble Tribunal, SZ, Chennai on the basis of the newspaper report published in Dinamalar, Chennai City supplement Edition dated 13.07.2020 under the caption "Frothing of Chemical Foam in the River Thenpennai", the issues alleged are large scale foam in Thenpennai River due to untreated chemical effluents discharged from Kelavarapalli Reservoir and residential sewage is also mixed with the water affecting water quality.

The Hon'ble National Green Tribunal, Chennai vide order dated 28.06.2021 disposed of the case and directed that, " … *(vii) The Chief Secretary, State of Karnataka, Chief Secretary, State of Tamil Nadu, Central Pollution Control Board, Regional Office, Bangalore and Chennai and respective Chairman of the Pollution Control Boards are directed to file periodical progress report to this Tribunal, once in three months along with the water quality analysis so as ascertain the improvement caused on account of the implementation of the recommendations made by the respective departments and if they found any gap in spite of the implementation of the recommendations, they are also directed to submit their further remedial measures to be taken by the respective department to resolve the issue permanently when they are filing their progress report, once in three months."*

In this regard, Central Pollution Control Board has filed Progress Report in September, 2021 and the same is attached for reference. A meeting was also conducted with the concerned departments viz., Karnataka SPCB, TN SPCB, PWD (TN), Minor Irrigation & Water Resource Management, BWSSB on 02.12.2021 (11:00 AM). It was informed that the updated status on the action points be submitted by all the concerned departments on or before 15.12.2021 so as to enable CPCB to file the progress report by end of December 2021 with the approval of Competent Authority, CPCB, Delhi.

It is informed that, Lakes Department under BBMP was directed to carryout measurement and monitoring of water quality in major tanks and confluence points leading to River Thenpennai in compliance to the Hon'ble NGT directions and the same is not complied. It is requested to ensure compliance by Lakes Department, BBMP in consultation with other concerned departments and submit the report to CPCB at the earliest.

CPCB will conduct next meeting to discuss the status of compliance and progress report on 15.12.2021.

With Warm Regards,

Selvi P K
Scientist D
Regional Directorate
CPCB, Bengaluru
9868166753

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2 attachments

JOINT PROGRESS REPORT_OA No 111 of 2020 (1).pdf
11463K

Hon'ble NGT Order dated 28.06.2021.pdf
3045K

Gmail PKSELVI SIVA <pkselvi.rdb@gmail.com>

Compliance of Hon'ble NGT Order dated 28.06.2021 in the matter of O.A No 111 of 2020 regarding River Thenpennai

PKSELVI SIVA <pkselvi.rdb@gmail.com> Thu, Dec 23, 2021 at 6:57 PM
To: sepbc52@yahoo.co.in, DURUGAPPA K <sebgl@kpwd.gov.in>, SEMIBNG <SEMIBNG@gmail.com>, senpcb@gmail.com, acbloresouth@gmail.com, navaneethmrit@gmail.com, Dhananjaya Karnam EE <danbwssb@gmail.com>, eewwm3@bwb.gov.in, navaneethmsrit <navaneethmsrit@gmail.com>, ee mdpura1 <ee.mdpura1@gmail.com>, mahadevagowda123 <mahadevagowda123@gmail.com>, DR H R Mahadev <commissioner-bda@ka.gov.in>, eeeasthr <eeeasthr@gmail.com>, eeeasthsr <eeeasthsr@gmail.com>, hindustani7707 <hindustani7707@gmail.com>, ravicpillappa@gmail.com, karthicpcb@gmail.com
Cc: ravicpillappa@gmail.com, SEMIBNG <SEMIBNG@gmail.com>, rdohosur@gmail.com, sepbc52@yahoo.co.in, senpcb@gmail.com, acbloresouth@gmail.com, navaneethmrit@gmail.com, Dhananjaya Karnam EE <danbwssb@gmail.com>, eewwm3@bwb.gov.in, deehosur <deehosur@gmail.com>, DURUGAPPA K <sebgl@kpwd.gov.in>, navaneethmsrit <navaneethmsrit@gmail.com>, ee mdpura1 <ee.mdpura1@gmail.com>, mahadevagowda123 <mahadevagowda123@gmail.com>, eeeasthsr <eeeasthsr@gmail.com>, eeeasthr <eeeasthr@gmail.com>, hindustani7707 <hindustani7707@gmail.com>, Suresh S <ssuresh.cpcb@nic.in>, Suresh satyanarayana <cpcbsuresh@gmail.com>

Sub: Hon'ble NGT, Southern Zone, Chennai order in the matter of O.A. 111 of 2020 (SZ) regarding "Frothing of Chemical Foam in the River Thenpennai" – Compliance

Ref: Orders of Hon'ble NGT, Southern Zone, Chennai dated 14.12.2021 (copy enclosed)

Sir,

In the matter of O.A 111 of 2020, a SuoMotu case registered by the Hon'ble Tribunal, SZ, Chennai on the basis of the newspaper report published in Dinamalar, Chennai City supplement Edition dated 13.07.2020 under the caption "Frothing of Chemical Foam in the River Thenpennai", the issues alleged are large scale foam in Thenpennai River due to untreated chemical effluents discharged from Kelavarapalli Reservoir and residential sewage is also mixed with the water affecting water quality.

The Hon'ble National Green Tribunal, Chennai vide order dated 14.12.2021 mentioned that, 'Even recently, in some of the newspaper reports, it was reported that similar things are recurring in Thenpennai River when water is being released from Kelavarapalli reservoir.' The following directions are issued as below:

"(i) Under such circumstances, we direct the above authorities to submit the compliance report and the action taken report, if there is any non-compliance by the respective departments on or before 11.01.2022 by e-filing ....

..... If they did not submit the report as directed, then they are directed to appear before this Tribunal through Video Conference, to show cause as to why action should not be taken against them for non-compliance of the direction issued by this Tribunal as contemplated under Section 25 read with Section 26 & 28 of the National Green Tribunal Act, 2010."

In view of above, it is requested to ensure compliance of the Hon'ble NGT Order dated 14.01.2021 and submit the compliance report before Hon'ble NGT. In this regard, a meeting is scheduled to be held on **24.12.2021 (04:00 PM)** through video conferencing. The link for the meeting is meet.google.com/oko-ubzu-yqj.

Encl. (i) NGT Order dated 14.12.2021
(ii) NGT Order dated 28.06.2021

With Warm Regards,

Selvi P K
Scientist D
Regional Directorate

CPCB, Bengaluru
9868166753

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2 attachments

Hon'ble NGT Order dated 28.06.2021.pdf
3045K

NGT Order dated 14.12.2021.pdf
1054K

Gmail PKSELVI SIVA <pkselvi.rdb@gmail.com>

Compliance of Hon'ble NGT Order dated 28.06.2021 in the matter of O.A No 111 of 2020 regarding River Thenpennai

PKSELVI SIVA <pkselvi.rdb@gmail.com> Tue, Dec 28, 2021 at 6:35 PM
To: sepbc52@yahoo.co.in, DURUGAPPA K <sebgl@kpwd.gov.in>, SEMIBNG <SEMIBNG@gmail.com>, senpcb@gmail.com, acbloresouth@gmail.com, navaneethmrit@gmail.com, Dhananjaya Karnam EE <danbwssb@gmail.com>, eewwm3@bwb.gov.in, navaneethmsrit <navaneethmsrit@gmail.com>, ee mdpura1 <ee.mdpura1@gmail.com>, mahadevagowda123 <mahadevagowda123@gmail.com>, DR H R Mahadev <commissioner-bda@ka.gov.in>, eeeasthr <eeeasthr@gmail.com>, eeeasthsr <eeeasthsr@gmail.com>, hindustani7707 <hindustani7707@gmail.com>, ravicpillappa@gmail.com, karthicpcb@gmail.com
Cc: ravicpillappa@gmail.com, SEMIBNG <SEMIBNG@gmail.com>, rdohosur@gmail.com, sepbc52@yahoo.co.in, senpcb@gmail.com, acbloresouth@gmail.com, navaneethmrit@gmail.com, Dhananjaya Karnam EE <danbwssb@gmail.com>, eewwm3@bwb.gov.in, deehosur <deehosur@gmail.com>, DURUGAPPA K <sebgl@kpwd.gov.in>, navaneethmsrit <navaneethmsrit@gmail.com>, ee mdpura1 <ee.mdpura1@gmail.com>, mahadevagowda123 <mahadevagowda123@gmail.com>, eeeasthsr <eeeasthsr@gmail.com>, eeeasthr <eeeasthr@gmail.com>, hindustani7707 <hindustani7707@gmail.com>, Suresh S <ssuresh.cpcb@nic.in>, Suresh satyanarayana <cpcbsuresh@gmail.com>

Sub: Hon'ble NGT, Southern Zone, Chennai order in the matter of O.A. 111 of 2020 (SZ) regarding "Frothing of Chemical Foam in the River Thenpennai" – Compliance

Ref: Orders of Hon'ble NGT, Southern Zone, Chennai dated 14.12.2021 (copy enclosed)

Sir,

In the matter of O.A 111 of 2020, a SuoMotu case registered by the Hon'ble Tribunal, SZ, Chennai on the basis of the newspaper report published in Dinamalar, Chennai City supplement Edition dated 13.07.2020 under the caption "Frothing of Chemical Foam in the River Thenpennai", the issues alleged are large scale foam in Thenpennai River due to untreated chemical effluents discharged from Kelavarapalli Reservoir and residential sewage is also mixed with the water affecting water quality.

The Hon'ble National Green Tribunal, Chennai vide order dated 14.12.2021 mentioned that, 'Even recently, in some of the newspaper reports, it was reported that similar things are recurring in Thenpennai River when water is being released from Kelavarapalli reservoir…' and issued following directions as below:

"(i) Under such circumstances, we direct the above authorities to submit the compliance report and the action taken report, if there is any non-compliance by the respective departments on or before 11.01.2022 by e-filing ....

..... If they did not submit the report as directed, then they are directed to appear before this Tribunal through Video Conference, to show cause as to why action should not be taken against them for non-compliance of the direction issued by this Tribunal as contemplated under Section 25 read with Section 26 & 28 of the National Green Tribunal Act, 2010."

In this regard, a meeting was held on 24.12.2021 (04:00 PM) through video conferencing, wherein the following issues and concerns were discussed;

i. With regard to Recommendations in the Joint Committee Report in the matter of O.A No 111 of 2020 (copy attached as Annexure) related to flow measurements of major tanks, storm water drains and major confluence points in River Thenpennai; water quality of the water flowing in River Thenpennai in their respective jurisdictions the status of compliance be provided to CPCB by BWSSB, BDA, BBMP, Minor Irrigation and Lakes Department.

ii. Details of sewage generation, management and the capacity vis-a-vis efficiency of STPs in Bengaluru for treatment of sewage generated from outflowing into River

Thenpennai be updated in the Joint Committee Report by BWSSB (copy attached).

iii. The compliance report and Action taken report submitted by TNPCB be updated as on December 2021 and submit the same with photographic evidence of the progress made with regard to solid waste management.

Hon'ble NGT also directed that, *"...CPCB, RD, Bangalore and Chennai are directed to monitor the implementation of the recommendations made by the Joint Committee and if there is any violation or non-implementation of the directions, then they are also directed to issue necessary direction to the defaulting Department to comply with the same and on their failure, take appropriate action against them in accordance with law. .."*

In view of above, it is requested to ensure compliance of the Hon'ble NGT Order dated 14.01.2021 and submit the compliance report before Hon'ble NGT on or before 11.01.2022.

With Warm Regards,

Selvi P K
Scientist D
Regional Directorate
CPCB, Bengaluru
9868166753

[Quoted text hidden]

4 attachments

Hon'ble NGT Order dated 28.06.2021.pdf
3045K

NGT Order dated 14.12.2021.pdf
1054K

Status of Domestic Sewage Management in Bangalore.docx
19K

Annexure V_Status of STPs in K&C and Hebbal Valley by BWSSB.pdf
598K

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA

NGT MATTER (On Priority)

File No. Tech(39)/Legal(NGT)/RDS/2021-22/730

January 10, 2022

To

The Chairman
Karnataka State Pollution Control Board
Parisara Bhavan, #49, Church Street
Bengaluru – 560 001

Sub: Hon'ble NGT, Southern Zone, Chennai order in the matter of O.A. 111 of 2020 (SZ) regarding "Frothing of Chemical Foam in the River Thenpennai" – Compliance

Ref: Orders of Hon'ble NGT, Southern Zone, Chennai dated 14.12.2021 (copy enclosed)

Sir,

In the matter of O.A 111 of 2020, a SuoMotu case registered by the Hon'ble Tribunal, SZ, Chennai on the basis of the newspaper report published in Dinamalar, Chennai City supplement Edition dated 13.07.2020 under the caption "Frothing of Chemical Foam in the River Thenpennai", the issues alleged are large scale foam in Thenpennai River due to untreated chemical effluents discharged from Kelavarapalli Reservoir and residential sewage is also mixed with the water affecting water quality.

The Hon'ble National Green Tribunal, Chennai vide order dated 14.12.2021 mentioned that, '*Even recently, in some of the newspaper reports, it was reported that similar things are recurring in Thenpennai River when water is being released from Kelavarapalli reservoir.*'

CPCB, RD, Bengaluru sought compliance status of the Action points and recommendations of the Joint Committee Report, June 2021 vide email communications and letters dated 01.12.2021, 02.12.2021, 23.12.2021 and 28.12.2021. CPCB, RD, Bengaluru also conducted meetings on 02.12.2021 and 24.12.2021 to discuss the status of compliance and action taken report on the same. However, no proactive actions and tangible progress has been made on the action points and recommendations of the Joint Committee Report, June 2021.

In this connection, the action points and recommendations due for action are related to flow measurement and water quality analysis of major tanks/lakes flowing into River Thenpennai, random inspection of water polluting industries in the periphery of River Thenpennai for the year 2021-22 and to impose Environmental Compensation on the defaulting units, flow measurements of major tanks/storm water drains/ major confluence points in River Thenpennai, installation of online monitoring station in a suitable location of River Thenpennai near the interstate border, Assessment of treated sewage from STPs and to impose Environmental Compensation on the defaulting STPs.

Contd...2/-

क्षेत्रीय निदेशालय (दक्षिण) : निसर्ग भवन, ए-ब्लाक, प्रथम एवं द्वितीय तल, तिम्मय्या रोड, 7-डी मैन, शिवनगर, बेंगलूरु – ५६० ०७९.
Regional Directorate (South) : " Nisarga Bhawan ", A-Block, 1st & 2nd Floors, Thimmaiah Road, 7th D - Main, Shivanagar, Bengaluru - 560 079.
दूरभाष / Telephone : 080-23233739. 23233827, 23233996, 23233600, 23232559, 23226002, 23222539, Fax : 080-23234059
ई-मेल / E-mail : cpcbszo@yahoo.com, zobangalore.cpcb@nic.in

प्रधान कार्यालय : परिवेश भवन, पूर्वी अर्जुन नगर, दिल्ली- ११० ०३२.
Head Office : Parivesh Bhawan, East Arjun Nagar, Delhi - 110 032.
दूरभाष / Telephone : 011-43102030, Fax : 22305793, 22307078, 22307079, 22301932, 22304948
ई-मेल / E-mail : cpcb@nic. in वेबसाईट / Website : www.cpcb.nic.in

It is informed that, BWSSB STPs upgradation project awarded to IISC is completed and the final draft report is forwarded herewith for providing technical inputs and assessment of Environmental Compensation in case of defaulters. Copy of the final draft BWSSB STPs upgradation Report and Joint Progress Report (Trimonthly), Sep 2021 filed before Hon'ble NGT are attached for reference and compliance, thereof.

In view of above, it is reemphasized to ensure strict compliance of directions of the Hon'ble NGT vide order dated 14.12.2021 and recommendations of the Joint Committee Report, June 2021 in the matter of O.A No. 111 of 2020 regarding "Frothing of Chemical Foam in the River Thenpennai". Therefore, in case of failing to comply shall attract actions under Section 18(1)(b) of the Water (Prevention and Control of Pollution) Act, 1974.

Yours faithfully

S. Suresh

(S. Suresh)
Regional Director
9480672128
cpcbsuresh@gmail.com

Encl. (i) NGT Order dated 14.12.2021
(ii) NGT Order dated 28.06.2021
(iii) Joint Progress Report, Sep 2021

Copy to:

1. The Chief Secretary, Government of Karnataka
   Government of Karnataka
   Room No. 320, 3rd Floor, Vidhana Soudha
   Bengaluru – 560 001

2. The Chairman,
   Bangalore Water Supply and Sewerage Board (BWSSB)
   2nd Floor, Cauvery Bhawan
   Kempegowda Road, Bengaluru – 560 009

3. The Chairman
   Bangalore Development Authority (BDA)
   Kumara Park West, T.Chodaiah Road
   Bengaluru – 560 020

4. The Chief Engineer
   Lakes Department,
   N.R Square, Bengaluru - 560002

S. Suresh

(S. Suresh)

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA

NGT MATTER (On Priority)

File No. Tech(39)/Legal(NGT)/RDS/2021-22/676

December 27, 2021

To

1. The Chief Secretary to Government
Government of Tamilnadu
Namakkal Kavignar Maaligai
Fort St.George, Chennai 600 009

2. The District Collector
Krishnagiri District
First Floor Collectorate
Krishnagiri – 635001

3. The Engineer-in-Chief
Water Resource Organisation and
Chief Engineer (General), PWD
Chepauk, Chennai – 600005.

4. The Superintending Engineer,
Water Resource Organisation
Public Works Department
Pennaiyar Basin Circle, Chengam Road
Opp. Ramanashrmam, Tiruvannamalai - 606603

5. The Chief Engineer
Public Works Department
K.R Circle, Bangalore – 560 001

6. The Chief Engineer
Water Resources Department Organisation
Ananda Rao Circle, Bangalore -560 009

7. The Commissioner
Bangalore Development Authority (BDA)
Kumara Park West, T.Chodaiah Road
Bengaluru – 560 020

10. The Chief Secretary to Government
Government of Karnataka
Room No. 320, 3rd Floor, Vidhana Soudha
Bengaluru – 560 001.

11. The Chairman
Tamilnadu Pollution Control Board
76, Mount Salai
Guindy, Chennai - 600 032

12. The Chairman
Karnataka State Pollution Control Board
Parisara Bhavan, #49, Church St, Bengaluru – 560 001

13. The Deputy Commissioner and District Magistrate
Kempegowda Road, Behind Kandaya Bhavana
Bengaluru Urban District
Bengaluru- 560009

14. The Secretary
Department of Environment
Govt. Secretariat, Fort, St. George
Chennai – 600 009

15. The Secretary
Department of Forest, Environment & Ecology
Room no. 708, Gate 2, Multi Storied Building
Dr. Ambedkar Veedhi, Bengaluru – 560 001

16. The Commissioner
Bruhat Bengaluru Mahanagara Palike (BBMP)
N.R Square, Bengaluru – 560 002

क्षेत्रीय निदेशालय (दक्षिण) : निसर्ग भवन, ए–ब्लाक, प्रथम एवं द्वितीय तल, तिम्मय्या रोड, 7–डी मैन, शिवनगर, बेंगलूरु – ५६० ०७९.
Regional Directorate (South) : " Nisarga Bhawan ", A-Block, 1st & 2nd Floors, Thimmaiah Road, 7th D - Main, Shivanagar, Bengaluru - 560 079.
दूरभाष / Telephone : 080-23233739. 23233827, 23233996, 23233600, 23232559, 23226002, 23222539, Fax : 080-23234059
ई–मेल / E-mail : cpcbszo@yahoo.com, zobangalore.cpcb@nic.in

प्रधान कार्यालय : परिवेश भवन, पूर्वी अर्जुन नगर, दिल्ली– ११० ०३२.
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ई–मेल / E-mail : cpcb@nic. in वेबसाईट / Website : www.cpcb.nic.in

8. The Engineer-in-Chief
Bangalore Water Supply and Sewerage Board (BWSSB)
2nd Floor, Cauvery Bhawan
Kempegowda Road, Bengaluru – 560 009

9. Superintending Engineer
Minor Irrigation & Ground Water Development Circle, Jayanagar Complex,
Bengaluru 560041

18. The Chief Engineer
Lakes Department,
N.R Square, Bengaluru - 560002

Sub: Hon'ble NGT, Southern Zone, Chennai order in the matter of O.A. 111 of 2020 (SZ) regarding "Frothing of Chemical Foam in the River Thenpennai" – Compliance

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..... If they did not submit the report as directed, then they are directed to appear before this Tribunal through Video Conference, to show cause as to why action should not be taken against them for non-compliance of the direction issued by this Tribunal as contemplated under Section 25 read with Section 26 & 28 of the National Green Tribunal Act, 2010."

In this regard, a meeting was held on 24.12.2021 (04:00 PM) through video conferencing, wherein the following issues and concerns were discussed;

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iii. The compliance report and Action taken report submitted by TNPCB be updated as on December 2021 and submit the same with photographic evidence of the progress made with regard to solid waste management.

Hon'ble NGT also directed that, *"...CPCB, RD, Bangalore and Chennai are directed to monitor the implementation of the recommendations made by the Joint Committee and if there is any violation or non-implementation of the directions, then they are also directed to issue necessary direction to the defaulting Department to comply with the same and on their failure, take appropriate action against them in accordance with law. .."*

In view of above, it is requested to ensure compliance of the Hon'ble NGT Order dated 14.01.2021 and submit the compliance report before Hon'ble NGT on or before 11.01.2022.

Yours faithfully

S. Suresh

(S. Suresh)
Regional Director
9480672128
cpcbsuresh@gmail.com

Encl. (i) NGT Order dated 14.12.2021
(ii) NGT Order dated 28.06.2021

Final Report

BWSSB STP upgradation Project

IISc Bangalore

22 November 2021

Table of Contents:

1.0 BACKGROUND

In order to meet the new effluent discharge standards given by National Green Tribunal (NGT), an effort is undertaken by the Bangalore Water Supply and Sewerage Board (BWSSB) to upgrade old sewage treatment plants. IISc team was engaged to inspect and recommend suitable modifications to the current treatment process to meet the required standards. The responsibilities included technical visits to all Sewage treatment plant (STP) sites to understand the process, detailed water quality analysis of samples taken from the STPs, giving recommendations based on the water quality analysis, and modelling to ensure effluent meets NGT standards. As part of this effort, technical site visits were carried out to all the STPs and samples were collected at all sites.

List of STPs:

1. K & C valley (60 MLD)
2. Bellandur Amani kere (90 MLD)
3. Kadubeesanhalli phase -1 (50 MLD)
4. Kadugodi (6 MLD)
5. Halasuru (2 MLD)
6. Rajacanal phase -1 (40 MLD)
7. Rajacanal phase -2 (40 MLD)
8. Horamvu Agara (20 MLD)
9. K R Puram phase -1 (20 MLD)
10. Yelemallappa Chettikere (15 MLD)
11. Nagasandra phase -1 (20 MLD)
12. Nagasandra phase -2 (20 MLD)
13. Mallathahalli (5 MLD)
14. Chikkabanavara (5 MLD)
15. Mailasandra phase -1 (75 MLD)
16. Kempabudhi (1MLD)
17. Doddabele (20 MLD)

The team was informed that Madiwala STP was under maintenance and hence was not operational; similarly, V Valley STP is under up-gradation and hence not operating. Further, the team was informed that the Kengeri STP was included in the list by mistake. Therefore these three STP locations were not visited.

2.0 METHODOLOGY:

1. All STP sites were visited. Information about the plant capacity, treatment process, new construction/ rehabilitation and possible issues was obtained at each location. The treatment facility at each location was visually inspected to assess its functioning.
2. Water samples were collected at each site and analyzed. Based on the analyzed effluent, the STPs were classified into three categories: 1) STPs meeting NGT-BNR standards, 2) Marginally underperforming STPs and 3) Poorly performing STPs
3. For STPs requiring intervention, 'as is' models were created using Biowin. The 'as is' models were validated using collected water quality data. The validated models were optimized at full flow.

3.0 PROCEEDINGS OF THE PROJECT

- A report with details of 6 STPs meeting NGT-BNR standards was submitted. The report is attached as Appendix - 3.
- A report with details of 11 STPs requiring intervention was submitted. The report is attached as Appendix - 4.
- A presentation was given in the presence of the Chairman of BWSSB and all BWSSB executive and assistant engineers. The presentation is attached as Appendix - 5.
- Trip reports for all site visits were submitted. These reports are attached as Appendix 6 to 11.

4.0 FINAL RECOMMENDATIONS:

3.1 V Valley 180 MLD STP

- The entire biological treatment units (bio-filters) are below the highest flood level (HFL). As such, even after minor rainfall events, all treatment units get flooded from backwater from the drain. This completely disturbs the treatment process and kills the microbial population in the

biological treatment units. Regeneration of microbial population takes weeks, during which time the quality of effluent is affected.

- Hence the construction of a new 150 MLD treatment plant is recommended instead of rehabilitation of the old plant.

3.2 Doddabele 20MLD STP

- The plant is currently operating at full capacity. The STP is likely to receive more sewage in the near future. Therefore, it is recommended that provisions for increasing the plant's capacity be made to receive and treat the additional sewage.

3.3 Halasuru 2 MLD STP

- A lot of oil and grease were observed in the incoming sewage and SBR basins. It is recommended that the nearby restaurants be given a warning about not letting water with a high concentration of oil and grease get into the mainline. They should be given a directive to install oil and grease traps. Furthermore, an oil and grease trap should be installed at the STP as part of primary treatment.

5.0 CONCLUSIONS:

- All STPs on the list were visited and inspected
- Water quality analysis was done for samples collected from STPs
- Process modifications were suggested for STPs not meeting NGT standard
- Out of 17, STPs studied, 6 STPs are meeting NGT-BNR standards. Out of these 6 STPs, 4 are working at maximum capacity and cannot be expected to take on more load. 2 STPs, namely Chikkabanavara and Nagasandra phase 2 can take on more load. Chikkabanavara is currently only using two of the three SBR basins available on site; with the used use of the third basin, it can take up more load. Nagasandra phase 2 is currently operating at half its capacity and

therefore can take up an additional load till it meets its design capacity. Details for these six plants are given in Appendix - 1 And Appendix - 3.

- Out of the 17, STPs studied, 8 were marginally underperforming in terms of nutrient removal. Out of these 8 four were Extended aeration plants, and 4 were SBRs. Simultaneous nitrification and denitrification by creating aerated and unaerated zones in the aeration basin were suggested as modifications for the Extended aeration plants. The addition of an unaerated mixing stage after the aeration stage was suggested as a modification for the SBR plant. Details of modifications for individual plants is given in Appendix - 4. The standard operating procedure based on the modifications is given in Appendix - 1.
- Out of the 17 STPs studied, 3 were performing very poorly. 2 of these plants were Extended aeration plants, and the remaining one was a UASB plant. The main issue with Extended aeration plants were intermittent operations and insufficient aeration. Inspection and repair of all required equipment were recommended for these plants. Additionally, simultaneous nitrification-denitrification by creating aerated and unaerated zones in the aeration basin were suggested as modifications for proper nutrient removal when the plants are operating continuously. The UASB plant maintenance modifications were suggested for the proper functioning of the technology. Further system modification was given to ensure proper nutrient removal. The details of the modifications suggested for individual plants are given in Appendix - 4. The standard operating procedure based on the modification suggested for individual plants is given in Appendix – 1.
- Maintenance of chlorine contact tanks is an issue across all STPs, and it is decreasing the quality of effluent. Hence it is recommended that periodic maintenance of chlorine contact tanks be done

to keep them clean. It is also recommended that they be repainted, preferably blue and with anti-algae paint.

- Continuous monitoring for 6 STPs meeting the NGT standards is necessary to ensure long term compliance with NGT standards. Similarly, continuous monitoring will be required for all other plants after given modifications are applied to ensure long term compliance.

APPENDIX – 1

STANDARD OPERATING PROCEDURES FOR ALL SEWAGE TREATMENT PLANTS

1.0 Nagasandra phase 2: 20 MLD

- The current operational procedures are adequate for achieving BNR removal as per NGT standards.
- Continue the current operational cycle, which includes 2 hrs of filling and aeration, 1hr of settling and 1 hr of decantation. Continuous monitoring should be done to assure the NGT standards are met with long term.
- At the current operating conditions, the plant can achieve adequate nutrient removal for a daily average flow of up to 20MLD, which is the plant's design capacity.
- A recommendation would be to keep an eye on the sludge settling and increase the settling time accordingly.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.

2.0 Chikkabanavara: 5 MLD

- The current operational procedures are adequate for achieving BNR removal as per NGT standards.
- Continue with the current operational cycle, which includes 1.5hr of filling and aeration, 0.5 hrs of settling and 1 hr of decanting. Continuous monitoring should be done to assure the NGT standards are met with long term
- Currently, two out of three SBR basins are being operated on 3hr cycles. The plant can achieve adequate nutrient removal at the current operating conditions for a daily average flow of up to 5.5MLD.
- If the incoming flow goes beyond this value, the third basin will have to be used, and operations will have to be altered to 3 basin/3hr conditions.
- A recommendation would be to reduce aeration time and increase settling time.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.

3.0 Horamavu: 20 MLD

- The current operational procedures are adequate for achieving BNR removal as per NGT standards.
- Continue the current operational cycle, which includes 2 hrs of filling and aeration, 1hr of settling and 1 hr of decantation. Continuous monitoring should be done to assure the NGT standards are met with long term.
- The plant is currently operating almost at its design capacity and cannot take on more load.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.

4.0 Doddabele: 20 MLD

- The current operational procedures are adequate for achieving BNR removal as per NGT standards.
- Continue the current operational cycle, which includes 0.5 hrs of filling and mixing, 0.75hrs of filling and aeration, 1.75 hrs of aeration, 0.5 hrs of mixing, 0.5 hrs of settling and 2hrs of decanting. Continuous monitoring should be done to assure the NGT standards are met with long term.
- The plant is currently operating almost at its design capacity and cannot take on more load.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.

5.0 K&C Valley: 60 MLD

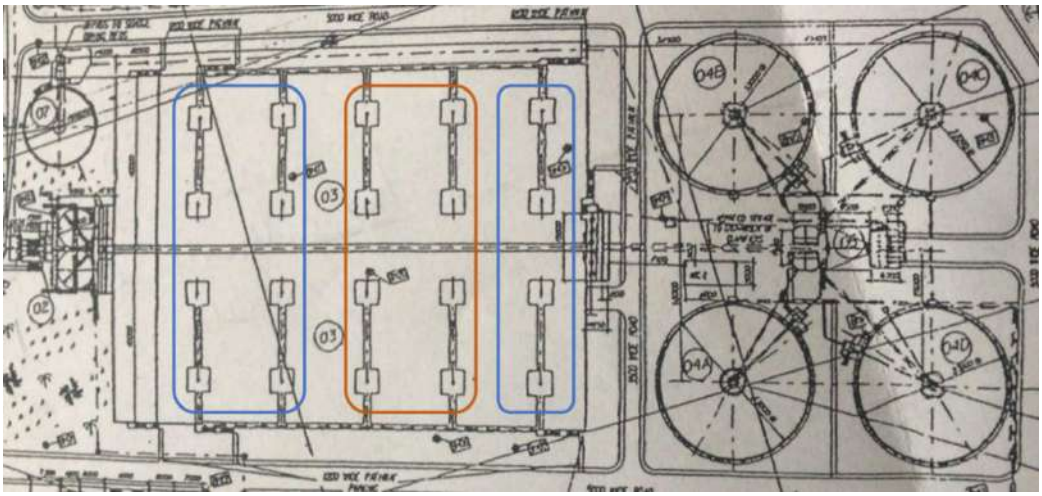
- The current operational procedures are adequate for achieving BNR removal as per NGT standards.
- The plant is operating at its capacity and cannot take any more load. Continuous monitoring should be done to assure the NGT standards are met with long term.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.

6.0 Bellandur: 90 MLD

- The current operational procedures are adequate for achieving BNR removal as per NGT standards.
- The plant is operating at its capacity and cannot take any more load. Continuous monitoring should be done to assure the NGT standards are met with long term.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.

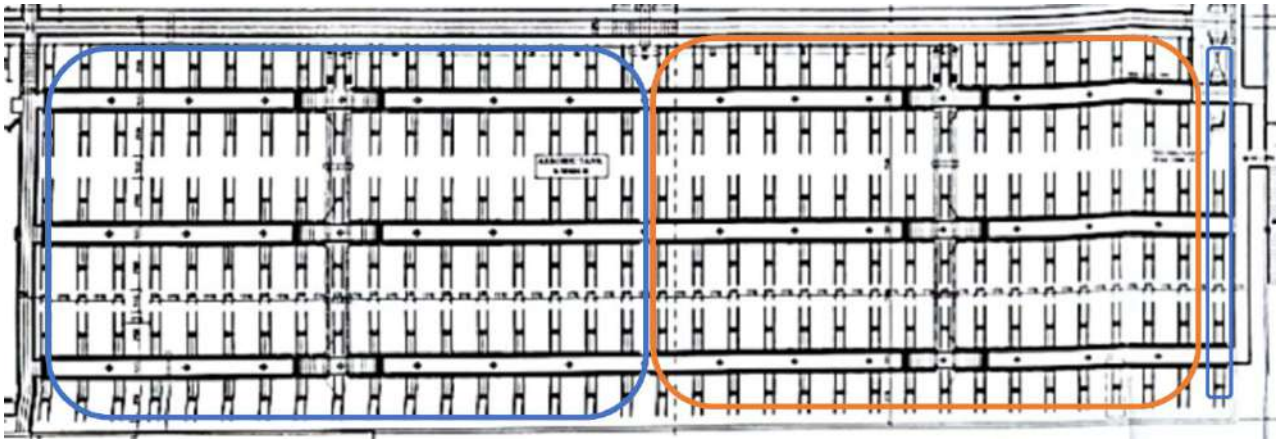
7.0 Rajacanal phase 1: 40 MLD

- Split the aeration basin to create three zones: aerated-unaerated-aerated.
- Turn on the first two rows (4 aerators) of surface aerators to achieve a dissolved oxygen concentration of 3 mg/L. The hydraulic retention time of the aeration zone at the inflow of 40 MLD should be 4 hrs.
- Turn off the next two rows (4 aerators) of surface aerators to create an anoxic zone with a retention time of 4 hrs at 40 MLD inflow.
- Turn on the last row of (2 aerators) of surface aerators to achieve a dissolved oxygen concentration of 2 mg/L. The hydraulic retention time of the aeration zone should be 2hrs at 40 MLD inflow.
- The MLSS in the tank should be increased to fall between 3500-4000 mg/L by controlling RAS and WAS.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.



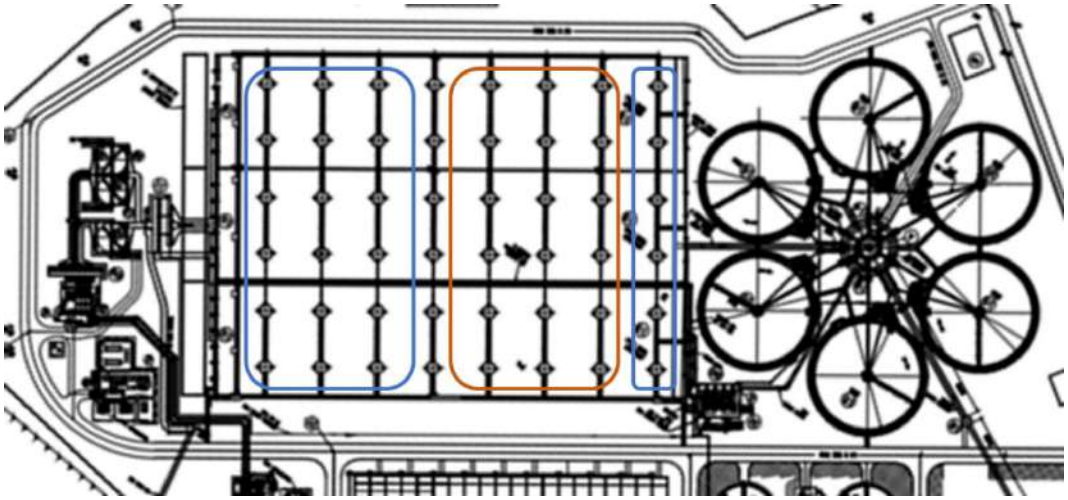
8.0 Rajacanal phase 2: 40 MLD

- Split the aeration basin to create an aeration zone followed by an anoxic zone.
- Turn on the first 16 rows of diffusers to achieve a dissolved oxygen concentration of 3.5 mg/L. The hydraulic retention time of the aeration zone at an inflow of 45.5 MLD should be 4.1 hrs.
- Turn off the next 16 rows of diffusers to create an anoxic zone with a retention time of 3.8 hrs at 45.5 MLD inflow.
- Turn on the last row of diffusers to polish the water. The retention time would be 0.3 hrs.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.



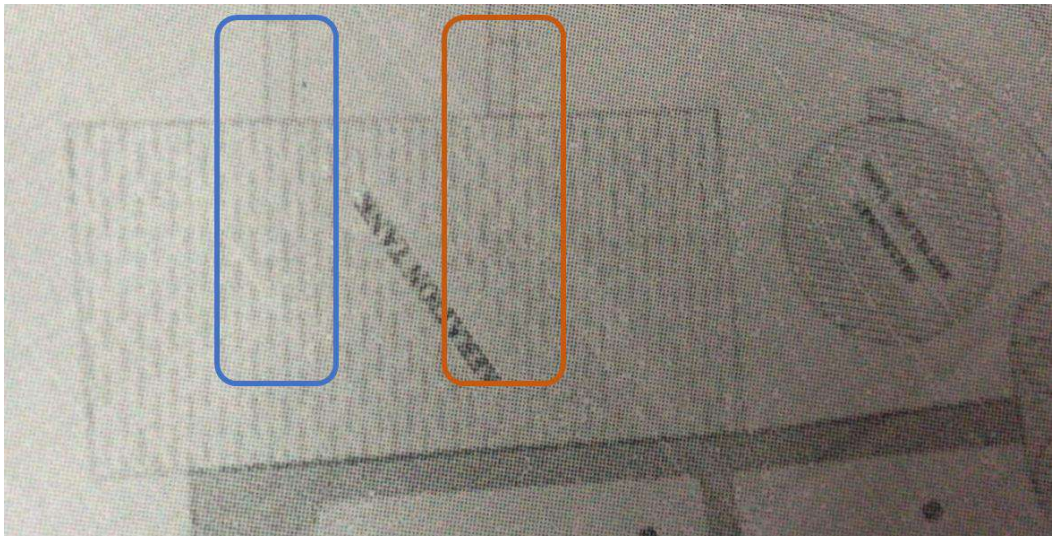
9.0 Mailasandra: 70 MLD

- Split the aeration basin to create three zones: aerated-unaerated-aerated.
- Turn on the first three rows of surface aerators to achieve a dissolved oxygen concentration of 3 mg/L. The hydraulic retention time of the aeration zone at an inflow of 75 MLD should be 5.4 hours.
- Turn off the next four rows of surface aerators to create an anoxic zone with a retention time of 5.4 hours at 75 LD inflow.
- Turn on the last row of surface aerators to achieve a dissolved oxygen concentration of 2 mg/L. The retention time of the aeration zone should be 1.5 hrs.
- The MLSS in the aeration basin is claimed to be 3500 mg/L but is most likely less than 2000 mg/L. Therefore increase the MLSS level in the aeration basin to a concentration between 3500-4000 mg/L by altering RAS and WAS.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.



10.0 Kempambudhi: 1 MLD

- Split the aeration basin into two zones: aerated followed by unaerated.
- Turn on the first row of surface aerators to achieve a dissolved oxygen level of 2 mg/L. The hydraulic retention time in the aeration zone should be 9.72 hrs at an inflow of 1 MLD.
- Turn off the second row of surface aerators to create an anoxic zone with a retention time of 9.72 hrs.
- The MLSS in the aeration tank, though claimed to be between 3500-3600 mg/L, is most likely less than 2000 mg/L. The MLSS in the aeration basin should be brought up to the claimed concentration.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.



11.0 Kadugodi: 6 MLD

- The current cycle includes 45 mins filling, 45 mins aeration, 45 mins settling, and 45 mins decanting.
- This operational cycle should be altered to include 1.5 hrs of filling and aeration, 40 mins of unaerated mixing, 60 mins of settling and 45 mins of decanting. The dissolved oxygen concentration during the aeration stage should be maintained at 3.5 mg/L.
- In case carbon limiting conditions occur, extra carbon should be added before the unaerated mixing stage.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.

12.0 Halasuru: 2 MLD

- The current cycle includes 2hrs of filling and aeration, 1 hr of settling and 1 hr of decanting.
- This operational cycle should be altered to include 2 hrs of filling and aeration, 1 hr of unaerated mixing, 1 hr of settling and 1 hr of decanting. The dissolved oxygen concentration during the aeration stage should be maintained at 3.5 mg/L.
- In case carbon limiting conditions occur, extra carbon should be added before the unaerated mixing stage.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.

13.0 Yellamellappa Chettikere: 15 MLD

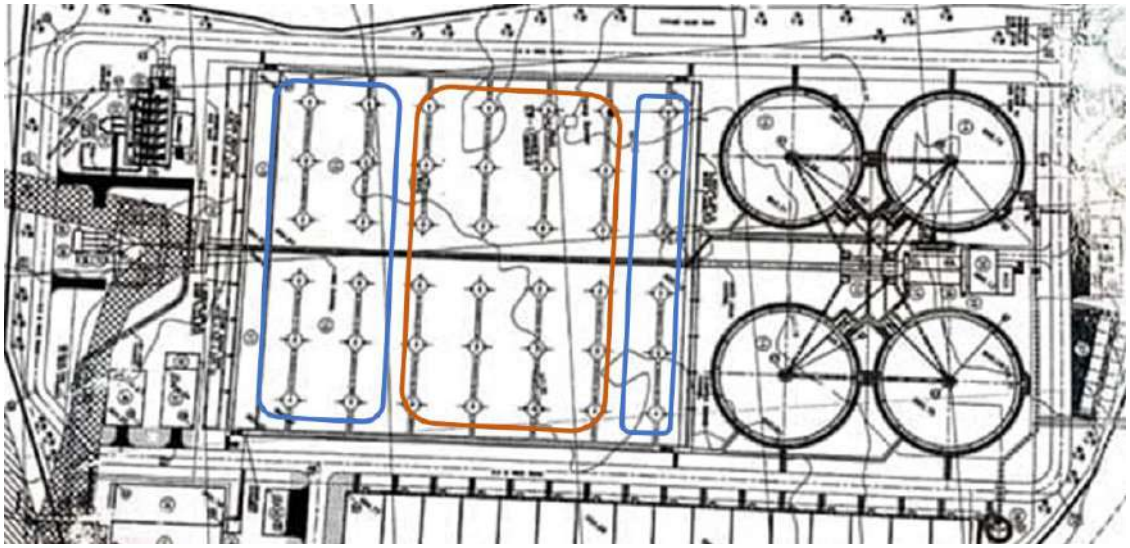
- The current cycle includes 1.5 hrs of filling, 1.5 hrs of aeration, 1.5 hrs settling and 1.5 hrs decanting.
- This operational cycle should be altered to include 1.5 hrs of filling, 1.5 hrs aeration, 1.5 hrs of unaerated mixing, 1.5 hrs of settling and 1.5 hrs of decanting. The dissolved oxygen concentration during the aeration stage should be maintained at 3.5 mg/L.
- In case carbon limiting conditions occur, extra carbon should be added before the unaerated mixing stage.
- The MLSS in the SBR should be maintained at a concentration between 3500-4000 mg/L
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.

14.0 Malthahalli: 5 MLD

- The current cycle includes 64 mins of filling, 80 mins of aeration, 15 mins rection time, 69 mins of settling and 60 mins of decanting.
- This operation cycle should be altered to include 144 mins of filling and aeration, 2 hrs of unaerated mixing, 1.2 hrs of settling and 60 mins of decanting.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.

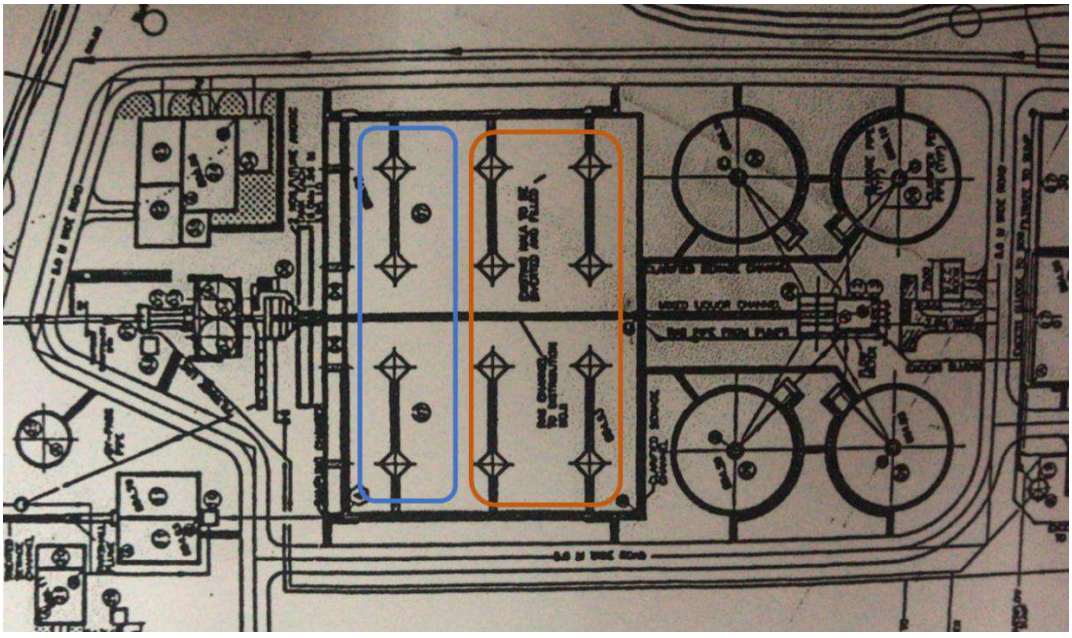
15.0 Kadubeesanhalli: 50 MLD

- The aeration basin should be split into three zones: aerated-unaerated-aerated
- Turn on the first two rows of aerators to achieve a dissolved oxygen concentration of 2 mg/L. The hydraulic retention time in the aeration zone should be 3.5 hrs at an inflow of 50 MLD.
- Turn off the next four rows of surface aerators to create an anoxic zone of retention time of 6.9 hrs.
- Turn on the last row of the surface aerators to achieve a dissolved oxygen concentration of 1 mg/L. The hydraulic retention time in the aeration zone should be 1.7 hrs at 50 MLD inflow.
- The MLSS in the aeration basin should be maintained between 3000-3500 mg/L.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.



16.0 Nagasandra phase 1: 20 MLD

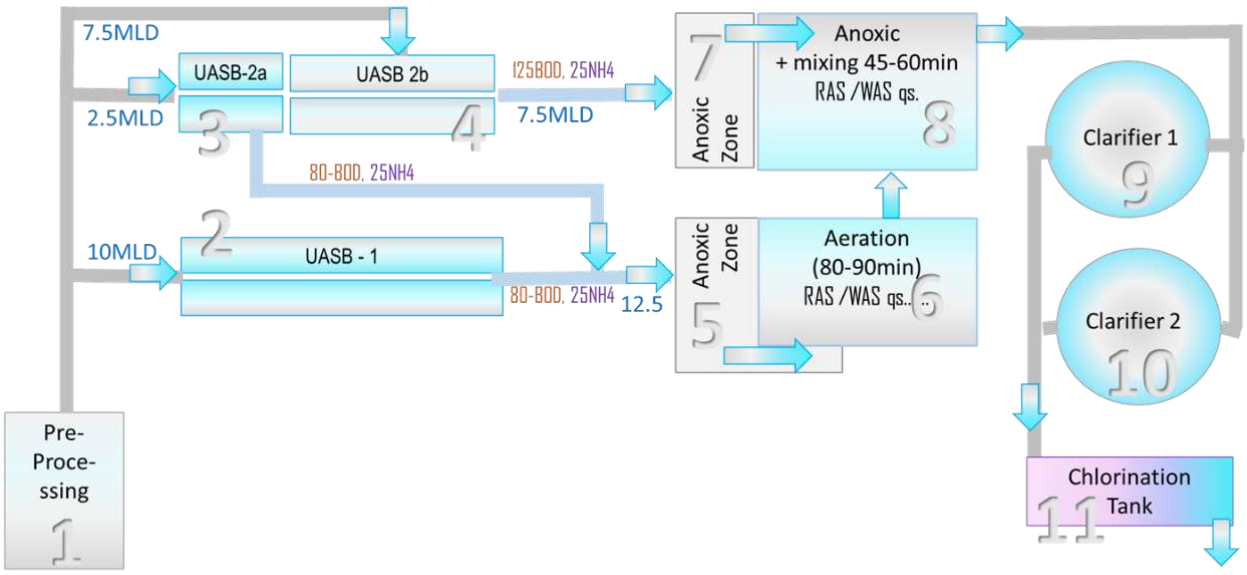
- Split the aeration basin into two zones, aerated followed by unaerated
- Turn on the first row of aerators to achieve a dissolved oxygen concentration of 2 mg/L. The hydraulic retention time in the aeration zone should be 4hrs at 20 MLD inflow.
- Turn off the next two rows of aerators to create an anoxic zone of retention time 8 hrs at 20 MLD inflow.
- The MLSS in the aeration basin should be maintained at a concentration of 3500 mg/L.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.



17.0 K R Puram: 20 MLD

- The primary treatment unit should be fixed. Any equipment broken or needing maintenance should be attended to immediately.
- The UASB downflow inlet pipes should be unclogged.
- Inspect and fix any other blockages causing sewage to bypass the UASB.
- The feed levels to the UASB should never be less than one-third of the rated capacity of the UASB (here, it is 20 MLD). If the feed levels are low for more than a week, proper start-up procedures should be taken up. Shock loads of more than 10% to the UASB should be prevented.
- The quality of sludge in the UASB and aeration basin should be monitored continuously.
- Once the UASB tanks are made properly operational, one of the UASB tanks should be divided into two zones, as shown in the image below. The smaller zone will have 25% of the volume of the full tank, whereas the larger zone will have a volume that is 75% that of the full tank. Feed to different UASB tanks should be kept proportional to the numbers given in the diagram below.
- There are two aeration basins on the plant. One should be converted into an anoxic mixing basin, and the other should be kept as an aeration basin.
- The smaller zone and the other full UASB tank should be loaded at a normal rate to achieve an effluent BOD of about 80 mg/L. The effluent from these tanks should be directed towards the aeration basin, where a retention time of 80-90 mins should be ensured.
- The larger zone of the UASB should be loaded at a higher rate to achieve effluent BOD of about 125 mg/L.
- The effluent from the larger UASB zone and effluent of the aeration basin should be mixed in the anoxic mixing basin, allowing for a retention time of 45-60 mins.

- The effluent from the anoxic mixing tank should be taken to the clarifiers. Necessary activated sludge should be returned from the clarifiers to the aeration basin.
- The chlorine contact tank should be cleaned properly. It should be repainted with anti-algae paint, preferably blue.
- Toxicity Characteristic Leaching Procedure (TCLP) test should be done for the sludge before disposal. A year worth of TCLP test reports should be kept in the records for the plant.
- A detailed inventory of the recycled and wasted sludge should be kept on the record.
- All equipment should be inspected to check whether they are functioning properly and efficiently. Any equipment needing maintenance or replacement should be tended to as soon as possible.



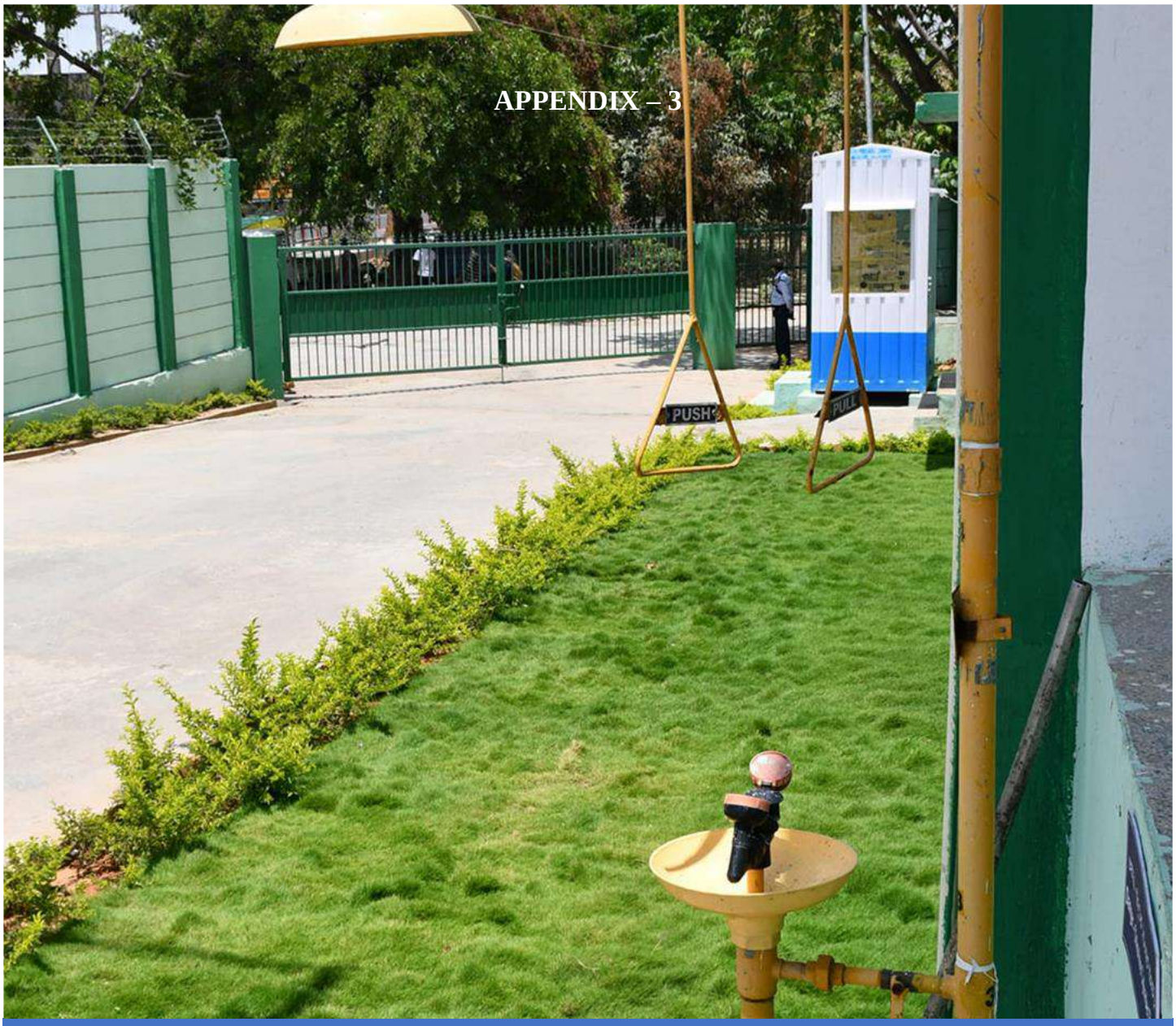
APPENDIX – 2

Table: Values used for simulation purposes

STP	Inlet Parameters						Outlet Parameters					
	pH	COD (mg/L)	BOD (mg/L)	TKN (mg/L)	Nitrate Nitrogen (mg/L)	Total Phosphorus (mg/L)	pH	TSS (mg/L)	COD (mg/L)	BOD (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)
Nagasandra phase 2	7.3	725	310	55	8	6.2	7.3	9	49.9	4.7	5.1	0.65
Chikkabanavara	6.9	623	307	40	8.2	4	7.5	5	49.9	7.5	9.7	0.12
Horamavu	6.7	570	350	45	7.5	8.5	7.4	8	48.8	4.4	9.8	0.49
Doddabele	7	413	203	50	7	4.5	7.6	7	54.4	3.2	9.4	0.78
K&C Valley	8.5	448	193	40	6	15.3	7	9	27	3.4	5	0.7
Belandur	8	460	200	45	7	13	7.6	13	47	7	6.7	0.8
Rajacanal phase 2	7.5	743	310	50	3.2	5.4	7.8	6	56	8.1	17.7	0.5
Rajacanal phase 1	7.2	660	280	40	8.6	3	7.3	6	54	8.2	15	0.09
Mailsandra	7.5	552	224	37	8.1	4.5	7.7	11	64	8.3	13.8	0.8
Kempambudhi	7	450	230	35	5.8	3	7.5	7	48.8	10.56	15.8	0.2
Kadugodi	7.4	375	190	50	6.9	6.9	7.5	9	72.7	25.33	17.2	0.3
Halasuru	7	331	125	35	6	2.3	7.4	8	56	14.4	14.7	0.4
Yellamellappa chettikere	7.4	365	125	35	6	3.3	7.5	8	40.4	14.6	17.8	0.3
Malathahalli	7.2	511	228	48	10.6	4.5	7.5	11	48.8	16.2	17.3	0.2
Kadubeesanhalli	7.2	650	139	71	3.3	13.5	7.6	100	92	10	35	10.3
Nagasandra phase 1	7.4	580	261	73	6.6	5.6	7.2	16	58	28.25	47.7	0.5
K R Puram	7.4	437	306	55	3	7	7.4	183	56	8.2	50.9	0.7

Please note: These values are based on average data and single grab sample; some variations are expected.

APPENDIX – 3



Final Report - A

Final effluent quality for optimally operating STPs

IISc Bangalore

3rd November 2021

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1.0 BACKGROUND

In order to meet the new effluent discharge standards given by National Green Tribunal (NGT), an effort is undertaken by the Bangalore Water Supply and Sewerage Board (BWSSB) to upgrade old sewage treatment plants. IISc team was engaged to inspect and recommend suitable modifications to the current treatment process to meet the required standards. The responsibilities included technical visits to all Sewage treatment plant (STP) sites to understand the process, detailed water quality analysis of samples taken from the STPs, giving recommendations based on the water quality analysis, and modelling to ensure effluent meets NGT standards. As part of this effort, technical site visits were carried out to all the STPs and samples were collected at all sites.

List of STPs:

18. K & C valley
19. Bellandur Amani kere
20. Kadubeesanhalli phase -1
21. Kadugodi
22. Halasuru
23. Rajacanal phase -1
24. Rajacanal phase -2
25. Horamvu Agara
26. K R Puram phase -1
27. Yelemallappa Chettikere
28. Nagasandra phase -1
29. Nagasandra phase -2
30. Mallathahalli
31. Chikkabanavara
32. Mailasandra phase -1
33. Kempabudhi
34. Doddabele

The team was informed that Madiwala STP was under maintenance and hence was not operational; similarly, V Valley STP is under up-gradation and hence not operating. Further, the team was informed that the Kengeri STP was included in the list by mistake. Therefore these three STP locations were not visited.

The analysis of collected samples showed that six out of the seventeen STPs studied are currently operation optimally and conforming to NGT standards. This report summarizes the water quality data for these six STPs and gives recommendations to further improve effluent quality.

List of six STPs conforming to NGT standards.

1. K & C Valley – 60 MLD – ASP with Power Generation
2. Belandur- 90 MLD – ASP
3. Horamvu Agara – 20 MLD – SBR Process
4. Nagasandra phase -II – 20 MLD – SBR Process
5. Chikkabanavara – 5 MLD – SBR Process
6. Doddabele – 20 MLD – SBR Process

2.0 SAMPLING AND ANALYSES METHODOLOGY:

Approximately one litre of sample was collected at each of the sampling locations described above. Sampling was carried out as per US EPA Standards. Appropriate precautions were taken to avoid cross-contamination and personnel safety.

The samples were analyzed for 8 parameters (physical, chemical and microbiological). Physical and chemical parameters measured were pH, Total Suspended Solids, Biochemical and Chemical Oxygen Demand, Total N, Total P and Residual chlorine. The biological parameter evaluated was Fecal Coliform. All parameters were analyzed as per APHA Standard methods for the examination of water. Annexure I gives details of the methods used for each parameter.

3.0 WATER QUALITY DATA

3.1 Physical Parameters: pH and TSS

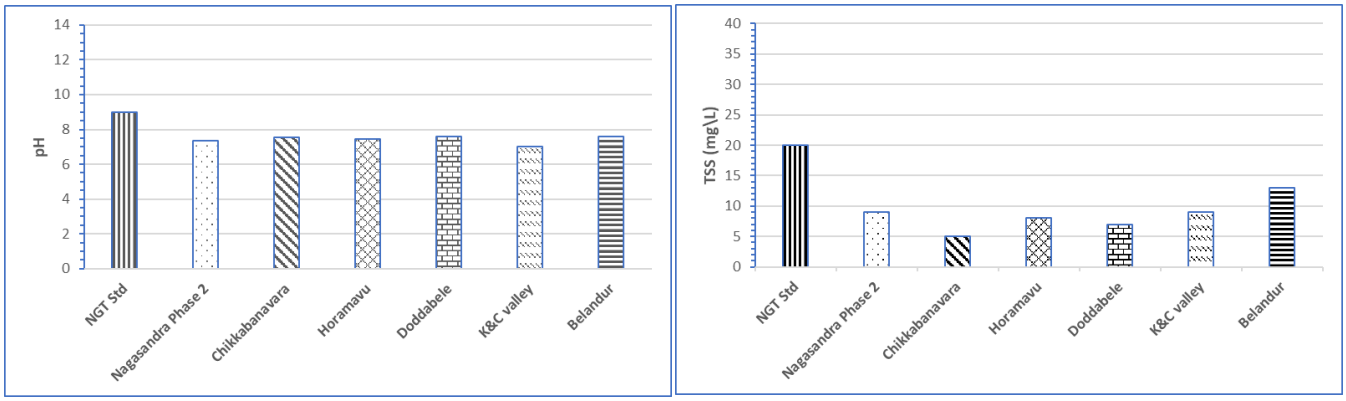

Figure 1: Assessed physical parameters for optimally operating sewage treatment plants effluent (a) pH (b) Total Suspended Solids (TSS)

3.2 Oxygen demand: BOD and COD

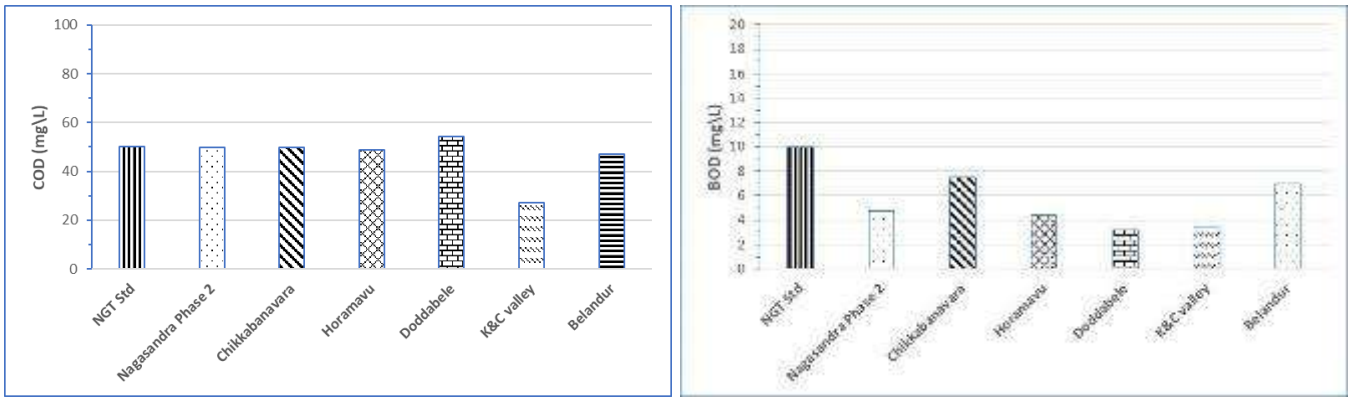

Figure 2: Assessed oxygen demand for sewage treatment plants effluent (a) Biological Oxygen Demand (BOD) (b) Chemical Oxygen Demand (COD). All meet standards.

3.3 Nutrient Removal: Total Nitrogen and Phosphorus

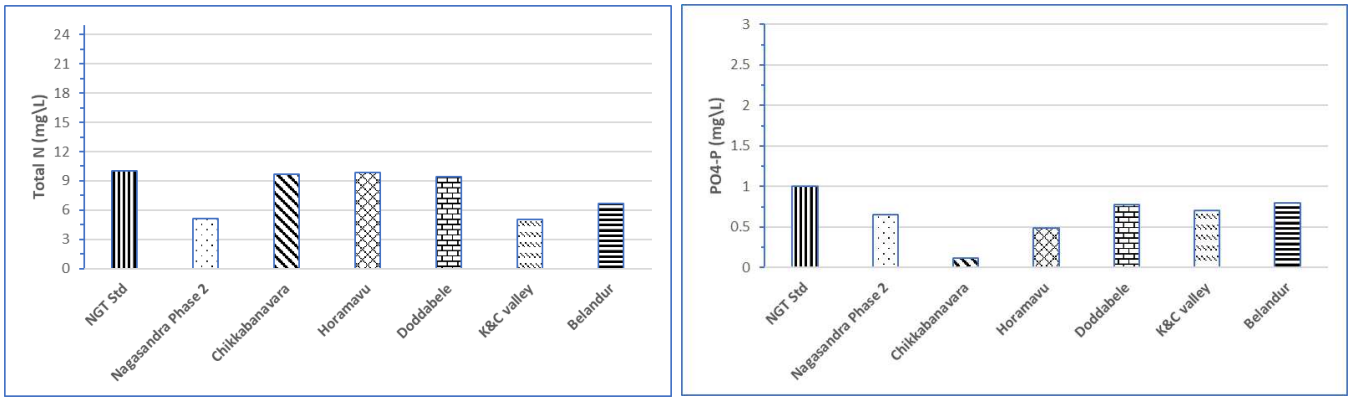

Figure 3: Assessed nutrient parameters for sewage treatment plants effluent (a) Total Nitrogen (b) Phosphorus as PO_4-P

3.4 Residual Chlorine and Microbiological Analysis

Table 1: Residual Chlorine and Fecal Coliform

Sl. No.	Parameters	Unit	NGT Discharge Standards	STP					
				Nagasandra Phase 2	Chikkabanavara	Horamavu	Doddabele	K&C valley	Bellandur
1.	Residual chlorine	mg/L	0.2-1	0.42	0.11	0.05	0	0.3	0.2
2.	Fecal Coliform	MPN/100 mL	<100	Too numerous to count	Too numerous to count	Too less to detect	Too numerous to count	308	300

The residual chlorine dose in the final effluent needs to be rechecked, which is the possible reason for the higher fecal coliform count (Except for Horamayu STP) found in the effluent.

4.0 CONCLUSIONS AND RECOMMENDATIONS:

1. Unclean Chlorine contact tanks with settled sludge and algal growth are increasing the COD of effluent.
2. Chlorine contact tanks should be thoroughly cleaned, tiled and painted with algae-resistant paint or coating, preferably in blue color.
3. To further improve the quality of effluent, it is advised that the Dissolved Oxygen levels during aeration should be increased by increasing the aeration time and settling time should also be increased in the case of SBR technology.
4. Residual chlorine is measured at various stages of chlorination, however, it is recommended that appropriate residual chlorine content is measured after adequate chlorine addition, retention time and needs to be measured before discharge point.

Annexure-I

Table 1: Parameters analyzed and Analysis methodology

Sl No.	Parameters	Method References
1.	Turbidity	APHA 23rd Edition 2130-B
2.	Conductivity	APHA 23rd Edition 2510-B
3.	pH	APHA 23rd Edition 4500-H^+, B
4.	BOD for 5 days at 20˚C	APHA 23rd Edition 5210-B
5.	COD	APHA 23rd Edition 5220-C
6.	Dissolved Oxygen	APHA 23rd Edition 4500-O, C
7.	Total Alkalinity as $CaCO_3$	APHA 23rd Edition 2320-B
8.	Total Hardness as $CaCO_3$	APHA 23rd Edition 2340-C
9.	Nitrate	APHA 23rd Edition 4500-NO_3^-, E
10.	Ammonia-N	IS: 3025 (Part 34)- 2009
11.	Total Phosphates	APHA 23rd Edition 4500-P, G
12.	Surfactants	APHA 23rd Edition 5400-C

APPENDIX – 4

Final Report - B

Final effluent quality and recommendations for non-optimal STPs

IISc Bangalore

10 November 2021

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List of Figures ad Tables:

1.0 BACKGROUND

In order to meet the new effluent discharge standards given by Honarable National Green Tribunal (NGT), an effort is undertaken by the Bangalore Water Supply and Sewerage Board (BWSSB) to upgrade old sewage treatment plants. IISc team was engaged to inspect and recommend suitable modifications to the current treatment process to meet the required standards. The responsibilities included technical visits to all Sewage treatment plant (STP) sites to understand the process, detailed water quality analysis of samples taken from the STPs, giving recommendations based on the water quality analysis, and modelling to ensure effluent meets Hon'ble NGT's Biological Nutrients Removal (BNR) standards. As part of this effort, technical site visits were carried out to all the STPs and samples were collected at all sites.

List of STPs:

1. K & C valley (60 MLD)
2. Bellandur Amani kere (90 MLD)
3. Kadubeesanhalli phase -1 (50 MLD)
4. Kadugodi (6 MLD)
5. Halasuru (2 MLD)
6. Rajacanal phase -1 (40 MLD)
7. Rajacanal phase -2 (40 MLD)
8. Horamvu Agara (20 MLD)
9. K R Puram phase -1 (20 MLD)
10. Yelemallappa Chettikere (15 MLD)
11. Nagasandra phase -1 (20 MLD)
12. Nagasandra phase -2 (20 MLD)
13. Mallathahalli (5 MLD)Chikkabanavara (5 MLD)
14. Mailasandra phase -1 (75 MLD)
15. Kempabudhi (1MLD)
16. Doddabele (20 MLD)

The team was informed that Madiwala STP was under maintenance and hence was not operational; similarly, V Valley STP is under up-gradation and hence not operating. Further, the team was informed that the Kengeri STP was included in the list by mistake. Therefore these three STP locations were not visited.

The analysis of collected samples showed that eleven out of the seventeen STPs studied are currently not conforming to NGT-BNR standards. This report summarizes the water quality data for these elven STPs and gives recommendations to improve the effluent quality further.

List of eleven STPs not conforming to NGT BNR standards.

1. Rajacanal phase -1 (40 MLD)
2. Rajacanal phase -2 (40 MLD)
3. Mailasandra phase -1 (75 MLD)
4. Kempabudhi (1 MLD)
5. Kadubeesanhalli phase -1 (50 MLD)
6. Nagasandra phase -1 (20 MLD)
7. Kadugodi (6MLD)
8. Halasuru (2MLD)
9. Yelemallappa Chettikere (15 MLD)
10. Mallathahalli (5 MLD)
11. K R Puram phase -1 (20 MLD)

Three out of the eleven STPs were performing extremely poorly, and the other eight were borderline. The poorly performing plants included Kadubeesanhalli, K R Puram and Nagasandra phase -1.

2.0 SAMPLING AND ANALYSES METHODOLOGY:

Approximately one litre of sample was collected at each of the sampling locations described above. Sampling was carried out as per US EPA Standards. Appropriate precautions were taken to avoid cross-contamination and personnel safety.

The samples were analyzed for 8 parameters (physical, chemical and microbiological). Physical and chemical parameters measured were pH, Total Suspended Solids, Biochemical and Chemical Oxygen Demand, Total N, Total P and Residual chlorine. The biological parameter evaluated was Fecal Coliform. All parameters were analyzed as per APHA Standard methods for the examination of water. Annexure I gives details of the methods used for each parameter.

3.0 WATER QUALITY DATA FOR BORDERLINE STPS

3.1 Inlet Parameters:

3.1.1 Oxygen demand: BOD and COD:

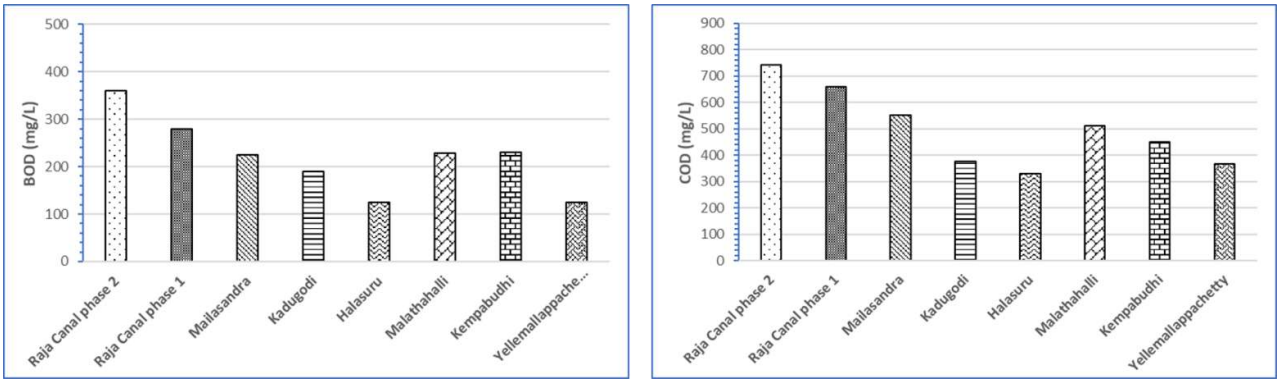


Figure 4: Assessed oxygen demand for borderline sewage treatment plants influent (a) Chemical Oxygen Demand (COD) (b) Biological Oxygen Demand (BOD)

3.1.2 pH, Nitrogen, and phosphorus:

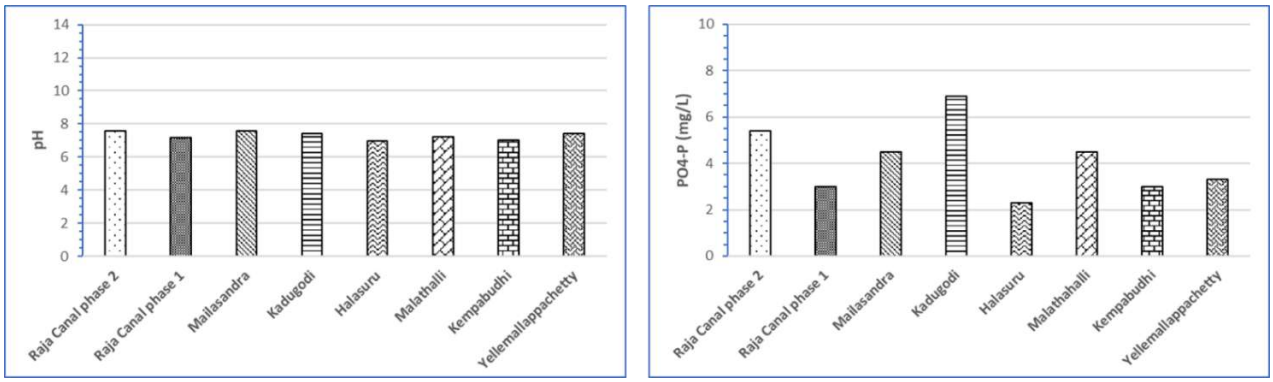


Figure 5: Assessed physical and nutrient parameters for borderline sewage treatment plants influent (a) pH (b) Phosphorus as PO_4-P

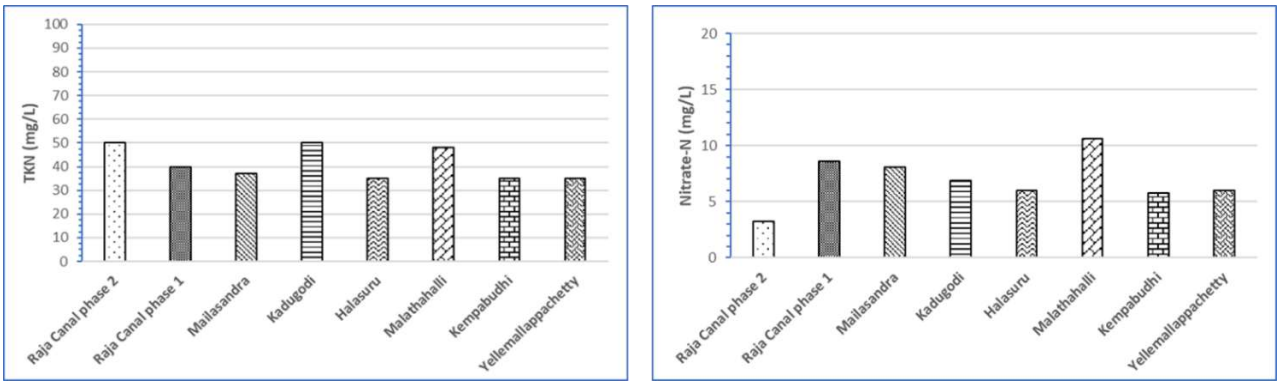


Figure 6: Assessed nutrient parameters for borderline sewage treatment plants influent (a) TKN (b) Nitrate-N

3.2 Outlet Parameters:

3.2.1 Oxygen demand: BOD and COD:

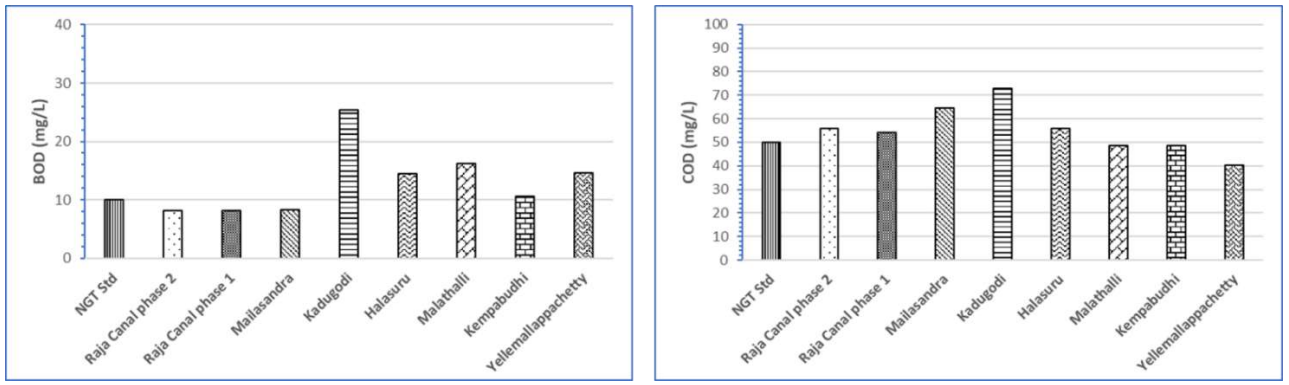


Figure 7: Assessed oxygen demand for borderline sewage treatment plants effluent (a) Chemical Oxygen Demand (COD) (b) Biological Oxygen Demand (BOD)

3.2.2 Nutrient Removal: Total N and Phosphorus

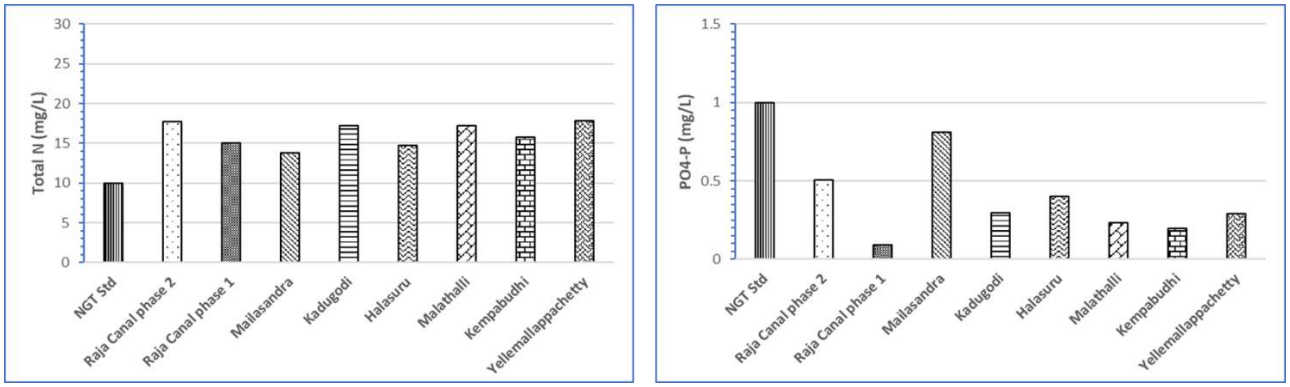


Figure 8:Assessed nutrient parameters for borderline sewage treatment plants effluent (a) Total Nitrogen (b) Phosphorus as PO_4-P

3.2.3 Physical Parameters: pH and TSS

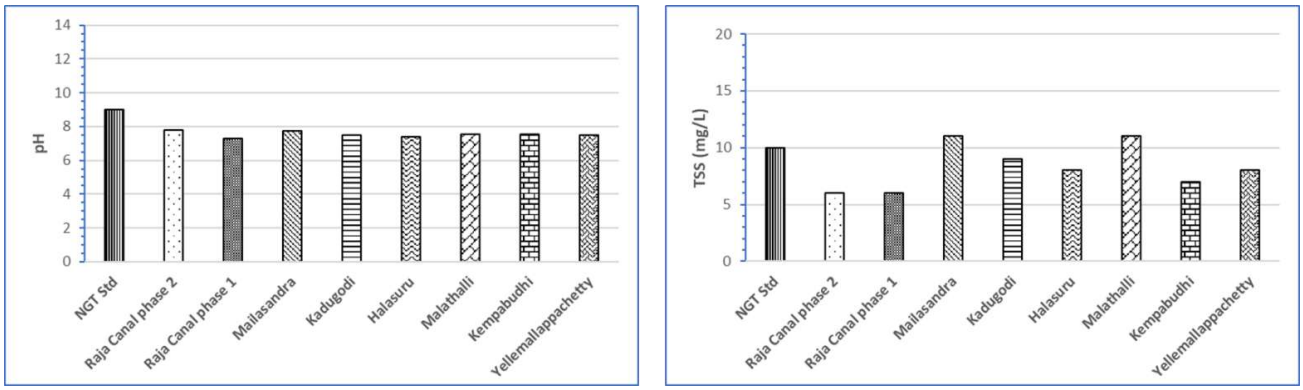


Figure 9: Assessed physical parameters for borderline sewage treatment plants effluent (a) pH (b) Total Suspended Solids (TSS)

3.2.4 Residual chlorine and Microbiological analysis:

Table 2: Residual Chlorine and Fecal Coliform		
Sl. No.	**STP**	**Parameters**
		Fecal Coliform (MPN/100 mL)
		Hon'ble NGT Discharge Standards (<100)
1	Raja Canal phase 2	Too numerous to count
2	Raja Canal phase 1	Too numerous to count
3	Mailasandra	Too numerous to count
4	Kadugodi	Too numerous to count
5	Halasuru	< 230
6	Malathahalli	Too numerous to count
7	Kempabudhi	Too numerous to count
8	Yellemallappa chettikere	Too numerous to count

4.0 WATER QUALITY DATA FOR POORLY PERFORMING STPS

4.1 Inlet Parameters:

4.1.1 Oxygen demand: BOD and COD:

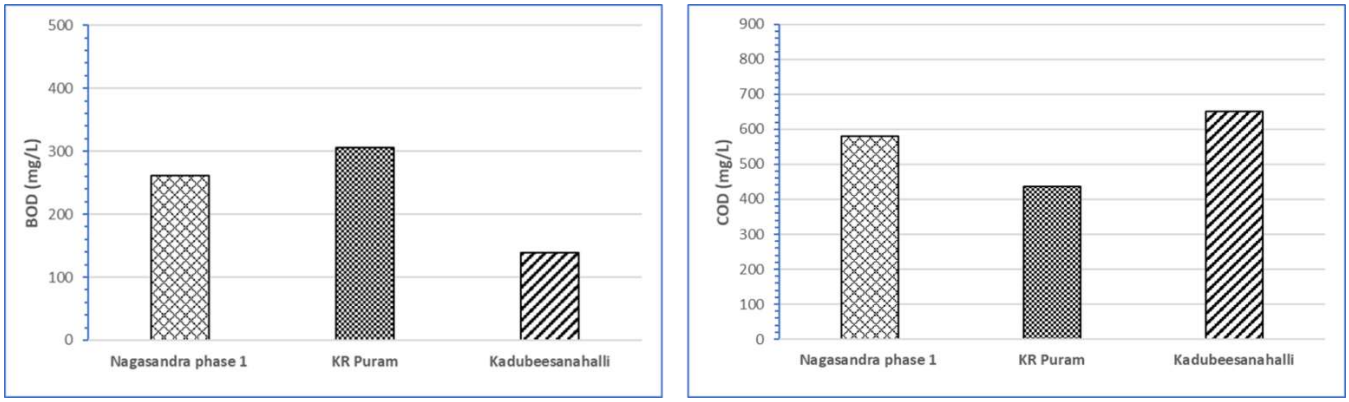


Figure 10: Assessed oxygen demand for poorly performing sewage treatment plants influent (a) Chemical Oxygen Demand (COD) (b) Biological Oxygen Demand (BOD)

4.1.2 pH, Nitrogen, and phosphorus:

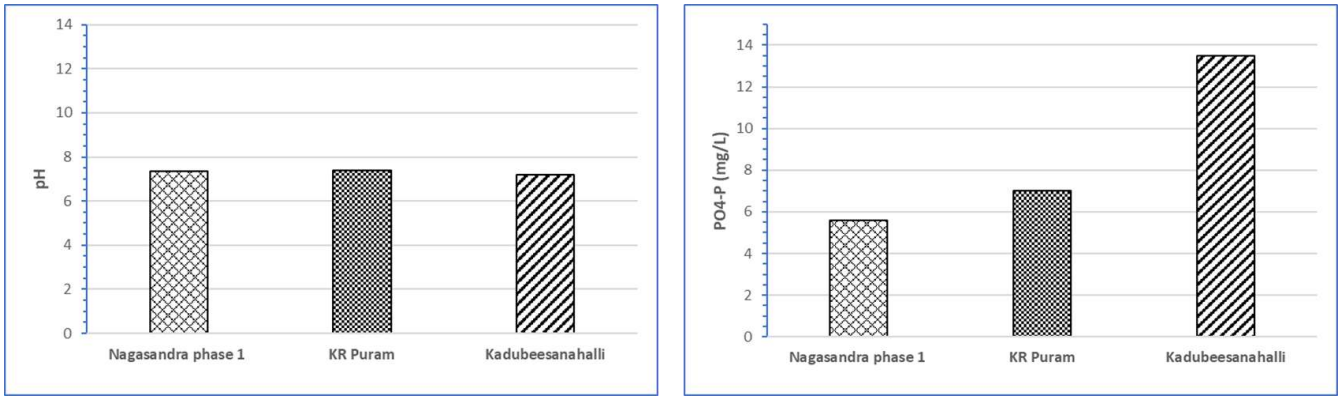


Figure 11: Assessed physical and nutrient parameter for borderline sewage treatment plants influent (a) pH (b) Phosphorus as PO_4-P

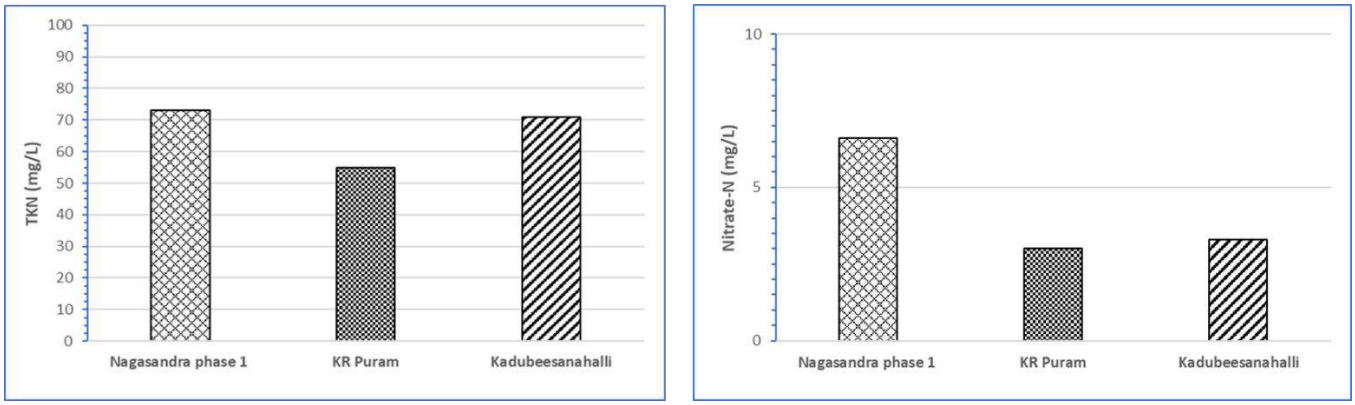


Figure 12:Assessed nutrient parameters for poorly performing sewage treatment plants influent (a) TKN (b) Nitrate-N

4.2 Outlet Parameters:

4.2.1 Oxygen demand: BOD and COD:

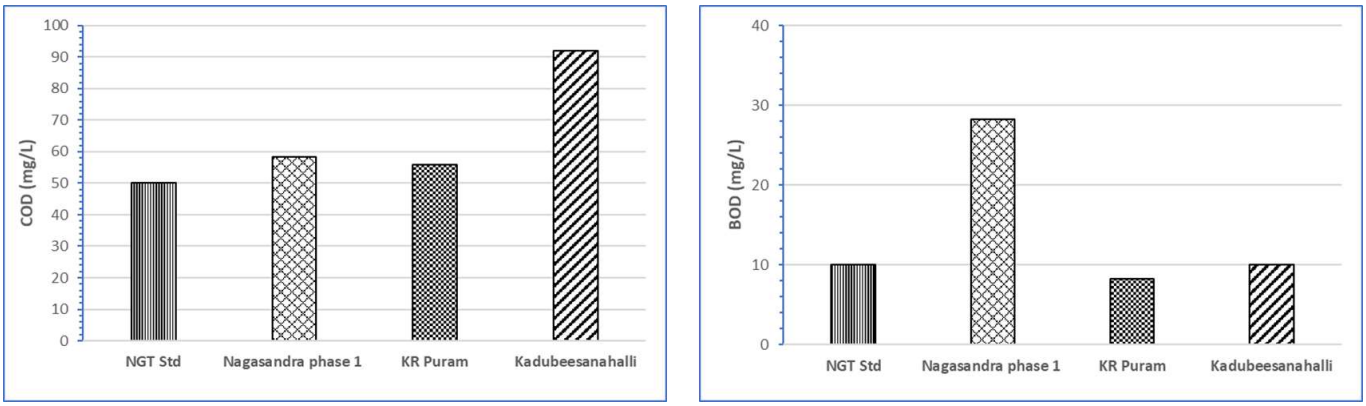
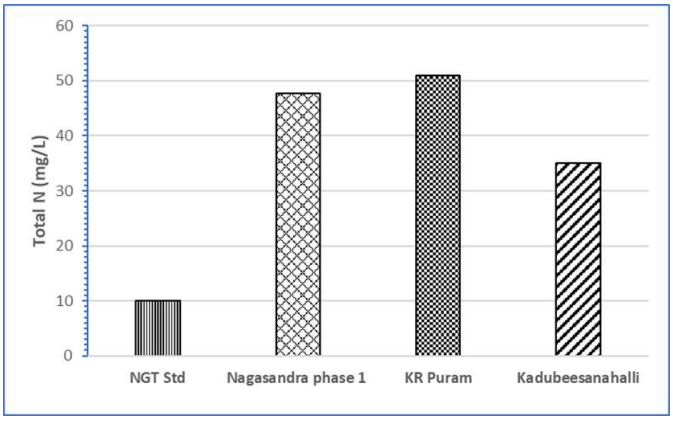


Figure 13: Assessed oxygen demand for poorly performing sewage treatment plants effluent (a) Chemical Oxygen Demand (COD) (b) Biological Oxygen Demand (BOD)

4.2.2 Nutrient Removal: Total N and Phosphorus



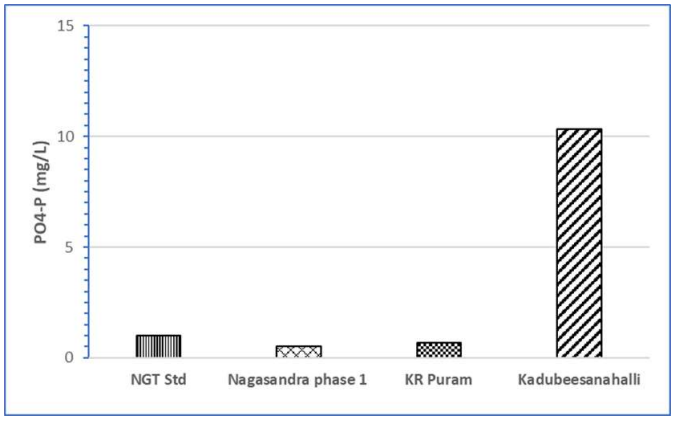
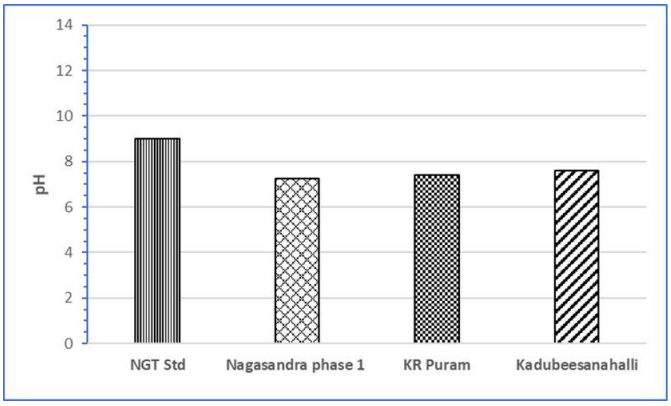


Figure 14: Assessed nutrient parameters for poorly performing sewage treatment plants effluent (a) Total Nitrogen (b) Phosphorus as PO4-P

4.2.3 Physical Parameters: pH and TSS



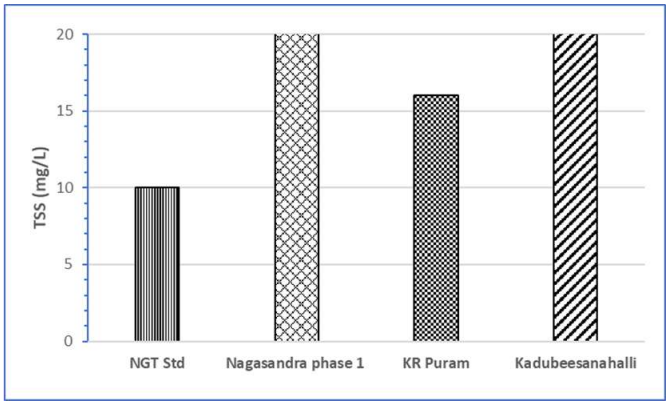


Figure 15: Assessed physical parameters for poorly performing sewage treatment plants effluent (a) pH (b) Total Suspended Solids (TSS)

4.2.4 Residual chlorine and Microbiological analysis:

Table 3: Residual Chlorine and Fecal Coliform

Sl. No.	STP	Parameters
		Fecal Coliform (MPN/100 mL)
		Hon'ble NGT Discharge Standards (<100)
1	Nagasandra phase 1	Too numerous to count
2	KR Puram	Too numerous to count
3	Kadubeesanahalli	Too numerous to count

5.0 RECOMMENDATIONS FOR BORDERLINE STPS:

5.1 Rajacanal phase 1:

5.1.1 Current status of the plant:

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
35 MLD	2004	EAP	2700 mg/L	85%	400 m^3/day	1.8 2 mg/L	Yes

1. The Dissolved oxygen level maintained in the aeration basin is at par with the claimed DO levels. The plant uses surface aerators.
2. The current MLSS in the aeration tank are most likely lower than the claimed value
3. The water quality analysis shows that the plant meets the BOD and phosphorus standards but does not meet the total Nitrogen and COD standards.
4. Unclean Chlorine contact tanks with settled sludge and algal growth are increasing the COD of effluent.

5.1.2 Modifications required to meet NGT-BNR standards

1. Turn the aerators on and off in such a way as to split the aeration tank into three separate zones
2. Zone 1 is aerated at 3 mg/L. Zone 2 is unaerated, and zone 3 is aerated at 2 mg/L.
3. This modification will result in the removal of Nitrogen. Further increasing the MLSS in the tank will improve nitrogen removal.
4. The MLSS in the aeration tank should be increased by at least 1000 mg/L.
5. Chlorine contact tanks should be thoroughly cleaned, tiled and painted with algae-resistant paint or coating, preferably in blue color.

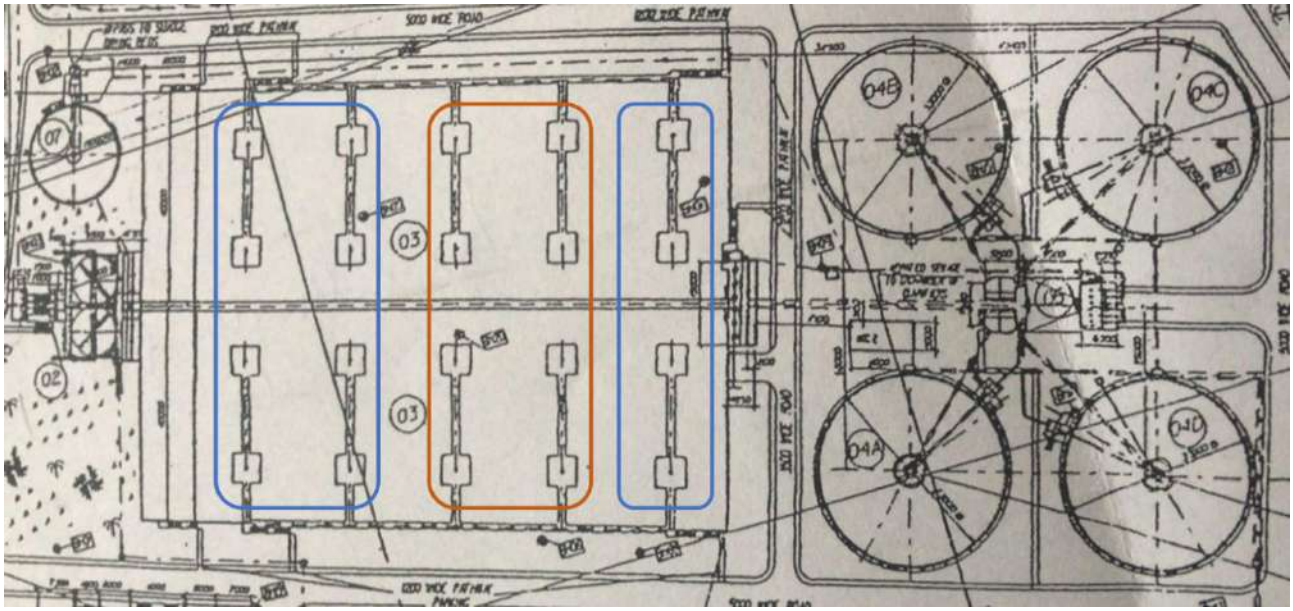


Figure 16: Layout of Rajacanal phase – 1 indicating which aerators to turn on and off. Blue: Aerators ON, Orange: Aerators OFF

5.2 Rajacanal phase -*2*

5.2.1 Current status of the plant:

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
45 MLD	2018	EAP	3500 mg/L	80%	~2000 m^3/day	3 mg/L	Yes

1. The Dissolved oxygen level maintained in the aeration basin is at par with the claimed DO levels. The plant uses diffuse aerators
2. The water quality analysis shows that the plant meets the BOD and phosphorus standards but does not meet the total Nitrogen and COD standards.
3. Unclean Chlorine contact tanks with settled sludge and algal growth are increasing the COD of effluent.

5.2.2 Modifications required to meet NGT-BNR standards

1. Turn the aerators on and off in such a way as to split the aeration tank into two separate zones
2. Zone 1 is aerated at 3.5 mg/L, and Zone 2 is unaerated.

3. This modification will result in the removal of Nitrogen. Further increasing the MLSS in the tank will improve nitrogen removal.
4. Chlorine contact tanks should be thoroughly cleaned, tiled and painted with algae-resistant paint or coating, preferably in blue color.

Figure 17: Layout of Rajacanal phase – 2 indicating which aerators to turn on and off. Blue: Aerators ON, Orange: Aerators OFF

5.3 Mailasandra phase -*1*

5.3.1 Current status of the plant:

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
70 MLD	2015	EAP	3500 mg/L	73%	~550 m^3/day	-	Yes

1. The Dissolved oxygen level maintained in the aeration basin is 2-3 mg/L. The plant uses surface aerators
2. The MLSS in the aeration tank is not adequate.

3. The water quality analysis shows that the plant meets the BOD and phosphorus standards but does not meet the total Nitrogen and COD standards.
4. Unclean Chlorine contact tanks with settled sludge and algal growth are increasing the COD of effluent.

5.3.2 Modifications required to meet NGT-BNR standards

1. Turn the aerators on and off in such a way as to split the aeration tank into three separate zones
2. Zone 1 is aerated at 3.5 mg/L. Zone 2 is unaerated, and zone 3 is aerated at 3.5 mg/L
3. This modification will result in the removal of Nitrogen. Further increasing the MLSS in the tank will improve nitrogen removal. MLSS should be increased by at least 1000 mg/L.
4. Chlorine contact tanks should be thoroughly cleaned, tiled and painted with algae-resistant paint or coating, preferably in blue color.

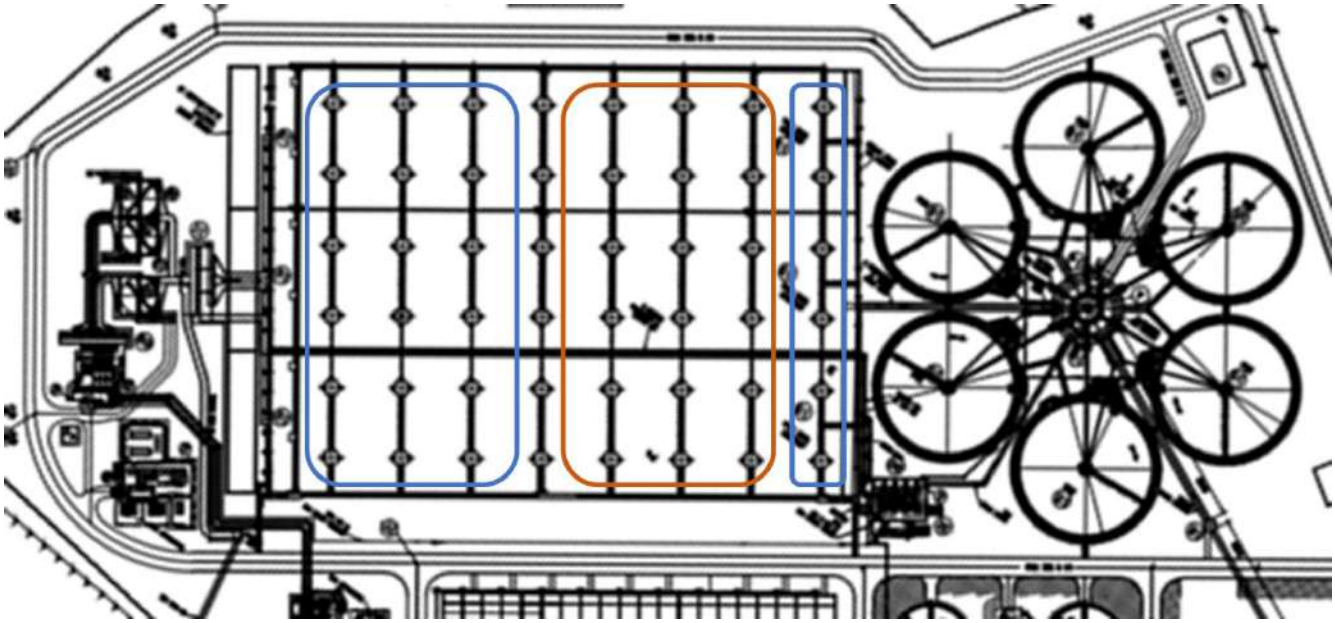


Figure 18: Layout of Mailasandra phase – 1 indicating which aerators to turn on and off. Blue: Aerators ON, Orange: Aerators OFF

5.4 Kempabudhi:

5.4.1 Current status of the plant:

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
1 MLD	2002	EAP	3500-3600 mg/L	21 m^3/hr for 22 hrs	21 m^3/hr for 2 hrs	2-2.4 mg/L	No

1. The grit chamber is clogged.
2. The Dissolved oxygen level maintained in the aeration basin is most likely < 1 mg/L. The plant uses surface aerators.
3. The MLSS in the aeration tank is most likely less than the claimed value. The sludge in the aeration tank is lean and filamentous. The RAS ratio is low.
4. The water quality analysis shows that the plant meets the COD and phosphorus standards however does not meet the total Nitrogen and BOD standards.

5.4.2 Modifications required to meet NGT-BNR standards

1. Turn the aerators on and off in such a way as to split the aeration tank into two separate zones
2. Zone 1 is aerated at 1.75 mg/L. Zone 2 is unaerated.
3. This modification will result in the removal of Nitrogen.
4. Increase the RAS ratio to increase the MLSS in the tank; this will improve the nitrogen removal as well as BOD and COD removal and increase the settling quality of the sludge. The MLSS should be increased by at least 1000 mg/L.
5. The grit and screen chamber should be cleaned properly to increase the efficiency of its use
6. It is recommended that the plant is operated at a lower inflow rate and the rest of the sewage be diverted to other STPs.

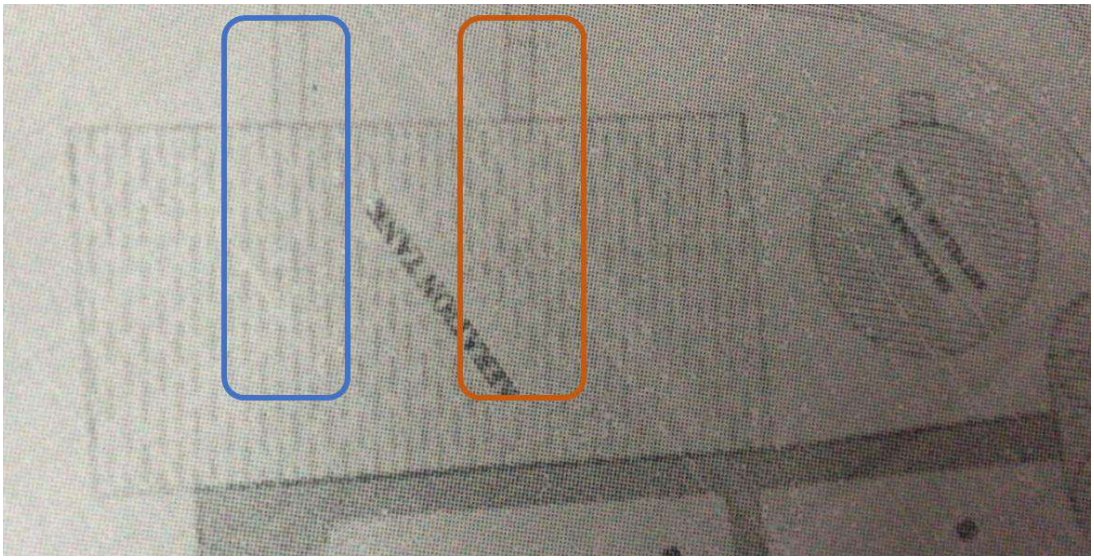


Figure 19: Layout of Kempabudhi indicating which aerators to turn on and off. Blue: Aerators ON, Orange: Aerators OFF

5.5: Kadugodi:

5.5.1 Current status of the plant:

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
4.6 MLD	2018	SBR	3000-3500 mg/L	30 m^3/hr for 1.5 hr/cycle	~ 207 m^3/day	1-4 mg/L	Yes

1. There are three SBR units, out of which one unit is on standby. Diffuse aerators are used during the aeration cycle.
2. Adequate aeration is maintained during the aeration phase.
3. Surfactants are present in the influent but are removed during the treatment process.
4. The effluent did not meet COD, BOD and total nitrogen standards.
5. The Chlorine contact tank had algal growth, insect larva growth, and mould growth, leading to higher COB and BOD in the effluent water.

5.5.2 Modifications required to meet all NGT-BNR standards

1. The current cycle includes an unaerated filling stage. The aeration should begin with filling so that the total aeration time is 1.5 hrs. (keep the filling stage unaerated only if nitrates in the influent are high and are not removed during the primary process). Dissolved oxygen during aeration time should be maintained at 3.5 mg/l
2. The current cycle includes settling time of 45 mins which should be increased to 102 mins.
3. In the case of diluted sewage, additional carbon may have to be added to the sewage to assure proper nutrient removal.

5.6: Halasuru:

5.6.1 Current status of the plant:

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
2 MLD	2018	SBR	3500 mg/L	30 m^3/hr for 2 hr/cycle	As needed	2.5-3 mg/L	Yes

1. There are two SBR units; both are operational. Diffuse aerators are used during the aeration cycle.
2. The influent included a high quantity of oil and grease, which was observed in the SBR chambers in the form of frothing.
3. The effluent did not meet COD, BOD and total nitrogen standards.
4. The sludge settling was poor, which led to high BOD and COD values in the effluent.

5.6.2 Modifications required to meet NGT-BNR standards

1. The MLSS in the SBR tank should be increased by at least 1000 mg/L by controlling the RAS ratio. Currently, the RAS is at 33-36% and should be increased. Dissolved oxygen during aeration time should be maintained at 3.5 mg/l
2. The current cycle includes settling time of 1 hr, which should be increased to 2 hrs.

3. Oil and grease traps should be installed in the primary treatment to remove excess oil and grease in the influent.
4. In the case of diluted sewage, additional carbon may have to be added to the sewage to assure proper nutrient removal.

5.7: Yellamallappa Chettikere:

5.7.1 Current status of the plant:

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
14.6 MLD	2018	SBR	-	-	310 m^3/day	-	Yes

1. There are four SBR units. Diffuse aerators are used during the aeration cycle.
2. The effluent did not meet the BOD and total nitrogen standards.

5.7.2 Modifications required to meet NGT-BNR standards

1. The MLSS in the SBR tank should be increased by controlling WAS. Dissolved oxygen during aeration time should be maintained at 3.5 mg/l
2. The current cycle includes settling time of 1.5 hr, which should be increased to 3 hrs.
3. In the case of diluted sewage, additional carbon may have to be added to the sewage to assure proper nutrient removal.

5.8: Malathahalli:

5.8.1 Current status of the plant:

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
4.7 MLD	2018	SBR	3500-3600 mg/L	-	391 m^3/day	< 2 mg/L	No

1. There are two SBR units; both are operational. Diffuse aerators are used during the aeration cycle.
2. The effluent did not meet the BOD and total nitrogen standards.
3. The effluent of SBR passes through a cloth filter and chlorine contact tank. Both tanks are unclean and lead to the addition of BOD and COD to the effluent.

5.8.2 Modifications required to meet NGT-BNR standards

1. The aeration should begin with filling so that the total aeration time becomes 2.24 hrs. (However, if the influent has a high nitrate-N concentration, which is not removed during primary treatment, the fill time should be unaerated). Dissolved oxygen during aeration time should be maintained at 3.5 mg/l
2. The current cycle includes settling time of 69 mins which should be increased to 3.2 hrs.
3. Oil and grease traps should be installed in the primary treatment to remove excess oil and grease in the influent.
4. One Inlet screen needs repair, one blower needs to be replaced, and one centrifuge that is not working should be replaced.
5. In the case of diluted sewage, additional carbon may have to be added to the sewage to assure proper nutrient removal.

6.0 RECOMMENDATIONS FOR POORLY PERFORMING STPS

6.1 Kadubeesanahalli phase - 1:

6.1.1 Current status of the plant:

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination

43 MLD	2005	EAP	-	60%	40%	-	No

1. The IISc team suspected that the plant operation had been suspended for some time and had only resumed a few hours before the visit. The high concentration of ammoniacal Nitrogen in the effluent supported this assessment.
2. The MLSS in the aeration tank is not adequate.
3. The effluent quality was not satisfactory and included suspended matter. The water quality analysis shows that the plant met none of the Hon'ble NGT standards. However, if operated properly, the effluent quality will improve.

6.1.2 Modifications required to meet NGT-BNR standards

1. Turn the aerators on and off in such a way as to split the aeration tank into three separate zones
2. Zone 1 is aerated at 2 mg/L. Zone 2 is unaerated, and zone 3 is aerated at 1 mg/L.
3. This modification will result in the removal of Nitrogen. However, a further increase in MLSS is required to improve nitrogen and carbon removal capacity.
4. Increase the RAS ratio to increase the MLSS in the tank; this will improve the nitrogen removal as well as BOD and COD removal and increase the settling quality of the sludge. The MLSS value should be between 2500-3500 mg/L

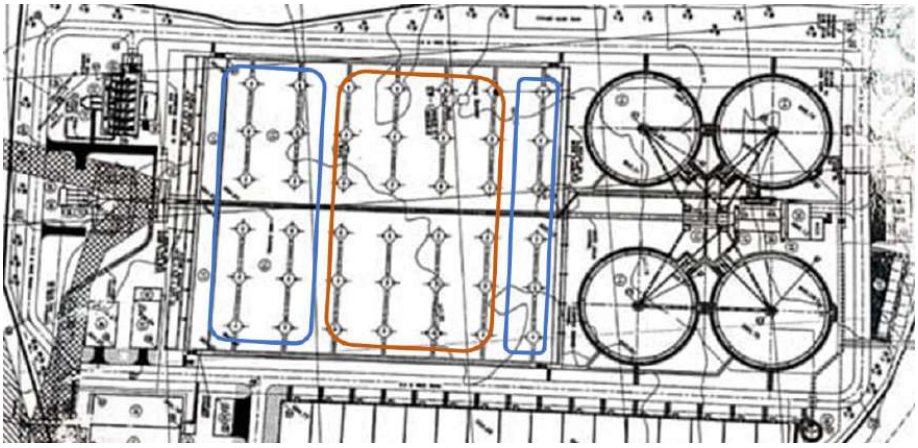


Figure 20: Layout of Kadubeesanahalli – 1 indicating which aerators to turn on and off. Blue: Aerators ON, Orange: Aerators OFF

6.2 Nagasandra phase - 1:

6.2.1 Current status of the plant:

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
11 MLD	2005	EAP	-	-	-	-	No

1. Oil and grease, and algae were observed in the grit chamber
2. The plant uses surface aerators. Aeration is not being done properly. Aerators are not run 24 hrs and are turned off during nighttime. The high ammoniacal nitrogen concentration in the effluent fortifies this assessment.
3. The MLSS in the aeration tank is not adequate. Sludge settling is not adequate.
4. The effluent quality was not satisfactory. The water quality analysis shows that the plant met none of the Hon'ble NGT-BNR standards.

6.2.2 Modifications required to meet NGT-BNR standards

1. Turn the aerators on and off in such a way as to split the aeration tank into two separate zones
2. Zone 1 is aerated at 2 mg/L. Zone 2 is unaerated.

3. This modification will result in the removal of Nitrogen. However, a further increase in MLSS is required to improve nitrogen and carbon removal capacity. MLSS levels should be between 3000-3500 mg/L.
4. Increase the RAS ratio to increase the MLSS in the tank; this will improve the nitrogen removal as well as BOD and COD removal and increase the settling quality of the sludge.
5. The scraper mechanism should be inspected for rust, flow directional gates are broken and should be replaced. Other equipment should be checked and replaced.
6. Anoxic mixers are not working and should be replaced.
7. Surface aerators are running with noise and vibrations. There is a reduction in rpm due to rewinding. Gearboxes have outlived their service life. If possible, shift to diffuse aerators.
8. The strength of material for clarifiers should be analyzed, and the system should be assessed and replaced accordingly.
9. Major flow meters are not working and should be replaced.

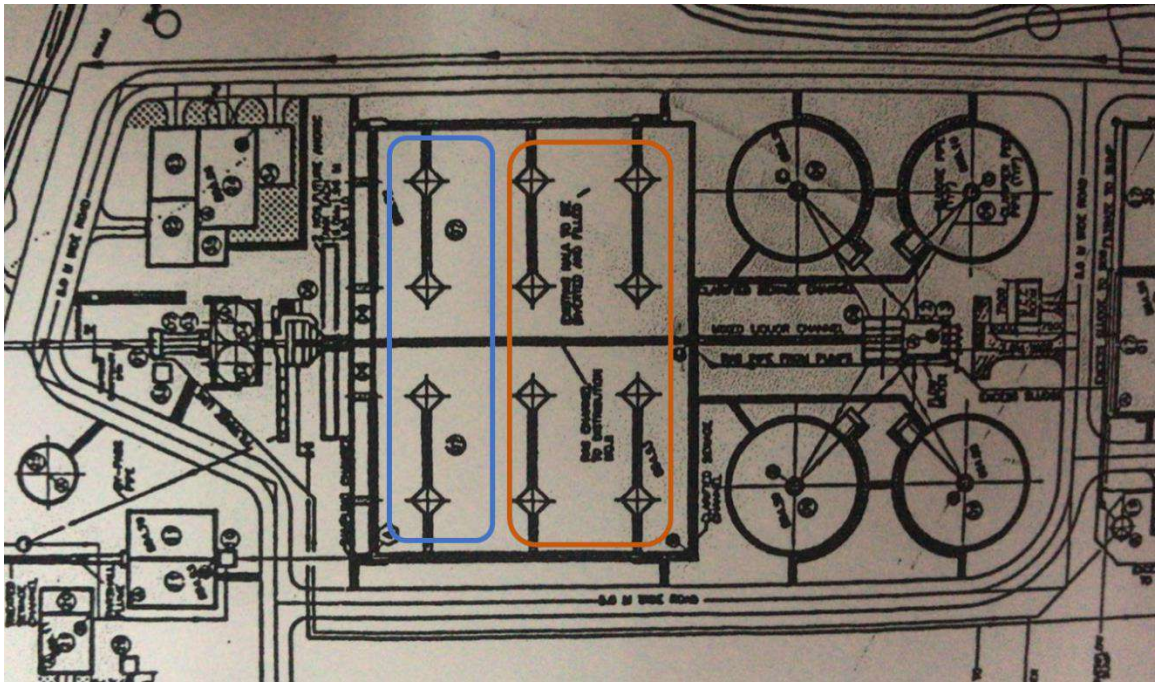


Figure 21: Layout of Nagasandra phase – 1 indicating which aerators to turn on and off. Blue: Aerators ON, Orange: Aerators OFF

6.3: K R Puram:

6.3.1 Current status of the plant:

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination methodology
11 MLD	2005	UASB + EAP	3500 mg/L	100%	0.8 MLD	2 mg/L	No chlorination

1. The UASB is blocked, and some of the sewage is bypassing the UASB and directly entering the ASP system leading to higher nitrogen levels in the effluent.
2. The DO level in the aeration tank is significantly lower than the claimed levels. The sludge collected from the aeration tank shows the same.
3. The ammoniacal nitrogen content in the effluent is very high, indicating that sufficient aeration is not taking place and raw sewage is bypassing the UASB
4. The effluent did not meet the COD and total nitrogen standards.
5. The plant is designed for effluent Nitrogen of no more than 50 mg/l

6.3.2 Modifications required to meet NGT-BNR standards

1. The UASB should be made operational so that no influent is bypassing it and proper nutrient removal occurs.
2. MLSS in the aeration tank should be increased to optimal levels, ensuring proper removal of nutrients.
3. The modification to the plant operation are suggested in the layout below; it includes splitting one of the UASB tanks into two and altering the flow in the extended aeration process.

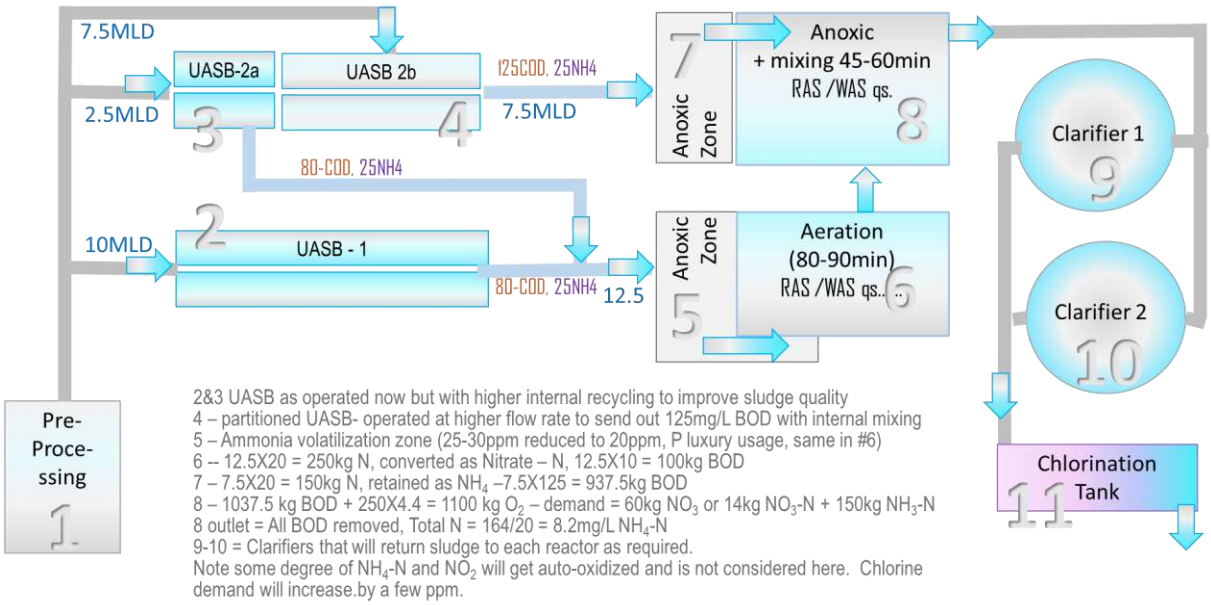


Figure 22: Modified layout for K R Puram STP

7.0 GENERAL RECOMMENDATIONS FOR ALL PLANTS:

5. Unclean Chlorine contact tanks with settled sludge and algal growth are increasing the COD of effluent.
6. Chlorine contact tanks should be thoroughly cleaned, tiled and painted with algae-resistant paint or coating, preferably in blue color.
7. All plant equipment such as screens, grit scrappers, flow meters, and aerators should be inspected and replaced wherever necessary.
8. Chlorine dose should be given to the effluent at all locations to reduce the concentration of pathogenic micro-organisms.
9. Residual chlorine is measured at various stages of chlorination; however, it is recommended that appropriate residual chlorine content is measured after adequare residence time post chlorine addition and needs to be measured before the discharge point.

Annexure-I

Table 4: Parameters analyzed and Analysis methodology

Sl No.	Parameters	Method References
13.	Turbidity	APHA 23rd Edition 2130-B
14.	Conductivity	APHA 23rd Edition 2510-B
15.	pH	APHA 23rd Edition 4500-H^+, B
16.	BOD for 5 days at 20˚C	APHA 23rd Edition 5210-B
17.	COD	APHA 23rd Edition 5220-C
18.	Dissolved Oxygen	APHA 23rd Edition 4500-O, C
19.	Total Alkalinity as $CaCO_3$	APHA 23rd Edition 2320-B
20.	Total Hardness as $CaCO_3$	APHA 23rd Edition 2340-C
21.	Nitrate	APHA 23rd Edition 4500-NO_3^-, E
22.	Ammonia-N	IS: 3025 (Part 34)- 2009
23.	Total Phosphates	APHA 23rd Edition 4500-P, G
24.	Surfactants	APHA 23rd Edition 5400-C

APPENDIX – 5

BWSSB

STP COMPLIANCE WITH NGT-BNR STANDARDS

DR. L N RAO, PROF. MOHAN KUMAR AND PROF. H N CHANAKYA

SCOPE OF WORK:

The scope of work included:

1. On site inspection of all 20 STPs included in the list
2. Collection and analysis of water samples
3. Recommendations for modifying the operation of STPs to meet the new BNR standards

NGT Standards:

Parameter	Unit	Standard
pH	-	5.5-9
Biological Oxygen Demand	mg/L	10
Chemical Oxygen Demand	mg/L	50
Total Suspended Solids	mg/L	20
Total Nitrogen	mg/L	10
Total Phosphorus	mg/L	1
Total Coliforms	MPN/100 ml	<100 desirable, <230 OK

Details of the STPs studied:

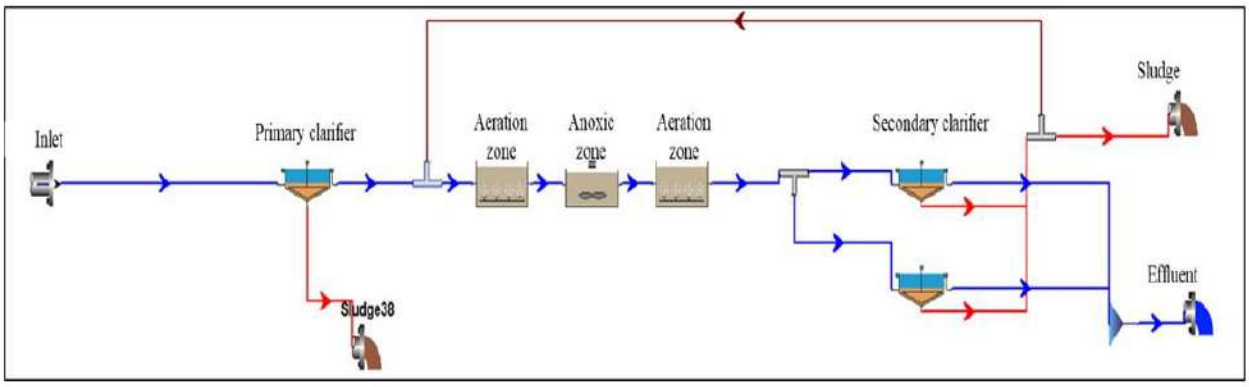
The list included 20 STPs. Out of the 20 STPs, **V Valley** STP is under upgradation and hence not completely operational, similarly **Madiwala** STP is also under construction and hence non-operational. Further the team was informed that **Kengeri** STP was put on the list unintentionally. Therefore, these were not visited.

List of STPs Studied:

1. K & C valley (60 MLD)
2. Bellandur Amani kere (MLD)
3. Horamvu Agara (20 MLD)
4. Nagasandra phase -2 (20 MLD)
5. Chikkabanavara (5 MLD)
6. Doddabele (20 MLD)
8. Rajacanal phase -1 (40 MLD)
9. Rajacanal phase -2 (40 MLD)
10. Mailasandra phase -1 (75 MLD)
11. Kempabudhi (1MLD)
12. Kadugodi (6 MLD)
13. Halasuru (2MLD)
14. Yelemallappa Chettikere (15 MLD)
15. Mallathahalli (5 MLD)
15. Kadubeesanahalli (50 MLD)
16. Nagasandra phase -1 (20 MLD)
17. K R Puram phase -1 (20 MLD)

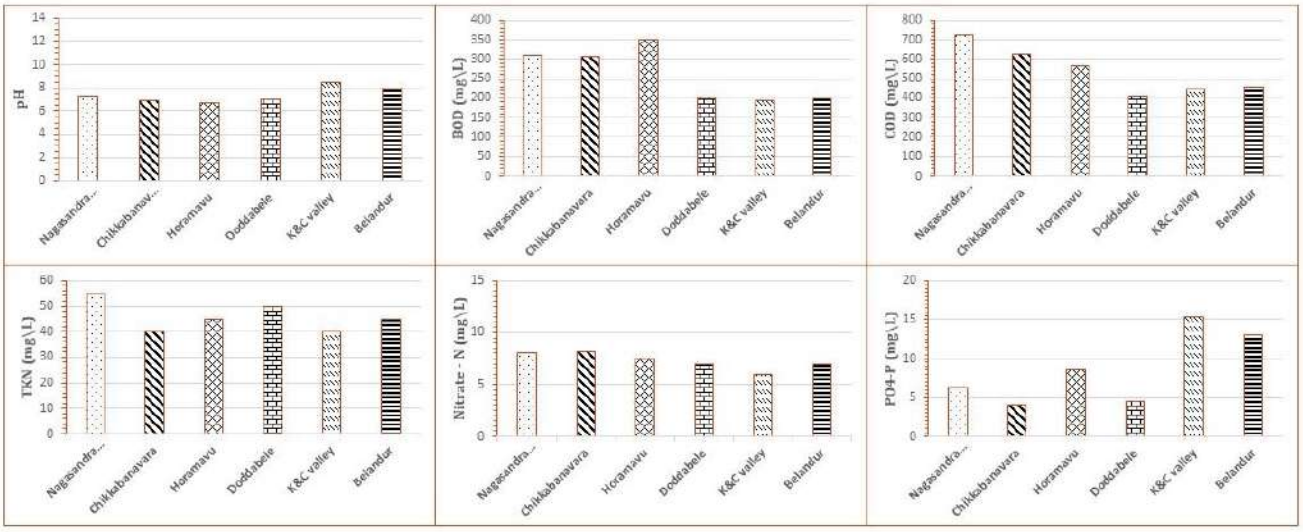
Methodology used :

1. An 'As-Is BioWin' Simulation model for each of the STPs was created

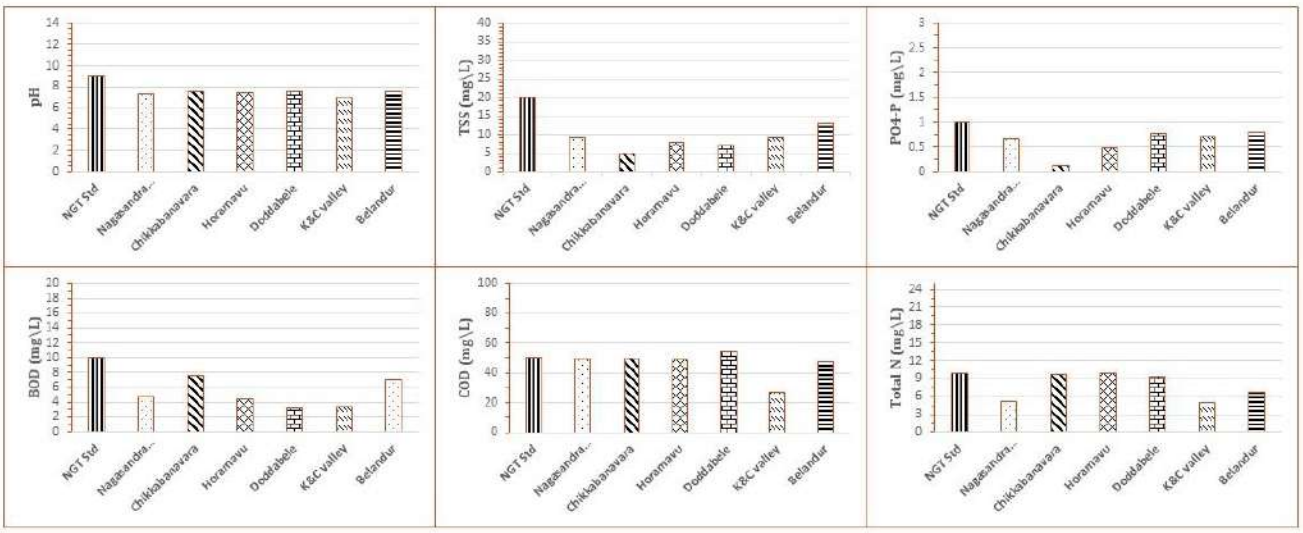


2. The created model was validated for the water samples collected and analyzed
3. Using the validated model at full flow conditions, the model was run for different scenarios and the optimum values for each STPs have been determined.

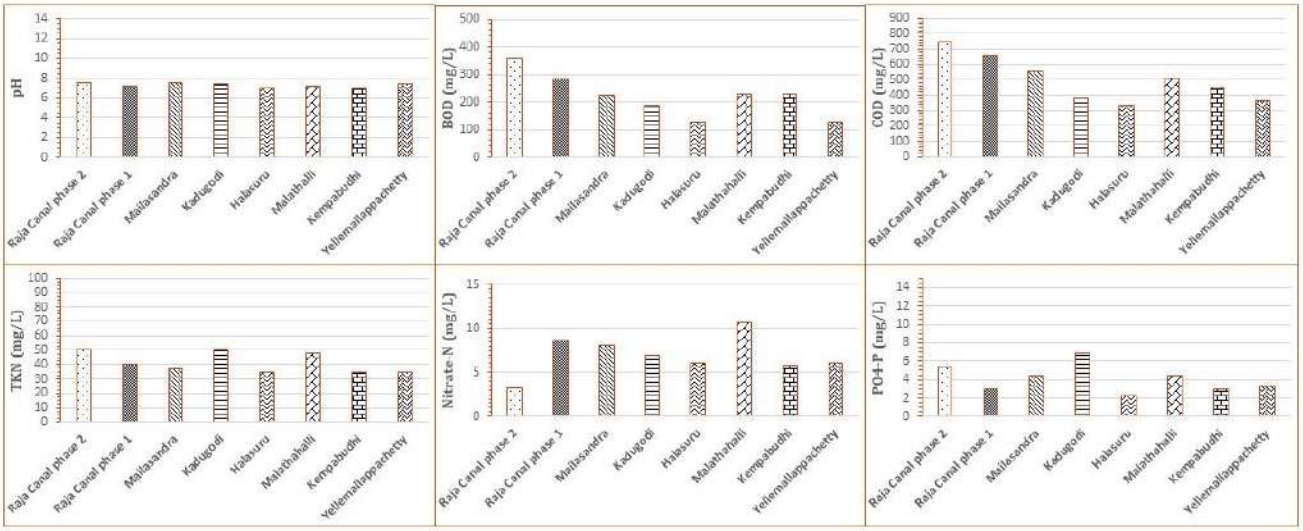
STPs meeting NGT-BNR standards: Inlet parameters



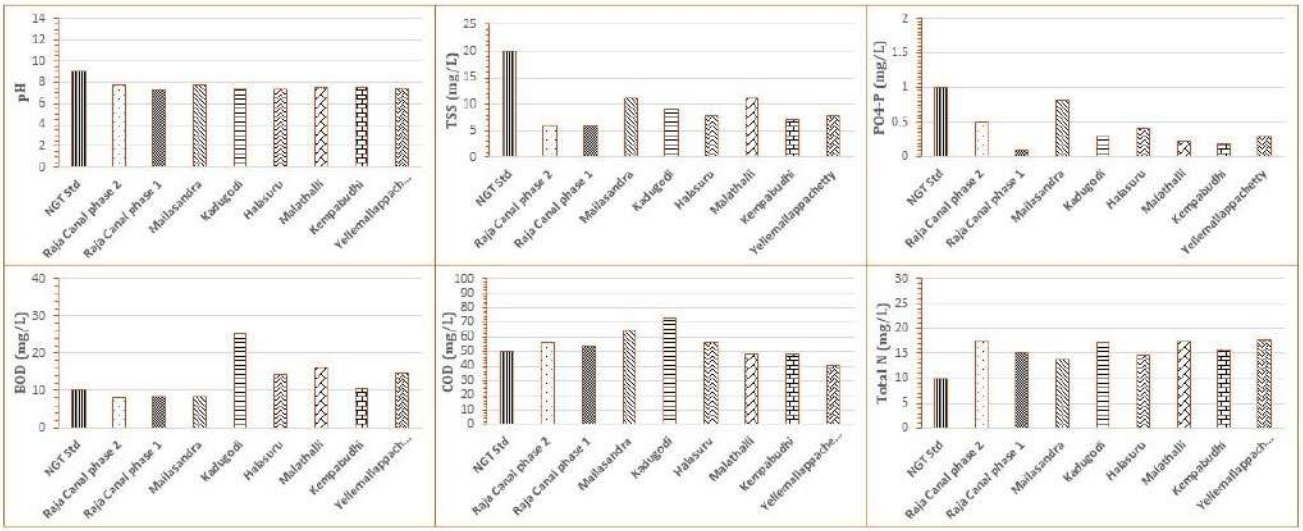
STPs meeting NGT-BNR standards: Outlet parameters



Marginally underperforming STPs: Inlet parameters

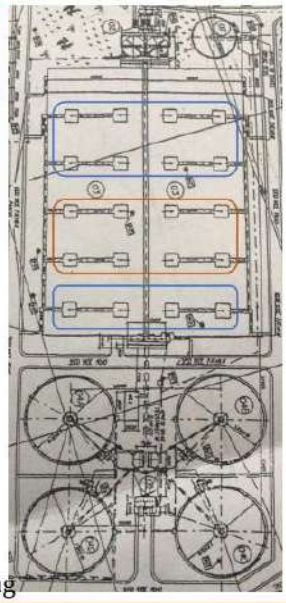


Marginally underperforming STPs: Outlet parameters



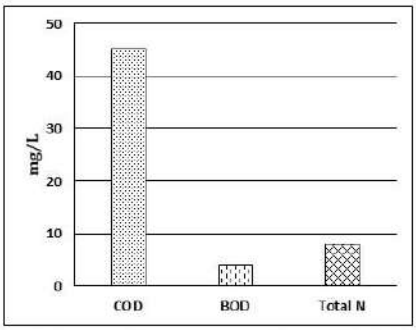
Rajacanal phase -1: 40 MLD

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
35 MLD	2004	EAP	2700 mg/L	85%	400 m^3/day	1.8-2.0 mg/L	Yes



SUGGESTED MODIFICATIONS:

1. Turn the aerators on and off in such a way as to split the aeration tank into three separate zones
2. Zone 1 is aerated at 3 mg/L. Zone 2 is left unaerated, and zone 3 is aerated at 2 mg/L.
3. The MLSS in the aeration tank should be increased to 3500 mg/L.
4. Surface aerators and other equipment should be inspected and replaced where necessary.



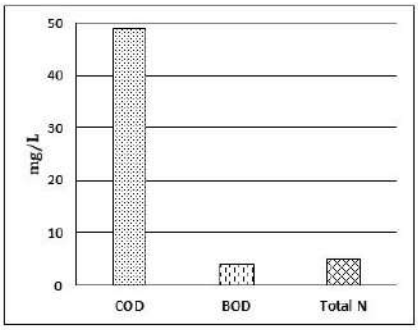
Expected Output Parameters from Modelling

Rajacanal phase - 2: 40 MLD

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
45 MLD	2018	EAP	3500 mg/L	80%	~2000 m^3/day	3 mg/L	Yes

SUGGESTED MODIFICATIONS:

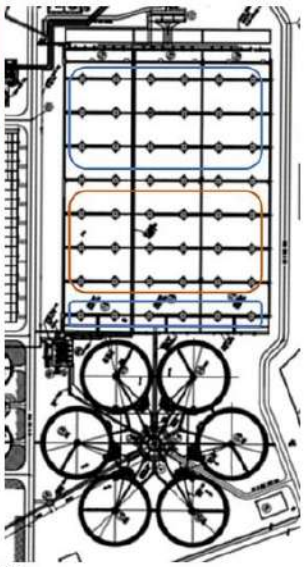
1. Turn the aerators on and off in such a way as to split the aeration tank into two separate zones
2. Zone 1 is aerated at 3.5 mg/L, and Zone 2 is unaerated. Turn on the last set of aerators.
3. The MLSS in the aeration tank should be increased to 4000 for further improvements
4. Consider sending excess 5 MLD to phase 1



Expected Output Parameters from Modelling

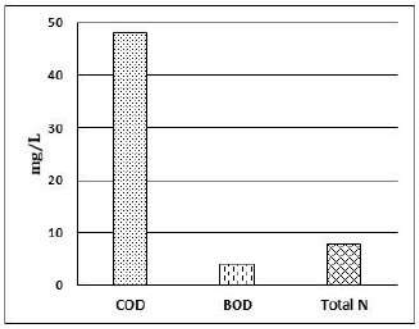
Mailasandra phase -1: 75 MLD

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
70 MLD	2015	EAP	3500 mg/L	73%	~550 m^3/day	-	Yes



SUGGESTED MODIFICATIONS:

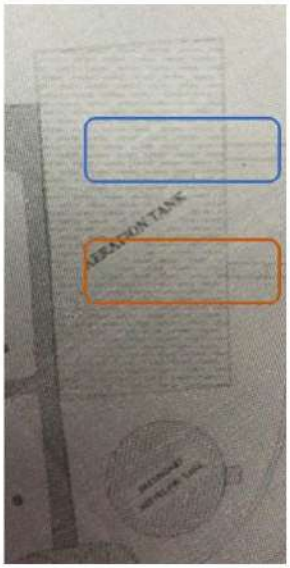
1. Turn the aerators on and off in such a way as to split the aeration tank into three separate zones
2. Zone 1 is aerated at 3 mg/L. Zone 2 is left unaerated, and zone 3 is aerated at 2 mg/L.
3. The MLSS in the aeration tank should be increased to 4000 mg/L.



Expected Output Parameters from Modelling

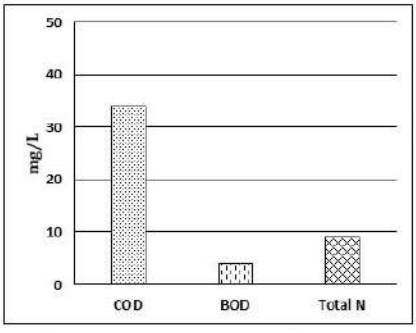
Kempambudhi: 1 MLD

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
1 MLD	2002	EAP	3500-3600 mg/L	21 m^3/hr for 22 hrs	21 m^3/hr for 2 hrs	2-2.4 mg/L	No



SUGGESTED MODIFICATIONS:

1. Turn the aerators on and off in such a way as to split the aeration tank into two separate zones
2. Zone 1 is aerated at 2 mg/L. Zone 2 is left unaerated.
3. The MLSS should be increased to 4000 mg/L.
4. It is recommended that the plant is operated at a lower inflow rate (0.6 MLD) and the rest of the sewage be diverted to downstream STPs



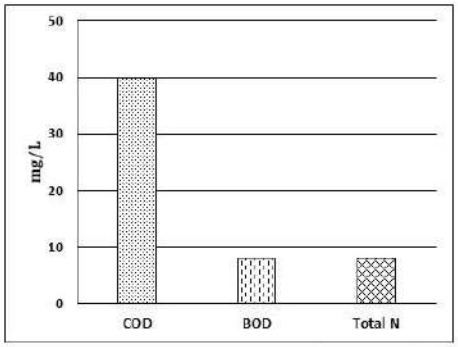
Expected Output Parameters from Modelling

Kadugodi: 6 MLD

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
4.6 MLD	2018	SBR	3000-3500 mg/L	30 m^3/hr for 1.5 hr/cycle	~ 207 m^3/day	1-4 mg/L	Yes

SUGGESTED MODIFICATIONS:

1. The current cycle includes an unaerated filling stage. The aeration should begin with filling so that the total aeration time is 1.5 hrs. Dissolved oxygen during aeration time should be maintained at 3.5 mg/l
2. The current cycle includes settling time of 45 mins which should be increased to 100 mins.
3. In the case of diluted sewage, additional carbon may have to be added to the sewage to assure proper nutrient removal.



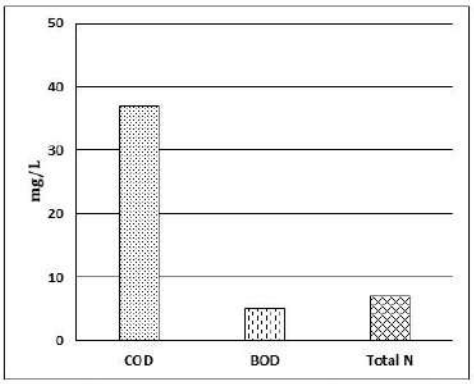
Expected Output Parameters from Modelling

Halasuru: 2 MLD

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
2 MLD	2018	SBR	3500 mg/L	30 m^3/hr for 2 hr/cycle	As needed	2.5-3 mg/L	Yes

SUGGESTED MODIFICATIONS:

1. The MLSS in the SBR tank should be increased to 4000 mg/L by controlling the RAS ratio. Dissolved oxygen during aeration time should be maintained at 3.5 mg/l
2. The current cycle includes settling time of 1 hr., which should be increased to 2 hrs. till proper settling quality of sludge is recorded.
3. Oil and grease traps should be installed in the primary treatment to remove excess oil and grease in the influent.



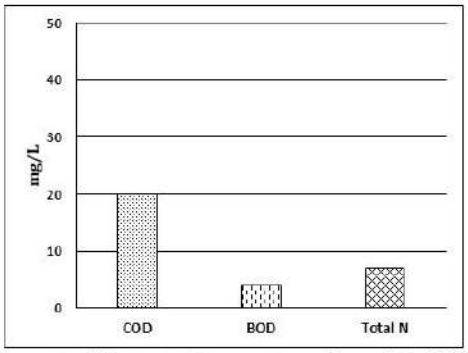
Expected Output Parameters from Modelling

Yellamallappa chettikere: 15 MLD

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
14.6 MLD	2018	SBR	-	-	310 m^3/day	-	Yes

SUGGESTED MODIFICATIONS:

1. The MLSS in the SBR tank should be increased by controlling WAS. Dissolved oxygen during aeration time should be maintained at 3.5 mg/l
2. The current cycle includes settling time of 1.5 hr., which should be increased to 3 hrs.
3. In the case of dilute sewage being received, additional carbon may have to be added to the sewage to assure proper nutrient removal.
4. Make provisions for diverting rainwater and increase BOD levels



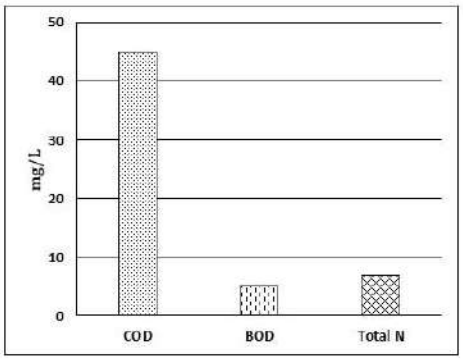
Expected Output Parameters from Modelling

Malathahalli: 5 MLD

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
4.7 MLD	2015	SBR	3500-3600 mg/L	-	391 m^3/day	< 2 mg/L	No

SUGGESTED MODIFICATIONS:

1. The aeration should begin with filling so that the total aeration time becomes 2.24 hrs. (However, if the influent has a high nitrate-N concentration, which is not removed during primary treatment, the fill time should be unaerated). Dissolved oxygen during aeration time should be maintained at 3.5 mg/l
2. The current cycle includes settling time of 69 mins which should be increased to 3.2 hrs. till proper sludge quality is achieved.



Expected Output Parameters from Modelling

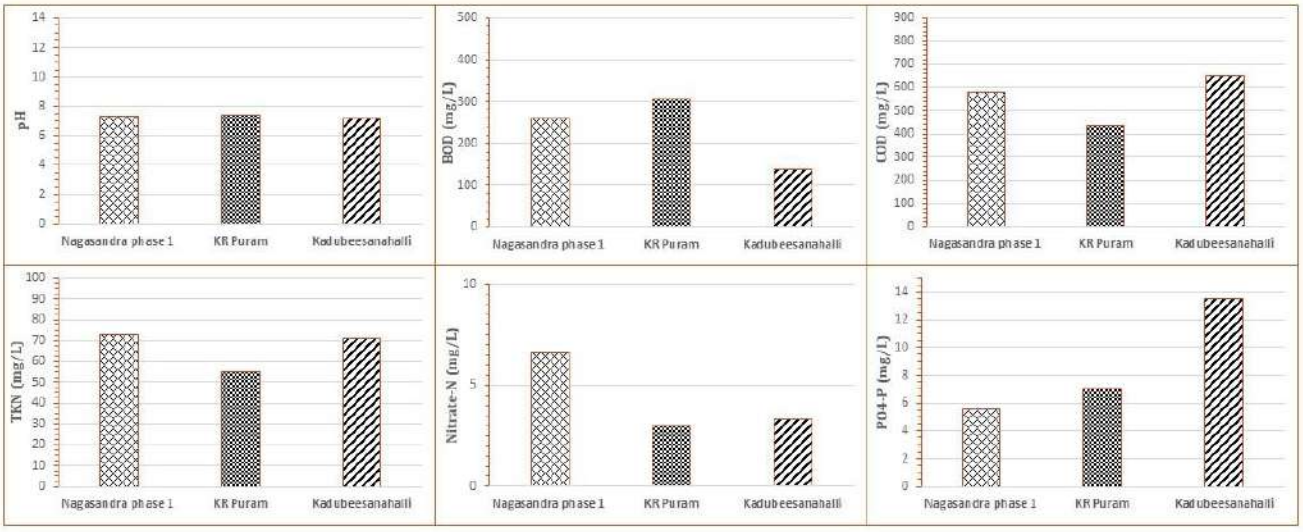
Malathahalli: 5 MLD

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
4.7 MLD	2018	SBR	3500-3600 mg/L	-	391 m^3/day	< 2 mg/L	No

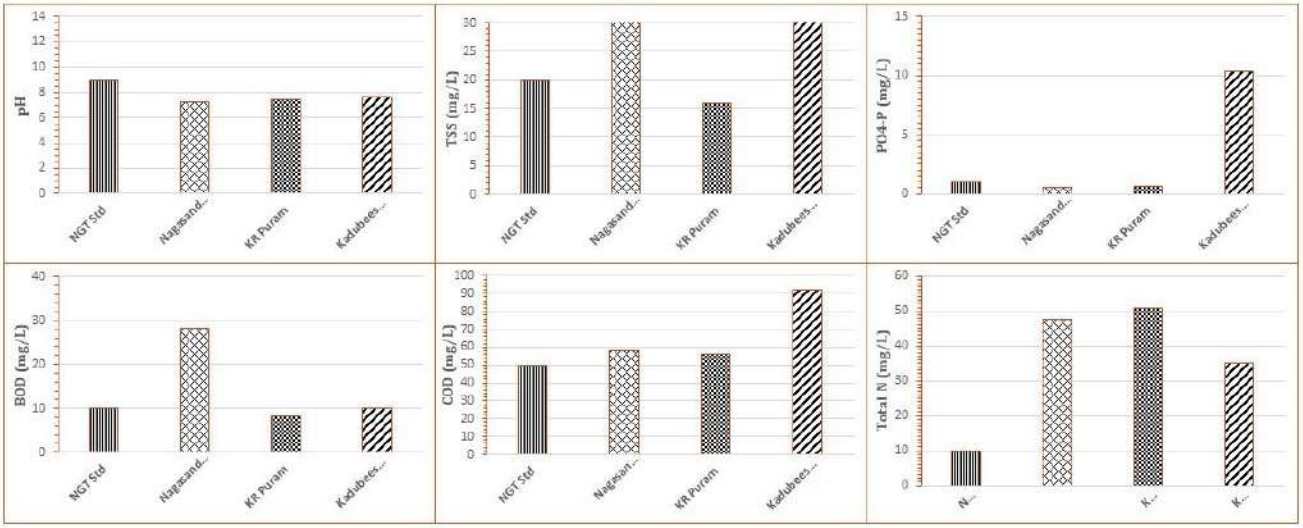
FURTHER MODIFICATIONS REQUIRED:

1. Oil and grease traps should be installed in the primary treatment to remove excess oil and grease in the influent.
2. One Inlet screen needs repair, one blower needs to be replaced, and one centrifuge that is not working should be replaced.
3. In the case of diluted sewage, additional carbon may have to be added to the sewage to assure proper nutrient removal.

Poorly performing STPs: Inlet parameters



Poorly performing STPs: Outlet parameters

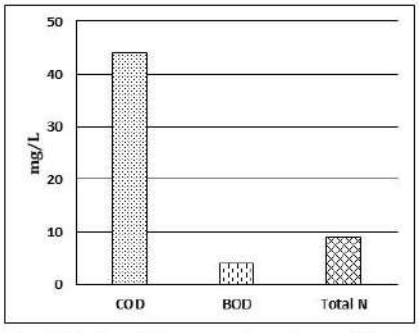


Kadubeesanahalli: 50 MLD

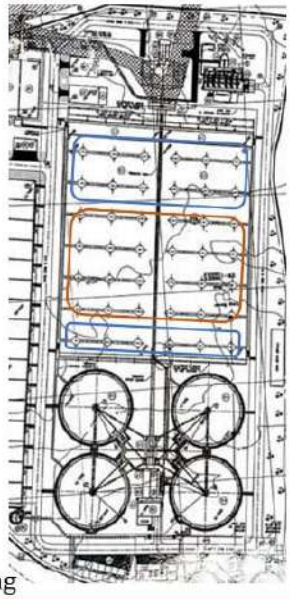
Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
43 MLD	2005	EAP	-	60%	40%	-	No

SUGGESTED MODIFICATIONS:

1. Turn the aerators on and off in such a way as to split the aeration tank into three separate zones
2. Zone 1 is aerated at 2 mg/L. Zone 2 is unaerated, and zone 3 is aerated at 1 mg/L.
3. The MLSS value should be between 2500-3500 mg/L



Expected Output Parameters from Modelling

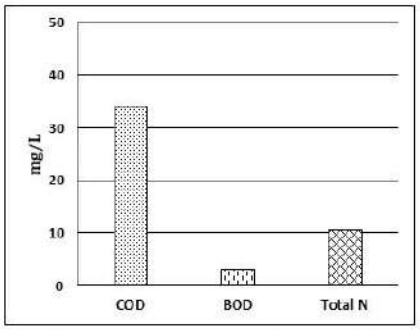


Nagasandra phase -1: 20 MLD

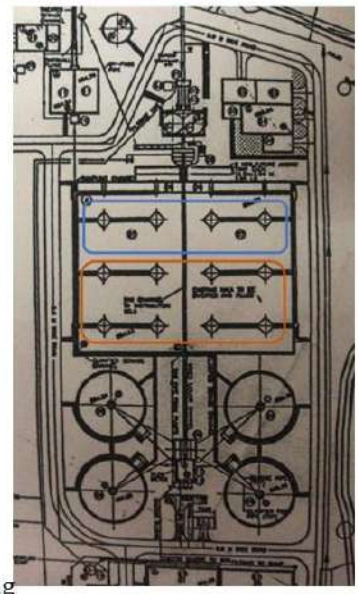
Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
11 MLD	2005	EAP	-	-	-	-	No

SUGGESTED MODIFICATIONS:

1. Turn the aerators on and off in such a way as to split the aeration tank into two separate zones
2. Zone 1 is aerated at 2 mg/L. Zone 2 is unaerated.
3. MLSS levels should be between 3000-3500 mg/L.



Expected Output Parameters from Modelling



Nagasandra phase -1:

Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination
11 MLD	2005	EAP	-	-	-	-	No

FURTHER MODIFICATIONS:

1. The scraper mechanism should be inspected for rust, flow directional gates are broken and should be replaced. Other equipment should be checked and replaced.
2. Anoxic mixers are not working and should be replaced.
3. Surface aerators are running with noise and vibrations. There is a reduction in rpm due to multiple rewindings. Gearboxes have outlived their service life. If possible, shift to diffuse aerators.
4. The strength of material for clarifiers should be analyzed, and the system should be assessed and replaced accordingly.
5. Major flow meters are not working and should be replaced.

K R Puram: 20 MLD

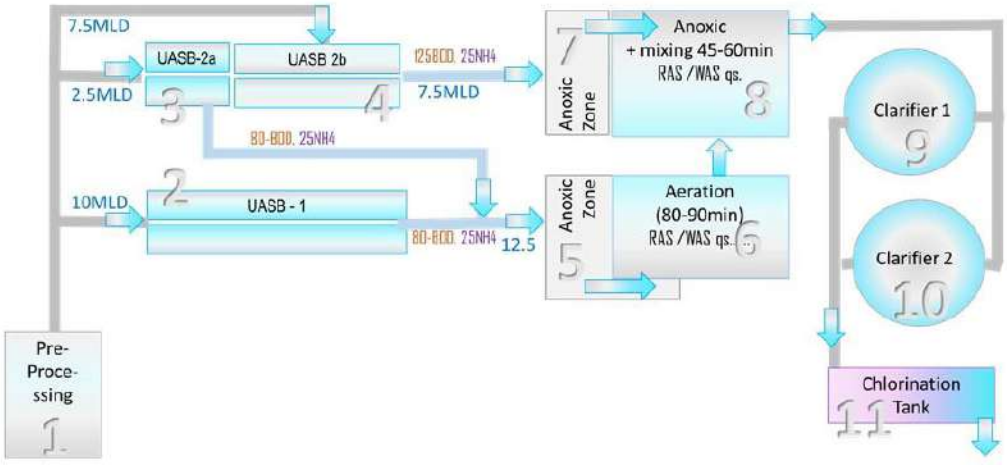
Current flow	Year	Operation technology	Claimed MLSS	RAS	WAS	Claimed DO levels	Chlorination methodology
11 MLD	2005	UASB + EAP	3500 mg/L	100%	0.8 MLD	2 mg/L	No chlorination

INITIAL SUGGESTED MODIFICATIONS:

- Primary treatment needs to be fixed. Any units/equipment that are not working should be inspected and repaired
- UASB downflow inlet pipes are blocked/clogged. These should be unclogged and made sure that they are working properly
- The UASB should be made operational so that no influent is bypassing it and proper nutrient removal occurs. The sludge quality and performance need to be monitored from time to time.
- The surface aerators should be inspected and fixed to make sure they are aerating properly
- MLSS in the aeration tank should be increased to optimal levels, ensuring proper removal of nutrients.

K R Puram: 20 MLD

FURTHER MODIFICATION:



General Recommendations:

1. Unclean Chlorine contact tanks with settled sludge and algal growth are increasing the COD of effluent.
2. Chlorine contact tanks should be thoroughly cleaned, tiled and painted with algae-resistant paint or coating, preferably in blue color.

General Recommendations:

3. All plant equipment such as screens, grit scrappers, flow meters, and aerators should be inspected and replaced wherever necessary.
4. The extent of non-settled portion of sludge should be monitored and reported daily as part of routine SVI and SSI test. This will allow timely tweaking of the process through SCADA.
5. Chlorine dose should be given to the effluent at all locations to reduce the concentration of pathogenic micro-organisms.
6. Chlorine demand should be monitored and reported routinely to ensure satisfactory disinfection is being done.
7. It is recommended that appropriate residual chlorine content is measured after at least 30 mins after chlorine addition and needs to be measured before the discharge point.

Summary and Conclusions:

List of STPs Studied:

1. K & C valley (60 MLD)
2. Bellandur Amani kere (MLD)
3. Horamvu Agara (20 MLD)
4. Nagasandra phase -2 (20 MLD)
5. Chikkabanavara (5 MLD)
6. Doddabele (20 MLD)

Out of the 17 STPs inspected, 6 were compliant with NGT standards. However continuous monitoring should be done to assure long term compliance

8. Rajacanal phase -1 (40 MLD)
9. Rajacanal phase -2 (40 MLD)
10. Mailasandra phase -1 (75 MLD)
11. Kempabudhi (1MLD)
12. Kadugodi (6 MLD)
13. Halasuru (2MLD)
14. Yelemallappa Chettikere (15 MLD)
15. Mallathahalli (5 MLD)

Out of the 17 STPs inspected, 8 were marginally underperforming. Modification for improvement were suggested for all 8 STPs

15. Kadubeesanahalli (50 MLD)
16. Nagasandra phase -1 (20 MLD)
17. K R Puram phase -1 (20 MLD)

Out of the 17 STPs inspected, 3 were performing poorly. Modification for improvement were suggested for all 3 STPs

Acknowledgement :

BWSSB TEAM:
Sri Suresh S T
Sri Pavan N
Sri Miraganje M
Sri Raghu R
Sri Dharanish J
Srimati Vidya K
Sri Prakash S
Sri Girivasa M N

IISc TEAM:
Anirudha T P
Santrupt R M
Srimati Kavita Verma
Sohan Yadav
Shivani Kulkarni

THANK YOU!

APPENDIX – 6

SITE VISIT REPORT: VRISHBHAVATHI VALLEY CATCHMENT AREA SEWAGE TREATMENT PLANTS (2nd Feb 2021)

Details of the Locations Visited:

The team visited three Sewage Treatment Plants (STP) in the Vrishabhavthi Valley Catchment area, namely V. Valley Nayandanahalli, Mailasandra Kengeri and Doddabele. Information about the plant capacity, treatment processes, new construction /rehabilitation and possible issues were obtained for each plant from the BWSSB as well as the respective maintenance teams. At each of the location, the plant maintenanace and management teams appraised the IISc Team of the design, functioning, constrants, neighbourhood issues and adverse events, if any. This discussion session was followed by an inspection tour of the treatment facilities and assessment of their functioning based on a visual assessment as well as data collected (log books) by the management team. Also, water samples were collected at the inlet and outlet of for each plant.

1. Vrishabhavaty Valley Nayandanahalli STP:

The V Valley Nayandanahalli treatment plant was first constructed in 1974 to produce 123MLD primary treated effluent. It was upgraded in 1999 to a capacity of 180 MLD along with addition of secondary treatment. Out of which 60 MLD is a tertiary treatment plant.

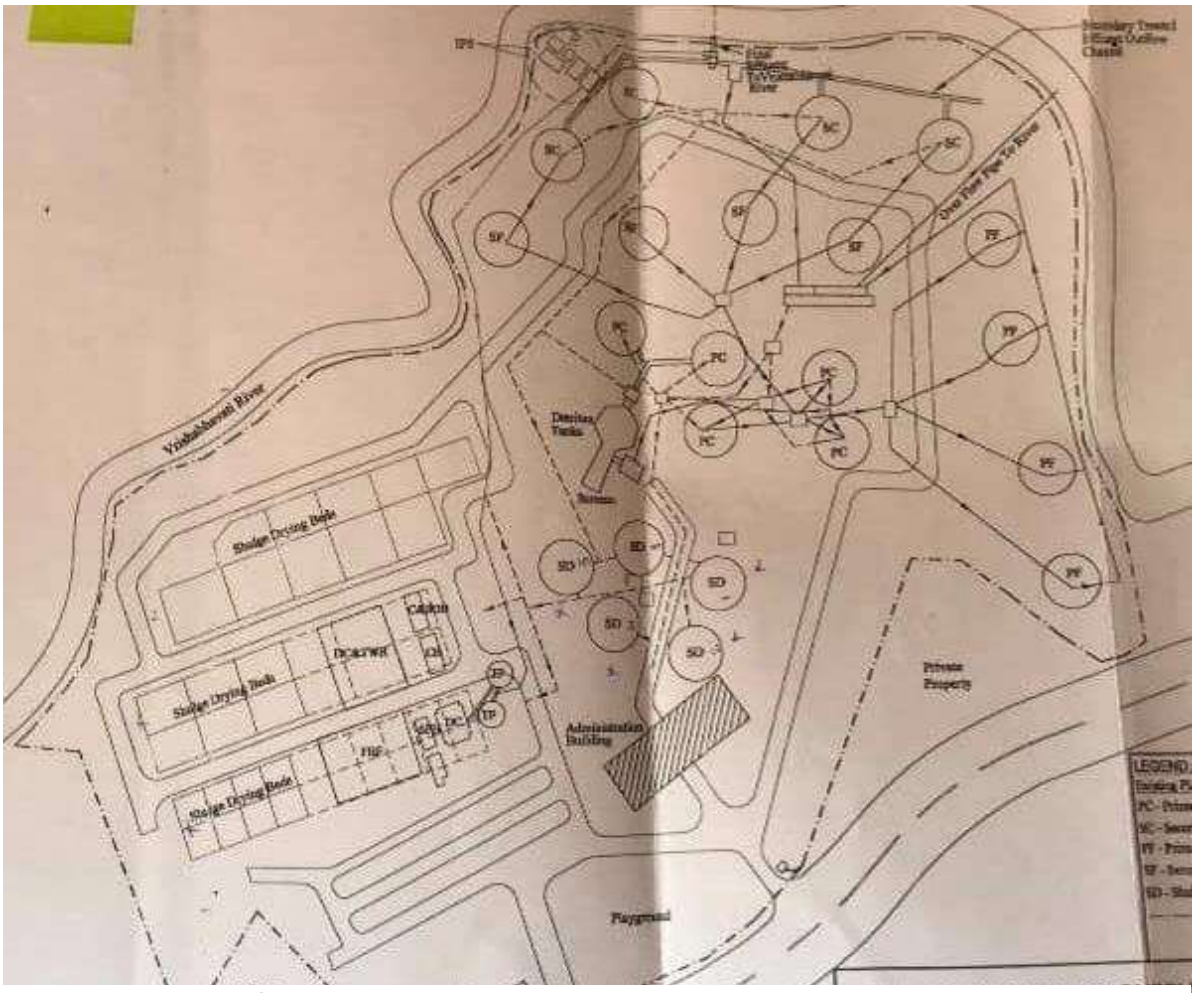


Figure 23: Plan for the original 180 MLD plant at V Valley Nayandanahal updated in 1990

The original plant built here was early in the 1970's and was a trickling filter based treatment system. The process flow details are included in the figure below: The old 180 MLD plant is now being rehabilitated to improve its treatment efficiency.

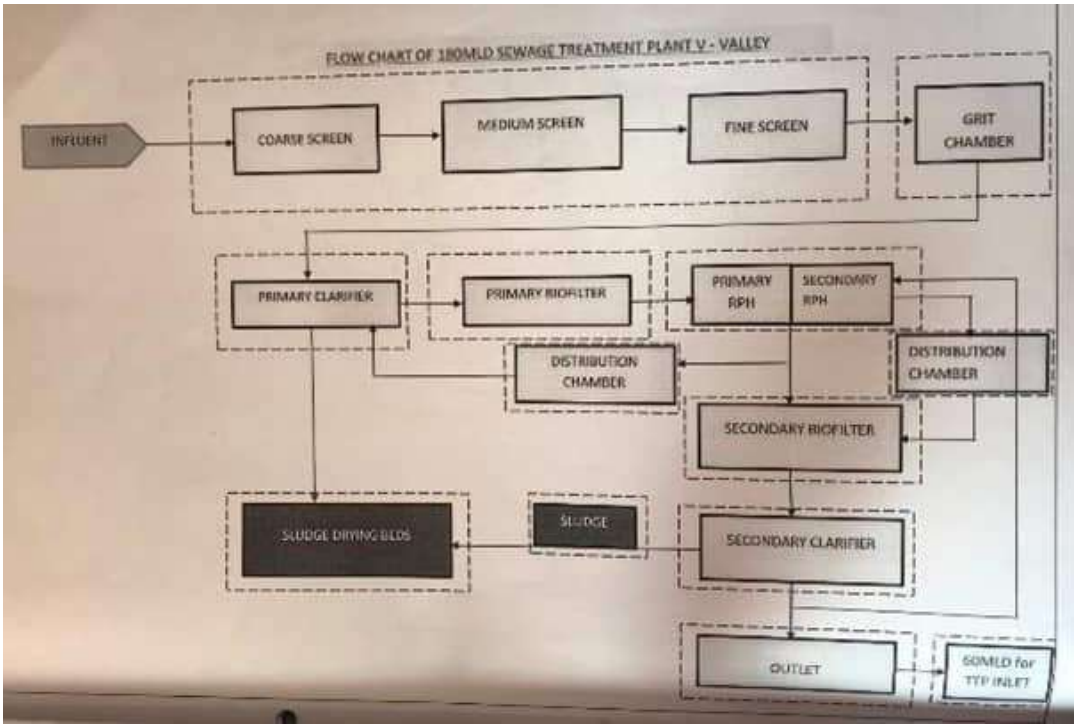


Figure 2: Treatment process flow details for the 180 MLD plant

Figure3: Original yet to be rehabilitated Primary filter

Figure 424: Original yet to be rehabilitated Secondary Clarifiers.

Figure 5: Rehabilitated Primary Clarifiers

Figure 625: Rehabilitated Primary Filter

Construction of a new 150 MLD plant was completed on site in 2020. It is expected to become operational in 2021. The new treatment plant uses an Activated Sludge Process (ASP) with Biological Nutrient Removal (BNR) for water treatment. Both plants together are expected to treat 300 MLD of sewage, which will account for a little more than half of the wastewater generated in Vrishabhavathi valley.

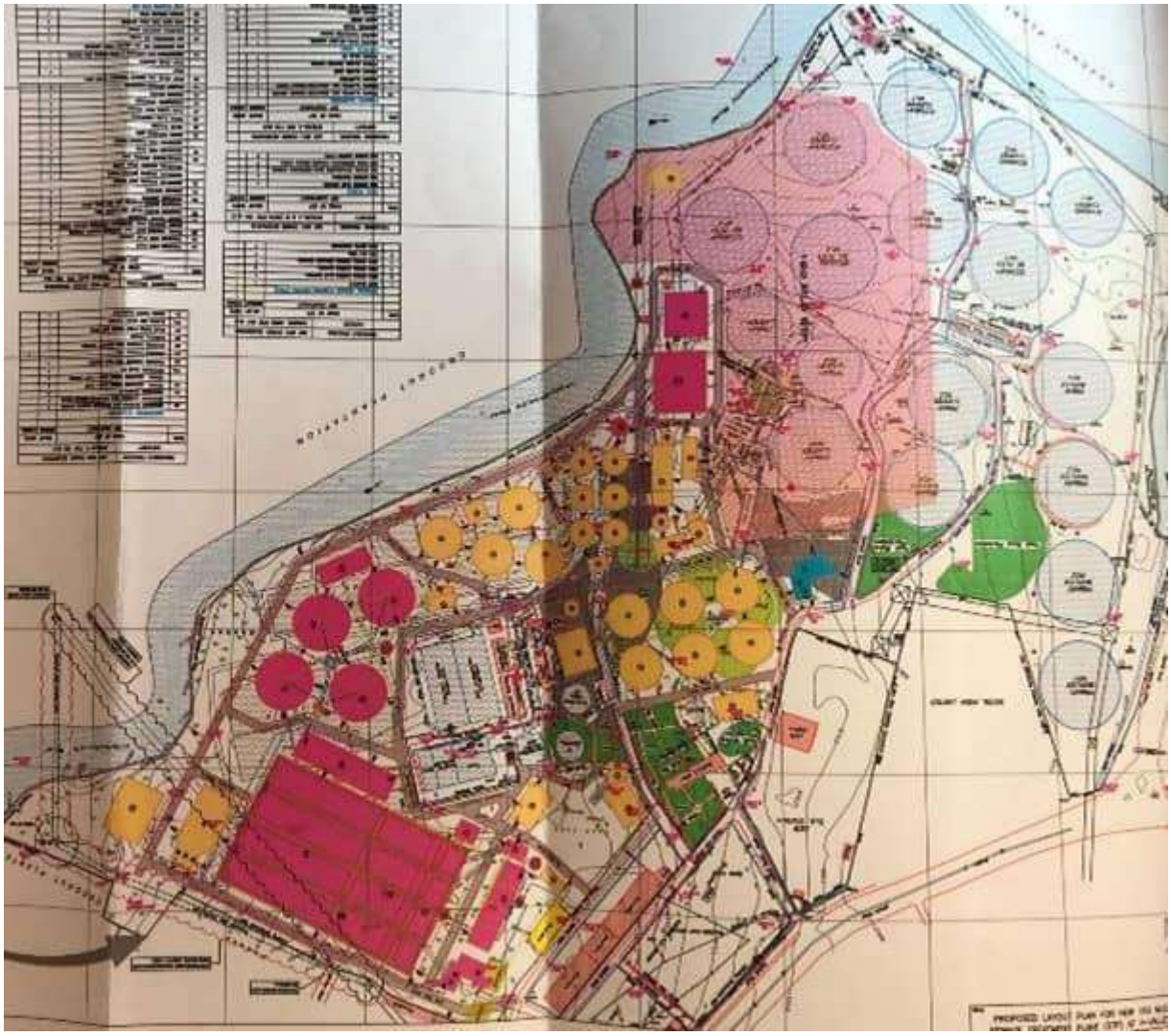


Figure 726: Plan for the new 300MLD Sewage treatment plant at V Valley Nayandanahalli

The new plant will meet the new required standards set by NGT. The old rehabilitated system will need some readjustment to meet the new standards.

2. Mailasandra STP

The Mailasandra Secondary Sewage treatment plant was constructed in 2006. It has a capacity of 75 MLD and receives is wastewater from Kyathamaranahalli and Arkavathi Valley, Nagarbavi, Kanakapura Road and ISRO layout.

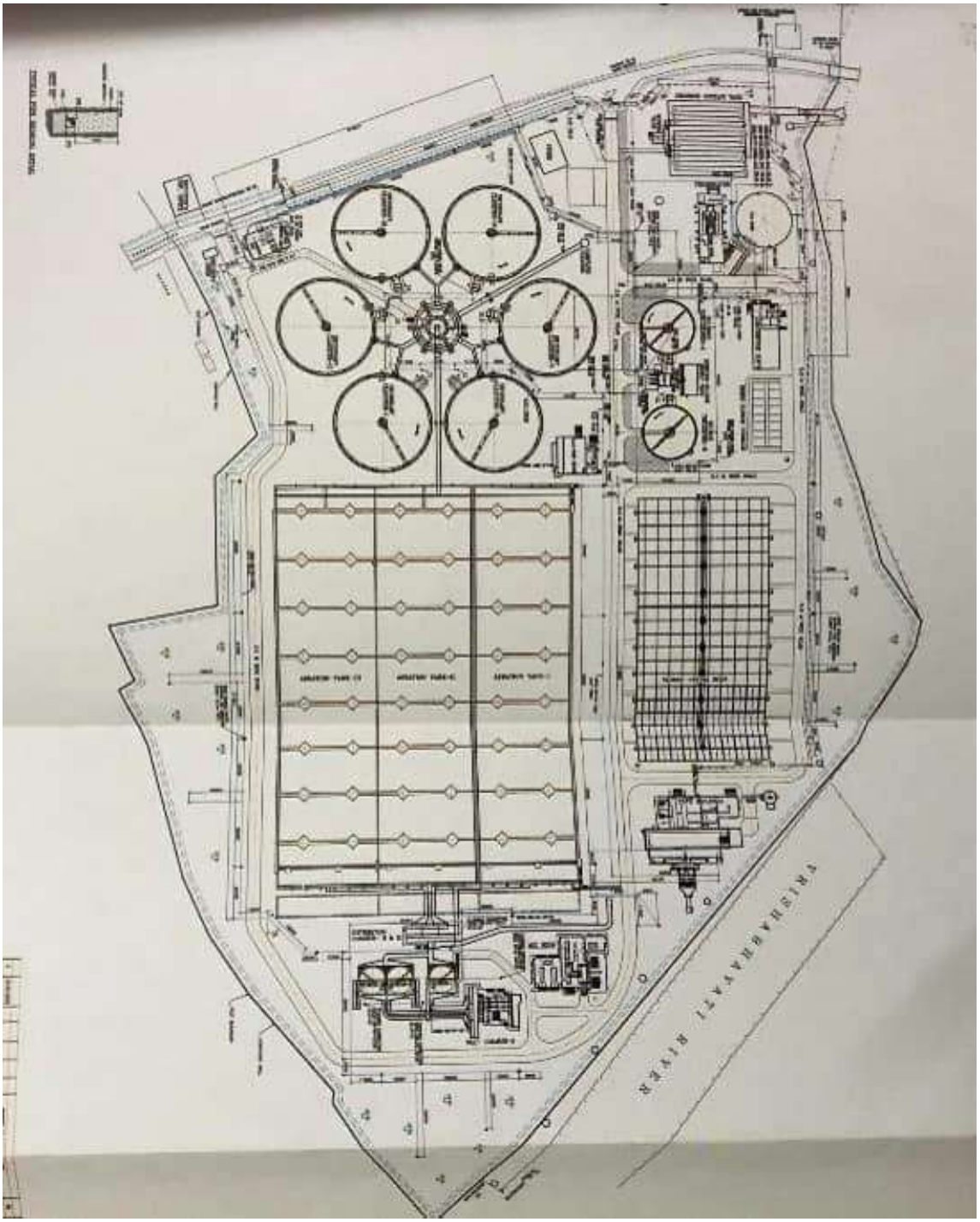


Figure 827: Plan for the Mailasandra Sewage treatment plant

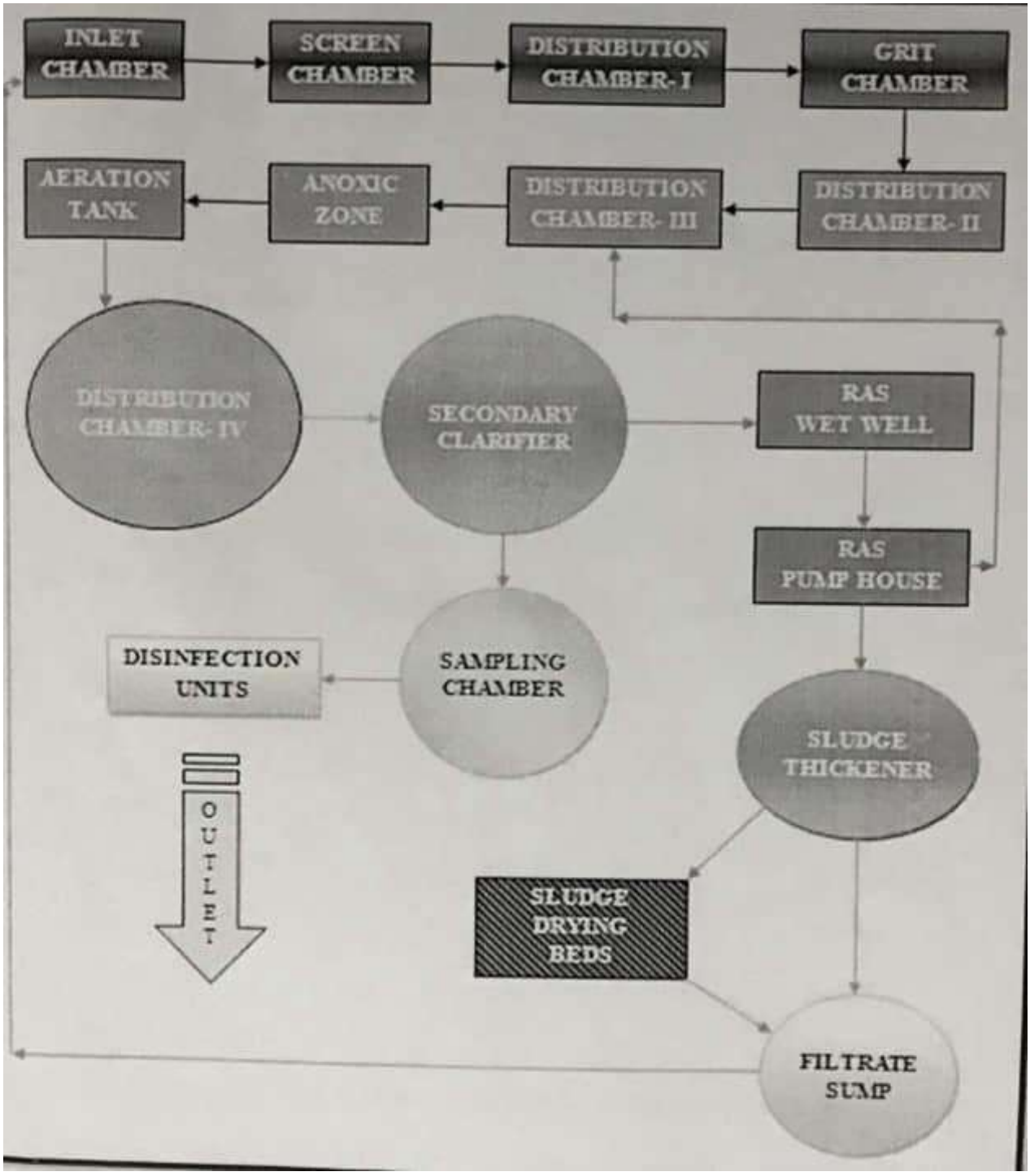


Figure 9 :Treatment process flow for Mailasandra treatment plant

Figure 28: Sewage Inlet Chamber

Figure 10: Grit Chamber

Figure 1129: Anoxic Zone

Figure 12: Aeration Tank

Figure 1330: Secondary Clarifier

3. Doddabele Sewage Treatment Plant

The Doddabele Sewage treatment plant has a capacity of 20 MLD. It uses Sequential Batch Reactor (SBR) technology, wherein aeration, and clarification including Biological Nutrient removal, are all carried out in the same reactor. This plant has a SCADA system for operational control and monitoring.

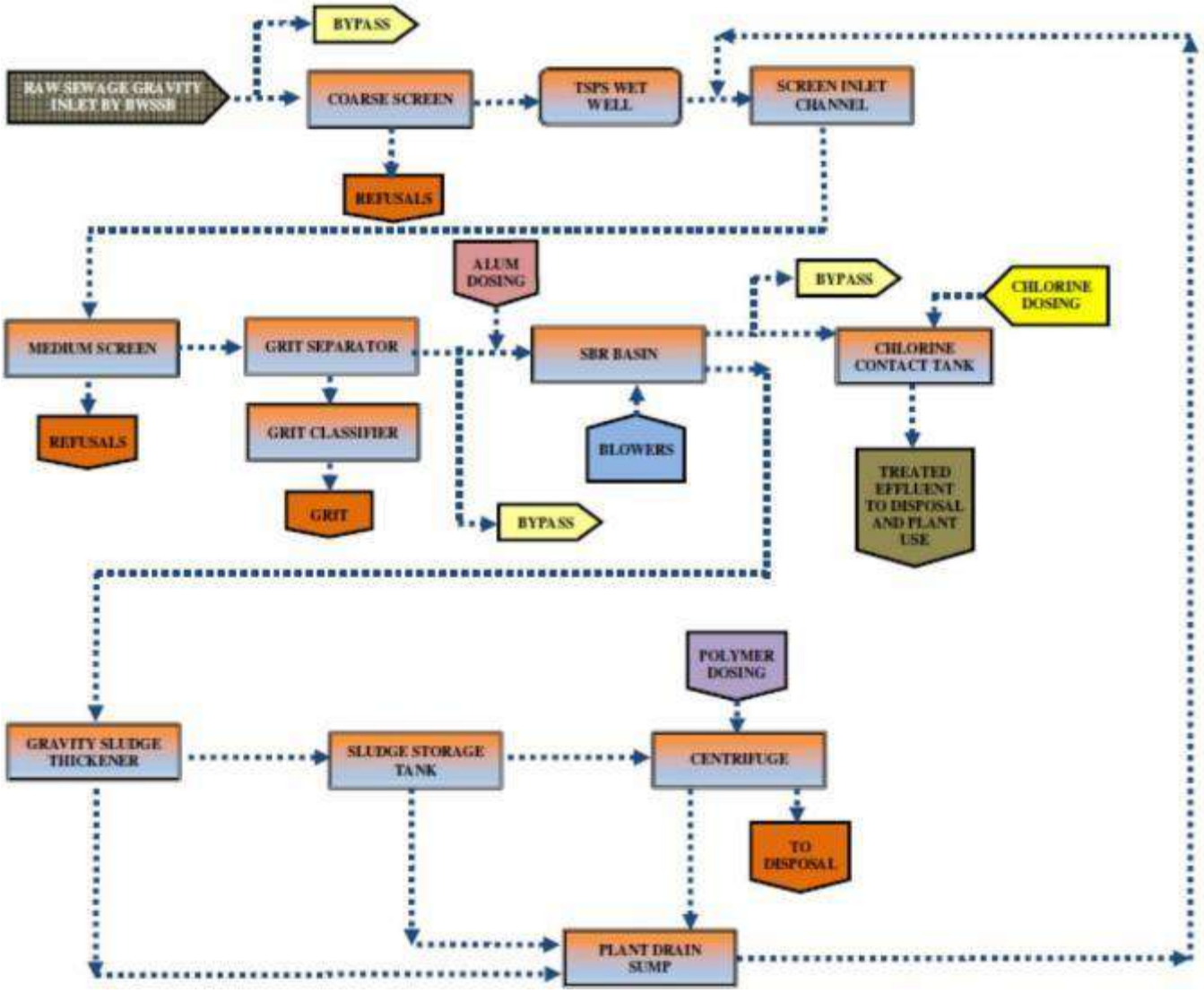


Figure 1431: Treatment Process Flow details for Doddabele treatment plant

Figure 1532: Coarse Screen

Figure 1633: Grit Separator

Figure 1734: Sequential Batch Reactor in aeration mode

Figure 1835: Sequential Batch Reactor in settling/Clarification mode

Figure 1936: Chlorine Contact Tank

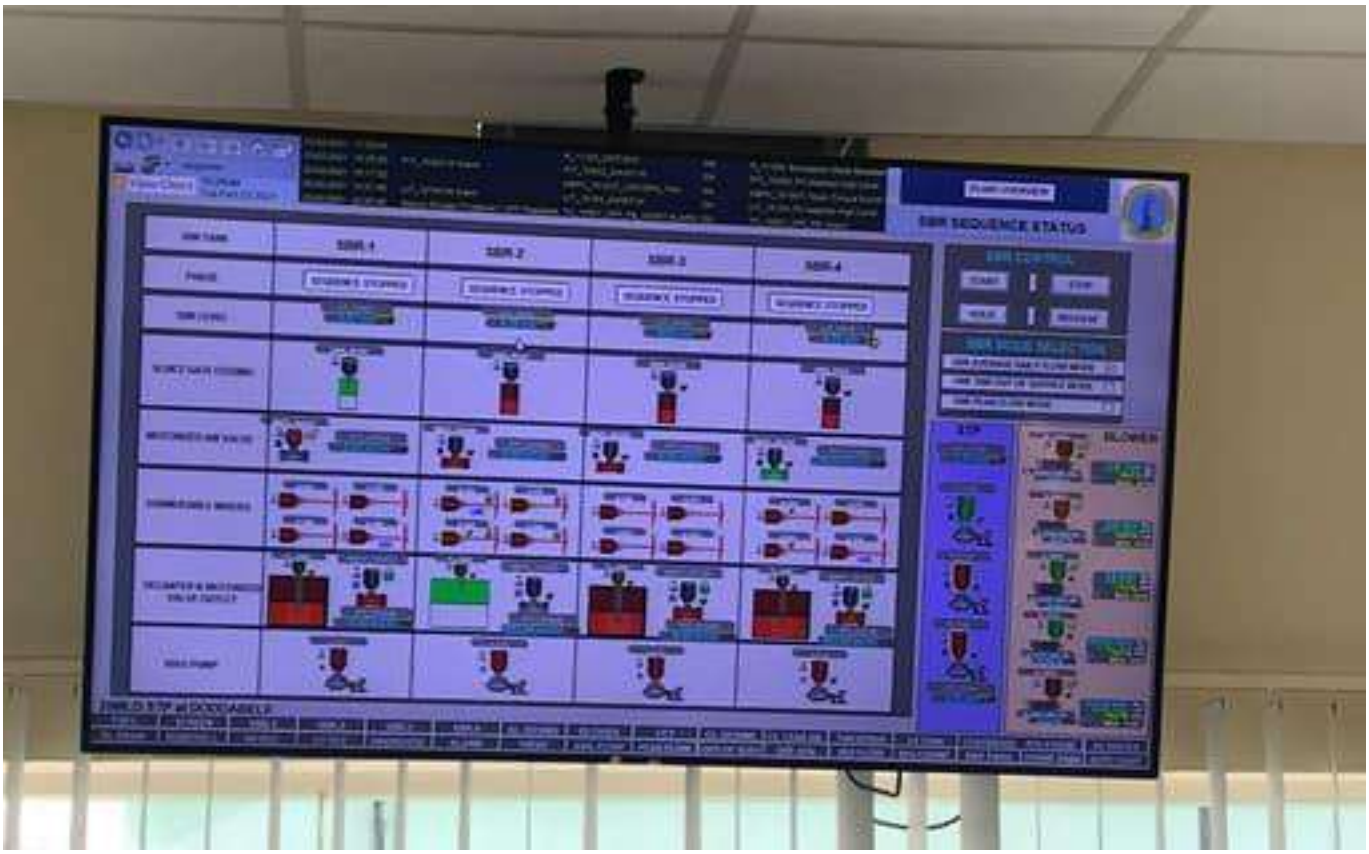


Figure 2037: SCADA monitoring system at Doddabele sewage treatment plant

APPENDIX – 7

SITE VISIT REPORT: SOUTH BANGALORE DIVISION SEWAGE TREATMENT PLANTS (1st April 2021)

Details of the locations Visited:

The team visited four sewage treatment plants in South Bangalore, namely Sarakky, Hulimavu, Agram and Kadubeesanahalli. Information about the plant capacity, treatment processes, new construction/rehabilitation, and possible issues was obtained for each plant from the BWSSB team. The discussion session was followed by a tour of the treatment facilities, and inlet and outlet water samples were collected for each plant.

1] Sarakky Sewage treatment plant:

The Sarakky plant was constructed recently and became operational in 2020. The plant has a capacity of 5 MLD out of which currently 4-4.5MLD is being utilized. It is expected that the load on the plant will increase when the neighboring villages are connected to the main sewage system. The treatment process flow for the plant includes screening through coarse and fine screens, followed by centrifugal grit removal. The next step in treatment process is sequential batch reactors. This plant has two SBR basins each operating alternately on a 3hr cycle time. The total cycle time included 1.5 hrs. of filling and aeration phase, 0.5 hrs. of settling phase and 1 hr. of decantation phase. From the SBR basins the water then flows through fiber disc filter to reduce total suspended solids in the water. The final stage in the treatment process is chlorination. At the Sarakky plant the level of chlorination was not adequate.

Figure 1 38: Layout of the Sarakky sewage treatment plant

Figure 2 39: Sequential Batch reactor at Sarakky plant in settling mode.

Figure 3: Fiber Disc filter chamber at Sarakky plant

Figure 4: Sarakky plant outlet. Images 1,2 3 and 6 show the Sarakky lake where the treated water is released. Image 5 shows the plant outlet. Images 4 and 7 show comparison between lake and treated water (Clearer beaker is the treated water). Image 8 Shows comparison between inlet and outlet water of the plant. Image 9 shows the SCADA monitoring system for the Sarakky plant.

2] Hulimavu Sewage Treatment Plant:

The Hulimavu treatment plant was also constructed recently and became operational in 2020. It has a capacity of 10 MLD out of which currently on average only 5.7 MLD is being utilized. The treatment process flow for the plant is similar to the Sarakky plant. It includes coarse and fine screens followed by centrifugal grit chambers, from which the water enters anoxic chamber. The water is then fed to the sequential batch reactors. The plant has two sequential batch reactors which operate alternately on a 4hr cycle time. The total cycle includes 2hrs. Filling and aeration phase, 1hr. Settling phase and 1 hr. decantation phase. From the SBR chambers the water flows into the disk cloth filter tank where it is filtered to remove excess suspended solids. The final step of the process is chlorination. At Hulimavu treatment plant as well the chlorine dosing was insufficient.

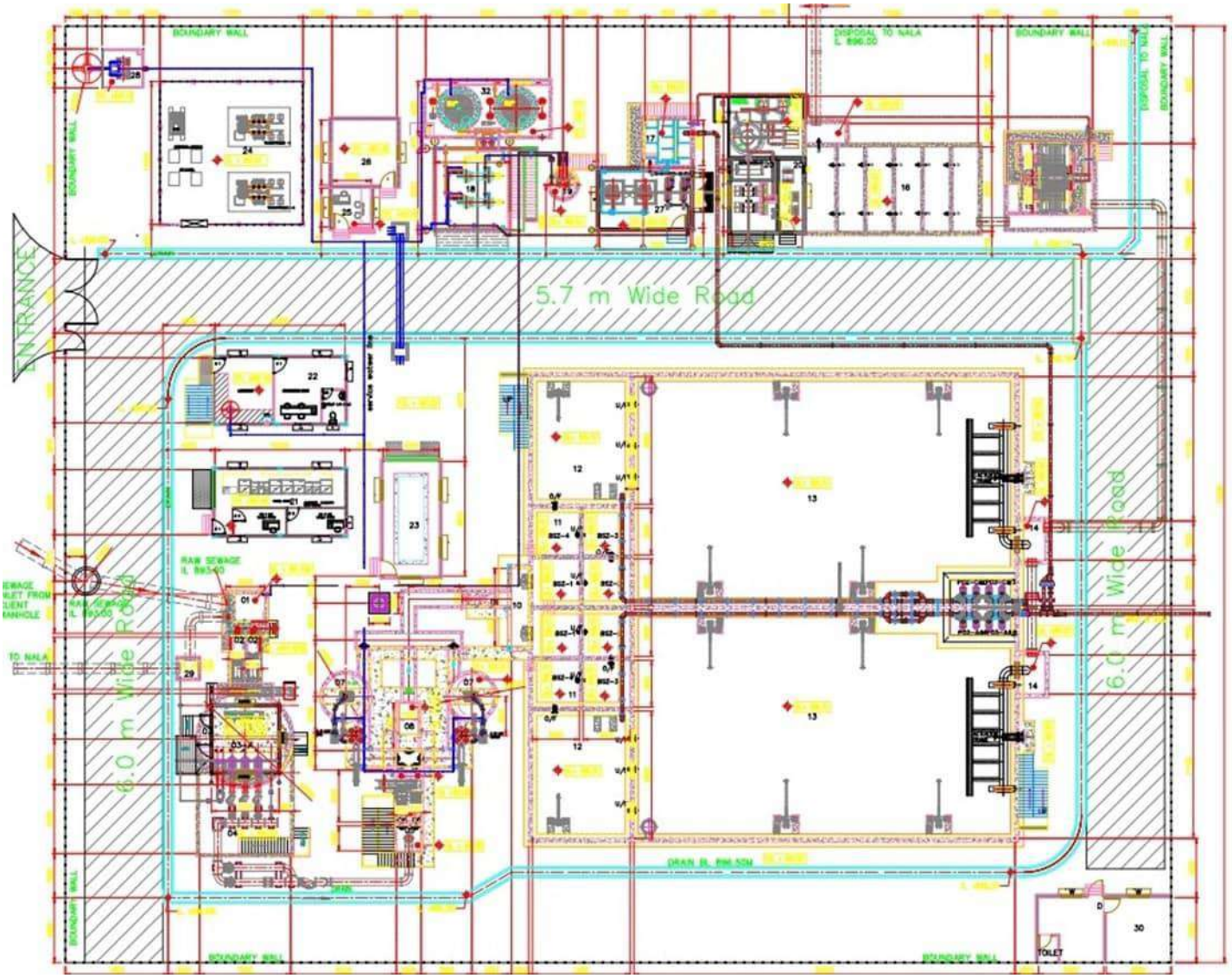


Figure 5: Layout of the Hulimavu sewage treatment plant

Figure 6: Inlet to the Hulimavu treatment plant

Figure 7: Coarse Screen at Hulimavu treatment plant

Figure 8: Fine screen at Hulimavu treatment plant

Figure 40: Grit Chamber

Figure 1041: Anoxic chamber

Figure 11 : Sequential Batch reactor at Hulimavu plant in Aeration mode

Figure 12: Disk Cloth filter chamber at Hulimavu plant

Figure 13: Hulimavu treatment plant

3] Agram Sewage treatment plant

The Agram sewage treatment has a capacity of 35 MLD out of which currently about 17-18 MLD is being utilized. The treatment flow process for the plant is exactly like Sarakky plant. The only difference is in capacities/number of treatment chambers. Agram plant has four SBR basins that operate in complementary cycles to maintain continuous flow of water. Chlorination at this plant is adequate. Chlorine is dosed in gas form at the rate 8kg/hr., the final concentration in the water depends on net outflow but chlorine could be smelled in the outlet water as well as collected samples.

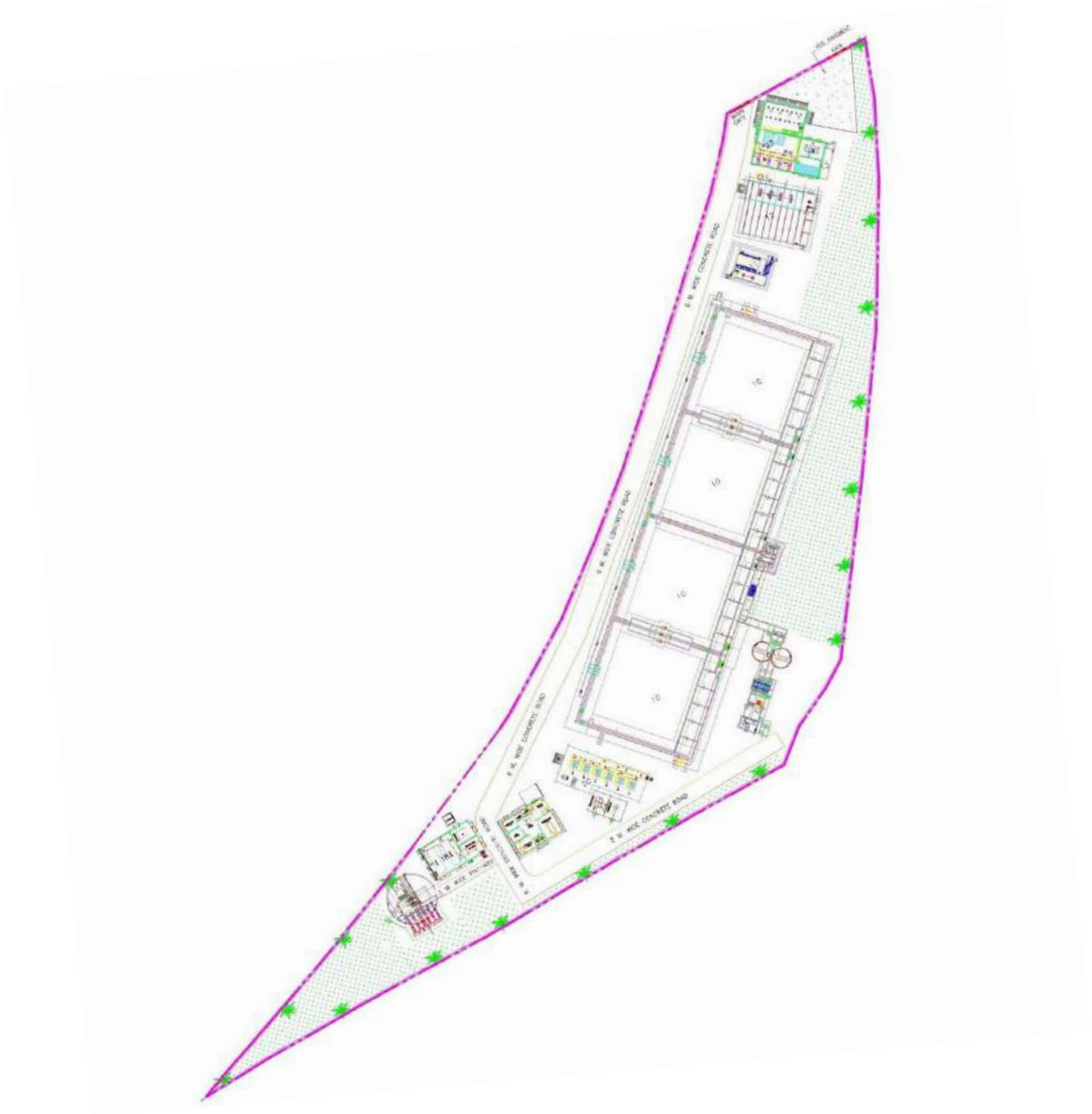


Figure 14: Layout of Agram sewage treatment plant

Figure 15: Hulimavu Plant. 1) Coarse screen and fine Screen 2) SBR basin in settling mode 3) SBR basin in Aeration mode 4) SBR basin decanter 5) Outlet water

Figure 16: Chlorine contact chamber

4] Kadubeesanahalli sewage treatment plant

The Kadubeesanahalli treatment plant is a traditional activated sludge type treatment plant. It has a capacity of 50 MLD out of which about 43 MLD is currently being utilized. The general treatment flow process of the plant includes primary treatment: coarse, fine screening and grit removal; secondary treatment: Aeration and clarification and tertiary treatment: chlorination. The Kadubeesanahalli plant consists of two Aeration basins and four secondary clarifiers. During the inspection the team suspected that the plant operation has been suspended for some time and had only resumed a few hours before the visit. Therefore, the quality of effluent was not satisfactory, it included a lot of suspended matter coarse as well as fine. Turbidity of water was high and dissolved oxygen was low.

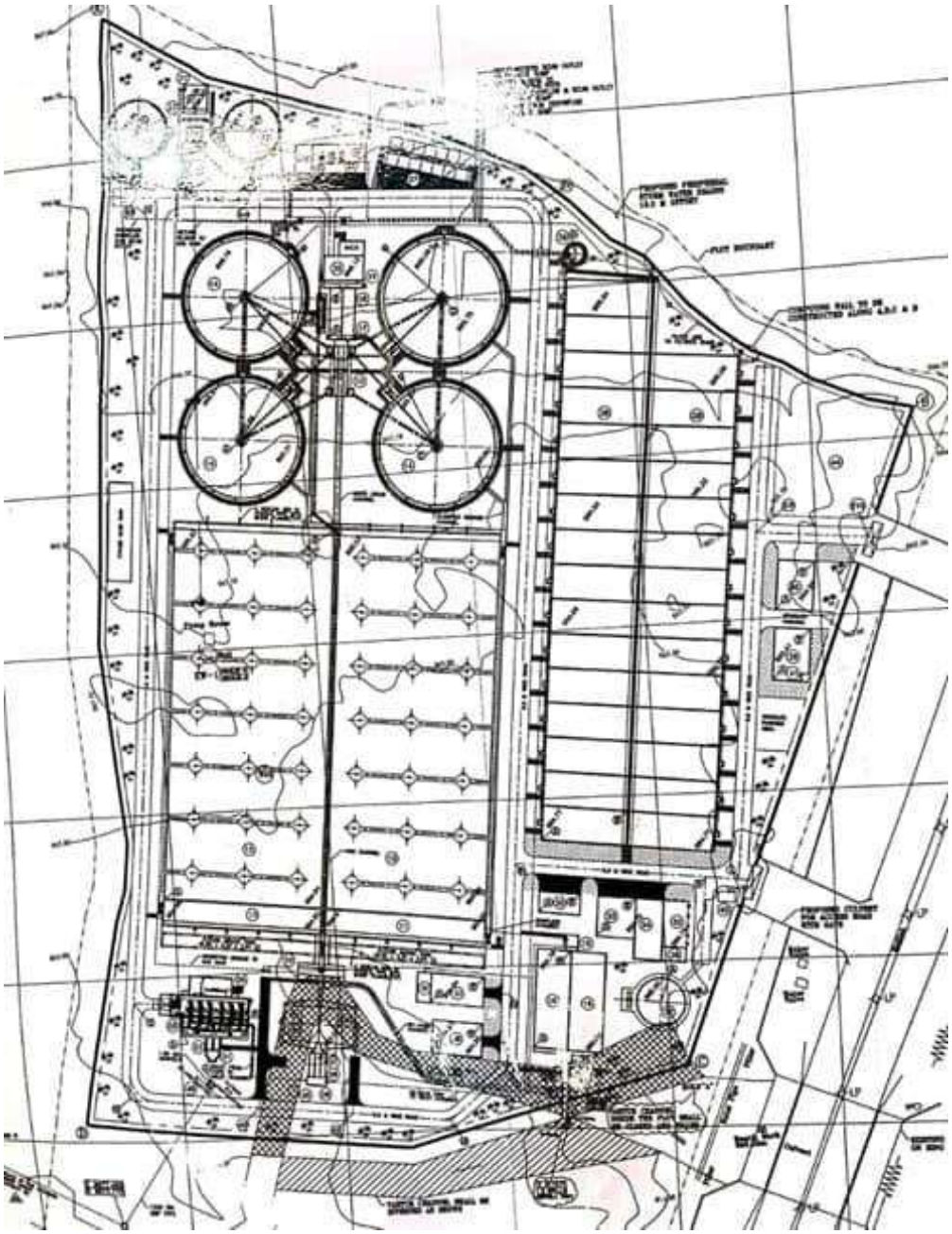


Figure 17: Layout of Kadubeesanahalli Plant

Figure 18: Kadubeesanahalli Plant. 1) Anaerobic zone 2) Aeration Basin 3,4) Filamentous sludge bulking 5) MLSS measurement for both aeration basins 6,7,8,9,10) Effluent of the plant

APPENDIX – 8

SITE VISIT REPORT: ARKAVATHI DIVISION SEWAGE TREATMENT PLANTS (30th September 2021)

Background:

In order to meet the new effluent discharge standards given by National Green Tribunal (NGT), an effort is undertaken by the Bangalore Water Supply and Sewerage Board (BWSSB) to upgrade old sewage treatment plants. IISc team was engaged to inspect and recommend suitable modifications to the current treatment process to meet the required standards. As part of this effort, several visits have been made to many old STPs. During the visit on 30th September 2021, the IISc team visited four Sewage Treatment Plants (STP) in the Arkavathi division, namely Nagasandra Phase I, Nagasandra Phase II and Chikkabanavara. Information about the plant capacity, treatment processes, new construction /rehabilitation, and possible issues was obtained for each plant from the BWSSB and the respective maintenance teams. At each location, the plant maintenance and management teams appraised the IISc Team of the design, functioning, constraints, neighbourhood issues and adverse events, if any. This discussion session was followed by an inspection tour of the treatment facilities and assessment of their functioning based on a visual inspection as well as data collected (logbooks) by the management team. Also, water samples were collected at the inlet and outlet for each plant. Details for each plant visited are included in this report.

1] Nagasandra Phase I sewage treatment plant:

The Nagasandra Phase I sewage treatment plant (STP) was commissioned in 2005 and is currently being maintained by WABAG. The plant has a treatment capacity of 20 MLD, out of which currently only 9-11 MLD is being utilized. The STP uses extended aeration technology to treat incoming sewage. The treatment process flow includes an inlet chamber, screening chamber, grit chamber, anoxic chamber, aeration basin, clarifiers and chlorine contact tank. The plant receives sewage from the N K Halli catchment area. Currently, the effluent from the plant is let into an open channel that goes to T G Halli Village. Future plans are to let the treated sewage into Madavara Lake. During the treatment plant inspection, it was observed that oil grease and algae were present in the grit chamber. Furthermore, it was seen that proper aeration was not being done. The team was informed that the aerators were not run during nighttime and partially run during the daytime. In addition to this, the motors for the aerators had been rewound multiple times, leading to a major loss in efficiency. Due to insufficient aeration, DO levels in the aeration basin were found to be low. Biological nutrient removal was not adequate and below requirements. Inspection of the sludge showed that proper sludge granules were not being formed, and the settling time was high; indirectly indicating need for improvement in sludge quality with changes in operation mode. The management kept no proper records for RAS and WAS. Chunks of floating sludge were observed in the effluent. Excessive frothing was also observed in the effluent, indicating incomplete breakdown of surfactants and related compounds. The team was informed that several cloth manufacturing factories nearby were letting excess detergents and starch into the incoming sewage, which were causing some of the issues observed in the treatment plant. No chlorination was occurring, and it was suggested that the chlorine contact tank be

cleaned and repainted before proper chlorination is started again. To assess the performance of the plant, samples were collected throughout the treatment plant to be analyzed at the IISc lab.

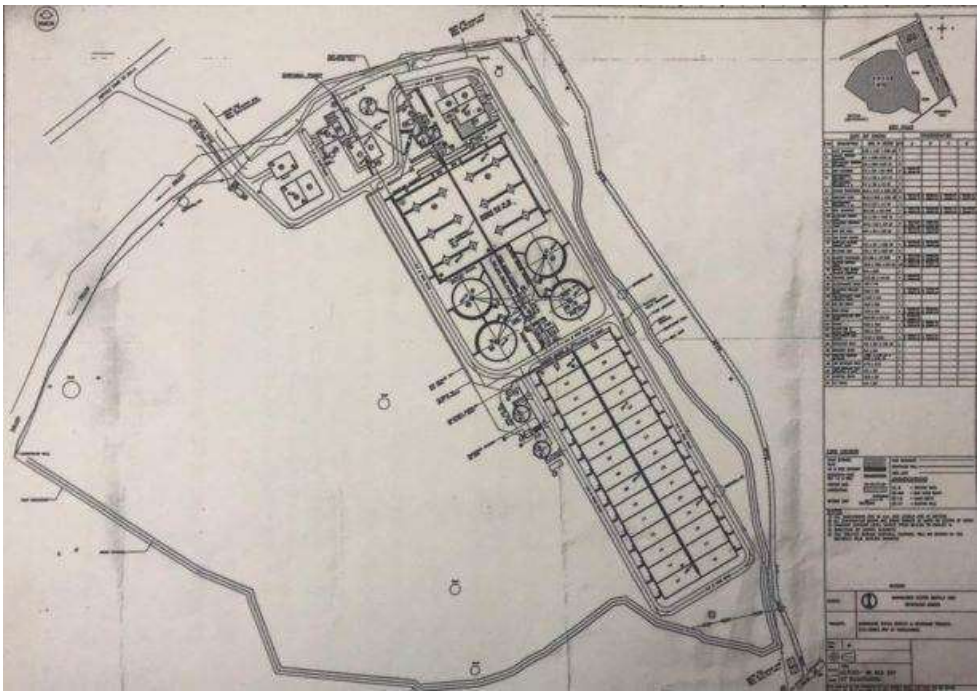


Figure 1: Layout for Nagasandra Phase I STP

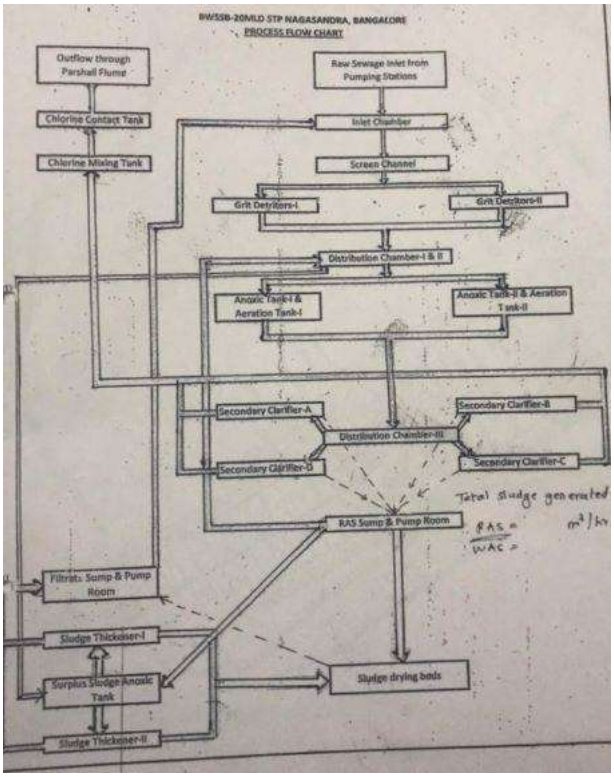


Figure 2: Treatment flow process diagram for Nagasandra Phase I STP

Figure 3: Nagasandra Phase I STP 1 - Plant Inlet 2 - FOG suspended in grit chamber 3 - Grit collected in grit chamber 4 - Sludge collected from the aeration basin

Figure 4: Nagasandra Phase I STP 1- Aeration Basin 2 - Secondary Clarifier 3 - Chlorine contact tank 4 – Final effluent (some froth formation at the outlet and some turbidity can be seen in the final effluent)

Figure 5: Samples collected at Nagasandra Phase I STP 1- Raw Inlet 2- Aeration basin inlet with RAS mixed 3- Aeration basin outlet 4- Clarifier outlet (dark sludge indicating inadequate aeration)

2] Nagasandra Phase II Sewage treatment plant:

The Nagasandra Phase II STP was commissioned in 2018 and is being maintained by Gharpure Engineering and Construction Ltd. The plant has an ultimate capacity of 20 MLD, out of which currently only 11-12 MLD is being utilized. The plant uses SBR technology to treat incoming sewage. The treatment process flow for the plant includes a screening chamber, grit chamber, SBR basins, and chlorine contact tank. The plant has four SBR basins operating in conjunction. The MLSS concentration maintained in the SBR basins is 3500-4000 mg/L, and the DO concentration maintained is 2.5-3mg/L. Diffused aerators are used to aerate the basin and are cleaned once every three months by backflushing. The RAS and WAS quantities for the plant are 190 and 140 m^3/hr, respectively. The plant receives sewage from catchment areas, namely: Medarahali, Bagalagunte, Karibhuvanahalli and Nagasandra. The team was informed that random spikes in oil concentration were observed in the incoming sewage possibly due to the presence of several big automobile repair and service stations and mechanical workshops present in the catchment area. During the inspection, it was observed that grit removed from the sewage was good quality sand, and the team was informed that the quantity of grit doubled during the monsoon season. Inspection of sludge in the lab showed good granulation and settling time. It was suggested that the chlorine contact tank be cleaned thoroughly and repainted, preferably blue. To assess the effluent quality and plant performance, samples were collected throughout the plant to be analyzed at the IISc lab.

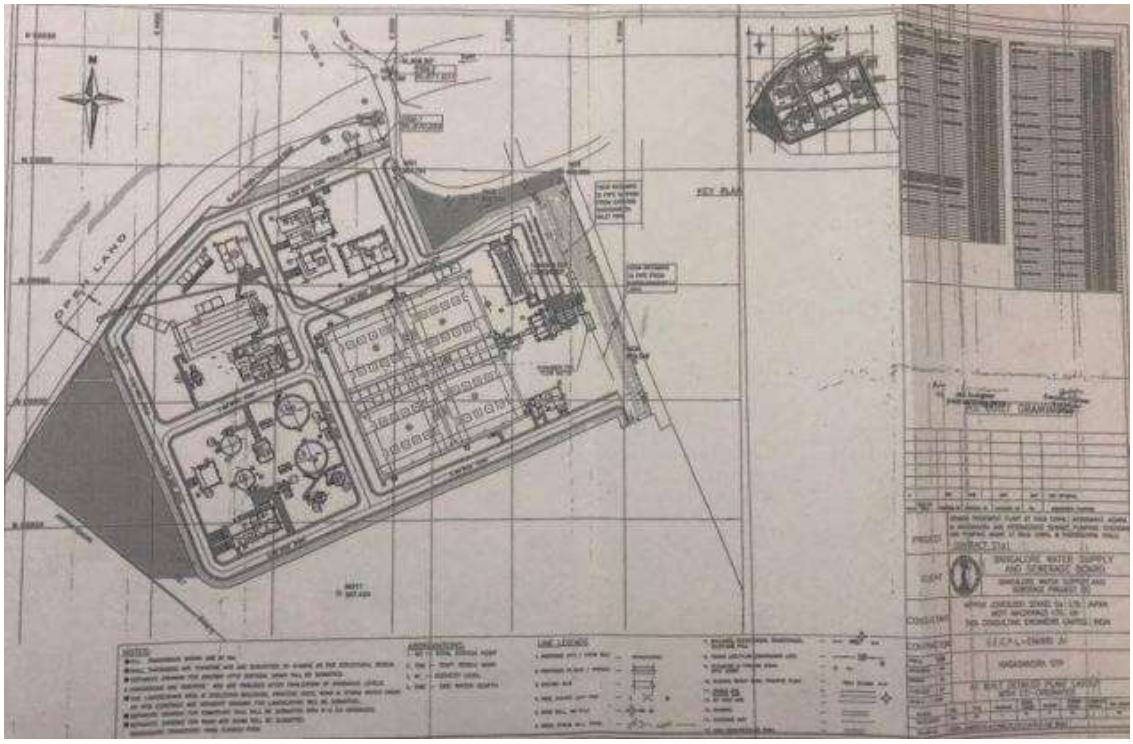


Figure 42: Layout for Nagasandra Phase II STP

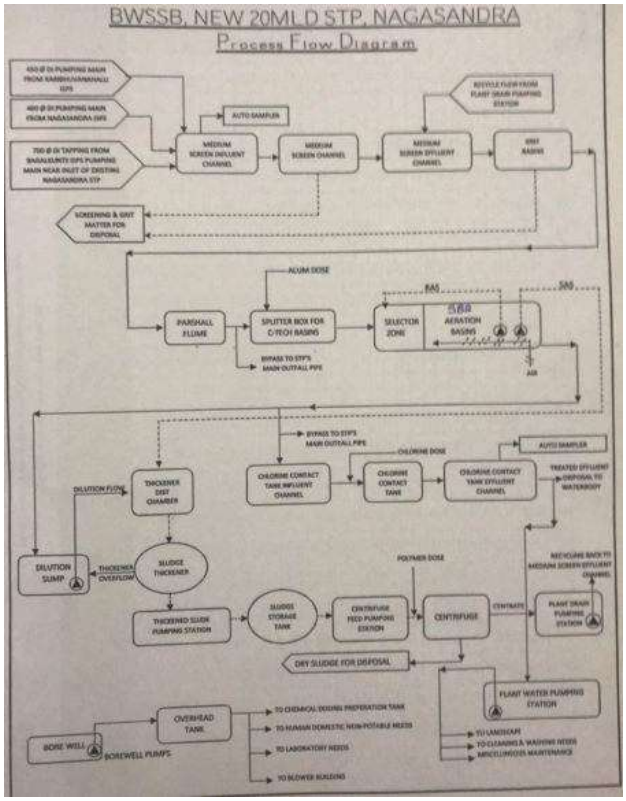


Figure 7: Treatment flow process for Nagasandra Phase II STP

Figure 8: Nagasandra Phase II STP 1- Raw water inlet 2- Bar screen 3- Grit chamber outlet 4- Grit collected from the grit chamber 5- sludge settlement study for SBR basins

Figure 9: Nagasandra Phase II STP 1- comparison between influent and effluent for the plant 2- chlorine contact tank 3- final effluent 4- SBR basin in decanting mode

Figure 10: Samples collected at Nagasandra Phase II STP 1- raw inlet 2- Inlet to SBR basin 3- Final stages of aeration 5- final effluent 6- Outlet of SBR

3] Chikkabanavara Sewage treatment plant:

The Chikkabanavara STP was commissioned in 2018 and was contracted and maintained by M/s Suez. The plant has a capacity of 5 MLD and is currently receiving on average 4.5 MLD sewage. The plant uses SBR technology to treat incoming sewage. The treatment process flow includes an inlet chamber, screening chamber, grit chamber, SBR basins, and chlorine contact tank. The plant has three SBR basins, out of which only two are being used in conjunction on a 3 hr cycle for average flow. In the case of peak flow (peak factor is 1.05), the cycle time changes to 4 hrs. The plant is designed to store and treat excess sewage in the SBR chambers. The plant has design COD and BOD values 800 and 350 mg/L, respectively. The team was informed that the current influent contains 20-30 mg/L TN and 4 mg/L phosphorus. The MLSS maintained in SBR chambers is 3000 mg/L, and the DO level at the end of aeration is 1.5 mg/L. Aeration is done using diffused aerators. The diffusers are cleaned every six months manually and by backwash. The SBR basins are cleaned every two months. RAS is 40%, and the RAS and WAS volumes are 95 and 49 m^3/hr, respectively. During the inspection, excessive duckweed growth was observed in one of the SBR basins being used as back-up capacity (it was being cleaned due to the duckweed growth). Floating sludge was observed in the SBR outlet once in a while. The water was being dosed with chlorine at 0.2-0.3 mg/L concentration. The team was informed that the effluent contained 60-65 mg/L COD and 11-12 mg/L BOD. The effluent was being let into the adjoining Chikkabanavara lake. The sludge generated from the plant is being used as manure. To assess the effluent quality and plant performance, samples were collected throughout the treatment plant to be analyzed later at the IISc lab. In addition,

the team was informed that Suez did some analysis previously to optimize the plant performance. The IISc team requested a report for the same.

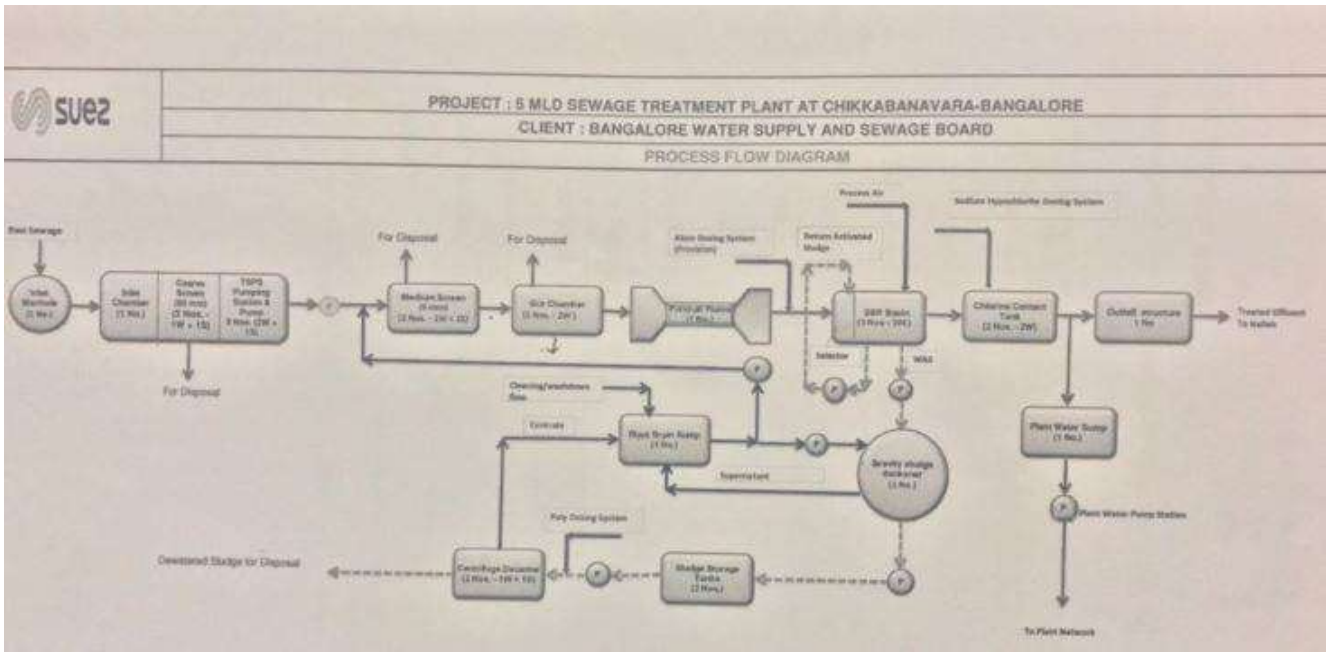


Figure 11: Treatment flow process for Chikkabanavara STP

Figure 12: Chikkabanavara STP 1-Raw inlet seage 2- outlet of grit chamber 3- SBR in aeration mode 4- SBR basin in decant mode 5- final effluent discharge

Figure 13: Chikkabanavara STP 1-Raw Inlet sewage 2- SBR basin in aeration mode 3- Grit collected from grit chamber 4- duckweed infestation in SBR basin 5- Decanter 6- final effluent discharge

Figure 14: Samples collected at Chikkabanavara STP 1-Raw inlet sewage 2- inlet to SBR 3- Final aeration in SBR 4- outlet of SBR 5- final effluent

APPENDIX – 9

SITE VISIT REPORT: CHALLANGHATTA AND HEBBALLA DIVISION SEWAGE TREATMENT PLANTS (1st October 2021)

Background:

In order to meet the new effluent discharge standards given by National Green Tribunal (NGT), an effort is undertaken by the Bangalore Water Supply and Sewerage Board (BWSSB) to upgrade old sewage treatment plants. IISc team was engaged to inspect and recommend suitable modifications to the current treatment process to meet the required standards. As part of this effort, several visits have been made to many old STPs. During the visit on 1st October 2021, the IISc team visited four Sewage Treatment Plants (STP) in the Challaghatta and Hebbala divisions, namely K R Puram, Horamavu agara, Rajacanal Phase I and Rajacanal Phase II. Information about the plant capacity, treatment processes, new construction /rehabilitation, and possible issues was obtained for each plant from the BWSSB and the respective maintenance teams. At each location, the plant maintenance and management teams appraised the IISc Team of the design, functioning, constraints, neighbourhood issues and adverse events, if any. This discussion session was followed by an inspection tour of the treatment facilities and an assessment of their functioning based on a visual inspection as well as data collected (logbooks) by the management team. Also, water samples were collected at the inlet and outlet for each plant. Details for each plant visited are included in this report.

1] K R Puram sewage treatment plant:

The K R Puram sewage treatment plant (STP) was commissioned in 2005 and is currently being maintained by M/s Toshiba. The plant has a capacity of 20 MLD, out of which currently only 7-10MLD is being utilized. The plant uses an Up-flow Anaerobic Sludge Blanket reactor followed by extended aeration to treat the incoming sewage. The general treatment process flow for the plant includes pre-treatment with screens and grit chamber; followed by biological treatment including UASB reactors, aerators and secondary clarifiers; followed by disinfection system, which is currently non-operational. The aeration unit was designed to contain an anoxic zone and surface aerators. The team was informed upon arrival that the plant was not operating optimally. During the inspection, it was found that in UASB sludge granulation was inadequate, small in size, bulky and had poor settling quality. Similarly, the sludge from the aerators did not have the required texture and did not settle as expected. It was observed that sufficient aeration was not taking place in the aeration unit leading to poor sludge quality. Floating sludge clumps were observed

in the chlorine contact tank. It was recommended that the chlorine contact tank be cleaned thoroughly and repainted. To assess the performance of the plant and its various treatment units, samples were collected at different locations along the treatment plant, including sludge samples, to be analyzed at the IISc lab.

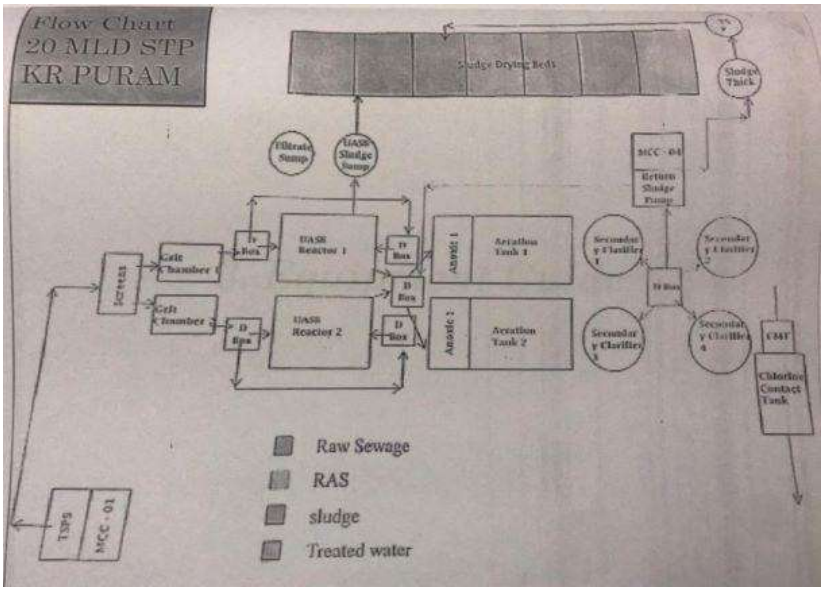


Figure 1: Treatment process flow for the K R Puram STP

Figure 2: K R Puram STP 1 - Grit chamber 2 - Grit collected from grit chamber 3 - UASB basin 4 - Anoxic zone in aeration basin 5 - Aeration basin

Figure 3: K R Puram STP 1 - Inlet to secondary clarifiers 2 - Outlet of secondary clarifiers 3 - Secondary clarifier 4 - Chlorine contact tank 5 - Sludge floating in chlorine contact tank 6 – treated effluent outlet channel

Figure 4: Samples collected at K R Puram STP 1- Raw inlet sewage 2- Outlet of UASB reactor 3,4- Outlet of Aeration basin

2] Horamavu Agara Sewage treatment plant:

The Horamavu Agara plant was commissioned in 2018 and is being maintained by Gharpure Engineering and Construction Ltd. The plant has a capacity of 20 MLD and is operating at full capacity. The plant uses SBR technology to treat incoming sewage. The treatment process flow for the plant includes receiving chamber, screening chamber, grit chamber, SBR basins and chlorine contact tank. The plant has 4 SBR basins operating in conjunction on 4 hr cycle. MLSS in the range 2500-3500 mg/l is maintained in the SBR basins, and the returned sludge and surplus sludge volumes for the plant are 190 and 150 m^3/hr, respectively. A dose to maintain residual chlorine of 0.3 mg/L was given in the chlorine contact tank. It was recommended that the chlorine contact tank be cleaned thoroughly and repainted. The plant receives sewage pumped from Rajacanal. The effluent from the plant was let into Kelkere lake, located near the plant; it is now pumped to the HN valley ground water recharge program. The sludge produce in the plants is mainly used as manure by nearby farmers. The team was informed that the effluent is meeting all NGT standards. To assess the effluent quality and performance of the plant, samples were collected throughout the plant to be analyzed later at the IISc lab.

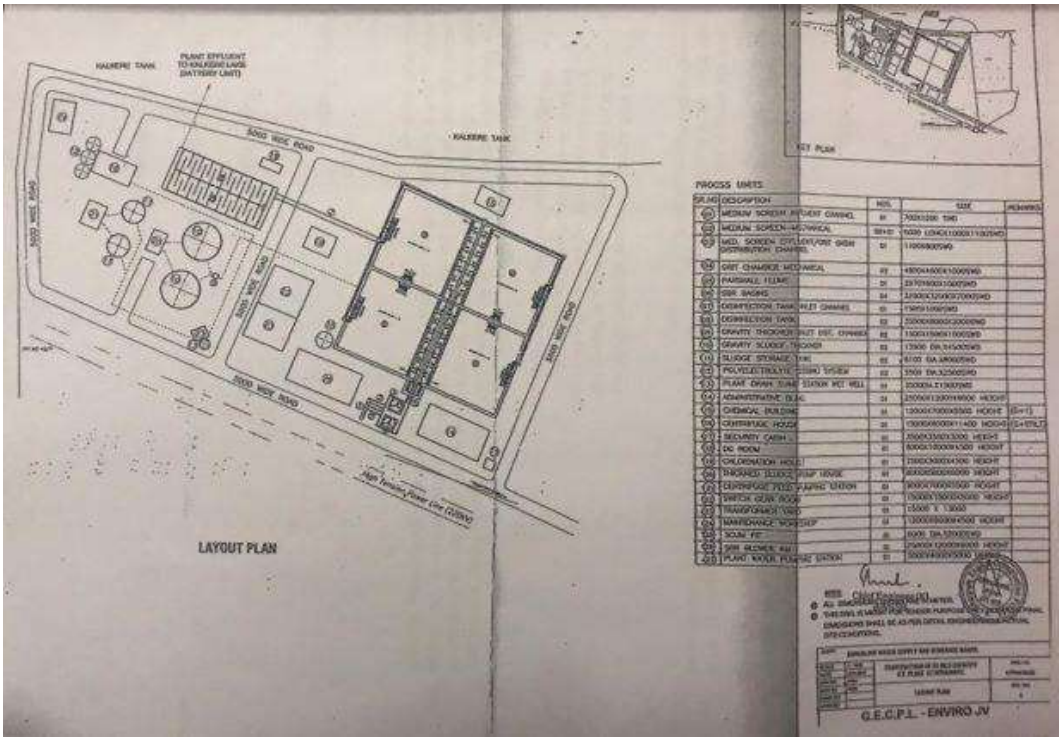


Figure 5: Layout for Horamavu agara STP

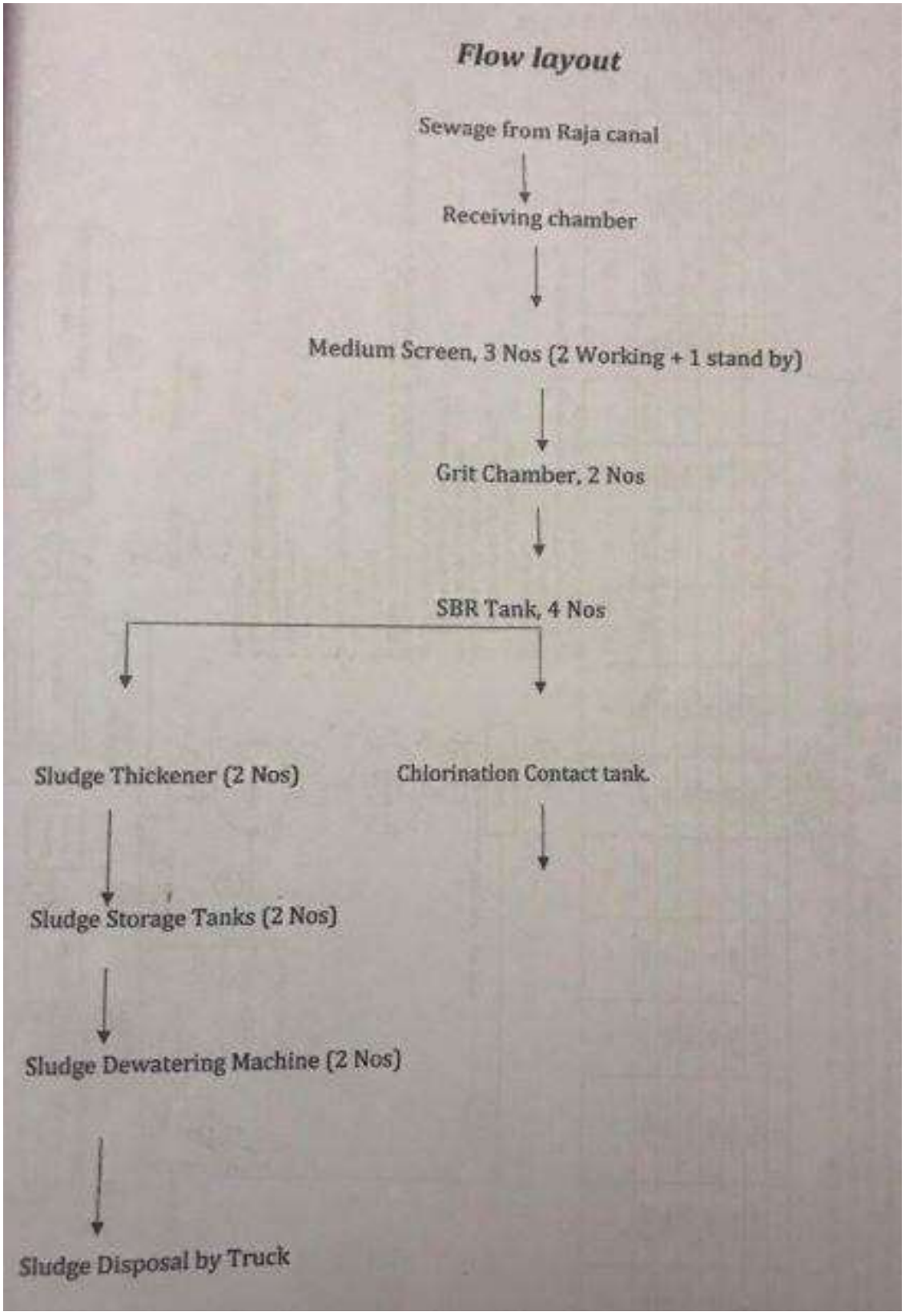


Figure 6: Treatment process flow for Horamvu agara STP

Figure 43: Horamavu agara STP 1- Selection zones in the SBR Basin 2- Kelkere lake adjacent to the plant, which filled with treated water 3- SBR basin in decanting phase 4- Chlorine contact tank 5&6 - Final treated effluent

Figure 8: Samples collected at Horamavu agara STP 1- Raw inlet sewage 2- Outlet of grit chamber 3- Final stages of aeration 4- Outlet of SBR 5- Final treated effluent

3] Rajacanal Phase I and Phase II Sewage treatment plant:

Rajacanal phase I and phase II plants were both commissioned in 2004. These are both 40 MLD plants currently being maintained by Suez. Phase I currently receives 32-35 MLD sewage, and Phase II receives 45 MLD sewage. Both plants receive sewage from the same catchment area. Both plants use extended aeration method to treat incoming sewage. Phase I uses surface aerators while phase II uses diffuse aerators, otherwise the process maintained is same. The general treatment process flow for the plants includes screening chamber, grit chamber, anoxic zone, aeration basin, secondary clarifiers and chlorine contact tank. For phase I, the aeration basin maintains the MLSS concentration of 2700 mg/L and DO concentration of 1.8-2 mg/L. RAS ratio for phase I is 0.7. For phase II, the MLSS concentration of 3500 mg/L and DO concentration of 3 mg/L is maintained in the aeration basin. The effluent quality suggested that the phase II plant was more efficient than phase I, though both produced good results. Effluent from both plants is being used for irrigation in Chikabanapur village and is pumped to the HN valley indirect tank recharge project. To assess the effluent quality and performance of the plant, samples were collected throughout the treatment plant to be analyzed at the IISc lab.

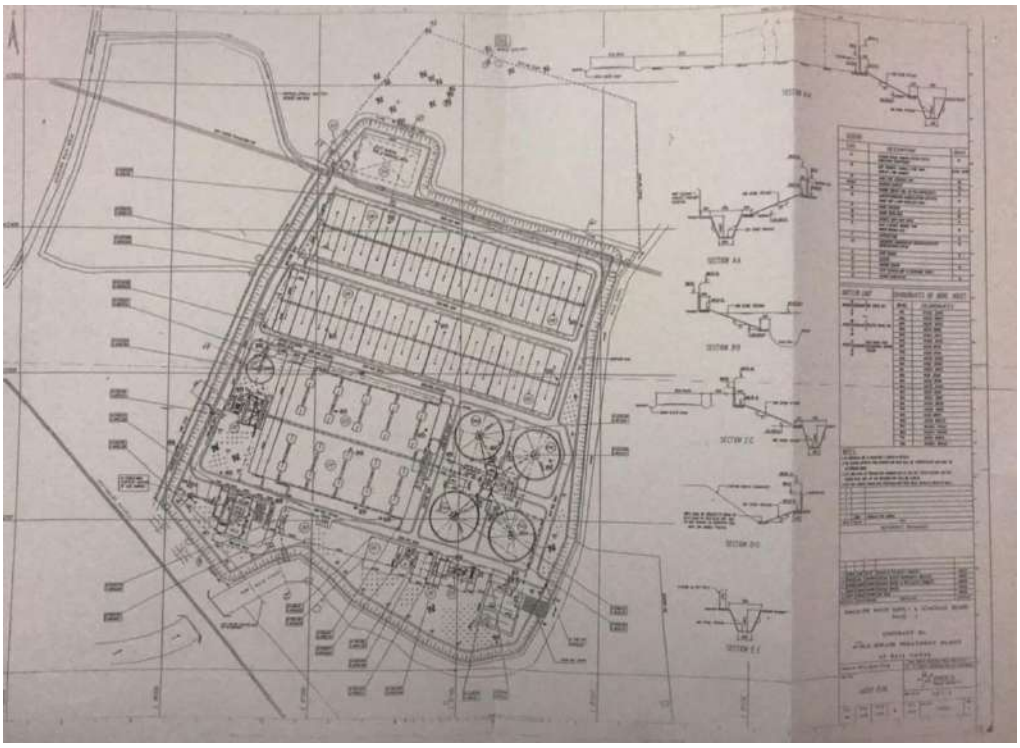


Figure 9: Layout for Rajacanal Phase I

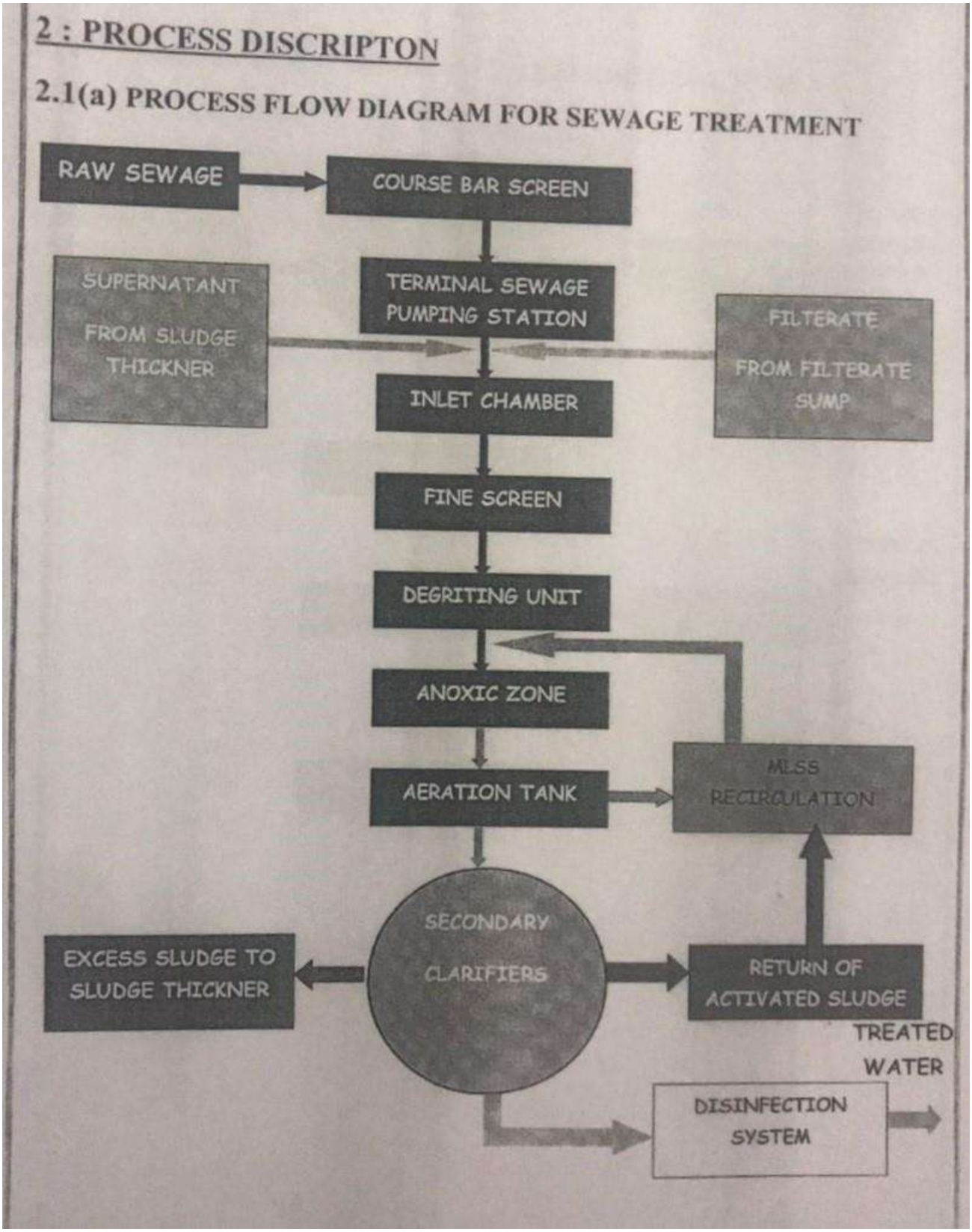


Figure 10: Treatment process flow for Rajacanal Phase I STP

Figure 11: Rajacanal Phase I STP 1- Aeration Basin 2- Secondary clarifier 3- comparison between raw inlet sewage and treated effluent for the STP 4- chlorine contact tank 5- effluent discharge channel

Figure 44: Samples collected at Rajacanal Phase I STP 1-Raw inlet sewage 2- Outlet of grit chamber 3- Outlet of secondary clarifier 4- final treated effluent

Figure 13: Rajacanal Phase II STP 1- Outlet of Grit chamber 2- Aeration basin 3- Secondary clarifier 4- chlorine contact tank 5- final treated effluent 6- effluent discharge channel

Figure 14: Samples collected at Rajacanal Phase II STP 1- Raw inlet sewage 2- Outlet of grit chamber 3- Outlet of aeration chamber 4- Outlet of secondary clarifier 5- final treated effluent

APPENDIX – 10

SITE VISIT REPORT: KORAMANGALA DICISION SEWAGE TREATMENT PLANTS (12th October 2021)

Background:

In order to meet the new effluent discharge standards given by National Green Tribunal (NGT), an effort is undertaken by the Bangalore Water Supply and Sewerage Board (BWSSB) to upgrade old sewage treatment plants. IISc team was engaged to inspect and recommend suitable modifications to the current treatment process to meet the required standards. As part of this effort, several visits have been made to many old STPs. During the visit on 12th October 2021, the IISc team visited two Sewage Treatment Plants (STP) in the Koramangala division, namely Kadugodhi and Halasuru. Information about the plant capacity, treatment processes, new construction /rehabilitation, and possible issues was obtained for each plant from the BWSSB and the respective maintenance teams. At each location, the plant maintenance and management teams appraised the IISc Team of the design, functioning, constraints, neighbourhood issues and adverse events, if any. This discussion session was followed by an inspection tour of the treatment facilities and assessment of their functioning based on a visual inspection as well as data collected (logbooks) by the management team. Also, water samples were collected at the inlet and outlet for each plant. Details for each plant visited are included in this report.

1] Kadugodhi sewage treatment plant:

The Kadugodhi sewage treatment plant (STP) was commissioned in 2018 and is currently being maintained by M/s Suez. The plant has a treatment capacity of 6 MLD, out of which currently 4.5 MLD capacity is being utilized. The plant uses SBR technology to treat incoming sewage. The treatment process flow includes an inlet chamber, screening chamber, grit chamber, SBR basins, and chlorine contact tank. The plant has three SBR basins, out of which only two are being used in conjunction on a 4 hr cycle for average flow, and one is on standby. Alum is dosed at 5ppm concentration before the water enters the SBR basins. The MLSS maintained in SBR chambers is 3000-3500 mg/L, and the DO maintained level at the end of aeration is between 1-4 mg/L. Aeration is done using diffuse aerators. The RAS and WAS volumes are 114 and 207 m^3/hr, respectively. During the inspection, excessive froth was observed in the effluent of the grit chamber, possibly due to high incoming surfactant concentration. Scaling was observed on various surfaces and diffusers, possibly due to high sulfate and hardness of incoming sewage. Furthermore, excessive duckweed growth was observed in the standby SBR basins, but the basin has not been cleaned since commissioning. Inspection of sludge showed that granules were small, the settling was okay but not as fast as required. The water was being dosed with hypochlorite solution to maintain a minimum of 0.2 ppm residual chlorine concentration. The measurement done using the Hach comparator kit showed the residual chlorine concentration to be 0.6 ppm. The chlorine contact tank had algal growth, insect larva growth and mould growth. The effluent TSS concentration was high. It was suggested that the settling time be increased to reduce the TSS. The sludge generated from the plant is dewatered and then disposed of by a contractor. It was suggested that sludge characterization be done, and a year's worth of data should be maintained in the archive. To assess the effluent quality and plant performance, samples were collected throughout the treatment plant to be analyzed later at the IISc lab.

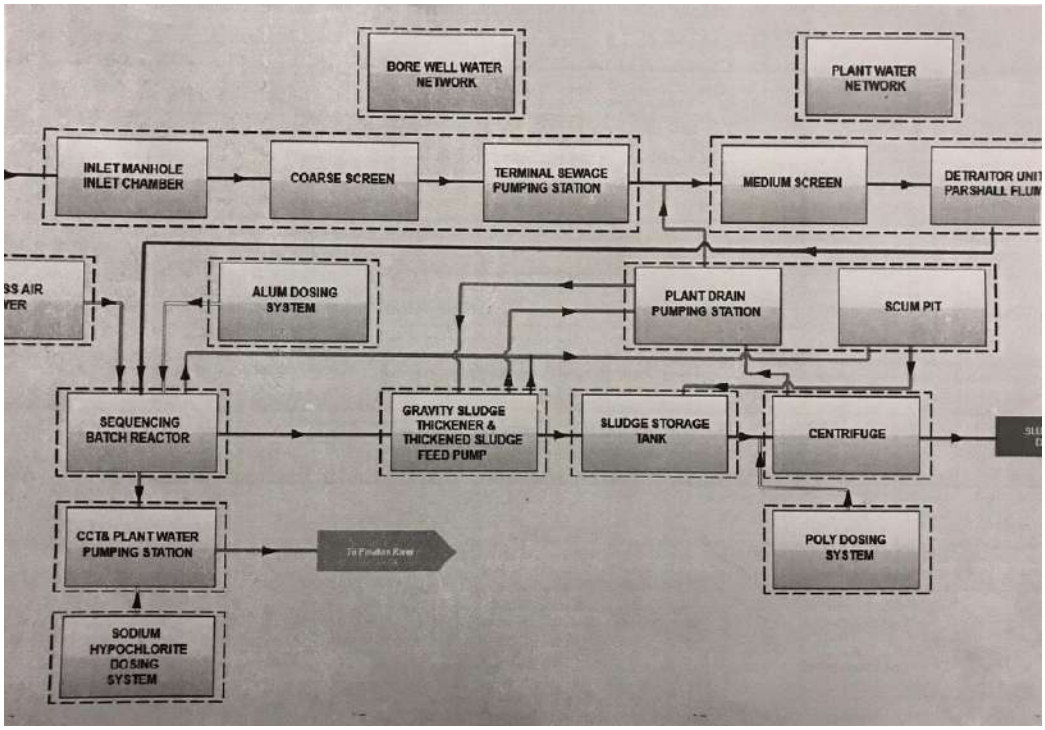


Figure 1: Treatment flow process diagram for Kadugodhi Sewage treatment plant

Figure 2: Kadugodhi STP 1- Screen chamber 2- SBR in aeration mode 3- SBR in decanting mode 4- Chlorine contact tank

Figure 3: Samples collected at Kadugodhi STP 1- Raw sewage inlet 2- Outlet of grit chamber 3- Final stage aeration (SBR) 4- Outlet of SBR 5- Final treated effluent

2] Halasuru Sewage treatment plant:

The Halasuru STP was commissioned in 2018 and is being maintained by M/s Eurotech. The plant has an ultimate capacity of 2 MLD, is being utilized at full capacity. The incoming sewage was dilute and low BOD and phosphate concentration. The plant uses SBR technology to treat incoming sewage. The treatment process flow for the plant includes a screening chamber, grit chamber, SBR basins, and chlorine contact tank. The plant has two SBR basins operating in conjunction. The MLSS concentration maintained in the SBR basins is 3500mg/L, and the DO concentration maintained is 2.5-3mg/L. The RAS and WAS quantities for the plant are calculated using pump capacity and pumping time. The RAS ratio is 33%. During the inspection, a large amount of oil and grease was seen frothing in the SBR basins during aeration. Inspection of sludge in the lab showed sludge settling was very poor. Even after 3 min, there was barely any settlement of sludge, and no granules were formed. Increasing RAS, aeration time and DO levels were suggested as a remedy to improve sludge quality. To assess the effluent quality and plant performance, samples were collected throughout the plant to be analyzed at the IISc lab.

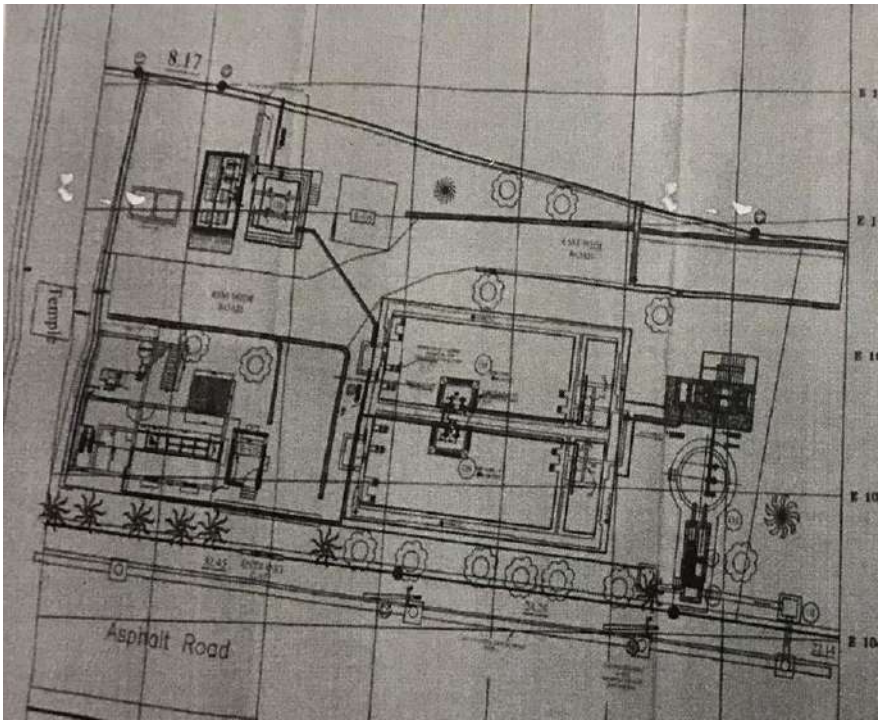


Figure 4: Layout of Halasuru sewage treatment plant

Figure 5: Halasuru STP 1-Outlet of grit chamber 2- SBR basin in aeration mode 3- Outlet of SBR basin 4- Final treated effluent release channel

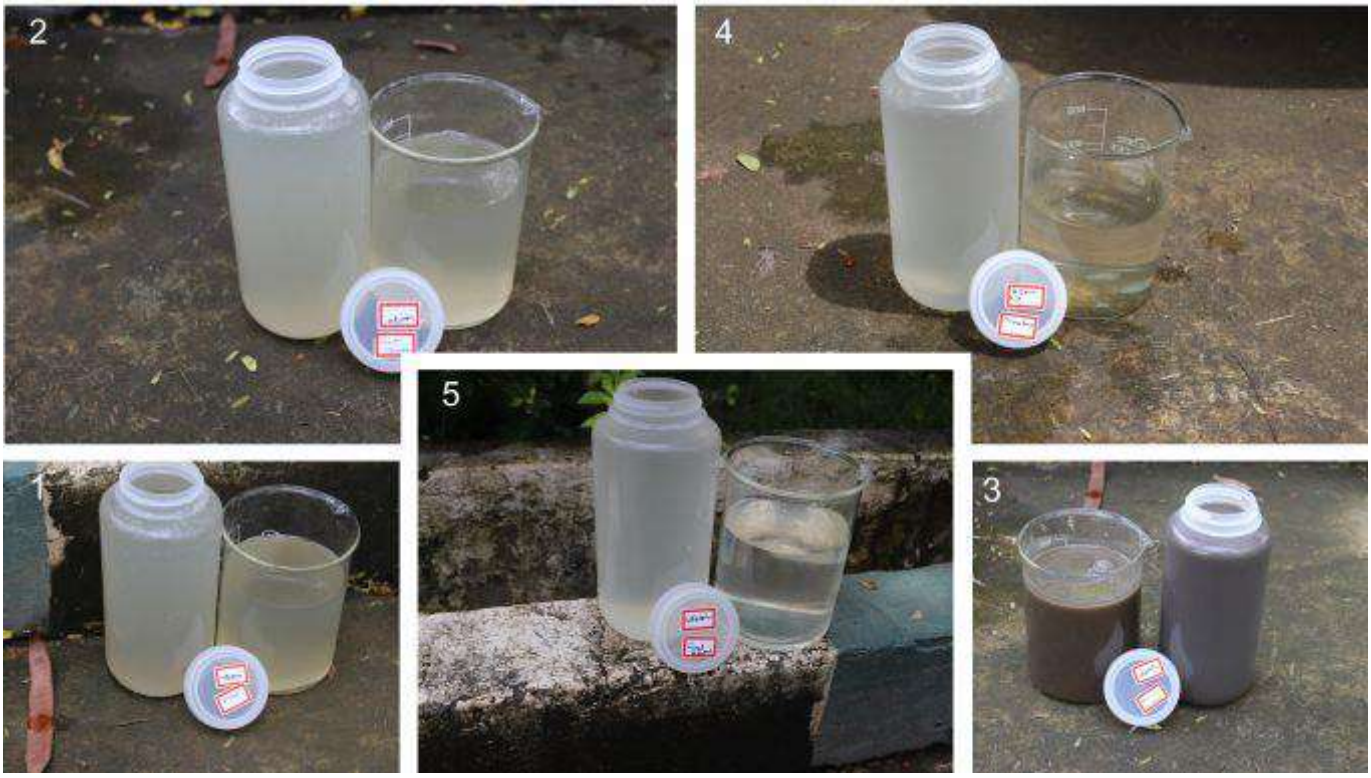


Figure 6: Samples collected at Halasuru STP 1-Raw sewage inlet 2- Outlet of grit chamber 3- final stage aeration (SBR) 4- Outlet of SBR 5- final treated effluent

APPENDIX – 11

SITE VISIT REPORT: ARKAVATHI AND VRISHBHAVATHI VALLEY SEWAGE TREATMENT PLANTS (13th October 2021)

Background:

In order to meet the new effluent discharge standards given by National Green Tribunal (NGT), an effort is undertaken by the Bangalore Water Supply and Sewerage Board (BWSSB) to upgrade old sewage treatment plants. IISc team was engaged to inspect and recommend suitable modifications to the current treatment process to meet the required standards. As part of this effort, several visits have been made to many old STPs. During the visit on 13th October 2021, the IISc team visited two Sewage Treatment Plants (STP) in the Arkavathi and Vrushbhavathi valley divisions, namely Mallathahalli and Kempabudhi, respectively. Information about the plant capacity, treatment processes, new construction /rehabilitation, and possible issues was obtained for each plant from the BWSSB and the respective maintenance teams. At each location, the plant maintenance and management teams appraised the IISc Team of the design, functioning, constraints, neighbourhood issues and adverse events, if any. This discussion session was followed by an inspection tour of the treatment facilities and assessment of their functioning based on a visual inspection as well as data collected (logbooks) by the management team. Also, water samples were collected at the inlet and outlet for each plant. Details for each plant visited are included in this report.

1] Mallathahalli sewage treatment plant:

The Mallathahalli sewage treatment plant (STP) was commissioned in 2011 and is currently being maintained by M/s Toshiba. The plant has a treatment capacity of 5 MLD, out of which currently up to 4.7 MLD is being utilized. Excess sewage coming to the site is diverted to another sewage treatment plant in Doddabele. The STP uses SBR technology to treat incoming sewage. The treatment process flow includes an inlet chamber, screening chamber, grit chamber, SBR basin, cloth media filter and chlorine contact tank. The speciality of this treatment plant is that it only has one pump that pumps raw inlet sewage to primary treatment. After that, water flows through the treatment units by gravity. The plant has 2 circular SBR chambers, which run on 288 minutes cycles. 5 cycles are run per day, and individual cycle consists of 64 mins of filling and mixing (anaerobic), 80 mins of aeration, 15 min of reaction time, 69 mins of settling and 60 mins of decanting. During the treatment plant inspection, it was observed that a lot of oil and grease were present in the inlet chamber. This was most likely due to the presence of restaurants in the catchment area. Similarly, oil and grease was also observed in the SBR basin. The team was informed that no activated sludge was returned to the SBR basin due to gravity flow. MLSS concentration of 3500-3600 mg/L is maintained in the SBR basin by controlling the wasting sludge flow rate. Dissolved oxygen concentration at the end of the aeration cycle was maintained at <2 mg/L. Furthermore, an inspection of sludge showed that there were two types of sludge present in the sample. One settled well and had good granule formation; the other did not settle as well as required. It was suggested that aeration time and intensity should be increased to increase the overall quality of the sludge. No chlorination was done, and it was suggested that the chlorine contact tank be cleaned and repainted before proper chlorination is started again. The effluent from the treatment plant was let into Mallathahalli lake, which is located next to the STP. However, Bruhat Bengaluru Mahanagar Palike (BBMP) requested that 50% of the effluent be pumped to Ullar lake.

Currently, as Malathahalli lake is under maintenance, all of the effluent is being pumped to Ullar lake. To assess the performance of the plant, samples were collected throughout the treatment plant to be analyzed at the IISc lab.

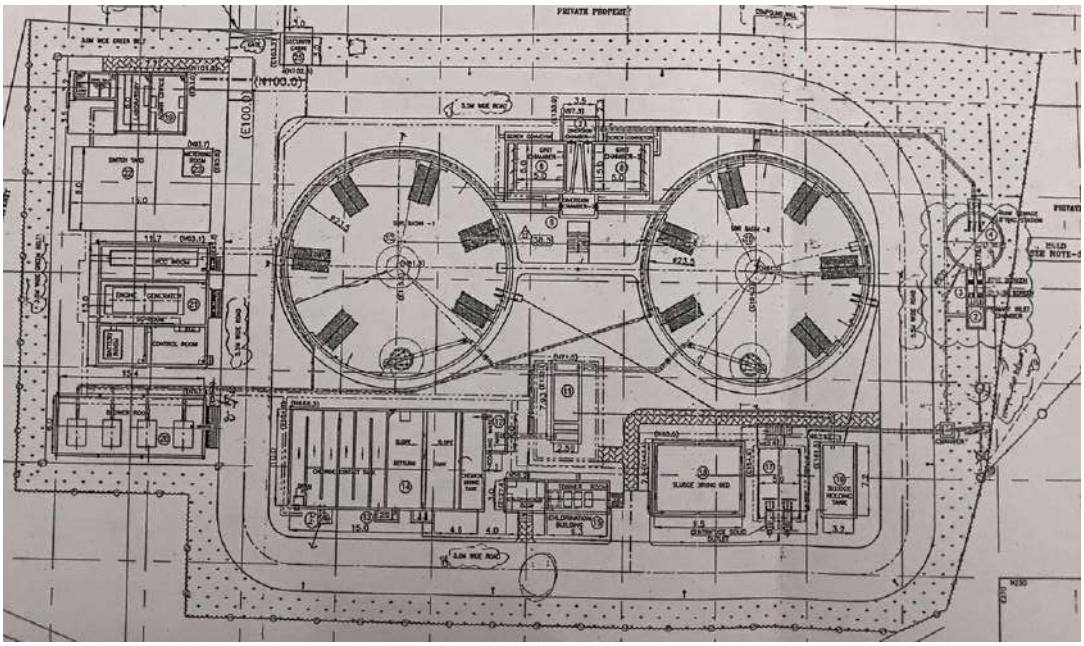


Figure 1: Layout of Mallathahalli sewage treatment plant

Figure 2: Mallathahalli STP 1- Screen chamber 2- Grit chamber 3- SBR basin 4- Disc cloth filter 5- Chlorine contact tank

Figure 3: Samples collected at Mallathahalli STP 1- Raw sewage inlet 2- Outlet of grit chamber 3- final stage aeration (SBR) 4- Outlet of SBR 5- Final treated effluent

2] Kempabudhi Sewage treatment plant:

The Kempabudhi STP was commissioned in 2002. The plant has an ultimate capacity of 1 MLD and is operating at full capacity. The plant uses extended aeration technology to treat incoming sewage. The treatment process flow for the plant includes an inlet chamber, bar and grit chamber, aeration basin, clarifier and treated water storage tank. The MLSS concentration maintained in the aeration basin is 3500-3600 mg/L, and the DO concentration maintained is 2.2-2.4mg/L. Diffused aerators are used to aerate the basin. The RAS and WAS quantities for the plant are 0.75 MLD and 18.9 m^3/day, respectively. During the inspection, it was observed that oil and grease was floating in the bar and grit chamber. The grit chamber was clogged with grit. Inspection of sludge in the lab showed that the sludge was lean and filamentous. The settling time for the sludge was very high, and the floc size was small. It was suggested that the DO levels in the aeration chamber should be increased. To assess the effluent quality and plant performance, samples were collected throughout the plant to be analyzed at the IISc lab.

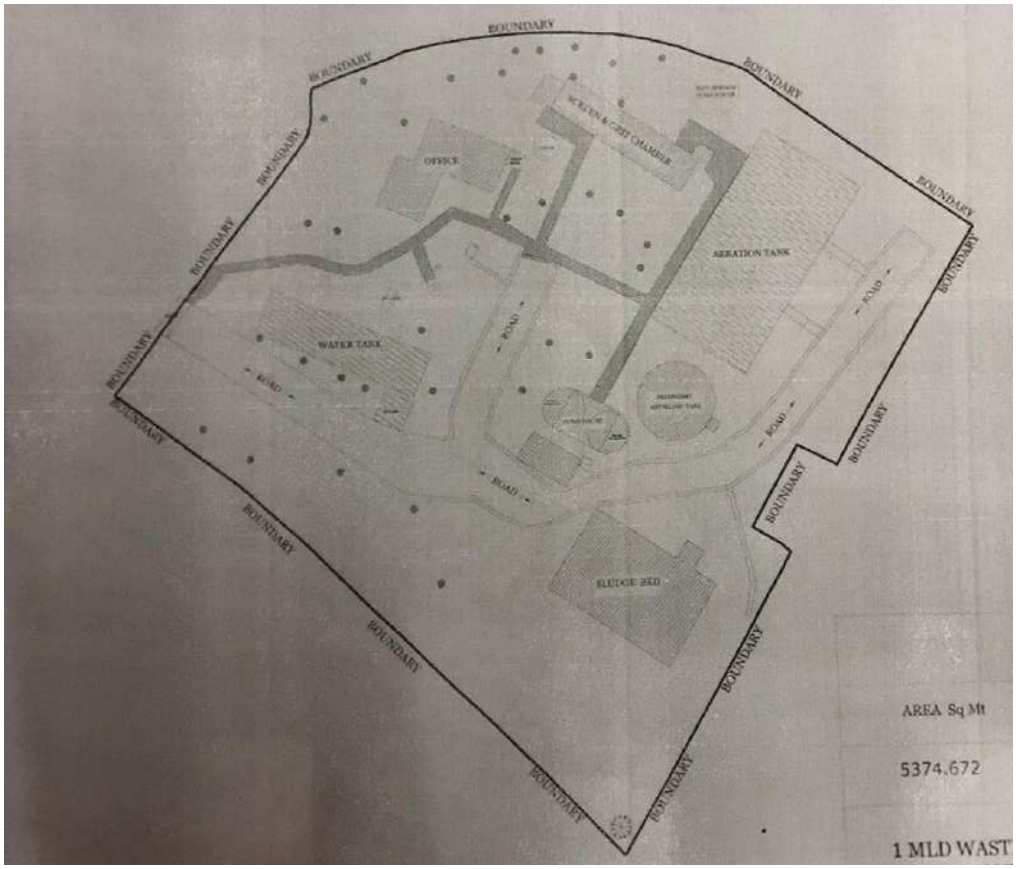


Figure 4: Layout for Kempabudhi sewage treatment plant

Figure 5: Kempabudhi STP 1- Grit chamber 2,3 - Aeration basin

Figure 6: Samples collected at Kempabudhi STP 1- Raw sewage inlet 2- Outlet of grit chamber 3- Outlet of aeration basing 4- final treated effluent

Water Quality Analysis of STPs - BWSSB

Annexure V

Sl No	Division	Name of STP/TTP/ WRP	Average Flow in MLD		pH		TSS in mg/l		BOD in mg/l		COD in mg/l		Ammonium Nitrogen (NH4-N) in mg/l		Nitrate Nitrogen (N-NO3) in mg/l		Total Phosphorus in mg/l		TKN in mg/l		Fecal Coliform in MPN	FRC in PPM
			Inlet	Outlet	Raw Sewage	Treated Water	Raw Sewage	Treated Water	Raw Sewage	Treated Water	Raw Sewage	Treated Water	Raw Sewage	Treated Water	Raw Sewage	Treated Water	Raw Sewage	Treated Water	Raw Sewage	Treated Water	Treated Water	Treated Water
1	(STP-CV)	218 MLD STP at K&C Valley	186.80	182.13	7.12	7.72	321.00	9.80	226.00	7.70	520.00	30.00	22.50	1.19	0.58	3.64	8.10	0.70	43.65	4.40	50.00	0.90
2		60 MLD STP at K&C Valley	60.72	58.08	7.44	7.52	270.73	8.83	167.53	6.33	323.37	20.90	41.12	0.64	-	6.35	6.15	0.63	60.45	-	142.33	1.00
3		30 MLD STP at K&C Valley	32.40	31.26	6.96	7.66	213.90	8.28	244.23	6.41	418.97	32.60	20.60	2.40	5.70	1.87	3.20	0.40	37.30	4.37	68.00	0.72
4		New 150 MLD STP at K&C Valley	111.45	100.05	7.25	7.34	315.97	8.25	286.07	8.37	342.33	21.29	40.87	0.62	-	6.55	5.73	0.85	60.62	-	138.63	1.00
5		Existing 20 MLD STP at K R Puram	15.11	13.64	6.96	7.75	374.33	13.90	273.33	7.67	487.77	41.40	20.60	1.70	6.10	1.70	8.60	0.80	52.00	9.60	-	
6		New 20 MLD STP at KR puram	16.10	15.62	7.38	7.80	267.60	6.00	328.90	5.30	470.90	26.50	41.80	3.90	-	6.90	14.70	0.70	38.90	5.40	52.90	0.70
7		15 MLD STP at	14.66	14.34	7.13	7.54	277.33	5.33	208.33	5.88	357.33	40.93	20.52	0.48	-	0.67	3.34	0.32	34.31	-	46.67	0.97

		Yelemallappa Chetti																			
8		4 MLD TTP at Cubbon Park	0.77	0.76	6.53	7.12	229.00	1.00	233.00	1.20	449.00	16.00	21.00	<1	4.30	2.10	8.00	<0.1	42.00	2.30	BDL	0.20
9		1.5 MLD TTP at Lalbagh	1.51	1.49	6.68	7.15	173.00	1.00	237.00	1.90	439.00	15.00	25.00	<1	4.90	2.30	9.00	<0.1	43.00	1.40	BDL	0.20
10	(STP-KV)	90 MLD STP at Bellandur Amanikere	94.70	91.86	7.12	7.54	277.00	8.00	185.00	5.00	473.00	27.00	42.53	0.55	5.70	5.40	5.90	0.55	62.65	4.70	77.14	0.90
11		50 MLD STP at Kadabeesanahalli Ph-1	42.94	42.42	6.94	7.65	192.93	11.48	180.61	9.87	575.16	68.39	15.42	1.36	-	1.58	5.69	0.66	66.65	5.72	191.13	0.46
12		35 MLD STP at Agaram	33.80	33.99	7.15	7.70	187.00	4.00	173.00	4.10	273.00	23.00	12.21	1.31	-	NA	6.00	0.30	22.59	4.30	23.40	1.00
13		10 MLD STP at Hulimavu	7.49	7.37	7.17	7.46	293.17	6.84	165.27	5.04	223.53	27.97	15.50	1.44	-	6.72	4.05	0.63	28.73	4.72	37.83	0.70
14		6 MLD STP at Kadugodi	3.57	3.40	7.20	7.66	279.00	13.00	341.00	9.00	632.00	49.00	30.00	0.71	-	3.80	4.00	0.70	65.00	6.00	121.00	0.27
15		5 MLD STP at Sarakki	3.29	3,27	7.16	7.30	219.48	4.90	203.20	2.85	231.72	16.66	19.01	1.93	-	-	4.76	0.60	21.82	4.03	24.76	0.91
16		2 MLD STP at Halasuru	1.97	1.93	7.59	7.40	136.40	2.60	138.90	2.70	347.10	30.90	27.00	2.00	-	3.30	2.70	0.50	32.30	3.10	74.00	0.50
17		5 MLD STP at ChikkaBeguru	3.57	3.50	7.22	7.76	279.00	6.13	275.20	5.75	323.26	34.66	22.56	1.69	-	-	6.98	0.43	25.33	6.27	38.53	0.86
18	(STP-HV)	100 MLD STP at Hebbal	78.52	63.39	6.99	7.46	374.80	4.74	232.00	4.84	476.13	29.33	18.36	1.10	-	6.38	11.85	0.61	19.84	-	-	0.48

19		40 MLD STP at Rajacanal-Ph1	24.87	24.54	7.20	7.54	307.37	5.96	292.67	6.07	691.29	32.73	4.67	55.00	-	5.67	-	1.06	36.92	3.28	20.00	0.70
20		40 MLD STP at Rajacanal	42.96	35.62	7.25	7.35	747.40	7.73	304.20	6.92	743.47	43.47	31.71	1.47	-	6.07	5.75	0.87	41.37	.-	-	0.91
21		20 MLD STP at Horamavu Agara	18.69	18.63	7.24	7.43	428.73	7.10	300.67	7.55	726.40	28.83	30.05	0.81	-	6.22	-	0.33	39.26	.-	45.37	1.14
22		15 MLD STP at Jakkur	15.24	15.34	6.68	7.39	221.21	33.00	163.18	1.21	491.96	14.96	22.63	0.98	38.58	2.77	5.99	0.52	-	-	21.20	0.30
23		10 MLD TTP at Yelahanka	10.21	1.25	6.80	7.30	243.00	3.30	237.00	3.50	436.00	28.00	19.80	22.00	-	-	-	0.60	40.20	-	15.00	0.20
24		1 MLD TTP at Hennur	0.30	0.30	6.50	7.20	250.00	9.00	250.00	8.00	350.00	40.00	-	-	-	-	-	-	-	-	-	-
25	(STP-AV)	20 MLD STP at Nagasandra	13.48	12.69	7.22	7.32	372.00	7.00	301.00	7.10	704.00	46.00	34.31	0.50	-	7.10	6.23	0.20	55.21	-	61.00	0.20
26		20 MLD STP at Nagasandra Ph-1	10.20	9.89	7.08	7.74	336.00	10.30	254.00	7.70	581.00	54.00	46.00	4.50	-	5.50	9.30	3.40	72.00	5.10	80.00	0.25
27		5 MLD STP at Mallathahalli	3.76	3.64	7.01	7.50	318.00	3.29	211.33	3.26	520.28	21.04	18.60	1.20	9.20	3.40	5.80	<0.1	45.70	4.20	110.00	-
28		5 MLD STP at Chikkabanavara	4.97	4.55	6.92	7.78	217.73	12.00	306.00	12.00	625.00	64.00	24.23	0.75	-	3.43	3.50	0.76	32.23	-	109.00	0.30
29	(STP-VV)	180 MLD STP at V Valley	76.30	75.20	7.30	7.70	392.00	73.00	200.00	66.00	432.00	148.00	23.90	12.30	8.30	7.10	9.60	7.80	-	-	170.00	-

		60 MLD TTP at V Valley	6.70	6.50	7.80	7.60	72.00	3.00	67.00	3.00	151.00	18.00	21.00	4.10	6.20	4.70	8.50	2.00	-	-	90.00	-
30		1 MLD WRP at Kempambudhi	0.97	0.95	7.00	7.30	315.00	5.00	220.00	5.00	423.00	33.00	19.80	2..20	5.10	3.60	8.50	1.50	-	-	70.00	-
31		75 MLD STP at Mailasandra	64.90	63.48	7.22	7.57	212.33	4.30	215.67	4.54	537.60	26.57	36.27	2.26	7.40	5.80	4.10	0.20	48.50	BDL	50.00	-
32		60 MLD STP at Kengeri	34.29	30.15	7.10	7.25	383.67	5.77	290.19	6.55	695.10	36.92	35.72	0.93	-	3.48	4.58	0.94	45.84	-	199.93	-
33		40 MLD STP at Doddabele	40.46	39.51	7.52	7.27	234.47	5.37	183.17	6.30	383.63	28.80	21.19	1.78	-	-	4.19	0.53	38.76	-	52.73	1.11
34		20 MLD STP at Doddabele	19.37	18.65	7.09	7.28	246.13	5.30	204.60	7.44	412.93	40.53	37.93	0.38	-	5.21	4.39	0.57	47.58	-	39.67	0.68
		Average	**31.34**	**30.18**			**285.11**	**9.27**														

REGIONAL LABORATORY
CENTRAL POLLUTION CONTROL BOARD
REGIONAL DIRECTORATE, BENGALURU-560079
WATER & WASTEWATER LABORATORY

Annexure VI

Sl. No	Name of the Parameter with unit	River Thenpennai (Chokarasanapalli)	
		June 2021	August 2021
1.	pH at 25˚C	7.6	7.6
2.	EC at 25˚C µs/cm	1100	1104
3.	COD, mg/L	85	158
4.	$BOD_{3d\,,\,27^{\circ}C}$, mg/L	41	72
5.	Oxygen dissolved, mg/L	BDL	BDL
6.	TDS at 180˚C, mg/L	599	588
7.	TSS at 103-105˚C, mg/L	42.3	38.8
8.	Chloride, mg/L	150	146
9.	Fluoride, mg/L	1.73	1.28
10.	Alkalinity, mg $CaCO_3$/L	217	312
11.	Ammonical Nitrogen as N, mg/L	6.7	2.0
12.	Total Hardness, mg $CaCO_3$/L	281	275
13.	Magnesium as Mg, mg/L	13	9.7
14.	Calcium as Ca, mg/L	91	94
15.	Phosphate as P, mg/L	4.45	4.0
16.	Potassium, mg/L	18.7	16.7
17.	Sodium, mg/L	116	73
18.	Sulphate, mg/L	38.4	34.5
19.	Nitrite as N, mg/L	0.03	2.42
20.	Nitrate as N , mg/L	2.05	2.11
21.	Sodium Absorption Ratio (SAR)	3.01	1.9
22.	% Sodium	45.32	34.9
Classification as per Best Designated Use Criteria: Class E			

Annexure - IV

Thenpennaiyar River Water samples collected at Chokarasanapalli village at the inter State Border (on Behalf of TNPCB during Joint Monitoring Committee Visit from September 2017 to May 2018)

Sl. No.	Parameter	Units	Date of Sample Collection								
			20.09.2017	24.10.2017	21.11.2017	12.12.2017	18.01.2018	22.02.2018	22.03.2018	26.04.2018	24.05.2018
1	pH	Number	7.13	7.65	7.28	6.90	7.58	7.89	7.72	7.54	7.32
2	Total Suspended Solids	mg/l	-	-	38	36	38	36	34	42	44
3	Total Dissolved Solids	mg/l	610	-	1040	780	880	760	1510	1008	1160
4	Chloride	mg/l	-	-	325	320	360	300	320	400	440
5	Sulphate	mg/l	-	-	260	140	160	120	140	200	210
6	Oil and Grease	mg/l	-	-	1.0	1.0	1.0	1.0*	1.0*	1.0*	1.0*
7	BOD 3 days at 27^{0}C	mg/l	6	10	20	30	26	28	26	32	26
8	COD	mg/l	64	-	64	88	80	80	80	88	88
9	Conductivity	mg/l	1050	-	1368	1280	1050	1403	1760	1388	1154
10	Dissolved Oxygen	mg/l	1.0*	1.0*	1.0*	1.0*	2.60	4.20	2.60	1.00	1.0*
AEL, TNPCB, Salem											
11	Total Coliform	MPN / 100 ml	1400	2200	110000	350000	280000	170000	170000	140000	170000
12	Fecal Coliform	MPN / 100 ml	490	----	----	----	----	----	----	----	----

30/12/20

DISTRICT ENVIRONMENTAL ENGINEER
TAMILNADU POLLUTION CONTROL BOARD
HOSUR

30.12.2019

Thenpennaiyar River Water sample collected at Chokarasanapalli village at inter State Border by the DEE, TNPCB, Hosur from June 2018 to December 2018

Sl. No.	Parameter	Units	Date of Sample Collection						
			28.06.2018	25.07.2018	22.08.2018	27.09.2018	26.10.2018	29.11.2018	31.12.2018
1	pH	Number	7.68	7.56	6.22	7.16	7.44	6.13	5.87
2	Total Suspended Solids	mg/l	18	96	260	124	36	24	24
3	Total Dissolved Solids	mg/l	808	960	986	972	716	670	708
4	Chloride	mg/l	205	185	225	410	200	275	244
5	Sulphate	mg/l	91	117	20	60	43	36	38
6	Oil and Grease	mg/l	1.0*	1.0*	1.0*	1.0*	2.0*	1.0*	2.0
7	BOD 3 days at 27°C	mg/l	6.0	16	12	20	22	32	32
8	COD	mg/l	40	80	80	80	160	128	80
9	Dissolved Oxygen	mg/l	0.88	2.55	-	2.30	1.94	2.12	5.40
AEL, TNPCB, Salem									
10	Total Coliform	MPN / 100 ml	----	220000	17000	1700	2100	2200	2800
11	Fecal Coliform	MPN / 100 ml	----	----	----	----	----	----	----

DISTRICT ENVIRONMENTAL ENGINEER
TAMILNADU POLLUTION CONTROL BOARD
30.12.2024 HOSUR

Thenpennaiyar River Water samples collected at Chokarasanapalli village at the inter State Border by the TNPCB, DEE, Hosur from January 2019 to December 2019

Sl. No.	Parameter	Units	Date of Sample Collection											
			24.01.2019	22.02.2019	28.03.2019	11.04.2019	09.05.2019	20.06.2019	11.07.2019	16.08.2019	20.09.2019	18.10.2019	27.11.2019	25.12.2019
1	pH	Number	7.12	6.57	6.19	6.38	7.50	6.72	7.64	7.62	8.14	7.42	7.92	8.23
2	Total Suspended Solids	mg/l	18	26	38	40	18	28	568	540	280	126	38	450
3	Total Dissolved Solids	mg/l	702	852	810	928	698	1620	968	788	654	624	760	754
4	Chloride	mg/l	265	250	230	230	200	640	425	235	195	325	220	220
5	Sulphate	mg/l	42	42	40	7.0	19.0	299	148	81	35	88	59	138
6	Oil and Grease	mg/l	1.0*	1.0	1.0*	2.0	2.0	1.0*	1.0*	2.0	1.0*	1.0*	3.0	16
7	BOD 3 days at 27°C	mg/l	14	18	16	24.0	10.0	20	56	152	10	15	48	40
8	COD	mg/l	80	176	80	200	48	80	104	216	152	96	72	96
9	Dissolved Oxygen	mg/l	13.8	4.15	4.56	3.34	4.00	4.20	2.08	4.58	2.86	2.21	5.04	3.21
AEL, TNPCB, Salem														
10	Total Coliform	MPN / 100 ml	----	3300	2400	2400	2100	3500	3400	2800	3500	4300	3900	4800
11	Fecal Coliform	MPN / 100 ml	----	----	----	----	----	----	----	----	----	----	----	----

DISTRICT ENVIRONMENTAL ENGINEER
TAMILNADU POLLUTION CONTROL BOARD
30.12.2019 HOSUR

Thenpennaiyar River Water samples collected at Chokarasanapalli village at the inter State Border by the TNPCB, DEE, Hosur from January 2020 to December 2020

Sl. No.	Parameter	Units	Date of Sample Collection											
			23.01.2020	20.02.2020	19.03.2020	22.05.2020	26.06.2020	30.07.2020	19.08.2020	20.08.2020	24.09.2020	22.10.2020	26.11.2020	24.12.2020
1	pH	Number	8.12	8.01	7.91	8.01	6.95	7.15	7.27	7.24	7.19	5.58	7.01	6.89
2	Total Suspended Solids	mg/l	548	308	140	122	756	324	426	958	258	204	136	40
3	Total Dissolved Solids	mg/l	820	866	832	662	502	616	710	632	598	890	468	794
4	Chloride	mg/l	250	225	210	185	130	160	175	180	157	125	175	209
5	Sulphate	mg/l	98	143	74	117	79	37	278	112	24	26	92	11
6	Oil and Grease	mg/l	1.0*	1.0	1.0*	6.00	2.00	1	2	1	2	1.0*	4	2
7	BOD 3 days at 27°C	mg/l	12	40	42	48	21	47	168	33	24	27	44	40
8	COD	mg/l	144	176	96	128	128	72	480	168	320	96	3.36	272
9	Dissolved Oxygen	mg/l	3.72	0.31	2.40	2.79	0.32	4.77	4.72	4.61	4.3	3.2	0.88	0.42
10	Dissolved Phosphate	mg/l	-	-	-	-	-	-	3.35	-	-	-	-	-
11	Total Hardness	mg/l	-	-	-	-	-	-	430	-	-	-	-	-
12	Sulphide	mg/l	-	-	-	-	-	-	1.0*	-	-	-	-	-
AEL, TNPCB, Salem														
13	Total Coliform	MPN / 100 ml	5800	6300	1200	210	940	1100	----	1400	2200	840	1700	1200
14	Fecal Coliform	MPN / 100 ml	----	----	2800	----	----	----	----	----	----	----	----	----

30/12/24
DISTRICT ENVIRONMENTAL ENGINEER
TAMILNADU POLLUTION CONTROL BOARD
30.12.2024 HOSUR

Thenpennaiyar River Water samples collected at Chokarasanapalli village at the inter State Border by the TNPCB, DEE, Hosur from January 2021 to November 2021

Sl. No.	Parameter	Units	Date of Sample Collection									
			20.01.2021	25.02.2021	25.03.2021	27.04.2021	28.06.2021	27.07.2021	23.08.2021	23.09.2021	26.10.2021	22.11.2021
1	pH	Number	7.63	7.04	6.35	6.92	6.17	6.09	7.23	6.29	6.66	6.38
2	Total Suspended Solids	mg/l	100	72	94	84	74	60	96	48	12.0	18
3	Total Dissolved Solids	mg/l	696	244	150	728	750	464	584	584	464	440
4	Chloride	mg/l	205	200	90	180	190	160	160	195	130	130
5	Sulphate	mg/l	74	26	40	42	40	21	48	53	91	50
6	Oil and Grease	mg/l	2	2	2	4	2	2	2	2	1.0*	1.0*
7	BOD 3 days at 27°C	mg/l	31	47	40	23	26	24	49	46	3.0	5.0
8	COD	mg/l	152	168	224	136	40	104	200	96	64	24
9	Dissolved Oxygen	mg/l	0.39	0.51	0.96	0.21	0.58	2.42	2.6	2.68	6.12	4.51
10	Conductivity	µs/cm	-	-	-	-	1162	720	906	906	719	682
11	Turbidity	NTU	-	-	-	-	2.52	2.34	2.32	2.30	2.34	2.38
12	SAR (Sodium Absorption Ratio)	meq/L	-	-	-	-	0.64	0.56	0.58	0.54	0.52	0.56
13	Boron	mg/l	-	-	-	-	0.002*	0.07	0.06	0.07	0.06	0.06
14	Free Ammonia (NH3)	mg/l	-	-	-	-	0.36	1.95	1.95	1.87	1.76	1.88
AEL, TNPCB, Salem												
15	Total Coliform	MPN / 100 ml	1300	1400	2600	1700	1200	700	1200	1500	1200	580
16	Fecal Coliform	MPN / 100 ml	----	----	----	840	----	260	----	----	----	250

Note: From the Report of Analysis it reveals that the parameters such as BOD, DO and Total Coliform are in higher level and the quality of the surface water flowing in River Thenpennai does not meeting the Category "B" (Outdoor bathing (Organised)) of the Designated Best Use Water Quality Criteria notified under Environment (Protection) Rules, 1986, but, water quality false under Category "E" (Irrigation, Industrial Cooling, Controlled Waste disposal) of the Designated Best Use Water Quality Criteria notified under Environment (Protection) Rules, 1986.

DISTRICT ENVIRONMENTAL ENGINEER
TAMILNADU POLLUTION CONTROL BOARD
HOSUR
30.12.2021

Annexure -2

Water Quality of the river Dakshina Pinakini near Mugalur Bridge

Year	Sampling Location	Date Of Sample	Classification				
			A	B	C	D	E
2018-19	Dakshina Pinakini River, Near Mugalur Bridge, Mugalur, Bengaluru	24.05.2018	-	-	-	D	-
		12.06.2018	-	-	-	-	E
		26.07.2018	-	-	-	-	E
		14.08.2018	-	-	-	-	E
		18.09.2018				D	
		26.10.2018	-	-	-	D	-
		27.11.2018	-	-	-	D	-
		14.12.2018	-	-	-	-	E
2019-20		11.04.2019	-	-	-	D	-
		18.05.2019	-	-	-	-	E
		03.05.2019	-	-	-	-	E
		14.03.2019	-	-	-	-	E
		05.02.2019	-	-	-	-	E
		16.01.2019	-	-	-	D	-
		14.06.2019	-	-	C	-	
		16.07.2019	-	-	-	D	-
		5.08.2019	-	-	-	-	E
		6.08.2019	-	-	-	-	E
		17.10.2019	-	-	-	D	-
		05.11.2019	-	-	-	-	E
		17.09.2019	-	-	-	D	-
		12.12.2019	-	-	-	-	E
		30.01.2020	-	-	-	D	-
		09.01.2020	-	-	-	-	E
2020-21		22.04.2020	-	-	-	-	E
		27.05.2020	-	-	-	-	E
		11.08.2020	-	-	-	D	-
		09.09.2020	-	-	-	D	-
		22.10.2020	-	-	-	D	-
		27.11.2020	-	-	-	-	E
		24.12.2020	-	-	-	-	E
		08.01.2021	-	-	-	-	E
		21.01.2021	-	-	-	-	E
		10.02.2021	-	-	-	-	E
		09.03.2021	-	-	-	-	E
		17.06.2021	-	-	-	-	E
		14.07.2021	-	-	-	-	E
		11.08.2021	-	-	-	-	E
		16.09.2021	-	-	-	-	E
		27.10.2021	-	-	-	D	-

ANALYSIS REPORT

Date: 13-09-2021

Page 1of 2

1	Station code	4107				Type of Water Body		Lake
2	Date & time of Sample taken	Date	11-08-2021	Time	10.00 AM			
3	Name of Monitoring Station	Mugaluru Bridge				**SAMPLE COLLECTED BY : Sri. ST. Narayanaswamy, DEO, RO: Sarjapura**		
4	Visible Effluent Discharge in Proximity	None √	Moderate	High	Other	Completed by	Scientific Assistant	
5	Weather	Cloudy	Clear √	Windy	Raining	Verified by	Deputy Scientific Officer	
6	Depth of water body (meter)	< 50 cm	50-100cm √	>100 cm	Flood	AGENCY:	KARNATAKA	
7	Human Activities	Cattle Wading	Melon Farming	Fishing	Other √	Date of commencement of test	11-08-2021	
8	Colour	Clear	Turbid	Light Grey √	Brown	Date of completion of test	19-08-2021	
9	Odour	None	Fishy	H_2S	Other √	Sample Report No.	W-1131	
10	Particulars of sample collected	Lake Water Sample				Sample No.	W-1131	

Sl No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	Temperature	°C	-	-	-	-	-	25	Thermometric
2	pH@25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	7.0	IS 3025 (Part 11)
3	Conductivity@25° C	µs/cm	-	-	-	-	2250	1098	IS 3025 (Part 14)
4	Total Coliform	MPN /100ml	50	500	5000	-	-	1600×10^6	APHA 23rd edition (9221 A, B,C), 9-68 to 9-75
5	Fecal Coliform	MPN /100ml	-	500 (Desirable) 2500 (Max permissible)	-	-	-	140×10^6	APHA 23rd edition (9221 E,D), 9-77 to 9-78
6	Dissolved Oxygen	mg/L	6	5	4	4	-	BDL	IS 3025 (Part 38)
7	Biochemical Oxygen Demand (3 days @ 27 ° C)	mg/L	2	3	3	-	-	57	IS 3025 (Part 44)
8	Chemical Oxygen Demand	mg/L	-	-	-	-	-	316	IS 3025 (Part 58)
9	Boron as B	mg/L	-	-	-	-	2.0	BDL	APHA 23rd edition (4500-B B)
10	Nitrate as N	mg/L	-	-	-	-	-	3.0	IS 3025 (Part 34)
11	Ammonia as N	mg/L	-	-	-	-	-	21.2	IS 3025 (Part 34)
12	Turbidity	mg/L	-	-	-	-	-	124	IS 3025 (Part 10)

P.T.O

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2	Date & time of Sample taken	Date	11-08-2021	Time	10.00 AM	SAMPLE COLLECTED BY Sri. ST. Narayanaswamy, DEO, RO: Sarjapura
3	Name of Monitoring Station	Mugaluru Bridge				W-1131
4	Date of commencement of test	11-08-2021				W-1131
5	Date of completion of test	19-08-2021				
6	Particulars of sample collected	Lake Water Sample				

13	Total Hardness as $CaCO_3$	mg/L	-	-	-	-	-	252	IS 3025 (Part 21)
14	Calcium as $CaCO_3$	mg/L	-	-	-	-	-	148	IS 3025 (Part 40)
15	Magnesium as $CaCO_3$	mg/L	-	-	-	-	-	25	IS 3025 (Part 46)
16	Chloride as Cl	mg/L	-	-	-	-	-	148	IS 3025 (Part 32)
17	Sodium as Na	mg/L	-	-	-	-	-	165	IS 3025 (Part 45)
18	Potassium as K	mg/L	-	-	-	-	-	26	IS 3025 (Part 45)
19	Sulphate as SO_4	mg/L	-	-	-	-	-	12	IS 3025 (Part 24)
20	P- Alkalinity	mg/L	-	-	-	-	-	Nil	IS 3025 (Part 23)
21	Total Alkalinity as $CaCO_3$	mg/L	-	-	-	-	-	396	
22	Bicarbonate (HCO_3)	mg/L	-	-	-	-	-	396	
23	Carbonate (CO_3)	mg/L	-	-	-	-	-	Nil	
24	Total Dissolved Solids	mg/L	-	-	-	-	-	768	IS 3025 (Part 16)
25	Total Phosphate as P	mg/L	-	-	-	-	-	0.53	IS 3025 (Part 31)
26	Fluoride as F	mg/L	-	-	-	-	-	0.24	IS 3025 (Part 60)

INFERENCE	**Class " E "** - Irrigation, Industrial cooling, Controlled Waste disposal as per Primary water quality criteria-CPCB.

Note: 1. The above results pertain only to the sample tested.
2. The report shall not be reproduced without the written approval of the laboratory.
3. Samples will be stored for a period of 10 days from the date of issue of report.
4. Decision Rule: "Statement of conformity / non conformity applies only to test results as per standard stipulated by regulatory authority".
5. BDL: Below Detection Level in mg/L.
Boron as B:0.1; Dissolved Oxygen: 0.5.

Radha.M.N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

Authorized Signatory (Chemical)
(Farhath Jabeen)
Deputy Scientific Officer

---End of Report---

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KARNATAKA STATE POLLUTION CONTROL BOARD
CENTRAL ENVIRONMENTAL LABORATORY

Legal 42(3)/87-E(P)ACT, 1986 RECOGNISED ENVIRONMENTAL LABORATORY
ISO/IEC 17025 Accredited Testing Laboratory by NABL Vide Certificate Number TC-5487
ISO 45001:2018 CERTIFIED LABORATORY

ilac-MRA TC-5487

ANALYSIS REPORT

Date: 26-10-2021

1	Station code	4107				Type of Water Body	Lake
2	Date & time of Sample taken	Date	16-09-2021	Time	12.05 PM	SAMPLE COLLECTED BY : Sri. C R Manjunath , EO, RO: Sarjapura	
3	Name of Monitoring Station	Mugaluru Bridge					
4	Visible Effluent Discharge in Proximity	None	Moderate √	High	Other	Completed by	Scientific Assistant
5	Weather	Cloudy	Clear √	Windy	Raining	Verified by:	Deputy Scientific Officer
6	Depth of water body (meter)	< 50 cm	50-100cm√	>100 cm	Flood	AGENCY:	KARNATAKA
7	Human Activities	Cattle Wading	Melon Farming	Fishing	Other √	Date of commencement of test	17-09-2021
8	Colour	Clear	Turbid	Light √ Grey	Brown	Date of completion of	24-09-2021
9	Odour	None	Fishy	H_2S √	Other	Sample Report No.	W-1718
10	Particulars of sample collected	Lake Water Sample				Sample No.	W-1718

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	Temperature	°C	-	-	-	-	-	25	Thermometric
2	pH@25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	7.1	IS 3025 (Part 11)
3	Conductivity@25° C	µs/cm	-	-	-	-	2250	1264	IS 3025 (Part 14)
4	Total Coliform	MPN /100ml	50	500	5000	-	-	$240x10^3$	APHA 23rd edition (9221 A, B,C). 9-68 to 9-75
5	Fecal Coliform	MPN /100ml	-	500 (Desirable) 2500 (Max permissible)	-	-	-	$49x10^3$	APHA 23rd edition (9221 E,D) 9-77 to 9-78
6	Dissolved Oxygen	mg/L	6	5	4	4	-	BDL	IS 3025 (Part 38)
7	Biochemical Oxygen Demand (3 days @ 27 ° C)	mg/L	2	3	3	-	-	67	IS 3025 (Part 44)
8	Chemical Oxygen Demand	mg/L	-	-	-	-	-	320	IS 3025 (Part 58)
9	Boron as B	mg/L	-	-	-	-	2.0	BDL	APHA 23rd edition (4500-B B
10	Nitrate as N	mg/L	-	-	-	-	-	3.3	IS 3025 (Part 34)

P.T.O

1	Station code	4107				Type of Water Body	Lake
2	Date & time of Sample taken	Date	16-09-2021	Time	12.05 PM	SAMPLE COLLECTED BY : Sri. C R Manjunath , EO, RO: Sarjapura	
3	Name of Monitoring Station	Mugaluru Bridge				W-1718	
4	Date of commencement of test	17-09-2021				W-1718	
5	Date of completion of test	24-09-2021					
6	Particulars of sample collected	Lake Water Sample					

11	Ammonia as N	mg/L	-	-	-	-	-	16.2	IS 3025 (Part 34)
12	Turbidity	mg/L	-	-	-	-	-	19	IS 3025 (Part 10)
13	Total Hardness as $CaCO_3$	mg/L	-	-	-	-	-	272	IS 3025 (Part 21)
14	Calcium as $CaCO_3$	mg/L	-	-	-	-	-	144	IS 3025 (Part 40)
15	Magnesium as $CaCO_3$	mg/L	-	-	-	-	-	128	IS 3025 (Part 46)
16	Chloride as Cl	mg/L	-	-	-	-	-	132	IS 3025 (Part 32)
17	Sodium as Na	mg/L	-	-	-	-	-	106	IS 3025 (Part 45)
18	Potassium as K	mg/L	-	-	-	-	-	13	IS 3025 (Part 45)
19	Sulphate as SO_4	mg/L	-	-	-	-	-	43	IS 3025 (Part 24)
20	P- Alkalinity	mg/L	-	-	-	-	-	Nil	IS 3025 (Part 23)
21	Total Alkalinity as $CaCO_3$	mg/L	-	-	-	-	-	388	
22	Bicarbonate (HCO_3)	mg/L	-	-	-	-	-	388	
23	Carbonate (CO_3)	mg/L	-	-	-	-	-	Nil	
24	Total Dissolved Solids	mg/L	-	-	-	-	-	892	IS 3025 (Part 16
25	Total Phosphate as P	mg/L	-	-	-	-	-	2.23	IS 3025 (Part 31
26	Fluoride as F	mg/L	-	-	-	-	-	0.3	IS 3025 (Part 60

INFERENCE	Class " E" – Irrigation, Industrial cooling, Controlled Waste disposal as per Primary water q criteria-CPCB.

Note: 1. The above results pertain only to the sample tested.
2. The report shall not be reproduced without the written approval of the laboratory.
3. Samples will be stored for a period of 10 days from the date of issue of report.
4. Decision Rule: "Statement of conformity / non conformity applies only to test results as per standard stipulated by regulatory authority".
5. BDL: Below Detection Level in mg/L.
Boron as B:0.1, Total Phosphate as P:0.05;

Radha. M. N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

Authorized Signatory (Chemical)
(Farhath Jabeen)
Deputy Scientific Officer

---End of Report---

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TC-5487

KARNATAKA STATE POLLUTION CONTROL BOARD
CENTRAL ENVIRONMENTAL LABORATORY

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K.S.P.C.B., "Nisarga Bhavan"
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Shivanagar, Bangalore – 560079

ANALYSIS REPORT

Date: 18-11-2021

1	Station code	4107				Page 1of 2			
2	Date & time of Sample taken	Date	27-10-2021	Time	01.55 PM	Type of Water Body		River	
3	Name of Monitoring Station	Dakshina Pinakini River, Mugaluru Bridge				**SAMPLE COLLECTED BY :** Sri. C.R. Manjuanth, EO, **RO**: Sarjapura			
4	Visible Effluent Discharge in Proximity	None	Moderate √	High	Other	Completed by	Scientific Assistant		
5	Weather	Cloudy	Clear √	Windy	Raining	Verified by:	Deputy Scientific Officer		
6	Depth of water body (meter)	< 50 cm	50-100cm√	>100 cm	Flood	AGENCY:	KARNATAKA		
7	Human Activities	Cattle Wading	Melon Farming	Fishing	Other √	Date of commencement of test	28-10-2021		
8	Colour	Clear	Turbid	Light Grey √	Brown	Date of completion of test	02-11-2021		
9	Odour	None	Fishy	H_2S	Other √	Sample Report No.	W-2204		
10	Particulars of sample collected	River Water Sample				Sample No.	W-2204		

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	Temperature	°C	-	-	-	-	-	25	Thermometric
2	pH@25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	7.1	IS 3025 (Part 11)
3	Conductivity@25° C	µs/cm	-	-	-	-	2250	856	IS 3025 (Part 14)
4	Total Coliform	MPN /100ml	50	500	5000	-	-	1600 x10²	APHA 23rd edition (9221 A, B,C). 9-68 to 9-75
5	Fecal Coliform	MPN /100ml	-	500 (Desirable) 2500 (Max permissible)	-	-	-	150x10²	APHA 23rd edition (9221 E,D). 9-77 to 9-78
6	Dissolved Oxygen	mg/L	6	5	4	4	-	5.6	IS 3025 (Part 38)
7	Biochemical Oxygen Demand (3 days @ 27 ° C)	mg/L	2	3	3	-	-	5.0	IS 3025 (Part 44)
8	Chemical Oxygen Demand	mg/L	-	-	-	-	-	52	IS 3025 (Part 58)
9	Boron as B	mg/L	-	-	-	-	2.0	BDL	APHA 23rd edition (4500-B B)
10	Nitrate as N	mg/L	-	-	-	-	-	2.1	IS 3025 (Part 34)
11	Ammonia as N	mg/L	-	-	-	-	-	1.13	IS 3025 (Part 34)
12	Turbidity	mg/L	-	-	-	-	-	5.1	IS 3025 (Part 10)
13	Total Hardness as $CaCO_3$	mg/L	-	-	-	-	-	300	IS 3025 (Part 21)

P.T.O

1	Station code	4107				Type of Water Body	River	
2	Date & time of Sample taken	Date	27-10-2021	Time	01.55 PM	SAMPLE COLLECTED BY : Sri. C.R. Manjuanth, EO, RO: Sarjapura		
3	Name of Monitoring Station	Dakshina Pinakini River, Mugaluru Bridge				W-2204		
4	Date of commencement of test	28-10-2021				W-2204		
5	Date of completion of test	02-11-2021						
6	Particulars of sample collected	River Water Sample						

14	Calcium as $CaCO_3$	mg/L	-	-	-	-	-	152	IS 3025 (Part 40)
15	Magnesium as $CaCO_3$	mg/L	-	-	-	-	-	148	IS 3025 (Part 46)
16	Chloride as Cl	mg/L	-	-	-	-	-	108	IS 3025 (Part 32)
17	Sodium as Na	mg/L	-	-	-	-	-	88	IS 3025 (Part 45)
18	Potassium as K	mg/L	-	-	-	-	-	10	IS 3025 (Part 45)
19	Sulphate as SO_4	mg/L	-	-	-	-	-	35	IS 3025 (Part 24)
20	P- Alkalinity	mg/L	-	-	-	-	-	Nil	IS 3025 (Part 23)
21	Total Alkalinity as $CaCO_3$	mg/L	-	-	-	-	-	248	
22	Bicarbonate (HCO_3)	mg/L	-	-	-	-	-	248	
23	Carbonate (CO_3)	mg/L	-	-	-	-	-	Nil	
24	Total Dissolved Solids	mg/L	-	-	-	-	-	582	IS 3025 (Part 16)
25	Total Phosphate as P	mg/L	-	-	-	-	-	0.07	IS 3025 (Part 31)
26	Fluoride as F	mg/L	-	-	-	-	-	0.21	IS 3025 (Part 60)
27	Copper as Cu	mg/L	-	-	-	-	-	BDL	IS 3025(Part 42)
28	Zinc as Zn	mg/L	-	-	-	-	-	0.047	IS 3025 (Part 49)
29	Nickel as Ni	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 54)
30	Manganese as Mn	mg/L	-	-	-	-	-	0.443	APHA 23rd edition (3111B)
31	Total Chromium as Cr	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 52)
32	Iron as Fe	mg/L	-	-	-	-	-	0.526	IS 3025 (Part 53)
33	Cadmium as Cd	mg/L	-	-	-	-	-	BDL	IS 3025(Part 41)
34	Lead as Pb	mg/L	-	-	-	-	-	BDL	IS 3025(Part 47)

INFERENCE	Class " D" – Propagation of Wild Life, Fisheries as per Primary water quality criteria-CPCB.

Note: 1. The above results pertain only to the sample tested.
2. The report shall not be reproduced without the written approval of the laboratory.
3. Samples will be stored for a period of 10 days from the date of issue of report.
4. Decision Rule: "Statement of conformity / non conformity applies only to test results as per standard stipulated by regulatory authority".
5. BDL: Below Detection Level in mg/L.
Boron as B:0.1; Copper:0.05; Nickel:0.1; Total Chromium:0.2; Cadmium:0.04; Lead:0.2.

Radha. M.N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

Authorized Signatory (Chemical)
(Gouri Golsangi)
Assistant Scientific Officer

—End of Report—

Annexure VII

CPCB

ಫ್ಯಾಕ್ಸ್/Fax : 080-25586321
ಈಮೇಲ್/E-mail : ho@kspcb.gov.in
ವೆಬ್‌ಸೈಟ್/Website : http://kspcb.gov.in

25581383, 25589112
25588151, 25588270
25588142, 25586520

ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿ
Karnataka State Pollution Control Board
"ಪರಿಸರ ಭವನ", 1 ರಿಂದ 5ನೇ ಮಹಡಿಗಳು, ನಂ. 49, ಚರ್ಚ್ ಸ್ಟ್ರೀಟ್, ಬೆಂಗಳೂರು - 560 001, ಕರ್ನಾಟಕ, ಭಾರತ
"Parisara Bhavana", 1st to 5th Floor, # 49, Church Street, Bengaluru - 560 001, Karnataka, INDIA

No. KSPCN/SEO-INFRA/NGT-111/2020/2020-21 / 4590

09 DEC 2021

केन्द्रीय प्रदुषण नियंत्रण बोर्ड
10 DEC 2021
बेंगलूर/प्रावती सं...842.....

To
Regional Director,
Central Pollution Control Board,
Nisarga Bhavan,
Bangalore-560 001.

Sir,

Kind Attention Ms. Selvi

Sub: Furnishing of ATR on OA 111/2020 as on 30.11.2021.

Adverting to the above, please find enclosed herewith the ATR on the OA 111/2020 as on 30.11.2021. This is for your kind information.

Thanking You,

Yours faithfully,

√Member Secretary

Encl: As above.

10/12/2021

Smt PKS.

Summary of items/works in respect of KSPCB as on 12.12.2021
(Sl No. ii(i), ii(iv), iii(1), v(1), v(3), vii(1))

Sl. No. (MC-Sl.No.)	*Directions of Hon'ble NGT vide orders dated18.02.2021*	Progress as on 12.12.2021
1.	***ii)I*** *.BWSSB may engage a CSIR Institute like CLRI or NEERI or others for evaluating performance of STPs located in K&C and Hebbal valleys. (viz., there are 32 STPs in Bangalore including 21 STPs in Koramangla&Challaghatta and Hebbal Valleys). The same may be supervised by KSPCB. The final report may be submitted to KSPCB for review.*	The report is expected before 31.12.2021
2.	***ii(iv)*** *The outcome of the performance study of STPs may be submitted as Status of Compliance of the State Functionaries of Karnataka to the Monitoring Committee constituted in the matter of O.A 125/2017, for review and reporting.*	Based on the reports a joint meeting will be held to draw an action plan
3.	***iii(1)*** *Among the industries those that are Red/Orange category (small, medium and large) with treated effluent discharge option as surface water/sewer drain/others (which includes industries having ZLD) in River basin of Thenpennai be monitored for effluent*	There is no discharge of untreated effluents in the drains. K.S.P.C.B. has engaged 12 Marshals With Emergency response Vehicles to identify illegal discharges. 4 Nos Vehicle has been purchased by the KSPCB for this purpose.

	characteristics by concerned SPCBs, so as to ascertain the quality of treated effluent discharge as per the Consent Conditions of SPCBs. The details of the compliance status and action taken report be placed in public domain (TNPCB and KSPCB website).	
4.	***v(1)*** *EC be calculated and imposed based on the Performance Evaluation of STPs and Random Verification of Grossly Polluting Industries.*	List of Industries (36 units) for which EC has been imposed. **(Annexure-1)**
5.	***v(3)*** *Calculation of EC by the three member Committee comprising of CPCB, TNPCB and KSPCB, after submission of Reports by the concerned authorities (BWSSB, KSPCB, TNPCB)*	The same will be furnished to the CPCB.
6.	***vii(1)*** *The trend of water quality and its improvement at major confluence points may be monitored for the year 2021-22 on a monthly basis and a report be submitted to CPCB to ensure the quality of water flowing in River Thenpennai.*	However, to monitor the same, K.S.P.C.B. is monitoring the water quality of Thenpennai or Dhakshinanapinakini river near Muggaluru Bridge where continues online monitoring system is provided and the same is synced to the command control center & the KSPCB the data of 3 months is attached. KSPCB has also entrusted the technical study set the status of the river sample WWF.

MEMBER SECRETARY
KARNATAKA STATE POLLUTION CONTROL BOARD

Annexure- 1

LIST OF INDUSTRIES FOR WHICH ENVIRONMENTAL COMPENSATION HAS BEEN IMPOSED

Sl No	Name and Address of the Industry	Category	Amount in lakhs
1	Saify Industries, Plant 3, Plot No.75, Jigani Industrial Area, Anekal Taluk, Bangalore Urban District	MR	50
2	Rathna Enterprises, Sy No. 577, 85 CI, 1st Phase,Jigani Indsutrial Area, Jigani, Anekal Taluk, Bangalore Urban District	SR	25
3	Sun Clad Coaters, Plot No. 18/A, KSSIDC Industrial Area, Jigani 2nd Phase, Anekal Taluk, Bengaluru Urban District	SR	25
4	Kumar Organic Products Private Limited, ; Plot NO:62, Road NO:3 & 5, Jigani Industrial Area, Anekal Taluk, Bangalore Urban District – 560105	LR	100
5	Kumar Organic Products Limited ; Plot No.60/65, Road No.3, Jigani Industrial Area, Anekal, Bangalore Urban – 562106	LR	100
6	Power Control Equipments. , Unit II, Plot No. 40-A, KIADB Industrial Area, Jigani I Phase, Jigani, Anekal Taluk, Bangalore	MR	50
7	Keshav Industries, Plot No. SPL-1, KSSIDC, 2nd Phase, Jigani Industrial Area, Anekal Taluk, Bengaluru Urban District-560105	SR	25
8	Govardhan Accumulators, Plot No. 81-E , 2nd Phase, Jigani Industrial Area, Anekal Taluk, Bengaluru Urban District	SR	25
9	Arihant Metals and Extruded Pvt. Limited, Plot No. 9-L, Yarandahalli,Bommasandra Industrial Area 1st Phase, Anekal Taluk, Bangalore	MR	50
10	Ravi Industries, No. 206, Sy.No. 239P, Bommasandra Jigani Link Road, Industrial Area, Anekal Taluk, Bangalore	SR	25
11	K. K Industries, Plot No. 162/A, Bommasandra Jigani Link Road, 4th Phase, Bommasandra Industrial Area, Rajapura Village, Jigani Hobli, Anekal Taluk,Bangalore Urban District	SR	25
12	Omax Autos Limited.,Plot No. 06, 4th Phase, Bommasandra Jigani Link Road, Anekal Taluk, Bangalore Urban District	LR	100
13	Stellance Pharma science Private Limited.,(Formerly M/s. Karnataka Chemsyn Limited)., Plot No.456 A & B, Road No. 3, Industrial Area, Jigani, Anekal Taluk, Bangalore.	LR	100
14	Aron Universal Limited., Sy.No. 25/1, 2nd Phase, Jigani Industrial Area, Jigani, Anekal Taluk, Bangalore	LR	100
15	Anand Industries, Shed No.B-87, Bommasandra Industrial Estate, I Stage, Hosur Road, Anekal Tq, Bengaluru Urban District – 560099	SR	25

16	Siera Silk Mills Private Limited, Plot No. 51, Bommasandra - Jigani Link Road Industrial Area, 4th Phase, Anekal Taluk, Bangalore Urban District- 560 099	LR	100
17	Golden Enviro Creators, # 278, Bommasandra - Jigani Link Road, Jigani Hobli, Anekal Taluk, Bangalore	SR (CSTP)	25
18	Hikal Ltd., (Ralchem Limited,,) ; Plot No:82/A, Kiadb, , Jigani Industrial Area, Anekal, Bangalore Urban - 562106,	LR	100
19	Toyota Industries Engine (I) Pvt Limited (Formerly known as Kirloskar Toyota Textile Machinery Private Limited), (TIEI) Plot NO: 9, Jigani Industrial Area, Anekal Taluk, Bangalore Urban District - 562 106	LR	100
20	Taegutec India Private Limited, Plot No. 119 & 120, 4th Phase, Bommasandra Industrial Area, Anekal Taluk, Bangalore Urban District	LR	100
21	Radhamani Textiles Private Limited (Formerly known as Radhamani Exports Limited) , Plot No. 314(P), 315(P), 316- 318 & 319(P), Bommasandra - Jigani Link Road Industrial Area, 4th Phase, Anekal Tq	MO	50
22	Sandhar Automotives (SLD Auto (A Unit of Sandhar Technologies Limited), Plot No. 8, Bommasandra - Jigani Link Road Industrial Area, 4th Phase, Anekal Taluk, Bangalore Urban District- 560 099	LR	100
23	Indo Nissin Foods Private Limited, Plot ; NO:18-A2., Jigani Industrial Area, Anekal Taluk, Bangalore Urban District - 562	LO	100
24	Anand Sweets & Savouries, NO.31-A, Road No.2, 1st Phase, Anekal Taluk, Bangalore.	SR	25
25	Resil Chemicals Private Limited, Plot No. 53-57, IV Phase, Bommasandra Industrial Area, Anekal Taluk, Bangalore Urban Dist	LR	100
26	M/s. Adcock ingram Limited Plot No. 49, B C & D Bommasandra Indl Area, 1st Stage, Hosur Road, Attibele Hobli, Anekal Taluk, Bengaluru - 560099	LO	100
27	M/s Anand Industries,Shed No.B-87, Bommasandra Industrial Estate, I Stage, Hosur Road, Anekal Tq,Bengaluru Urban District – 560099	SR	25
28	M/s Switchgear & Control Technics Pvt. Ltd., Plot No. 152, Bommasandra Industrial Area, Hosur Road, Anekal Taluk, Bangalore – 560 099.	LO	100
29	M/s GRG Fine Foods Pvt. Ltd. Plot No.121H, Bommasandra IndustrialArea,Hosur Main Road,Anekal Taluk, Bangalore Urban Dist-560 099	SO	25
30	M/s. Saify Industry, Plant -1, Plot No. 49 A-1, Bommasandra Industrial Area, 5th Cross, Off: Hosur Road, Anekal Taluk, Bengaluru 560 099	MR	50
31	M/s. Sansera Engineering Ltd,(Formley Known as Gearock Forge Private Limited, Plot No. 143-B8, BIA,Hebbagodi Post, Anekal Taluk,Bangalore Urban District.	MO	50
32	M/s Mysore Fruit Products, Sy No.39 to 69, Veerasandra Village, Anekal Taluk, Bangalore Urban District.	LO	100

33	M/s. Ramsons Garment Finishing Equipment Pvt Ltd, (IFB industries Ltd.,) Plot No. 3-B, Bommasandra Industrial Area, I Phase, Anekal Taluk, Bangalore Urban District- 560 099	MR	50
34	M/s. Vinir Engineering Private Limited, Plot No. 102/104, Bommasandra Industrial Area, Anekal Taluk, Bangalore Urban District.	LO	100
35	M/s Ananda MotorsNo. 55, Opp. SKF, Hebbagodi, MBT Compound, Bommasandra Industrial AreaAnekal Taluk, Attibele Hobli, Bengaluru	SO	25
36	Bill forge Pvt. Ltd., Plot No. 9C Bommasandra Indl Area, Hosur Road, Attibele Hobli, Anekal Taluk	LR	100
Total Rs.			**2350**

Annexure -2

Water Quality of the river Dakshina Pinakini near Mugalur Bridge

Year	Sampling Location	Date Of Sample	Classification				
			A	B	C	D	E
2018-19	Dakshina Pinakini River, Near Mugalur Bridge, Mugalur, Bengaluru	24.05.2018	-	-	-	D	-
		12.06.2018	-	-	-	-	E
		26.07.2018	-	-	-	-	E
		14.08.2018	-	-	-	-	E
		18.09.2018				D	
		26.10.2018	-	-	-	D	-
		27.11.2018	-	-	-	D	-
		14.12.2018	-	-	-	-	E
2019-20		11.04.2019	-	-	-	D	-
		18.05.2019	-	-	-	-	E
		03.05.2019	-	-	-	-	E
		14.03.2019	-	-	-	-	E
		05.02.2019	-	-	-	-	E
		16.01.2019	-	-	-	D	-
		14.06.2019	-	-	C	-	
		16.07.2019	-	-	-	D	-
		5.08.2019	-	-	-	-	E
		6.08.2019	-	-	-	-	E
		17.10.2019	-	-	-	D	-
		05.11.2019	-	-	-	-	E
		17.09.2019	-	-	-	D	-
		12.12.2019	-	-	-	-	E
		30.01.2020	-	-	-	D	-
		09.01.2020	-	-	-	-	E
2020-21		22.04.2020	-	-	-	-	E
		27.05.2020	-	-	-	-	E
		11.08.2020	-	-	-	D	-
		09.09.2020	-	-	-	D	-
		22.10.2020	-	-	-	D	-
		27.11.2020	-	-	-	-	E
		24.12.2020	-	-	-	-	E
		08.01.2021	-	-	-	-	E
		21.01.2021	-	-	-	-	E
		10.02.2021	-	-	-	-	E
		09.03.2021	-	-	-	-	E
		17.06.2021	-	-	-	-	E
		14.07.2021	-	-	-	-	E
		11.08.2021	-	-	-	-	E
		16.09.2021	-	-	-	-	E
		27.10.2021	-	-	-	D	-

Regional Office: Bangalore –Anekal
Floor "NISARGA BHAVAN"
7th 'D' Cross, Thimmaiah Road,
Sanegoravanahalli, Shivanagar
Bengaluru -560 010
Tel/Fax: 080 -23229538

Karnataka State Pollution Control Board
ಪ್ರಾದೇಶಿಕ ಕಛೇರಿ: ಬೆಂಗಳೂರು – ಆನೇಕಲ್
೨ನೇ ಮಹಡಿ, "ನಿಸರ್ಗ ಭವನ",
7ನೇ 'ಡಿ' ಅಡ್ಡ ರಸ್ತೆ, ತಿಮ್ಮಯ್ಯ ರಸ್ತೆ,
ಸಾನೆಗೊರವನಹಳ್ಳಿ, ಶಿವನಗರ,
ಬೆಂಗಳೂರು - 560 010
ದೂರವಾಣಿ: 080- 23229538

ಕರ್ನಾಟಕ ರಾಜ್ಯ
ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿ

towards a cleaner Karnataka

No. KSPCB/RO-Anekal/Revocation/2021-22/709 Date: 15 DEC 2021

To,

The Member Secretary,
Karnataka State Pollution Control Board,
No. 49, Church Street,
Bengaluru – 560 001

Kind Attn :- SEO, Infrastructure Cell

Sir,

Sub: - Furnishing the the operational status of the units on closure order issued by the Board – reg.

Ref: - Board office memo no. 4511 dtd: 06.12.2021 received in this office through mail on 07.12.2021.

****

With reference to the above, the Closure orders issued by the Board for various non compliances under Water Act, Air Act & Hazardous & Other Waste (Management & Transboundry Movement) Rules, 2016 and it was not w.r.t installation of STP's. Please find herewith enclosed the Operational status of the units on closure order issued by the Board.

This is for your kind information & further needful.

RECEIVED
16 DEC 2021
KSPCB, Bangalore

Yours Sincerely

Environmental Officer
15/12/2021

Operational status of the units on closure order issued by the Board - Regional Office, Anekal.

l No	Name and Address of the industries	Category	Date of Issue Closure direction	Date of Issue Revocation order	Status	Validity under Water Act	Validity under Air Act	Domestic effluent discharge point	Observations made during inspection
1	Kumar Organic Products Limited , Plot No 60/65, Road No.3, Jigani Industrial Area, Anekal, Bangalore Urban - 562106.	LR	26.10.2018	Revocation order issued under Water and Air Act on 07.09.2019	Revoked	30.06.2026	30.06.2026	Combined ETP	Industry is having Combined ETP to treat both domestic and industrial effluent with ZLD facility followed by 2stage RO system, MEE & ATFD & is operating.
2	Kumar Organic Products Private Limited, , Plot NO:62, Road NO:3 & 5, Jigani Industrial Area, Anekal Taluk, Bangalore Urban District - 560105	LR	26.10.2018	Revocation order issued under Water and Air Act on 07.09.2019	Revoked	30.06.2026	30.06.2026	Combined ETP	Industry is having Combined ETP to treat both domestic and industrial effluent with ZLD facility followed by 2stage RO system, MEE & ATFD & is operating.
	Sharada Electrochem, No. S.P 175, 1st Phase, Jigani, KSSIDC Industrial Area, Anekal Taluk, Bengaluru Urban District - 560105	SR	05.11.2018	Revocation order issued under Water and Air Act on 04.06.2019	Revoked	30.06.2022	30.06.2022	Septic tank and soak pit	Industry have made agreement with CETP for discharge of trade effluent from plating section and scrub liquid after pre treatment.
	Sri Shivashakthi Rubbers, No.84-P4, 1st Phase, J.I.A. Jigani Hobli, B'lore	SR	13.11.2018	Revocation order issued under Water Act on 24.01.2019	Revoked	30.06.2022	30.06.2022	Septic tank and soak pit	Industry have made agreement with CETP for discharge of scrubbed liquid after pre treatment.
	Sathya Industries, No.142/145,Jigani Industrial Area, Dr. B.R Ambedkar Industrial Estate, 1st Phase, Anekal Taluk, Bengaluru Urban District - 560 106	SR	19.11.2018	Revocation order issued under Water Act on 22.12.2018	Revoked	30.06.2022	30.06.2022	Septic tank and soak pit	Industry has provided effluent (washings) collection tank and primary treatment plant for neutralization before uploading to CETP.
	Pavithra Chemicals, No. 183, Jigani, KSSIDC Industrial Estate, Jigani, Anekal Taluk, Bengaluru Urban District	SR	05.11.2018	Revocation order issued under Water Act on 31.12.2019	Revoked	30.06.2022	--	Septic tank and soak pit	Industry has provided collection tank to collect spillages /washings above the ground level and trade effluent handed over to CETP after primary treatment.

7	Shine Chemical Industries, No.SP-165, Jigani Industrial Estate, Jigani, Anekal Taluk, Bengaluru Urban District - 562106	SR	24.11.2018	Revocation order issued under Water and Air Act on 17.09.2019	Revoked	30.06.2023	30.06.2023	Septic tank and soak pit	Closure order was issued for failure to apply for consent and non complinace with the hazardous waste rules. Industry have applied for Consent & also complied w.r.t Hazardous waste, Rules. Trade effluent is disposed to CETP after primary treatment.
8	SB Refinaries, Plot No. 81, Bommasandra - Jigani Link Road Industrial Area, 4th Phase, Anekal Taluk, Bangalore Urban District- 560 099	SO	26.06.2018	Revocation order issued under Water and Air Act on 02.05.2019	Revoked	30.06.2023	30.06.2023	Septic tank and soak pit	Presently the industry is closed on its own and they have dismantled all the machineries from past one year. The same was corresponded to Board on 09.07.2021. Industry is not significant from water pollution point of view.
9	Vohra Packaging, No:94, Ii Phase, , Jigani Industrial Area, Anekal, Bangalore Urban - 562106.	SG	25.03.2019	Revocation order issued under Water Act on 04.09.2019	Revoked	31.12.2015	31.12.2015	Septic tank and soak pit	Presently industry has closed operations on its own.
10	Ekomate Systems India Private Limited, Plot No. 141, Bommasandra - Jigani Link Road Industrial Area, 4th Phase, Anekal Taluk, Bangalore Urban District- 560 099	SG	27.03.2019	Revocation order issued under Water Act on 03.06.2019	Revoked	31.12.2017	--	Septic tank and soak pit	The industry is closed on its own from 13.05.2019.
11	Sudarshan Brick Works, Survey Nos. 5 & 7, Chikkahagade Village, Sidi Hosakote Post, Kasaba Hobli, Anekal Taluk, Bangalore Urban District	SG	27.03.2019	CFO issued from this office vide No.A-108866 dtd: 11.02.2019 valid up to 31.12.2025 under Air Act	Revoked	--	31.12.2025	--	Closure order was issued under Water Act for the industry for operating without valid consent of the Board. Industry applied for Consent & Consent was issued under Air Act up to 31.12.2025. Industry is not significant from water pollution point of view.
12	Shine Electroplating Industries, No. 105, 4th Phase, Bommasandra Jigani Link Road, Anekal Taluk, Bangalore	SR	23.01.2020	Revocation order issued under Water Act on 05.08.2020	Revoked	30.06.2024	30.06.2024	Septic tank and soak pit	Trade effluent from the plating activity is disposed to CETP after primary treatment.
13	Power Control Equipment, Unit-II, ; Plot No.40-A, Phase-I, Road No.3, Jigani Indl. Area, Bangalore.	MR	05.02.2020	Revocation order issued under Water and Air Act on 21.03.2020	Revoked	30.06.2021	30.06.2021	Septic tank and soak pit	Industry has conducted leak test for ETP collection tanks and provided scrubber to the Air pollution control equipment with adequate chimney height provided exclusive hazardous storage area and display board as per H & OW (M & TM) Rules, 2016.

14	Ravi Industries, Plot No. 206, Survey No. 239-P, Bommasandra - Jigani Link Road Industrial Area, Anekal Taluk, Bengaluru Urban District - 560 099	SR	05.02.2020	Revocation order issued under Water and Air Act on 02.03.2020	Revoked	30.06.2024	30.06.2024	Septic tank and soak pit	Industry has provided ETP of 10 KLD followed by RO plant of capacity 2000 liters/hr for treating of effluent generation from the process. The RO treated water is directly used in their process , RO rejects is disposed to CETP
15	Sun Clad Coaters, Plot No.18/A, 2nd Phase KSSIDC Indl. Area, Jigani, Anekal Taluk, Bangalore.	SR	05.02.2020	Revocation order issued under Water and Air Act on 22.04.2020	Revoked	30.06.2022	30.06.2022	Septic tank and soak pit	Industry has replaced the old scrubber and blower with the new ones provided dust collector to the boiler with port hole and plart form. Provided hazardous waste storage area storage of hazardous waste. Waste water generated from the process is handed over to CETP after primary treatment and disposal.
16	Aron Universal Private Limited, Survey No: 25/1, Jigani Industrial Area, 2nd Phase, Anekal Taluk, Bengaluru Urban District - 560105	LR	05.02.2020	Revocation order issued under Water and Air Act on 14.07.2020	Revoked	30.06.2022	30.06.2022	CETP	Industry has installed 15 KLD STP and the analysis report are herewith enclosed.
17	Arihant Metals & Extruded Private Limited, Plot No. 9-L, Yarandahalli, Bommasandra Industrial Area, I Phase, Anekal Taluk, Bengaluru Urban District - 562 158	MR	06.02.2020	Revocation order issued under Water and Air Act on 02.03.2020	Revoked	30.06.2026	30.06.2026	Septic tank and soak pit	Trade effluent generated from the pickling section are handed over to CETP after primary treatment.
18	Saify industries (plant-3),(formerly Automax) ; Plot No.75, Jigani Indl Area, Jigani, Anekal Taluk, Bengaluru Urban District - 560 099	MR	05.02.2020	Hon'ble High Court order industry was operating (W.A No. 3532/2020 dtd: 02.03.2020) & applied for revocation of closure order	Revoked	30.06.2022	30.06.2022	Septic tank and soak pit	The trade effluent generated from the process is treated in ETP of 50 KLD followed with 2 stage RO . The treated effluent and the RO permeate is completely recyled back to the process only RO rejects is uploaded to CETP.
19	Omax Autos Limited, Plot No. 6, KIADB Industrial Area, Bommasandra - Jigani Link Road Industrial Area, 4th Phase, Anekal Taluk, Bangalore Urban District- 560 099	LR	05.02.2020	Revocation order issued under Water Act on 02.02.2020	Revoked	30.06.2021	30.06.2021	ETP & STP	Presently the industry is closed on its own from 15.03.2021.

20	Progressive Poly Pack Industries, Plot No. 90, Road No. 3, Bommasandra Industrial Area, 4th Phase, Anekal Taluk, Bangalore Urban District- 560 099	SG	22.06.2020	CFO issued from this office vide No. AW-110206 dtd: 14.06.2019 valid up to 31.12.2025 under Water and Air Act.	Revoked	31.12.2025	31.12.2025	Septic tank and soak pit	Closure order was issued under Water Act for the industry for operating without valid consent of the Board. Industry applied for Consent & Consent was issued up to 31.12.2025. Industry is not significant from water pollution point of view.

Note :- The Closure orders issued by the Board was not w.r.t installation of STP's or waste water discharge due to non opeation of STP from the industry.

Environmental Officer

15/12/2021

ACTION TAKEN REPORT ON SHORT TERM & LONG TERM ACTION PLAN IN THE JOINT COMMITTEE REPORT IN THE MATTER OF O.A NO. 111 OF 2020 BY TAMILNADU POLLUTION CONTROL BOARD (AS ON 15-12-2021)

- **Status of Compliance and Action Taken Report on the Action Plan**
  [Action Points [III (1), V (2), V (3), VI (1), VI (2), VII (1)]

Submitted by
DISTRICT ENVIRONMENTAL ENGINEER
TAMILNADU POLLUTION CONTROL BOARD
HOSUR, KRISHNAGIRI DISTRICT

Action Points	Agency Responsible (Timeline)	Progress made as on 15th December, 2021	Proposed Action Plan with target date (if any)	Remarks
III. Random Verification of grossly polluting (water polluting) industries located in the River Basin and Assessment of wastewater management and discharge mode.				
1. Among the industries those that are Red/Orange category (small, medium and large) with treated effluent discharge option as surface water/sewer drain/others (which includes industries having ZLD) in River basin of Thenpennai be monitored for effluent characteristics by concerned SPCBs, so as to ascertain the quality of treated effluent discharge as per the Consent Conditions of SPCBs. The details of the compliance status and action taken report be placed in public domain (TNPCB and KSPCB website).	TNPCB (Six months)	There is no discharge of industrial effluent into river Thenpennai in the area under investigation ie., from Chokkarasanapalli Village to Kelavarapalli Dam stretch. 1) **M/s. Premier WVG & SPG Mills Pvt Ltd.**, Belathur Village, Bagalur / (Red-Large) located nearby the river stretch. It is an textile dyeing and weaving unit having ZLD system and there is no discharge of sewage/trade effluent into outside the unit premises. The details of STP and ZLD based ETP system installed for the treatment of sewage and trade effluent is enclosed vide **Annexure-I.** The report of Analysis (ROA) of treated sewage and treated trade effluent (RO Permeate) collected	The industries located in the area covered under the investigation in Thenpennaiar River Basin are closely monitored by the TNPC Board to ensure zero liquid discharge.	The unit is located at a distance of 900 meter from River Thenpennai. Renewal Consent with validity upto 31.03.2022.

Action Points	Agency Responsible (Timeline)	Progress made as on 15th December, 2021	Proposed Action Plan with target date (if any)	Remarks
		from the unit for the past one year (Jan 2020 to November 2021) is enclosed vide **Annexure-II.** From the ROA, it reveals that the quality of treated sewage and treated trade effluent are satisfying the standards prescribed by the TNPC Board. The report of analysis (ROA) of AAQ/SM survey conducted in the vicinity of the unit during the period 23.09.2021 is enclosed vide **Annexure-III.** From the ROA, it reveals that the pollutant parameters are well within the standards prescribed by the TNPC Board.		
V. Environmental Compensation be imposed by SPCBs after evaluating performance of STPs and identification of defaulters upon Random Verification				
2. EC be calculated and imposed based on Random Verification of Grossly Polluting Industries.	TNPCB (Six months)	No violating/defaulting industries are identified.	-	-
3. Calculation of EC by the three member Committee comprising of CPCB, TNPCB and KSPCB, after submission of Reports by the concerned authorities (BWSSB, KSPCB,	CPCB (Six months on receipt of the Study Report and recommendations/criteria for imposing EC from KSPCB and TNPCB)			

Action Points	Agency Responsible (Timeline)	Progress made as on 15th December, 2021	Proposed Action Plan with target date (if any)	Remarks
TNPCB).				
VI. Sewage and Solid Waste Management in the villages (13) adjoining River Thenpennai up till Kelavarapalli				
1. Feasibility study for providing Sewage Treatment options (such as oxidations ponds/ diversion channels or wetlands etc.) by TNPCB followed by implementation by Local authority of the district.	Feasibility study by TNPCB in consultation with local authority for implementation (Six months)	Construction of diversion channel with wet land system at a cost of Rs. 25 Lakh has been provided at Bagalur village for the treatment of sewage generated from part of the Bagalur village by the local body of Hosur Panchayat Union and work has been completed and commissioned.	For the remaining four stretches, construction of wetland system will be executed after approval of District Collector, Krishnagiri under grey water management scheme and the works will be completed before 31.03.2022 as reported by the BDO, Hosur.	Bagalur village. Additional time requested by the local body due to COVID Pandemic situation.
		Construction of diversion channel with wet land system at a cost of Rs. 24 Lakh has been provided at Belathur village for the treatment of sewage generated from part of the Belathur village by the local body of Hosur Panchayat Union and work has been completed and commissioned.	For the remaining stretches, construction of wetland system will be executed after approval of District Collector, Krishnagiri under grey water management scheme and the works will be completed before 31.03.2022 as reported by the BDO, Hosur.	Belathur village Additional time requested by the local body due to COVID Pandemic situation

Action Points	Agency Responsible (Timeline)	Progress made as on 15th December, 2021	Proposed Action Plan with target date (if any)	Remarks
			Construction of diversion channel with wet land system for the treatment of sewage generated from the Sokkarasanapalli village will be carried by the Hosur Panchayat Union after obtaining necessary approval of District Collector, Krishnagiri under grey water management scheme and the works will be completed within 3 months as reported by the BDO, Hosur.	Sokkarasanapalli village. Additional time requested by the local body due to COVID Pandemic situation.
		The sewage generated from part of the 70 houses is being treated through the septic tank followed by the soak pit.	Construction of diversion channel with wet land system for the treatment of part of sewage generated from the Chennasandiram village will be carried by the Hosur Panchayat Union after obtaining necessary approval of District Collector, Krishnagiri under grey water management scheme and the works will be completed within 3 months as reported by the BDO, Hosur.	Chennasandiram Additional time requested by the local body due to COVID Pandemic situation.
		The sewage generated from part of 125 houses is being treated through the septic tank followed by the soak pit.	Construction of diversion channel with wet land system for the treatment of part of sewage generated from the Kanimangalam village will be carried by the Hosur Panchayat Union after obtaining necessary approval of District Collector, Krishnagiri	Kanimangalam Additional time requested by the local body due to COVID Pandemic situation.

Action Points	Agency Responsible (Timeline)	Progress made as on 15th December, 2021	Proposed Action Plan with target date (if any)	Remarks
			under grey water management scheme and the works will be completed within 3 months as reported by the BDO, Hosur.	
		The sewage generated from 40 houses is being treated through the septic tank followed by the soak pit and there is no discharge of sewage into River Thenpennai.		Guliganapalli (Kodiyalam) village.
		The sewage generated from Thummanapalli village Panchayat [280 houses in Sathyamangalam and 98 houses in Muneeswar Nagar] is being treated through the septic tank followed by the soak pit and there is no discharge of sewage into River Thenpennai.		Sathiyamangalam, Muneeswar Nagar
		The sewage generated from 190 houses is being treated through the septic tank followed by the soak pit and there is no discharge of sewage into River Thenpennai.		Lingapuram
		The sewage generated from 220 houses is being treated through the septic tank followed by the soak pit and there is no discharge of sewage into River Thenpennai.		Baduthepalli

Action Points	Agency Responsible (Timeline)	Progress made as on 15th December, 2021	Proposed Action Plan with target date (if any)	Remarks
		The sewage generated from 25 houses is being treated through the septic tank followed by the soak pit and there is no discharge of sewage into River Thenpennai.		Kempasandiram
		The sewage generated from 121 houses is being treated through the septic tank followed by the soak pit and there is no discharge of sewage into River Thenpennai.		Singasadanapalli
2. Solid Waste Management Plan be devised and executed by concerned Block Development Officer, Hosur Taluk to ensure the solid wastes are not disposed on the riverside and managed as per Solid Waste Management Rules, 2016.	Concerned Block Development Officer to submit to TNPCB (six months)	The local body of Hosur Panchayat Union has removed the solid waste dumped in the banks of River Thenpennai.		Bagalur

Action Points	Agency Responsible (Timeline)	Progress made as on 15th December, 2021	Proposed Action Plan with target date (if any)	Remarks
		The average collection of solid waste in the Bagalur Panchayat is about 2.0 MT. The Municipal Solid Waste is being collected through door to door collection by engaging 19 Thooimai Kavalars and deploying with five tri-cylces and three electronic bikes. The local body of Hosur Panchayat Union has constructed the Micro Compost Centre (MCC) with a maximum capacity to process 3.0 MT of segregated biodegradable municipal solid wastes at a cost of Rs. 20 Lakh and commissioned.	Under Central Government scheme of National Rurban Mission project a Plastic shredding unit is proposed at a cost of Rs. 20 Lakhs to handle the plastic wastes and the shredded plastics will be used for road laying works. The work will be completed before 31.01.2022 as reported by the BDO, Hosur.	Additional time requested by the local body due to COVID Pandemic situation.
		The average collection of solid waste in the Belathur Panchayat is about 2.0 MT. The Municipal Solid Waste is being collected through door to door collection by		Belathur

Action Points	Agency Responsible (Timeline)	Progress made as on 15th December, 2021	Proposed Action Plan with target date (if any)	Remarks
		engaging 19 Thooimai Kavalars and deploying with five tri-cylces and three electronic bikes. The local body of Hosur Panchayat Union has constructed the Micro Compost Centre (MCC) with a maximum capacity to process 3.0 MT of segregated biodegradable municipal solid wastes at a cost of Rs. 24 Lakh and commissioned.		
		The solid wastes generated from the Sokkarasanapalli village are being collected and brought to the segregation shed and segregated as bio-degradable and non-biodegradable wastes.		Sokkarasanapalli village.
		The non-biodegradable wastes are burnt through the Solid waste Disposal Incinerator established at Estimate Cost of Rs.18.00 Lakhs by CSR fund of M/s. Excide factory. (Photographs enclosed).		

Action Points	Agency Responsible (Timeline)	Progress made as on 15th December, 2021	Proposed Action Plan with target date (if any)	Remarks
		The solid wastes generated from the households are being collected through Thooimai Kavalars and brought to the segregation shed and segregated as bio-degradable and non-biodegradable wastes for further treatment and dispose. (Photographs enclosed).		Guliganapalli, Sathiyamangalam, Muneeswar Nagar, Lingapuram, Baduthepalli, Kempasandiram, Chennasandiram, Singasadanapalli, Kanimangalam, Kallipuram and Oddapalli Thinna villages.
VII. Regular Water Quality Monitoring at important locations				
1. The trend of water quality and its improvement at major confluence points may be monitored for the year 2021-22 on a monthly basis and a report be submitted to CPCB to ensure the quality of water flowing in River Thenpennai.	TNPCB &KSPCB (to monitor on yearly basis)	The water quality of River Thenpennai is being monitored on monthly basis at interstate border i.e at Chokkarasanapalli Village and the report of analysis for the period from September 2017 to November 2021 is enclosed vide **Annexure-IV.**		Refer **Annexure-IV** – ROA of Thenpennai River. at Chokkarasanapalli Village from September 2017 to November 2021.

30/12/2021

District Environmental Engineer,
Tamilnadu Pollution Control Board,
Hosur.

SITE PHOTOGRAPHS:

Diversion channel with wet land system for the treatment of sewage Bagalur Village (During Construction stage)

Diversion channel with wet land system for the treatment of sewage Belathur Village (During Construction stage)

Diversion channel with wet land system for the treatment of sewage Bagalur Village (After Commissioning)

MCC work under progress in Bagalur (During Construction stage)

MCC in Bagalur (After Completion)

MCC work under progress in Belathur

MCC in Belathur (After Completion)

MCC in Belathur (After Completion)

Solid wastes dumped in the river bed area have completely been removed by the local bodies.

Solid waste Disposal Incinerator at Sevaganapalli Panchayat

Solid wastes dumped in the river bed area have completely been removed by the local bodies.

SOLID WASTE MANAGEMENT ACTIVITIES:

Solid Waste Management – Belathur village

Solid Waste Management – Baduthepalli village

Solid Waste Management – Guliganapalli village

Solid Waste Management – Sathiyamangalam village

Solid Waste Management – Lingapuram village

Solid Waste Management – Kembasandiram village

Annexure - I

M/S. PREMIER SPG & WVG MILLS PVT LTD, SF.NO. 54/1, 56/1,56/4, 57/1, 66/3, 57/13, 66/1, 55/2, 56/5, 56/2, 55/2, 55/4, 55/1, 54/2, 55/3,etc.,BELATHUR VILLAGE, HOSUR TALUK, KRISHNAGIRI DISTRICT

SEPTIC TANK AND SP/DT - STP COMPONENTS:

SL. No.	Name of the Treatment Unit	No. of Units	Dimensions in metres
1	Septic tank - I	1	8.5x3.5x2.4
2	Septic tank - II	1	4.5x2.5x2.4

ETP COMPONENTS:

SL. No.	Name of the Treatment Unit	No. of Units	Dimensions in metres
1	Bar Screen	1	1.75x4.2
2	Equalization tank No.1	1	14.x13x4 - 743KL
3	Equalization No.2	1	6.5x15x4 - 390KL
4	Equalization No.3	1	6.2x15x4 - 370KL
5	Distribution Tank	1	5x4.5x6 - 135KL
6	Biological Tank	1	17x28.5x6 - 2970KL
7	Denitrification Tank	1	2.7x2x6 -32.4KL
8	Lamella Clarifier	1	6x4.5x6 - 162KL
9	Pre Treatment - 1	1	4x4x3.5 - 56KL
10	Pre Treatment -2	1	4x4x3.5 - 56KL
11	Clariflocculator	1	9.75Dx3.5H - 261KL
12	Traction Clarifier -1	1	12.2Dx3H-350KL
13	Traction Clarifier -2	1	12.2DX3h -350KL
14	Sludge Thickner	1	4.5Dx2.8H - 56KL
15	Sludge Decanter (Dewatering system)	1	5KL/Hr

16	Activated Carbon Filter	2	1.8Dx1.6H
17	Quartz Filter	1	2Dx3.4H
18	Ultra Filtration	1	1200KLD
19	Muitible Effect Evaporator (5 Effect Falling Film)	1	250 KLD
20	Solar Evaporation Pan (540 Sq.M x18No's)	18	9720 Sq.mtr
21	Sludge Return Sump	1	60 KL
22	RO I – A	1	40 KL/Hr - 800KLD
23	RO I B (Standby)	1	60KL/Hr (1200 KLD)
24	RO II - A	1	40KL/Hr (800KLD)
25	RO III	1	25KL/Hr - (500 KLD)
26	Forced Circulation Evaporator (Two Effect)	1	1 KL/Hr - 20KLD
27	Salt Recovery System (Vertical Thin Film Dryer)	1	0.260 KL/Hr -5.2 KLD
28	RO II -B (Stand by)	1	40KL/Hr(800KLD)
29	Combined RO permeate RCC Tank	2	6.2 x 5.5 x 7.4 M
30	RO III stage reject collection RCC Tank	2	4.75 x 9.5 x 2.8 M
31	Pressure Sand Filter	2	1.8 D x 1.6 H (Mtrs)

30/12/2014
DISTRICT ENVIRONMENTAL ENGINEER
TAMILNADU POLLUTION CONTROL BOARD
HOSUR
30.12.2014

ANNEXURE-III

TAMIL NADU POLLUTION CONTROL BOARD

District Environmental Laboratory, Hosur .

AMBIENT AIR QUALITY SURVEY – Report of Analysis

Report No.48 / AAQS/2021-2022 Date:07.10.2021

1. Name of the Industry : M/s. Premier Spg & Wvg Mills Pvt Ltd,
2. Address of the Industry : Belathur Village, Hosur Taluk, Krishnagiri Dt.
3. Date of Survey : 23.09.2021.
4. Duration of Survey : 8 Hours
5. Category :Red – Large
6. Land Use Classification :Textile Processing

Ambient Temperature (^{0} C)	Min	Max	Relative Humidity (%)	Min	Max
	28	30		55	71
Weather Condition	Clear sky		Rain Fall (mm)	NIL	
Predominant Wind Direction	NW- SE		Mean Wind Speed (km/hr)	---	

Ambient Air Quality Survey Results

Sl. No.	Location	Direction *	Distance (m) *	Height Form GL (m)	Pollutants Concentration (microgram / m^3)		
					PM 10	SO_2	NO_2
1	Top of the Scaffolding Near 'D' Gate	NE	150	2	56	14	16
2	Top of the Scaffolding Near Main Gate	E	270	2	58	16	18
3	Top of the Scaffolding Inside the Ladies Hostel	SE	170	2	60	20	22
4	Top of the Scaffolding near STP	SW	400	2	46	12	14
5	Top of the Scaffolding Near Evaporator	NW	300	2	44	11	12

Note: * With respect to major emission

Deputy Chief Scientific Officer,
District Environmental Laboratory
TNPCB / Hosur.

Test Performed	Test Method
PM10	IS 5182 : (Part 23) – 2006
SO2	Modified West – Graeke / IS 5182 : (Part 2) – 2001 RA: 2012
NOx	Jacobs – Hochheiser / IS 5182 : (Part 6) – 2006 RA:2012

TAMILNADU POLLUTION CONTROL BOARD

District Environmental Laboratory, Hosur

AMBIENT AIR QUALITY SURVEY

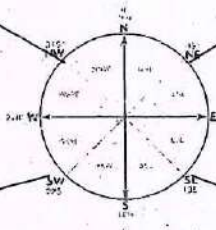
Schematic Diagram Showing Location of Sampling

Report No.48 / AAQS/2021-2022 Date:07.10.2021

1. Name of the Industry : M/s. Premier Spg & Wvg Mills Pvt Ltd,
2. Address of the Industry : Belathur Village, Hosur Taluk, Krishnagiri Dt.
3. Date of Survey : 23.09.2021.

Station : V (NW)	
PM_{10}	: 44
SO_2	: 11
NO_2	: 12

Station : I(NE)	
PM_{10}	: 56
SO_2	: 14
NO_x	: 16



Station : II(E)	
PM_{10}	: 58
SO_2	: 16
NO_x	: 18

Station : IV (SW)	
PM_{10}	: 46
SO_2	: 12
NO_x	: 14

Station : III(SE)	
PM_{10}	: 60
SO_2	: 20
NO_2	: 22

Note: All the values are expressed in and restricted to sampling period of 8 hours.

Meteorological Conditions:	
Predominant Wind Direction	NW - SE
Wind Speed	----
Weather Condition	Clear Sky
Rainfall	Nil

11/10/21

Deputy Chief Scientific Officer,
District Environmental Laboratory
TNPCB / Hosur.

TAMIL NADU POLLUTION CONTROL BOARD

District Environmental Laboratory, Hosur

STACK MONITORING SURVEY – Report of Analysis

Report No.48 / AAQS/2021-2022 Date:07.10.2021

1. Name of the Industry : M/s. Premier Spg & Wvg Mills Pvt Ltd,
2. Address of the Industry : Belathur Village, Hosur Taluk, Krishnagiri Dt.
3. Date of Survey : 23.09.2021.
4. Type of Industry : Textile Processing

Stack Monitoring Survey Results

Sl. No.	Stack attached to	Stack .Temp ^0C	Velocity in (m/ sec)	Discharge rate In Nm^3/ Hr	Pollutants (mg / Nm^3)		
					PM	SO_2	NO_X
1	Multifuel Boiler 10T/Hr	112	6.9222	13677	41	26	12

Test Performed	Test Method
PM	IS 11255: (Part 1) – 1985
SO2	IS 11255: (Part 2) – 1985
NOx	IS 11255: (Part 7) – 2005

A. Balasubramanian 11/10/21

Deputy Chief Scientific Officer,
District Environmental Laboratory
TNPCB / Hosur.

Annexure - II

CONSOLIDATED ROA OF TREATED SEWGAE AND EFFLUENT SAMPLES COLLECTED FROM THE UNIT OF M/S. PREMIER SPG & WVG MILLS PVT LTD, SF.NO. 54/1,56/1,56/4,57/1,66/3,57/13,66/1,55/2,56/5,56/2.55/2,55/4,55/1,54/2,55/3,etc., BELATHUR VILLAGE, HOSUR TALUK, KRISHNAGIRI DISTRICT

a) TREATED SEWAGE

S.No.	Parameter	Jan 20	Feb 20	Mar 20	May 20	June 20	July 20	Aug 20	Sep 20	Oct 20	Nov 20	Dec 20	Jan 21	Feb 21	Mar 21
1	pH	7.62	8.12	7.62	7.47	6.48	6.75	7.41	7.70	6.59	6.82	6.73	8.04	6.04	7.02
2	TSS	42	4.0	4.0	4.0	6.0	4.0	4.0	6.0	18	20	2.0	10	4.0	6.0
3	BOD	12	1.0	1.0	2.0	1.0	2.0	2.0	5.0	12	5.3	5.0	6.0	3.0	3.0

b) R.O PERMEATE

S.No.	Parameter	Jan 20	Feb 20	Mar 20	May 20	Jun 20	Jul 20	Aug 20	Sep 20	Oct 20	Nov 20	Dec 20	Jan 21	Feb 21	Mar 21
1	pH	6.24	8.01	7.96	7.98	6.61	6.26	7.33	6.69	6.72	7.21	7.21	7.26	6.52	7.11
2	TSS	6.0	12	24	4.0	4.0	4.0	2.0	2.0	4.0	4.0	4.0	26	6.0	4.0
3	TDS	974	854	1070	1752	1016	222	826	194	664	106	1990	1942	1204	136
4	Chloride	240	130	300	385	210	85	165	75	135	65	400	445	222	25.0
5	Sulphate	166	107	292	369	57	33	127	24	77	14	35	124	440	24.0
6	Oil and Grease	1.0*	1.0*	6.0	1.0*	1.0*	1.0*	1.0	1.0*	1.0*	1.0*	1.0*	1.0*	1.0*	1.0*
7	BOD	8.0	3.0	12	8.0	1.0	1.0	1.0	2.0	11	2.73	5.0	12	2.0	2.0
8	COD	72	40	64	40	8.0	8.0	40	8.0	32	64	32	**112**	**24**	**64.0**
9	Lead	-	-	0.001*	0.001*	0.001*	-	-	-	-	-	-	-	-	-
10	Cadmium	-	-	0.001*	0.001*	0.001*	-	-	-	-	-	-	-	-	-
11	Total Kjeldhal Nitrogen	-	-	3.8	3.62	1.0*	-	-	-	-	-	-	-	-	-
12	Total Residential Chlorine	-	-	0.002*	0.1*	0.01*	-	-	-	-	-	-	-	-	-
13	Phenolic Compounds	-	-	0.005*	0.005*	0.01*	-	-	-	-	0.5*	0.5*	0.5*	0.5*	0.5*
14	Sulphide	-	-	2.0*	1.0*	0.01*	-	-	-	-	2.0*	2.0*	2.0*	2.0*	2.0*
15	Percent Sodium	-	-	49	46	2.0	-	-	-	-	-	-	-	-	-
16	Total Chromium	-	-	-	-	0.001*	-	-	-	-	0.01*	0.03*	0.03*	0.03*	0.03*
17	Ammonical Nitrogen	-	-	-	-	-	-	-	-	-	1.68	3.92	5.04*	3.92	5.04

30/12/2021
DISTRICT ENVIRONMENTAL ENGINEER
TAMILNADU POLLUTION CONTROL BOARD
30.12.2021 HOSUR

c) PRINTING EFFLUENT CLARIFIER

S.No.	Parameter	Dec 20
1	pH	7.01
2	TSS	572
3	TDS	1664
4	Chloride	550
5	Sulphate	522
6	Oil and Grease	4.0
7	BOD	135
8	COD	144
9	Total Chromium	0.01*
10	Ammonical Nitrogen	6.72
11	Sulphide	2.0*
12	Phenolic Compounds	0.5*

30/12/2024
DISTRICT ENVIRONMENTAL ENGINEER
TAMILNADU POLLUTION CONTROL BOARD
HOSUR
30.12.2024

CONSOLIDATED ROA OF TREATED SEWGAE AND EFFLUENT SAMPLES COLLECTED FROM THE UNIT OF M/S. PREMIER SPG & WVG MILLS PVT LTD, SF.NO. 54/1,56/1,56/4,57/1,66/3,57/13,66/1,55/2,56/5,56/2.55/2,55/4,55/1,54/2,55/3,etc., BELATHUR VILLAGE, HOSUR TALUK, KRISHNAGIRI DISTRICT

a) TREATED SEWAGE

S.No.	Parameter	Apr 21	July 21	Aug 21	Sep 21	Oct 21	Nov 21
1	pH	6.65	6.58	6.57	6.01	5.06	5.92
2	TSS	10	10.0	6.0	4.0	6.0	4.0
3	BOD	7.0	5.0	10.0	7.0	4.0	2.0

b) R.O PERMEATE

S.No.	Parameter	Apr 21	July 21	Aug 21	Sep 21	Oct 21	Nov 21
1	pH	6.15	5.71	6.29	5.94	6.24	6.20
2	TSS	4.0	6.0	4.0	6.0	4.0	4.0
3	TDS	260	2540	276	294	1278	1226
4	Chloride	75.0	500	150	170	385	600
5	Sulphate	19.0	735	22	14	230	270
6	Oil and Grease	1.0*	1.0*	1.0*	1.0*	1.0*	1.0*
7	BOD	2.0	22.0	11.0	15.0	7.0	2.0
8	COD	16.0	184	40	48	136	24
9	Lead	-	-	-	-	-	-
10	Cadmium	-	-	-	-	-	-
11	Total Kjeldhal Nitrogen	-	-	-	-	-	-
12	Total Residential Chlorine	-	-	-	-	-	-
13	Phenolic Compounds	0.5*	0.5*	0.5*	0.5*	0.5*	0.5*
14	Sulphide	2.0*	2.0*	2.0*	2.0*	2.0*	2.0*
15	Percent Sodium	-	-	-	-	-	-
16	Total Chromium	0.03*	0.03*	0.03*	0.03*	0.03*	0.03*
17	Ammonical Nitrogen	6.72	10.09	7.84	10.68	6.72	6.72

30/12/24
DISTRICT ENVIRONMENTAL ENGINEER
TAMILNADU POLLUTION CONTROL BOARD
30.12.2024 HOSUR

TAMIL NADU POLLUTION CONTROL BOARD

From	To
Dr. M. Senthilkumar., M.E., Ph.D., District Environmental Engineer, Tamil Nadu Pollution Control Board, No.149-A, Ist floor, Dharga, SIPCOT-I, HOSUR– 635 126, Krishnagiri District.	The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Chennai-32.

Lr. No. F.46/Tech/DEE/TNPCB/HSR/NGT/2021 Dated: 30.12.2021.

Sir,

Sub:	TNPC Board – O/o.DEE, Hosur - Hon'ble NGT (SZ) Chennai, Order dated 28.06.2021 in O.A.No 111/2020 – Periodical Progress Report – Submitted – Reg.
Ref: 1.	The Orders of Hon'ble National Green Tribunal, (SZ) Chennai, dated 28.06.2021 in O.A.No 111/2020.
2.	Email received from the Board (Law section) dated 29.12.2021

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In the matter of O.A 111 of 2020, a SuoMotu case registered by the Hon'ble Tribunal, SZ, Chennai on the basis of the newspaper report published in Dinamalar, Chennai City supplement Edition dated 13.07.2020 under the caption "Frothing of Chemical Foam in the River Thenpennai", the issues alleged are large scale foam in Thenpennai River due to untreated chemical effluents discharged from Kelavarapalli Reservoir and residential sewage is also mixed with the water affecting water quality.

The Hon'ble National Green Tribunal (SZ), Chennai vide order dated 28.06.2021 disposed of the case giving certain directions as below:

"(i) *The Joint Committee report dated 20.11.2020 and further report of November, 2020 and subsequent progress report of the Joint Committee dated 02.06.2021 which are extracted above are recorded and accepted.*

(ii) The concerned Departments mentioned in the Joint Committee report are directed to implement the directions issued by the Joint Committee, so as to resolve the issue permanently within a time frame provided by them.

(iii) Chairman, Karnataka Pollution Control Board and Chairman, Tamil Nadu Pollution Control Board are directed to monitor the implementation of the recommendations made by the Joint Committee by the respective Departments and also assess the improvement of the water quality in their respective areas and if any, further action is to

be taken, they are directed to take further action against those who are not complying with the directions issued by the Joint Committee, which results in further pollution to the Thenpennai River and also the connecting rivers which reaches the Kelavarapalli reservoir from where the water is released to Thenpennai River from State of Karnataka.

(iv) The Central Pollution Control Board, Regional Office, Bangalore as well as Regional Office Chennai are also directed to monitor the implementation of the recommendations made by the Joint Committee and if there is any violation or non-implementation of the directions, then they are also directed to issue necessary direction to the defaulting Department to comply with the same and on their failure, take appropriate action against them in accordance with law.

(v) The Chief Secretary, State of Karnataka is directed to review the action taken by the respective department and if there is any gap found, then issue necessary direction to the concerned departments for implementing the directions within their State and if any support is required from the Government level then provide both technical as well as financial support in this regard.

(vi) The Chief Secretary, State of Tamil Nadu is also directed to monitor the directions issued by the Joint Committee as far as State of Tamil Nadu is concerned and also the timeline provided by the Tamil Nadu Pollution Control Board in implementation of the Solid Waste Management Rules, 2016 in these areas which also causes some sort of pollution to water quality in Thenpennai River.

(vii) The Chief Secretary, State of Karnataka, Chief Secretary, State of Tamil Nadu, Central Pollution Control Board, Regional Office, Bangalore and Chennai and ***respective Chairman of the Pollution Control Boards are directed to file periodical progress report to this Tribunal, once in three months along with the water quality analysis so as ascertain the improvement caused on account of the implementation of the recommendations made by the respective departments and if they found any gap in spite of the implementation of the recommendations, they are also directed to submit their further remedial measures to be taken by the respective department to resolve the issue permanently when they are filing their progress report, once in three months."***

In view of the above, I submit herewith the periodical progress report ending 15.12.2021 in the CPCB prescribed format (**Enclosed vide Annexure**) so as to filed before The Hon'ble National Green Tribunal (SZ), Chennai.

Further, it is submitted and recommended that necessary directions may be issued to the Block Development Officer, Hosur Panchayat Union, Hosur, Krishnagiri District under Section 5 of Environment (Protection) Act, 1986 on the following lines:

1) The Hosur Panchayat Union shall comply with the provisions of Solid Waste Management Rules, 2016 and shall comply with the orders passed by the Hon'ble NGT, in O.A. No. 606 of 2018 and Hon'ble NGT (SZ) in O.A. No. 111 of 2020 from time to time.

2) The Hosur Panchayat Union shall ensure 100% collection of solid waste being generated within its jurisdiction with proper segregation, door to door collection, processing and disposal by complying with the provisions of the Solid Waste Management Rules, 2016.

3) The Hosur Panchayat Union shall operate and maintain the Micro Compost Centre (MCC) installed at Belathur and Bagalur village efficiently and continuously so as to ensure the processing and disposal of solid waste by complying with the provisions of the Solid Waste Management Rules, 2016.

4) The Hosur Panchayat Union shall ensure that there is no dumping of Municipal Solid Waste along the banks of River Thenpennaiar.

5) The Hosur Panchayat Union shall expedite the installation of plastic shredding machine at Bagalur village on or before 31.01.2022 and the shredded plastics will be utilized for road laying works as reported.

6) The Hosur Panchayat Union shall expedite the construction of diversion channel with wetland system for the remaining four stretches at Bagalur village on or before 31.03.2022 for the treatment of sewage generated in Balgalur village as reported.

7) The Hosur Panchayat Union shall expedite the construction of diversion channel with wetland system for the remaining stretches at Belathur village on or before 31.03.2022 for the treatment of sewage generated in Belathur village as reported.

8) The Hosur Panchayat Union shall expedite the construction of diversion channel with wetland system for the Sokkarasanapalli, Chennasandiram and Kanimangalam Villages on or before 31.03.2022 for the treatment of sewage generated in the said villages as reported.

It is also submitted and recommended that necessary directions may be issued to the Executive Engineer, PWD, WRO, Upper Pennaiyar Basin Division, Dharmapuri- 5 under Section 5 of Environment (Protection) Act, 1986 on the following lines:

1) The Executive Engineer, PWD, WRO, Upper Pennaiyar Basin Division, Dharmapuri (Custodian of River Thenpennai) shall ensure that no solid wastes are permitted to dump on either side of river bank and no domestic sewage are allowed to let into the river stretches located in Krishnagiri District so as to maintain pristine of River Thenpenaiar water quality along the stretches in Krishnagiri District.

This is submitted for favour of kind information and further action please.

30/12/2024

District Environmental Engineer,
Tamil Nadu Pollution Control Board,
Hosur.

30/12/2024

Enclosure: As above.