**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**

| | | |
|---|---|---|
| | networking by BWSSB | |
| 8. | Annexure VII: Copy of the letter dated 24.09.2021 issued to KSPCB | 171 - 172 |
| 9. | Annexure VIII: Report of analysis for the period from September 2017 to April 2021; Copy of Action Taken Report and Progress made by TNPCB | 173 - 177 |
| 10. | Annexure IX: Copy of Status Report by BDA | 178 - 181 |

S. Suresh 29/9/2021

**Place: Bengaluru** **DEPONENT**

**Date:** 29/9/2021

S. SURESH
REGIONAL DIRECTOR
CENTRAL POLLUTION CONTROL BOARD
REGIONAL DIRECTORATE (SOUTH)
MIN. OF ENV, FORESTS & CC, GOVT. OF INDIA
BENGALURU - 560 079. MOB : 9480672128

# JOINT PROGRESS REPORT (TRIMONTHLY)–

## "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)***

**September, 2021**

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

# CONTENTS

## LIST OF ANNEXURES

**Annexure I** - Copy of the Hon'ble NGT Order dated 28.06.2021

**Annexure II** – Copy of communications and letters dated 08.07.2021 and 13.09.2021 addressed to concerned Departments of Government of Karnataka; Copy of the letter seeking nomination from RD, Chennai dated 30.07.2021

**Annexure III** – Format for Compliance with respect to Hon'ble NGT Order dated 28.06.2021

**Annexure IV** – Department-wise action points and its Compliance Status with updated latest progress made

**Annexure V** – Work order issued to IISC by BWSSB

**Annexure VI** – Copy of the work orders awarded for sewerage networking by BWSSB

**Annexure VII** – Copy of the letter dated 24.09.2021 issued to KSPCB

**Annexure VIII** – Report of analysis for the period from September 2017 to April 2021; Copy of Action Taken Report and Progress made by TNPCB

**Annexure IX** - Copy of Status Report by BDA.

# 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 notified under the Environment (Protection) Rules, 1986. 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.

In the matter, 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.*"

*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.*

*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.*

Copy of the Hon'ble NGT Order dated 28.06.2021 is appended as ***Annexure I***.



6

# CHAPTER II

## MEETINGS AND DISCUSSIONS

In compliance with the NGT Order dated 28.06.2021, CPCB, Regional Directorate, Bengaluru sent various communications dated 08.07.2021 and 13.09.2021 to the concerned departments in Government of Karnataka and 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 communications and letters addressed to concerned Departments of Government of Karnataka is appended as **Annexure II**.

With regard to action points related to Tamil Nadu Pollution Control Board, nomination was sought from CPCB, Regional Directorate, Chennai vide letter dated 30.07.2021 in compliance with the Hon'ble NGT Order dated 28.06.2021. Copy of the letter dated 30.07.2021 is appended as ***Annexure II***.

Thereafter, CPCB, Regional Directorate, Bengaluru conducted two meetings on 12th August, 2021 and 06th September, 2021 through video conferencing with the members of the joint committee and concerned departments. In the said meeting, it was informed that a format (appended as ***Annexure III***) along with Hon'ble NGT order dated 28.06.2021 have been circulated among the members of the committee and concerned agencies/authorities/departments vide aforesaid communications. They were requested to provide individual Action Taken Report on the Action Plan of the Joint Committee Report and compliance thereof.

In the meeting, CPCB briefed the directions of NGT Order dated 28.06.2021 and emphasized that "*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."*

*"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 above, the concerned departments were asked to provide signed copy of individual progress reports to CPCB (nodal agency) for filing the trimonthly Progress Report before Hon'ble Tribunal in the matter.

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

(i) 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 to comply with Hon'ble NGT Order dated 28.06.2021.

(ii) KSPCB and TNPCB to provide water quality analysis reports of the Interstate monitoring locations (i.e. Mugalur bridge and Sokkarasanapalli) for last three months for finding any improvement in the quality of water in River Thenpennai (in compliance to directions of Hon'ble NGT Order dated 28.06.2021_.

(iii) BWSSB, KSPCB and Lakes Department (BBMP) were also requested to provide information related to flow measurement and water quality of major tanks/lakes associated with River Thenpennai.

*(iv)* 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 ….”*

The Joint Report of CPCB, Regional Directorates (Bengaluru and Chennai) in the matter of O.A No 111 of 2020 is prepared based on the inputs and progress made by the concerned departments in Government of Karnataka and Tamilnadu.

# CHAPTER III

## STATUS OF COMPLIANCE AND PROGRESS MADE

The joint committee devised Action Plan in the 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 department-wise action points and its status of compliance with updated latest progress report is appended as **Annexure IV.**

The Compliance status of the recommendations made in the Progress Report, June 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.**

CPCB, RD, Bengaluru was informed that 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.

Therefore, CPCB, RD Bengaluru interacted with concerned departments viz., Bangalore Water Supply and Sewerage Board (BWSSB), Lakes Department under BBMP, Bruhat Mahanagara Palike (BBMP), Minor Irrigation and Ground Water Development (MI) and Karnataka State Pollution Control Board (KSPCB) in the meetings conducted on 12th August, 2021 and 06th September, 2021 through video conferencing, and discussed the role of each of departments in measurement of flow of major tanks, storm water drains and major confluence points on River Thenpennai.

It was learned that the provisions of 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.

Minor Irrigation has updated the status that in Kolar 78 tanks are filled by pumping 6.69 TMC and in Chikkaballapur 24 tanks are filled by pumping 1.16 TMC, which is accounted as 7.85 TMC in 102 tanks.

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 delineated to the departments by Chief Secretary, Government of Karnataka.

**(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.**

Bangalore Water Supply and Sewerage Board (BWSSB) informed vide email dated 09.09.2021 that Report is yet to be submitted by the organisation and will be shared once completed. Work order issued to IISC is attached as **Annexure V**.

**(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) was to commence on 02.07.2021 and will complete on 01.01.2024. The Operation and Maintenance of the same will commence on 02.01.2021 and complete on 31.12.2030. Copy of the work orders awarded to the above firms are appended as **Annexure VI**.

**(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), Lakes Department under BBMP, Bruhat Mahanagara Palike (BBMP), Minor Irrigation and Ground Water Development (MI) and Karnataka State Pollution Control Board (KSPCB) in the meetings conducted on 12th August, 2021 and 06th September, 2021 through video conferencing and discussed the role of each of 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.

The provisions of 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.

Section 3 of the Karnataka Lake Conservation and Development Authority Act, 2014 stipulates Constitution of the Authority which is reproduced as "(*1) As soon as may be after the date of commencement of this Act, the Government shall constitute an Authority to be called the Karnataka Lake Conservation and Development Authority. (2) The Authority shall be a body corporate by the name aforesaid having perpetual succession and a common seal, with power, subject to the provisions of this Act to hold property and shall by the said name sue or be*

*sued. (3) The Governing Council of the Authority shall consist of the following members, namely:-*

| | |
|---|---|
| (a) The Chief Secretary to Government shall be the Chairperson of the Governing Council:- | |
| (b) The Additional Chief Secretary or Principal Secretary to Government, Forest, Ecology and Environment Department | Ex-officio Member |
| (c) Additional Chief Secretary or Principal Secretary to Government, Finance Department | Ex-officio Member |
| (d) Additional Chief Secretary or Principal Secretary to Government, Urban Development Department | Ex-officio Member |
| (e) The Principal Secretary or Secretary to Government, Minor Irrigation Department | Ex-officio Member |
| (f) The Principal Secretary or Secretary to Government, Animal Husbandry or Fisheries Department | Ex-officio Member |
| (g) The Principal Secretary to Government, Revenue Department | Ex-officio Member |
| (h) The Member Secretary, Karnataka State Pollution Control Board, Bengaluru | Ex-officio Member |
| (i) The Chairman, Bangalore Water Supply and Sewerage Board, Bengaluru | Ex-officio Member |
| (j) The Commissioner, Bangalore Development Authority, Bengaluru | Ex-officio Member |
| (k) The Commissioner, Bruhat Bangalore Mahanagara Palike, Bengaluru | Ex-officio Member |
| (l) The Secretary to Government Forest, Ecology and Environment Department (Ecology and | Ex-officio Member |

| | |
|---|---|
| Environment) | |
| (m) Three non-official members nominated by the Government from amongst experts in the in the field of environment and ecology or lake conservation of whom at least one shall be a woman and one shall be a person belonging to the Scheduled Castes or Scheduled Tribes | Non Official Member |
| (n) The Chief Executive Officer of the Authority | Member Secretary |

In this regard, the authority comprising of above members 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. **Figure 1** depicts the functions of various departments in Government of Karnataka for Conservation and Restoration of Lakes in Karnataka.

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 yet to be provided.

Flow and 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. The treated water (7.85 TMC) is being pumped to 78 and 24 tanks of Kolar and Chikkaballapur respectively through Minor Irrigation.

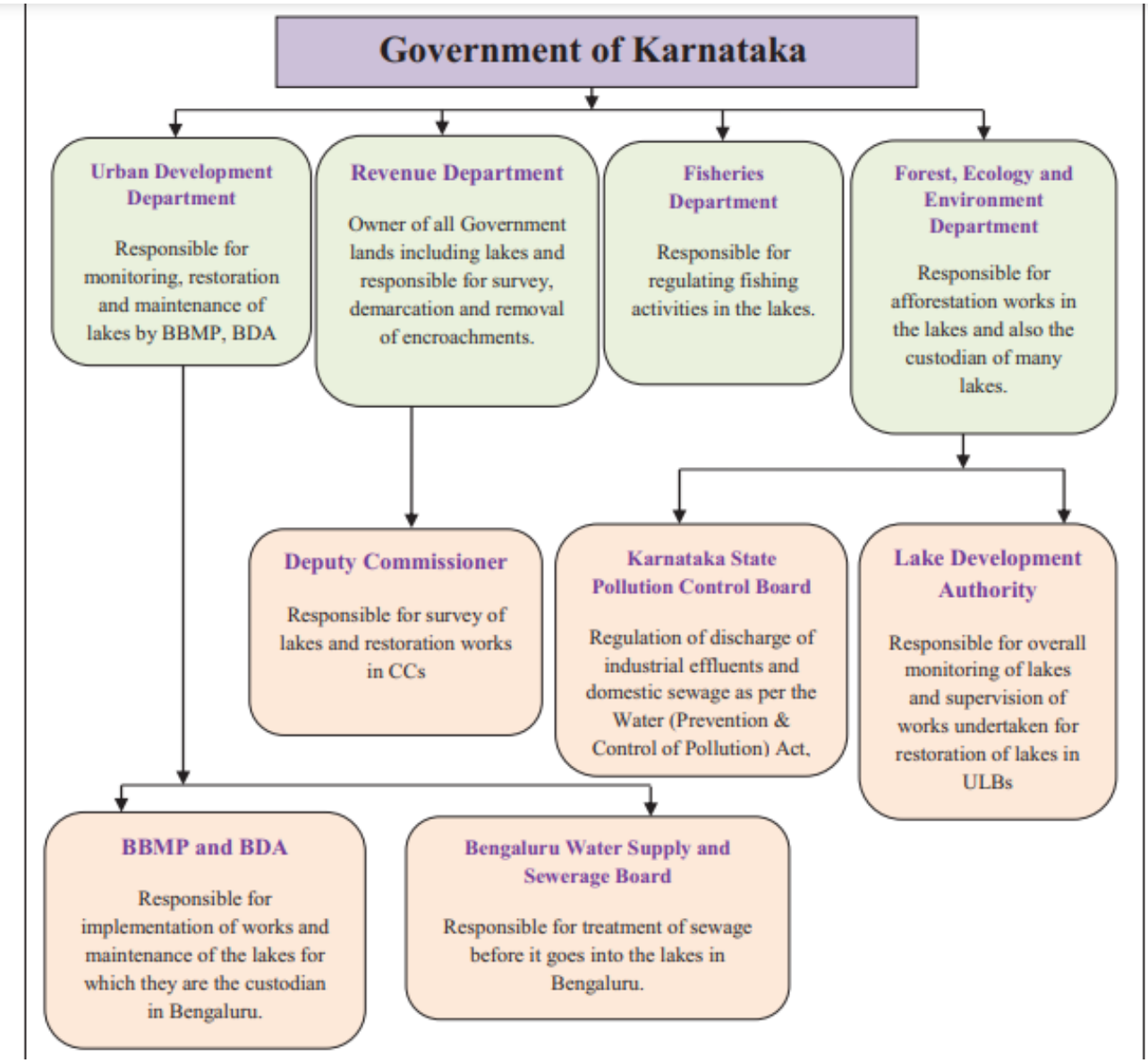


**Figure 1. Functions of Various Departments in Government of Karnataka for conservation and restoration of lakes in Urban Local Bodies (ULBs) including Bengaluru**

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.

In view of above, CPCB, RD, Bengaluru vide letter dated 24.09.2021 regarding Complete updated status of compliance to the Hon'ble NGT Order dated 28.06.2021, again insisted strict compliance of the directions of the aforesaid Hon'ble NGT Order by KSPCB. Copy of the letter is appended as **Annexure VII**.

**(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/NGT/SEO-INFRA/2021-22/2754 dated 08.09.2021 informed that 12 marshals with Emergency Response Vehicles to identify illegal discharges and 04 vehicles have been purchased for the purpose.

Further, TNPCB through Principal Secretary to Government, Environment, Climate Change & Forests Department vide letter no. 12080/EC.1/2021-3, dated 17.09.2021 provided sampling and analysis of the industries located in the periphery and results.

In view of above, CPCB, RD, Bengaluru vide letter dated 24.09.2021 regarding Complete updated status of compliance to the Hon'ble NGT Order dated 28.06.2021, again insisted strict compliance of the directions of the aforesaid Hon'ble NGT Order by KSPCB. Copy of the letter is appended as **Annexure VII**.

**(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.**

No Environmental Compensation imposed since April, 2021, as KSPCB has not given details of any physical verification or inspection of the units with sampling or analysis carried out for the year 2021-22.

Whereas TNPCB has not found any defaulting units up to September, 2021.

In view of above, CPCB, RD, Bengaluru vide letter dated 24.09.2021 regarding Complete updated status of compliance to the Hon'ble NGT Order dated 28.06.2021, again insisted strict compliance of the directions of the aforesaid Hon'ble NGT Order by KSPCB. Copy of the letter is appended as **Annexure VII**.

**(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.

**(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.

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 July 2021) reveal that the water quality falls under Class E as per Designated Best Use Criteria. There is improvement in the water quality in terms of the parameters such as BOD, Turbidity, EC, SAR, Boron and Free ammonia, however DO & Total Coliform are not meeting the Designated Best Use Criteria for classification of the water. Copy of report of analysis of water quality upto July, 2021 are attached as **Annexure VIII.**

However, water quality analysis result of Mugalur, Karnataka is not provided for the last three months by Karnataka SPCB, which is important to ascertain the water quality at the exit point of Inter State Border in Karnataka.

In addition to above, 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.

In view of above, CPCB, RD, Bengaluru vide letter dated 24.09.2021 regarding Complete updated status of compliance to the Hon'ble NGT Order dated 28.06.2021, again insisted strict compliance of the directions of the

aforesaid Hon'ble NGT Order by KSPCB. Copy of the letter is appended as **Annexure VII**.

**(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.**

Despite reminders and continued pursuation by CPCB, RD, Bengaluru with BBMP, no 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 is provided and therefore not complied with the Hon'ble NGT Order dated 28.06.2021.

**(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.**

Bangalore Development Authority has submitted the same status regarding construction of wetlands and the same is appended as **Annexure IX.**

**(11) Due to unexpected surge in COVID-19 during April to May, 2021, the joint committee recommends that the timeline for compliance of the above recommendations may be provided as six months (till December 2021).**

In this regard, it is humbly submitted that extension of time up to December 2021 may be provided for all the concerned Departments in Government of Karnataka for complying with the Recommendations of Joint Committee.

# CHAPTER IV

# CONCLUDING REMARKS

While reviewing the progress made on the recommendations of the Joint Committee Report, it is observed that, no response is received from the Chief Secretary, Government of Karnataka 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. Despite letters and communications to the Chief Secretary, Government of Karnataka enclosing directions of Hon'ble NGT Order dated 28.06.2021 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 them in this regard.

In this regard, Chief Secretary, Government of Karnataka is required to clearly direct and delineate the role and responsibility among 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 of River Thenpennai at the interstate location Sokkarasanapalli in Tamilnadu was provided by TNPCB. In sokkarasanapalli, Tamilnadu the water quality analysis results (as on July 2021) reveal that the water quality falls under Class E as per Designated Best Use Criteria. There is improvement in the water quality in terms of the parameters such as BOD, Turbidity, EC, SAR, Boron and Free ammonia, however DO & Total Coliform are not meeting the Designated Best Use Criteria for classification of the water.

Further, water quality analysis result of Mugalur, Karnataka is not provided by Karnataka SPCB, which is important to ascertain the water quality at the exit point of Inter State Border in Karnataka.

In addition to above, 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.

It is humbly submitted that the matter will be pursued with the Chief Secretary, Government of Karnataka and Karnataka State Pollution Control Board (KSPCB) 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.

*****

**Item No.11:**

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
Dt.13.07.2020, "Frothing of
Chemical Foam in the River Thenpennai"

... Applicant(s)

**Versus**

1. The Principal Secretary to Government,
   Public Works Department,
   Govt. Secretariat, Fort, St. George,
   Chennai- 600 009

2. The Secretary tyo Government of Tamil Nadu,
   Department of Environment,
   Govt. Secretariat, Fort, St. George,
   Chennai- 600 009

3. The Secretary to Government of Karnataka,
   Department of Forest Environment & Ecology,
   Room No. 708,Gate 2, Multi storied Building,
   Dr. Ambedkar Veedhi, Bangalore- 560001

4. Engineer in Chief (Water Resources Organisation)
   And Chief Engineer (General)
   Public Works Department
   Chepauk, Chennai- 600 005

5. The Chairman
   Tamil Nadu Pollution Control Board,
   No. 76, Anna Salai, Guindy,
   Chennai, Tamil Nadu- 600 032

6. The Chairman
   Karnataka State Pollution Control Board,
   "Parisara Bhavan", 49, 4th & 5th Floor,
   Chuch Street, Bangalore- 560001

7. The District Collector
Krishnagiri District,
First Floor Collectorate,
Krishnagiri- 635001

...Respondent(s)

**Date of Judgement: 28.06.2021.**

**CORAM**:

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

**HON'BLE DR. K. SATYAGOPAL, EXPERT MEMBER**

For Applicant(s): Suo Motu

For Respondent(s): Mr. C. Harsharaj for R1,R2, R4 and R7
Mr. Darpan K.M. for R3
Mr. C. Kasirajan through Ms. Ashwini for R5
Mr. M.R. Gokul Krishnan through Ms. Ojas Sivakumar for R6
Mr. R. Tirunavukarasu for CPCB

## ORDER

1. The above case has been suo motu registered by this Tribunal on the basis of the newspaper report published in Dinamalar Chennai City Supplementary edition dated 13.07.2020 under the caption "தென் பெண்ணை ஆற்றில் தேங்கிய ரசாயண நுரை" (Froathing of Chemical Foam in the River Thenpennai). It was seen from the report that large scale foam is seen in Thenpennai River which according to the report is due to discharge of untreated chemical from industries and that was coming from State of Karnataka. It is also alleged in the newspaper that whenever water is released through this river from Kelavarapalli Reservoir, Hosur, then foam appears in the river which affects the water quality.
2. It is also alleged in the report that apart from discharge of chemical effluent from the industries, residential sewage is also mixed with water affecting the quality of the water. Considering the fact that there arises a substantial

question of environment, this Tribunal had admitted the matter and appointed a joint Committee consisting of the following officials:

> (i)District Collector, Krishnagiri District or the Officer not below the rank of Assistant Collector, or Sub-Divisional Magistrate who is in charge of that area nominated by the District Collector,
> (ii) Superintending Engineer of Public Works Department and Water Resources Organisation, who is in charge of this area.
> (iii) a Senior Officer from Central pollution Control Board, Regional Officer, Bangalore.
> (iv)a Senior Officer deputed by the Chairman from Tamil Nadu Pollution Control Board.
> (v) a Senior Officer deputed by the Chairman, Karnataka State Pollution Control Board.
> (vi) District Collector, Bangalore Urban District or any Officer not below the rank of Assistant Collector or a Sub-Divisional Magistrate deputed by the District Collector, Attibele, Bangalore Urban District.

to ascertain the following things:

> The committee is directed to ascertain the water quality and also ascertain the sources of pollution and take action against the person who are responsible in accordance with law including imposition of environmental compensation.
> The committee is also directed to submit a long term and short term action plan with shorter time lines to protect the water body against pollution. If there is any contamination caused, the committee is also directed to suggest ways and means to remedy the same.

3. The Central Pollution Control Board, Regional Office, Bangalore will be the nodal agency for co-ordination and for providing all necessary logistics for this purpose. The case was originally posted to 05.10.2020 for appearance of the parties, filing the response and also for consideration of reports. On 05.10.2020, this Tribunal had considered the interim report submitted by the Joint Committee dated 01.10.2020, e-filed 24.11.2020 which was extracted in para 4 of the order which reads as follows:

> *"**1.0 Background:***
> *Hon'ble National Green Tribunal, Southern Zone, Chennai in the matter of O.A No. 111 of 2020; Tribunal on its own motion based on the News Item in Tamil Newspaper Dinamalar Chennai Edition dated 13.07.2020, "Frothing of Chemical Foam in the River Thenpennai" Vs The Principal Secretary to Government, Public Works Department, Chennai & Ors., passed orders dated 20.07.2020. Copy of Hon'ble NGT Orders dated 20/07/2020 is appended as **Annexure I**.*
> *Excerpts of the News Item in Tamil Newspaper Dinamalar Chennai Edition dated 13.07.2020, "Frothing of Chemical Foam in the River Thenpennai" is given below:*
> *(i)On 13th July, 2020 about 640 Cusecs water was discharged from Kelavarapalli Reservoir, Hosur and huge amount of chemical foam was found in Thenpennai River.*

*(ii)The flow of water into the reservoir increased gradually from 320 cusecs (09th July, 2020) to 480 cusecs (11th July, 2020) due to heavy rainfall in the catchment area.*

*(iii)In general, whenever the flow of water increases in Kelavarapalli reservoir the domestic sewage and industrial effluent from Karnataka mixes into the river in huge quantity.*

*(iv)On the day of 13th July, 2020, a huge quantity of sewage/effluent were discharged into Thenpennai and therefore, chemical froth/foam were found floating on the surface of water flowing in Kelavarapalli and near thattakalapalli bridge.*

*Hon'ble Tribunal(SZ), Chennaivide its ordersdated 20.07.2020 appointed a Joint Committee to inspect the area in question and submit status as well as action taken report, if there is any violation found. The Hon'ble Tribunal has also issued following directions to the committee;*

*(i)To ascertain the water quality and also ascertain the sources of pollution and take action against the person who are responsible in accordance with law including imposing of environmental compensation.*

*(ii)To submit a long term and short term action plan with shorter time lines to protect the water body against pollution. If there is any contamination caused, the committee is also directed to suggest ways and means to remedy the same.*

*Hon'ble Tribunal vide aforesaid orders directed the committee to submit the report within a period of two months i.e., on or before 05.10.2020.*

*2.0* ***Constitution of Joint Committee and Meetings***

*In compliance to the aforesaid orders dated 20/07/2020 of Hon'ble Tribunal (SZ), Chennai, a Joint Committee comprising of following members has been constituted by Central Pollution Control Board (Nodal Agency) vide its Office Memorandum No. Tech 39/Legal(NGT)/RDS/2020-21/466-474 dated 24.08.2020 and 16.09.2020. Copy of the said Office Memorandum is appended as* ***Annexure II& III****.*

| | | |
|---|---|---|
| *1.* | *Sh. Gunasekaran*<br>*Revenue Divisional Officer &*<br>*Sub Divisional Magistrate*<br>*Hosur Division, Tamilnadu* | *Member* |
| *2.* | *Sh. N Suresh*<br>*Superintending Engineer, WRO*<br>*Public Works Department*<br>*Tiruvannamalai, Tamilnadu* | *Member* |
| *3.* | *Sh B H Manjunath**<br>*Superintending Engineer*<br>*Public Works Department*<br>*Bangalore Circle, Karnataka* | *Member* |
| *4.* | *Sh. N Nagaraj*<br>*Superintending Engineer*<br>*Minor Irrigation & Ground Water*<br>*Jayanagar,*<br>*Bangalore, Karnataka* | *Member* |

| | | |
|---|---|---|
| *5.* | *Dr M Senthil Kumar*<br>*District Environmental Engineer*<br>*Tamilnadu Pollution Control Board*<br>*Hosur District, Tamilnadu* | *Member* |
| *6.* | *Sh. M K Prabhudev*<br>*Chief Environmental Officer – 2*<br>*Karnataka Pollution Control Board*<br>*Bangalore, Karnataka* | *Member* |
| *7.* | *Sh Shivanna M G*<br>*Assistant Commissioner (South)*<br>*Bangalore Urban*<br>*Karnataka* | *Member* |
| *8.* | *Smt. Selvi P K*<br>*Scientist D, Regional Directorate*<br>*Central Pollution Control Board*<br>*Bangalore* | *Nodal*<br>*& Member* |

**Subsequent to transfer of Sh. K Durugappa, Superintending Engineer vide Government of Karnataka Order dated 28-08-2020, Sh B H Manjunath, Superintending Engineer, PWD, Bangalore has been nominated as a member of the above Joint Committee.*

*Three meetings were organized by Central Pollution Control Board, Bangalore (Nodal Agency) with the members of Joint Committee on 20.08.2020, 04.09.2020 and 18.09.2020 and minutes were circulated for necessary actions. First and Second Meeting of the Joint Committee were conducted on 20.08.2020& 04.09.2020 to discuss about the preliminary information to be collected before conducting Monitoring and Sampling of River Thenpennai. Therefore, the joint committee decided to collate following information from the concerned departments to carry out further investigations in the matter;*

| ***S.No*** | ***Information Required from concerned Departments /Organisations in Tamilnadu and Karnataka*** |
|---|---|
| ***A.*** | ***Minor irrigation and Water Resources Organisations*** |
| *1.*<br>*2.*<br><br><br>*3.*<br>*4.* | *Drainage River Map of Thenpennai.*<br>*Details of Water Quality Monitoring locations (viz.,drainage (flow), length, velocity etc.) in the entire stretch of river from origin till Kelavarapalli Reservoir.*<br>*Designated use of water flowing in the river stretch*<br>*Quantity of water discharged from the river stretch for irrigation and other purposes*<br>*Annual Rainfall and Rainfall details for August,* |

| | |
|---|---|
| *5.*<br><br>*6.* | *September, October 2020*<br><br>*Custodian of the river to preserve the quality of water to be pristine.* |
| ***B.*** | ***State Pollution Control Boards*** |
| *7.*<br><br><br>*8.* | *Details of Water quality Monitoring Locations and water quality data of the River in terms of DO, BOD, COD, TC, phosphates & others for the last three years.*<br><br>*Major Sources of pollution (industrial and domestic) –*<br><br>*(a) Status of list of industries with its type/category/classification,Effluent generation, characteristics, treatment, discharge details etc.*<br>*(b) Details of domestic effluent generation, treatment, discharge options etc.*<br>*(c) Status of Operation of Sewage Treatment Plants with its performance evaluation.*<br>*(d) Information regarding open dumping of solid or biomedical or hazardous waste, open burning of waste and illegal encroachment or other activities along the river bed etc.* |
| ***C.*** | ***Public Works Department*** |
| *9.*<br><br><br>*10.* | *Status of sewage discharge and sewerage networking plan in the unsewered area.*<br><br>*About Kelavarapalli dam and designated use of dam water.* |

*Subsequently, it was discussed and decided to collect the following information from Bangalore Water Supply and Sewerage Board (BWSSB), Bangalore Development Authority (BDA) and Bangalore Bruhat Mahanagara Palike (BBMP) in the second meeting of the Joint Committee conducted on 04.09.2020;*

*(a) Status of Sewage Treatment Plants (STPs) (existing & operational, under construction and proposed) in Koramangala &Challaghatta valley and Hebbal Valley*

*(b) Drainage map / layout showing locationsof STPs with capacity and sewerage networking in those valleys*

*(c) Details of flow of domestic sewage measured at inlet and outlet (after treatment) of each of the STPs*

*(d) Performance of STPs based on its operational capacity, Waste water generated vs actual quantity treated, gap analysis andtreated waste water quality (w.r.t discharge standards of STP) in Real Time Monitoring stations installed etc.*

*(e) Quantum of untreated sewage flowing in Koramangala&Challaghatta and Hebbal valley with its proposed Underground Drainage network plan and others*

*(g) Details of plan for diversion of treated wastewater to Kolar, Chikaballapurand other districts of Karnataka*

*(h) Details of Rejuvenation of lakes and water bodies in Bengaluru etc.*

*Third meeting of the Joint Committee was conducted on 18.09.2020 to discuss and review the status of Action taken on the defaulters followed by Action Plan for compliance etc.*

## *CHAPTER 3*

### *3.0 About River Thenpennai*

*Thenpennai River also known as South Pennar or Dakshina Pinakini is an interstate River. The River originates on the south eastern slopes of*

*Chennakesava Hills, northwest of Nandidurg of Chikkaballapur district in Karnataka State at an altitude of 1000m above mean sea level, which flows in the southern direction through Chikkaballapura, Bengaluru Rural and Bengaluru Urban districts in Karnataka state and descends to Tamilnadu near Hosur.*

*Thenpennai river basin is one of the largest rivers of the state of Tamil Nadu. The river has supported many a civilizations of peninsular India in supplying precious water for drinking, irrigation and industry to the people of the states of Karnataka, Tamil Nadu and Pondicherry.The total length of Ponnaiyar River is 432 km, of which 112 km lies in Karnataka state, 180 km in Dharmapuri andKrishnagiri, 34 km in Thiruvannamalai and 106 km in Cuddalore, Kallakurichi and Villupuram districts of Tamil Nadu before joining Bay of Bengal. En route, it branches into Chinnar, Markanda, Vaniar and Pamban rivers in Tamilnadu. With a total catchment of approximately 16,019 km$^2$, it is dry for the most part of the year but swells during the north east monsoon season.*

*In Karnataka, the river traverses through series of zilla panchayat tanks and also Minor Irrigation tanks namely Nandi tank, Kuppalli tank, Chadalapura tank, Kothanuru tank, Kolavanahalli tank, Cikkadigenahalli tank, Bommanahalli tank, Kanithahalli tank, Muthur tank, malluru tank, Amani Bhadranakere tank in Chikkaballapur district, HosakoteDoddakere tank in Bengaluru Rural district, and YelemallappaChettykere tank in Bengaluru Urban District.Drainage basin of River Thenpennai or South Pennar flowing in Karnataka & Tamilnadu is given as* ***Figure 1****.*

*The stretch of the river is mostly dry to scanty from Origin (Nandi) towards Chikkaballapur, Hoskote and Kolar districts of Karnataka. Before descending the interstate border into Tamilnadu, overflow of water from Bellandur and Varthur lakes carrying domestic sewage of Koramangala&Challaghatta andHebbal valleys of Bangalore adds to the flow in river Thenpennaithereby causes frothing of river stretch.*

## *CHAPTER – 4*

### *4.0 Preliminary Joint Committee Survey and Investigation*

*Joint Committeeconducted a preliminary survey during 28.08.2020 and 01.09.2020, in order to investigate thecurrent scenario of River flowing in both the states (Karnataka and Tamilnadu). The findings of the preliminary reconnaissance survey of Chikkaballapur, Kolar and Hoskote districts in Karnataka are given below:*

***(A) Chikkaballapur District:****South Pinakini river flows in Chikkaballapur, Siddlaghatta and Chintamani (border) taluks in Chikkaballapur District.*

*The basin of the river is very small and for majority of the period in a year, the river basin remains dry.*

*Since this river connects many tanks, water flow can be seen only when the tanks overflows.*

*Under Chikkaballapur district jurisdiction, on the banks of this river, no major industries can be seen.*

*Photographs of the river between Bommanahalli tank and Kanithahalli tank in Chikkaballapur taluk is given below as* ***Figure 2****.*

*(B)* ***Kolar District:*** *South Pinakini river flows in Kolar, Malur and Bangarpet taluks in Kolar District.*

- *The basin of the river is very small and for majority of the period in a year, the river basin remains dry.*
- *Since this river connects many tanks, water flow can be seen only when the tanks overflows.*
- *Under Kolar district jurisdiction, Markandeya major tank in Bangarpet taluk (the catchment area is in Malur taluk) discharged water only 15 years back and the tank is having a flood discharge of 8,200 Cusecs. Catchment area is 113.14 Sq miles with tank's total capacity of 807 Units which irrigates the total irrigation area of about 847 acres. At the time of discharge, water flow through this valley joins at Yarragolu dam. Water will be used for drinking purpose by people in 3 taluks namely Kolar, Bangarpet,*

*Malur. Finally the discharge of Yarragolu dam water joins the valley of south pennar of Krishnagiri district in Tamilnadu state.*

*Photographs of the river flowingin Markandaya tank of Bangarpet taluk are given as* ***Figure 3.***

***(C) Hoskote District:*** *South Pinakini river flows in Hoskote and Anekal (border) in Bangalore Rural District.*

- *The basin of the river is very small and for majority of the period in a year, the river basin remains dry.*
- *Since this river connects Hoskote and Channasandra tanks, water flow can be seen only when the tanks overflows.*
- *Under Hoskote jurisdiction, on the banks of this river, no major industries can be seen.*

*Photograph of Hoskote tank in Hoskote taluk is given as* ***Figure 4****.*

*In addition to above, preliminary reconnaissance survey of River basin of South Pennar flowing in Bangalore district was also conducted and the observations are given below;*

*(D)* ***Bangalore District:****Survey was carried out in the areas of River South Pennar drainage basin covering Hebbal Valley and Koramangla / Chalghatta Valley, wherein series of lakes/tanks namely, Agara, Bellandur, Varthur (K & C Valley), yellamalappachetty lake, kadugodi bridge, Channasandra bridge (Hebbal), Hoskote tank, Mugalur bridge followed by few industrial pocketsin Samethanahalli and Thiruvaranga were also visited.*

i. *Water was found to be flowing clear from Agaralake to the storm water drain, however domestic sewage and solid waste was found mixing down the drain near Agara lake.*
ii. *It was observed that due to the desilting work, temporary channels were created on the outer ring of the tanks in Bellandur and Varthur for enabling flow of water through the tanks. Color of water was found to be flowing greyish in varthur as compared to Bellandur lake and it was informed that untreated domestic sewage from about 110 villages/hamlets in Bangalorejoins varthur(sewerage networking is under progress and same will be completed by 2023) .*
iii. *Two weirs of Hoskote tanks were observed to be having less water and no flow was found during the visit.*
iv. *Further, water flowing in Mugalur (KSPCB monitoring location) was also observed to be frothy and greyish, where few piggery units were found discharging washings/effluent.*
v. *Some micro/small scale dyeing units were also found operational illegally and discharging untreated effluent down the drain nearly 50 maway from the river stretch in Samethanahalli and immediate actions were taken by Karnataka SPCB to close those units.*
vi. *Also, a few other non-operational/closed and dismantled dyeing units in Samethanahalli and Thiruvaranga were also visited during the survey. In Samethanahalli, water was observed to be flowing greyish and frothy, where few dyeing units were found dismantled and non-operational.*
vii. *It is prudent to be noted that, washings and droppings of piggery farms located in samethanahalli and thiruvaranga add to organic load of the River flowing in Samethanahalli.*
viii. *Information regarding number of STPs (operational status) and proposed STPs (capacity) of K&C Valley and Hebbal valley was explained by Bangalore Water Supply and Sewerage Board (BWSSB) during the survey with the help of layout map. Desilting work carried out in Bellandur and Varthur tanks was also shared by Bangalore Development Authority (BDA).*

*Photographs of the survey conducted are given as* ***Figure 5 (a, b & c).***

***Figure 5. a) Solid Waste dumping in Chennasandrabridge;b) frothy foam floating in Samethanahalli weir; c) few micro/small scale dyeing units discharging untreated effluent down the drain in Samethanahalli***

*Then, the joint committee conducted survey in the areas of River South Pennar drainage basin flowing down southcovering Sokarasanapalli (KSPCB monitoring location), Singasadanapalli (Central Water Commission monitoring location), Kodiyalam, Bagalur villages near hosur and Kelavarapalli Reservoir in Tamilnadu.*

***(E) Villages near Hosur, Tamilnadu**:*

***(i)** Details of the villages with Population density located on Thenpennai riverine namely, singasadanapalli, kodiyalam, kooliganapalli, sokkarasanapalli, bagalur, lingapuram, ottapallithinna, kanimangalam, padathepalli, nanjapuram, sathyamangalam, muneeswararnagar, kembasandhiram, chennasandiram, kallipuram were provided as below;*

| S. No. | Name of Village | Distance from the River bed (m) | Number of houses | Population | Population density (Sq. Km) |
|---|---|---|---|---|---|
| 1. | Singasadanapalli | 1000 | 120 | 660 | 242.50 |
| 2. | kodiyalam (kooliganapalli) | 500 | 260 | 1106 | 217.03 |
| 3. | sokkarasanapalli | 500 | 250 | 855 | 348.97 |
| 4. | bagalur | 50 | 1500 | 11000 | 2534 |
| 5. | lingapuram | 100 | 300 | 2000 | 1666.67 |
| 6. | ottapallithinna | 400 | 35 | 130 | 97.01 |
| 7. | kanimangalam | 1000 | 110 | 310 | 94.80 |
| 8. | padathepalli | 1000 | 120 | 390 | 127.03 |
| 9. | nanjapuram | - | - | - | - |
| 10. | sathyamangalam, muneeswararnagar | 500 | 255 | 1390 | 260.787 |
| 11. | kembasandhiram | 500 | 25 | 550 | 705.12 |
| 12. | chennasandiram | 600 | 300 | 1417 | 885.62 |
| 13. | kallipuram | - | - | - | - |
| | **Total** | | **3275** | **19808** | **7179.5** |

ii. *It has been informed by representative of Tamilnadu Pollution Control Board that there are no industrial discharge along the stretch of Thenpennai River in Tamilnadu and no underground sewerage lines or STPs operating near the Riverside. Further, Tamilnadu SPCB informed that following industries are located near the river stretch;*

| **S.No** | **Name of the industry** | **Classification/ Category** | **Discharge Options** | **Remarks** |
|---|---|---|---|---|
| 1. | M/s Premier VVG & SPG Mills Pvt Ltd., Belathur, Bagalur | Textile / Large /Red | Zero Liquid Discharge | dyeing and printing operation suspended for past six months |
| 2. | M/s Exide Industries Ltd., , Chichuruganapalli, Sevaganapalli | integrated battery manufacturing unit/ Large /Red | Zero Liquid Discharge | 4 km away from river and divided by undulated terrain |
| 3. | M/s Shahi Exports Pvt. Ltd.,Sevaganapalli | Textile garment unit / Large / Green | STP and treated effluent utilized for green belt | No discharge outside premises. |

iii. *Color of Water flowing in the River stretch was observed to be greyish in sokkarasanapalli, frothy/slight greyish in kodiyalam, brownish to grey in Bagalur bridge and greenish in Kelavarapalli Reservoir.*

iv. *Solid waste dumping and mixing of domestic sewage into the river stretch flowing through bagalur bridge was also observed and Tamil Nadu Pollution Control Board was asked to take note of the scenario for appropriate actions.*

v. *Representative of Tamilnadu Pollution Control Board has informed that sewage generation has been estimated as 0.8 MLD (approx.) from Bagalur village and 0.01 MLD to 0.15 MLD (approx.) from rest of the villages in*

*Tamilnadu. It was also informed that the sewage generated in the above hamlets percolates within the hamlet limits and therefore may not get discharged into River Thenpennai.*

vi. *Average rainfall of Kelavarapalli is about 533 mm.*

***4.1 About Kelavarapalli Reservoir***

*Kelavarapalli Reservoir Project wasbuilt in 1978-1995 at Krishnagiri district, Tamilnadu and the Reservoir or Dam is situated at a distance of 8 km from Karnataka and 10 km away from Hosur, tamilnadu across the River Thenpennai, which actually originates from the eastern slopes of Chennakesava Hills in karnataka. The dam further leads water to the districts of Dharmapuri, Tiruvannamalai, Kallakuruchi, Villupuram and Cuddalore before joining Bay of Bengal. Google earth image of Kelavarapalli reservoir with sampling locations are shown as* ***Figure 7****.*

*Kelavarapalli Dam is situated atthe latitude of 12°52'42"N and longitude of 78°46'06'' E which is located in the Northwestern part of Tamil Nadu, bordering Karnataka and Andhra Pradesh states. The Dam is operational from 10th November 2002. Salient features of the dam include:*

***(a) <u>Salient features of Dam:</u>***

1. *Type of dam : Masonnry cum earthern Dam*
2. *Length : 665m*
3. *Height : 13.50m*
4. *FRL Water spread Area : 433.20 Hec*
5. *Volume : 0.481 TMC*
6. *Catchment area : 2442.00 Sq.Km*
7. *Gross Capacity : 13.61 Mcum*
8. *Maximum Water level : 831.50*
9. *FRL : 831.50*
10. *Water Supply Period : 1st Crop = July to December - 150 Days*

11. *Spillway Type : Ogee Crest Type*
12. *Spillway Nos : 7 Nos*
13. *Spillway Size : 12.20m x 6.10m*
14. *Crest Level : 825.40*
15. *Design flood Discharge : 88980 Cusecs*
16. *River Sluice : 1 No ( 1.20m x1.82m)*
17. *Canal Sluice : 2 Nos (0.90m x 1.50m)*
18. *Length of Canals*

| | | |
|---|---|---|
| *Right Main Canal (RMC)* | = | *21.99 km* |
| *Left Main Canal (LMC)* | = | *25.500 km* |
| *LMC Branch canal I* | = | *5.40 km* |
| *LMC Branch canal II* | = | *3.80 km* |
| *LMC Branch canal III* | = | *2.78 km* |
| *LMC Branch canal IV* | = | *4.96 km* |
| *LMC Branch canal V* | = | *0.71 km* |
| *Distributaries I of B.C IV* | = | *1.80 km* |
| *Distributaries II of B.C. IV* | = | *2.00 km* |
| *Distributaries I of B.C V* | = | *1.48 km* |
| *Distributaries II of B.C. V* | = | *1.15 km* |
| ***Total*** | = | ***71.57km*** |

19. *Irrigation Area : 3676 Hec*
20. *Approved Estimate : Rs.551.50 Lakhs*
21. *Revised Estimate : Rs.606.70 Lakhs*

***(b) <u>Present condition of Dam (as on 09.09.2020)</u>***

1. *Water level : 12.30 m*
2. *Water storage level : 343.74 Mcuft*
3. *Water incoming : 400 cusecs*
4. *Water discharge : 400 cusecs*

*Kelavarapalli Dam SIPCOT Central Water Supply Scheme provided 14.00 MLD of water to Hosur Municipality Phase I during 2015-16. Water*

*supply of Hosur Municipality is mainly being met out from the Government of Tamilnadu's Hoganekkal water supply Project which was executed & maintained by Tamilnadu Water Supply and Drainage Board (a statutory body under Tamilnadu Government) and the other sources are from Kelavarapalli Dam, one from Perandapalli River and few local wells. At present the entire Municipality is receiving 30.39 MLD of water supply from all the above said sources. (Source: https://www.twadboard.tn.gov.in/content/major-water-supply-schemes-1518).*

*Since Ponnaiyar river is the sole water source in Krishnagiri, Tiruvannamalai and Cuddalore districts, it has been extensively dammed. As it enters Tamilnadu, the water is stored in the Kelavarapalli dam reservoir near Hosur. The surplus amount reaches the Krishnagiri dam, which is situated 60 km downstream.*

***4.2 Excerpts of Thenpennai River Monitoring in the matter of O.S No. 2 of 2015& O.A No. 125/2017***

*In compliance to Hon'ble Supreme Court directions in the Original Suit No. 02 of 2015, ajoint monitoring Report on River Cauvery and Thenpennaiyar was submitted by CPCB, KSPCB and TNPCB, wherein the monitoring team carried out sampling of water for the period September 2017 to May 2018. The committee filed the report before the Hon'ble Court in 2018 (the case is pending before Hon'ble Supreme Court). The findings of the Report is given as below:*

1. *In case of River Thenpennaiyar at Sokarasanapalli, the water quality falls below designated best use Class C during all nine monitoring and the critical parameters are BOD, DO and TC. The Total Coliform was always > 5000 MPN/1000 ml and DO was <1 except during January and February 2018 showing the DO as 2.4 and 3.8 mg/l respectively. BOD also exceeded the Sewage standards notified 20 mg/l for all nine months showing the water is highly polluted.*
2. *The River Thenpennaiyar receives the outflow of treated and untreated sewage of Bellandur and varthur lake system. Comprehensive plan of restoration of these lakes along with identifying other sources of untreated sewage into the River only will help to restore the quality of the river. Government of Karnataka may prepare such plan on priority considering the pollution issues of Bellandur and varthur lake system, which contributes to the pollution of Thenpennaiyar River.*

*On the subject of remedial action for restoration of Bellandur, Agara and Varthur lakes at Bangalore, including preventing discharge and dumping of pollutants, removing encroachments from catchment area and other steps for restoration, Hon'ble Tribunal, Principal Bench, New Delhi, in the matter of O.A No. 125/2017, constituted a monitoring committee headed by Justice ShSantosh Hegde, former Judge of the Hon'ble Supreme Court to oversee the execution of the action plan. In this regard, summary of Compliance Report to the observations of the Monitoring Committee in respect of BWSSB, BDA, UDD, Minor Irrigation and KSPCB was filed before Hon'ble NGT, Principal Bench on 04.08.2020, wherein Hon'ble Tribunal vide orders dated 13.08.2020 has directed that* ***"…the left-over work may be expeditiously completed which may be reviewed by the Monitoring Committee. The status of compliance as on 31.12.2020 may be compiled by the Monitoring Committee and report furnished to this Tribunal by 15.01.2021…****".*

***4.3 Major Sources of Pollution***

*Major sources of pollution to River Thenpennai appear to be from untreated/partial treated sewage from Bangalore. Sewage generated from Bengaluru is the predominant reason for deterioration of lakes and water bodies in Bangalore, which is ultimately flowing into river Thenpennai.*

*There are various reasons such as ageing of sewers, encroachment of sewers, damages in the sewerage system, crown corrosion of sewers etc. for direct discharges of a part of wastewater from housing colonies and such discharge is flowing through Storm Water Drains and enters lakes in Bengaluru. Lakes in Bengaluru were created for rain water harvesting and once served as sources of water supply to the city. Lakes are under the custody*

*of various departments namely Bangalore Bruhat Mahanagara Palike (BBMP), Bangalore Development Authority (BDA), Karnataka Forest Department (KFD), Lake Development Authority (LDA), Minor Irrigation and Water Resources Department.*

*In recent years, few lakes have been converted into built-up area owing to industrialization and urbanisation. Among all the lakes, Bellandur and Varthur are highly polluted due to discharge of untreated and partially treated sewage from the city. Bellandur lake receives nearly 55 to 60 % of Bangalore's sewage and further drains into varthur lake, then flows into Thenpennai River towards south of Bangalore. Lakes are polluted due to inadequate drainage system leading to bypassing of sewage into lakes, entry of sewage from apartments/commercial establishments into storm water drains leading to lakes, insufficient sewage treatment plants, encroachment of lakes and Rajakaluves (storm water drains), dumping of municipal solid waste, construction and demolition wastes, illegal discharge of industrial effluents etc.The foremost reason for pollution of Bellandur Lake is sewage/ Sullage flowing in the storm water drains. One of the main reasons for development of foam in the waste weir is agitation of water falling over a height and due to surfactants present in sewage. Now after establishment of sluice gate and weir modification development of foam reduced considerably. Additionally, fertilisers used by farmers of Karnataka as well as Tamilnadu may add to the pollution of river thenpennai.*

*4.4* ***Status of Domestic Sewage Management in Bangalore***

*Sewage is one of the major causes for poor water quality of rivers, lakes and water bodies causing adverse impacts on human health and aquatic species. Bangalore Water Supply and Sewerage Board (BWSSB) was formed in 1964 to provide Sewerage system in unsewered areas in Bangalore in a phased manner. Domestic Sewage generation in Bengaluru has been estimated as 1157 MLD which is attributed to increased urbanization and population.The actual amount of sewage generated would be higher since a large number of private bore wells exist and there is no scientific estimate of the quantity of water withdrawn from them.*

*Sewage flow follows the regional topography and flow down along the three principal valleys and five minor valleys ensuring free flow of sewage without any major pumping requirement. It is estimated that roughly 1,400 MLD of wastewater flows through its three valleys – the Vrishabhavathi, the Koramangla - Challaghatta, and the Hebbal. Also treated wastewater of Bangalore is also being diverted to recharge drought ridden stretch/tanks of chikbellapur and kolar districts.*

*KSPCB informed that the industries have been encouraged to opt for Zero Liquid Discharge (ZLD). Further, 08 CETPs are operational for treating effluent generated from small scale industries from Bangalore. KSPCBhas been directed by CPCB to make entries in the river basin module on status of ETPs in the state based on Hon'ble Supreme Court and Hon'ble NGT Orders and the same is under progress.*

*Status of Sewage Treatment Plants of K&C and Hebbal Valleys in Bangalore, as provided by BWSSB is given as* ***Annexure IV.*** *Domestic sewage generation of hamlets/areas located in the stretch of Hebbal and K&C Valley, Bangalore is around 420 MLD & 611 MLD respectively, of which 814.5 MLD is being treated in 21 STPs located in the two valleys. BWSSB informed thatin hebbal valley, 03 STPs of 100 MLD, 20 MLD and 10 MLD capacities are under construction phase and the same will be commissioned by Dec 2020. In addition to that, construction of one STP with 07 MLD capacity is also under pipeline in hebbal valley.In case of Koramangla & Chalghatta valley, of 02 STPs, one STP (150 MLD) will be commissioned by Dec 2020.*

*In compliance to Hon'ble Supreme Court directions in the Original Suit No. 02 of 2015, Chief Secretary, Government of Karnataka submitted to Hon'ble Supreme Court in 2018 that, fourteen STPs of total 129 MLD for 110 villages under Japan International Cooperation Agency (JICA) Fund Scheme were proposed. It was then assessed that, with the establishment of those STPs, the total capacity of STPs to treat the sewage from Bengaluru would rise up*

*from the existing capacity of 1050 MLD to 1575 MLD by 2020 and 1704 MLD by 2022.*

*In addition to above, as per the Government of Karnataka Notification No. FEE 316 EPC 2015, Bengaluru dated 19.01.2016, KSPCB Clearance is required for the following projects:*

a) *All residential group housing projects/apartments with 20 units and above or having total BUA of 2,000 sq.m including basement*
b) *Commercial constructions projects (commercial complexes, office, IT related activities etc) with total built up area of 2,000 sq.m and above*
c) *Educational institutions with or without hostel facility having total built up area of 5,000 sq.m and above*
d) *Townships and area development projects with an area of 10 acres and above*

*Accordingly, KSPCB is covering apartments with 20 flats & above and commercial buildings of 2000 sq.mtsand area development projects of 10 acres and above only. All the projects covered by KSPCB under consent mechanism are required to provide Sewage Treatment Plant (STP) for treating the sewage. However, sewage generated from the smaller projects like apartments with less than 20 flats, commercial buildings with less than 2000 sq.mts built up area are required to be treated by BWSSB.*

*KSPCB has filed two Criminal cases against BWSSB w.r.t pollution of Bellandur Lake. Further, as per the directions of Hon'ble NGT in the matter of O.A.125/2017, Karnataka State Pollution Control Board has imposed Environmental Compensation against the defaulting Apartments/Housing Associations. Few projects have approached the Hon'ble High Court of Karnataka in this matter. As per the directions of Hon'ble High Court of Karnataka,Karnataka State Pollution Control Board is following the due procedure.*

## *CHAPTER V*

## *SAMPLING AND ANALYSIS OF RIVER THENPENNAI*

### *5.0 Sampling Locations*

*The Joint Committee identified the following sampling points for collecting surface water samples based on the reconnaissance surveyconducted in Tamilnadu and Karnataka during 28th August and 01st September, 2020;*

| *S. No.* | *State* | *Sampling Points (No. of samples)* | *Geo-Coordinates* | |
|---|---|---|---|---|
| *1* | *Tamil Nadu* | *i) Kelavarapalli reservoir* | *$12.769^0$N* | *$77.875^0$E* |
| | | *ii) Kelavarapalli outfall* | *$12.769^0$N* | *$77.877^0$E* |
| | | *iii) Kodiyalam* | *$12.857^0$N* | *$77.823^0$E* |
| | | *iv) Bagalur Bridge* | *$12.831^0$N* | *$77.871^0$E* |
| *2.* | *Inter State Boundary* | *v) Sokkarasanapalli* | *$12.853^0$N* | *$77.831^0$ E* |
| | | *vi) Mugalur Bridge* | *$12.896^0$N* | *$77.831^0$E* |
| *3.* | *Karnataka* | *vii) Agara Lake* | *$12.923^0$N* | *$77.639^0$E* |
| | | *viii) Y Junction (Agara/Koramangla)* | *$12.923^0$N* | *$77.646^0$E* |
| | | *ix. Bellandur* | *$12.931^0$N* | *$77.677^0$E* |
| | | *x. Varthur* | *$12.945^0$N* | *$77.746^0$E* |
| | | *xi. Channasandra* | *$12.985^0$N* | *$77.776^0$E* |
| | | *xii. Samethanahalli* | *$12.970^0$N* | *$77.784^0$E* |

*Surface water samples of the above twelve locations were collected by Joint Committee on 09th and 10th September, 2020. Thenpennai River basin Map showing the sampling locations in Karnataka and Tamilnadu are given below as* ***Figure 8****;*

*Geographic profile and details of the sampling locations in the sequence of the flow of River Thenpennai is provided below;*

*(i)* ***Agara:***

*Agaralake spread over 98 acre, is located at Agara in southeast direction of Bengaluru. The lake receives outfall from the upstream Madivala*

*lake.The excess water from Agara lake overflows through the storm water drain to Bellandur lakenear southwest direction. At varthur, the flow of water was found clear and no frothing was found. However, domestic sewage and solid waste was found mixed down the drain with greyish color leading to Bellandur.*

*(ii)* ***Bellandur:***

*Bellandur Lake is located in southeast direction of Bengaluru and is the largest lake in the city and the weir flow of Agara Lake joins Bellandurlake. It was observed that, of the two Bellandur Lake weirs, water was flowing in one weir towards Southern direction (near Bellandur village, popularly called as Bellandur bridge) through channels created on the outer ring of the lake, whereas Northern weir (near Yamalur, popularly called as Yamalur bridge) was taken up for restoration work by BDA.*

*It was also observed that, the storm water drain near bellandur lake was found with lots of floating materials such as plastic bags and municipal solid waste etc. This might be due to local people residing in the area with no awareness about solid waste collection and management. There is a need for clearance of solid waste dumped in the storm water drain and lake by local authorities and monitoring by KSPCB to protect the lake from pollution. At Bellandur, the flow of water was found slightly clear and no frothing was found.*

*(iii)* ***Varthur:***

*The Varthur Lake takes the main inflow from outflow weirs of Bellandur Lake, along with some other water entry points (about 6 to 9) between outer ring road (that connects Marathalli with Sarjapura road) and Varthur, between which the Varthur Lake lies. It was seen that Varthur Lake has 02 outflow weirs viz: Northern weir near Sigma Softech Park, Ramagondanahalli (popularly called as Varthur Kodi) and Southern weir near Varthur (popularly called as Varthur Bridge).*

*Even in varthur lake, water was flowing only in southern weir as the Northern weir was taken up for restoration work by BDA.It was informed that both the weir flow of the lake joins at a point at about 600 m in South Eastern direction of the Northern weir, thereafter, the stream joins the South Pennar River, through Ajjigondahalli bridge, at about 3.8 Km in east of north eastern direction. The joined streams of out flow weir of Varthur Lake flowing en route, Ajjigondahalli Bridge, represents entire wastewater / domestic effluent of K & C Valley flowing into South Pennar River. At varthur, the flow of water was found greyish to brown and no frothing was found.*

*(iv)* ***Channasandra:***

*Channasandra Bridge located on Hope Farm Junction towards Chikka Tirupathi Road, flows in Southern direction in order to further confluence with the out flow of Varthur Lake (K & C Valley).*

*Whereas, lakes of Hebbal Valley flows into Yelemalappa Chetty Lake (YMC Lake) located on Old Madras Road. Over flow through the outflow weir of YMC Lake joins the South Pennar River at about 4.9 Km South East of YMC Lake and flows in southern direction to joinchannasandra bridge. At channasandra, the flow of water was found green in colorwith absolutely no frothing. However, solid waste was found dumped near the bridge.*

*(v)* ***Samethanahalli:***

*Samethanahalliis located downstream of varthur lake at south eastern direction of Bangalore outskirts. Domestic and industrial discharges of samethanahalli confluences into tributaries of South pennar river basin and flows down to join downstream of ajjingondahalli towards Mugalur. At samethanahalli, the flow of water was greyish with froth floating over.*

*Few unauthorized micro/small scale dyeing units were found operational during the visit and found discharging untreated effluent down the drain. KSPCB has taken immediate action to close those units.*

*(vi)* ***Mugalur:***

*Mugalur Bridge is on Sarjapura – Chikka Tirupati road which is at a distance of about 11.47 Km south east of northern weir of Varthur Lake. The South Pennar River leaves Karnataka State and enters into Tamil Nadu and joins Kelavarapalli reservoir (about 7.5 Km north east of Hosur city) which is located at about 14.18 Km south east of Mugalur Bridge. At Mugalur Bridge, the flow of water was greyish to brown and it contained scanty pockets of froth*

*here and there. Solid waste dumping and outlet of piggery farm into the river was found near the area.*

*(vii)* ***Sokarasanapalli:***

*Sokarasanapalli is located at interstate border of Tamilnadu and Karnataka with a distance of 500 m from the river bed.*

*Sokarasanapalli is an interstate water quality monitoring location being sampled by Karnataka on a quarterly basis. The flow of water in sokkarasanapalli was observed as greyish and with growth of floating aquatic plants in a large area.*

*(viii)* ***Kodiyalam:***

*Kodiyalam is situated in north east direction of Hosur district, Tamilnadu. In kodiyalam, there is one anicut which has two sluices constructed to distributewater flowing from sokkarasanapalli for agriculture purpose. Central Water Commission, Cauvery and Southern Rivers Division monitors flow of the river at this location. Water was found to be flowing in greyish color and frothy foam was floating on the river.*

*(ix)* ***Bagalur:***

*Bagalur bridge is situated in north eastern direction of hosur district, Tamilnadu. Bagalur bridge was found with water flowing in brown to greyish color and solid waste was found dumped on either sides of the river bed. Cattles were also found grazingthe grass near the solid waste dumped area which could cause lethal effects due to plastics and other inert materials dumped over.*

*(x)* ***Kelavarapalli:***

*Kelavarapalli dam is located in the Northwestern part of Tamil Nadu.400 cusecs of water was found flowing through spillway shutters with reasonably clear water in green color on the day of visit. Also scanty pockets of froth was seen due to water flowing with force from high fall of the dam.*

*In the areas namely, samethanahalli, mugalur, sokkarasanapalli, kodiyalam, bagalur kelavarapalli water was found being pumped and used for agriculture in the nearby areas.*

*5.1* ***Sampling Protocol***

*The surface water samples of the above identified 12 locations in River Thenpennai were collected during 09$^{th}$ and 10$^{th}$ September, 2020 and submitted to laboratory for analysis. The Joint Committee followed CPCB's Standard Operating Procedure for National Water Quality Monitoring Programme and Submission of data developed in August, 2017. The scope of the SOP is to standardise the process of sample collection, preservation, handling and analysis, preparation of data reports, etc.*

*The analysis results of the aforesaid surface water samples of12 locations in River Thenpennai are awaited.*

***Submission of Joint Committee to the Hon'ble NGT, Southern Zone, Chennai***

*The Joint Committee constituted in O.A No. 111 of 2020,is of the opinion that to complete the assigned tasks as per Terms of Referencei.e (i) to inspect the area in question and submit status as well as action taken report to CPCB, if there is any violation found; (ii) to ascertain the water quality and also ascertain the sources of pollution and take action against the person who are responsible in accordance with law including imposition of environmental compensation; (iii) to submit a long term and short term action plan with shorter timelines to protect the water body against pollution (iv) to suggest ways and means to remedy the same if there is any contamination caused, the committee requires* ***an additional time of six weeks****.*

*In view of above, it is humbly prayed that a time period of 06 weeks may kindly be given to this Joint Committee to submit report upon incorporating the analysis results of samples taken, Action Taken Report on defaulters, Long Term and Short Term Action Plan with shorter timelines, Recommendations, etc. in compliance to the Hon'ble NGT Orders dated 20.07.2020."*

4. Thereafter, this Tribunal passed the following order:

*5.It is seen from the report that water analysis has not been completed and the environmental compensation has not been calculated for which they require six weeks time.*
*6.So considering the circumstances, we feel that some more time can be given to the committee to submit the report as directed by this Tribunal.*
*7.The committee is directed to submit the report on or before 26.11.2020 by e-filing along with necessary hardcopies to be produced as per Rules.*
*8.The concerned State departments are also directed to submit their independent response to the allegations made and the steps taken by them to avoid such things in future, before the next hearing date.*
*9.The Registry is directed to communicate this order to the members of the committee as well as to the official respondents by e-mail immediately so as to enable them to comply with the direction.*

the case was posted to 26.11.2020 for consideration of further report.

5. Thereafter, the matter has been adjourned from time to time and it was taken up on 18.02.2021. On that date, this Tribunal had considered the report submitted by Tamil Nadu Pollution Control Board signed on 18.11.2020 and received on 24.11.2020 which was extracted in para 4 of the order which reads as follows:

**1.0 Background:**
*Hon"ble National Green Tribunal, Southern Zone, Chennai in the matter of O.A No. 111 of 2020; Tribunal on its own motion based on the News Item in Tamil Newspaper Dinamalar Chennai Edition dated 13.07.2020, "Frothing of Chemical Foam in the River Thenpennai" Vs The Principal Secretary to Government, Public Works Department, Chennai &Ors., passed orders dated 20.07.2020. Copy of Hon"ble NGT Orders dated 20/07/2020 is appended as* ***Annexure***
*Excerpts ofthe News Item in Tamil Newspaper Dinamalar Chennai Edition dated 13.07.2020, "Frothing of Chemical Foam in the River Thenpennai" is given below:*
*(i) On 13th July, 2020 about 640 Cusecs water was discharged from Kelavarapalli Reservoir, Hosur and huge amount of chemical foam was found in Thenpennai River.*
*(ii) The flow of water into the reservoir increased gradually from 320 cusecs (09th July, 2020) to 480 cusecs (11th July, 2020) due to heavy rainfall in the catchment area.*
*(iii) In general, whenever the flow of water increases in Kelavarapalli reservoir the domestic sewage and industrial effluent from Karnataka mixes into the river in huge quantity.*
*(iv) On the day of 13th July, 2020, a huge quantity of sewage/effluent were discharged into Thenpennai and therefore, chemical froth/foam were found floating on the surface of water flowing in Kelavarapalli and near thattakalapalli bridge.*
*Hon"ble Tribunal (SZ), Chennai vide its orders dated 20.07.2020 appointed a Joint Committee to inspect the area in question and submit status as well as action taken report, if there is any violation found. The Hon"ble Tribunal has also issued following directions to the committee.*
*(i) To ascertain the water quality and also ascertain the sources of pollution and take action against the person who are responsible in accordance with law including imposing of environmental compensation.*
*(ii) To submit a long term and short term action plan with shorter time lines to protect the water body against pollution. If there is any*

*contamination caused, the committee is also directed to suggest ways and means to remedy the same.*

*Hon"ble Tribunal vide aforesaid orders directed the committee to submit the report within a period of two months i.e., on or before 05.10.2020.*

*The Joint Committee submitted interim report on 01.10.2020 and informed the Hon"ble NGT that the report of the joint committee requires six weeks time and the report would be submitted after incorporating the analysis results of samples collected in River Thenpennai along with action plan. In this regard, Hon"ble NGT accepted the interim report and vide order dated 05.10.2020 directed that, "… some more time can be given to the committee to submit the report as directed by this Tribunal…*

*The Committee is directed to submit the report on or before 26.11.2020…"*

***„„To submit the report on or before 26.11.2020 by e-filing along with necessaryhardcopies to be produced as per Rules ".***

***„„The concerned state departments are also to submit their independent response to the allegations mage and the steps taken by them to avoid such things in future, before the next hearing date. """.***

*Copy of the Hon"ble NGT Order dated 05.10.2020 is appended as* ***AnnexureII****.*

***Constitution of Joint Committee and Meetings***

*In compliance to the aforesaid orders dated 20/07/2020 of Hon"ble Tribunal (SZ), Chennai, a Joint Committee comprising of following members has been constituted by Central Pollution Control Board (Nodal Agency) vide its Office Memorandum No. Tech 39/Legal (NGT)/RDS/2020-21/466-474 dated 24.08.2020 and 16.09.2020.*

*Copy of the said Office Memorandum is appended as* ***Annexure III& IV****.*

| | | |
|---|---|---|
| *1.* | *Sh. Gunasekaran*<br>*Revenue Divisional Officer &*<br>*Sub Divisional Magistrate*<br>*Hosur Division, Tamilnadu* | *Member* |
| *2.* | *Sh. N Suresh*<br>*Superintending Engineer, WRO*<br>*Public Works Department*<br>*Tiruvannamalai, Tamilnadu* | *Member* |
| *3.* | *Sh B H Manjunath**<br>*Superintending Engineer*<br>*Public Works Department*<br>*Bangalore Circle, Karnataka* | *Member* |
| *4.* | *Sh. N Nagaraj*<br>*Superintending Engineer*<br>*Minor Irrigation & Ground Water Development Circle, Jayanagar*<br>*Bangalore, Karnataka* | *Member* |
| *5.* | *Dr M Senthil Kumar*<br>*District Environmental Engineer*<br>*Tamilnadu Pollution Control Board*<br>*Hosur District, Tamilnadu* | *Member* |

| | | |
|---|---|---|
| *6.* | *Sh. M K Prabhudev*<br>*Chief Environmental Officer – 2*<br>*Karnataka Pollution Control Board*<br>*Bangalore, Karnataka* | *Member* |
| *7.* | *ShShivanna M G*<br>*Assistant Commissioner (South)*<br>*Bangalore Urban*<br>*Karnataka* | *Member* |
| *8.* | *Smt. Selvi P K*<br>*Scientist D, Regional Directorate*<br>*Central Pollution Control Board*<br>*Bangalore* | *Nodal Officer & Member* |

**Subsequent to transfer of Sh. K Durugappa, Superintending Engineer vide Government of Karnataka Order dated 28-08-2020, Sh B H Manjunath, Superintending Engineer, PWD, Bangalore has been nominated as a member of the above Joint Committee.*

*Three meetings were organized by Central Pollution Control Board, Bangalore (Nodal Agency) with the members of Joint Committee on 20.08.2020, 04.09.2020 and 18.09.2020 and minutes were circulated for necessary actions. First and Second Meeting of the Joint Committee were conducted on 20.08.2020& 04.09.2020 to discuss about the preliminary information to be collected before conducting Monitoring and Sampling of River Thenpennai. Therefore, the joint committee decided to collate following information from the concerned departments to carry out further investigations in the matter;*

| ***Sl.No*** | ***Information Required from concerned Departments / Organisations in Tamilnadu and Karnataka*** |
|---|---|
| ***A.*** | ***Minor irrigation and Water Resources Organisations*** |
| *1.* | *Drainage River Map of Thenpennai.* |
| *2.* | *Details of Water Quality Monitoring locations (viz., drainage (flow), length, velocity etc.) in the entire stretch of river from origin till Kelavarapalli Reservoir.* |
| *3.* | *Designated use of water flowing in the river stretch* |
| *4.* | *Quantity of water discharged from the river stretch for irrigation and other purposes.* |
| *5.* | *Annual Rainfall and Rainfall details for August, September, October 2020* |
| *6.* | *Custodian of the river to preserve the quality of water to be pristine.* |

| | |
|---|---|
| ***B.*** | ***State Pollution Control Boards*** |

| | |
|---|---|
| *7.* | *Details of Water Quality Monitoring Locations and water quality data of the River in terms of DO, BOD, COD, TC, phosphates & others for the last three years.* |
| *8.* | *Major Sources of pollution (industrial and domestic) :–*<br>*(a) Status of list of industries with its type/category/classification, Effluent generation, characteristics, treatment, discharge details etc.*<br>*(b) Details of domestic effluent generation, treatment, discharge options etc.* |
| | *(c) Status of Operation of Sewage Treatment Plants with its performance evaluation.*<br>*(d) Information regarding open dumping of solid or biomedical or hazardous waste, open burning of waste and illegal encroachment or other activities along the river bed etc.* |
| ***C.*** | ***Public Works Department*** |
| *9.* | *Status of sewage discharge and sewerage networking plan in the unsewered area.* |
| *10.* | *About Kelavarapalli dam and designated use of dam water.* |

*Subsequently, it was discussed and decided to collect the following information from Bangalore Water Supply and Sewerage Board (BWSSB), Bangalore Development Authority (BDA) and Bangalore Bruhat Mahanagara Palike (BBMP) in the second meeting of the Joint Committee conducted on 04.09.2020;*

*(a) Status of Sewage Treatment Plants (STPs) (existing & operational, under construction and proposed) in Koramangala & Challaghatta Valley and Hebbal Valley.*

*(b) Drainage map / layout showing locations of STPs with capacity and sewerage networking in those valleys.*

*(c) Details of flow of domestic sewage measured at inlet and outlet (after treatment) of each of the STPs.*

*(d) Performance of STPs based on its operational capacity, Waste water generated vs actual quantity treated, gap analysis and treated waste water quality (w.r.t discharge standards of STP) in Real Time Monitoring stations installed etc.*

*(e) Quantum of untreated sewage flowing in Koramangala & Challaghatta and Hebbal valley with its proposed Underground Drainage network plan and others.*

*(f) Details of plan for diversion of treated wastewater to Kolar, Chikaballapurand other districts of Karnataka.*

*(g) Details of Rejuvenation of lakes and water bodies in Bengaluru etc.*

*Third meeting of the Joint Committee was conducted on 18.09.2020 to discuss and review the status of Action taken on the defaulters followed by Action Plan for compliance etc.,*

### 3.0 About River Thenpennai

*Thenpennai River also known as South Pennar or Dakshina Pinakini is an interstate River. The River originates on the south eastern slopes of Chennakesava Hills, northwest of Nandidurg of Chikaballapur district in Karnataka State at an altitude of 1000m above mean sea level, which flows in the southern direction through Chikkaballapura, Bengaluru*

*Rural and Bengaluru Urban districts in Karnataka state and descends to Tamilnadu near Hosur.*

*Thenpennai river basin is one of the largest rivers of the state of Tamil Nadu. The river has supported many a civilizations of peninsular India in supplying precious water for drinking, irrigation and industry to the people of the states of Karnataka, Tamil Nadu and Pondicherry. The total length of Ponnaiyar River is 432 km, of which 112 km lies in Karnataka state, 180 km in Dharmapuri and Krishnagiri, 34 km in Thiruvannamalai and 106 km in Cuddalore, Kallakurichi and Villupuram districts of Tamil Nadu before joining Bay of Bengal. En route, it branches into Chinnar, Markanda, Vaniar and Pamban rivers in Tamilnadu. With a total catchment of approximately 16,019 km$^2$, it is dry for the most part of the year but swells during the north east monsoon season*

*In Krnataka, the river traverses through series of zilla panchayat tanks and also Minor Irrigation tanks namely Nandi tank, Kuppalli tank, Chadalapura tank, Kothanuru tank, Kolavanahalli tank, Cikkadigenahalli tank, Bommanahalli tank, Kanithahalli tank, Muthur tank, malluru tank, Amani Bhadranakere tank in Chikkaballapur district, Hosakote Doddakere tank in Bengaluru Rural district, and*

*Yelemallappa Chettykere tank in Bengaluru Urban District. Drainage basin of River Thenpennai or South Pennar flowing in Karnataka & Tamilnadu is given as* ***Figure 1****.*

*The stretch of the river is mostly dry to scanty from Origin (Nandi) towards Chikkaballapur, Kolar district, Bangalore Urban District and Hoskote Taluk of Bangalore Rural districts of Karnataka. Before descending the interstate border into Tamilnadu, overflow of water from Bellandur and Varthur lakes carrying domestic sewage of Koramangala & Challaghatta and Hebbal valleys of Bangalore adds to the flow in river Thenpennaithereby causes frothing of river stretch.*

***Preliminary Joint Committee Survey and Investigation***

***4.0Preliminary Reconnaissance Survey and Observations***

*The Joint Committee conducted a preliminary survey during 28.08.2020 and 01.09.2020, in order to investigate the current scenario of River flowing in both the states (Karnataka and Tamilnadu). The findings of the preliminary reconnaissance survey of Chikkaballapur, Kolar districts, Bangalore Urban District and Hoskote Taluk in Bangalore rural districts in Karnataka.*

*Then, the joint committee conducted survey in the areas of River South Pennar drainage basin flowing down south covering Sokarasanapalli (KSPCB monitoring location), Singasadanapalli (Central Water Commission monitoring location), Kodiyalam, Bagalur villages near Hosur and Kelavarapalli Reservoir in Krishnagiri District, Tamilnadu are given below.*

***Villages near Hosur, Krishnagiri District Tamilnadu****:*

i. *Details of the villages with Population density located on Thenpennai riverine namely, Singasadanapalli, Kodiyalam, Kooliganapalli, Sokkarasanapalli, Bagalur, Lingapuram, Ottapallithinna, Kanimangalam, Paduthepalli, Nanjapuram, Sathyamangalam, Muneeswararnagar, Kembasandhiram, Chennasandiram, Kallipuram were provided as below.*

| ***Sl.No*** | ***Name of Village*** | ***Distance from the River bed (m)*** | ***Number of houses*** | ***Population*** | ***Population density (Sq. Km)*** |
|---|---|---|---|---|---|
| *1.* | *Singasadanapalli* | *1000* | *120* | *660* | *242.50* |

| | | | | | |
|---|---|---|---|---|---|
| *2.* | *kodiyalam (kooliganapalli)* | *500* | *260* | *1106* | *217.03* |
| *3.* | *Sokkarasanapalli* | *500* | *250* | *855* | *348.97* |
| *4.* | *Bagalur* | *50* | *1500* | *11000* | *2534* |
| *5.* | *Lingapuram* | *100* | *300* | *2000* | *1666.67* |
| *6.* | *Ottapallithinna* | *400* | *35* | *130* | *97.01* |
| *7.* | *Kanimangalam* | *1000* | *110* | *310* | *94.80* |
| *8.* | *Paduthepalli* | *1000* | *120* | *390* | *127.03* |
| *9.* | *Nanjapuram* | *-* | *-* | *-* | *-* |
| *10.* | *Sathyamangalam, Muneeswararnagar* | *500* | *255* | *1390* | *260.787* |
| *11.* | *Kembasandhiram* | *500* | *25* | *550* | *705.12* |
| *12.* | *Chennasandiram* | *600* | *300* | *1417* | *885.62* |
| *13.* | *Kallipuram* | *-* | *-* | *-* | *-* |
| | ***Total*** | | ***3275*** | ***19808*** | ***7179.5*** |

*ii.Tamilnadu Pollution Control Board informed that there are no industrial discharges along the stretch of Thenpennai River in Tamilnadu and no underground sewerage lines or STPs operating near the Riverside. Further, Tamilnadu SPCB informed that following industries are located near the river stretch.*

| ***Sl.No*** | ***Name of the industry*** | ***Classification /Category*** | ***Discharge Options*** | ***Consent Issued Details*** | ***Remarks*** |
|---|---|---|---|---|---|
| *1.* | ***M/s Premier VVG & SPG Mills Pvt Ltd****., Belathur, Bagalur.* | *Textile / Large /Red* | *Zero Liquid Discharge and there is no discharge of industrial* | *CTO issued on 15.11.1995 valid up to 31.03.1996* | *The unit is located at a distance of 900 meter from River Thenpennai.* |
| | | | *effluent / Sewage into River Thenpennai* | *RCO issued on 20.03.2017 valid upto 31.03.2022* | *Re-commissioning the dyeing and printing operation during first week of October 2020.* |
| *2.* | ***M/s Exide Industries Ltd.,*** *,Chichuruganapalli, Sevaganapalli* | *Integrated Battery manufacturing unit/ Large /Red* | *Zero Liquid Discharge and there is no discharge of industrial effluent / Sewage into River Thenpennai* | *CTO issued on 13.11.2013 valid up to 31.03.2014*<br><br>*RCO issued on 20.12.2017 valid upto 31.03.2022* | *4 km away from river and divided by undulated terrain.* |

| | | | | | |
|---|---|---|---|---|---|
| *3.* | ***M/s Shahi Exports Pvt Ltd.,*** *Sevaganapalli.* | *Textile garment unit / Large / Green* | *STP and treated effluent utilized for green belt and there is no discharge of Sewage into River Thenpennai* | *CTO issued on 22.08.2011 valid up to 31.03.2012*<br><br>*RCO issued on 03.07.2020 valid upto 31.03.2022* | *No discharge outside remises.* |

*iii.Color of Water flowing in the River stretch was observed to be greyish in sokkarasanapalli, frothy/slight greyish in kodiyalam, brownish to grey in Bagalur bridge and greenish in Kelavarapalli Reservoir.*

*iv. Solid waste dumping and mixing of domestic sewage into the river stretch flowing through Bagalur bridge was also observed and Tamil Nadu Pollution Control Board was asked to take note of the scenario forappropriate actions.*

*v.The sewage generation from Bagalur village has been estimated as 0.8 MLD (approx.) and 0.01 MLD to 0.15 MLD (approx.) from rest of the villages in Tamilnadu. It was also informed that the sewage generated in the above hamlets percolates within the hamlet limits and therefore maynot get discharged into River Thenpennai.*

*vi.Average rainfall of Kelavarapalli is about 533 mm.*

*Kelavarapalli Reservoir Project was built in 1978-1995 at Krishnagiri district, Tamilnadu and the Reservoir or Dam is situated at a distance of 8 km from Karnataka and 10 km away from Hosur, Tamilnadu across the River Thenpennai, which actually originates from the eastern slopes of Chennakesava Hills in Karnataka. The dam further leads water to the districts of Dharmapuri, Tiruvannamalai, Kallakuruchi, Villupuram and Cuddalore before joining Bay of Bengal.* the latitude of 12°52‟42″N and longitude of78°46‟06”” E which is located in the Northwestern part of Tamil Nadu,bordering Karntaka and Andhra Pradesh States. The Dam is operational from 10th November 2002. Salient features of the dam include:

***(a) <u>Salient features</u> of Dam:***

1. *Type of dam : Masonnry cum earthern Dam*
2. *Length : 665m*
3. *Height : 13.50m*
4. *FRL Water spread Area : 433.20 Hec.*
5. *Volume : 0.481 TMC*
6. *Catchment area : 2442.00 Sq.Km*
7. *Gross Capacity : 13.61 Mcum*
8. *Maximum Water level : 831.509.*
9. *FRL : 831.50*
10. *Water Supply Period : 1st Crop = July to December - 150 Days*
11. *Spillway Type :Ogee CrestType*
12. *Spillway Nos : 7 Nos*
13. *Spillway Size : 12.20m x 6.10m*
14. *Crest Level : 825.40*
15. *DesignfloodDisg :88980 Cusecs*
16. *River Sluice : 1 No ( 1.20m x1.82m)*
17. *Canal Sluice : 2 Nos (0.90m x 1.50m)*

18. *Length of Canals*

| | |
|---|---|
| *Right main canal (RMC)=* | *21.99* |
| *Left Main canal (LMC)=* | *25.500 km* |
| *LMC Branch canal5.40 km* | |
| *LMC Branch canal II* | *3.80 km* |
| *LMC Branch canal III* | *2.78 km* |
| *LMC Branch canal IV* | *4.96 km* |
| *LMC Branch canal V* | *0.71 km* |
| *Distributaries I of B.C IV* | *1.80 km* |
| *Distributaries II of B.C. IV* | *2.00 km* |
| *Distributaries I of B.C V* | *1.48 km* |
| *Distributaries II of B.C. V* | *1.15 km* |
| ***Total*** | ***71.57km*** |

19. *Irrigation Area : 3676 Hec*

20. *Approved Estimate : Rs.551.50 Lakhs*

21. *Revised Estimate : Rs.606.70 Lakhs*

***(b) <u>Present condition of Dam (as on 09.09.2020)</u>***

1. *Water level : 12.30 m*
2. *Water storage level : 343.74 Mcuft*
3. *Water incoming : 400 cusecs*
4. *Water discharge : 400 cusecs*

*Kelavarapalli Dam SIPCOT Central Water Supply Scheme provided 14.00 MLD of water to Hosur Municipality Phase I during 2015-16. Water supply of Hosur Municipality is mainly being met out from the Government of Tamilnadu"s Hoganekkal water supply Project which was executed & maintained by Tamilnadu Water Supply and Drainage Board (a statutory body under Tamilnadu Government and the other sources are from Kelavarapalli Dam, one from Perandapalli River and few local wells. At present the entire Municipality is receiving 30.39 MLD of water supply from all the above said sources. (Source: https://www.twadboard.tn.gov.in/content/major-water-supply-schemes-1518).*

*Since Ponnaiyar river is the sole water source in Krishnagiri, Tiruvannamalai and Cuddalore districts, it has been extensively dammed. As it enters Tamilnadu, the water is stored in the Kelavarapalli dam reservoir near Hosur. The surplus amount reaches the Krishnagiri dam, which is situated 60 km downstream.*

***Excerpts of Thenpennai River Monitoring in the matter of O.S No. 2 of 2015 before Hon"ble Supreme Court & in the matter of O.A No. 125/2017 before Hon"ble NGT:***

***A) In O.S No. 2 of 2015 before Hon"ble Supreme Court***

*In compliance to Hon"ble Supreme Court directions in the Original Suit No. 02 of 2015, ajoint monitoring Report on River Cauvery and Thenpennaiyar was submitted by CPCB, KSPCB and TNPCB, wherein the monitoring team carried out sampling of water for the period September 2017 to May 2018. The committee filed the report before the Hon"ble Court in 2018 (the case is pending before Hon"ble Supreme Court). The findings of the Report is given as below:*

1. *In case of River Thenpennaiyar at Sokarasanapalli, the water quality falls below designated best use Class C during all nine monitoring and the critical parameters are BOD, DO and TC. The Total Coliform was always > 5000 MPN/1000 ml and DO was <1 except during January and February 2018 showing the DO as 2.4 and 3.8 mg/l respectively. BOD*

*also exceeded the Sewage standards notified (i.e 20 mg/l) for all nine months showing the water is highly polluted.*

2. *The River Thenpennaiyar receives the outflow of treated and untreated sewage of Bellandur and varthur lake system. Comprehensive plan of restoration of these lakes along with identifying other sources of untreated sewage into the River only will help to restore the quality of the river. Government of Karnataka may prepare*
   *such plan on priority considering the pollution issues of Bellandur and varthur lake system, which contributes to the pollution of Thenpennaiyar River.*

***B) In O.A No. 125/2017 before Hon"ble NGT***

*On the subject of remedial action for restoration of Bellandur, Agara and Varthur lakes at Bangalore, including preventing discharge and dumping of pollutants, removing encroachments from catchment area and other steps for restoration, Hon"ble Tribunal, Principal Bench, New Delhi, in the matter of O.A No. 125/2017, constituted a monitoring committee headed by Justice ShSantosh Hegde, former Judge of the Hon"ble Supreme Court to oversee the execution of the action plan. In this regard, summary of Compliance Report to the observations of the Monitoring Committee in respect of BWSSB, BDA, UDD, Minor Irrigation and KSPCB was filed before Hon"ble NGT, Principal Bench on 04.08.2020, wherein Hon"ble Tribunal vide orders dated 13.08.2020 has directed that* ***"…the left- over work may be expeditiously completed which may be reviewed by the Monitoring Committee. The status of compliance as on 31.12.2020 may be compiled by the Monitoring Committee and report furnished to this Tribunal by15.01.2021…****".*

***4.3Major Sources of Pollution***

*Major sources of pollution to River Thenpennai appear to be from untreated/partial treated sewage from Bangalore. Sewage generated from Bengaluru is the predominant reason for deterioration of lakes and water bodies in Bangalore, which is ultimately flowing into river Thenpennai.*

*There are various reasons such as ageing of sewers, encroachment of sewers, damages in the sewerage system, crown corrosion of sewers etc. for direct discharges of a part of wastewater from housing colonies and such discharge is flowing through Storm Water Drains and enters lakes in Bengaluru. Lakes in Bengaluru were created for rain water harvesting and once served as sources of water supply to the city. Lakes are under the custody of various departments namely Bangalore Bruhat Mahanagara Palike (BBMP), Bangalore Development Authority*
*(BDA), Karnataka Forest Department (KFD), Lake Development Authority (LDA), Minor Irrigation and Water Resources Department.*

*In recent years, few lakes have been converted into built-up area owing to industrialization and urbanisation. Among all the lakes, Bellandur and Varthur are highly polluted due to discharge of untreated and partially treated sewage from the city. Bellandur lake receives nearly 40 % of Bangalore"s sewage and further drains into varthur lake, then flows into Thenpennai River towards south of Bangalore. Lakes are polluted due to inadequate drainage system leading to bypassing of sewage into lakes, entry of sewage from apartments/commercial establishments into storm water drains leading to lakes, insufficient sewage treatment plants, encroachment of lakes and Rajakaluves (storm water drains), dumping of municipal solid waste, construction and demolition wastes, illegal discharge of industrial effluents etc. The foremost reason for pollution of Bellandur Lake is sewage/ Sullage flowing in the storm water drains. One of the main reasons for development of foam in the waste weir is agitation of water falling over a height and due to surfactants present in sewage. Now after establishment of sluice gate and weir*

*modification, foam formation reduced considerably. Additionally, fertilisers used by farmers of Karnataka as well as Tamilnadu may add to the pollution of river thenpennai.*

***SAMPLING AND ANALYSIS OF RIVER THENPENNAI***

***5.0Sampling Locations***

*The Joint Committee identified the following sampling points for collecting surface water samples based on the reconnaissance survey conducted in Tamilnadu and Karnataka during 28th August and 01st September, 2020.*

| ***Sl.No*** | ***State*** | ***Sampling Points (no. of samples)*** | ***Geo-Coordinates*** | |
|---|---|---|---|---|
| *1.* | *Karnataka* | *i. Agara drain*<br>*ii. Y junction (Agara/Koramangla)*<br>*iii. Bellandur diversion channel* | | |
| | | *iv. Varthur diversion channel*<br>*v. Channasandra bridge*<br>*vi. Samethanahalli weir* | | |
| *2.* | *Inter State* | *vii. Mugalur bridge*<br>*viii. Sokkarasanapalli* | | |
| *3.* | *Tamilnadu* | *ix. Bagalur bridge*<br>*x. Kodiyalam*<br>*xi. Kelavarapalli reservoir*<br>*xii. Kelavarapalli outfall* | | |

*Surface water samples of the above twelve locations were collected by Joint Committee on 09th and 10th September, 2020. Thenpennai River basin Map showing the sampling locations in Karnataka and Tamilnadu are given below as* ***Figure 4****.*

*Geographic profile and details of the sampling locations in the sequence of the flow of River Thenpennai in Krishnagiri District, Tamilnadu is provided below;*

***(i) Sokarasanapalli:***

*Sokarasanapalli is located at interstate border of Tamilnadu and Karnatakawith a distance of 500 m from the river bed.*

*Sokarasanapalli is an interstate water quality monitoring location being sampled by Karnataka on a quarterly basis. The flow of water in sokkarasanapalli was observed as greyish and with growth of floating aquatic plants in a large area.*

***(ii) Kodiyalam:*** *Kodiyalam is situated in north east direction of Hosur district, Tamilnadu. In kodiyalam, there is one anaicut which has two sluices constructed to distributewater flowing from sokkarasanapalli for agriculture purpose. Central Water Commission, Cauvery and Southern Rivers Division monitors flow of the river at this location. Water was found to be flowing in greyish color and frothy foam was floating on the river.*

***(iii)*** **Bagalur bridge:**

*Bagalur bridge is situated in north eastern direction of Hosur district, Tamilnadu. Bagalur bridge was found with water flowing in brown to greyish color and solid waste was found dumped on either sides of the river bed. Cattles were also found grazing the grass near the solid waste dumped area which could cause lethal effects due to plastics and other inert materials dumped over.*

***(iv)*** **Kelavarapalli dam:**

*Kelavarapalli dam is located in the Northwestern part of Tamil Nadu.400 cusecs of water was found flowing through spillway shutters with reasonably clear water in green color on the day of visit. Also scanty pockets of froth was seen due to water flowing with force from high fall of the dam.*

*In the areas namely, Samethanahalli, Mugalur, Sokkarasanapalli, Kodiyalam, Bagalur, Kelavarapalli water was found being pumped and used for agriculture in thenearby areas.*

**Sampling Protocol**

*The surface water samples of the above identified 12 locations in River Thenpennai were collected during 09th and 10th September, 2020 and submitted to laboratory for analysis. The Joint Committee followed CPCB"s Standard Operating Procedure for National Water Quality Monitoring Programme and Submission of data (August, 2017). The scope of the SOP is to standardise the process of sample collection, preservation, handling and analysis, preparation of data reports, etc.*

**Results and Discussion:**

*The River originates in Nandi Hills of Chikkaballapur district and the flow is mostly dry to scanty from Origin (Nandi) towards Chikkaballapur district, Kolar District, Bangalore Urban District and Hoskote taluk of Bangalore Rural district. Therefore, no samples could be collected till Hoskote tank.*

*Subsequently, it was informed by KSPCB that overflow of water from Bellandur and Varthur lakes carrying domestic sewage of Koramangala&Challaghatta and Hebbal valleys of Bangalore adds to the flow in river Thenpennai. Accordingly, samples were collected from the diversion channels of Bellandur and Varthur lakes,Agara drain, Y Junction to ascertain the sources of pollution flowing into River Thenpennai.*

*The joint committee discussed that the quality of water flowing in river Thenpennai could be assessed based on the water samples from the above four major drains/channels, river flowing in major confluence points and interstate monitoring locations identified in consultation with concerned State Pollution Control Boards such as Channasandra bridge, Samethanahalli, Mugalur bridge, Sokkarasanapalli, Bagalur bridge, Kodiyalam, Kelavarapalli.*

*The analysis results of the samples collected from all the above 12 locations were compared with Designated Best Use (DBU) criteria and Classification notified under Environment (Protection) Rules, 1986. The categorisation and classification of water flowing in River Thenpennai is given below at* ***Table 1****.*

***Table 1. Classification as per Designated Best Use Criteria of Samples collected in River Thenpennai***

| ***Sample Locations*** | ***Designated Best Use Criteria*** | | | | | | | | | | ***Class*** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *pH* | *DO* | *SS* | *Turbidity (NTU)* | *FC (MPN/100 ml)* | *BOD* | *EC (µs/cm)* | *SAR* | *Boron* | *Free Ammonia* | *Designated Best Use Criteria* |
| ***Sampling in diversion channel of Lakes / Tanks, Bengaluru – Outfall into River Thenpennai*** | | | | | | | | | | | |
| *Agara Drain* | *6.92* | *3.8* | *21.5* | *18.9* | *500* | *16* | *810* | *1.6* | *0.016* | *Nil* | *E* |
| *Y junction* | *6.87* | *4.9* | *59* | *11.4* | *900* | *15* | *762* | *1.3* | *0.019* | *Nil* | *D* |
| *Bellandur diversion channel* | *6.89* | *5* | *45* | *10.4* | *1600* | *11* | *758* | *1.4* | *0.016* | *Nil* | *D* |
| *Varthur diversion channel* | *7.04* | *3.7* | *115* | *27.5* | *500* | *10* | *706* | *1.4* | *0.015* | *Nil* | *E* |

| ***Sampling Locations in River Thenpennai*** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Channasandra bridge* | *7.02* | *3.8* | *171* | *13.8* | *900* | *11* | *931* | *2* | *0.017* | *Nil* | *E* |
| *Samethanahalli* | *6.98* | *2.4* | *78* | *35* | *1600* | *10* | *825* | *1.8* | *0.015* | *Nil* | *E* |
| *Mugalur Bridge* | *6.79* | *2.4* | *574* | *450* | *500* | *21* | *628* | *1.5* | *0.017* | *Nil* | *E* |
| *Sokkarasanapalli* | *6.83* | *3.5* | *806* | *630* | *900* | *23* | *648* | *1.6* | *0.015* | *Nil* | *E* |
| *Kodiyalam* | *6.82* | *1.6* | *1474* | *997* | *900* | *26* | *727* | *1.5* | *0.018* | *Nil* | *E* |
| *Bagalur bridge* | *6.92* | *2.2* | *1121* | *850* | *500* | *53* | *1111* | *2.2* | *0.019* | *Nil* | *E* |
| *Kelavarapalli Reservoir* | *7.35* | *4.7* | *50* | *12.4* | *500* | *11* | *1069* | *2.4* | *0.019* | *Nil* | *D* |
| *Kelavarapalli Outfall* | *7.19* | *5.2* | *10* | *7.5* | *900* | *10* | *1049* | *2.2* | *0.017* | *Nil* | *D* |
| *Designated Best Use Criteria* | *A - Drinking Water Source without conventional treatment but after disinfection*<br>*B - Outdoor bathing (Organised)*<br>*C - Drinking water source after conventional treatment and disinfection*<br>*D-Propagation of wildlife and Fisheries*<br>*E-Irrigation, Industrial Cooling, Controlled waste disposal* | | | | | | | | | | |
| *Classification of River Thenpennai* | *The analysis of Water Samples collected at 12 locations joining River Thenpennai shows that the Water Quality of the River falls under the Class E as per Designated Best Use Criteria notified under Environment (Protection) Rules, 1986.* | | | | | | | | | | |

*Analysis of water quality in River Thenpennai reveal that Dissolved oxygen concentration was found be above > 4mg/l only in kelavarapalli reservoir, its outfall, Y junction, and Bellandur diversion channel. The water quality was found to be deteriorated in terms of presence of oxygen from channasandra bridge till Bagalur bridge of River Thenpennai and also in varthur diversion channel and Agara drain. Improved oxygen level found in kelavarapalli reservoir may be attributed to large area of the reservoir allowing the suspended solids to settle and the water flowing through sluices with a high rise fall. Further, greenish plants/algal growth in scanty pockets seen in Kelavarapalli and Sokkarasanapalli known as Eutrophication, arises from the oversupply of nutrients (N & P), which leads to overgrowth of plants and algae. Degradation of dead algae and plants by microbes consuming dissolved oxygen in the water may lead to the state of hypoxie.*

*Further, BOD of the water was found to be not complying in all the sampled locations as per Designated Best Use Criteria notified under Environment (Protection) Rules, 1986. Wherein, BOD is found to be beyond the permissible limit in Bagalur bridge (53 mg/l) when compared with the General Standards for discharge of Environmental Pollutants Part-A: Effluents notified under The Environment (Protection) Rules, 1986,which is also shown in Figure 5 below.*

*The total and faecal coliform analysis indicates the „potability" of water & its suitability for consumption/drinking. The count measures the concentration of total coliform bacteria associated with the possible presence of disease causing organisms. The Total Coliform was found to be non complying in all the sampling points of River Thenpennai. Analysis of Faecal coliform count in River Thenpennai shows that the concentration of microbial count in the range of 500 to 1600 MPN/100 ml which may be attributed to discharge of untreated and partially treated sewage into the River.*

*Results of suspended solids in the Analysis of water quality in River*

*Thenpennai were compared with the prescribed limits of General Standards for discharge of Environmental Pollutants Part-A: Effluents notified under The Environment (Protection) Rules, 1986, which reveal that the values were not complying in the locations viz., Channasandra bridge, Mugalur bridge, Sokkarasanapalli, Bagalur bridge, Kodiyalamand in Varthur diversion channel. The larger the Suspended solids, the larger shall be the presence of bacteria, protozoa and viruses. High TSS wastewater cannot be easily disinfected, as the suspended particles "hide" these microorganisms and also react with chemical disinfectants. The Physico-Chemical Parameters analysed for the samples collected in River Thenpennai is given at* ***Table 2****. Figure 7 below shows the comparison chart of TSS, TDS and total hardness.*

***Table 2. Analysis Results of Physico Chemical Parameters in River Thenpennai.***

| *Sample Locations* | ***Physico-chemical Parameters (mg/l)*** | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *TDS* | *COD* | *TC* | *Total Alk* | *Fluoride* | *Chloride* | *Sulphate* | *O-Phosphate* | *Total Phosphate* | *Anionic surfactant* | *Surface Active Agents* | *Ammoniacal Nitrogen* | *Total Hardness* | *Calcium* | *TKN* | *Nitrate-N* | *Nitrite-N* | *TOC* | *Na* | *K* | *Mg* | *Phenols* |
| ***Bengaluru diversion channel of Lakes / Tanks – Outfall into River Thenpennai*** | | | | | | | | | | | | | | | | | | | | | | |
| *Agara Lake* | ***476*** | ***57*** | ***1600*** | ***227*** | ***3.8*** | ***65*** | ***41*** | ***0.53*** | ***0.68*** | ***BDL*** | ***BDL*** | ***BDL*** | ***237*** | ***69*** | ***12.3*** | ***2*** | ***0.05*** | ***7.9*** | ***57*** | ***11*** | ***16*** | ***BDL*** |
| *Y junction* | ***410*** | ***53*** | ***900*** | ***216*** | ***0.19*** | ***65*** | ***62*** | ***0.47*** | ***0.61*** | ***BDL*** | ***BDL*** | ***BDL*** | ***216*** | ***62*** | ***12.6*** | ***2*** | ***0.23*** | ***6.5*** | ***44*** | ***11.8*** | ***15*** | ***BDL*** |
| *Bellandur lake* | ***414*** | ***45*** | ***1600*** | ***216*** | ***0.25*** | ***75*** | ***22*** | ***0.84*** | ***1.01*** | ***BDL*** | ***BDL*** | ***1.6*** | ***192*** | ***62*** | ***11.5*** | ***2*** | ***0.12*** | ***7*** | ***45*** | ***10.5*** | ***9*** | ***BDL*** |
| *Varthur lake* | ***408*** | ***37*** | ***900*** | ***169*** | ***3.8*** | ***75*** | ***51*** | ***0.42*** | ***0.62*** | ***BDL*** | ***BDL*** | ***BDL*** | ***188*** | ***54*** | ***11*** | ***BDL*** | ***0.12*** | ***16*** | ***44*** | ***10.2*** | ***13*** | ***BDL*** |
| ***Sampling Locations in River Thenpennai*** | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Channa sandra bridge | 536 | 41 | 900 | 216 | 3.8 | 126 | 49 | 1.06 | 1.38 | BDL | BDL | BDL | 209 | 69 | 17.3 | 5 | 0.36 | 11 | 66 | 12.2 | 9 | BDL |
| Sameth anahalli industrial zone | 484 | 33 | 1600 | 192 | 2.3 | 100 | 53 | 1.11 | 1.32 | BDL | BDL | BDL | 184 | 57 | 11.3 | 4 | 0.3 | 14 | 56 | 11.3 | 10 | BDL |
| Mugalur Bridge | 363 | 86 | 900 | 137 | 0.23 | 70 | 57 | 0.53 | 1.73 | BDL | BDL | BDL | 139 | 41 | 12.1 | 2 | 0.05 | 10.4 | 41 | 9.3 | 9 | BDL |
| Sokkarasanapalli | 363 | 90 | 900 | 157 | 0.2 | 70 | 21 | 0.63 | 0.8 | 0.34 | 0.45 | BDL | 145 | 41 | 14.8 | BDL | 0.01 | 10 | 44 | 9 | 10 | BDL |
| Kodiyalam | 404 | 98 | 1600 | 196 | 0.35 | 100 | 55 | 0.6 | 1.7 | BDL | BDL | BDL | 180 | 44 | 19.5 | 2.2 | 0.11 | 9.9 | 47 | 9.5 | 17 | BDL |
| Bagalur bridge | 640 | 204 | 900 | 298 | 1.2 | 138 | 19 | 0.93 | 1.32 | 0.43 | 0.49 | BDL | 265 | 74 | 26.9 | BDL | 0.03 | 13 | 80 | 13 | 19 | BDL |
| Kelavarapalli Reservoir | 620 | 33 | 1600 | 200 | 0.23 | 131 | 52 | 0.98 | 1.57 | BDL | BDL | BDL | 241 | 70 | 6.6 | 4.9 | 0.24 | 10.7 | 86 | 14 | 16 | BDL |
| Kelavarapalli Outfall | 612 | 41 | 1600 | 235 | 0.3 | 150 | 33 | 1.97 | 2.23 | BDL | BDL | BDL | 265 | 65 | 7.1 | 2.7 | 0.25 | 10 | 81 | 13.5 | 25 | BDL |
| Classification of River Thenpennai | The analysis of Water Samples collected at 12 locations joining River Thenpennai reveals that characteristics of water w.r.t Fluoride is not complying with the permissible limits prescribed under Drinking Water specification of Indian Standard IS 10500:2012 and General Standards for discharge of Environmental Pollutants Part-A: Effluents notified under The Environment (Protection) Rules, 1986 in the areas viz., Agara lake, Varthur lake, Channasandra bridge and Samethanahalli. | | | | | | | | | | | | | | | | | | | |

***Figure. 7 Analysis results of Suspended Solids and Total Solids***

*Analysis results of heavy metals in River Thenpennai are given at* ***Table 3*** *below. Metals and heavy metals namely, Aluminium, Chromium, Manganese, Iron, Cobalt, Nickel, Copper, Zinc, Total Arsenic, Selenium, Cadmium, Mercury and Lead were analysed in all the 12 locations of River.*

***Table 3. Heavy Metal Concentrations of 12 locations in River Thenpennai***

| **Sample Locations** | **Heavy Metals in mg/l** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Al* | *Cr* | *Mn* | *Fe* | *Co* | *Ni* | *Cu* | *Zn* | *Total As* | *Se* | *Cd* | *Hg* | *Pb* |
| ***Sampling in diversion channel of Lakes / Tanks, Bengaluru – Outfall into RiverThenpennai*** | | | | | | | | | | | | | |
| *Agara Drain* | *0.661* | *0.009* | *0.152* | *1.380* | *BLQ* | *BLQ* | *0.004* | *0.066* | *BLQ* | *BLQ* | *BLQ* | *0.001* | *BLQ* |
| *Y junction* | *0.640* | *0.003* | *0.221* | *1.405* | *BLQ* | *0.003* | *0.031* | *0.051* | *BLQ* | *BLQ* | *BLQ* | *0.005* | *0.006* |
| *Bellandur diversion channel* | *0.668* | *BLQ* | *0.182* | *1.174* | *0.001* | *0.003* | *0.010* | *0.046* | *BLQ* | *BLQ* | *BLQ* | *0.012* | *0.005* |
| *Varthur diversion channel* | *0.758* | *BLQ* | *0.225* | *1.637* | *BLQ* | *BLQ* | *0.013* | *0.042* | *0.001* | *BLQ* | *BLQ* | *0.005* | *0.005* |
| ***Sampling Locations in River Thenpennai*** | | | | | | | | | | | | | |
| *Channa sandra bridge* | *0.174* | *BLQ* | *0.200* | *0.728* | *BLQ* | *BLQ* | *0.006* | *42.051* | *BLQ* | *BLQ* | *BLQ* | *0.003* | *BLQ* |
| *Sameth anahalli weir* | *0.354* | *BLQ* | *0.110* | *0.990* | *BLQ* | *BLQ* | *BLQ* | *0.003* | *BLQ* | *BLQ* | *BLQ* | *0.006* | *BLQ* |
| *Mugalur Bridge* | *1.378* | *BLQ* | *0.219* | *3.148* | *BLQ* | *BLQ* | *0.024* | *0.042* | *BLQ* | *BLQ* | *BLQ* | *0.003* | *0.007* |
| *Sokkara sanapalli* | *1.798* | *BLQ* | *0.268* | *4.202* | *0.003* | *0.004* | *0.022* | *0.062* | *BLQ* | *BLQ* | *BLQ* | *BLQ* | *0.008* |
| *Kodiyalam* | *3.239* | *0.003* | *0.379* | *10.286* | *0.007* | *0.010* | *BLQ* | *0.172* | *BLQ* | *BLQ* | *0.004* | *BLQ* | *0.025* |
| *Bagalur bridge* | *1.510* | *BLQ* | *0.348* | *4.891* | *0.003* | *0.005* | *0.010* | *0.096* | *BLQ* | *BLQ* | *BLQ* | *BLQ* | *0.010* |
| *Kelavar apalli Reservoir* | *BLQ* | *BLQ* | *0.216* | *0.104* | *BLQ* | *BLQ* | *BLQ* | *21.483* | *BLQ* | *BLQ* | *BLQ* | *0.002* | *BLQ* |
| *Kelavar apalli Outfall* | *BLQ* | *BLQ* | *0.200* | *0.221* | *BLQ* | *BLQ* | *BLQ* | *BLQ* | *BLQ* | *BLQ* | *BLQ* | *0.002* | *BLQ* |

*A. Water Quality of tanks/diversion channels leading to River*

*B. Water Quality of River Thenpennai*

***Figure. 8 Analysis results of Metals and Heavy Metal***

*Heavy metal analysis of samples collected in River Thenpennai shows that non-permissible concentration of mercury was found in Bellandur lake (0.012 mg/l) followed by non-permissible levels of Zinc in channasandra bridge and kelavarapalli. Further, non-permissible levels of Iron were found in Mugalur bridge, Sokkarasanapalli,Bagalurand Kodiyalam. Nowadays, due to a variety of anthropogenic actions, the river water typically receives untreated sewage, domestic waste, industrial and agricultural effluents leading to polluted river stretch.*

*Analysis results reveal that concentration of fluoride has been found to be not complying in the locations namely, Agara drain, Varthur diversion channel, Channasandra bridge and Samethanahalli weir. The concentration of fluoride in the River Thenpennai in the above areas were reported to be in the range of 0.19 to 3.8 mg/l, which may be attributed to usage of groundwater as drinking water source along with water supplied by Bangalore Water Supply and Sewerage Board followed by untreated sewage discharge into the river. However, as reported by World Health Organisation in its report Fluoride in Drinking Water, Fluorides may also enter a river as a result of industrial discharges (Slooff et al., 1988). The maximum level of fluoride which the body may tolerate is 1.5 parts per million (ppm) which is often based on water fluoride content. The other sources for fluoride are infiltration of agricultural runoff containing chemical fertilisers, improper disposal of liquid waste from industries, alumina smelting, cement production and ceramic and brick firing. Analysis results of Fluorides, Phosphates and Nitrates are given as* ***Figure 9 and 10*** *respectively.*

***Figure. 9 Analysis results of Fluorides and Phosphates***

*Nitrogen and phosphorus in all forms are major rate limiting elements essential for the growth of algae and other vegetation in water bodies leading to a state called eutrophication. The greenish color water with large vegetation growth is common sight for not only lakes and ponds but also slow moving rivers. Eutrophication leads to many problems related to water quality: • Large Dissolved oxygen variation leads to fish kills • Filling the water body with dead algae and other vegetation. • Decomposition of dead algae and vegetation at the bottom causing oxygen depletion and further release of nutrient. • Release of algal toxins and odors causing substances make the water unsuitablefor human and animal consumption.*

***Figure. 10 Analysis results of Nitrates***

*The water quality was also analysed for the presence of pesticides namely, Anilopho, 2-4 D, Carbaryl, Beta Endosulfan, Aldrin, Dieldrin, Alpha HCH, Alpha Endosulfan, Beta HCH, Delta HCH, Endosulfan sulphate, Ethion, Gamma HCH, o,p‟ DDD, o,p‟ DDE, o,p‟ DDT, p,p‟ DDD, p,p‟ DDE, p,p‟ DDT, Methyl parathion, Malathion, Chlorpyriphos. However, no traces of pesticides was found in the samples collected in River Thenpennai and channels/drain/overflow of tanks leading to the River.*

*Analysis of water samples collected also reveal that no presence of Anionic Surfactants and Surface Active Agents in River Thenpennai except in Sokkarasanapalli and Bagalur bridge.*

*It is submitted that, there recorded an average rainfall of more than 100 mm on the previous night of sampling i.e 09.09.2020. Subsequent to the rainfall day, the locations namely, Agara drain, Y junction, Bellandur diversion channel, Varthur diversion channel, Channasandra bridge, Samethanahalli were inspected and samples were collected on 10.09.2020.*

***Findings and Observations :***

1. *The stretch of the river is mostly dry to scanty from Origin (Nandi) towards Chikkaballapur district, Kolar District, Bangalore Urban District and Hoskote taluk of Bangalore Rural district. Overflow of water from Bellandur and Varthur lakes carrying domestic sewage of Koramangala & Challaghatta and Hebbal valleys of Bangalore adds to the flow in river Thenpennai thereby causes frothing of river stretch.*
2. *The Joint committee has also observed that flow of Surface water in River Thenpennai carries about a portion of treated wastewater from STPsi.e 300 MLD {750 (STP capacity) – 450 (Treated water diverted to*

*Kolar & Chikkaballapur)} and untreated sewage i.e258 MLD (i.e866 MLD – 608 MLD) of Bangalore, as informed by BWSSB.*

3. *Solid Waste dumping was found in the locations including Agara drain, Bellandur diversion channel, Y Junction, Channasandra bridge, Mugalur bridge and bagalur bridge, which needs to be removed by the concerned agencies of the State Government.Tamilnadu Pollution Control Board has instructed the Block Development Officer for taking action for proper disposal of solid waste and domestic sewage in the area of investigation, which is provided in Section 6.0 of Chapter VI.*
4. *Frothy flow was found in locations namely, Samethanahalli, Mugalur, Kodiyalam, Kelavarapalli which may be attributed to mix of industrial effluents and domestic sewage flowing from the areas. However, it is also noted that no presence of surface active agents and anionic surfactants were found in the samples collected during the monitoring except in Sokkarasanapalli and Bagalur bridge.*
5. *Analysis results of River Thenpennai reveals that the quality of the surface water flowing in River Thenpennai falls under Category E of the Designated Best Use Criteria notified under Environment (Protection) Rules, 1986, which is attributed to absence of sufficient dissolved oxygen and presence of suspended solids followed by faecal coliform in all the locations. There appears deteriorated Dissolved Oxygen in the river stretches from Channasandra bridge to Bagalur bridge.*
6. *Faecal coliform count in River Thenpennai were found to be in the concentration of 500 to 1600 MPN/100 ml which may be attributed to discharge of untreated and partially treated sewage with night soil contamination.*
7. *No traces of pesticides were found in the surface water samples collected.*
8. *It was observed that water flowing in samethanahalli, mugalur, sokkarasanapalli, kodiyalam, bagalur, kelavarapalliis being pumped and used for agriculture in the nearby fields/farms, which may be checked for water quality, on a regular basis by concerned authorities to ensure the water quality, as it is also being used for edible food crops. Necessary steps may be taken by the agricultural departments of respective State Governments.*
9. *The surface water quality needs improvement in terms of dissolved oxygen, Total Coliform/Faecal Coliform, suspended solids, dissolved solids, nitrates, phosphates and heavy metals.*
10. *Therefore, the joint committee recommends development of Biodiversity park and wetland as per CPCB Guidelines titled „Guidelines for setting up of Biodiversity parks in Floodplains of Rivers of India, including River Ganga", at suitable locations as a means of remedial measures.*

*In the matter of O.A No. 111 of 2020, Tamilnadu Pollution Control Board carried out inspections of unauthorized dyeing units on 14.09.2020 based on the telephonic message received from the public of Paduthepalli village, Hosur Taluk, Krishnagiri district. During the inspection, TNPCB made followingobservations;*

*Two unauthorized dyeing units carrying out dyeing of cotton fabric/hosieries were found operational, namely (a) M/s Veeraraj Dyeing, SF No. 156/1, Pauthepalli Village, Nanthimangalam Post, Hosur Taluk, Krishnagiri District, owned by SmtYellamma, w/o Sh Bowseruvappa and (b) M/s Moorthy dyeing, SF No. 209/3B2, Pauthepalli village,*

*Nanthimangalam post, Hosur taluk, Krishnagiri district, owned by Smt. Sikkathayamma, w/o ShKembaiyya.*

*(i) The above units have not obtained Consent to Operate from TNPCB and permission from other Government agencies/authorities. The units were found to be drawing water from agri borewell for the dyeing activity and discharging untreated dyeing effluent into the River Thenpennai*

*through pipeline causing pollution of River.*

*(ii) The above two units were found to be located within 5 km from the Riverbed of Thenpennai, against the regulations passed by G.O Ms. No. 127/E&F/EC Dept./ECIII/ dated 08.05.1998.*

*(iii) No Effluent Treatment Plant was provided for the treatment of the trade effluent generated and the untreated dyeing colored effluent was being discharged directly into River Thenpennai through pipeline.*

*(iv) TNPCB sought permission from DC, Krishnagiri and Chairman of District Coordination Committee for Krishnagiri district to stop the illegal discharge of effluent into water bodies/land and to take stringent action against defaulting units as per the guidelines.*

*(v) Subsequent to the approval of the Chairman, DCC dated 15.09.2020, actions were taken to disconnect TNEB power supply followed by demolishing of machineries/shed installed by the unauthorized dyeing units on 17.09.2020 by the members of DCC with police protection, to prevent any such dyeing operations in the future. Photographs taken before and after demolishing the units are provided as Figure 11 below:*

*Samples at sokkarasanapalli village have been continued till date. From the said analysis reports, it has been revealed that parameters such as Dissolved oxygen, Biochemical oxygen demand and Total Coliform are exceeding the Class B of Designated Best Use (DBU) criteria and Classification notified under Environment (Protection) Rules, 1986.*

*It has also been submitted that, the industries generating trade effluent in Krishnagiri District are treating their trade effluent through Effluent Treatment Plants and the treated effluent are being either recycled back to their process or discharged on their own land for green belt development after satisfying the standards prescribed by the Board. There is no discharge of trade effluent into river thenpennai from Krishnagiri district. However, all the industries are being closely monitored by Tamilnadu Pollution Control Board. A note on the water quality analysis carried out by TNPCB is appended as* ***Annexure V****.*

***A. Action Taken by TNPCB with regard to Solid Waste Management and domestic sewagemanagement***

*On the basis of field survey and investigation carried out by the joint committee in Bagalur bridge along River Thenpennai, the following instructions have been given to the Block Development Officer, Hosur Panchayat Union, Hosur, Krishnagiri District by TNPCB;*

*(i) The Solid Waste and Biomedical waste generated from the areas viz., Bagalur covered under the local body jurisdiction shall be collected, segregated and disposed as per the provisions of Solid Waste Management Rules, 2016.*

*(ii) The Solid Wastes dumped in the banks of River Thenpennai shall be cleared immediately around the river bed in Bagalur area and near Bagalur Bridge, and to dispose them in a proper scientific manner as per the provisions of Solid Waste Management Rules, 2016.*

*Similarly, TNPCB has given instructions to the Block Development officer of Hosur panchayat Union in Hosur, Krishnagiri District that the domestic sewage generated from the households, commercial establishments and other activities shall not be discharged into River Thenpennai, and the entire sewage shall be treated and disposed by providing suitable treatment system.*

*In this regard, the local body has also been instructed to submit action taken report w.r.t solid waste management and sewage management*

*alongwith short term and long term action plan to avoid discharging of sewage into River from the inhabitants of Bagalur.* ***6.1 Long Term and Short Term Action Plan for improving the Water Quality of River Thenpennai***

*The joint monitoring team comprising of CPCB, KSPCB and TNPCB have reported in the case of Original Suit No. 02 of 2015 that, "the River Thenpennaiyar receives the outflow of treated and untreated sewage of Bellandur and Varthur lake system. Comprehensive plan of restoration of these lakes along with identifying other sources of untreated sewage into the River only will help to restore the quality of the river. Government of Karnataka may prepare such plan on priority considering the pollution issues of Bellandur and Varthur lake system, which contributes to the Pollution of Thenpennaiyar River". Further, Hon"ble Tribunal, Principal Bench, New Delhi, in the matter of O.A No. 125/2017, constituted a monitoring committee headed by Justice ShSantosh Hegde, former Judge of the Hon"ble Supreme Court to oversee the execution of the action plan on remedial action for restoration of Bellandur, Agara and Varthur lakes at Bangalore.*

*The joint committee with due cognizance of the water quality of River Thenpennai reported in section 5.2 above and the action plan already reported by the joint monitoring team comprising of CPCB, KSPCB and TNPCB and execution of the action plan on remedial action for restoration of Bellandur, Agara and Varthur lakes at Bangalore by the monitoring committee in O.A no. 125/2017, the following long term and short term action plan has been prepared*

| ***Action Points*** | ***Present Status*** | ***Proposed Action by the Joint Committee*** | ***Agency Responsible (Timeline)*** |
|---|---|---|---|
| *Random Verification of grossly polluting (water polluting) industries located in theRiver Basin and Assessment ofwastewater management and dischargemode.* | *The information of grossly polluting industries located in the river basin along with the status of effluent management has been compiled by KSPCB.* | *Among the industries those that are Red/Orange category(small, medium and large) with treated effluent discharge option as surface water/sewer drain (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 &KSPCB (six months)* |
| *Sewage and* | *Among the* | *Feasibility study for providing* | *Feasibility* |

| | | | |
|---|---|---|---|
| *Solid Waste Management in the villages (13) adjoining River Thenpennai up till Kelavarapalli* | *villages located near River Thenpennai, Bagalur is having population of about 11,000 and the domestic sewage generation is estimated to be 0.0715 MLD. Further, Solid Waste generation is estimated to be about 1.5 Tons/day.* | *Sewage Treatment options (such as oxidations ponds/ diversion channels or wetlands etc.) by TNPCB followed by implementation by Local authority of the district.*<br><br>*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 river side.* | *study by TNPCB in consultation with local authority for implementation (six months)*<br><br>*Concerned Block Development Officer to submit to TNPCB (six months)* |
| *Regular Water Quality Monitoring at important locations* | *Water Quality is being monitored by KSPCB by installing real time monitoring stations in Bellandur and Varthur. Further, Mugalur bridge and sokkarasanapalli is being monitored under National Water Quality Monitoring Programme.* | *The trend of water quality and its improvement 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 (every year)* |

*In view of the above, a letter has been addressed to the Block Development Officer, Hosur, Krishnagiri District vide T.O. Letter dated 23.10.2020* ***(Annexure VI)*** *and instructed that the solid wastes dumped in the banks of River Thenpennai shall be cleared immediately around the river bed in Bagalur area and near Bagalur Bridge, and to dispose them in a proper scientific manner as per the provisions of the Municipal Solid Waste Management Rules, 2016.*

*Further, a letter has also been addressed to the Block Development Officer, Hosur vide T.O. Letter dated 23.10.2020* ***(Annexure VI)*** *and instructed that the sewage generated from the households, commercial establishment and other activities shall not be discharged into River Thenpennai, and the entire sewage shall be treated and disposed by providing suitable treatment system and requested to furnish the* ***short-term and Long-term action plan*** *shall be prepared and implement to avoid the discharging of Sewage into River Thenpennai ."*

6. We have also considered the Joint Committee report dated nil e-filed on 03.02.2021 received on 17.02.2021, which was extracted in para 5 of the order which reads as follows:

## CHAPTER – 1
## BACKGROUND

Hon'ble National Green Tribunal, Southern Zone, Chennai in the matter of O.A No. 111 of 2020; Tribunal on its own motion based on the News Item in Tamil Newspaper Dinamalar Chennai Edition dated 13.07.2020, "Frothing of Chemical Foam in the River Thenpennai" Vs The Principal Secretary to Government, Public Works Department, Chennai &Ors., passed orders dated 20.07.2020. Copy of Hon'ble NGT Orders dated 20/07/2020 is appended as ***Annexure I***.

Excerpts of the News Item in Tamil Newspaper Dinamalar Chennai Edition dated 13.07.2020, "Frothing of Chemical Foam in the River Thenpennai" is given below:

(i) On 13th July, 2020 about 640 Cusecs water was discharged from Kelavarapalli Reservoir, Hosur and huge amount of chemical foam was found in Thenpennai River.

(ii) The flow of water into the reservoir increased gradually from 320 cusecs (09th July, 2020) to 480 cusecs (11th July, 2020) due to heavy rainfall in the catchment area.

(iii) In general, whenever the flow of water increases in Kelavarapalli reservoir the domestic sewage and industrial effluent from Karnataka mixes into the river in huge quantity.

(iv) On the day of 13th July, 2020, a huge quantity of sewage/effluent were discharged into Thenpennai and therefore, chemical froth/foam were found floating on the surface of water flowing in Kelavarapalli and near thattakalapalli bridge.

Hon'ble Tribunal(SZ), Chennaivide its ordersdated 20.07.2020 appointed a Joint Committee to inspect the area in question and submit status as well as action taken report, if there is any violation found. The Hon'ble Tribunal has also issued following directions to the committee;

(i) To ascertain the water quality and also ascertain the sources of pollution and take action against the person who are responsible in accordance with law including imposing of environmental compensation.

(ii) To submit a long term and short term action plan with shorter time lines to protect the water body against pollution. If there is any contamination caused, the committee is also directed to suggest ways and means to remedy the same.

Hon'ble Tribunal vide aforesaid orders directed the committee to submit the report within a period of two months i.e., on or before 05.10.2020.

The Joint Committee submitted interim report on 01.10.2020 and informed the Hon'ble NGT that the report of the joint committee requires six weeks time and the report would be submitted after incorporating the analysis results of samples collected in River Thenpennaialongwith action plan. In this regard, Hon'ble NGT accepted the interim report and vide order dated 05.10.2020 directed that, *"... some more time can be given to the committee to submit the report as directed by this Tribunal...*

*The Committee is directed to submit the report on or before 26.11.2020..."*

Copy of the Hon'ble NGT Order dated 05.10.2020 is appended as ***Annexure II***.

## CHAPTER – 2
## CONSTITUTION OF JOINT COMMITTEE AND MEETINGS

In compliance to the aforesaid orders dated 20/07/2020 of Hon'ble Tribunal (SZ), Chennai, a Joint Committee comprising of following members has been constituted by Central Pollution Control Board (Nodal Agency) vide its Office Memorandum No. Tech 39/Legal(NGT)/RDS/2020-21/466-474 dated 24.08.2020 and 16.09.2020. Copy of the said Office Memorandum is appended as

***Annexure III& IV***.

| | | |
|---|---|---|
| 1. | Sh. Gunasekaran<br>Revenue Divisional Officer &<br>Sub Divisional Magistrate Hosur Division, Tamilnadu | Member |
| 2. | Sh. N Suresh<br>Superintending Engineer, WRO<br>Public Works Department Tiruvannamalai, Tamilnadu | Member |
| 3. | Sh B H Manjunath* Superintending Engineer Public Works Department<br>Bangalore Circle, Karnataka | Member |
| 4. | Sh. N Nagaraj Superintending Engineer<br>Minor Irrigation & Ground Water Development Circle, Jayanagar<br>Bangalore, Karnataka | Member |
| 5. | Dr M Senthil Kumar<br>District Environmental Engineer Tamilnadu Pollution Control BoardHosur District, Tamilnadu | Member |
| 6. | Sh. M K Prabhudev<br>Chief Environmental Officer – 2 Karnataka Pollution Control BoardBangalore, Karnataka | Member |
| 7. | ShShivanna M G<br>Assistant Commissioner (South)Bangalore Urban Karnataka | Member |
| 8. | Smt. Selvi P K<br>Scientist D, Regional DirectorateCentral Pollution Control Board Bangalore | Nodal Officer& Member |

**Subsequent to transfer of Sh. K Durugappa, Superintending Engineer vide Government of Karnataka Order dated 28-08-2020, Sh B H Manjunath, Superintending Engineer, PWD, Bangalore has been nominated as a member of the above Joint Committee.*

Three meetings were organized by Central Pollution Control Board, Bangalore (Nodal Agency) with the members of Joint Committee on 20.08.2020, 04.09.2020 and 18.09.2020 and minutes were circulated for necessary actions. First and Second Meeting of the Joint Committee were conducted on 20.08.2020& 04.09.2020 to discuss about the preliminary information to be collected before conducting Monitoring and Sampling of River Thenpennai. Therefore, the joint committee decided to collate following information from the concerned departments to carry out further investigations in the matter;

| **S.No** | **Information Required from concerned Departments / Organisations in Tamilnadu and Karnataka** |
|---|---|
| **A.** | **Minor irrigation and Water Resources Organisations** |

| | |
|---|---|
| 1. | Drainage River Map of Thenpennai. |
| 2. | Details of Water Quality Monitoring locations (viz.,drainage (flow), length, velocity etc.) in the entire stretch of river from origin till Kelavarapalli Reservoir. |
| 3. | Designated use of water flowing in the river stretch |
| 4. | Quantity of water discharged from the river stretch for irrigation and other purposes. |
| 5. | Annual Rainfall and Rainfall details for August, September, October 2020 |
| 6. | Custodian of the river to preserve the quality of water to be pristine. |
| **B.** | **State Pollution Control Boards** |
| 7. | Details of Water Quality Monitoring Locations and water quality data of the River in terms of DO, BOD, COD, TC, phosphates & others for the last three years. |
| 8. | Major Sources of pollution (industrial and domestic) –<br>(a) Status of list of industries with its type/category/classification,Effluent generation, characteristics, treatment, discharge details etc.<br>(b) Details of domestic effluent generation, treatment, discharge options etc.<br>(c) Status of Operation of Sewage Treatment Plants with its performance evaluation.<br>(d) Information regarding open dumping of solid or biomedical or hazardous waste, open burning of waste and illegal encroachment or other activities along the river bed etc. |
| **C.** | **Public Works Department** |
| 9. | Status of sewage discharge and sewerage networking plan in the unsewered area. |
| 10. | About Kelavarapalli dam and designated use of dam water. |

Subsequently, it was discussed and decided to collect the following information from Bangalore Water Supply and Sewerage Board (BWSSB), Bangalore Development Authority (BDA) and Bangalore Bruhat Mahanagara Palike (BBMP) in the second meeting of the Joint Committee conducted on 04.09.2020;

(a) Status of Sewage Treatment Plants (STPs) (existing & operational, under construction and proposed) in Koramangala&ChallaghattaValley and Hebbal Valley

(b) Drainage map / layout showing locationsof STPs with capacity and sewerage networking in those valleys

(c) Details of flow of domestic sewage measured at inlet and outlet (after treatment) of each of the STPs

(d) Performance of STPs based on its operational capacity, Waste water generated vs actual quantity treated, gap analysis andtreated waste water quality (w.r.t discharge standards of STP) in Real Time Monitoring stations installed etc.

(e) Quantum of untreated sewage flowing in Koramangala&Challaghatta and Hebbal valley with its proposed Underground Drainage network plan and others

(g) Details of plan for diversion of treated wastewater to Kolar,
Chikaballapurand other districts of Karnataka

(h) Details of Rejuvenation of lakes and water bodies in Bengaluru etc.

Third meeting of the Joint Committee was conducted on 18.09.2020 to discuss and review the status of Action taken on

the defaulters followed by Action Plan for compliance etc.

Subsequent to the orders of the Hon'ble NGT dated 05.10.2020, two meetings were organized with the state functionaries of Karnataka (BWSSB and KSPCB) on 08.10.2020 and 22.10.2020 to discuss& collate the information about the details of industries located in Karnataka near the River basin of Thenpennai and status of STPs located in Koramangla&Challaghatta and Hebbal Valley.

**CHAPTER 3**

**ABOUT RIVER THENPENNAI**

Thenpennai River also known as South Pennar or DakshinaPinakini is an interstate River. The River originates on the south eastern slopes of Chennakesava Hills, northwest of Nandidurg of Chikaballapur district in Karnataka State at an altitude of 1000m above mean sea level, which flows in the southern direction through Chikkaballapura, Bengaluru Rural and Bengaluru Urban districts in Karnataka state and descends to Tamilnadu near Hosur.

Thenpennairiver basin is one of the largest rivers of the state of Tamil Nadu. The river has supported many a civilizations of peninsular India in supplying precious water for drinking, irrigation and industry to the people of the states of Karnataka, Tamil Nadu and Pondicherry.The total length of Ponnaiyar River is 432 km, of which 112 km lies in Karnataka state, 180 km in Dharmapuri andKrishnagiri, 34 km in Thiruvannamalai and 106 km in Cuddalore, Kallakurichi and Villupuram districts of Tamil Nadu before joining Bay of Bengal. En route, it tributaries are Chinnar, Markandeyanahi, Vaniar and Pamban rivers in Tamilnadu. With a total catchment of approximately 16,019 $km^2$, it is dry for the most part of the year but swells during the north east monsoon season.

In Karnataka, the river traverses through series of zilla panchayat tanks and also Minor Irrigation tanks namely Nandi tank, Kuppalli tank, Chadalapura tank, Kothanuru tank, Kolavanahalli tank, Cikkadigenahalli tank, Bommanahalli tank, Kanithahalli tank, Muthur tank, malluru tank, Amani Bhadranakere tank in Chikkaballapur district, Hosakote Doddakere tank in Bengaluru Rural district, and Yelemallappa Chettytank in Bengaluru Urban District.Drainage basin of River Thenpennai or South Pennar flowing in Karnataka & Tamilnadu is given as **Figure 1**.

The stretch of the river is mostly dry to scanty from Origin (Nandi) towardsChikkaballapur, Kolar district, Bangalore Urban District and Hoskote taluk of Bangalore Rural districts of Karnataka. Before descending the interstate border into Tamilnadu, overflow of water from Bellandur and Varthur lakes carrying domestic sewage of Koramangala&Challaghatta andHebbal valleys of Bangalore adds to the flow in river Thenpennaithere by causes frothing in the river stretch.

**CHAPTER – 4**

**PRELIMINARY JOINT COMMITTEE SURVEY AND INVESTIGATION**

**Preliminary Reconnaissance Survey and Observations**

The Joint Committee conducted a preliminary survey during 28.08.2020 and 01.09.2020, in order to investigate the current scenario of River flowing in both the states (Karnataka and Tamilnadu). The findings of the preliminary reconnaissance survey of Chikkaballapur, Kolar districts, Bangalore Urban

District and Hoskote taluk in Bangalore rural districts in Karnataka are given below:

**(A) Chikkaballapur District:**South Pinakini river flows in Chikkaballapur, Siddlaghatta and Chintamani (border) taluks in Chikkaballapur District.

- The basin of the river is very small and for majority of the period in ayear, the river basin remains dry.
- Since this river connects many tanks, water flow can be seen onlywhen the tanks overflows.
- Under Chikkaballapur district jurisdiction, on the banks of this river,no major industries can be seen.

Photographs of the river between Bommanahalli tank and Kanithahalli tank in Chikkaballapur taluk is given below as **Figure 2**.

**(B) Kolar District:** South Pinakini river flows in Kolar, Malur and Bangarpet taluks in Kolar District.

- The basin of the river is very small and for majority of the period in ayear, the river basin remains dry.
- Since this river connects many tanks, water flow can be seen only when the tanks overflows.
- Under Kolar district jurisdiction,Markandeya major tank in Bangarpet taluk (the catchment area is in Malur taluk) discharged water only 15 years back and the tank is having a flood discharge of 8,200 Cusecs. Catchment area is 113.14 Sq miles with tank's total capacity of 807

Units which irrigates the total irrigation area of about 847 acres. At the time of discharge, water flow through this valley joins at Yarragolu dam. Water will be used for drinking purpose by people in 3 taluks namely Kolar, Bangarpet, Malur. Finally, the discharge of Yarragolu dam water joins the valley of south pennar of Krishnagiri district in Tamilnadu state.

Photograph of the river flowingin Markandaya tank of Bangarpet taluk is given as **Figure 3.**

**(C) Hoskote Taluk:** South Pinakini river flows in Hoskote taluk in BangaloreRural district.

- The basin of the river is very small and for majority of the period in ayear, the river basin remains dry.
- Water flow can be seen only when the tanks overflow in Hoskote taluk.
- Under Hoskote jurisdiction, on the banks of this river, no majorindustries can be seen.

Photograph of Hoskote tank in Hoskote taluk is given as **Figure 4**.

River also flows down in Anekal (border) in Bangalore Urban District.

In addition to above, preliminary reconnaissance survey of River basin of South Pennar flowing in Bangalore district was also conducted and the observations are given below;

**(D) Bangalore District:**Survey was carried out in the areas of River South Pennar drainage basin covering Hebbal Valley and Koramangla / Chalghatta Valley, wherein series of lakes/tanks namely, Agara, Bellandur, Varthur (K & C Valley), Yellamalappachetty lake, Kadugodi bridge, Channasandra bridge (Hebbal), Hoskote tank, Mugalur bridge followed by few industriesin Samethanahalli and Thiruvaranga were also visited and found dismantled/closed.

i. Water was found to be flowing clear from Agara lake to the

storm water drain, however domestic sewage and solid waste was found mixing down the drain near Agara lake.

ii. It was observed that due to the desilting work, temporary diversion channels were created on the outer ring of the tanks in Bellandur and Varthur for enabling flow of water through the tanks. Color of water was found to be flowing greyish in varthur as compared to Bellandur lake and it was informed that untreated domestic sewage from about 110 villages/hamlets in Bangalorejoins varthur(sewerage networking is under progress and same will be completed by 2023).

iii.Two weirs of Hoskote tanks were observed to be having less water and no flow was found during the visit.

iv. Further, water flowing in Mugalur (KSPCB monitoring location) was also observed to be frothy and greyish, where few pig farming activity were found discharging washings.

v. Some micro/small scale dyeing units were also found operational illegally and discharging untreated effluent down the drain nearly

50 maway from the river stretch in Samethanahalli weir and immediate actions were taken by Karnataka SPCB to close those units.

vi. Also, a few other non-operational/closed and dismantled dyeing units in Samethanahalli and Thiruvaranga were also visited during the survey. In Samethanahalli, water was observed to be flowing greyish and frothy, which may be attributed to joining of sewage from K&C valley. Details of Action taken on the defaulting industries, as provided by KSPCB is discussed in Section 6.0of chapter VI.

vii. Washings and droppings of piggery farms located in samethanahalli and thiruvarangamay add to organic load of the River flowing in Samethanahalli.

viii. Color of the water flowing in the tanks and course of River Thenpennai was found to be greyish in Varthur diversion channel, Agara drain, Y junction, Samethanahalli weir and Mugalur bridge.

ix. Information regarding number of STPs (operational status) and proposed STPs (capacity) of K&C Valley and Hebbal valley was explained by Bangalore Water Supply and Sewerage Board (BWSSB) during the survey with the help of layout map. Details of Sewage management in the two valleys of Bangalore is provided in section 4.4 of Chapter 4. Information about desilting work carried out in Bellandur and Varthur tanks was also shared by Bangalore Development Authority (BDA).

**Figure 5. a) Solid Waste dumping in Channasandra bridge;b) frothy foam floating in Samethanahalli weir; c) few unauthorized micro/small scale dyeing units made to close, by KSPCB in Samethanahalli; Google Earth Image of Sampling location in Samethanahalli; d) Google Earth Imageof Sampling location in Mugalur Bridge**

Then, the joint committee conducted survey in the areas of River South Pennar drainage basin flowing down southcovering Sokarasanapalli (KSPCB monitoring location), Singasadanapalli (Central Water Commission monitoring location), Kodiyalam, Bagalur villages near hosur and Kelavarapalli Reservoir in Tamilnadu.

**(E) Villages near Hosur, Tamilnadu**:

i. Details of the villages with Population density located on Thenpennai riverine namely, singasadanapalli, kodiyalam, kooliganapalli, sokkarasanapalli, bagalur, lingapuram, ottapallithinna, kanimangalam, padathepalli, nanjapuram,

sathyamangalam,muneeswararnagar,kembasandhiram ,chennasandiram,kallipuramwere provided as below;

| S.No | Name of Village | Distance from the River bed (m) | Numberof houses | Population | Population density (Sq. Km) |
|---|---|---|---|---|---|
| 1. | Singasadanapalli | 1000 | 120 | 660 | 242.50 |
| 2. | kodiyalam (kooliganapalli) | 500 | 260 | 1106 | 217.03 |
| 3. | sokkarasanapalli | 500 | 250 | 855 | 348.97 |
| 4. | bagalur | 50 | 1500 | 11000 | 2534 |
| 5. | lingapuram | 100 | 300 | 2000 | 1666.67 |
| 6. | ottapallithinna | 400 | 35 | 130 | 97.01 |
| 7. | kanimangalam | 1000 | 110 | 310 | 94.80 |
| 8. | padathepalli | 1000 | 120 | 390 | 127.03 |
| 9. | nanjapuram | - | - | - | - |
| 10. | sathyamangalam, | 500 | 255 | 1390 | 260.787 |
| 11. | kembasandhiram | 500 | 25 | 550 | 705.12 |
| 12. | chennasandiram | 600 | 300 | 1417 | 885.62 |
| 13. | kallipuram | - | - | - | - |
| | Total | | 3275 | 19808 | 7179.5 |

i. It has been informed by representative of Tamilnadu Pollution Control Board that there are no industrial discharge along the stretch of Thenpennai River in Tamilnadu and no underground sewerage lines or STPs operating near the Riverside. Further, Tamilnadu SPCB informed that following industries are located near the river stretch;

| S. No | Name of the industry | Classification/ Category | Discharge Options | Details of Consent | Remarks |
|---|---|---|---|---|---|
| 1. | M/s Premier VVG & SPG Mills Pvt Ltd., Belathur, Bagalur | Textile / Large /Red | Zero Liquid Discharge and there isno discharge of industrial effluent / sewage into River Thenpennai | Consent to Operate issued on 08.11.2001 valid up to 31.03.2003<br><br>Renewal of Consent issued on 20.03.2017 valid upto 31.03.2022 | The unit is located at a distance of 900 meter from River Thenpennai.<br><br>Re-commissioning the dyeing and printing operation during first week of October 2020. |

| | | | | | |
|---|---|---|---|---|---|
| 2. | M/s Exide Industries Ltd., Chichuruganapalli, Sevaganapalli | integrated battery manufacturing unit/ Large /Red | Zero Liquid Discharge and there is no discharge of industrial | CTO issued on 13.11.2013 valid | 4 km away from riverand |
| | | | effluent / sewage into River Thenpennai | up to 31.03.2014<br><br>Renewal of Consent issued on 20.12.2017 valid upto 31.03.2022 | divided by undulated terrain |
| 3. | M/s Shahi Exports Pvt. Ltd., Sevaganapalli | Textile garment unit / Large / Green | STP and treated effluent utilized for green belt and there is no discharge of Sewage into River Thenpennai | CTO issued on 22.08.2011 valid up to 31.03.2012<br><br>RCO issued on 03.07.2020 valid upto 31.03.2022 | No discharge outside premises |

iii.Color of Water flowing in the River stretch was observed to be greyish in sokkarasanapalli, frothy/slight greyish in kodiyalam, brownish to grey in Bagalur bridge and greenish inKelavarapalli Reservoir.

iv.Solid waste dumping and mixing of domestic sewage into the river stretch flowing through bagalur bridge was also observed and Tamil Nadu Pollution Control Board was asked to take note of the scenario for appropriate actions. Action taken report is given in section 6.0 of chapterVI.

v.Representative of Tamilnadu Pollution Control Board has informed that sewage generation has been estimated as 0.8 MLD (approx.) from Bagalur village and 0.01 MLD to 0.15 MLD (approx.) from rest of the villages in Tamilnadu. It was also informed that the sewage generated in the above hamlets percolates within the hamlet limits and therefore may not get discharged into River Thenpennai.

vi.Average rainfall of Kelavarapalliis about 533 mm.

**About Kelavarapalli Reservoir**

Kelavarapalli Reservoir Project wasbuilt in 1978-1995 atKrishnagiri district, Tamilnadu and the Reservoir or Dam is situated at a distance of 8 km from Karnataka and 10 km away from Hosur,tamilnadu across the River Thenpennai, which actually originates from the eastern slopes of Chennakesava Hills in karnataka. The dam further leads water to the districts of Dharmapuri, Tiruvannamalai, Kallakuruchi, Villupuram and Cuddalorebefore joining Bay of Bengal. Google earth image of Kelavarapalli reservoir with sampling locations are shown as **Figure 7**.

Kelavarapalli Dam is situated atthe latitude of 12°52'42"N and longitude of 78°46'06'' E which is located in the Northwestern part of Tamil Nadu, bordering Karnataka and Andhra Pradesh states. The Dam is operational from 10th November 2002. Salient features of

the dam include:

**(a) <u>Salient features of Dam:</u>**

1. Type of dam :Masonnry cum earthern Dam
2. Length : 665m
3. Height : 13.50m
4. FRL Water spread Area : 433.20 Hec
5. Volume : 0.481 TMC
6. Catchment area : 2442.00 Sq.Km
7. Gross Capacity : 13.61 Mcum
8. Maximum Water level : 831.50 9. FRL : 831.50
10. Water Supply Period : 1st Crop = July to December – 150 Days
    : 2nd Crop = February to May - 90 Days
11. Spillway Type : Ogee Crest Type
12. Spillway Nos : 7 Nos
13. Spillway Size : 12.20m x 6.10m
14. Crest Level : 825.40
15. Design flood Discharge : 88980 Cusecs
16. River Sluice : 1 No ( 1.20m x1.82m)
17. Canal Sluice : 2 Nos (0.90m x 1.50m)
18. Length of Canals

    Right Main Canal (RMC) =21.99 km

    Left Main Canal (LMC) =25.500 km
    LMC Branch canal I = 5.40 km
    LMC Branch canal II = 3.80 km
    LMC Branch canal III = 2.78 km
    LMC Branch canal IV = 4.96 km
    LMC Branch canal V = 0.71 km
    Distributaries I of B.C IV = 1.80 km
    Distributaries II of B.C. IV =2.00 km
    Distributaries I of B.C V = 1.48 km
    Distributaries II of B.C. V = 1.15 km
    **Total = 71.57km**
19. Irrigation Area : 3676 Hec
20. Approved Estimate : Rs.551.50 Lakhs
21. Revised Estimate : Rs.606.70 Lakhs

**(b) <u>Present condition of Dam (as on 09.09.2020)</u>**

1. Water level :12.30 m
2. Water storage level :343.74 Mcuft
3. Water incoming :400 cusecs
4. Water discharge :400 cusecs

Kelavarapalli Dam SIPCOT Central Water Supply Scheme provided 14.00 MLD of water to Hosur Municipality Phase I during 2015-16. Water supply of Hosur Municipality is mainly being met out from the Government of Tamilnadu'sHoganekkal water supply Project which was executed & maintained by Tamilnadu Water Supply and Drainage Board (a statutory body under Tamilnadu Government) and the other sources are from Kelavarapalli Dam, one from Perandapalli River and few local wells. At present the entire Municipality is receiving 30.39 MLD of water supply from all

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(*S
ource:* *https://www.twadboard.tn.gov.in/content/major-water-supply-schemes- 1518*).

Since Thenpennai river is the sole water source in Krishnagiri, Tiruvannamalai and Cuddalore districts, it has been extensively dammed. As it enters Tamilnadu, the water is stored in the Kelavarapalli dam reservoir near Hosur. The surplus amount reaches the Krishnagiri dam, which is situated 60 km downstream.

**Excerpts of Thenpennai River Monitoring in the matter of O.S No. 2 of 2015 before Hon'ble Supreme Court&in the matter of O.A No. 125/2017 before Hon'ble NGT**

**A) In O.S No. 2 of 2015 before Hon'ble Supreme Court**

In compliance to Hon'ble Supreme Court directions in the Original Suit No. 02 of 2015, ajoint monitoring Report on River Cauvery and Thenpennaiyarwas submitted by CPCB, KSPCB and TNPCB, wherein the monitoring team carried out sampling of water for the period September 2017 to May 2018. The committee filed the report before the Hon'ble Court in 2018 (the case is pending before Hon'ble Supreme Court). The findings of the Report is given as below:

1. In case of River Thenpennaiyar at Sokarasanapalli, the water quality falls below designated best use Class C during all nine monitoring and the critical parameters are BOD, DO and TC. The Total Coliform was always
   > 5000 MPN/1000 ml and DO was <1 except during January and February 2018 showing the DO as 2.4 and 3.8 mg/l respectively. BOD also exceeded the Sewage standards notified (i.e20 mg/l) for all nine months showing the water is highly polluted.
2. The River Thenpennaiyar receives the outflow of treated and untreated sewage of Bellandur and varthur lake system. Comprehensive plan of restoration of these lakes along with identifying other sources of untreated sewage into the River only will help to restore the quality of the river. Government of Karnataka may prepare such plan on priority considering the pollution issues of Bellandur and varthur lake system, which contributes to the pollution of Thenpennaiyar River.

**B) In O.A No. 125/2017 before Hon'ble NGT**

On the subject of remedial action for restoration of Bellandur, Agara and Varthur lakes at Bangalore, including preventing discharge and dumping of pollutants, removing encroachments from catchment area and other steps for restoration, Hon'ble Tribunal, Principal Bench, New Delhi, in the matter of O.A No. 125/2017, constituted a monitoring committee headed by Justice ShSantosh Hegde, former Judge of the Hon'ble Supreme Court to oversee the execution of the action plan. In this regard, summary of Compliance Report to the observations of the Monitoring Committee in respect of BWSSB, BDA, UDD, Minor

Irrigation and KSPCB was filed before Hon'ble NGT, Principal Bench on 04.08.2020, wherein Hon'ble Tribunal vide orders dated 13.08.2020 has directed that "***…the left-over work may be expeditiously completed which may be reviewed by the Monitoring Committee. The status of compliance as on 31.12.2020 may be compiled by the Monitoring Committee and report furnished to this Tribunal by 15.01.2021…***".

**Major Sources of Pollution**

Major sources of pollution to River Thenpennai appear to be from untreated/partial treated sewage from Bangalore. Sewage generated from Bengaluru is the predominant reason for deterioration of lakes and water bodies in Bangalore, which is ultimately flowing into river Thenpennai.

There are various reasons such as ageing of sewers, encroachment of sewers, damages in the sewerage system, crown corrosion of sewers etc. for direct discharges of a part of wastewater from housing colonies and such discharge is flowing through Storm Water Drains and enters lakes in Bengaluru. Lakes in Bengaluru were created for rain water harvesting and once served as sources of water supply to the city. Lakes are under the custody of various departments namely Bangalore BruhatMahanagaraPalike (BBMP), Bangalore Development Authority (BDA), Karnataka Forest Department (KFD), Lake Development Authority (LDA), Minor Irrigation and Water Resources Department.

In recent years, few lakes have been converted into built-up area owing to industrialization and urbanisation. Among all the lakes, Bellandur and Varthur are highly polluted due to discharge of untreated and partially treated sewage from the city. Bellandur lake receives nearly 40 % of Bangalore's sewage and further drains into varthur lake, then flows into Thenpennai River towards south of Bangalore. Lakes are polluted due to inadequate drainage system leading to bypassing of sewage into lakes, entry of sewage from apartments/commercial establishments into storm water drains leading to lakes, insufficient sewage treatment plants, encroachment of lakes and Rajakaluves (storm water drains), dumping of municipal solid waste, construction and demolition wastes, illegal discharge of industrial effluents etc.The foremost reason for pollution of Bellandur Lake is sewage/ Sullage flowing in the storm water drains. One of the main reasons for development of foam in the waste weir is agitation of water falling over a height and due to surfactants present in sewage. Now after establishment of sluice gate and weir modification, foam formation reduced considerably, informed KSPCB. Additionally, fertilisers used by farmers of Karnataka as well as Tamilnadu may add to the pollution of river thenpennai.

**Status of Domestic Sewage Management in Bangalore**

Sewage is one of the major causes for poor water quality of rivers, lakes and water bodies causing adverse impacts on human health and aquatic species. Bangalore Water Supply and Sewerage Board (BWSSB) was formed in 1964 to provide Sewerage system in areas of Bangalore in a phased manner. Domestic Sewage generation in Bengaluru has been estimated as 1160 MLD which is attributed to increased urbanization and population. The actual amount of sewage generated would be higher since a large number of private bore wells exist and there is no scientific estimate of the quantity of water withdrawn from the

borewells.

Sewage flow follows the regional topography and flow down along the three principal valleys and five minor valleys ensuring free flow of sewage without any major pumping requirement. Also treated wastewater of Bangalore is also being diverted to recharge drought ridden stretch/tanks of chikbellapur and kolar districts.

KSPCB informed that the industries have been encouraged to opt for Zero Liquid Discharge (ZLD). Further, 08 CETPs are operational for treating effluent generated from small scale industries from Bangalore. KSPCBhas been directed by CPCB to make entries in the river basin module on status of ETPs in the state based on Hon'ble Supreme Court and Hon'ble NGT Orders and the same is under progress.

In compliance to Hon'ble Supreme Court directions in the Original Suit No. 02 of 2015, Chief Secretary, Government of Karnataka submitted to Hon'ble Supreme Court in 2018 that,*"…fourteen STPs of total 129 MLD for 110 villages under Japan International Cooperation Agency (JICA) Fund Scheme were proposed. It was then assessed that, with the establishment of those STPs, the total capacity of STPs to treat the sewage from Bengaluru would rise up from the existing capacity of 1050 MLD to 1575 MLD by 2020 and 1704 MLD by 2022*."

In this connection, BWSSB has now informed that fourteen STPs of total 124 MLD for 110 villages under Japan International Cooperation Agency (JICA) Fund Scheme were proposed and 3 STPs of 400 MLD capacities are under construction with the help of Megacity Revolving Fund (MCRF). It is now assessed that, with the establishment of those STPs, the total capacity of STPs to treat the sewage from Bengaluru would rise up from the existing capacity of 1182.5 MLD to 1582.5 MLD by 2021 and same would be increased to 1726.5 MLD by 2024.

Domestic sewage generation of hamlets/areas namely, Gottigere, JP Nagar, Puttenahalli, Bilekahalli, Arekere Lake, Hulimavu Lake, Madiwala lake, BTM Layout, HSR Layout, Agara Lake, Shivajinagar, Ulsoor Lake, Domlur, Indiranagar, HAL, Kalasipalya, Lalbagh Road, KH Road, Shantinagar Bus Station, National Games Village, Ejipura, Sinivagilu located in the stretch of Hebbal and K&C Valley, Bangaloreis around 292 MLD &574 MLD (total 866 MLD) respectively, of which608 MLD (70 %) is being treated in 21 STPs(having capacity of736.5 MLD located in the two valleys).Further, as per Action plan of BWSSB,110 MLD of the balance sewage will be taken into sewerage network by completing the works in 2022.

BWSSB has also reported that as per the understanding with Minor Irrigation Department the treated waste water from 21 STPs are to be diverted to Kolar and Chikkaballapur districts to recharge the drought ridden tanks. Presently,it is estimated that approximately 290 MLD of treated wastewater (as against the quantity of 400 MLD as per MoU with Minor Irrigation) from 4 STPs located in K&C valley treated water is discharged to 126 minor irrigation tanks located in Kolar District. Further, it has been reported that around 100 MLD of treated wastewater from 03 STPs located in Hebbal Valley is discharged to 65 minor irrigation tanks of chikkaballapur district. The information on the quantity of treated wastewaterthat has been diverted for recharging the minor irrigation tanks, as provided by Minor Irrigationare given below;

| **S No** | **District** | **No. of Tanks filled till October, 2020** | **Water Pumped (TMC)** |
|---|---|---|---|
| 1. | Kolar | 78 | 6.69 |

| | | | |
|---|---|---|---|
| 2. | Chikkaballapur | 24 | 1.16 |
| **Total** | | **102** | **7.85** |

The status of sewage generation, treatment and enhancement of treatment capacity plan, as reported by BWSSB, is given below:

| | |
|---|---|
| A. Quantity of Sewage generated in Bangalore | 1160 MLD |
| B. Quantity of Sewage generated inK&C and Hebbal Valley, Bangalore | 866 MLD |
| C. Number of STPs in two valleys | 21 Nos. |
| D. Treatment capacity of the21 STPs in two valleys | 736.5 MLD |
| E. Quantity of Sewage actually treated by 21 STPs in two valleys (on an average) | 608 MLD |
| F. Quantity of treated wastewater diverted for irrigation toKolar &Chikkaballapur districts | 390 MLD from 07 STPs |
| G. Total gap in wastewater treatment in the two valleys ofBangalore | (i) Gap in installed Capacity of STPs = 866 – 736.5 = 129.5 MLD<br>(ii) Gap in actual treatment of wastewater in STPs = Installed capacity (736.5 MLD) – Operational Capacity (608 MLD) = 128.5 MLD<br><br>Total Gap in waste water treatment = (i) + (ii) = 258 MLD |
| H. Total Enhancement of Sewage | K&C valley = 150 MLD |
| iTreatment capacity of STPs in two valleys, Bangalore estimated by BWSSB | Hebbalvalley =133 MLD<br><br>Total enhancement of capacity of STPs =<br>283 MLD |
| iEnhancement of sewage treatment<br>STP capacity of STPs in entire benguluru<br>(Covering both the valleys) estimated by<br>BWSSB | 1582.5 MLD by 2021<br>1726.5 MLD by 2024 |

BWSSB has informed that in Hebbal valley, 02 STPs of 100 MLD capacity at Hebbal and 20MLD STP at K.R Puram is under construction and the same will be commissioned in 2021. In addition to that, construction of one STP with 07 MLD capacity is also under progress in Hebbal valley. To further enhance the sewage treatment capacity, a STP of 6MLD at Horamavu in Hebbal Valley is planned and the same will be operational by 2023. An average 59 MLD of sewage generation is estimated (which includes sewage generation from part of 110 villages in Hebbal Valley) where presently there is no sewer network.

In case of Koramangla & Challghatta valley, of 02 STPs, one STP at Chikkabegur has already started treating sewage and another STP (150 MLD) will be commissioned by Dec 2020. Status of Sewage Treatment Plants of K&C and Hebbal Valleys in Bangalore along with its performance in terms of capacity, as provided by BWSSB is given as **Annexure V.**

Considering 135 lpcd water supply for the population of

1062278 in 110 villages in 2019, the estimated quantum of sewage generation from 110 villages of BBMP limit in K&C and Hebbal Valley is calculated as 143.41 MLD, which remains untapped for treatment in STPs due to absence of Under Ground Drainage Network by BWSSB.

In addition to above, as per the Government of Karnataka Notification No. FEE 316 EPC 2015, Bengaluru dated 19.01.2016, KSPCB Clearance is required for the following projects:

a) All residential group housing projects/apartments with 20 units and above or having total BUA of 2,000 sq.m including basement

b) Commercial constructions projects (commercial complexes, office, IT related activities etc) with total built up area of 2,000 sq.m and above

c) Educational institutions with or without hostel facility having total built up area of 5,000 sq.m and above

d) Townships and area development projects with an area of 10 acres and above

Accordingly, KSPCB is covering apartments with 20 flats & above and commercial buildings of 2000 sq.mtsand area development projects of 10 acres and above only. All the projects covered by KSPCB under consent mechanism are required to provide Sewage Treatment Plant (STP) for treating the sewage. However, sewage generated from the smaller projects like apartments with less than 20 flats, commercial buildings with less than 2000 sq.mts built up area are required to be treated by BWSSB.

KSPCB has filed two Criminal cases against BWSSB w.r.t pollution of Bellandur Lake. Further, as per the directions of Hon'ble NGT in the matter of O.A.125/2017, Karnataka State Pollution Control Board has imposed Environmental Compensation against the defaulting Apartments/Housing Associations. Few projects have approached the Hon'ble High Court of Karnataka in this matter. As per the directions of Hon'ble High Court of Karnataka,Karnataka State Pollution Control Board is following the due procedure. Details of action taken by KSPCB on the defaulting apartments/housing complexes are provided in section 6.0 of Chapter VI.

## CHAPTER V

## SAMPLING AND ANALYSIS OF SURFACE WATER FLOWING INTO RIVERTHENPENNAI

### Sampling Locations

The Joint Committee identified the following sampling points for collecting surface water samples based on the reconnaissance surveyconducted in Tamilnadu and Karnataka during 28th August and 01st September, 2020;

| S.No | State | Sampling Points (no. of samples) | Geo-Coordinates | |
|---|---|---|---|---|
| 1. | Karnataka | i. Agara drain | 12.923 °N | 77.639 °E |
| | | ii. Y junction drain (Agara/Koramangla) | 12.923 °N | 77.646 °E |
| | | iii. Bellandur diversion | | 77.677 °E |

| | | | | |
|---|---|---|---|---|
| | | channel<br>iv. Varthur diversion channel<br>v. Channasandrabridge<br>vi. Samethanahalli weir | 12.931 °N<br>12.945 °N<br>12.985 °N<br>12.970 °N | 77.746 °E<br>77.776 °E<br>77.784 °E |
| 2. | Inter State Boundary | vii. Mugalur bridge (Karnataka<br>viii. Sokkarasanapalli (Tamilnadu) | 12.853 °N<br>12.896 °N | 77.831 °E<br>77.831 °E |
| 3. | Tamilnadu | ix. Bagalur bridge<br>x. Kodiyalam<br>xi. Kelavarapalli reservoir<br>xii. Kelavarapalli outfall | 12.769 °N<br>12.769 °N<br>12.857 °N<br>12.831 °N | 77.875 °E<br>77.877 °E<br>77.823 °E<br>77.871 °E |

Surface water samples of the above twelve locations were collected by Joint Committee on 09th and 10th September, 2020. Thenpennai River basin Map

Geographic profile and details of the sampling locations in the sequence of the flow of River Thenpennai is provided below;

**(i) Agara drain:**

Agara lake spread over 98 acre, is located at Agara in southeast direction of Bengaluru. The lake receives outfall from the upstream Madivala lake. The excess water from Agara lake overflows through the storm water drain to Bellandur lake near southwest direction. At Agara, the flow of water was found clear and no frothing was found. However, domestic sewage and solid waste was found mixed down the drain with greyish color leading toBellandur.

**(ii)Bellandur diversion channel:**

Bellandur Lake is located in southeast direction of Bengaluru and is the largest lake in the city and the weir flow of Agara Lake joins Bellandur lake. It was observed that, of the two Bellandur Lake weirs, water was flowing in one weir towards Southern direction (near Bellandur village, popularly called as Bellandur bridge) through channels created on the outer ring of the lake, whereas Northern weir (near Yamalur, popularly called as Yamalur bridge) was taken up for restoration work by BDA.

It was also observed that, the storm water drain near bellandur lake was found with lots of floating materials such as plastic bags and municipal solid waste etc. This might be due to local people residing in the area with no awareness about solid waste collection and management. There is a need for clearance of solid waste dumped in the storm water drain and lake by local authorities and monitoring by KSPCB to protect the lake from pollution. At Bellandur, the flow of water was found slightly clear and no frothing was found.

**(i) Varthur diversion channel:**

The Varthur Lake takes the main inflow from outflow weirs of Bellandur Lake, along with some other water entry points (about 6 to 9) between outer ring road (that connects Marathalli with Sarjapura road) and Varthur, between which the Varthur Lake

lies. It was seen that Varthur Lake has 02 outflow weirs viz: Northern weir near Sigma Softech Park, Ramagondanahalli (popularly called as Varthur Kodi) and Southern weir near Varthur (popularly called as Varthur Bridge).

Even in varthur lake, water was flowing only in southern weir as the Northern weir was taken up for restoration work by BDA.It was informed that both the weir flow of the lake joins at a point at about 600 m in South Eastern direction of the Northern weir, thereafter, the stream joins the South Pennar River, through Ajjigondahalli bridge, at about 3.8 Km in east of north eastern direction. The joined streams of out flow weir of Varthur Lake flowing en route, Ajjigondahalli Bridge, represents entire wastewater / domestic effluent of Koramangla&Challaghatta Valley flowing into South Pennar River. At varthur, the flow of water was found greyish to brown and no frothing wasfound.

**(iii) Channasandra bridge:**

Channasandra Bridge located on Hope Farm Junction towardsChikkaTirupathi Road, flows in Southern direction in order to further confluence with the out flow of Varthur Lake (K & C Valley).

Whereas, lakes of Hebbal Valley flows into YelemalappaChetty Lake (YMC Lake) located on Old Madras Road. Over flow through the outflow weir of YMC Lake joins the South Pennar River at about 4.9 Km South East of YMC Lake and flows in southern direction to joinchannas and rabridge. At channasandra, the flow of water was found green in colorwith absolutely no frothing. However, solid waste was found dumped near the bridge.

**(iv) Samethanahalli weir:**

Samethanahalliis located downstream of varthur lake at south eastern direction of Bangalore outskirts. It was observed that domestic and industrial discharges of samethanahalliconfluences into tributaries of South pennar river basin and flows down to join downstream of ajjingondahalli towards Mugalur. At samethanahalli, the flow of water was greyish with froth floating over.

Few unauthorized micro/small scale dyeing units were found operational during the visit and found discharging untreated effluent down the drain. KSPCB has taken immediate action to close those units.

**(v) Mugalur bridge:**

Mugalur Bridge is on Sarjapura – ChikkaTirupati road which is at a distance of about 11.47 Km south east of northern weir of Varthur Lake. The South Pennar River leaves Karnataka State and enters into Tamil Nadu and joins Kelavarapalli reservoir (about 7.5 Km north east of Hosur city) which is located at about 14.18 Km south east of Mugalur Bridge. At Mugalur Bridge, the flow of water was greyish to brown and it contained scanty pockets of froth here and there. Solid waste dumping and outlet of pig farming into the river was found near the area.

**(vi) Sokarasanapalli:**

Sokarasanapalli is located at interstate border of Tamilnadu and Karnataka with a distance of 500 m from the river bed.

Sokarasanapalli is an interstate water quality monitoring location being sampled by Karnataka on a quarterly basis. The flow of water in sokkarasanapalli was observed as greyish and with growth of floating aquatic plants in a large area.

**(vii) Kodiyalam:**

Kodiyalam is situated in north east direction of Hosur district, Tamilnadu. In kodiyalam, there is one anicut which has two sluices constructed to distributewater flowing from sokkarasanapalli for agriculture purpose. Central Water Commission, Cauvery and Southern Rivers Division monitors flow of the river at this location. Water was found to be flowing in greyish color and frothy foam was floating on the river.

**(viii) Bagalur bridge:**

Bagalur bridge is situated in north eastern direction of hosur district, Tamilnadu. Bagalur bridge was found with water flowing in brown to greyish color and solid waste was found dumped on either sides of the river bed. Cattles were also found grazingthe grass near the solid waste dumped area which could cause lethal effects due to plastics and other inert materials dumped over.

**(ix) Kelavarapalli dam:**

Kelavarapalli dam is located in the Northwestern part of Tamil Nadu.400 cusecs of water was found flowing through spillway shutters with reasonablyclear water in green color on the day of visit. Also scanty pockets of froth were seen due to water flowing with force from high fall of the dam.

In the areas namely, samethanahalli, mugalur, sokkarasanapalli, kodiyalam, bagalurkelavarapalli water was found being pumped and used for agriculture in the nearby areas.

**Sampling Protocol**

The surface water samples of the above identified 12 locations in River Thenpennai were collected during 09th and 10th September, 2020 and submitted to laboratory for analysis. The Joint Committee followed CPCB's Standard Operating Procedure for National Water Quality Monitoring Programme and Submission of data (August, 2017). The scope of the SOP is to standardise the process of sample collection, preservation, handling and analysis, preparation of data reports, etc.

**Results and Discussion:**

The River originates in Nandi Hills of Chikkaballapur district and the flow is mostly dry to scanty from Origin (Nandi) towards Chikkaballapur district, Kolar District, Bangalore Urban District and Hoskote taluk of Bangalore Rural district. Therefore, no samples could be collected till Hoskote tank.

Subsequently, it was informed by KSPCB that overflow of water from Bellandur and Varthur lakes carrying domestic sewage of

Koramangala&Challaghatta and Hebbal valleys of Bangalore adds to the flow in river Thenpennai. Accordingly, samples were collected from the diversion channels of Bellandur and Varthur lakes,Agara drain, Y Junction to ascertain the sources of pollution flowing into River Thenpennai.

The joint committee discussed that the quality of water flowing in river Thenpennaicould be assessed based on the water samples from the above four major drains/channels, river flowing in major confluence points and interstate monitoring locations identified in consultation with concerned State Pollution Control Boards such as Channasandra bridge, Samethanahalli, Mugalur bridge, Sokkarasanapalli, Bagalur

bridge, Kodiyalam, Kelavarapalli.

The analysis results of the samples collected from all the above 12 locations were compared with Designated Best Use (DBU) criteria and Classification notified under Environment (Protection) Rules, 1986. The categorisation and classification of water flowing in River Thenpennai is given below at **Table 1**.

**Table 1. Classification as per Designated Best Use Criteria of Samples collected in River Thenpennai**

| **Sample Locations** | **Designated Best Use Criteria** | | | | | | | | | | **Class** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | pH | DO | SS | Turbidity (NTU) | FC (MPN /100 ml) | BOD | EC (µs/cm) | SAR | Boron | Free Ammonia | Designated Best Use Criteria |
| **Sampling in diversion channel of Lakes / Tanks, Bengaluru – Outfall into River Thenpennai** | | | | | | | | | | | |
| AgaraDrain | 6.92 | 3.8 | 21.5 | 18.9 | 500 | 16 | 810 | 1.6 | 0.016 | nil | E |
| Y junction | 6.87 | 4.9 | 59 | 11.4 | 900 | 15 | 762 | 1.3 | 0.019 | nil | D |
| Bellandur diversion channel | 6.89 | 5 | 45 | 10.4 | 1600 | 11 | 758 | 1.4 | 0.016 | nil | D |
| Varthur diversion channel | 7.04 | 3.7 | 115 | 27.5 | 500 | 10 | 706 | 1.4 | 0.015 | nil | E |
| **Sampling Locations in River Thenpennai** | | | | | | | | | | | |
| Channasandra bridge | 7.02 | 3.8 | 171 | 13.8 | 900 | 11 | 931 | 2 | 0.017 | nil | E |
| Samethanahalli | 6.98 | 2.4 | 78 | 35 | 1600 | 10 | 825 | 1.8 | 0.015 | nil | E |
| Mugalur Bridge | 6.79 | 2.4 | 574 | 450 | 500 | 21 | 628 | 1.5 | 0.017 | nil | E |
| Sokkarasanapalli | 6.83 | 3.5 | 806 | 630 | 900 | 23 | 648 | 1.6 | 0.015 | nil | E |
| Kodiyalam | 6.82 | 1.6 | 1474 | 997 | 900 | 26 | 727 | 1.5 | 0.018 | nil | E |
| Bagalur bride | 6.92 | | 1121 | 850 | 500 | 53 | 1111 | | 0.019 | nil | E |
| Kelavarapa lli | 7.35 | | 50 | 12.4 | 500 | 11 | 1069 | | 0.019 | nil | D |
| Kelavarapa llil | 7.19 | | 10 | 7.5 | 900 | 10 | 1049 | | 0.017 | nil | D |
| Designated Best Use Criteria | A - Drinking Water Source without conventional treatment but after disinfectionB - Outdoor bathing (Organised)<br>C - Drinking water source after conventional treatment and disinfectionD – Propagation of Wild life and Fisheries<br>E - Irrigation, Industrial Cooling, Controlled Waste disposal | | | | | | | | | | |
| Classification of River Thenpennai | The analysis of Water Samples collected at 12 locations joining River Thenpennai shows that the Water Quality of the River falls under the Class E as per Designated Best Use Criteria notified under Environment (Protection) Rules, 1986. | | | | | | | | | | |

Analysis of water quality in River Thenpennai reveal that Dissolved oxygen concentration was found be above > 4mg/l only in kelavarapalli reservoir, its outfall, Y junction, and Bellandur diversion channel. The water quality was found to be deteriorated in terms of presence of oxygen fromchannasandra bridge till Bagalur bridge of River Thenpennai and alsoinvarthur diversion channelandAgara drain. Improvedoxygen level

foundinkelavarapalli reservoir may be attributed to large area of the reservoir allowing the suspended solids to settle and the water flowing through sluices with a high rise fall. Further, greenish plants/algal growth in scanty pockets seen in Kelavarapalli and Sokkarasanapalli known as Eutrophication, arises from the oversupply of nutrients (N & P), which leads to overgrowth of plants and algae. Degradation of dead algae and plants by microbes consuming dissolved oxygen in the watermay lead to the state of hypoxie.

Further, BOD of the water was found to be not complying in all the sampled locations as per Designated Best Use Criteria notified under Environment (Protection) Rules, 1986. Wherein,BOD is found to be beyond the permissible limit inBagalur bridge (53 mg/l) when compared with the General Standards for discharge of Environmental Pollutants Part-A: Effluents notified under The Environment (Protection) Rules, 1986, which is also shown in Figure 10 below.

The total and faecal coliform analysis indicates the 'potability' of water & its suitability for consumption/drinking. The count measures the concentration of total coliform bacteria associated with the possible presence of disease causing organisms. The Total Coliform was found to be non complying in all the sampling points of River Thenpennai.Analysis of Faecal coliform count in River Thenpennai shows that the concentration of microbial count in the range of 500 to 1600 MPN/100 ml which may be attributed to discharge of untreated and partially treated sewage into the River.

Figure 11 gives the comparison of TC and FC in the 12 locations of River Thenpennai.

Results of suspended solids in the Analysis of water quality in River Thenpennai were comparedwith the prescribed limits of General Standards for discharge of Environmental Pollutants Part-A: Effluents notified under The Environment (Protection) Rules, 1986, whichreveal that the values were not complying in the locations viz., Varthur diversion channel, Channasandra bridge, Mugalur bridge, Sokkarasanapalli,Bagalur bridge, Kodiyalam. The larger the Suspended solids, the larger shall be the presence of bacteria, protozoa and viruses. High TSS wastewater cannot be easily disinfected, as the suspended particles "hide" these microorganisms and also react with chemical disinfectants. The Physico-Chemical Parameters analysed for the samples collected in River Thenpennai is given at **Table 2**. Figure 12 below shows the comparison chart of TSS, TDS and total hardness.

**Table 2. Physico-chemical Parameters (mg/l) analysed in River Thenpennai**

| Sample Locations | COD | Total Coliform | Total Alk | Fluoride | Chloride | Sulphate | O-Phosphate as P | Total Phosphate as P | Anionic surfactant | Surface Active Agents | Ammoniacal Nitrogen | Total Hardness | Calcium | TKN | Nitrate-N | Nitrite-N | TOC | Na | K | Mg | Phenols |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Bengaluru diversion channel of Lakes / Tanks – Outfall into River Thenpennai** | | | | | | | | | | | | | | | | | | | | | |
| Agara Drain | 57 | 1600 | 227 | 3.8 | 65 | 41 | 0.53 | 0.68 | BDL | BDL | BDL | 237 | 69 | 12.3 | 2 | 0.05 | 7.9 | 57 | 11 | 16 | BDL |
| Y junction drain | 53 | 900 | 216 | 0.19 | 65 | 62 | 0.47 | 0.61 | BDL | BDL | BDL | 216 | 62 | 12.6 | 2 | 0.23 | 6.5 | 44 | 11.8 | 15 | BDL |
| Bellandur diversion channel | 45 | 1600 | 216 | 0.25 | 75 | 22 | 0.84 | 1.01 | BDL | BDL | 1.6 | 192 | 62 | 11.5 | 2 | 0.12 | 7 | 45 | 10.5 | 9 | BDL |
| Varthur diversion channel | 37 | 900 | 169 | 3.8 | 75 | 51 | 0.42 | 0.62 | BDL | BDL | BDL | 188 | 54 | 11 | BDL | 0.12 | 16 | 44 | 10.2 | 13 | BDL |
| **Sampling Locations in River Thenpennai** | | | | | | | | | | | | | | | | | | | | | |
| Channasandra bridge | 41 | 900 | 216 | 3.8 | 126 | 49 | 1.06 | 1.38 | BDL | BDL | BDL | 209 | 69 | 17.3 | 5 | 0.36 | 11 | 66 | 12.2 | 9 | BDL |
| Samethanahalli industrialzone | 33 | 1600 | 192 | 2.3 | 100 | 53 | 1.11 | 1.32 | BDL | BDL | BDL | 184 | 57 | 11.3 | 4 | 0.3 | 14 | 56 | 11.3 | 10 | BDL |
| MugalurBridge | 86 | 900 | 137 | 0.23 | 70 | 57 | 0.53 | 1.73 | BDL | BDL | BDL | 139 | 41 | 12.1 | 2 | 0.05 | 10.4 | 41 | 9.3 | 9 | BDL |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sokkarasanapalli | 90 | 900 | 157 | 0.2 | 70 | 21 | 0.63 | 0.8 | 0.34 | 0.45 | BDL | 145 | 41 | 14.8 | BDL | 0.01 | 10 | 44 | 9 | 10 | BDL |
| Kodiyalam | 98 | 1600 | 196 | 0.35 | 100 | 55 | 0.6 | 1.7 | BDL | BDL | BDL | 180 | 44 | 19.5 | 2.2 | 0.11 | 9.9 | 47 | 9.5 | 17 | BDL |
| Bagalurbridge | 204 | 900 | 298 | 1.2 | 138 | 19 | 0.93 | 1.32 | 0.43 | 0.49 | BDL | 265 | 74 | 26.9 | BDL | 0.03 | 13 | 80 | 13 | 19 | BDL |
| Kelavarapalli | 33 | 1600 | 200 | 0.23 | 131 | 52 | 0.98 | 1.57 | BDL | BDL | BDL | 241 | 70 | 6.6 | 4.9 | 0.24 | 10.7 | 86 | 14 | 16 | B |
| | | | | | | | | | | | | | | | | | | | | | D L |
| | 41 | 1600 | 235 | 0.3 | 150 | 33 | 1.97 | 2.23 | BDL | BDL | BDL | 265 | 65 | 7.1 | 2.7 | 0.25 | 10 | 81 | 13.5 | 25 | B D |
| Classification of River Thenpennai | The analysis of Water Samples collected at 12 locations joining River Thenpennai reveals that characteristics of water w.r.t Fluoride is not complying with the permissible limits prescribed under Drinking Water specification of Indian Standard IS 10500:2012 and General Standards for discharge of Environmental Pollutants Part-A: Effluents notified under The Environment (Protection) Rules, 1986 in the areas viz., Agara drain, Varthur diversion channel, Channasandra bridge and Samethanahalli. | | | | | | | | | | | | | | | | | | | |

Analysis results of heavy metals in River Thenpennai are given at **Table 3**below. Metals and heavy metals namely, Aluminium, Chromium, Manganese, Iron, Cobalt, Nickel, Copper, Zinc, Total Arsenic, Selenium, Cadmium, Mercury and Lead were analysed in all the 12 locations of River.

**Table 3. Heavy Metal Concentrations of 12 locations in River Thenpennai**

| Sample Locations | Heavy Metals in mg/l | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Al | Cr | Mn | Fe | Co | Ni | Cu | Zn | Total As | Se | Cd | Hg | Pb |
| **Sampling in diversion channel of Lakes / Tanks, Bengaluru – Outfall into River Thenpennai** | | | | | | | | | | | | | |
| Agara Drain | 0.661 | 0.009 | 0.152 | 1.380 | BLQ | BLQ | 0.004 | 0.066 | BLQ | BLQ | BLQ | 0.001 | BLQ |
| Y junction | 0.640 | 0.003 | 0.221 | 1.405 | BLQ | 0.003 | 0.031 | 0.051 | BLQ | BLQ | BLQ | 0.005 | 0.006 |
| Bellandur diversion channel | 0.668 | BLQ | 0.182 | 1.174 | 0.001 | 0.003 | 0.010 | 0.046 | BLQ | BLQ | BLQ | 0.012 | 0.005 |
| Varthur diversion channel | 0.758 | BLQ | 0.225 | 1.637 | BLQ | BLQ | 0.013 | 0.042 | 0.001 | BLQ | BLQ | 0.005 | 0.005 |
| **Sampling Locations in River Thenpennai** | | | | | | | | | | | | | |
| Channasandra bridge | 0.174 | BLQ | 0.200 | 0.728 | BLQ | BLQ | 0.006 | 42.051 | BLQ | BLQ | BLQ | 0.003 | BLQ |
| Samethanahalli weir | 0.354 | BLQ | 0.110 | 0.990 | BLQ | BLQ | BLQ | 0.003 | BLQ | BLQ | BLQ | 0.006 | BLQ |
| Mugalur Bridge | 1.378 | BLQ | 0.219 | 3.148 | BLQ | BLQ | 0.024 | 0.042 | BLQ | BLQ | BLQ | 0.003 | 0.007 |
| Sokkarasanapalli | 1.798 | BLQ | 0.268 | 4.202 | 0.003 | 0.004 | 0.022 | 0.062 | BLQ | BLQ | BLQ | BLQ | 0.008 |
| Kodiyalam | 3.239 | 0.003 | 0.379 | 10.286 | 0.007 | 0.010 | BLQ | 0.172 | BLQ | BLQ | 0.004 | BLQ | 0.025 |
| Bagalur bridge | 1.510 | BLQ | 0.348 | 4.891 | 0.003 | 0.005 | 0.010 | 0.096 | BLQ | BLQ | BLQ | BLQ | 0.010 |
| Kelavarapalli Reservoir | BLQ | BLQ | 0.216 | 0.104 | BLQ | BLQ | BLQ | 21.483 | BLQ | BLQ | BLQ | 0.002 | BLQ |
| Kelavarapalli Outfall | BLQ | BLQ | 0.200 | 0.221 | BLQ | BLQ | BLQ | BLQ | BLQ | BLQ | BLQ | 0.002 | BLQ |

Analysis results reveal that concentration of fluoride has been found to be not complying in the locations namely, Agara drain, Varthur diversion channel, Channasandra bridge and Samethanahalli weir. The concentration of fluoride in the River Thenpennai in the above areas were reported to be in the range of 0.19 to 3.8 mg/l, which may be attributed to usage of groundwater as drinking water sourcealongwith water supplied by Bangalore Water Supply and Sewerage Board followed by untreated sewage discharge into the river. However, as reported by World Health Organisation in its report Fluoride in Drinking Water, Fluorides may also enter a river as a result of industrial discharges (Slooff et al., 1988). The maximum level of fluoride which the body may tolerate is 1.5 parts per million (ppm) which is often based on water fluoride content. The other sources for fluoride are infiltration of agricultural runoff containing chemical fertilisers, improper disposal of liquid waste from industries, alumina smelting, cement production and ceramic and brick firing. Analysis results of Fluorides, Phosphates and Nitrates are given as **Figure 13 and 14** respectively.

Nitrogen and phosphorus in all forms are major rate limiting elements essential for the growth of algae and other vegetation in water bodies leading to a state called eutrophication. The greenish color water with large vegetation growth is common sight for not only lakes and ponds but also slow moving rivers. Eutrophication leads to many problems related to water quality: • Large Dissolved oxygen variation leads to fish kills • Filling the water body with dead algae and other vegetation. • Decomposition of dead algae and vegetation at the bottom causing oxygen depletion and further release of nutrient. • Release of algal toxins and odors causing substances make the water unsuitable for human and animal consumption.

diversion channel, Varthur diversion channel, Channasandra bridge, Samethanahalli were inspected and samples were

collected on 10.09.2020.

**Findings and Observations of the Joint Committee:**

1. The stretch of the river is mostly dry to scanty from Origin (Nandi) towards Chikkaballapur district, Kolar District, Bangalore Urban District and Hoskote taluk of Bangalore Rural district. Overflow of water from Bellandur and Varthur lakes carrying domestic sewage of Koramangala&Challaghatta and Hebbal valleys of Bangalore adds to the flow in river Thenpennai thereby causes frothing of river stretch.
2. The Joint committee has also observed that flow of Surface water in River Thenpennai carries about a portion of treated wastewater from STPsi.e 300 MLD {750 (STP capacity) – 450 (Treated water diverted to Kolar &Chikkaballapur)} and untreated sewage i.e258 MLD (i.e866 MLD – 608 MLD) of Bangalore, as informed by BWSSB.
3. Solid Waste dumping was found in the locations including Agara drain, Bellandur diversion channel, Y Junction, Channasandra bridge, Mugalur bridge and bagalur bridge, which needs to be removed by the concerned agencies of the State Government.Tamilnadu Pollution Control Board has instructed the Block Development Officer for taking action for proper disposal of solid waste and domestic sewage in the area of investigation, which is provided in Section 6.0 of Chapter VI.
4. Frothy flow was found in locations namely, Samethanahalli, Mugalur, Kodiyalam,Kelavarapalli which may be attributed to mix of industrial effluents and domestic sewage flowing from the areas. However, it is also noted that no presence of surface active agents and anionic surfactants were found in the samples collected during the monitoring except in Sokkarasanapalli and Bagalur bridge.
5. Analysis results of River Thenpennai reveals that the quality of the surface water flowing in River Thenpennai falls under Category E of the Designated Best Use Criteria notified under Environment (Protection) Rules, 1986, which is attributed to absence of sufficientdissolved oxygen and presence of suspended solids followed by faecal coliform in all the locations.There appearsdeterioratedDissolved Oxygen in the river stretches from Channasandra bridge to Bagalur bridge.
6. Faecal coliform count in River Thenpennai were found to be in the concentration of 500 to 1600 MPN/100 ml which may be attributed to discharge of untreated and partially treated sewage with night soil contamination.
7. No traces of pesticides were found in the surface water samples collected.
8. It was observed that water flowing in samethanahalli, mugalur, sokkarasanapalli, kodiyalam, bagalur, kelavarapalliis being pumped and used for agriculture in the nearby fields/farms, which may be checked for water quality, on a regular basis by concerned authorities to ensure the water quality, as it is also being used for edible food crops. Necessary steps may be taken by the agricultural departments of respective State Governments.
9. The surface water quality needs improvement in terms of dissolved oxygen, Total Coliform/Faecal Coliform, suspended solids, dissolved solids, fluorides, nitrates, phosphates, organic pollutants and heavy metals.
10. Therefore, the joint committee recommends development of Biodiversity park and wetland as per CPCB Guidelines titled 'Guidelines for setting up of Biodiversity parks in Floodplains of

Rivers of India, including River Ganga', at suitable locations and its feasibility may be identified by State Government Authorities of Karnataka and Tamilnadu as a means of remedial measures.

## CHAPTER VI

## ACTION PLAN AND REMEDIAL MEASURES

### 6.0 Action Taken Report on Defaulters

**A. Action taken on defaulting industries by Tamilnadu Pollution Control Board**

In the matter of O.A No. 111 of 2020, Tamilnadu Pollution Control Board carried out inspections of unauthorized dyeing units on 14.09.2020 based on the telephonic message received from the public of Paduthepalli village, Hosur Taluk, Krishnagiri district. During the inspection, TNPCB made following observations;

(i) Two unauthorized dyeing units carrying out dyeing of cotton fabric/hosieries were found operational, namely (a) M/s Veeraraj Dyeing, SF No. 156/1, Pauthepalli Village, Nanthimangalam Post, Hosur Taluk, Krishnagiri District, owned by SmtYellamma, w/o Sh Bowseruvappa and (b) M/s Moorthy dyeing, SF No. 209/3B2, Pauthepalli village, Nanthimangalam post, Hosur taluk, Krishnagiri district, owned by Smt. Sikkathayamma, w/o ShKembaiyya.

(ii) The above units have not obtained Consent to Operate from TNPCB and permission from other Government agencies/authorities. The units were found to be drawing water from agriborewell for the dyeing activity and discharging untreated dyeing effluent into the River Thenpennai through pipeline causing pollution of River.

(iii) The above two units were found to be located within 5 km from the Riverbed of Thenpennai, against the regulations passed by G.O Ms. No. 127/E&F/EC Dept./ECIII/ dated 08.05.1998.

(iv) No Effluent Treatment Plant was provided for the treatment of the trade effluent generated and the untreated dyeing colored effluent was being discharged directly into River Thenpennai through pipeline.

(v) TNPCB sought permission from DC, Krishnagiri and Chairman of District Coordination Committee for Krishnagiri district to stop the illegal discharge of effluent into water bodies/land and to take stringent action against defaulting units as per the guidelines.

(vi) Subsequent to the approval of the Chairman, DCC dated 15.09.2020, actions were taken to disconnect TNEB power supply followed by demolishing of machineries/shed installed by the unauthorized dyeing units on 17.09.2020 by the members of DCC with police protection, to prevent any such dyeing operations in the future. Photographs taken before and after demolishing the units are provided as Figure 15 below:

**Figure 15. Action Taken on Unauthorized dyeing units by Tamil Nadu Pollution Control Board**

**A. Water Quality Analysis of River Thenpennaiby TNPCB**

TNPCB informed that samples at sokkarasanapalli village have been continuedtill date. From the said analysis reports, it has been revealed that parameters such as Dissolved oxygen, Biochemical oxygen demand and Total Coliform are exceeding the standards prescribed by the Board.

It has also been submitted by TNPCB that, the industries generating trade effluent in Krishnagiri District are treating their trade effluent through Effluent Treatment Plants and the treated effluent are being either recycled back to their process or discharged on their own land for green belt development after satisfying the standards prescribed by the Board. There is no discharge of trade effluent into river thenpennai from Krishnagiri district. However, all the industries are being closely monitored by Tamilnadu Pollution Control Board. A note on the water quality analysis carried out by TNPCB is appended as ***Annexure VI***.

**B. Action Taken by TNPCB with regard to Solid Waste Management anddomestic sewage management**

On the basis of field survey and investigation carried out by the joint committee in Bagalur bridge alongside River Thenpennai, the following instructions have been given to the Block Development Officer, Hosur Panchayat Union, Hosur, Krishnagiri District by TNPCB;

(i) The Solid Waste and Biomedical waste generated from the areas viz., Bagalur covered under the local body jurisdiction shall be collected, segregated and disposed as per the provisions of Solid Waste Management Rules, 2016.

(ii) The Solid Wastes dumped in the banks of River Thenpennai shall be cleared immediately around the river bed in Bagalur area and near Bagalur Bridge, and to dispose them in a proper scientific manner as per the provisions of Solid Waste Management Rules, 2016.

Similarly, TNPCB has given instructions to the Block Development officer of Hosur panchayat Union in Hosur, Krishnagiri District that the domestic sewage generated from the households, commercial establishments and other activities shall not be discharged into River Thenpennai, and the entire sewage shall be treated and disposed by providing suitable treatment system.

In this regard, the local body has also been instructed to submit action taken report w.r.t solid waste management and sewage management alongwith short term and long term action plan to avoid discharging of sewage into River from the inhabitants of Bagalur.

**C. Action Taken on defaulters by Karnataka State Pollution ControlBoard**

**(i) Action taken on defaulting industries**

1. Thenpennai or DakshinaPinakini River catchment area is spread over inthe following districts;

a. Part of Bengaluru Urban
b. Part of Bengaluru Rural

c. Part of Kolar
d. Part of Chikkaballapura
2. Following Industrial Areas are located inThenpennai or DakshinaPinakini River catchment area:
i. Jigani
ii. Electronic city
iii. Veerasandra Industrial Area
iv. Bommasandra Industrial Area
v. Old Airport and HAL Complex.
vi. Doddanakundi Industrial Area.
vii. Sadaramangala Industrial Area
viii. White field
ix. New Air Port
x. Aerospace park near New Air Port
xi. Hardware Park near New Air Port
xii. Software Park near New Air Port
xiii. Hoskote Industrial Area
xiv. Malur Industrial Area
3. None of the above Industrial Areas are located on the banks ofThenpennai or DakshinaPinakini River
4. All the above Industrial Areas are located away from theDakshina Pinakini River.
5. None of the industries are permitted to discharge its effluents in toThenpennai or DakshinaPinakini River.
6. Quantity of effluent generation, treatment and utilization in Thenpennai or DakshinaPinakini River catchment area is as below: -

**(i) Generation of Domestic and trade effluents from industries**

| Total No.of industries (Red+Orange) | Quantity of effluent generated/treated in MLD | | Total |
|---|---|---|---|
| | Domestic | Trade | |
| 882 | 27.04 | 19.58 | 46.62 |

**(ii) Treatment and disposal ofDomestic and trade effluents fromindustries**

| Total generation of Domestic and Trade effluent in MLD | Treatment and disposal of effluent in MLD | | | | | |
|---|---|---|---|---|---|---|
| | Septic Tank andSoak Pit (Domestic only) | UGD | CETP | Reuse/On land | Stream | River |
| 46.62 | 1.79 | 0.96 | 0.65 | 43.22 | 00 | 00 |

*Note: As observed from the above table about 93% of treated effluents areutilized on land or reused.*

KSPCB has issued Closure Directions to 72 nos. of defaulting industries during 2018 – 2020. Out of which 29 No's of closure directions were revoked after compliance. The list and status is enclosed as***Annexure VII***. Further, Environmental Compensation imposed on the defaulting industries are discussed in Section 6.1 below.

**(ii) Action taken by KSPCBw.r.t Sewage Management in Bangalore**

i. Bangalore has nearly 3000 decentralized STPs. The treated sewage is proposed to be used mandatorily for the construction, gardening and Parks maintenance. KSPCB has identified the parks of City Corporation and the forest lands in the Bangalore Rural and Urban Districts and also other plantation on medians, avenues. Their GPS locations and latitude and longitude are obtained. The Excess treated sewage from the independent apartments is being connected to these usages. A user-friendly app is also being developed in the lines of aggregation of Cabs.

ii. A Study is being conducted by the Indian Institute of Science, Bengaluru to check the safety of using the treated sewage for the construction purpose with respect to the strength and the corrosion of steel. The requirement of water for the construction alone is expected to be 52 MLD including the Ready Mix Concrete (RMC) plants and about 20 MLD for other usages.

iii. It is proposed to introduce the Sensors for the online measurement of quality of treated sewage. The specifications have been developed in consultation with the experts and the Indian Institute of Science to make it mandatory to have these sensors to check the quality of the final treated water. This would help in making the quality treatedsewage available.

iv. On Continuous persuasion of KSPCB, online real time monitoring equipments are installed by BWSSB at 15 Nos. of STPs located in the Thenpennai or DakshinaPinakini River Catchment area. The Real time monitoring data is linked to KSPCB server and it is available in KSPCB and BWSSB websites.

Besides above, KSPCB has filed cases against 16 defaulting Apartmentsw.r.t domestic sewage management. The list and status is enclosed as***Annexure VIII***. Further, Environmental Compensation imposed on the Apartments arediscussed in the section 6.1 below.

**(iii)Action taken by KSPCBw.r.t pollution of lakes**

KSPCB is monitoring the water quality of 79 lakes located in DakshinaPinakini River catchment area. The annual water quality is confirming to D/E Class of Primary Water Quality Criteria. The list of lakes and its Quality is appended as***Annexure- IX***.

Action taken by Karnataka State Pollution Control Board on pollution oflakes in Bangalore is as below;

1. The KSPCB, Regional Office, Bangalore East has filed a Criminal Case under Water Act, 1974 against BWSSB (CC No. 928/2006) w.r.t. pollution of Bellandur Lake.
2. The KSPCB, Regional Office, Bommanahalli has filed one more Criminal Case under Water Act, 1974 against BWSSB in May 2015 (CC No. 30236/2015) w.r.t. pollution of Madiwala Lake, Arakere Lake and Hulimavu Lakes which are feeder Lakes for Bellandur Lake.
3. The Board is monitoring Lake Water quality, treated water quality from BWSSB STPs & other STPs of apartment / Commercial complexes / IT Parks etc., are being regularly monitored by the Board.

**(iv) Water Quality Analysis of River Thenpennai by KSPCB**

KSPCB is monitoring the water quality of Thenpennai or

DakshinaPinakini River near Mugalur bridge. The water quality is confirming to D/E Class of Primary Water Quality Criteria.TheWater Quality of River Thenpennai is appended as***Annexure X***.DakshinaPinakini is not a perennial river and the flow is only treated /untreated sewage of Bengaluru. The river water quality can be improved if and only when the sewage is treated in the STPs.

**(v) Other Actions and Initiatives by KSPCB for Waste Management**

Facilities available at Bengaluru for effective management of various wastes generated:

i. 08 No's of CETPs of total capacity of 1775 KLD are facilitating industries located in and around Bengaluru for effective treatment and disposal of effluents generated from SSI sectors.

ii. 2 No's of TSDF are facilitating Transport, Storage, treatment and Disposal of Hazardous Wastes generated from the industries.

iii. 5 No's of Common Bio Medical Waste Treatment Plants are facilitating Health care establishment in and around Bengaluru for effective treatment and disposal of Bio Medical Waste.

iv. Plastic carry bags are banned in the entire State by Government of Karnataka vide Gazette Notification No.FEE l7 EPC 2012 dated 11.03.2016.

For managing the solid waste, 9 land fill sites of 3350 TPD is established by BBMP.To encourage segregation at source, BBMP has established 188 Dry Waste Collection Centre. 10 mixed waste treatment facility, 7 landfill sites, 15 decentralized bio-methanation facility with 5 TPD capacity each. Further, Bulk Generators of waste like Hotels, Restaurants, KalyanMantaps, Apartments etc., have been directed to establish a system to handle Municipal Solid Waste generated in their premises or through empanelled service providers.

v. Board has accorded permission to BBMP to establish solid waste processing units at 7 different locations.Board has given authorization to M/s Rock Crystals, Bengaluru of installed capacity 1000 TPD for C&D waste processing.

vi. An Integrated Control & Command Centre has been set up at KSPCB, Bengaluru, wherein a common number (080) 2558 2559 is made available for the public. This Centre monitors the complaints until it is attended and the issue is resolved. This centre will also monitor the Emergency Response Vehicles.

vii. KSPCB has addressed the letter to Heads of the Stake Holders viz., BBMP, BWSSB, DMA, BESCOM and Rural Development and Panchayat Raj (RDPR) to co-operate in identifying the polluting industries operating without consent of the Board and having trade license or not to prevent pollution of Water bodies. Copy of the letter is enclosed as***Annexure-XI***.

viii. KSPCB has called expression of interest for installation CETP (Common Effluent Treatment Plant) at Peenya Industrial Area for treatment of Industrial Effluents generated from the Small

Scale Surface treatment units.

ix. All the common effluent treatment plants of the state are being fitted with the sensors which monitor the key parameters and also the quantity of effluents received and treated. The movement of vehicles is also tracked through GPS. The data is synced with the Command Control Centre for effective monitoring.

The control and prevention of pollution is a continuous process. Hence, the KSPCB is making all efforts to arrest and prevent pollution both Air & Water pollution on a continuous basis. Active co-operation is being sought from other Departments like BWSSB, BBMP, BDA and local bodies, else, the task of prevention and control of pollution cannot be accomplished. The KSPCB will undertake to continue its efforts to prevent and control the pollution within the parameters laid down under the provisions of Environmental Protection Act, Air Act and Water Act and abide by any directions to be issued by the Hon'ble NGT.

**Environmental Compensation**

**(i) With Respect to Violations observed in Sewage Management by KSPCB**

With regard to generation of sewage by the 873 Apartments located in the catchment area of the lakes (Bellandur and Varthur), the Hon'ble NGT vide order dated 6.12.2018 having accepted the recommendations of the NGT commission directed defaulting units to pay Environmental Compensation as per the table given below:

| SNo | Violations | Environmental Compensation |
|---|---|---|
| 1 | Where STP is required as per the EC/ Consent, but the facility has not constructed the STP despite generating sewage. | Rs. 10 Lakhs per month from the date of completion certificate or date of completion |
| 2 | Where actual capacity of STP is less than the capacity as shown in the EC/ Consent | Rs. 20000/per day from the date of inspection till final upgradation |
| 3 | Where the number of flats/ units actually constructed is more than the number of flats / units disclosed to KSPCB while obtaining Consent | Rs. 1 Lakh per unit per month from the date of construction until the grant of fresh requisite consent |
| 4 | Where STP is not functioning or parameters are not being met or untreated sewage is being bypassedfrom the STP or being otherwise diverted | Rs. 5 lakhs per default. |

Thereafter, the Hon'ble NGT vide direction in its order dated 21.10.2019 in OA No. 125/2017 in Paragraph (13), Karnataka SPCB has been made responsible to collect Environmental Compensation charges towards non – compliance by the Apartments/ Township/Commercial Establishments.

In view of the above, Board had assessed and issued Environmental Compensation notice related to not providing STP and also for non- conformity/by pass/discharge of treated/untreated sewage by the defaulting units. Further,

Show-Cause notice and notice of proposed directions were issued for continued violation.

In respect of the non compliances of the treated sewage, out of 376 units, 22 units have paid an Environmental Compensation (EC) amount of Rs 115 lakhs. Further, 6 Number of Petitioners have approached the Hon'ble High Court (writ petition No. 4540/2020). The Hon'ble High Court has issued interim order on 26.02.2020 directing the KSPCB to issue Show cause notice to the petitioner.

Post-COVID 19, Video Conference was done on 04.07.2020 calling all the Apartments who are due to pay the EC. After hearing them, the Board has taken a decision and directed the defaulters to pay the Environmental Compensation Charges as assessed by the Board earlier otherwise to initiate actions under 33(A) of the Water Act and as per the direction of the Hon'ble NGT. Post the personal hearing, as no EC has been paid, and the personal hearing proceedings are being brought to the notice of the Hon'ble NGT, Hon'ble High Court and Board would initiate action and the process is initiated and shortly the closure orders will be issued for such units by Karnataka SPCB.

KSPCB has imposed EC of Rs. 288.80 Crores on 496 No's of Apartment/Commercial establishment and Rs. 1.40 crores was collected. Detailsof Environmental Compensation imposed and collected are appendedas***Annexure- XII & XIII***.

Further, it is also submitted that in compliance with the Hon'ble Green Tribunal order dated 18.12.2019 in the matter of O.A No. 125/2017 before Principal Bench, the status and progress on sewage management (as on 15.07.2020) as submitted by Bangalore Water Supply and Sewerage Board before Hon'ble Tribunal is appended as ***Annexure XIV***.

**(ii) With Respect to Violations observed in Industrial Discharge byKSPCB**

As per the directions of the Hon'ble NGT in OA 1038/2018, KSPCBhas imposed Environmental Compensation in respect of 36 No's. of industries. However, the Hon'ble Supreme Court of India has stayed the process of levying of Environmental Compensation vide Civil Appeal Diary No.19271/2020 on 22.09.2020.Details of Environmental Compensation imposed by KSPCB on defaulting units are enclosed as***Annexure XV***.

With regard to industries observed to be discharging into River Thenpennai during the Joint committee monitoring, it is submitted that those units were illegally operatingand the same were made to close immediately. The joint committee also observed that those units are falling under small and micro scale units operating illegally.

**Long Term and Short Term Action Plan for improving the WaterQuality of River Thenpennai**

The joint monitoring team comprising of CPCB, KSPCB and TNPCB have reported in the case of Original Suit No. 02 of 2015 that, "*the River Thenpennaiyar receives the outflow of treated and untreated sewage of Bellandur and Varthur lake system. Comprehensive plan of restoration of these lakes along with identifying other sources of untreated sewage into the River only will help to restore the quality of the river. Government of Karnataka may*

*prepare such plan on priority considering the pollution issues of Bellandur and Varthur lake system, which contributes to the Pollution of Thenpennaiyar River*". Further, Hon'ble Tribunal, Principal Bench, New Delhi, in the matter of O.A No. 125/2017, constituted a monitoring committee headed by Justice ShSantosh Hegde, former Judge of the Hon'ble Supreme Court to oversee the execution of the action plan on remedial action for restoration of Bellandur, Agara and Varthur lakes atBangalore.

The joint committee with due cognizance of the water quality of River Thenpennai reported in section 5.2 above andthe action plan already reported by the joint monitoring team comprising of CPCB, KSPCB and TNPCB and execution of the action plan on remedial action for restoration of Bellandur, Agara and Varthur lakes at Bangalore by the monitoring committee in O.A no. 125/2017, the following long term and short term action plan has been prepared;

| **Action Points** | **Present Status** | **Proposed Action by the Joint Committee** | **Agency Responsible (Timeline)** |
|---|---|---|---|
| Estimation of fflow of water inRiver Thenpennai | The outfall flowof water in major tanks/lakes located in Bengaluru leading to River Thenpennai arebeing estimated by BWSSB as(as on Septembe r,2020):<br>(i) Agara lake – 139.31 MLD<br>(ii) Bellandu rlake – 268.25 MLD<br>(iii) Varthur lake – 275.25 MLD<br>In the absence of flow data of the tanks/lakes and major drains whose outfall joins River Thenpennai, theflow data ofRiver Thenpennaican | 1. BWSSB to measure the flow and discharge of all the tanks / lakes located in Koramangla&Challaghatta, Hebbal Valleys flowing in toRiver Thenpennai viz., Agara,Bellandur, Varthur, Channasandra, YellamalappaChetty,samethanahalli weir Mugalur etc. Flowdetails of tanks in the upstream(Hoskote taluk, Bangalore rural, chikkaballapur) may also beincluded if overflow is detected.<br>2. Flow or discharge of each of the tanks that are recharged by treated wastewater by BWSSB i.e. 126 tanks in Kolar District and 65 tanks in Chikaballapur district.<br>3. Measurement of flow of all the major drains (i.e storm water drains)joining the river for estimate of flow of River Thenpennaiand maintenance ofall records. | BWSSB and Minor Irrigation (Three months)<br>Minor Irrigation (Threemonths) |

| | | | |
|---|---|---|---|
| | not be arrived at. | | |
| | | | BWSSB and Minor Irrigation (Threemonths) |
| Study of Performance evaluation of Sewage Treatment Plants in Bangalore by engaging a CSIR institute | The performance of the STPs located in Koramangla and Challaghatta, Hebbal Valley sare being assessed based on its capacity utilised and characteristics byBWSSB. However, the treated wast e water quality needs to be ascertained.<br><br>Further, Water quality of water (treated water by BWSSB) diverted for irrigation to chikkaballapur and Kolar Districts throughMinor Irrigation Department is required to be assessed.<br><br>Therefore, there is need to conduct audit ofthe data of quantity | (i) BWSSB may engage a CSIRInstitute like CLRI or NEERIor others for evaluatingperformance of STPs located inK&C and Hebbal valleys. (viz.,there are 32 STPs in Bangalore including 21 STPs inKoramangla&Challaghatta andHebbal Valleys). The samemay be supervised by KSPCB.The final report may besubmitted to KSPCB forreview.<br><br>(ii) Completion of seweragenetwork for the villages in Koramangla&Challaghatta andHebbal Valleys (of 110villages identified by BBMP)for tapping the sewagegenerated, as already submittedto Hon'ble Tribunal, PrincipalBench, Delhi in the matter of O.A no. 125/2017. (Next dateof hearing: 15.01.2021)<br><br>(iii) Strengthening of STP conveyance system to improve sewage getting completely tapped and treated, in order to avoid discharge into River Thenpennai.<br><br>(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. | BWSSB and KSPCB (Six months)<br><br>BWSSB (as per the timeline fixed in O.ANo. 125/2017)<br><br>BWSSB(on a regularbasis) |

| | | | |
|---|---|---|---|
| | of sewage generation, sewage treatment capacity installedvs actuall yoperated and treated wastewater characteristics. | | |
| | | | KSPCB and BWSSB (after completion of thestudy) |
| Random Verification ofgrossly polluting (water polluting) industries located in the River Basinand Assessmentof wastewaterm anagement and discharge mode. | The information of grossly polluting industries located in the river basin alongwith the status of effluent management has been compiled by KSPCB. | Among the industries those that areRed/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 monitoredfor 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 &KSPCB (six months) |
| Rejuvenation oflakes to remediate the pollution caused in River Thenpennai | Bellandur and Varthur lakes arebeing desilted by Bangalore Development Authority (BDA)and awaits guidelines andsilt analysis report from Karnataka SPCBfor disposal ofthe | Advisory for development of Biodiversity park and wetland in the River basin of Thenpennai or DakshinaPinakinias per CPCB Guidelines titled '*Guidelines for setting up of Biodiversity parks in Floodplains of Rivers of India, including River Ganga*' be notified in consultation with Government of Karnataka and KSPCB.<br><br>Completion of Biodiversity park, which comprises of;<br>(i) Feasibility study | BDA and concerned State functionaries of Government of Karnataka(six months) |

| | | | |
|---|---|---|---|
| | silt followedby developmentof Biodiversitypark and wetlands in compliance with the Hon'ble NGT Orders in | for development of Biodiversity parks in the River basin of Thenpennai<br>(ii) Preparation of Detailed Project | Bangalore Development |
| | the matter of O.A No. 125/2017. | Report (DPR) for development of Biodiversity parks in Bellandur an Varthur<br>(iii) Award of Project<br>(iv) Completion of the Project | Authority (not more thanOne year or as per the timeline fixed in O.A No. 125/2017) |
| Environmental Compensation be imposed by SPCBs after evaluating performance ofSTPs and identification ofdefaulters uponRandom Verification. | Performance evaluation of STPs by BWSSB and random inspection of industries is required to be carried out by KSPCB/TNPCB with specific reference to River Thenpennai. | EC be calculated and imposed based on the Performance Evaluation of STPs and Random Verification of Grossly Polluting Industries.<br><br>EC be calculated and imposed based on Random Verification ofGrossly Polluting Industries<br><br>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). | BWSSB and KSPCB (Six months)<br><br>TNPCB (Six months)<br><br>CPCB (Six months on receipt of the Study Report and recommendations/criteriafor imposing EC from KSPCB and TNPCB) |
| Sewage and Solid Waste Management inthe villages (13) adjoining River Thenpennai uptill Kelavarapalli | Among the villages located near River Thenpennai, Bagalur is having population ofabout 11,000 andthe domestic sewage generation is estimated to be 0.0715 MLD. | 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.<br><br>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. | Feasibility study by TNPCB in consultation with local authority for implementation (six months)<br><br>Concerned Block Development Officer tosubmit to TNPCB (six months) |

| | | | |
|---|---|---|---|
| | Further, Solid Waste generation in Bagalur is estimated to be about 1.5 Tons/day. | | |
| Regular Water Quality Monitoring a timportant | Water Quality is being monitored by KSPCB by installing real | The trend of water quality and its improvement at major confluence points may be monitored for the year 2021-22 on a monthly basis | TNPCB &KSPCB (to monitor on yearly basis) |

**Remedial Measures - Action Plan for Rejuvenation of Lakes**

The Bellandur Lake has a catchment area of about 148 sq.km (37,000 acres) spread across Central, South, East & South East of Bangalore.The Lake receives water from three main valleys:a) Valley originating from JP Nagar, Puttenahalli, Bilekahalli, Arekere Lake, Hulimavu Lake, Madiwala lake, BTM Layout, HSR Layout, Agara Lake & finally joining Bellandur Lake;

b) Valley originating from Shivajinagar, Ulsoor Lake, Domlur, Indiranagar, HAL and finally joining Bellandur Lake; and c) Valley originating from Kalasipalya, Lalbagh Road, KH Road, Shantinagar Bus Station, National Games Village, Ejipura, Sinivagilu and finally joining Bellandur Lake.

There are two outflow weirs to Bellandur Lake – One near Bellandur Village & other near Yemlur Village. Lake series joining Bellandur Lake are Sarakki Lake, Arakere Lake, Begur Lake, Madiwala Lake, Agara Lake, Ibblur Lake. Both the outflow finally joins Varthur Lake. The outflow from Varthur Lake joins South Pinakini River.

Varthur lake has a total area of 439 acres and 34 Guntas with total periphery length of 8.4 km. The lake receives water from 5 inlets and the 02 outlets. For flood control and water level management near Varthur, waste weir sluice gates are provided.

Desilting work is under progress in Bellandur and Varthur lakes as per the directions of Hon'ble NGT. Then, wetland construction will be carried out post de-silting work by Bangalore Development Authority which is shown in **Figure 16** below.

Further, development of biodiversity parks in those lakes are also under progress. The above status has been reported by BDA in compliance to the orders of Hon'ble NGT dated 14.08.2020 in the matter of O.A No. 125/2017, to oversee the execution of the action plan on remedial action for restoration of Bellandur, Agara and Varthur lakes at Bangalore, including preventing discharge and dumping of pollutants, removing encroachments from catchment area and other steps for restoration by the monitoring committee headed by Justice ShSantosh Hegde, former Judge of the Hon'ble Supreme Court.

**Notification of Standards for Phosphorus in Soaps & Detergents**

Froth formation and related items are taken up by NGT in OA 125/2017 and noted that, major cause for foam formation is considered to be discharge of untreated sewage through open

drains.

i. As per directions of the Hon'ble National Green Tribunal, MoEF& CC and CPCB have been requested by KSPCB to limit the phosphorous content in Soaps & Detergents being manufactured by the industries. Since it is a Standard specified on a product, the same is to be effected by Bureau of Indian Standards. In this regard Bureau of Indian Standards has published notification during August 2020 for the following products.

a. Synthetic Detergents for washing woollen and silks Fabrics -Specification (Second Revision)

b. Household Laundry Detergent Bars- Specification (ThirdRevision)

c. Household Laundry Detergent Powders- Specification. (FifthRevision).

ii. The above notifications are enclosed as***Annexure- XVI***.

**CHAPTER VII CONCLUDING REMARKS**

The causes and sources of pollution has been assessed by the joint committee based on the samples collected from 12 locationsin River Thenpennaiduring September, 2020. It has been ascertained that, the water quality of River Thenpennai falls under the category of Class E (Irrigation, Industrial Cooling, Controlled Waste disposal) of the Designated Best Use Criteria notified under Environment (Protection) Rules, 1986. The reason being largely, the discharge of treated and untreated sewage from Bangalore, a Comprehensive plan for restoration of the quality of River Thenpennai is under consideration before Hon'ble Supreme Court in O.S No. 02 of 2015 and Hon'ble National Green Tribunal O.A No. 111 of 2020.

In cognizance of the above, the joint committee has devised an Action plan (Long Term and Short Term with timelines) under section 6.2 of Chapter VI for restoring the quality of River Thenpennai. Therefore, it is humbly prayed that, the improvement of River Water Quality would require union of orders/directions of Hon'ble NGT in O.A No. 125/2017 and in O.A No. 111/2020 alongwith directions of Hon'ble Supreme Court in O.S No. 02of 2015.

7. It is also mentioned in the report that there is a matter pending before the Principal Bench as O.A. No. 125/2017 and also before the Hon'ble Supreme Court as CS-02/2015. Though, it was mentioned in the report that certain timelines are provided in the action plan it was not clear from the report as to whether those timelines are being adhered to by the respective departments, this Tribunal had directed to file a further report by the Committee after supervising the implementation of action plan that has been submitted by the State of Karnataka and other departments and submit a further progress report in this regard. The case was posted to

08.04.2021 for that purpose. Thereafter, the matter was adjourned from time to time and lastly it was posted to today for that purpose.

8. When the matter came up for hearing today Mr. Harsharaj through Mr. Aurn represented respondents 1, 2, 4 and 7, Mr. Darpan K.M. represented 3rd respondent, Mr. C. Kasirajan through Ms. Ashwini represented 5th respondent, Mr. M.R. Gokul Krishnan through Ms. Ojas Sivakumar represented 6th respondent and Mr. R. Thirunavukarasu represented CPCB, which is a nodal agency for coordination and also submitting the report.

9. We have received further progress report of the Joint Committee dated 02.06.2021, e-filed on the same date and received on 04.06.2021 which reads as follows:

> ***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 notified under the Environment (Protection) Rules, 1986. 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.
> In the matter, Hon'ble NGT in its recent order dated 18.02.2021 issued directions that *"It is seen from the report that there is no source of pollution from Tamil Nadu area and also source of pollution was from the Karnataka region and certain action plans have been prepared by the Karnataka State for the purpose of remedying the situation on the basis of the directions given by this Tribunal in this case and also by the Principal Bench in O.A No. 125 of 2017 and the case pending before the Hon'ble Supreme Court as C.S 2 of 2015. Though certain time line has been provided*

*in the action plan, it is not clear as to whether anything has transpired at the ground level for the implementation of the action plan that has been submitted by the respective departments before the committee. So the respective departments who have given the action plan before the committee are directed to submit separate status report regarding the action taken by them on the basis of the action taken report. The committee is also directed to supervise the implementation of the action plan that has been submitted by the State of Karnataka and other departments and submit a further progress report regarding the same and also the improvement of the water quality on account of the short term measures that has been taken by the departments before this Tribunal on or before 8.4.2021…".* Copy of the Hon'ble NGT Order dated 18.02.2021 is appended as ***Annexure I***.

## CHAPTER II MEETINGS AND DISCUSSIONS

In compliance with the NGT Order dated 18.02.2021, CPCB, member of the joint committee sent various communications dated 19.02.2021, 26.02.2021 and 24.03.2021 to the concerned departments in Government of Karnataka and informed that the long term and short term action plan prepared by the joint committee for execution by the concerned agencies be complied as per the specified timelines.

With regard to action points related to Bangalore Development Authority (BDA) and Bruhat Bengaluru Mahanagara Palike (BBMP), the departments were requested to send nomination of a nodal officer to provide the progress report in compliance with the stipulated timelines vide letter dated 03.03.2021. Copy of the communications and letters dated 19.02.2021, 26.02.2021, 24.03.2021 and 03.03.2021 are appended as ***Annexure II***.

Thereafter, the Joint Committee conducted a meeting on 10th March, 2021 through video conferencing with the members of the joint committee and concerned departments. In the said meeting, it was informed that a format (appended as ***Annexure III***) along with Hon'ble NGT order dated 18.02.2021 have been circulated among the members of the committee and concerned agencies/authorities/departments vide aforesaid communications for providing individual Action Taken Report on the Action Plan of the Joint Committee Report and compliance thereof.

In the meeting, CPCB briefed the directions of NGT Order dated 18.02.2021 and emphasized that "*the respective departments who have given the action plan before the committee are directed to submit separate status report regarding the action taken by them on the basis of the action taken report*" as directed by Hon'ble NGT vide order dated 18.02.2021. In view of above, the concerned departments were asked to provide signed copy of individual progress reports to CPCB (nodal agency) for filing the Progress Report before Hon'ble Tribunal in the matter before next date of hearing (i.e. 08.04.2021).

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

(i) As both the NGT matters (O.A No. 125/2017 and 111/2020) are separately dealt in the Hon'ble NGT, Principal Bench, New Delhi and Southern Zone, Chennai, respectively, the action plan related to random verification of industries located near the river bed, environmental compensation and performance evaluation of STPs have to be exclusively

addressed by BWSSB, TNPCB and KSPCB to comply with Hon'ble NGT Order dated 18.02.2021.

(ii) KSPCB and TNPCB to provide water quality analysis reports of the Interstate monitoring locations (i.e. Mugalur bridge and Sokkarasanapalli) for last two months for finding any improvement in the quality of water in River Thenpennai (in compliance to directions of Hon'ble NGT Order dated 18.02.2021 with regard to "*improvement of the water quality on account of the short term measures that has been taken by the departments before this Tribunal*").

Further, a meeting through video conferencing was organized with BDA, BBMP, BWSSB and KSPCB at CPCB, Bengaluru, on 16.03.2021 to discuss the action points with regard to measurement of flow of tanks/lakes flowing into River Thenpennai, rejuvenation of lakes and Water quality to be maintained as pristine. It was discussed that the action taken report and progress made with regard to the aforesaid action points would be provided to CPCB for filing the progress report.

In the matter, Karnataka State Pollution Control Board (KSPCB) has nominated Sh Syed Khaja Mohiddin, Senior Environmental Officer as nodal officer for the Joint Committee in place of Sh M K Prabhudev, Chief Environmental Officer for compliance, thereof. Copy of KSPCB letter no. KSPCB/CEO-2/OA No. 111/2020/2020-21/5603 dated 09th March 2021 is appended as ***Annexure IV***.

In the absence of compliance status report and Action taken report from the concerned departments (viz., KSPCB, BDA, BWSSB, BBMP), the joint committee was not be able to file the progress report on the basis of the Action Taken Report on or before 08.04.2021. Therefore, the Joint Committee constituted in O.A No. 111 of 2020 has decided seeking an additional time of four weeks for complying with the orders of the Hon'ble NGT (SZ), Chennai dated 18.02.2021. In view of above, Hon'ble NGT has reposted the matter to a later date i.e 27.04.2021.

Due to prevailing COVID-19 pandemic situation and in the light of sudden and exponential surge in COVID-19 cases, the Competent Authority,

Hon'ble NGT, New Delhi vide Office Order No. NGT/PB/313/Admin/2014/Vol (III)/152 dated 15th April 2021 has pleased to modify the Calendar with respect to summer vacations to be observed in all the Benches of National Green Tribunal. All the matters scheduled to be listed from 19.04.2021 to 18.05.2021 of NGT (Principal Benches) and Zonal Benches has been adjourned/re- scheduled. In the said order, the case no. O.A No. 111 of 2020, which was earlier scheduled on 27.04.2021 is adjourned to 08.06.2021.

Amidst the COVID-19 pandemic the joint committee has convened a video conferencing on 24.05.2021 with the concerned departments to update any further progress and compliance made with regard to the Action Plan submitted before Hon'ble Tribunal.

## CHAPTER III
## STATUS OF COMPLIANCE AND PROGRESS MADE

The joint committee devised Action Plan comprising of 17 action points which includes (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 department-wise action points and its status of compliance are given as **Table 1**. 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.

Table 1. Status of Compliance and Progress with reference to the Action Pointsof the Joint Committee

| **Action Points** | **Agency Responsible (Timeline)** | **Status of Compliance (Complied / Not Complied / Partially Complied/ Under Progress)** | **Proposed Timelines (Yes /No)** | **Remarks** |
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| **I. Estimation of flow of water in River Thenpennai** | | | | |
| 1. BWSSB to measure the flow and discharge of all the tanks / lakes located in Koramangla & Challaghatta, Hebbal Valleys flowing in to River Thenpennai viz., Agara, Bellandur, Varthur, Channasandra, Yellamalappa Chetty, samethanahalli weir, Mugalur etc.Flow details of tanks in the upstream (Hoskote taluk, Bangalore rural, chikkaballapur) may also be included if overflow is detected. | BWSSB and Minor Irrigation (Three months) | BWSSB – Partially Complied; | No. timelines notprovided for measurement of flow in lakes/tanks by the concerned department. | BWSSB has provided the details of flow of sewage into STPs located in K&C valley and assessed the flow of treated water that is being sent for Ground water recharge through Minor irrigation. |

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| Flow or discharge of each of the tanks that are recharged by treated wastewater by BWSSB i.e. 126 tanks in Kolar District and 65 tanks in Chikkaballapur district. | Minor Irrigation (Three months) | Minor Irrigation – Partially Complied. | | Minor irrigation department has taken up works that comprises lifting of treated wastewater to fill 191 tanks in kolar and chikkaballapur districts for ground water recharging Purpose only. The flow and discharge arenot measured by at each tank bythe department. However at Present under These projects 102 tanks has Been filled in both Kolar and Chikkaballapur Districts by pumping 7.85 TMC of treated water available from BWSSB STP. Regarding flow measurements, Minor irrigation department has not installed any flow measuring devices for any minor irrigation tanks. |
| 3. Measurement of flow of all the major drains (i.e. storm water drains) joining the river for estimate of flow of River Thenpennai and maintenance of all records. | BWSSB and Minor Irrigation (Three months) | Not Applicable | | The concerned department responsible for measurement of flow in storm water drains could not be ascertained or entrusted by the Joint committee in this regard. It was informed that both the departments (BWSSB & MI) do not cover the activity of storm |

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| | | | | water drain flow measurement under the ambit/scope. |
| **II. Study of Performance evaluation of Sewage Treatment Plants in Bangalore by engaging a CSIR institute** | | | | |
| (i) BWSSB may engage a CSIR Institute like CLRI or NEERI or others for evaluating | BWSSB and KSPCB (Six months) | BWSSB - Partially Complied.<br><br>KSPCB – Partially | Timeline –Not provided. | (i) BWSSB has signed an agreement with M/s Society for Innovation and Development, |
| 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. | | Complied. | | IISC, Bangalorefor BNR Removal Studies of STPs. The outcome of the study would be made available to the Hon'bleNGT.<br><br>(ii) KSPCB would review the findings of the study before furnishing to the Joint Committee and Hon'ble NGT. |
| (ii) Completion of sewerage network for the villages in Koramangla & Challaghatta and Hebbal Valleys (of 110 villages identified by BBMP) for Tapping the sewage generated, asalready submitted to Hon'ble Tribunal, Principal Bench, Delhi in the matter of O.A no. 125/2017. (Next date of hearing: 15.01.2021) | BWSSB (as per the timeline fixed in O.ANo. 125/2017) | BWSSB – Partially complied | Time line – 110 villages network will be completed inthe year 2024. | -- |
| (iii) Strengthening of STP conveyance system to improvesewage getting completely tapped | BWSSB (on a regular basis) | BWSSB – Partially complied | Time line - Ongoing and continuous | Maintenance of sewer lines is also done regularly based |

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| and treated, in order to avoid discharge into River Thenpennai.<br><br>(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. | KSPCB and BWSSB (after completion of the study) | KSPCB and BWSSB – To be complied once the performance study report of STPs is completed. | Timeline – after completion of the study | complaints of sewer lines will also be taken periodically to ensure proper flow of sewage.<br><br>The final outcome of the performance study would be reviewed by KSPCBbefore furnishing to the Joint Committee and Hon'ble NGT. |
| **III. Random Verification of grossly polluting (water polluting) industries located in the RiverBasin a of wastewater management and discharge mode.** | | | | |
| i. 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 | TNPCB & KSPCB (six months) | TNPCB - Complied<br><br>KSPCB – Not Complied | Timeline – On a continuous basis | TNPCB has provided analysis report of M/s Premier SPG & WVG Mills Ltd., Belathur, Hosur upto March, 2021. However, TNPCB needs to cover few more industries randomly in the river basin verification. |

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| 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). | | | | Further, TNPCB to keep a check on illegal discharge from unauthorized industries.<br><br>KSPCB to carry out Random verification of industries from the year 2021-22 onwards. |
| **IV. Rejuvenation of lakes to remediate the pollution caused in River Thenpennai** | | | | |
| 1. Advisory for development of Biodiversity park and wetland in the River basin of Thenpennai or Dakshina Pinakini as per CPCB Guidelines titled '*Guidelines for setting up of Biodiversity parks in Floodplains of Rivers of India, including River Ganga*' be notified in consultation with Government of Karnataka and KSPCB.<br><br>2. Completion of Biodiversity park, which comprises of;<br>(i) Feasibility study<br><br>for development of Biodiversity parks in the River basin of Thenpennai<br><br>(ii) Preparation of Detailed Project Report (DPR) for development of Biodiversity parks in Bellandur an Varthur<br><br>(iii) Award of Project<br><br>(iv) Completion of the Project | BDA and concerned State functionaries of Government of Karnataka (six months)<br><br>Bangalore Development Authority (not more than One year or as per the timeline fixed in O.A No. 125/2017) | BDA – Not Applicable with reference to latest Hon'ble NGT Orders dated 12.03.2021 | Timeline - Not required. | i. Hon'ble NGT, Principal Bench, New Delhi vide IA No.392/2020 and 395/2020 in Original Application No.125/2017 rejected the proposal in its order dated 15.12.2020, highlighting "The BDA has wrongly understood that biodiversity parks are to be set up within the lake boundary. Such parks are to be set up along the periphery of lake boundary".<br><br>iii. It is pointed out that the BDA has again taken a wrong stand for demarcating area between maximum flood level and the lake periphery instead of doing so along the periphery of the lake boundary i.e. ensuring that area of lakes is not used in the process. The proposal of the |

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| | | | | BDA appears to be to develop the bio-diversity park within the boundary of the lake and the full tank level adversely affects the lake."<br><br>iv. There is no space available for development of biodiversity parks near Bellandur & Varthur lake. However development of wetland has already been considered and work order has been issued to the agencies. Meanwhile agencies have taken up de silting of designated area of wetland for construction of wetland in Bellandur & Varthur lakes. |
| **V. Environmental Compensation be imposed by SPCBs after evaluating performance of STPs and identification of defaulters upon Random Verification** | | | | |
| 1. EC be calculatedand imposed based on the Performance Evaluation of STPs and Random Verification of Grossly Polluting Industries. | BWSSB and KSPCB (Six months) | BWSSB – To be calculated once the performance study is completed;<br><br>KSPCB – To be complied | Timeline – Not provided by the concerned departments. | To be assessed by the concerned departments in Karnataka and Tamilnadu. |
| 2. EC be calculated and imposed based on Random Verification of Grossly Polluting Industries. | TNPCB (Six months) | TNPCB – To be calculated once the random verification is carried out for remaining zones in the river basin | | |

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| 3. Calculation of ECby the three member Committee comprising of CPCB, TNPCB and KSPCB, after submission of Reports by the concerned authorities (BWSSB, KSPCB, TNPCB). | CPCB (Six months on receipt of the Study Report and recommendations/criteria for imposing EC from KSPCB and TNPCB) | CPCB – To be complied once the Reports and Recommendations from KSPCB and TNPCB are received. | | |
| **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.) | Feasibility study by TNPCB in consultation with local authority for implementation (TNPCB - six months) | TNPCB – Complied | Timeline – Before 31.10.2021 | Construction of diversion channel with wet land system for the treatment of sewage generated |
| by TNPCB followed by implementation by Local authorityof the district.<br><br>2. Solid Waste Management Plan be devised and executed by concerned Block Development Officer, Hosur taluk to ensure the solid wastes arenot disposed onthe riverside and managed as per Solid Waste Management Rules, 2016. | Concerned Block Development Officer to submit to TNPCB (six months) | BDO – Under Progress | Timeline – Before 31.10.2021 | from the villages by the local body of Hosur Panchayat Union is under progress.<br><br>i. The local body ofHosur Panchayat Union has constructed the Micro Compost Centre for treatment of segregated biodegradable municipal solid wastes.<br><br>ii. Under Central Government scheme of National urban Mission project a Plastic shredding unit is proposed at a cost of Rs. 20 Lakhs to handle the plastic wastes in Bagalur.<br><br>iii. In Sokkarasanapalli, the non-biodegradable wastes are burnt through the Solid waste Disposal Incinerator |

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| | | | | established at estimate cost of Rs.18.00 Lakhs by CSR fund of M/s. Excide factory. |
| **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) | TNPCB – Complied;<br><br>KSPCB – Complied | Analysis of water quality to be carried out on a continuous basis. | Water quality analysis of River Thenpennai at the interstate locations namely Mugalur Bridge in Karnataka and Sokkarasanapalli in Tamilnadu was provided by KSPCB and TNPCB. The same has to be carried out for the parameters to classify as per the as per Designated Best Use Criteria. In mugalur, the water quality analysis results (as on January 2021) reveal that the water quality falls under Class E as per Designated Best Use Criteria. The aforesaid results show that there has been no improvement in the water quality flowing into the River, despite of the aforesaid efforts by departments such as BWSSB in tapping the |
| | | | | untreated sewage and enhancement of sewage treatment capacity (as claimed), which otherwise would have been discharged into |

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| | | | | River Thenpennai. In case of sokkarasanapalli, the parameters namely, turbidity, EC, SAR, Boron and Free ammonia has not been calculated to ascertain the classification of the water as per Designated Best Use Criteria. |
| 2. Responsibility asa Custodian of Rivers/tanks in Karnataka vests with State Functionaries namely, BWSSB, BBMP, BDA, Lake Development Authority, Minor Irrigation Department. Therefore, Water Quality of the water flowing in River Thenpennai be maintained pristine and tested for its characteristics in the respective jurisdictions. | BWSSB, BBMP, BDA, Minor Irrigation Department (every year) | BWSSB – Partially Complied;<br><br>BBMP – Not Complied;<br><br>BDA –Partially Complied;<br><br>Minor Irrigation – Partially Complied. | Timeline – to be provided by the concerned departments in Governmentof Karnataka | In one instance, BWSSB has requested the professors of IISc who are entrusted with the studies of Environmental Impact due to augmentation of treated water from K&C Valley STP's into Kolar District Lakes to share the results of the samples collected and as reported by them the Biological Nutrients in the ultimate discharge point of Lakshmi Sagar Lake are well within the NGT stipulations. |

## Department-wise Compliance Status

## A. Bangalore Water Supply and Sewerage Board (BWSSB)

I. With regard to **enhancement of capacity of sewage treatment capacity** in Bangalore, the status of commissioning and operation of new STPs are provided as below;

(i) One 150 MLD Capacity new Sewage Treatment Plant based on activated sludge process with BNR with Power generation was to be completed by 30.07.2020. The overall progress as on 31.03.2021 is 93% against the planned target of 100.00%. As per the commitment to NGT, intake of sewage was taken on

22.03.2021 (before March 2021) and treatment is in progress. Presently, about 100MLD of sewage is being augmented, it requires minimum of 45 days for developing MLSS and to achieve the effluent standards. By the end of April 2021, the results will be achieved. The balance liquid stream will be completed by May 2021 and the work will be completed in all respects including sludge line by July 2021.

(ii) Construction of 210 MLD capacity ISPS at Koramangala Sports Complex including O&M for 7 years was completed on 29.01.2020.

(iii) The Sarakki STP of capacity 5.0 MLD at Sarakki lake was completed and commissioned on 08.11.2019. Presently the treated water is let into Sarakki Lake.

(iv) The Chikkabeguru STP of capacity 5.0 MLD was completed in September, 2020. Presently the treated water is let into ChikkabegurLake.

(v) The Hulimavu STP of capacity 10 MLD was completed and commissioned on 31.03.2020. Presently the treated water is let into Hulimavu Lake.

(vi) Augmenting sewage from Iblur side and conveying to Bellandur Amanikere STP (Laying of sewer sub main) was completed and commissioned on 23.12.2020.

(vii) The Agaram STP of capacity 35 MLD was completed and commissioned on 31.03.2020. Presently the treated water is let into Agaram Lake.

(viii) A waste water wet well of 32.5 MLD Capacity near the premises of 90MLD Bellanduru Amanikhane STP to augment sewage from the adjoining areas of Bellanduru Amanikhane STP. The overall progress as on 31.03.2021 is 70% against the planned target of 100.00%. However, the temporary arrangement made for pumping sewage to Bellanduru Amanikhane STP. (Proposed Timeline: 31.05.2021)

Though the progress is not achieved due to COVID-19, intermediate arrangements have been made and presently sewage is augmented to Bellanduru STP, however the work will be completed before 31.05.2021.

(ix) With regard to up gradation of 4 MLD STP at Madivala, the overall progress as on 31.03.2021 is 38.00% as against 100% and the work will be completed by December 2021. However, it is ensured that during this rehabilitation work the sewage which was earlier augmented to this STP is now diverted to Agaram ISPS by linking this network to ISPS through 900 mm dia sewer link line. At present, there is no sewage entry into the Madivala lake. This STP was taken up by Karnataka Lake Conservation and Development Authority with funds from KSPCB. Due to poor progress on this work has been handed over to BWSSB. From then onwards BWSSB has taken up upgradation of this STP. Maintenance of sewer lines is also done regularly based on the complaints and extensive, massive desilting of sewer lines will also be taken periodically to ensure proper flow of sewage. (Proposed timeline: 31.12.2021).

II. With regard to **Estimation of flow of Water in River Thenpennai,** it issubmitted that,

(x) The flow in the SWD's was measured in the month of April-2019 and the details of flow are, (a) HAL - 48.60; (b) Agaram & Koramangala (Y- Junction) - 179.50; Total-228.10 MLD.

(xi) The flow details of STP's at K&C Valley, Bellandur on the day of measurement were, (a) 218 MLD-170 MLD (b) 60 MLD-22 MLD; (c) 30 MLD-26MLD (d) 90 MLD-30 MLD; (e) Total-248 MLD.

(xii) After carrying out major interlinking/new pipeline works on the upstream side, the flow was measured in the 1st week of March-2020, the details are, (a) HAL-31.4 MLD; (b) Agaram & Koramangala (Y-Junction) - 114.26; (c) Total-145.66 MLD.

(xiii) The flow details of STP's at K&C Valley, Bellandur on the day of measurement were, (a) 218 MLD-180 MLD; (b) 60 MLD-51 MLD; (c) 30 MLD-30 MLD; (d) 90 MLD-70 MLD; (e) Total-331 MLD.

(xiv) At present the flow details of STP at K&C valley measurement were, (a) 218 MLD-194 MLD; (b) 60 MLD-60MLD; (c) 30 MLD- 30MLD; (d) 90 MLD -93 MLD; (e) 50 MLD-42MLD; (f) 2MLD-1.50MLD; (g) 1.50MLD- 1.50MLD; (h) 4MLD-2MLD; (i) 5MLD-4.50MLD; (j) 10MLD-5MLD; (k) 5MLD-3MLD; (l) 35MLD-18MLD; (m) 150 MLD-83 MLD; (n) Total=542.50 MLD.

As can be seen from the above it is clear where the flow in the SWD to an extent of 294.50 MLD has been reduced and are being augmented to STP's. The combined treatment capacity of the above plants will be

664.50 MLD against a measured flow of 583 MLD. Presently 542.50 MLD of sewage is being treated. The total treated sewage will be 542.50 MLD (93%) as against the measured flow of 583 MLD. The balance quantity will be augmented in phased manner (110 villages network will be completed in the year 2024). The details of the flow measurements at Bellandhur and Varthur lakes are given in ***Annexure V*** (pg no. 162)

**III.**With regard to **Study of Performance evaluation of Sewage TreatmentPlants in Bangalore by engaging a CSIR institute**

With regard to proposal for upgradation of all existing STPs with facilities to removal of Biological Nutrient Removal at 248 MLD STP at K&C Valley. It is informed that the operating STPs of 90 MLD STP at Bellandur Amanikere, 60 MLD STP at K&C Valley, 5 MLD STP at Sarakki and under construction STP's of 150 MLD at K&C Valley, 5 MLD at Chikkabegur, 10 MLD Hulimavu and 35 MLD STP at Agaram are with Biological Nutrient Removal process.

The working STPs at Cubbon Park and Lalbagh are Tertiary Treatment Plants. For the 248 MLD (KC Valley), upgradation the DPR and the estimate is ready and had been sent to Government for approval.

Further, for not having received responses for the tenders, based on the concept note developed by Professors of IISc and in consultation with the consultants M/s CH2M Hill India Pvt. Ltd., modifications in process were made to achieve removal of nutrients in the other two STP's i.e. 30 MLD STP & 218 MLD STP. Based on the directions of the Hon'ble NGT committee, samples were collected jointly by CPCB, KSPCB and IISc, wherein it is clear that due to the modification made in the process the Biological Nitrates have been removed and the same is complying with the NGT requirements.

Also, it is to submit that the treated effluent from all the 3 above STP's and one more 90 MLD STP at Bellandur Amanikere are eventually transmitted to the Minor Irrigation Jack Well situated near Bellandur Amanikere from where the effluent is finally discharged into Lakshmi Sagar Lake of Kolar District.

After these modifications BWSSB has got tested the effluent from the MI Jack Well 2 near Bellandur Amanikere and has

ascertained the reduction in Biological Nutrients. As per the test reports, the Total Nitrogen is 6.4 mg/ltr and the Total Phosphates is 0.85 mg/ltr which is within the ranges as suggested by Hon'ble NGT.

To further ascertain the status of Biological Nutrients values in the treated effluent discharged at Lakshmi Sagar Lake, BWSSB has requested the professors of IISc who are entrusted with the studies of Environmental Impact due to augmentation of treated water from K&C Valley STP's into Kolar District Lakes to share the results of the samples collected and as reported by them the Biological Nutrients in the ultimate discharge point of Lakshmi Sagar Lake are well within the NGTstipulations.

The Final DPR for the 248 MLD (KC Valley) has been submitted to Govt for approval. Copy of the Agreement dated 07.12.2020 with M/s Society for Innovation and Development, Indian Institute of Science and work order dated 10.12.2020 is appended as ***Annexure V*** (pg no 163 - 170).

(xv) Interim remediation - The peripheral diversion channels have been constructed by the BDA in both the lakes and sewage water is flowing through this channel. Entry of sewage water into these lakes has been stopped. Further, the BWSSB have installed aerating systems and was completed by 31.01.2020 at 1) HAL side and Kempapura inlet, 2) Agaram inlet, 3) Koramangala inlet, 4) Iblur inlet coming under Bellandur Lake,

5) Northern and 6) Southern side of Varthur lake for inline treatment of sewage. Further, in addition the BWSSB is also installing artificial floating islands.

In order to comply with the time line of 01.02.2020 fixed in the orders of the NGT, the aerating systems in the 06 locations were installed before 31.01.2020 and same have been observed by the NGT Committee during their inspection of the said location on 21.01.2020.

Subsequently, in order to enhance the interim remediation artificial floating islands have also been installed. Same have been observed by the NGT Committee during their inspection on 25.02.2020.

**IV.**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, as already submitted to Hon'ble Tribunal, Principal Bench, Delhi in the matter of**

**O.A no. 125/2017; and Strengthening of STP conveyance system to improve sewage getting completely tapped and treated, in order to avoid discharge into River Thenpennai.**

(xvii) To properly design UGD network so as to feed the existing STPs to their full capacity and also to the STPs under construction treated water should be reused.

1. HAL SWD (Challaghatta Valley) – Totally 23 works are to be taken up for augmenting this flow, out of which 23 works were completedon 23.12.2020

2. Koramangala and Agaram Valley - Totally 48 works are to be taken up for augmenting this flow, out of which 48 works are completed on 23.12.2020
3. Iblur Catchment area - Completed and Commissioned on 23.12.2020.
4. Kempapura Catchment area - BWSSB has taken up work of laying

300 mm dia RCC NP3 sewer line for a length of 1000 RMT to convey the sewage generated in this area Bellanduru Amanekhane STP. The work is completed and commissioned in the month of May 2020.

(xviii) A proper mechanism should be developed/placed it identify the blockages in the existing UGDs and to attend them mechanically. BWSSB has 175 Jetting cum suction machines and 40 de-silting machines to clean the UGD lateral network. BWSSB is clearing the manholes once in a year. 06 High Pressure desilting machines and one recycler machine are engaged in cleaning of sub-mains and main sewers. Maintenance of sewer lines is also done regularly based on the complaints and extensive, massive desilting of sewer lines will also be taken periodically to ensure proper flow of sewage.

(xix) Laying of 1800 mm diameter raising main from 210 MLD ISPS to 150 MLD STP – S2D(a) of length 5.315 Km was completed on 07.01.2020. The Pumping main was commissioned on 22.03.2021.

(xx) As per the Hon'ble NGT order, BWSSB may further ensure that treated water is not discharged into the UGD network. Further, the list provided by KSPCB for 496 buildings having STPs has been inspected by BWSSB engineers and out of 496 buildings, 109 buildings UGD connections are disconnected, there is no BWSSB UGD network near 378 buildings, 2 buildings are beyond the 110 village limits of BBMP, 5 buildings addresses are repeated in the list, earlier for 1 building which address was not traceable has been identified – it is individual building for which STP is not applicable and 1 building does not have STP.

BWSSB is identifying the sources of discharge of sewage and will disconnect water supply and UGD connections of the defaulting establishments and also send a complaint to KSPCB. If the defaulting establishment is using ground water then the complaint has also to be booked with KSPCB for its action.

Further, the treated water was allowed as per the conditions stipulated in the order of the consent issued by KSPCB. Under the circumstances, BWSSB request not to take any action against its officials. The detailed report was submitted while furnishing compliance on 31.12.2020.

**V.** With regard to **Water Quality of the water flowing in River Thenpennai be maintained pristine and tested for its characteristics inthe respective jurisdictions.**

(xxi) Also, it is to submit that the treated effluent from all the 3 above STP's and one more 90 MLD STP at Bellandur Amanikere are eventually transmitted to the Minor Irrigation Jack Well situated near Bellandur Amanikere from where the effluent is finally discharged into Lakshmi Sagar Lake of Kolar District.

After these modifications BWSSB has got tested the effluent from the MI Jack Well 2 near Bellandur Amanikere and has ascertained the reduction in Biological Nutrients. As per the test reports, the Total Nitrogen is 6.4 mg/ltr and the Total Phosphates is 0.85 mg/ltr which is within the ranges as suggested by Hon'ble NGT.

To further ascertain the status of Biological Nutrients values in the treated effluent discharged at Lakshmi Sagar Lake, BWSSB has requested the professors of IISc who are entrusted with the studies of Environmental Impact due to augmentation of treated water from K&C Valley STP's into Kolar District Lakes to share the results of the samples collected and as reported by them the Biological Nutrients in the ultimate discharge point of Lakshmi Sagar Lake are

well within the NGTstipulations.

Copy of the Action Taken Report and Progress made on the Action points of the Joint Committee is appended as ***Annexure V***.

## B. KSPCB

Water quality analysis of River Thenpennai at the interstate locations namely Mugalur Bridge in Karnataka was provided by KSPCB. The same has to be carried out for the parameters to classify as per the Designated Best Use Criteria. In mugalur, the water quality analysis results (as on January 2021) reveal that the water quality falls under Class E as per Designated Best Use Criteria. The aforesaid results show that there has been no improvement in the water quality flowing into the River, despite of the aforesaid efforts by departments such as BWSSB in tapping the untreated sewage and enhancement of sewage treatment capacity (as claimed by BWSSB), which otherwise would have been discharged into River

Thenpennai. Copy of Water Quality Analysis results of mugalur is appended as ***Annexure VI*** (pg no 179 - 198).

Further, KSPCB 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.

Regarding random verifications of industries discharging effluents into the storm water drains, KSPCB has been carrying out inspections to identify such industries. Few industries have already been issued with closure orders. KSPCB will continue to inspect a minimum of 60 industries to ensure that they do not discharge the effluent in to the storm water drain. On identifying such instances, action will be initiated under section 33A ofWater Act.

After the waste water is treated by the primary STP's situated in the area falling under the jurisdiction of Bruhat Bengaluru Mahanagar Palike (BBMP), the water flows further downstream crossing various villages/hamlets situated in karnataka before entering Tamilnadu. 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.

Copy of the Action Taken Report and Progress made on the Action points of the Joint Committee is appended as ***Annexure VI***.

## C. TNPCB

The Progress made with regard to action points pertaining to Tamilnadu as on21st May 2021 is given below;

**I. Random Verification of grossly polluting (water polluting) industries located in the River Basin and Assessment of wastewater management and discharge mode**

i. There is no discharge of industrial effluent into river Thenpennai in thearea underinvestigation i.e from Chokkarasanapalli Village to Kelavarapalli Dam stretch. The industries located in Thenpennai river basin are closely monitored by the TNPCB to ensure to achieve the zero liquid discharge.

***II.*** *Environmental Compensation be imposed by SPCBs after evaluating performance of STPs and identification of defaulters upon Random Verification*

No violating/defaulting industries are identified.

***III.*** *Sewage and Solid Waste Management in the villages (13) adjoining River Thenpennai up till Kelavarapalli*

i. **Sewage Management** - Construction of diversion channel with wet land system at a cost of Rs. 25 Lakh has been provided (about 90% civil works completed) for the treatment of sewage generated from the Bagalur by thelocal body of Hosur Panchayat Union.

ii. Construction of diversion channel with wet land system at a cost of Rs. 24 Lakh has been provided (about 90% civil works completed) for the treatment of sewage generated from the Belathur village by the local body ofHosur Panchayat Union.

The wet land for the stream #1 in Bagalur and Belanthur will be completed on 30.06.2021. For the remaining four stretches and remaining stretches of Bagalur and Belanthur, 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 31.10.2021. Additional time requested by the local body due to COVID Pandemic situation.

iii. Chennasandiram - The sewage generated from part of the 70 houses is being treated through the septic tank followed by the soak pit.

iv.Kanimangalam - 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 sewage generated from the Sokkarasanapalli village, Chennasandiram village and Kanimangalam 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 05 months.

v. Guliganapalli (Kodiyalam) village - 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.

vi.Sathiyamangalam, Muneeswar Nagar - 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.

vii. Lingapuram - 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.

viii. Baduthepalli - 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.

ix.Kempasandiram - 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.

x. Chennasandiram - The sewage generated from 70 houses is being treated through the septic tank followed by the soak pit and there is no discharge of sewage into River Thenpennai.

xi.Singasadanapalli - 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.

xii. Kanimangalam - The sewage generated from 125

houses is being treated through the septic tank followed by the soak pit and there is no discharge of sewage into River Thenpennai.

xiii. **Solid Waste Management**: Bagalur and Belathur villages - The local body of Hosur Panchayat Union has removed the solid waste dumped in the banks of River Thenpennai.

The average collection of solid waste in the Bagalur & Belathur 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-cycles and three electronic bikes.

The local body of Hosur Panchayat Union has constructed the Micro Compost Centre with a maximum capacity to process 3.0 MT of segregated biodegradable municipal solid wastes in Bagalur and Belathur at a cost of Rs. 20 Lakh & Rs. 24 lakh respectively.

Under Central Government scheme of National urban Mission project a Plastic shredding unit is proposed at a cost of Rs. 20 Lakhs to handle the plastic wastes in Bagalur and the shredded plastics will be used for road laying works. The work will be completed before 31.10.2021. The MCC centre at Bagalur and Belathur is proposed to commission on 30.06.2021 & 30.07.2021 respectively.

Additional time requested by the local body due to COVID Pandemic situation.

xiv. Sokkarasanapalli village - 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. 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.

xv. Guliganapalli, Sathiyamangalam, Muneeswar Nagar, Lingapuram, Baduthepalli, Kempasandiram, Chennasandiram, Singasadanapalli, Kanimangalam, Kallipuram and Oddapalli Thinna villages - 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.

The progress made in construction of sewage management and solid waste management plans are given as **Figure 1**;

**IV.** With regard to the action point on **trend of water quality and its improvement at major confluence points** 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, the details of water quality of

River Thenpennai monitored at interstate border i.e. at Chokkarasanapalli Village and report of analysis for the period from September 2017 to April 2021 is appended in ***Annexure VII*** *(pg no* 211-214).

Copy of the Action Taken Report and Progress made on the Action points of the Joint Committee is appended as ***Annexure VII***.

## D. Bangalore Development Authority (BDA)

I. With regard to **development of Biodiversity parks** the status of compliance and progress made is given as;

Bangalore Development Authority has the jurisdiction of Bellandur & Varthur lakes. It has undertaken the desilting work in these two lakes. As per the action plan submitted by BDA for rejuvenation of Bellandur and Varthur lake,

development of wetland provision is made in the DPR. However, provision for development of biodiversity park was included pursuant to the Hon'ble NGT direction on 11.12.2019 indicating "Steps may be explored for development of wet lands and biodiversity parks apart from other remedial action for reducingthe pollution load on the recipient water bodies".

Accordingly, for development of biodiversity parks in Bellandur & varthur lakes, the following available area within the lake periphery was prepared under the advice of NGT appointed Monitoring committee.

The Hon'ble NGT appointed Monitoring Committee submitted the following area details on formation of Biodiversity parks before the Hon'ble NGT.

An area of 52.24 acres (East of bund 5.8 acres near suncity 13.85 acres near Y-junction North west corner 11.77 acres Ambedkar nagar and nearby area

14.87 acres) in Bellanduru lake: 16.6 acres (near main let 6.9 acres: Siddapura west side 2.46 acres and near Balagere 7.24 acres) in Varthur lake for biodiversity parks. The suggested areas are out of the periphery of the lakes. In such areas (biodiversity parks) silt of appropriate quantity from the lakes may be used for rising to appropriate heights. The biodiversity parks may be raised with help of an expert committee in the field. The biodiversity parks will act as carbon sink, lung space and habitat to avian and other fauna and flora. The committee suggested that no other structures should be allowed in the lake areas than as suggested by the NGT in para 28(xii).

The Hon'ble NGT in its order dated 4/13.08.2020 has rejected the proposals with the following observation. "BDA has wrongly understood that biodiversity parks are to be setup within the lake boundary. Such parks are to be setup along the periphery of the lake boundary." Copy of Hon'ble NGT Order dated 13.08.2020 is appended as ***Annexure VIII*** (pg no. 257 – 279).

Once again to insist upon the Hon'ble NGT for formation of biodiversity park and islands within the lake on similar lines done in other lakes of Bangalore, vide IA No.392/2020 and 395/2020 in Original Application No.125/2017. Hon'ble NGT rejected the proposal in its order dated 15.12.2020, highlighting the submission learned Amicus Curiae to the Hon'ble NGT as below;

"The BDA has wrongly understood that biodiversity parks are to be set up within the lake boundary. Such parks are to be set up along the periphery oflake boundary".

To carry out the biodiversity parks along the periphery of lake boundary in Bellandur & Varthur lake, no Government land is available along the periphery of the lake, as per the information given by the Additional Director of Land Records, (Bangalore east) dated 06.11.2020.

Once again on the advice of Hon'ble NGT appointed Monitoring Committee to identify and carryout survey, the area between tank full level and tank boundary where water does not spread throughout the year. Such area has been identified and marked on the lake map with levels. The new proposal with 99 acres 07 guntas in Bellandur lake and 31 acres 15 guntas in Varthur lake were indentified and submitted to Hon'ble NGT appointed Monitoring committee. The Monitoring Committee submitted the proposal before the Hon'ble NGT for consideration. Hon'ble NGT in its order dated 12.03.2021 (Copy of Hon'ble NGT

Order dated 12.03.2021 is appended as ***Annexure VIII*** (pg no. 280 - 337) placed the observation & comments of Amicus Curiae as stated below:

"Progress against item No.20 with reference to setting up of bio-diversity park is not satisfactory. It is pointed out that the BDA has again taken a wrong stand for demarcating area between maximum flood level and the lake periphery instead of doing so along the periphery of the lake boundary i.e. ensuring that area of lakes is not used in the process. The proposal of the BDA appears to be to develop the bio-diversity park within the boundary of the lake and the full tank level adversely affects the lake."

Hence, there is no space available for development of biodiversity parks near Bellandur & Varthur lake. However, development of wetland has already been considered and work order has been issued to the agencies. Meanwhile agencies have taken up de silting of designated area of wetland for construction of wetland in Bellandur & Varthur lakes.

It is beyond Bangalore Development Authority jurisdiction and hence agency for development of Bio diversity park, wetland in River basin of Thenpennai or Dakshina Pinakini decision is to be taken at Government level, Government of Karnataka.

**Bellandur lake**:- For desilting Work order was issued on 23.11.2020 to M/s RMN infrastructure pvt ltd and after preliminary preparation like removal of seepage water from the lake bed and recording of pre levels by total station survey, agency has began desilting of lake from 04.12.2020.

Karnataka state Pollution Board (KSPCB) has done the analysis of silt samples and the report was received on 06.03.2021. As per the analysis report desilted material is being transported to the designated quarry at Vittasandra and Mailasandra.

**Wetland**:- Formation of wetland item has been included in the DPR forrejuvenation of Bellandur lake at 3 major inlets viz.

1. Main Inlet (Y junction) proposed wetland area of 1,71,000 Sqm.
2. Iblur inlet proposed wetland area of 30750.00 Sqm.
3. HAL inlet proposed wetland area of 30,000 Sqm.

As per the work order issued on 23.11.2021 wetland at these above locations the agency will execute the wetland after desilting of the lake.

**Varthur lake**:- For desilting Work order was issued on 23.11.2020 to M/s Star Infratech pvt ltd and after preliminary preparation like removal of seepage water from the lake bed and recording of pre levels by total station survey, agency has began desilting of lake from 04.12.2020.

Karnataka state Pollution Board (KSPCB) has done the analysis of silt samples and the report was received on 12.02.2021. As per the analysis report desilted material is being transported to the formers for their Agriculture purpose. As per the analysis of silt samples, the silt is suitable for Agriculture purpose.

**Wetland**:- Formation of wetland item has been included in the DPR for rejuvenation of Varthur lake at 1. Main Inlet in an wetland area of 163491 Sqm

As per the work order issued on 23.11.2020 wetland at these above locations the agency will execute the wetland after desilting of the lake.

**II.** With regard to **Water Quality of the water flowing in River Thenpennai be maintained pristine and tested for**

**its characteristics in the respective jurisdictions.**

In a parallel case, the Hon'ble National Green Tribunal, Principal Bench, New Delhi, Original Application No.125/2017 has issued directions in its Order dated on 18.12.2019 and final order dated 12.03.2021 vide page no.04 (sub sl no.xi), directing the "State PCB may develop a robust water quality monitoring programme for monitoring of water quality of drains leading to the lakes and also undertake water quality monitoring at least 5 location for each lake". As per the directions of Hon'ble NGT, monitoring of water quality of drains leading to the lakes is to be carried out by the State PCB.

The Bellandur and Varthur lakes are only 2 lakes under the custodian of BDA which flow into river Thenpennai. These 2 lakes have been emptied for carrying out de-silting work. The water entering into the lake from the storm water drain has been diverted through diversion channel. Monitoring water quality in the lakes does not arise as there is no water in the lake, due to de- silting work under progress.

The responsibility of monitoring treated water at K & C Valley Sewage Treatment Plant (STP) is with BWSSB.

Copy of Action Taken Report and Progress made on the Action points of the Joint Committee is appended as ***Annexure VIII***.

**E. Minor Irrigation and Ground Water Development -**

With regard to **measurement of flow of discharge of all the tanks/lakes** located in Koramangla & Challaghatta valleys flowing into River Thenpennai, it is to submit that informed that all tanks in Bangalore Urban district are in the control of BBMP. Minor irrigation department has not

installed any flow measuring devices for any Minor irrigation tanks. To address the details of flow or discharge of each of the tanks that are recharged by treated wastewater by BWSSB, it is to submit that since last three years, 6.69 TMC water was pumped to fill 78 tanks in Kolar and by pumping 1.16 TMC to fill 24 tanks in Chikkaballapur.

Whereas it is to submit that storm water drains and main river course are not in the jurisdiction of Minor Irrigation Department.

At present, 380 MLD of treated water is available for pumping from BWSSB treatment plants in KC valley and HN Valley for filling 102 tanks in Kolar and Chikkaballapur districts. After the total quantity of 650 MLD from BWSSB treatment plants are received then all the 191 tanks would be filled for ground water recharge.

Minor irrigation department has taken up works that comprises lifting of treated wastewater to fill 191 tanks in kolar and in chikkaballapur districts for ground water recharging purpose only. The flow and discharge are not measured by at each tank by the department. However, at present under these projects 102 tanks has been filled in both Kolar and Chikkaballapur districts by pumping 7.85 TMC of treated water available from BWSSB STP. Regarding flow measurements, Minor irrigation department has not installed any flow measuring devices for any minor irrigation tanks.

*With regard to Water Quality of the water flowing in River Thenpennai be maintained pristine and tested for its characteristics in the respective jurisdictions.*

It is to submit that water quality measurement is not covered under the ambit of Minor Irrigation and the quality of the water has to be monitored at the treated water discharge points by BWSSB. Therefore, the water quality is not

measured by the Minor Irrigation department.

Copy of Action Taken Report and Progress made on the Action points of the Joint Committee is appended as ***Annexure IX***.

### *F. Bruhat Bengaluru Mahanagra Palike (BBMP)*

With regard to **Water Quality of the water flowing in River Thenpennai be maintained pristine and tested for its characteristics in the respective jurisdictions**, no information has been provided.

## CHAPTER IV OBSERVATIONS AND RECOMMENDATIONS

i. 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.

ii. 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.

iii. 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 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.

iv. 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.

v. 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.

vi. 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.

vii. 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.

viii. 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.

ix. 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.

x. Due to unexpected surge in COVID-19 during April to May, 2021, the joint committee recommends that the timeline for compliance of the above recommendations may be provided as six months (till December 2021).

## *CHAPTER V CONCLUDING REMARKS*

While referring to the Department wise compliance status with observation is provided in Table 1 above, it is to submit that Bruhat Bengaluru Mahanagar Palike (BBMP) has not provided compliance status and action taken report in this regard.

It has been observed that, 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, the Government of Karnataka is required to intervene and clearly direct the concerned department i.e. RRC and the Karnataka Tank/Lake Conservation & Protection Authority who has

been vested upon the responsibility and custodian role for lakes/tanks and rivers in Karnataka. It has been informed by BWSSB, BDA, BBMP and Minor irrigation that the activities involving flow measurements and water quality monitoring are not covered under the ambit of the above departments. Therefore, jurisdictions of the River and its tanks on the river bed be clearly earmarked by the Government of Karnataka with concerned department(s) including RRC and the Karnataka Tank/Lake Conservation & Protection Authority for the purpose of monitoring and protection of surface water (lakes/tanks/rivers).

Water quality analysis of River Thenpennai at the interstate locations namely Mugalur Bridge in Karnataka and Sokkarasanapalli in Tamilnadu was provided by KSPCB and TNPCB. The same has to be carried out for the parameters to classify as per the Designated Best Use Criteria. In mugalur, the water quality analysis results (as on January 2021) reveal that the water quality falls under Class E as per Designated Best Use Criteria. The aforesaid results show that there has been no improvement in the water quality flowing into the River, despite of the aforesaid efforts by departments such as BWSSB in tapping the untreated sewage and enhancement of sewage treatment capacity (as claimed by BWSSB), which otherwise would have been discharged into River Thenpennai. Therefore, the joint committee is of the view that 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 falling under the jurisdiction of Bruhat Bengaluru Mahanagar Palike (BBMP), the water flows further downstream crossing various villages/hamlets situated in karnataka before entering Tamilnadu. 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.

In case of sokkarasanapalli, the parameters such as BOD, DO & Total Coliform are not complying with the standards notified under Environment (Protection) Rules, 1986. Besides, the parameters namely, turbidity, EC, SAR, Boron and Free ammonia may also be analysed to ascertain the classification of the water as per Designated Best Use Criteria.

The joint committee submits that, Hon'ble NGT vide orders dated 12.03.2021 in the matter of O.A No. 125/2017 regarding remedial action for restoration of Bellandur and Varthur Lakes at Bangalore, including preventing discharge and dumping of pollutants, removing encroachments from catchment area and other steps for restoration, before Principal Bench, New Delhi has issued landmark directions, which is reproduced as below; "*.. there is need for further continuous action and effective monitoring at the highest level in the Government. Consistent with earlier order on the subject, such monitoring needs to be taken over by the Chief Secretary, Karnataka who may take stock of all the left-over issues, with the assistance off other identified authorities and experts (which may include Indian Institute of Science, Bengaluru). He may inter alia interact with the State Lake Conservation and Development Authority and Forest, Ecology and Environment Departments. First meeting may be held latest by March 31,*

*2021. Thereafter, review meetings may be held atleast once in a month to monitor further progress and completion of targets, already fixed or which may be further fixed. It will be open to all persons interested in restoration and maintenance of the lakes in question to give their suggestions and other assistance which may be duly considered by the Chief Secretary, Karnataka on its merits. All pending projects for setting up of STPs, fencing of lake, removal of encroachments, etc. may be given to preventing formation of foam and fire incidents. Directions in earlier orders and current order to duly carried out and overseen by the Chief Secretary, as already mentioned, atleast once a month. … The application is disposed of accordingly*."

In view of the above directions, it is humbly submitted that, ongoing efforts, developments and progress in the past few months on the action plan submitted by Government of Karnataka and Tamilnadu in compliance to the Hon'ble NGT order dated 18.02.2021 (please refer Chapter III of the Joint Committee Progress Report) be considered by Hon'ble Tribunal. Therefore, the joint committee submits that, Hon'ble Tribunal may consider issuing necessary directions to the concerned departments (BWSSB, BDA, BBMP, Minor Irrigation, RRC and the Karnataka Tank/Lake Conservation & Protection Authority, KSPCB and TNPCB) to accomplish the activities as tabulated in table 1 along with recommendations of the joint committee in Chapter IV within a period of six months timeline (due to unexpected surge in COVID19 in the country).

Further, it is humbly prayed that, Hon'ble Tribunal may consider issuing necessary directions to the Chief Secretary, Government of Karnataka to provide 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 a quarterly basis to the Hon'ble Tribunal, Southern Zone, Chennai regarding the progress made and action taken on the complete action plan, till the work is completed as per the timelines.

10. The Tamil Nadu Pollution Control Board also filed action taken report on short term and long term measures signed on 23.03.2021, e-filed on 25.03.2021 and received on 26.03.2021 which reads as follows:

**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:**

- **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**
**Tamil Nadu Pollution Control Board**
**Hosur, Krishnagiri District**

| Action Points | Agency Responsible<br><br>(Timeline) | Progress made as on 31st March, 2021 | Proposed Action Plan with target date (if any) | Remarks |
|---|---|---|---|---|
| **I. 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.<br><br>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.<br><br>The details of STP and ZLD based ETP system installed for the treatment of sewage and trade effluent is enclosed vide Annexure-I.<br><br>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.<br><br>Renewal Consent with validity upto 31.03.2022. |

| Action Points | Agency Responsible (Timeline) | Progress made as on 31st March, 2021 | Proposed Action Plan with target date (if any) | Remarks |
|---|---|---|---|---|
| | | from the unit for the past one year 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.<br><br>The report of analysis (ROA) of AAQ/SM survey conducted in the vicinity of the unit during the period 26.08.2020 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 | CPCB (Six months on receipt of the Study Report and | | | |

| Action Points | Agency Responsible<br><br>(Timeline) | Progress made as on 31st March, 2021 | Proposed Action Plan with target date (if any) | Remarks |
|---|---|---|---|---|
| and KSPCB, after submission of Reports by the concerned authorities (BWSSB, KSPCB, TNPCB). | recommendations/criteria for imposing EC from KSPCB and 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 (about 90% civil works completed) for the treatment of sewage generated from part of the Bagalur village by the local body of Hosur Panchayat Union. | The wet land for the stream #1 will be completed on 30.04.2021.<br><br>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 30.09.2021. | Bagalur village. |

| Action Points | Agency Responsible<br><br>(Timeline) | Progress made as on 31st March, 2021 | Proposed Action Plan with target date (if any) | Remarks |
|---|---|---|---|---|
| | | Construction of diversion channel with wet land system at a cost of Rs. 24 Lakh has been provided at Belathur village (about 90% civil works completed) for the treatment of sewage generated from part of the Belathur village by the local body of Hosur Panchayat Union. | The wet land for the stream #1 will be completed on 30.04.2021.<br><br>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 31.10.2021. | Belathur village |
| | | | 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 4 months. | Sokkarasanapalli village. |

| Action Points | Agency Responsible<br><br>(Timeline) | Progress made as on 31st March, 2021 | Proposed Action Plan with target date (if any) | Remarks |
|---|---|---|---|---|
| | | 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 4 months. | Chennasandiram |
| | | 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 under grey water management scheme and the works will be completed within 4 months. | Kanimangalam |

| Action Points | Agency Responsible<br><br>(Timeline) | Progress made as on 31st March, 2021 | Proposed Action Plan with target date (if any) | Remarks |
|---|---|---|---|---|
| | | 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<br><br>(Timeline) | Progress made as on 31st March, 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 | 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<br><br>(Timeline) | Progress made as on 31st March, 2021 | Proposed Action Plan with target date (if any) | Remarks |
|---|---|---|---|---|
| Taluk to ensure the solid wastes are not disposed on the riverside and managed as per Solid Waste Management Rules, 2016. | | 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.<br><br>The local body of Hosur Panchayat Union has constructed the Micro Compost Centre with a maximum capacity to process 3.0 MT of segregated biodegradable municipal solid wastes at a cost of Rs. 20 Lakh. | The MCC centre at Bagalur is proposed to commission on 30.04.2021.<br><br>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.<br><br>The work will be completed before 31.10.2021. | |
| | | The average collection of solid waste in the Belathur Panchayat | The MCC centre at Belathur village is proposed to commission on 31.05.2021. | Belathur |

| Action Points | Agency Responsible<br><br>(Timeline) | Progress made as on 31st March, 2021 | Proposed Action Plan with target date (if any) | Remarks |
|---|---|---|---|---|
| | | 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.<br><br>The local body of Hosur Panchayat Union has constructed the Micro Compost Centre with a maximum capacity to process 3.0 MT of segregated biodegradable municipal solid wastes at a cost of Rs. 24 Lakh. | | |
| | | The solid wastes generated from the Sokkarasanapalli village are being collected and brought to the segregation shed and segregated as bio-degradable and non- | | Sokkarasanapalli village. |

| Action Points | Agency Responsible<br><br>(Timeline) | Progress made as on 31st March, 2021 | Proposed Action Plan with target date (if any) | Remarks |
|---|---|---|---|---|
| | | biodegradable wastes. | | |
| | | 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). | | |
| | | 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. | | Guliganapalli, Sathiyamangalam, Muneeswar Nagar, Lingapuram, Baduthepalli, Kempasandiram, Chennasandiram, Singasadanapalli, Kanimangalam, Kallipuram and Oddapalli Thinna villages. |

| Action Points | Agency Responsible (Timeline) | Progress made as on 31st March, 2021 | Proposed Action Plan with target date (if any) | Remarks |
|---|---|---|---|---|
| | | (Photographs enclosed). | | |
| **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 and the report of analysis for the period from January 2020 to January 2021 is enclosed vide Annexure-IV. | | Refer Annexure-IV – ROA of Thenpennai River. |

11. We heard the Learned Counsel for State respondents.

12. It is seen from the progress report submitted by the Joint Committee, which was extracted above, that they have come to certain conclusions and issued recommendations. They have also mentioned about the directions issued by the Principal Bench in O.A. No. 125/2017 in respect of Bellandur & Varthur Lakes by giving directions to the Chief Secretary, Karnataka State to monitor the progress of the left over issues on the basis of the recommendations made by the Joint Committee appointed by the Principal Bench, so as to protect those two water bodies. Further, certain other recommendations are also made, which includes establishmentof continuous monitoring system of the water quality at the border of State of Karnataka from where water is released from the reservoir mentioned above and since such types of incidents are happening even now. 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 mentioned above, including the directions given by the Principal Bench in O.A. No. 125/2017. Unless all these directions and recommendations are scrupulously implemented, no permanent solution can be achieved for redressing the present problem as it is a recurring incident whenever water is released from the above said reservoir which runs through the Thenpennai River.

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.

14. So the application is disposed of as follows:

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.

15. With the above observations and directions, the application is disposed of.

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

.....E.M.
(Shri. Dr. K. Satyagopal)

O.A. No. 111/2020(SZ)
28th June , 2021. (AM)

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

142-153

July 08, 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 Chief Secretary to Government
Government of Karnataka
Room No. 320, 3rd Floor, Vidhana Soudha
Bengaluru – 560 001.

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

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

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

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

12. The Secretary
Department of Forest, Environment & Ecology
Room no. 708, Gate 2, Multi Storied Building
Dr. Ambedkar Veedhi, 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 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.

Contd/...

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

The Hon'ble National Green Tribunal, 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.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.*

ii. *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.*

iii. *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.*

iv. *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.*

v. *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.*

vi. *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."*

*Contd/...*

In view of above, it is requested to ensure compliance of the Hon'ble NGT Order dated 28.06.2021 and submit the compliance report before Hon'ble NGT. The status of implementation of the Recommendations of the Joint Committee shall be provided to Central Pollution Control Board, Regional Directorate, Bangalore and Regional Directorate, Chennai for filing the periodical progress report in the matter. The format with timelines for providing the progress report to CPCB, Regional Directorate is attached for necessary compliance.

In this regard, it is requested that the complete periodical information in the format may kindly be sent to Smt. Selvi P K, Scientist D/Sr. Env Engr. (Mobile: 9868166753, email: pkselvi.cpcb@nic.in / pkselvi.rdb@gmail.com) nodal officer and member of the committee from CPCB, RD, Bengaluru. In case of any queries, the nodal officer may be contacted.

Yours faithfully

S. Suresh 8/7/2021

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

*Encl. (i) Interim Report of the Joint Committee*
*(ii) Report of the Joint Committee*
*(iii) Progress Report of the Joint Committee*
*(iv) Format for providing periodical Compliance Status*

Copy to:

The Regional Director
Regional Directorate, Central Pollution Control Board
II floor, 77-A, South Avenue Road
Ambattur Industrial Estate, Chennai – 600 058

: Kindly nominate a nodal officer

S. Suresh 8/7/2021

**(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/2021-22 413

September 13, 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 Commissioner
Bangalore Development Authority (BDA)
Kumara Park West, T.Chodaiah Road
Bengaluru – 560 020

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

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

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

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

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

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

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

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

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

**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) Orders of Hon'ble NGT, Southern Zone, Chennai dated 28.06.2021 (copy enclosed)
(ii) CPCB letter no. Tech(39)/Legal(NGT)/RDS/2021-22 dated 06.07.2021

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

Contd/-2.

क्षेत्रीय निदेशालय (दक्षिण) : निसर्ग भवन, ए–ब्लाक, प्रथम एवं द्वितीय तल, तिम्मय्या रोड, 7–डी मैन, शिवनगर, बेंगलूरु –
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

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."*

It is informed that the status of implementation of the Recommendations of the Joint Committee is not provided as per the format circulated.

In view of above, it is requested to provide the status of implementation of the Recommendations of the Joint Committee to Central Pollution Control Board, Regional Directorate, Bangalore on or before **17.09.2021 (Friday)** for filing the periodical progress report in the matter. The format with timelines for providing the progress report to CPCB, Regional Directorate is attached for necessary compliance.

In this regard, it is informed that the concerned departments shall ensure compliance of the Hon'ble NGT Order dated 28.06.2021 and submit the compliance report before Hon'ble NGT. The complete periodical information in the format may kindly be sent to Smt. Selvi P K, Scientist D/Sr. Env Engr. (Mobile: 9868166753, email: pkselvi.cpcb@nic.in / pkselvi.rdb@gmail.com) nodal officer and member of the committee from CPCB, RD, Bengaluru. In case of any queries, the nodal officer may be contacted.

Yours faithfully

S. Suresh 13/9/2021

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

*Encl. (i) Interim Report of the Joint Committee*
*(ii) Report of the Joint Committee*
*(iii) Progress Report of the Joint Committee*
*(iv) Format for providing periodical Compliance Status*

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

File No. Tech(39)/Legal (NGT)/RDS/2021-22 30.07.2021

To
The Regional Director
Regional Directorate
Central Pollution Control Board
II Floor, 77-A South Avenue Road
Ambattur Industrial Estate, Chennai – 600 058

**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. Orders of Hon'ble NGT, Southern Zone, Chennai dated 28.06.2021 (copy enclosed)
ii. Letter No. Tech (39)/Legal (NGT)/RDS/2021-22 dated 08.07.2021

Madam,

In the matter of O.A 111 of 2020, a Suo Motu 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.

Hon'ble NGT vide order dated 28.06.2021 directed that the Central Pollution Control Board, Regional Office, Bangalore as well as Regional Office, Chennai 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 compliance to the above, RD-Bengaluru has issued letters to all the concerned enclosing copy of Hon'ble NGT Order dated 28.06.2021 and format for providing compliance status on the recommendations of the joint committee (copy enclosed) vide letter dated 08.07.2021 (copy enclosed). Please refer to the recommendations (SI No. v to viii in the format) that are pertaining to Tamil Nadu Pollution Control Board (TNPCB) for follow up and necessary compliance. Also, refer to action points in Annexure I of the said format (SI. No. III, V, VI, VII) pertaining to TNPCB for reference.

In this regard, nomination of a nodal officer from RD, Chennai was sought vide letter dated 08.07.2021 in order to review the implementation of the recommendations made by the joint committee

Contd...

क्षेत्रीय निदेशालय (दक्षिण) : निसर्ग भवन, ए–ब्लाक, प्रथम एवं द्वितीय तल, तिम्मय्या रोड, 7–डी मैन, शिवनगर, बेंगलूरु – 560 079.
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
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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

(falling under the jurisdiction of RD-Chennai) and provide inputs/comments while preparing a joint report (once in three months) for filing before Hon'ble NGT, Southern Zone, Chennai. However, nomination is not received yet.

In view of above, it is requested to send nomination from RD, Chennai for further compliance of Hon'ble NGT Order dated 28.06.2021. Next meeting of the joint committee is scheduled to be held on 12.08.2021 (11:30 AM) through video conferencing to discuss the progress made in the matter and active participation of nodal officer from RD, Chennai may be ensured.

Yours faithfully,

30/7/2021

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

**FORMAT**

**COMPLIANCE STATUS WITH RESPECT TO THE RECOMMENDATIONS IN THE JOINT COMMITTEE REPORT IN THE MATTER OF O.A NO. 111 OF 2020**

The joint Committee submitted the following observations and recommendations based on the compliance status provided by the concerned departments in Karnataka and Tamilnadu with respect to the short term and long term action plan in the joint committee report;

i. 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.

ii. 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.

iii. 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.

iv. 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.

v. 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.

vi. 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.

vii. 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.

In case of sokkarasanapalli, the parameters such as BOD, DO & Total Coliform are not complying with the standards notified under Environment (Protection) Rules, 1986. Besides, the parameters namely, turbidity, EC, SAR, Boron and Free ammonia may also be analysed to ascertain the classification of the water as per Designated Best Use Criteria.

viii. 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.

ix. 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.

x. 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.

xi. Due to unexpected surge in COVID-19 during April to May, 2021, the joint committee recommends that the timeline for compliance of the above recommendations may be provided as six months (till December 2021).

In view of the above recommendations of the joint committee, the Karnataka State Pollution Control Board and Tamilnadu Pollution Control Board shall prepare the Compliance Status in the format as given below:

| S.No | Agency / Department Responsible for Complying the Action Plan of the Joint Committee | Point wise Compliance Status of the Recommendations made in the Progress Report with targets (including timelines) | First Progress Report between 1st April to 31st August 2021 | Second Progress Report between 1st September to 30th November 2021 | Third Progress Report between 1st December 2021 to February 2022 |
|---|---|---|---|---|---|
| 1. | KSPCB | | | | |

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| 2. | TNPCB | | | | |
| 3. | BWSSB | | | | |
| 4. | BBMP | | | | |
| 5. | BDA | | | | |
| 6. | Karnataka Tank/Lake Conservation & Protection Authority or agency responsible for flow measurement and water quality maintenance in lakes | | | | |

**Copy of Short term and long term action plan in the joint committee report is at Annexure I.*

***Note:*** *In compliance to the Hon'ble NGT Order dated 28.06.2021, the status of compliance of the short-term and long term measures by the concerned departments may also be updated (please refer Annexure I).*

*Water quality of River Thenpennai be monitored by concerned SPCB of Karnataka and Tamilnadu at suitable inter-state locations (including Mugalur bridge, Sokkarasanapalli and others) and the analysis reports be submitted before Hon'ble Tribunal once in three months.*

*In compliance to the Hon'ble NGT Order dated 28.06.2021, if there is any violation or non-implementation of the directions, then Hon'ble also directed CPCB 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.*

*The pointwise compliance status, progress made and updated status on the action plan (short term and long term in* ***Annexure I****) shall be provided to CPCB, RD, Bengaluru and Chennai by concerned departments in Karnataka and Tamilnadu through concerned State Pollution Control Board once in three months (i.e. due date - 31st August 2021, 30th November 2021 and February 2022).*

***Annexure I***

## SHORT TERM AND LONG TERM ACTION PLAN IN THE JOINT COMMITTEE REPORT IN THE MATTER OF O.A NO. 111 OF 2020

The joint committee with due cognizance of the water quality of River Thenpennai reported in section 5.2 of the Joint Committee Report and the action plan already reported by the joint monitoring team comprising of CPCB, KSPCB and TNPCB and execution of the action plan on remedial action for restoration of Bellandur, Agara and Varthur lakes at Bangalore by the monitoring committee in O.A no. 125/2017, the following long term and short term action plan has been prepared;

| Action Points | Agency Responsible (Timeline) | Progress made as on 31st March, 2021 | Proposed Action Plan with target date (if any) | Remarks |
|---|---|---|---|---|
| **I. Estimation of flow of water in River Thenpennai** | | | | |
| 1. BWSSB to measure the flow and discharge of all the tanks / lakes located in Koramangla & Challaghatta, Hebbal Valleys flowing in to River Thenpennai viz., Agara, Bellandur, Varthur, Channasandra, Yellamalappa Chetty, samethanahalli weir Mugalur etc. Flow details of tanks in the upstream (Hoskote taluk, Bangalore rural, chikkaballapur) may also be included if overflow is detected. | BWSSB and Minor Irrigation (Three months) | | | |
| 2. Flow or discharge of each of the tanks that are recharged by treated | Minor Irrigation (Three months) | | | |

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| wastewater by BWSSB i.e. 126 tanks in Kolar District and 65 tanks in Chikaballapur district.<br>3. Measurement of flow of all the major drains (i.e storm water drains) joining the river for estimate of flow of River Thenpennai and maintenance of all records. | BWSSB and Minor Irrigation (Three months) | | | |
| **II. Study of Performance evaluation of Sewage Treatment Plants in Bangalore by engaging a CSIR institute** | | | | |
| (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. | BWSSB and KSPCB (Six months) | | | |
| (ii) Completion of sewerage network for the villages in Koramangla & Challaghatta and Hebbal Valleys (of 110 villages identified by | BWSSB (as per the timeline fixed in O.A No. 125/2017) | | | |

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| BBMP) for tapping the sewage generated, as already submitted to Hon'ble Tribunal, Principal Bench, Delhi in the matter of O.A no. 125/2017. (Next date of hearing: 15.01.2021) | | | | |
| (iii) Strengthening of STP conveyance system to improve sewage getting completely tapped and treated, in order to avoid discharge into River Thenpennai. | BWSSB (on a regular basis) | | | |
| (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. | KSPCB and BWSSB (after completion of the study) | | | |
| **III. Random Verification of grossly polluting (water polluting) industries located in the River Basin and Assessment of wastewater management and discharge mode.** | | | | |
| i. Among the industries those that are Red/Orange category (small, medium and large) with treated effluent discharge option as surface | TNPCB & KSPCB (six months) | | | |

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| 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). | | | | |
| **IV. Rejuvenation of lakes to remediate the pollution caused in River Thenpennai** | | | | |
| 1. Advisory for development of Biodiversity park and wetland in the River basin of Thenpennai or Dakshina Pinakini as per CPCB Guidelines titled '*Guidelines for setting up of Biodiversity parks in Floodplains of Rivers of India, including River Ganga*' be notified in consultation with Government of Karnataka and KSPCB.<br><br>2. Completion of Biodiversity park, which comprises of;<br>(i) Feasibility study for development | BDA and concerned State functionaries of Government of Karnataka (six months)<br><br>Bangalore Development Authority (not more than One year or as per the timeline fixed in O.A No. 125/2017) | | | |

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| of Biodiversity parks in the River basin of Thenpennai<br>(ii) Preparation of Detailed Project Report (DPR) for development of Biodiversity parks in Bellandur an Varthur<br>(iii) Award of Project<br>(iv) Completion of the Project | | | | |
| **V. Environmental Compensation be imposed by SPCBs after evaluating performance of STPs and identification of defaulters upon Random Verification** | | | | |
| 1. EC be calculated and imposed based on the Performance Evaluation of STPs and Random Verification of Grossly Polluting Industries.<br><br>2. EC be calculated and imposed based on Random Verification of Grossly Polluting Industries.<br><br>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). | BWSSB and KSPCB (Six months)<br><br>TNPCB (Six months)<br><br>CPCB (Six months on receipt of the Study Report and recommendations/criteria for imposing EC from KSPCB and 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 | Feasibility study by TNPCB in consultation with local authority for | | | |

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| oxidations ponds/ diversion channels or wetlands etc.) by TNPCB followed by implementation by Local authority of the district.<br><br>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. | implementation (six months)<br><br>Concerned Block Development Officer to submit to TNPCB (six months) | | | |
| **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.<br><br>2. Responsibility as a Custodian of Rivers/tanks in Karnataka vests with State Functionaries namely, BWSSB, BBMP, BDA, Lake Development Authority, Minor Irrigation Department. Therefore, Water Quality of the | TNPCB & KSPCB (to monitor on yearly basis)<br><br>BWSSB, BBMP, BDA, Minor Irrigation Department (every year) | | | |

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| water flowing in River Thenpennai be maintained pristine and tested for its characteristics in the respective jurisdictions. | | | | |

***Note:*** *In compliance to the Hon'ble NGT Order dated 18.02.2021, the improvement of the water quality on account of the short-term measures that has been taken by the departments may also be provided.*

*Water quality of River Thenpennai be monitored by concerned SPCB of Karnataka and Tamilnadu at suitable inter-state locations (For example, Mugalur bridge, Sokkarasanapalli and others) and the analysis reports be submitted before Hon'ble Tribunal on or before 08.04.2021.*

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**Annexure IV**

**Table 1. Status of Compliance and Progress with reference to the Action Points of the Joint Committee**

| Action Points | Agency Responsible (Timeline) | Compliance (Complied / Not Complied / Partially Complied/ Under Progress) | Status of Progress / Compliance |
|---|---|---|---|
| 1. BWSSB to measure the flow and discharge of all the tanks / lakes located in Koramangla & Challaghatta, Hebbal Valleys flowing in to River Thenpennai viz., Agara, Bellandur, Varthur, Channasandra, Yellamalappa Chetty, samethanahalli weir, Mugalur etc. Flow details of tanks in the | BWSSB and Minor Irrigation (Three months) | BWSSB – Partially Complied; | BWSSB has provided the details of flow of sewage into STPs located in K&C valley and assessed the flow of treated water at the STP Outlets, that is being sent for Ground water recharge through Minor irrigation. |

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| upstream (Hoskote taluk, Bangalore rural, chikkaballapur) may also be included if overflow is detected. | | | |
| 2. Flow or discharge of each of the tanks that are recharged by treated wastewater by BWSSB i.e. 126 tanks in Kolar District and 65 tanks in Chikkaballapur district. | Minor Irrigation (Three months) | Minor Irrigation – Partially Complied. | Minor irrigation department has taken up works that comprises lifting of treated wastewater to fill 191 tanks in kolar and chikkaballapur districts for ground water recharging purpose only. The flow and discharge are not measured by at each tank by the department. However at present under these projects 102 tanks has been filled in both Kolar and Chikkaballapur districts by pumping 7.85 TMC of treated water available from BWSSB STP. Regarding flow measurements, Minor irrigation department has not installed any flow measuring devices for any minor irrigation tanks.<br><br>The concerned department responsible for measurement of flow in storm water drains could not be ascertained or entrusted by the Joint committee in this regard. It was informed that both the departments (BWSSB & MI) do not cover the activity of storm water drain flow measurement under the ambit/scope. |
| 3. Measurement of flow of all the major drains (i.e. storm water drains) joining the river for estimate of flow of River Thenpennai | BWSSB and Minor Irrigation (Three months) | | |

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| and maintenance of all records. | | | |
| (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.<br><br>(ii) Completion of sewerage network for the villages in Koramangla & Challaghatta and Hebbal Valleys | BWSSB and KSPCB (Six months)<br><br>BWSSB (as per the timeline fixed in O.A No. 125/2017) | BWSSB - Partially Complied.<br><br>KSPCB – Partially Complied.<br><br>BWSSB –Partially complied | (i) BWSSB has signed an agreement with M/s Society for Innovation and Development, IISC, Bangalore for BNR Removal Studies of STPs. The outcome of the study would be made available to the Hon'ble NGT.<br><br>(ii) KSPCB would review the findings of the study before furnishing to the Joint Committee and Hon'ble NGT.<br><br>Work Order issued to M/s Passavant Energy & Environment India Pvt Ltd & M/s Passavant Energy & Environment GMBH (JV) Unit, Gurgaon, Haryana and M/s Larsen & Tourbo Limited, Mumbai, Maharashtra for Mahadevapura and Bommanahalli Zones (K&C Valley Catchment) is provided. |

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| (of 110 villages identified by BBMP) for tapping the sewage generated, as already submitted to Hon'ble Tribunal, Principal Bench, Delhi in the matter of O.A no. 125/2017. (Next date of hearing: 15.01.2021)<br>(iii) Strengthening of STP conveyance system to improve sewage getting completely tapped and treated, in order to avoid discharge into River Thenpennai. | BWSSB (on a regular basis) | BWSSB – Partially complied | Maintenance of sewer lines is also done regularly based on the complaints and extensive, massive desilting of sewer lines will also be taken periodically to ensure proper flow of sewage. |
| (iv) The outcome of the performance study of STPs may be submitted as Status of Compliance of the | KSPCB and BWSSB (after completion of the study) | KSPCB and BWSSB – To be complied once the performance study report of STPs is completed. | The final outcome of the performance study would be reviewed by KSPCB, before furnishing to the Joint Committee and Hon'ble NGT. |

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| State Functionaries of Karnataka to the Monitoring Committee constituted in the matter of O.A 125/2017, for review and reporting. | | | |
| i. 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 | TNPCB & KSPCB (six months) | TNPCB - Complied<br><br>KSPCB – Not Complied | TNPCB has provided analysis report of M/s Premier SPG & WVG Mills Ltd., Belathur, Hosur upto March, 2021. However, TNPCB needs to cover few more industries randomly in the river basin for compliance verification. Further, TNPCB to keep a check on illegal discharge from unauthorized industries.<br><br>KSPCB not provided the details of Random verification of industries carried out for the year 2021-22 onwards. |

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|---|---|---|---|
| the Consent Conditions of SPCBs. The details of the compliance status and action taken report be placed in public domain (TNPCB and KSPCB website). | | | |
| 1. Advisory for development of Biodiversity park and wetland in the River basin of Thenpennai or Dakshina Pinakini as per CPCB Guidelines titled '*Guidelines for setting up of Biodiversity parks in Floodplains of Rivers of India, including River Ganga*' be notified in consultation with Government of Karnataka and KSPCB.<br><br>2. Completion of Biodiversity park, | BDA and concerned State functionaries of Government of Karnataka (six months)<br><br>Bangalore Development Authority (not more than | BDA – Not Applicable with reference to latest Hon'ble NGT Orders dated 12.03.2021 | i. Hon'ble NGT, Principal Bench, New Delhi vide IA No.392/2020 and 395/2020 in Original Application No.125/2017 rejected the proposal in its order dated 15.12.2020, highlighting "The BDA has wrongly understood that biodiversity parks are to be set up within the lake boundary. Such parks are to be set up along the periphery of lake boundary".<br><br>ii. There is no space available for development of biodiversity parks near Bellandur & Varthur lake. However development of wetland has already been considered and work order has been issued to the agencies. Meanwhile agencies have taken up de silting of designated area of wetland for construction of wetland in Bellandur & Varthur lakes.<br><br>iii.Targeted date for completion of desilting of Bellandur & Varthur lake is 18 months (excluding monsoon) from the date of handing over the site i.e., 04.12.2020.<br><br>Desilting work is under progress. Construction of wetland in Bellandur & Varthur lake will be taken up after the completion of removal of silt from both the lakes, that is on or before the targeted period 03.06.2022 assigned for desilting of lakes. |

| | | | |
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| which comprises of;<br>(i) Feasibility study for development of Biodiversity parks in the River basin of Thenpennai<br>(ii) Preparation of Detailed Project Report (DPR) for development of Biodiversity parks in Bellandur an Varthur<br>(iii) Award of Project<br>(iv) Completion of the Project | One year or as per the timeline fixed in O.A No. 125/2017) | | |
| 1. EC be calculated and imposed based on the Performance Evaluation of STPs and Random Verification of Grossly Polluting Industries.<br><br>2. EC be calculated and imposed based on Random Verification of | BWSSB and KSPCB (Six months)<br><br>TNPCB (Six months) | BWSSB – To be calculated once the performance study is completed;<br><br>KSPCB – To be complied<br><br>TNPCB – To be calculated once the random verification is | To be assessed by the concerned departments in Karnataka and Tamilnadu. |

| | | | |
|---|---|---|---|
| Grossly Polluting Industries.<br><br>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). | CPCB (Six months on receipt of the Study Report and recommendations/criteria for imposing EC from KSPCB and TNPCB) | carried out for remaining zones in the river basin<br><br>CPCB – To be complied once the Reports and Recommendations from KSPCB and TNPCB are received. | |
| 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.<br><br>2. Solid Waste Management Plan be devised and executed by concerned Block Development | Feasibility study by TNPCB in consultation with local authority for implementation (TNPCB - six months)<br><br>Concerned Block Development Officer to | TNPCB – Complied<br><br>BDO – Under Progress | Construction of diversion channel with wet land system for the treatment of sewage generated from the villages by the local body of Hosur Panchayat Union is under progress.<br><br>i. The local body of Hosur Panchayat Union has constructed the Micro Compost Centre for treatment of segregated biodegradable municipal solid wastes.<br><br>ii. Under Central Government scheme of National urban Mission project a Plastic shredding unit is proposed at a cost of Rs. 20 Lakhs to handle the plastic wastes in Bagalur.<br><br>iii. In Sokkarasanapalli, 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. |

| | | | |
|---|---|---|---|
| Officer, Hosur taluk to ensure the solid wastes are not disposed on the riverside and managed as per Solid Waste Management Rules, 2016. | submit to TNPCB (six months) | | |
| 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) | TNPCB –Complied;<br><br>KSPCB – Not Complied | Water quality analysis of River Thenpennai at the interstate location Sokkarasanapalli in Tamilnadu was provided by TNPCB. The same has to be carried out for the parameters to classify as per the as per Designated Best Use Criteria. In sokkarasanapalli, Tamilnadu the water quality analysis results (as on July 2021) reveal that the water quality falls under Class E as per Designated Best Use Criteria. There is improvement in the water quality in terms of the parameters such as BOD, Turbidity, EC, SAR, Boron and Free ammonia, however DO & Total Coliform are not meeting the Designated Best Use Criteria for classification of the water. |
| 2. Responsibility as a Custodian of Rivers/tanks in Karnataka vests with State Functionaries namely, BWSSB, BBMP, BDA, Lake Development | BWSSB, BBMP, BDA, Minor Irrigation Department (every year) | BWSSB –Partially Complied;<br><br>BBMP – Not Complied;<br><br>BDA –Partially Complied; | Not complied by the Concerned Departments, Government of Karnataka. |

| | | | |
|---|---|---|---|
| Authority, Minor Irrigation Department. Therefore, Water Quality of the water flowing in River Thenpennai be maintained pristine and tested for its characteristics in the respective jurisdictions. | | Minor Irrigation – Partially Complied. | |

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Email:cewwm@bwssb.gov.in

Office : (080) 22945106

ಬೆಂಗಳೂರು ನೀರು ಸರಬರಾಜು ಮತ್ತು ಒಳಚರಂಡಿ ಮಂಡಳಿ

**BANGALORE WATER SUPPLY & SEWERAGE BOARD**
**Office of the Chief Engineer (WWM), 5th Floor**
**Cauvery Bhavan, K.G. Road, Bangalore-560009.**

No.BWSSB / CE(WWM)/ ACE(WWM) /TA/ 1871 /2020-21 Dated : 10/12/2020.

## Work Order

**To,**
Chief Executive,
**SOCIETY FOR INNOVATION AND DEVELOPMENT,**
**Indian Institute of Science,**
Innovation Centre Building of the Indian Institute of Science Campus,
Bangalore – 560012

**For Kind attention of**

| | |
|---|---|
| 1. Dr. Lakshminarayana Rao,<br>Assistant Professor,<br>Department of Civil Engineering,<br>The Indian Institute of Science,<br>Bangalore-560012 | 2. Pro. H.N. Chanakya,<br>Chief Research Scientist,<br>Department of Civil Engineering,<br>The Indian Institute of Science,<br>Bangalore-560012 |
| 3. Dr. M.S. Mohan Kumar,<br>Professor,(Retd.)<br>Department of Civil Engineering,<br>The Indian Institute of Science,<br>Bangalore-560012 | |

Sir,

Sub:- Work of conducting studies towards the up gradation of the existing twenty (20) sewage treatment plants of BWSSB, to meet the effluent discharge standards as directed by the Honorable National Green Tribunal.

Ref: 1. Letter No. BWSSB/CE(WWM)/ACE(WWM) 1 & 3/TA-1/799/2020-21 dated 27/07/2020

1. Proposal dated 10th of August 2020, titled Biological Nutrient Removal (BNR) of the treated effluent from STPs of BWSSB.
2. Letter No. BWSSB/CE(WWM)/ACE(WWM)-1&2/TA-1/1642/2020-21 Dt:11-11-2020.
4. Your e-mail dated 17.11.2020
5. No.BWSSB / CE(WWM)/ ACE(WWM)-1&2 /TA-1/1787/2020-21 Dated:01-12-2020
6. Agreement No.25/2020-21 Dated: 07.12.2020

*****

Pursuant to the above and signing the contract agreement for the work of conducting studies towards the up gradation of the existing twenty (20) sewage treatment plants of BWSSB, to meet the effluent discharge standards as directed by the Honorable National Green Tribunal at a cost of Rs.47,30,000/- (Rupees Fourty Seven lakhs Thirty thousand only), you are hereby informed to proceed with the execution of the said work. Further you are hereby informed to carry out the work under the instructions of Additional Chief Engineer (WWM-3)-(STP-K Valley), Executive Engineer (STP-V.Valley), Executive Engineer (STP-H.Valley), Executive Engineer (STP-A.Valley) and Executive Engineer (STP-C.Valley). Further the scope of work also includes the validation of the DPR and cost estimates during actual execution of work in addition to the scope of work included in the agreement.

Please acknowledge the receipt of this work order.

Thanking you,

Yours faithfully,

Chief Engineer (WWM)
BWSSB

Copy to ACE(WWM-3)-(STP-K.V)/EE(STP-V.V)/EE(STP-H.V)/EE(STP-A.V) and EE(STP-C.V) for information and immediate necessary action.

e-mail : cecd@bwssb.gov.in

Phone : 91-080-22945103

ಬೆಂಗಳೂರು ನೀರು ಸರಬರಾಜು ಮತ್ತು ಒಳಚರಂಡಿ ಮಂಡಳಿ

**BANGALORE WATER SUPPLY AND SEWERAGE BOARD**
**OFFICE OF THE CHIEF ENGINEER,**
**5th Floor Cauvery Bhavan, K.G Road, Bangalore-560 009.**

**No. BWSSB/CEKTE/TA-11/05/2020/ 719 /2021-22** **Date: 02 .07.2021**

## LETTER OF COMMENCEMENT

To

**M/s LARSEN & TOUBRO LIMITED**
L&T House Narottam Moraji Marg
Ballard Estate, P.O. Box No. 278
Mumbai, Maharashtra, India, Pin Code 400 001
and its construction Head Quarters at Mount
Poonamallee Road, P.O Box no 979,
Manapakkam, Chennai 600 089
Landline: 044-22704966
Email: kssuresh@lntecc.com

Sir,

**Sub:** Bengaluru Water Supply and Sewerage Project (Phase III) Contract Package:-26: "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 Mahadevpura and Bommanahali Zones (K&C Valley Catchment) (Works-B)" under JICA Loan ID - P266

Chief Engineer (K) Bangalore-9 BWSSB, 5th Floor, Cauvery Bhavan

Ref: 1. LOA: No. BWSSB/CEKTE/TA-11/05/2021/330/2021-22 dated 04/06/2021
2. Contract Agreement No.BWSSB-III/CP-26/ 01/2021-22, dated:01.07.2021

*~*~*

This is pursuant to your furnishing the requisite performance security as stipulated in ITB Clause 44.1 and signing of Contract Agreement with Bengaluru Water Supply and Sewerage Project (Phase III) Contract Package No.26 (CP-26), "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 Mahadevpura and Bommanahali Zones(K&C Valley Catchment) (Works-B)" under JICA Loan ID - P266.

LARSEN & TOUBRO LIMITED Construction - Chennai

In accordance with the above, we are pleased to inform you that as per the agreement executed by you with BWSSB and in accordance with the General Conditions of Contract, Clause 8.1, you are requested to commence the work in all respect for Contract Package No. 26 (CP-26), "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 Mahadevpura and Bommanahali Zones (K&C Valley Catchment) [Works – B]"as per the details furnished below,

| | |
|---|---|
| Date of Works Commencement (Works A and Works B) | 02.07.2021 |
| Date of Works Completion-(Works A and Works B) | 01.01.2024 |
| Time for Work Completion (Works A and Works B) | 913 days/30 months |
| Retention Period (Works A) | 365 days from the date of issue of the Commissioning Certificate |
| Defects Notification Period (Works B) | 365 days from the date of issue of Taking Over Certificate |
| Date of O&M Commencement (Works A) | 02.01.2024 |
| Date of O&M Completion (Works A) | 31.12.2030 |
| Time for O&M Completion (Works A) | O&M Contract – 7 Years/84 months / 2555 days |

You are requested to comply with all the Tender Conditions and also to contact the Executive Engineer (K-1) Division, Kapila Bhavan, 4$^{th}$T block Jayanagar, Bangalore immediately & take over the site for execution of work and subsequently hand over of works to BWSSB in all respects before the date of completion.

Copy of the Agreement dated: 01.07.2021 was handed over to your Firm.

Please acknowledge the receipt of this letter at the earliest.

Thanking you,

Chief Engineer (K) Bangalore-9 BWSSB, 6th Floor, Cauvery Bhavan

Received orginal dated 02nd /07/2021

Yours faithfully,

2/7/21

Chief Engineer (K)
BWSSB

LARSEN & TOUBRO LIMITED Construction - Chennai

1. Copy submitted to Chief Representative, JICA, for kind information.
2. Copy submitted to Hon'ble Chairman for kind information.
3. Copy submitted to EIC for kind information.
4. Copy submitted to FA-CAO for kind information.
5. Copy to ACE(K-1) & ACE(K-2) for information and needful.
6. Copy to Assistant Controller (Accounts), BWSSB for information.
7. Copy to EE(K-1) for information & necessary action along with a copy of the Agreement.
8. Copy to AO(K) for information and needful.
9. Copy to Team Leader M/s ONTB for kind information.

e-mail : cecd@bwssb.gov.in

Phone : 91-080-22945103

ಬೆಂಗಳೂರು ನೀರು ಸರಬರಾಜು ಮತ್ತು ಒಳಚರಂಡಿ ಮಂಡಳಿ

**BANGALORE WATER SUPPLY AND SEWERAGE BOARD**
**OFFICE OF THE CHIEF ENGINEER,**
**5th Floor Cauvery Bhavan, K.G Road, Bangalore-560 009.**

**No. BWSSB/CEKTE/TA-11/04/2020/ 765 /2021-22** **Date: 07 .07.2021**

## LETTER OF COMMENCEMENT

To

M/s Passavant Energy & Environment India Pvt Ltd
& M/s Passavant Energy & Environment GMBH (JV)
Unit No. 110, 1st Floor, BPTP Park Centra,
Tower A, Section 30, Gurgaon-122 001,Haryana
Ph:+918030498727

Sir,

**Sub:** Bengaluru Water Supply and Sewerage Project (Phase III)-Contract Package **CP-25** i.e., "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

Ref: 1. LOA: No. BWSSB/CEKTE/TA-11/04/2021/329/2021-22 dated 04/06/2021
2. Contract Agreement No. BWSSP-III/CP-25/ 03/2021-22, dated:07.07.2021

*~*~*

This is pursuant to your furnishing the requisite performance security Bank Guarantee as stipulated in ITB Clause 44.1 and signing of Contract Agreement with Bengaluru Water Supply and Sewerage Project (Phase III) Contract Package No.25 (CP-25), "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.

In accordance with the above, we are pleased to inform you that as per the agreement executed by you with BWSSB and in accordance with the General Conditions of Contract, Clause 8.1, you are requested to commence the work in all respect for Contract Package No. 25 (CP-25), "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]"as per the details furnished below.

| | |
|---|---|
| Date of Works Commencement (Works A and Works B) | 07.07.2021 |
| Date of Works Completion-(Works A and Works B) | 06.01.2024 |
| Time for Work Completion (Works A and Works B) | 913 days/30 months |
| Retention Period (Works A) | 365 days from the date of issue of the Commissioning Certificate |
| Defects Notification Period (Works B) | 365 days from the date of issue of Taking Over Certificate |
| Date of O&M Commencement (Works A) | 08.01.2024 |
| Date of O&M Completion (Works A) | 07.01.2031 |
| Time for O&M Completion (Works A) | O&M Contract – 7 Years/84 months / 2555 days |

You are requested to comply with all the Tender Conditions and also to contact the Executive Engineer (K-4) Division, BWSSB, Malleshwaram, Bangalore immediately & take over the site for execution of work and subsequently hand over of works to BWSSB in all respects before the date of completion.

Copy of the Agreement dated: 07.07.2021 was handed over to your Firm.

Please acknowledge the receipt of this letter at the earliest.

Thanking you,

| BWSSP (PHASE-3), STAGE - V | |
|---|---|
| Date Recd. | 12.07.2021 |
| Chrono In No. | ONB 5283 |
| File Name | CP-25 |
| File No | 01 |
| Copies To | DY, ACE |

Yours faithfully,

**Chief Engineer (K)**
**BWSSB**

1. Copy submitted to Chief Representative, JICA, for kind information.
2. Copy submitted to Hon'ble Chairman for kind information.
3. Copy submitted to EIC for kind information.
4. Copy submitted to FA-CAO for kind information.
5. Copy to ACE(K-1) & ACE(K-2) for information and needful.
6. Copy to Assistant Controller (Accounts), BWSSB for information.
7. Copy to EE(K-4), BWSSB, Malleshwaram, for information & necessary action along with a copy of the Agreement.
8. Copy to AO(K) for information and needful.
9. Copy to Team Leader M/s ONTB for kind information.

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 September 24, 2021

442

To

The Chairman
Karnataka State Pollution Control Board
Parisara Bhavan
#49, Church St, 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: (i) Orders of Hon'ble NGT, Southern Zone, Chennai dated 28.06.2021
(ii) CPCB letter no. Tech(39)/Legal(NGT)/RDS/2021-22 dated 06.07.2021
(iii) CPCB letter no. Tech(39)/Legal(NGT)/RDS/2021-22 dated 13.09.2021

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.

Hon'ble NGT Order dated 28.06.2021 may be referred for the directions of the Hon'ble Tribunal and recommendations of the Joint Committee. Karnataka SPCB letter no. KSPCB/NGT/SEO-INFRA/2021-22/2754 dated 08.09.2021 informed that 12 marshals with Emergency Response Vehicles to identify illegal discharges and 04 vehicles have been purchased for the purpose for random verification/inspection of industries. The data related to random verification / inspection of industries and monitoring of water quality (Mugalur) is not provided for the year 2021-22. With regard to installation of online monitoring system for water quality at border of Karnataka & Tamilnadu, no updated status or tangible progress is provided.

Also, 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, it 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.

Contd/...

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

In this regard, it is informed that the updated compliance status and progress may be provided to CPCB at pkselvi.cpcb@nic.in / pkselvi.rdb@gmail.com. Smt. Selvi P K, Scientist D/Sr. Env Engr. Mobile: 9868166753 from CPCB, RD, Bengaluru may be contacted for further queries in this regard.

Yours faithfully

S. Suresh
24/9/2021

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

## 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 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |

**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 $27^0$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 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |

**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 $27^0$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 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |

**Thenpennaiyar River Water samples collected at Chokarasanapalli village at the inter State Border by the TNPCB, DEE, Hosur from January 2020 to February 2021**

| 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 | 20.01.2021 | 25.02.2021 |
| 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 | 7.63 | 7.04 |
| 2 | Total Suspended Solids | mg/l | 548 | 308 | 140 | 122 | 756 | 324 | 426 | 958 | 258 | 204 | 136 | 40 | 100 | 72 |
| 3 | Total Dissolved Solids | mg/l | 820 | 866 | 832 | 662 | 502 | 616 | 710 | 632 | 598 | 890 | 468 | 794 | 696 | 244 |
| 4 | Chloride | mg/l | 250 | 225 | 210 | 185 | 130 | 160 | 175 | 180 | 157 | 125 | 175 | 209 | 205 | 200 |
| 5 | Sulphate | mg/l | 98 | 143 | 74 | 117 | 79 | 37 | 278 | 112 | 24 | 26 | 92 | 11 | 74 | 26 |
| 6 | Oil and Grease | mg/l | 1.0* | 1.0 | 1.0* | 6.00 | 2.00 | 1 | 2 | 1 | 2 | 1.0* | 4 | 2 | 2 | 2 |
| 7 | BOD 3 days at $27^0$C | mg/l | 12 | 40 | 42 | 48 | 21 | 47 | 168 | 33 | 24 | 27 | 44 | 40 | 31 | 47 |
| 8 | COD | mg/l | 144 | 176 | 96 | 128 | 128 | 72 | 480 | 168 | 320 | 96 | 3.36 | 272 | 152 | 168 |
| 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 | 0.39 | 0.51 |
| 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 | 1300 | 1400 |
| 14 | Fecal Coliform | MPN / 100 ml | ---- | ---- | 2800 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |

| **Thenpennaiyar River Water samples collected at Chokarasanapalli village at the inter State Border by the TNPCB, DEE, Hosur from March 2021 to July 2021** | | | | | | |
|---|---|---|---|---|---|---|
| **Sl. No.** | **Parameter** | **Units** | **Date of Sample Collection** | | | |
| | | | **25.03.2021** | **27.04.2021** | **28.06.2021** | **27.07.2021** |
| 1 | pH | Number | 6.35 | 6.92 | 6.17 | 6.09 |
| 2 | Total Suspended Solids | mg/l | 94 | 84 | 74 | 60 |
| 3 | Total Dissolved Solids | mg/l | 150 | 728 | 750 | 464 |
| 4 | Chloride | mg/l | 90 | 180 | 190 | 160 |
| 5 | Sulphate | mg/l | 40 | 42 | 40 | 21 |
| 6 | Oil and Grease | mg/l | 2 | 4 | 2 | 2 |
| 7 | BOD 3 days at $27^0$C | mg/l | 40 | 23 | 26 | 24 |
| 8 | COD | mg/l | 224 | 136 | 40 | 104 |
| 9 | Dissolved Oxygen | mg/l | 0.96 | 0.21 | 0.58 | 2.42 |
| 10 | Conductivity | µs/cm | - | - | 1162 | 720 |
| 11 | Turbidity | NTU | - | - | 2.52 | 2.34 |
| 12 | SAR (Sodium Absorption Ratio) | meq/L | - | - | 0.64 | 0.56 |
| 13 | Boron | mg/l | - | - | 0.002* | 0.07 |
| 14 | Free Ammonia (NH3) | mg/l | - | - | 0.36 | 1.95 |
| 15 | Dissolved Phosphate | mg/l | - | - | - | - |
| 16 | Total Hardness | mg/l | - | - | - | - |
| 17 | Sulphide | mg/l | - | - | - | - |
| AEL, TNPCB, Salem | | | | | | |
| 18 | Total Coliform | MPN / 100 ml | 2600 | 1700 | 1200 | |
| 19 | Fecal Coliform | MPN / 100 ml | ---- | 840 | ---- | |

# ಬೆಂಗಳೂರು ಅಭಿವೃದ್ಧಿ ಪ್ರಾಧಿಕಾರ
# Bangalore Development Authority

ಸಂಖ್ಯೆ :
No. BDA/Com/EM/T-142 /2021-22

ದಿನಾಂಕ :
Date : 17/09/2021

To,

Regional Director,
Central Pollution Control Board,
Regional Directorate (South),
Nisarga Bhawan, A-Block
1st & 2nd Floors, Thimmaiah Road,
7th D Main, Shivanagar,
Bangalore-560 079.

Sir,

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"

Ref:-
1. Hon'ble NGT order in the matter of O.A. 111 of 2020 (SZ), dated.18.02.2021.
2. Hon'ble NGT order in the matter of O.A. 111 of 2020 (SZ), dated.28.06.2021.
3. This office letter no.BDA/Com/EM/T-32/2021-22, dated.21.05.2021.
4. Your office e-mail dated.16.09.2021.

*****

With reference to the above subject regarding rejuvenation of Bellandur & Varthur lakes to remediate the pollution caused in the River Thenpennai, the up to date Progress Report by Bangalore Development Authority is hereby attached for further necessary action.

Yours faithfully

17/09/2021

Commissioner,
Bengaluru Development Authority
Bengaluru

# BANGALORE DEVELOPMENT AUTHORITY

**Hon'ble NGT, Southern zone, Channai order in the matter of OA No.111/2020 (SZ) regarding "Frothing of Chemical Foam in the River Thenpennai" – Compliance and Action Taken Report**

## IV. Rejuvenation of lakes to remediate the pollution caused in River Thenpennai

| Action points | Progress made on 16.09.2021 | Proposed Action plan with target date (if any) | Remarks |
|---|---|---|---|
| 1. Advisory for development of Bio diversity park, wetland in River basin of Thenpennai or Dakshina Pinakini as per CPCB guidelines titled 'Guidelines for setting up of Bio diversity parks in Floodplains of Rivers of India, including River Ganga' be notified in consultation with Government of Karnataka and KSPCB.<br><br>2. Completion of Bio diversity park which comprises of;<br><br>i) Feasibility study for development of Bio diversity parks in the River basin of Thenpennai<br>ii) Preparation of Detailed Project Report (DPR) for development of Biodiversity parks in Bellandur & Varthur lakes.<br>iii) Award of project. | Bangalore Development Authority has the jurisdiction of Bellandur & Varthur lakes. It has undertaken the desilting work in these two lakes. As per the action plan submitted by BDA for rejuvenation of Bellandur and Varthur lake, development of wetland provision is made in the DPR. However, provision for development of biodiversity park was included pursuant to the Hon'ble NGT direction on 11.12.2019 indicating "Steps may be explored for development of wet lands and biodiversity parks apart from other remedial action for reducing the pollution load on the recipient water bodies".<br><br>Accordingly for development of biodiversity parks in Bellandur & varthur lakes, the following available area within the lake periphery was prepared under the advice of NGT appointed Monitoring committee.<br><br>The Hon'ble NGT appointed Monitoring Committee submitted the following area details on formation of Biodiversity parks before the Hon'ble NGT.<br><br>An area of 52.24 acres (East of bund 5.8 acres near suncity 13.85 acres near Y-junction North west corner 11.77acres Ambedkar nagar and nearby area 14.87 acres) in Bellanduru lake: 16.6 acres (near main let 6.9 acres: Siddapura west side 2.46 acres and near Balagere 7.24 acres) in Varthur lake for biodiversity parks. The suggested areas are out of the periphery of the lakes. In such areas (biodiversity parks.) silt of appropriate quantity from the lakes may be used for rising to appropriate heights. The biodiversity parks may be raised with help of | Targeted date of completion of desilting of Bellandur & Varthur lake is 18 months (excluding mon soon) from the date of handing over of site i.e.,. 4.12.2020.<br><br>Desilting work is under progress. Construction of wet land in Bellandur & Varthur lake will be taken up after the completion of removal of silt from both the lakes, that is on or before the targeted period | |

| | | | | |
|---|---|---|---|---|
| iv) Completion of the project. | an expert committee in the field. The biodiversity parks will act as carbon sink, lung space and habitat to avian and other fauna and flora. The committee suggested that no other structures should be allowed in the lake areas than as suggested by the NGT in para 28(xii)<br><br>The Hon'ble NGT in its order dated 4/13.08.2020 has rejected the proposals with the following observation. "BDA has wrongly understood that biodiversity parks are to be setup within the lake boundary. Such parks are to be setup along the periphery of the lake boundary.<br><br>Once again to impress upon the Hon'ble NGT for formation of biodiversity park and islands within the lake on similar lines done in other lakes of Bangalore, vide IA No.392/2020 and 395/2020 in Original Application No.125/2017. Hon'ble NGT rejected the proposal in its order dated 15.12.2020, highlighting the submission learned Amicus Curiae to the Hon'ble NGT as below;<br><br>"The BDA has wrongly understood that biodiversity parks are to be set up within the lake boundary. Such parks are to be set up along the periphery of lake boundary".<br><br>To carry out the biodiversity parks along the periphery of lake boundary in Bellandur & Varthur lake, no Government land is available along the periphery of the lake, as per the information given by the Additional Director of Land Records, (Bangalore east) Dated.06.11.2020.<br><br>Once again on the advice of Hon'ble NGT appointed Monitoring Committee to identify and carryout survey, the area between tank full level and tank boundary where water does not spread throughout the year. Such area has been identified and marked on the lake map with levels. The new proposal with 99 acres 07 guntas in Bellandur lake and 31acres 15guntas in Varthur lake were indentified and submitted to Hon'ble NGT appointed Monitoring committee. The Monitoring Committee submitted the proposal before the Hon'ble NGT for consideration. Hon'ble NGT in its order dated.12.03.2021 placed the | 03.06.2022 assigned for desilting of lakes. | |

| | | | |
|---|---|---|---|
| | observation & comments of Amicus Curiae as stated below:<br><br>Progress against item No.20 with reference to setting up of bio-diversity park is not satisfactory. It is pointed out that the BDA has again taken a wrong stand for demarcating area between maximum flood level and the lake periphery instead of doing so along the periphery of the lake boundary i.e. ensuring that area of lakes is not used in the process. The proposal of the BDA appears to be to develop the bio-diversity park within the boundary of the lake and the full tank level adversely affects the lake.<br><br>Hence, there is no space available for development of biodiversity parks near Bellandur & Varthur lake. However development of wetland has already been considered and work order has been issued to the agencies. Meanwhile agencies have taken up de silting of designated area of wetland for construction of wetland in Bellandur & Varthur lakes. | | |

Further it is submitted that in respect of water quality to be maintained as pristine by the departments viz., BDA, BBMP, BWSSB & KSPCB, the Hon'ble National Green Tribunal, Principal Bench, New Delhi, in Original Application No.125/2017 has issued directions in its Order dated on 18.12.2019 and final order dated 12.03.2021 vide page no.04 (sub sl no.xi), directing the "State PCB may develop a robust water quality monitoring programme for monitoring of water quality of drains leading to the lakes and also undertake water quality monitoring at least 5 location for each lake". As per the directions of Hon'ble NGT, monitoring of water quality of drains leading to the lakes is to be carried out by the State PCB.

Bellandur and Varthur lakes are only 2 lakes in the K.C. Valley under the custody of BDA from which water flows into river Thenpennai. These 2 lakes have been emptied now for carrying out de-silting work. The desilting work is under progress, the water entering into the lake has been diverted through a diversion channel. Hence, monitoring water quality in the lake does not arise now.

The monitoring of treated water at K.C.Valley Sewage Treatment Plant (STP), the responsibility is lies with the BWSSB.

19/09/2021

Commissioner,
BDA, Bengaluru