BEFORE THE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE BENCH, AT CHENNAI

APPEAL No. 32 of 2025

R.L. Srinivasan

...Appellant

Vs.

The Union of India
Rep. by its Secretary to Government
Ministry of Environment & Forest & Climate Change
And Another

...Respondents

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Dated at Chennai this the 25th day of July 2025.

Counsel for Respondent-1 (MoEF & CC)

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BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
SOUTHERN ZONE BENCH, CHENNAI
Appeal No. 32 of 2025

R. L. Srinivasan **...Appellant**

Versus

Union of India and Anr. **...Respondents**

COUNTER AFFIDAVIT ON BEHALF OF RESPONDENT NO. 1, MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

I, Dr. S. Pradeep Kumar, S/o S. Sugumar, aged about 37 Years currently working as Scientist- 'B' in the Ministry of Environment, Forest and Climate Change (MoEF&CC), Regional Office, Chennai, solemnly affirm and declare the following:

1. That I, the above-named Deponent, am authorized and well conversant with the facts and circumstances of the present case and thus competent to swear the present Affidavit.
2. That I have read and understood the contents of the present Affidavit. The contents thereof are true and no part of it is false and no material has been concealed therefrom.
3. That without prejudice to the above and as an alternative submission, the deponent craves liberty to raise further required contentions during the course of the proceedings if sought by this Hon'ble Tribunal.

25/07/2025

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4. That, it is most respectfully submitted that the allegations made by the appellant are denied. Any allegation not specifically denied herein is also deemed to be denied.

5. That, it is most respectfully submitted that in the present Appeal, the appellant has challenged the decision of this Respondent dated 08.03.2025, whereby an amendment was granted to the Environmental Clearance (EC) dated 20.01.2016, permitting the 2nd Respondent to modify the fuel source for its proposed 1x800 MW coal-based thermal power plant, namely NCTPS Stage III, from 100% imported coal to a blend of 50% imported and 50% domestic coal. The appellant alleges that this amendment was granted in violation of the procedure laid down under the EIA Notification, 2006, particularly asserting that it was done without conducting a public hearing or comprehensive assessment studies as envisaged in the Terms of Reference (ToR) earlier issued by the Ministry of Environment, Forest and Climate Change (MoEF&CC).

6. That, it is most respectfully submitted that in the instant application, the appellant has sought interim relief by way of a stay on the operation of the 1st respondent's order dated 08.03.2025, which amended the environmental clearance dated 20.01.2016 to permit a change in coal usage from 100% imported to a 50:50 ratio of imported and domestic coal. The applicant further prays for the final relief of quashing or setting aside the said order dated 08.03.2025 and seeks any other order(s) deemed fit and proper in the facts and circumstances of the case to render justice.

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PRELIMINARY OBJECTIONS: ORIGINAL APPLICATION BARRED BY LIMITATION

7. That, it is most respectfully submitted that, the provision with regard to appeal is provided in the National Green Tribunal Act, 2010 under Section 16(h) which is as follows: "*Tribunal to have appellate jurisdiction. -Any person aggrieved by, - .... (h) an order made, on or after the commencement of the National Green Tribunal Act, 2010, granting environmental clearance in the area in which any industries, operations or processes or class of industries, operations and processes shall not be carried out or shall be carried out subject to certain safeguards under the Environment (Protection) Act, 1986 (29 of 1986);*

.....

may, within a period of thirty days from the date on which the order or decision or direction or determination is communicated to him, prefer an appeal to the Tribunal:

Provided that the Tribunal may, if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal within the said period, allow it to be filed under this section within a further period not exceeding sixty days."

8. That, it is most respectfully submitted that, by virtue of section 16 of National Green Tribunal Act, 2010, the period of limitation is 30 days from the date on which the order or decision or direction or determination was communicated. The decision of transferring Environmental

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Clearance (EC) to Tamil Nadu Power Generation and Distribution Corporation (TANGEDCO) was communicated on 08.03.2025, and the 30day period lapsed on 08.04.2025. However, the appellant filed this Appeal on 19.04.2025, resulting in a delay of approximately 11 days.

9. That, the proviso to Section 16, National Green Tribunal Act, 2010 is empowered to condone a delay if the appellant can establish sufficient cause for the same up to a period of 60 days. This proviso is intended to assist vigilant litigants who were genuinely prevented from initiating proceedings within the prescribed limitation period. The legal principle "*vigilantibus non dormientibus jura subveniunt*," rooted in Latin, underscores that legal remedies are available only to those who are diligent in protecting their rights.

10. That, it is most respectfully submitted that, in the instant case, the appeal was not filed within the prescribed 30 days, nor has any sufficient cause been shown to justify condoning the delay of approximately 11 days in filing. Therefore, this Hon'ble Tribunal shall dismiss the present Original Application, as the appellant has failed to provide a satisfactory and sufficient reason for the delay in filing it.

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REPLY ON MERITS:

11. That, it is most respectfully submitted that, the Answering Respondent has notified Environment Impact Assessment (EIA) Notification, 2006 under the provisions of the Environment (Protection) Act, 1986 which deals with the process to grant prior Environment Clearance (EC) for the new projects and activities listed in the Schedule of this notification, for expansion and modernization of the existing projects and for any change in product-mix in an existing manufacturing units.

12. That, it is most respectfully submitted that, EIA involves assessing the potential environmental effects of a proposed project, encompassing interconnected socio-economic, cultural, and human-health impacts—both positive and negative. Furthermore, it's crucial to note that the granting of EC to a project isn't a singular step; it follows a prescribed process outlined in the EIA Notification, 2006, which includes:

- **Stage (1) – Screening**(Category B only)
- **Stage (2) - Scoping** – i.e. prescribing Terms of Reference (TOR) or undertaking detailed Environment Impact assessment studies.
- **Stage (3) - Public Consultation** – to be conducted by the respective State Pollution Control Board/UT Pollution Control Committee.
- **Stage (4) - Appraisal** – by Expert Appraisal Committee (EAC).

13. That, it is most respectfully submitted that as per the extant provisions of EIA Notification, 2006, the thermal power plants is listed under item 1(d) to the schedule of EIA, 2006.

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Background of the case:

14. That, it is most respectfully submitted that M/s Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO), through an online application dated 26.05.2015, sought Environmental Clearance for the expansion of the North Chennai Thermal Power Project (Stage-III) by addition of 1x800 MW unit, along with CRZ Clearance for the associated foreshore facilities located at Villages Ennore and Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu.

15. That, it is most respectfully submitted that the Terms of Reference (ToR) for the preparation of the EIA/EMP report were granted by this Respondent on 28.05.2012, and subsequently, the validity of the ToR was extended until 27.05.2015 vide order dated 08.09.2014. The Public Hearing was held on 05.03.2015. Further, the State Level Coastal Zone Management Authority (CZMA) in its meeting held on 19.05.2015, recommended the grant of Coastal Regulation Zone (CRZ) clearance for the foreshore facilities.

16. That, it is most respectfully submitted that, based on the information, clarifications, documents submitted, and the presentations made by M/s Ramky Enviro Engineers Ltd., Hyderabad, before the Expert Appraisal Committee (EAC – Thermal Power) during its 38th and 46th meetings held on 25th–26th June, 2015 and 26th-27th November, 2015 respectively, and before the EAC (CRZ) during its 150th meeting held from 29th to 31st July, 2015, the proposal was recommended for grant of Environmental Clearance and CRZ clearance.

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17. That, it is most respectfully submitted that pursuant to the recommendations of the Expert Appraisal Committees, this Respondent granted Environmental Clearance for the 1x800 MW (Stage-III) North Chennai Thermal Power Project, and CRZ Clearance for the foreshore facilities located at Villages Ennore and Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu, under the provisions of the EIA Notification dated 14th September, 2006 and its subsequent amendments, and CRZ Notification, 2011 and its amendments, subject to compliance with specific and general conditions, including the stipulation that the imported coal requirement of 2.09 MTPA shall be met through MMTC, New Delhi. Copy of the EC letter dated 20.01.2016 is annexed herewith as **Annexure No. R1-1.**

18. That, it is most respectfully submitted that this Respondent, vide Office Memorandum dated 06.12.2023, has amended the earlier O.M. dated 11.11.2020, which pertains to the procedure for amendment in Environmental Clearance (EC) in cases involving a change in coal source by Thermal Power Plants. The revised Office Memorandum dated 06.12.2023 expressly states that, *'All Thermal Power Plants (including Captive Power Plants) having prior Environmental Clearance and proposing a change in the coal source shall approach the Ministry for amendment of the EC, along with a study on additional impact assessment and a revised Environmental Management Plan (EMP) based on the proposed change in coal source.'* Copy of the Office Memorandum dated 06.12.2023 is annexed herewith as **Annexure No. R1-2**.

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19. That, thereafter, it is most respectfully submitted that M/s Tamil Nadu Generation & Distribution Corporation Limited (TANGEDCO) submitted an online application on 14.06.2024 vide proposal no. IA/TN/THE/475354/2024, seeking amendment in the Environmental Clearance granted by the Ministry vide F.No. J-13012/14/2012-IA.II (T) dated 20th January 2016. The application was submitted in the prescribed format—Form 4 (including CAF, Form I Part A, B, and C)—along with an Additional Impact Assessment and Revised Environmental Management Plan (EMP) for the proposed change in coal source. The amendment was sought for the project titled "1x800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities by M/s Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO) at NCTPS Complex, Villages Ennore & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu," in accordance with the Ministry's Office Memorandum dated 06.12.2023 and the earlier O.M. dated 11.11.2020. Copy of the Additional Impact Assessment and Revised EMP submitted by Project Proponent in May 2024 is annexed herewith as **Annexure No. R1-3**.

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20. That, it is most respectfully submitted that the details of the amendment sought in the Environmental Clearance and CRZ Clearance dated 20.01.2016 are as follows:

Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
Point no. 3	The Imported Coal requirement of 2.09 MTPA will be sourced through MMTC, New Delhi.	The coal requirement is 2.69 MTPA in the ratio of Imported Coal 1.04 MTPA and domestic Coal 1.65 MTPA. The Imported and domestic coal will be sourced from MMTC, New Delhi and Kalinga block of Talcher, Mahanadhi, IB Valley Coal Fields, respectively.	TANGEDCO is planning to change from use of 100% Imported coal to use a mix of domestic coal and Imported coal in the ratio of 50%-50% proportion, which is in compliance of MoEF&CC OM dated 6th Dec. 2023 and previous OM dated 11th Nov, 2020 regarding Amendment in Environmental Clearance for change in coal source by Thermal Power Plants.

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21. That it is respectfully submitted that the present proposal was initially considered during the 11th meeting of the Expert Appraisal Committee (EAC) for Thermal Power Projects held on 27–28 June 2024, and was subsequently reconsidered during its 18th meeting held on 24 January 2025. The project/activity falls under Category 'A' of item 1(d) – 'Thermal Power Plants' – of the Schedule to the Environmental Impact Assessment (EIA) Notification, 2006, as amended, since the proposed expansion involves power generation capacity of 800 MW, which exceeds the threshold limit of 500 MW, and hence requires appraisal at the Central level by the sectoral EAC in the Ministry.

22. That it is respectfully submitted that while appraising the proposal for amendment to the Environmental Clearance (EC) dated 20.01.2016, granted to the 1x800 MW (Stage-III) North Chennai Thermal Power Project (TPP), the EAC thoroughly examined the implications of the proposed change in fuel mix—from 100% imported coal to a 50:50 blend of imported and domestic coal. The Committee noted that the proposed modification was in accordance with the Ministry's Office Memoranda dated 11.11.2020 and 06.12.2023. It was observed that this change would lead to increased coal consumption and higher ash generation, potentially affecting ambient air quality, particularly PM10 levels. However, the project proponent, M/s TANGEDCO, had submitted an Additional Impact Assessment along with a Revised Environmental Management Plan (EMP) addressing the anticipated impacts.

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23. That it is further submitted that the EAC, after detailed consideration of all relevant aspects—including ambient air quality data, site-specific conditions, existing infrastructure, and proposed pollution control measures—recommended approval of the amendment to the EC, permitting the revised coal mix, subject to additional environmental safeguards.

24. That it is most respectfully submitted that, based on the recommendations of the Expert Appraisal Committee (EAC), the proposal for the 1x800 MW (Stage-III) North Chennai Thermal Power Project and CRZ Clearance for foreshore facilities at Villages Ennore and Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu, submitted by M/s Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO), for a change in coal usage from 100% imported coal to a 50:50 blend of Indian and imported coal, was granted, subject to compliance with the following additional specific environmental safeguard conditions:

i. *Project proponent shall comply with all the directions passed by the Hon'ble National Green Tribunal vide its judgement dated 05/07/2022 in OA No 8 of 2016 titled as R.Ravimaran (Died) & Ors. vs Union of India & Ors. tagged with OA No 198 of 2016 titled as Meenava Thanthai K.R. Selvaraj Kumar vs The Chief Secretary Government of Tamil Nadu, Chennai & Ors. Compliance status in this regard shall be submitted to the concerned Regional Office of the MoEF&CC along with the six-monthly compliance report.*

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ii. *Project proponent shall obtain the amendment in CTO from SPCB as applicable in the instant case for the proposed amendments.*

iii. *Project proponent shall implement the protective measures proposed in EMP in a time-bound manner. The budget earmarked for the same is Rs 1,185.21crores (Capital) and Rs 98 crores(recurring) and should be kept in separate accounts and audited annually. The implantation status along with the amount spent with documentary proof shall be submitted to the concerned Regional Office for the activities carried out during the previous year.*

iv. *Regular monitoring of Fly Ash Pond shall be carried out and inspection should be done to avoid any chance of failure of bunds or leakage from the Ash Pond. The Pipe line carrying the fly ash shall also be inspected for any leakage at regular intervals. In case of any leakage immediate corrective measures needs to be taken and concerned authorities shall be informed. PP shall also keep a record of inspection.*

v. *Fly ash handling shall be done strictly as per extent rules/regulations of the Ministry/CPCB issued from time to time including Ministry's Notification No. S.O.5481(E) dated 31st December, 2021. No coal shall be transported through road shall be allowed.*

vi. *The transportation of Ash from the Thermal Power Plant to other Industries (Cement/brick) shall be through closed bulkers only.*

vii. *Water Sprinkling on roads shall be done in at regular interval on the roads atleast within 1 km range approaching the plant. A logbook shall be maintained for the activity and be in six monthly compliance report.*

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viii. *Project proponent shall ensure that roads for transportation shall be maintained and keep in good condition to avoid fugitive emissions.*

ix. *Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.*

x. *Project proponent shall provide regular health monitoring services and health services free of cost to people living in 10 km radius.*

xi. *Project proponent shall establish an Environment Management Cell and ensure to engage sufficient staff having environment related qualification for its smooth its functioning.*

xii. *Environment Audit of plant shall be done annually and report shall be submitted to Regional office of the Ministry.*

xiii. *Use of Diesel operated transportation vehicles shall be avoided as far as possible and BS-VI complaint vehicle shall be purchased and preference shall be given to EV/CNG/LNG based trucks for transportation raw materials, coal and disposal. Change to EV/CNG/LNG be done in a time bound manner.*

xiv. *Project proponent shall ensure that all types of plastic waste generated from the plant shall be stored separately in isolated area and disposed of strictly adhering to the Plastic Waste Management Rules 2016 (as amended). In pursuant to the Ministry's OM dated 18/07/2022 PP shall also create awareness among the people working in the project area as well as in its surrounding area on the ban on Single Use Plastic(SUP) in order to ensure compliance of Ministry's Notification published by the Ministry on 12/08/2021. A report along with photograph on the measures taken shall also be included in the six-monthly compliance report being submitted by PP.*

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xv. *Monitoring for heavy metals and fluoride in ground water and surface water shall be undertaken along with the regular monitoring and results/findings submitted along with half yearly monitoring report.*

xvi. *Project proponent is advised to implement the 'Ek Ped Maa Ke Naam' Campaign which was launched on 5th June 2024 on the occasion of the World Environment Day to increase the forest cover across the Country. This plantation drive is other than Green belt development. An action plan in this regard shall be submitted concerned RO.*

Copy of the Amendment in EC letter dated 08.03.2025 is annexed herewith as **Annexure No. R1-4**.

SPECIFIC REPLY TO THE ALLEGATIONS OF THE APPLICANT:

25. That, it is most respectfully submitted that the applicant's allegation—claiming that the Expert Appraisal Committee (EAC) failed to apply its mind while recommending the amendment for change in coal usage from 100% imported coal to a 50:50 mix of imported and domestic coal, and that the impugned order granting such amendment is in violation of the EIA Notification, 2006—is wholly misconceived and without merit. The recommendation of the EAC was made strictly in accordance with the Office Memorandum dated 06.12.2023, which explicitly stipulates that *'All Thermal Power Plants (including Captive Power Plants) having prior Environmental Clearance and proposing a change in the coal source shall approach the Ministry for amendment of the EC, along with*

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a study on additional impact assessment and a revised Environmental Management Plan (EMP) based on the proposed change in coal source.'

26. That the allegation of the appellant—that the Ministry failed to recognize that the nature and pollution footprint of the subject Thermal Power Plant had fundamentally changed with the modification sought by the 2nd Respondent, thereby rendering the earlier Environmental Clearance (EC) dated 20.01.2016 ineffective and inapplicable, and that the modification could not have been treated as a mere amendment—is misconceived and without merit.

27. That the appellant has failed to take into account the fact that the Expert Appraisal Committee (EAC), while recommending the amendment, had also prescribed specific environmental safeguard conditions to ensure continued compliance with environmental norms and effective mitigation of the potential impacts arising from the change in fuel mix.

28. That the EAC directed the project proponent (PP) to implement the protective measures proposed in the revised Environmental Management Plan (EMP) in a time-bound manner. A dedicated budget of ₹1,185.21 crores (Capital) and ₹98 crores (Recurring) has been earmarked for the same, which is required to be maintained in separate accounts and audited annually. The status of implementation, along with expenditure details supported by documentary evidence, is to be submitted to the concerned Regional Office for review of the activities undertaken during the preceding year.

29. That, among other specific environmental conditions, the EAC recommended the following:

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i. Regular monitoring of the Fly Ash Pond must be carried out to prevent any risk of bund failure or leakage. The pipeline carrying fly ash should also be inspected at regular intervals for any signs of leakage. In the event of any leakage, immediate corrective action must be undertaken, and the concerned authorities must be informed. The project proponent shall maintain a record of all such inspections.

ii. Handling of fly ash must strictly adhere to the prevailing rules and regulations issued by the Ministry and the Central Pollution Control Board (CPCB), including the Ministry's Notification No. S.O. 5481(E) dated 31st December 2021. No coal transportation by road shall be permitted.

iii. Transportation of ash from the Thermal Power Plant to user industries (e.g., cement or brick manufacturers) shall only be undertaken using closed bulkers.

iv. Regular water sprinkling must be carried out on roads, particularly within a 1 km radius of the plant's approach roads. A logbook documenting such activities must be maintained and included in the six-monthly compliance reports.

30. That, in light of the foregoing submissions, it is most respectfully submitted that the present appeal lacks merit and has been instituted on the basis of unfounded allegations that are unsupported by any substantive evidence. The appellant has failed to demonstrate how the impugned amendment violates the applicable legal framework or causes

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any environmental prejudice warranting interference by this Hon'ble Tribunal. It is further submitted that the decision of this Answering Respondent to grant an amendment to the Environmental Clearance (EC), allowing a change in the coal source from 100% imported coal to a blended use of domestic and imported coal, has been taken strictly in accordance with the applicable guidelines and procedural safeguards laid down under the Office Memorandum dated 06.12.2023. The said amendment was granted after a comprehensive evaluation by the Expert Appraisal Committee (EAC), which recommended it subject to rigorous environmental safeguards, and in full compliance with the principles of sustainable development and environmental protection.

PRAYER:

In view of the facts and circumstances stated above, it is most respectfully prayed that this Hon'ble Tribunal may be pleased to:

a. Dismiss the present appeal as being barred by limitation, devoid of merit, and based on unsubstantiated and baseless allegations;
b. Uphold the amendment to the Environmental Clearance dated 20.01.2016, as granted by this Respondent strictly in accordance with the Office Memorandum dated 06.12.2023 and upon due recommendation by the Expert Appraisal Committee (EAC);
c. Pass such other and further orders as this Hon'ble Tribunal may deem just, fit, and proper in the facts and circumstances of the case.

DEPONENT

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VERIFICATION:

Verified at Chennai on 25th day of July, 2025 that the contents of this affidavit are true and correct to my knowledge and as per official records maintained in the routine course of business. No part of the above affidavit is false and nothing material has been concealed there from.

DEPONENT

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J-13012/14/2012-IA.II (T)
Government of India
Ministry of Environment, Forest and Climate Change

Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, New Delhi-110003.

Dated: 20.01.2016

To

M/s Tamil Nadu Generation & Distribution Corporation Ltd.
(A successor entity of TNEB),
5th Floor Western Wing, NPKRR Maaligai,
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Telefax: - 044-28520878; E.mail:- cepr@tnebnet.org

Sub: Environmental Clearance for Expansion by addition of 1x800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities at Villages Ennore & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu by M/s Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO).

Sir,

This has reference to your online application dated 26.05.2015 and additional information/documents submitted vide letter dated 18.11.2015 & 20.11.2015 w.r.t the aforesaid project. This Ministry has examined the proposal. It is inter-alia, noted that the ToR for preparation of EIA/EMP report was accorded by the Ministry on 28.05.2012 and the validity of TOR was extended upto 27.05.2015 on 08.09.2014. Public Hearing was conducted on 05.03.2015. The State level CZMA in its meeting dated 19.05.2015 has recommended the CRZ clearance for foreshore facilities.

2. The land requirement for the proposed expansion is 76.9 Ha (190 acres), which is located inside the NCTPS complex. Entire land is under possession of TANGEDCO. There are no R&R issues. No further expansion is envisaged. There are no National Parks, Sanctuaries, Elephant/Tiger Reserves, Migratory Routes/Wildlife Corridors within 10 km of the project site. The site is 500 m away from High Tide Line (HTL) of Sea and 100 m away from the HFL of canal. The project site is a graded area with necessary drains developed during execution of NCTPS Stage I project (3x210 MW). The capital and recurring cost towards EMP is Rs. 480 Crores and 48 Crores respectively.

3. The imported coal requirement of 2.09 MTPA will be sourced through MMTC, New Delhi. FSA/MoU for Imported Coal MoU has been signed between MMTC limited, a GOI Enterprise and TANGEDCO on 25.05.2015 for supply of 2.51 MTPA of Coal for proposed NCTPS Stage III (1x800 MW) plant. The maximum sulphur and ash contents of the imported coal shall be 0.8% and 8% respectively. Ennore Port is establishing Coal Berth 3 (CB 3) exclusively for the use of TANGEDCO in addition to existing Coal Berth 1 & 2. It is proposed to transport coal from CB 3 to the NCTPS Stage III plant site through closed belt conveyors since the coal conveyor route is well within Port and Power plant area alone. Kamarajar Port Limited (erstwhile Ennore Port Limited) vide letter dated 28.07.2015 has consented for handling of imported coal for the proposed expansion TPP. Radio activity and heavy metal contents of coal to be sourced have been tested and the parameters are well within limits.

4. The potable water of about 9 MLD required for the plant will be met by treating sea water in R.O. based desalination plant. The sea water (1,65,600 KLD)

will be sourced Ennore port basin via existing intake channel of NCTPS Stage II. COC of 1.3 has been proposed to optimize water usage. The domestic wastewater from plant and service wastewater will be collected and treated and reused for greenbelt, dust suppression, etc. and zero discharge will be maintained. As sea water is proposed for cooling purpose, the same will be discharged into sea through the existing pre cooling channel of NCTPS.

5. The following facilities will be in CRZ area:

i. Coal conveyor having length of 3.5 km and elevation of 6 m for coal transportation form Ennore Port to NCTPS Stage-III TPP.
ii. Supporting trestles (Steel frames) for coal conveyor at about 6 m/8 m from ground level.
iii. Sea water intake from forebay of NCTPS stage-II intake & outlet pipe to pre cooling channel of NCTPS for discharge with intake pipe length of 3 km and outlet pipe length of 1.5 km.
iv. GRP (Glass Reinforced Plastic) pipes on the ground level for cooling water inlet and coolant water outlet.

6. Fly ash and bottom ash would be collected and stored in the silos and supplied to cement/brick industries for manufacturing cement and bricks. 100% Dry Fly ash Collection will be done by providing Pressurized Dry Fly ash Collection System. The fly ash from the existing Units is being sold by e-auction and the same is proposed for the instant Unit. An MOU is executed with M/s Dalmia Cements (Bharat) Ltd, Dalmiapuram, Tamilnadu for off take of fly ash from the proposed NCTPS Stage III (1x800MW). Ash pond water will be collected, treated and reused for slurry making.

7. Based on the information, clarification, documents submitted and presentations made by you and your consultant, viz. Ramky Enviro Engineers Ltd., Hyderabad, before the *Expert Appraisal Committee (EAC - Thermal Power) in its 38th & 46th Meetings held during 25th-26th June, 2015 & 26th-27th November, 2015, respectively and EAC (CRZ) in its 150th Meeting held during 29th-31st July, 2015,* the Ministry hereby accords environmental clearance to the above power plant under the provisions of EIA Notification dated September 14, 2006 & subsequent amendments therein and CRZ clearance for foreshore facilities under the provisions of CRZ Notification, 2011 & subsequent amendments therein subject to compliance of the following Specific and General conditions:

A. Specific Conditions:

(i) *Explore the feasibility of multiple distributing point for the discharge of cooling water into pre-cooling channel and also the widening of the pre-cooling channel.*

(ii) *PP shall endeavor to enter into MoUs with NHAI, Associations of Cement Industries and Municipal Authorities for ensuring full ash utilization.*

(iii) *As committed, FGD shall be installed to ensure emission below threshold limits.*

(iv) *Coal conveyance shall take place in closed conveyor and that there shall be no open stacking of the coal in the CRZ area.*

(v) *The intake water pipeline shall be laid as per provisions of CRZ Notification, 2011.*

(vi) *Disposal of hot water shall meet Tamil Nadu Pollution Control Board (TNSPCB) norms.*

(vii) *Water temperature shall be monitored at outlets of each of the unit (3 phases) and also at pre-cooling channel joining Ennore creek.*

(viii) *All the recommendations and conditions specified by Tamil Nadu Coastal Zone Management Authority (TNCZMA) vide letter No.10173/EC.3/2015-1 dated 16.06.2015, shall be complied with.*

(ix) *Explore to develop Green belt along the conveyor.*

(x) *Periodical monitoring of the sea water at the discharge point shall be done and report be submitted along with the six monthly monitoring reports.*

(xi) *Construction activity shall be carried out strictly as per the provisions of CRZ Notification, 2011. No construction work other than those permitted in Coastal Regulation Zone Notification shall be carried out in Coastal Regulation Zone area.*

(xii) Vision document specifying prospective plan for the site shall be formulated and submitted to the Regional Office of the Ministry within **six months**.

(xiii) Harnessing solar power within the premises of the plant particularly at available roof tops shall be carried out and status of implementation including actual generation of solar power shall be submitted along with half yearly monitoring report.

(xiv) *The sulphur and ash content of coal shall not exceed 0.8 % and 8 % respectively. In case of variation of quality at any point of time, fresh reference shall be made to the Ministry for suitable amendments to the environmental clearance.*

(xv) A long term study of radio activity and heavy metals contents on coal to be used shall be carried out through a reputed institute and results thereof analyzed every two year and reported along with monitoring reports. Thereafter mechanism for an in-built continuous monitoring for radio activity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.

(xvi) High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 30 mg/Nm^3. Adequate dust extraction system such as cyclones/bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided along with an environment friendly sludge disposal system.

(xvii) Adequate dust extraction system such as cyclones/ bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.

(xviii) The SO_2, NOx and Hg emissions shall not exceed 100 mg/Nm^3, 100 mg/Nm^3 and 0.03 mg/Nm^3 respectively.

(xix) The specific water consumption shall not exceed 2.5 m^3/MWh and zero waste water discharge shall be achieved.

(xx) COC of atleast 1.3 shall be adopted.

(xxi) Monitoring of surface water quantity and quality shall also be regularly conducted and records maintained. The monitored data shall be submitted to the Ministry regularly. Further, monitoring points shall be located between the plant and drainage in the direction of flow of ground water and records maintained. Monitoring for heavy metals in ground water shall also be undertaken and results/findings submitted along with half yearly monitoring report.

(xxii) A well designed rain water harvesting system shall be put in place within six months, which shall comprise of rain water collection from the built up and open area in the plant premises and detailed record kept of the quantity of water harvested every year and its use.

(xxiii) No water bodies including natural drainage system in the area shall be disturbed due to activities associated with the setting up / operation of the power plant.

(xxiv) Wastewater generated from the plant shall be treated before discharge to comply limits prescribed by the SPCB/CPCB.

(xxv) Explore the commercial utilization of brine instead of discharging into sea.

(xxvi) Disposal of solid/liquid from Desalination plant shall comply with the prescribed standards and if need be, environmental safeguard measures by providing balancing/neutralizing tank may be set up and operated regularly & efficiently.

(xxvii) Sea water quality shall be continuously monitored for salinity, turbidity and temperature at selective sites across the impacted zone including estuarine waters. Mitigative measures shall be undertaken through institutes such as Annamalai University for continuous preservation of mangroves and their ecology. The monitoring data shall be uploaded on the company's website and also submit to Regional Office of the Ministry every six months.

(xxviii) To minimize entrapment of even small marine flora and fauna, state of the art low aperture intake screens with high effectiveness for impingement and entrainment and fishnet around intake shall be installed.

(xxix) Fish catch along the impacted zone of sea should be monitored periodically by the Department of Fisheries, Government of Gujarat. The project proponent shall accordingly take up the matter with the Fishery Dept., Govt. of Gujarat from time to time.

(xxx) The project proponent shall upload environmental quality monitored data on a regular basis on its website.

(xxxi) Marginalized section of society particularly traditional fishermen communities shall be identified based on 2011 population census data and socio-economic study of the various strata of families such as those carrying out subsistence fishing, commercial fishing etc. shall be carried out and impact on their livelihoods shall be assessed separately. Accordingly, sustainable welfare scheme/measures shall be undertaken and status of implementation shall be submitted to the Regional Office of the Ministry within six months.

(xxxii) A state-of-the-art environmental laboratory at the project site shall be established such that the laboratory has facilities for long term monitoring of sea water quality and sediment in the impacted zone over and above and ambient air, soil quality analysis of the area. The proponent shall undertake mitigative measures if there are any negative impacts.

(xxxiii) Additional soil for leveling of the proposed site shall be generated within the sites (to the extent possible) so that natural drainage system of the area is protected and improved.

(xxxiv) Fugitive emission of fly ash (dry or wet) shall be controlled such that no agricultural or non-agricultural land is affected. Damage to any land shall be mitigated and suitable compensation provided in consultation with the local Panchayat.

(xxxv) Fly ash shall not be used for agricultural purpose. No mine void filling will be undertaken as an option for ash utilization without adequate lining of mine with suitable media such that no leachate shall take place at any point of time. In case, the option of mine void filling is to be adopted, prior detailed study of soil characteristics of the mine area shall be undertaken from an institute of repute and adequate clay lining shall be ascertained by the State Pollution Control Board and implementation done in close co-ordination with the State Pollution Control Board.

(xxxvi) Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Mercury and other heavy metals (As, Hg, Cr, Pb etc.) shall be monitored in the bottom ash. No ash shall be disposed off in low lying area.

(xxxvii) Green Belt consisting of three tiers of plantations of native species all around plant and at least 50 m width shall be raised. Wherever 50 m width is not feasible a 20 m width shall be raised and adequate justification shall be submitted to the Ministry. Tree density shall not be less than 2500 per ha with survival rate not less than 80 %.

(xxxviii) Green belt shall also be developed around the Ash Pond over and above the Green Belt around the plant boundary.

(xxxix) An Environmental Cell comprising of at least one expert in environmental science/ engineering, ecology, occupational health and social science, shall be created preferably at the project site itself and shall be headed by an officer of appropriate superiority and qualification. It shall be ensured that the Head of the Cell shall directly report to the Head of the Plant who would be accountable for implementation of environmental regulations and social impact improvement/mitigation measures.

(xl) The project proponent shall formulate a well laid Corporate Environment Policy and identify and designate responsible officers at all levels of its hierarchy for ensuring adherence to the policy and compliance with the conditions stipulated in this clearance letter and other applicable environmental laws and regulations.

(xli) CSR schemes identified based on need based assessment shall be implemented in consultation with the village Panchayat and the District Administration starting from the development of project itself. As part of CSR prior identification of local employable youth and eventual employment in the project after imparting relevant training shall be also undertaken.

Company shall provide separate budget for community development activities and income generating programmes.

(xlii) For proper and periodic monitoring of CSR activities, a CSR committee or a Social Audit committee or a suitable credible external agency shall be appointed. CSR activities shall also be evaluated by an independent external agency. This evaluation shall be both concurrent and final.

B) General Conditions:

(i) The treated effluents conforming to the prescribed standards only shall be re-circulated and reused within the plant. Arrangements shall be made that effluents and storm water do not get mixed.

(ii) A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising greenbelt/plantation.

(iii) Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fires in coal yard, especially during summer season. Copy of these measures with full details along with location plant layout shall be submitted to the Ministry as well as to the Regional Office of the Ministry.

(iv) Storage facilities for auxiliary liquid fuel such as LDO/ HFO/LSHS shall be made in the plant area in consultation with Department of Explosives, Nagpur. Sulphur content in the liquid fuel will not exceed 0.5%. Disaster Management Plan shall be prepared to meet any eventuality in case of an accident taking place due to storage of oil.

(v) First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.

(vi) Noise levels emanating from turbines shall be so controlled such that the noise in the work zone shall be limited to 85 dB(A) from source. For people working in the high noise area, requisite personal protective equipment like earplugs/ear muffs etc. shall be provided. Workers engaged in noisy areas such as turbine area, air compressors etc shall be periodically examined to maintain audiometric record and for treatment for any hearing loss including shifting to non noisy/less noisy areas.

(vii) Regular monitoring of ambient air ground level concentration of SO_2, NOx, $PM_{2.5}$ & PM_{10} and Hg shall be carried out in the impact zone and records maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be provided immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional Office of this Ministry. The data shall also be put on the website of the company.

(viii) Utilization of 100% Fly Ash generated shall be made from **4th** year of operation. Status of implementation shall be reported to the Regional Office of the Ministry from time to time.

(ix) Provision shall be made for the housing of construction labour (as applicable) within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care,

crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

(x) The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned within seven days from the date of this clearance letter, informing that the project has been accorded environmental clearance and copies of clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Website of the Ministry of Environment and Forests at http://envfor.nic.in.

(xi) A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad / Municipal Corporation, urban local Body and the Local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.

(xii) The proponent shall upload the status of compliance of the stipulated environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; SPM, RSPM ($PM_{2.5}$ & PM_{10}), SO_2, NO_x (ambient levels as well as stack emissions) shall be displayed at a convenient location near the main gate of the company in the public domain.

(xiii) The environment statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of the Ministry by e-mail.

(xiv) **The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment and Forests, its Regional Office, Central Pollution Control Board and State Pollution Control Board. The project proponent shall upload the status of compliance of the environmental clearance conditions on their website and update the same periodically and simultaneously send the same by e-mail to the Regional Office, Ministry of Environment and Forests.**

(xv) Regional Office of the Ministry of Environment & Forests will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental Impact Assessment Report and Environment Management Plan along with the additional information submitted from time to time shall be forwarded to the Regional Office for their use during monitoring. Project proponent will up-load the compliance status in their website and up-date the same from time to time at least six monthly basis. **Criteria pollutants levels including NO_x (from stack & ambient air) shall be displayed at the main gate of the power plant.**

(xvi) Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These cost shall be included as part of the project cost. The funds earmarked for the environment

protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.

(xvii) The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the project by the concerned authorities and the dates of start of land development work and commissioning of plant.

(xviii) Full cooperation shall be extended to the Scientists/Officers from the Ministry / Regional Office of the Ministry / CPCB/ SPCB who would be monitoring the compliance of environmental status.

C) An as built or as completed report on EMP to be submitted stating the scope/extent of work envisaged in the EIA along with estimated cost vis-à-vis the actual completed works and cost incurred. A certificate/completion certificate accordingly, shall have to be submitted before commissioning of the TPP.

8. The Ministry reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction. The Ministry may also impose additional environmental conditions or modify the existing ones, if necessary.

9. The environmental clearance for the power plant **shall be valid for a period of 7 years** from the date of issue of this letter to start operations by the power plant. The CRZ clearance for foreshore facilities **shall be valid for a period of 5 years** from the date of issue of this letter for commencement of construction & operation of foreshore facilities.

10. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

11. In case of any deviation or alteration in the project proposed including coal transportation system from those submitted to this Ministry for clearance, a fresh reference should be made to the Ministry to assess the adequacy of the condition(s) imposed and to add additional environmental protection measures required, if any.

12. The above stipulations would be enforced among others under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and rules there under, Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008 and its amendments, the Public Liability Insurance Act, 1991 and its amendments.

13. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

Yours faithfully,

(B. B. Barman)
Scientist 'F'

Copy to:

1. The Secretary, Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi 110001.

2. The Secretary (Environment), Environment Department, Government of Tamil Nadu.
3. The Chairman, Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi-110066.
4. The Chairman, Tamil Nadu Pollution Control Board, No. 76, Mount Road, Mount Salai, Guindy, Chennai - 600 032
5. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi- 110032.
6. The Additional Principal Chief Conservator of Forests (C), Regional Office (SEZ), 1st and IInd Floor, Handloom Export Promotion Council, 34, Cathedral Garden Road, Nungambakkam, Chennai- 34.
7. The District Collector, Thiruvallur District, Govt. of Tamil Nadu
8. Guard file/Monitoring file.
9. Website of MoEF&CC

(B. B. Barman)
Scientist 'F'

F. No. J-13012/8/2009-IA.II (T)
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)
***

Indira Paryavaran Bhawan
2nd Floor, Vayu wing
Aliganj, Jor Bagh Road
New Delhi-110 003

Dated 06.12.2023

OFFICE MEMORANDUM

Sub: Amendment in Environmental Clearance for change in coal source by Thermal Power Plants - reg.

The Ministry has issued an Office Memorandum (O.M.) of even no. dated 11.11.2020, facilitating the change in coal source for thermal power plants subject to compliance of relevant notifications as mentioned therein and a procedure to be followed as described therein.

2. The Hon'ble NGT vide Order dated 24.05.2023 in Original Application No. 74 of 2021 directed the MoEF&CC to revisit the O.M. dated 11.11.2020. In order to ensure the compliance of the directions of the Hon'ble NGT, the matter was deliberated by the Expert Appraisal Committee (EAC), constituted by the Ministry to consider the Thermal Power Projects for grant of Environmental Clearance (EC) under the provisions of the EIA Notification, 2006, as amended, and the EAC has recommended certain amendments in O.M. dated 11.11.2020.

3. Based on recommendations of the EAC and subsequent approval of Competent Authority, the Ministry hereby make following amendments in the O.M. dated 11.11.2020 :

i. The Para 7 of the O.M. dated 11.11.2020 shall be read as follows:

7. In order to simplify the procedure for change in coal source, the Ministry lays down the following procedure:

All the Thermal Power Plants (including Captive Power Plants) having prior Environmental Clearance can change the following coal sources including Lignite, sourced directly through e-auctions/short term linkage/long term linkage/other linkage options of the Ministry of Coal or any organization recognized for allotting coal linkages, without seeking amendment in Environmental Clearance, subject to compliance with conditions (a) to (f) enumerated in Office Memorandum dated 11.11.2020:

a. from domestic to domestic,
b. from domestic to domestic (blended with imported coal up to 30% content of imported coal)

c. from imported to imported (blended with domestic coal up to 10% content of domestic coal)
d. from imported to domestic (where the GCV of the domestic coal is of the same grade as of imported coal).

All the Thermal Power Plants (including Captive Power Plants) having Prior Environmental Clearance and going in for change in the coal source other than those falling in the aforementioned category of change in coal source shall approach the Ministry for amendment in environmental clearance along with a study on additional impact assessment and revised EMP based on the change in source of coal.

Further, condition no. (d) mentioned in Para 7 of the O.M. dated 11.11. 2020 shall stand substituted as follows:

(d) Additional ash pond shall not be permitted on account of increase in ash content in the raw coal due to change in coal source includng lignite other than the ash pond permitted and specified in the Prior Environmental Clearance. 100% fly ash utilization is to be achieved within 4 years in accordance with the extant provisions laid down in the Fly Ash notifications dated 14.09.1999, 27.08.2003, 03.11.2009 & 25.01.2016, 31.12.2021 and 30.12.2022 as amended from time to time.

4. This issues with the approval of the Competent Authority.

(L K Bokolia)
Director/ Scientist F

To,

1. All the Thermal Power Plants
2. The Chairman/Member Secretaries of all the Expert Appraisal Committees
3. The Chairman /Member Secretaries of all the SEIAAs /SEACs
4. The Chairman/Member Secretaries of all SPCBs /UTPCCs
5. The Deputy Director General of Forest of all ROs of MoEF&CC
6. All the Officers of I.A. Division

Copy for information to:

1. PS to Hon'ble Minister for Environment, Forest and Climate Change
2. PS to Hon'ble MoS (EF&CC)
3. PPS to the Secretary (EF&CC)
4. PPS to the AS (TK) / AS (NPG)
5. The Joint Secretary, Ministry of Coal,GoI
6. The Joint Secretary, Ministry of Power,GoI
7. Website of MoEF&CC/ Guard file

(L K Bokolia)
Director/ Scientist F

F. No.J-13012/8/2009-IA.II (T)
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)

Indira Paryavaran Bhawan
Aliganj, Jorbagh Road
New Delhi-110 003

Dated 11th November, 2020

Office Memorandum

Sub: Amendment in Environmental Clearance for change in coal source by Thermal Power Plants- reg.

The Environment Impact Assessment (EIA) Notification dated 14th September, 2006 under the Environment (Protection) Act, 1986 mandates the requirement of prior Environmental Clearance to the projects/activities listed in the schedule to the said Notification. The Environmental Clearances are granted for Thermal Power Projects as per the capacities mentioned in the Schedule of the EIA Notification, 2006.

2. The Environmental Clearance (EC) has been granted based on a specific coal source such as a specific coal mine (domestic coal), or Imported coal, or blend of Imported coal and domestic coal. The Environmental Clearance has stipulated a condition that an amendment in EC is to be sought from the Ministry in case of change in fuel source.

3. The Ministry has been receiving several proposals regarding change in coal source, viz. change in domestic coal due to change in fuel linkages/auctions, and switching from imported coal to domestic coal. The linkage period granted through short-term linkage and e-auctions vary from 3 months to 1 year, making Project Proponents to approach the Ministry for granting amendment in EC each time there is change in coal source. In each amendment process, new conditions are being stipulated by making old conditions redundant.

4. The Ministry of Power (MoP) vide Policy Advisory dated 28.4.2020 encouraged all the power generating companies who are using imported coal (part/full) to switch over to domestic coal to the extent possible. The MoP has also set up a mechanism to deal with difficulties faced by the power companies in obtaining required quantity, quality of domestic coal including logistic bottlenecks.

5. The present process of dealing with change in coal source is to apply at PARIVESH, subsequent appraisal by the Expert Appraisal Committee (EAC), processing of EAC recommendations and granting the amendment to the EC. The whole process would approximately take about 2-3 months.

6. The various environmental impacts due to change in coal source viz. increased ash quantity and its management, increased emissions, and impacts of transportation have already been addressed and adequate mitigation measures have been stipulated by the Ministry vide Notifications dated 7.12.2015, 28.6.2018 and 21.5.2020.

7. In order to simplify the procedure for change in coal source and encourage Thermal Power Plants to use domestic coal, **the Ministry has decided the following procedure**:

All the Thermal Power Plants (including Captive Power Plants) having Environmental Clearance can change the coal source (from imported to domestic, domestic to domestic, and domestic to imported) including Lignite, directly through e-auctions/short term linkage/long term linkage/other linkage options of Ministry of Coal or any organisation recognised for allotting coal linkages, without seeking the amendment in Environmental Clearance, subject to the following conditions and thereby making earlier conditions in the EC regarding coal source redundant:

a) Details regarding change in source (location of the source, proposed quantity, distance from the power plant and mode of transportation), quality (Ash, Sulphur, Moisture content and Calorific value) shall be informed to the Ministry and its concerned Regional Office. The quantity of coal transported from each source along with the mode of transportation shall be submitted as part of EC Compliance Report.

b) The applicable flue gas emissions standards for Particulate Matter, Sulphur Dioxide, Oxides of Nitrogen and Mercury shall be complied inline with Ministry's Notification vide S.O. 3305(E) dated 7.12.2015 and subsequent emissions. A progress of implementation and its compliance shall be submitted as part of Compliance Report.

c) Ash content in the Coal and Coal transportation is governed by the Ministry's Notification vide S.O. 1561(E) dated 21.5.2020. As far as possible, Coal transportation shall be done by rail/conveyor or other eco-friendly modes. However, road transportation is allowed with tarpaulin covered trucks till the railway/conveyor belt infrastructure is made available. A progress (Physical and financial) of rail connectivity from nearest railway siding or conveyor connectivity to the power plant shall be submitted in the EC compliance report.

d) Additional ash pond is not allowed due to increase in ash content in the raw coal as against the ash pond permitted in the Environmental Clearance. The 100% flyash utilisation is to be achieved within 4 years in line with Flyash Notifications dated 14.9.1999, 27.8.2003, 3.11.2009 & 25.1.2016 and amended time to time or extant regulations on Fly ash Utilisation.

e) In case of exceptional circumstances, project proponents may approach the Ministry for seeking permission to use an emergency ash pond with cogent reasons, if any.

f) The details regarding monthly generation, utilisation and disposal of flyash (including bottom ash) shall be submitted to the Ministry and its Regional Office.

This issues with the approval of the Competent Authority.

(Dr. S. Kerketta)
Director, IA Division

To

1. All the Thermal Power Plants.

2. The Chairman/Member Secretaries of all the Expert Appraisal Committees.
3. The Chairman /Member Secretaries of all the SEIAAs/SEACs.
4. The Chairman/Member Secretaries of all SPCBs/UTPCCs.
5. The Deputy Director General of Forest of all ROs of MoEF&CC.
6. All the Officers of I.A. Division.

Copy for information to:

1. PS to Hon'ble Minister for Environment, Forest and Climate Change.
2. PS to Hon'ble MoS (EF&CC).
3. The Joint Secretary, Ministry of Coal.
4. The Joint Secretary, Ministry of Power.
5. Sr. PPS to Secretary (EF&CC).
6. Sr. PPS to AS (RA) / AS (RSP).
7. Sr. PPS to JS (GM)/ JS (SKB)/JS (AKN).
8. Website of MoEF&CC/ Guard file.

RSSPL/TANGEDCO/THE-NCTPS-III/1-2024-AIA

Additional Impact Assessment & Revised EMP

for

Change of Coal - NCTPP 1X800 MW (Stage III) at NCTPS Complex, Villages Ennur & Puzhudivakkam Taluk Ponneri, Tiruvallur District, Tamil Nadu by TANGEDCO

EC Issued Date: 20th January, 2016
File No. J-13012/14/2012-IA. II (T)

Project Proponent

Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO)
144, Annasalai, Chennai 600002, Tamil Nadu, India

Consultant

Re Sustainability Solutions Private Limited
11B, Level 11, Galaxy by Aurobindo, Hitech City Rd, Gachibowli, Hyderabad, Telangana 500081
NABET Certificate No: NABET/EIA/2225/RA 0278

Submission Month: May-2024

Foreword

Sustainability

FOREWORD

This is 1X800 MW supercritical coal based Thermal Power Plant (TPP) Stage-III by Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) located at NCTPS Complex, Village Ennur & Puzhudivakkam, Taluk Ponneri, Tiruvallur District, Tamil Nadu. The project is listed as 1 (D) "Thermal Power Plants" activity as per EIA Notification 2006 under Category-A project. Environmental Clearance (EC) and Coastal Regulation Zone (CRZ) Clearance were secured from Expert Appraisal Committee (EAC-Thermal Power) Vide File No. J-13012/14/2012-IA. II (T) dated 20th Jan. 2016.

Now, TANGEDCO is planning to change from use of 100% Imported coal to use a mix of Indian coal as well as Imported coal in the ratio of 50% - 50% proportion. For which TANGEDCO is applying for amendment in Environmental Clearance (EC) as per MoEF&CC OM dated 6th Dec. 2023 and previous OM dated 11th Nov. 2020.

Total area of the project is 76.88 Ha (190 acres). The potable water required for the project will be met from Chennai Metro Water Supply & Sewerage Board (CMWSSB) for about 2 MGD (9092 m^3). The power requirement during construction phase will be met from the nearby 33/11kV substation from the North Chennai Thermal Power Project (Stage II).

To assess the environmental impact arising out due to change in the use of coal, TANGEDCO retained Re Sustainability Solutions Pvt. Ltd. (RSSPL) Hyderabad which is a QCI-NABET accredited consultant organization, to prepare an Additional Impact Assessment (AIA) & revised EMP report for obtaining amendment in the EC.

The AIA report presents the details of baseline data collected during Sep. 2022 to Oct. 2022 by Cholamandalam MS Risk Services Limited Comprising Ambient Air Quality, Noise measurement, Ground & Surface Water quality, Soil and Land environment, Ecology & biodiversity along with Socioeconomic and human inherent components of the 10 kms radius study area. The AIA report provides identification of adverse impacts along with prediction and evaluation of impacts due to the proposed change in the use of coal and also provides revised EMP to mitigate and control the adverse impacts.

The co-operation and support rendered by the officials of Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) in preparation for this report, are greatly acknowledged.

Dr. B. Chakradhar
Head of the Division
Re Sustainability Solutions Private Limited

Re Sustainability Solutions Private Limited
(formerly known as Ramky Enviro Services Private Limited)
Registered Office:
Level 11B, Aurobindo Galaxy,
Hyderabad Knowledge City,
Hitech City Road, Hyderabad-500 081, India.
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Annexure-1	Environmental Clearance Letter
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Abbreviations

Abbreviation

AAQ	Ambient Air Quality
ACM	Adaptive Coding and Modulation
ACW	Auxiliary Cooling Water
AERMOD	Atmospheric dispersion modeling system
AIA	Additional Impact Assessment Report
AMS	Air Monitoring Stations
BMCR	Boiler Maximum Continuous Rate
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CG	Coal Berth
CHP	Coal Handling Plant
CMWSSB	Chennai Metro Water Supply & Sewerage Board
COC	Cycles of Concentration
CPCB	Central Pollution Control Board
CRZ	Coastal Regulation Zone
CTE	Consent to Establish
DM	Demineralization
DNA	Designated National Authority
EAC	Expert Appraisal Committee
EC	Environmental Clearance
EMP	Environment Management Plan
EPL	Ennore Port Ltd
ERDAS	Earth Resources Data Analysis System
ESP	Electrostatic precipitator
ETPS	Ennore Thermal Power Station
FCC	False Colour Composite
FGD	Flue-gas desulfurization
FSA	Fuel Supply Agreement
GCV	Gross Calorific Value
GLC	Ground Level Concentration
GPS	Geographical Positioning Sensor
GW	Ground water
HP	High Pressure
IMD	Indian Meteorological Department
IOCL	Indian Oil Corporation Limited
LP	Low Pressure
LPG	Liquefied Petroleum Gas
LULC	Land use Land cover
MGD	Million Gallons per Day
MMTC	Minerals and Metals Trading Corporation Limited

MoEF&CC	Ministry of Environment, Forest & Climate Change
MoU	Memorandum of Understanding
MTPA	Million tonnes per annum
MTPA	Million Ton per Annum
MW	Megawatt
NAAQS	National Ambient Air Quality Standard
NCTPP	North Chennai Thermal Power Plant
NCTPS	North Chennai Thermal Power Station
OM	Office Memorandum
PLF	Plant Load Factor
RCC	Reinforced concrete
RH	Re-heaters
RO	Reverse Osmosis
SCR	Selective catalytic reduction
SEZ	Special Economic Zone
SH	Super heaters
SOI	Survey of India
SW	Surface water
TANGEDCO	Tamil Nadu Generation and Distribution Corporation Limited
TANTRANSCO	Tamil Nadu Transmission Corporation Ltd
TNEB	Tamil Nadu Electricity Board
TNPCB	Tamil Nadu Pollution Control Board
TPD	Ton per Day
TPH	Ton per Hour
TPP	Thermal Power Plant
TPS	Thermal Power Station
TWAD	Tamil Nadu Water Supply and Drainage
UF	Ultra Filtration
UNFCCC	U.N. Framework Convention on Climate Change
VHN	Village Health and Nutrition
WBM	Water Bound Macadam

Declaration of Experts

Declaration by Experts contributing to the Additional Impact Assessment (AIA) & Revised EMP of "1X800 MW (Stage-III) North Chennai TPP at NCTPS Complex Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Tiruvallur, Tamil Nadu by Tamil Nadu Generation & Distribution Corporation Limited (TANGEDCO)".

I, hereby, certify that I was a part of the team in the following capacity that developed this AIA & Revised EMP report.

Coordinator:

Name : Mr. V. Vijay Kumar

Sign & Date : 23/05/2024

Period of involvement : March, 2024– Till date

Contact information : vvijaykumar@resustainability.com

Functional Area Experts:

S. No	Functional Area	Name of the Expert	Involvement		Sign & Date
			Period	Task	
1	AP	Mr. V. Vijay Kumar	March 2024- Till date	Provided the required inputs for AP during project period.	23/05/2024
2	WP	Mrs. R. Radhika	March 2024- Till date	Provided the required inputs for WP during project period.	23/05/24
3	SHW	Dr. B. Chakradhar	March 2024- Till date	Provided the required inputs for SHW during project period.	23/05/24
4	SE	Mrs. Arpita Podder Paka	March 2024- Till date	Provided the required inputs for SE during project period.	23/05/2024
5	EB	Mr. Pawan Kumar Verma	March 2024- Till date	Provided the required inputs for EB during project period.	23/5/2024
6	SC	Mr. V. Vijay Kumar	March 2024- Till date	Provided the required inputs for SC during project period.	23/05/2024
7	AQ	Mr. V. Vijay Kumar	March 2024- Till date	Provided the required inputs for AQ during project period.	23/05/2024

8	NV	Dr. Hemanth Raj Kumar	March 2024- Till date	Provided the required inputs for NV during project period.	
9	LU	Mr. Uttam Kumar	March 2024- Till date	Provided the required inputs for LU during project period.	23/10/24
10	RH	Dr. B. Chakradhar	March 2024- Till date	Provided the required inputs for RH during project period.	23/10/24

Declaration by the Head of the accredited consultant organization/ authorized person:

I, **Dr. B. Chakradhar**, hereby, confirm that the above-mentioned experts prepared the AIA & Revised EMP report for "**1X800 MW (Stage-III) North Chennai TPP at NCTPS Complex Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu by Tamil Nadu Generation & Distribution Corporation Limited (TANGEDCO)**".

I also confirm that the consultant organization shall be fully accountable for any misleading information mentioned in this statement.

Signature :
Name : Dr. B. Chakradhar
Designation : Head of the Division
Name of the EIA Consultant Organization : Re Sustainability Solutions Private Limited
NABET Certificate No. & Issue Date : NABET/EIA/2225/ RA 0278 & 31st March 2023

NABET Certificate

QUALITY COUNCIL® OF INDIA
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National Accreditation Board for Education and Training

Certificate of Accreditation

Re Sustainability Solutions Private Limited *(formerly Ramky Enviro Services Pvt Ltd)*

Level 11, Aurobindo Galaxy, Hyderabad Knowledge City, Hitech City Road, Hyderabad 5000081

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including Open cast/ Underground mining	1	1 (a) (i)	A
2	Onshore Oil and gas exploration, development & production	2	1 (b)	A
3	River Valley projects	3	1 (c)	B
4	Thermal power plants	4	1 (d)	A
5	Petrochemical based processing	20	5 (e)	A
6	Synthetic organic chemicals industry	21	5 (f)	A
7	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	31	7 (c)	A
8	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	32	7 (d)	A
9	Bio-medical waste treatment facilities	32A	7 (da)	B
10	Common effluent treatment plants (CETPs)	36	7 (h)	B
11	Common municipal solid waste management facility (CMSWMF)	37	7 (i)	B
12	Building and construction projects	38	8 (a)	B
13	Townships and Area Development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Jan 17, 2023 and posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2721 dated March 31, 2023. The accreditation needs to be renewed before the expiry date by Re Sustainability Solutions Private Limited, Hyderabad following due process of assessment.

Sr. Director, NABET
Dated: March 31, 2023

Certificate No.
NABET/EIA/2225/RA 0278

Valid up to
Sept 26, 2025

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to the QCI-NABET website.

Undertaking by Proponent

UNDERTAKING BY PROPONENT

We, Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO), the proponent of the 1X800 MW coal based Thermal Power Plant (TPP) Stage-III located at NCTPS Complex, Village Ennur & Puzhudivakkam, Taluk Ponneri, Tiruvallur District, Tamil Nadu hereby declare that we have engaged M/s. Re Sustainability Solutions Private Limited (RSSPL) AQCI-NABET accredited (Certificate No. NABET/EIA/2225/RA 0278) EIA Consultant for the preparation of the Additional Impact Assessment report (AIA) & revised EMP for the project to seek the amendment in EC granted from MoEF&CC, New Delhi for change in use of coal in compliance of MoEF&CC OM dated 6th Dec. 2023 and previous OM dated 11th Nov. 2020. We hereby certify that the data/information presented in the report are factually correct and that we own the contents (information and data) of the AIA report and revised EMP.

Proponent

Authorized Signatory,

For Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO)

Chief Engineer / Projects-II
TANGEDCO
144, Annasalai, Chennai-600 002.

Office of the C.E. / Projects-II
TANGEDCO
27 MAY 2024
Chennai-2

Undertaking by Consultant

Sustainability

UNDERTAKING BY CONSULTANT

We, Re Sustainability Solutions Private Limited (RSSPL) an accredited EIA consultant (Certificate No. NABET/EIA/2225/RA 0278) involved in the preparation of EIA reports, hereby declare that Additional Impact Assessment and revised EMP report is prepared for 1X800 MW supercritical coal based Thermal Power Plant (TPP) Stage-III located at NCTPS Complex, Village Ennur & Puzhudivakkam, Taluk Ponneri, Tiruvallur District, Tamil Nadu by Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) to seek the amendment in EC granted from MoEF&CC, New Delhi for change in use of coal in compliance of MoEF&CC OM dated 6th Dec. 2023 and previous OM dated 11th Nov. 2020. In this regard, it is to certify that AIA and revised EMP report is prepared as per the guidelines and data provided by TANGEDCO which was collected by M/s. Cholamandalam MS Risk Services Limited, Chennai.

Dr. B. Chakradhar

Head of the Division
Re Sustainability Solutions Private Limited

Re Sustainability Solutions Private Limited
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Plagiarism Certificate

Sustainability

Certificate of Plagiarism Check

Title of Report	Additional Impact Assessment & Revised EMP for 1X800 MW (Stage-III) North Chennai TPP at NCTPS Complex Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Tiruvallur, Tamil Nadu by Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO)
Name of Accredited Organization	Re Sustainability Solutions Private Limited
Unique Identification Number	RSSPL/TANGEDCO/THE-NCTPS-III/1-2024-AIA
Name of Coordinator	Mr. V. Vijay Kumar
Name of the Software	Plagiarism Checker X
Date of Check	23.05.2024
Time of Check	5.30 PM

Declaration by the Head of the Accredited Consultant Organization (ACO)

I hereby certify that this AIA report and revised EMP has been evaluated using online/ In-house software i.e. Plagiarism Checker X. The report produced has been analyzed by the system and based on it, I certify that the report produced is in accordance with good scientific practice.

Date and sign of Coordinator/Head of ACO

RE SUSTAINABILITY SOLUTIONS PRIVATE LIMITED ★ Hyderabad

Name: Dr. B. Chakradhar
Designation: Head of Division
Re Sustainability Solutions Private Limited
NABET Certificate No. & Issue Date: NABET/EIA/2225/ RA 0278 Dt. 31st March, 2023

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Additional Impact Assessment & revised EMP

1.1 INTRODUCTION

Due to rapid industrialization and urbanization of Tamil Nadu, the demand for power is increasing at a fast pace. Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) is striving towards uplifting and bridging the power demand by executing the establishment of power plants of various capacities ranging from 500 MW to 800 MW. To continue the same, TANGEDCO has proposed to develop 1X800 MW Supercritical Coal based Thermal Power Plant (North Chennai Thermal Power Plant Stage-III) within the NCTPS complex using the existing infra structure facilities viz., Cooling water channel/ Coal conveyors for which Environmental Clearance (EC) and Coastal Regulation Zone (CRZ) Clearance were already secured from Expert Appraisal Committee (EAC-Thermal Power) Vide File No. J-13012/14/2012-IA. II (T) dated 20th Jan. 2016 ***(Annexure-I).***

Consent to Establish (CTE) was issued from Tamil Nadu Pollution Control Board (TNPCB) Vide Consent Order No. 170124499798 under Section 21 of the Air (Prevention and control of Pollution) Act, 1981, as amended in 1987 and 170114499798 under Section 25 of the Water (Prevention and control of Pollution) Act,1974, as amended in 1988 on 13th Apr. 2017 ***(Annexure-2).*** *Necessary CTE extension has been applied on 10th Apr. 2024 to Tamil Nadu pollution control Board and it is under process.*

Presently, TANGEDCO is planning to change from use of 100% Imported coal to use a mix of Indian coal as well as Imported coal in ratio of 50% - 50% proportion. For which TANGEDCO is applying for amendment in Environmental Clearance (EC) as per MoEF&CC OM dated 6th Dec. 2023 and previous OM dated 11th Nov. 2020.

1.2 IDENTIFICATION OF PRESENT PROPOSAL

NCTPP 1X800 MW (Stage III) unit has obtained EC from MoEF&CC with a condition of use of Imported coal requirement of 2.09 MTPA sourced through MMTC, New Delhi. FSA/MoU for Imported coal was signed between MMTC Limited, a GoI Enterprise and TANGEDCO on 25th May, 2015. The present proposal is for seeking the amendment in existing Environmental Clearance (EC) for change from use of 100% Imported coal to use a mix of Indian coal as well as Imported coal in ratio of 50% - 50% proportion.

The source of the Indian coal required for the project is met from Kalinga Block of the Talcher, Mahanadi and IB valley Coal fields and Imported coal through MMTC, New Delhi. Total 361 Ton/Hr of mix coal is required in 50% - 50% proportion. The Calorific value of proposed coal will be 4654 kcal/kg with 25.5 % of Ash content. An area of 8.09 Ha is available within the plant premises for stacking of Indian and Imported coal.

The sea water for cooling water requirement for the NCTPS Stage-I is drawn from the Ennore Port Basin located adjacent to the NCTPS Complex, through an intake channel. Another channel was constructed to draw cooling water for the requirement of NCTPS Stage-II and TANGEDCO's proposed Ennore SEZ Thermal Power Project which is located

near the NCTPS Complex. The drawal capacity of this channel is 65 cumec. After the drawal of Cooling water for NCTPS stage II TPP (2x600 MW) and Ennore SEZ TPP (2x800 MW), around 10 cumec is available. This balance quantity will be used for the cooling water requirement of NCTPS stage III TPP adopting Natural Draft cooling tower system. Desalination plant will be established to obtain raw water for the plant purposes.

1.2.1 Project Proponent

Tamil Nadu Electricity Board (TNEB) owned by the Government of Tamil Nadu, established on 1st July 1957 has remained the energy provider and distributor throughout the years. During 2008, the Tamil Nadu government agreed in principle for reorganizing TNEB through the formation of a holding company TNEB Ltd. (a state-owned Public Sector) and two subsidiary companies, namely Tamil Nadu Generation and Distribution Corporation Ltd (TANGEDCO) and Tamil Nadu Transmission Corporation Ltd. (TANTRANSCO).

- TANGEDCO is a 100% Government of Tamil Nadu owned company.
- TANGEDCO realizes its social obligation and is very much conscious of the importance of prevention of degradation of environment due to its various Thermal Stations.
- TANGEDCO's thermal power stations are being operated at high PLF and are being awarded productivity awards year after year.
- TANGEDCO has fully exploited the hydroelectric potential available in the State. To meet the ever-increasing energy demand in the coming years, developed several TPPs, details of the same are given **Table 1.1.**

Table 1.1: Status of the Thermal Power Plants of TANGEDCO

Name & Address	Units	Capacity (MW)	Date of Commissioning
Mettur Thermal Power Station-I (Stage-I)	I	210	07.01.1987
	II	210	01.12.1987
Mettur Thermal Power Station-I (Stage-II)	III	210	22.03.1989
	IV	210	27.03.1990
Mettur Thermal Power Station-II	I	600	12.10.2013
North Chennai Thermal Power Station	I	210	25.10.1994
	II	210	27.03.1995
	II	210	24.02.1996
North Chennai Thermal Power Station (Stage-II)	I	600	20.03.2014
	II	600	08.05.2014
North Chennai Thermal Power Station (Stage-III)	I	800	To be commissioned
Tuticorin Thermal Power Station (Stage-I)	I	210	09.07.1979
	II	210	17.12.1980

Name & Address	Units	Capacity (MW)	Date of Commissioning
Tuticorin Thermal Power Station (Stage-II)	III	210	16.04.1982
Tuticorin Thermal Power Station (Stage-III)	IV	210	11.02.1992
	V	210	31.03.1991

Source: https://www.tangedco.org/en/tangedco/about-us/generation/thermal-stations/

1.2.2 Nature, Location and Size of the Project

NCTPP Stage III is a 1X800 MW Supercritical coal based Thermal Power Plant (TPP) located in the NCTPS complex in an area of 76.88 Ha (190 acres), in Village Ennur & Puzhudivakkam, Ponneri Taluk, Tiruvallur District, Tamil Nadu. The site is located about 20 km north of Chennai city. The site is flanked on the east by Bay of Bengal, west by Ennore Village, north by existing NCTPS and south by Ennore back water/ creek. The site is approachable by road from Thiruvottiyur-Ponneri Highway starting from Pattamanthri junction with a distance of 6.0 km road leading to NCTPS. The nearest railway station is Athipattu Pudunagar at about 2.0 km, the nearest airport is at Chennai, which is about 36.0 km and the nearest sea port is Ennore Port which is about 3.0 km from the site.

Table 1.2: Site Features of the Project

S. no.	Particulars	Details
1	Location	Village Ennur & Puzhudivakkam, Taluk Ponneri, Tiruvallur District, Tamil Nadu
2	Soil type	Silica Sandy
3	Ground elevation	+9 M above MSL.
4	Available Land	76.88 Ha (190 acres)
5	Sol Topo sheet No.	66 C/3, C/4, C/7 & C/8
6	Geographical coordinates	Latitude: 13°14'0.83" to 13°14'49.37" N Longitude: 80°19'7.49" to 80°19'37.24 E
7	Nearest City	Chennai at South direction (20.0 Km)
8	Distance for CRZ	>500 m (Away from CRZ Regulations 1991)
9	Seismicity Zone	Earth Quake Zone-III as defined in IS: 1893-2002
10	Nearest Villages	Ennore 2.5 km (South), Minjur 6.5 km (West)
11	Nearest Railway Station	Ennore at 1.6 km in South Athipattu pudunagar at 2.0 km in West
12	Nearest Highway	State Highway 104 (Chennai Pulicat Road) at 4.7 km West

S. no.	Particulars	Details
13	Nearest Air Port	Chennai International Airport at 36.0 km in South-West
14	Nearest Lake	Pulicat Lake, 27.0 km in North
15	Nearest Sea	Bay of Bengal, East- >500m
16	Nearest Sea Port	Ennore Port – 3.0 km in North
17	Recorded Highest Flood Level (HFL) of the area	(+) 7.34 m with respect to M.S.L.
18	List of industries in the locality	• NCTPP I & II in NE • Adani Kattupalli port at 2.9 km in E • Kamaraja port at 1.2 km in E • IOCL Ennore LPG Bottling Plant 1.3 km in SW • Coromandel international 3.0 km in S • Bharat Petroleum Oil Terminal 0.7 km in W • Hindustan Petroleum Corporation Limited, 1 km in SW
19	Fishing harbor	Tiruvottiyur fishing harbour 8.5 km at S
20	Protected Ecological Sensitive Zones- Mangroves, wetlands, breeding / nesting grounds	Mangrove patches along the Kosasthalaiyar River, 32 m & 75 m in N
21	Coastal Areas rich in corals, mangroves, breeding ground of specific species	Pulicat Lake, 27.0 km in North Ennore creek at 1.5 km in SE
22	Critically polluted areas as per MoEF&CC notification	Manali industrial area ~13.0 Km towards SW

Figure 1.1: Location map of the site

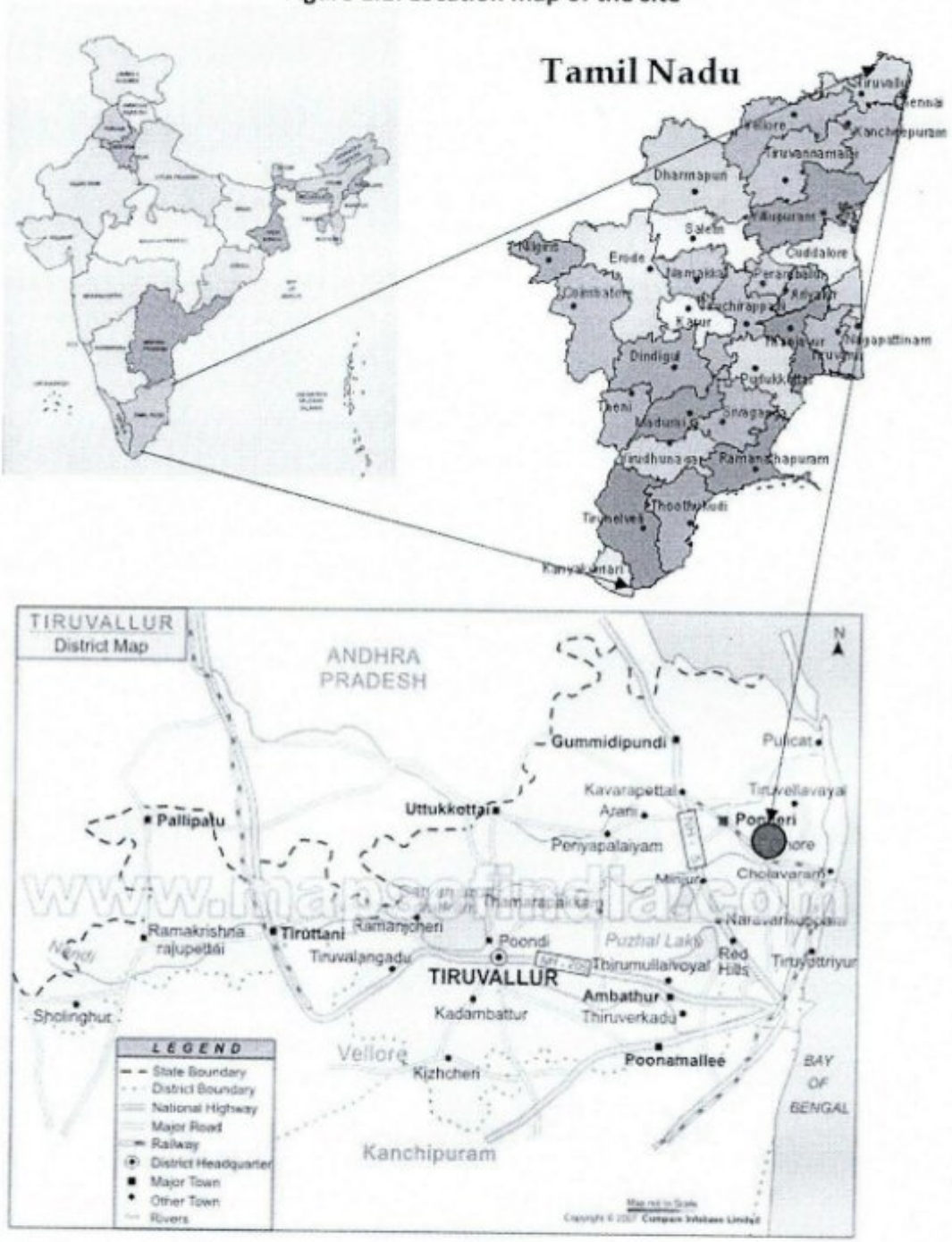
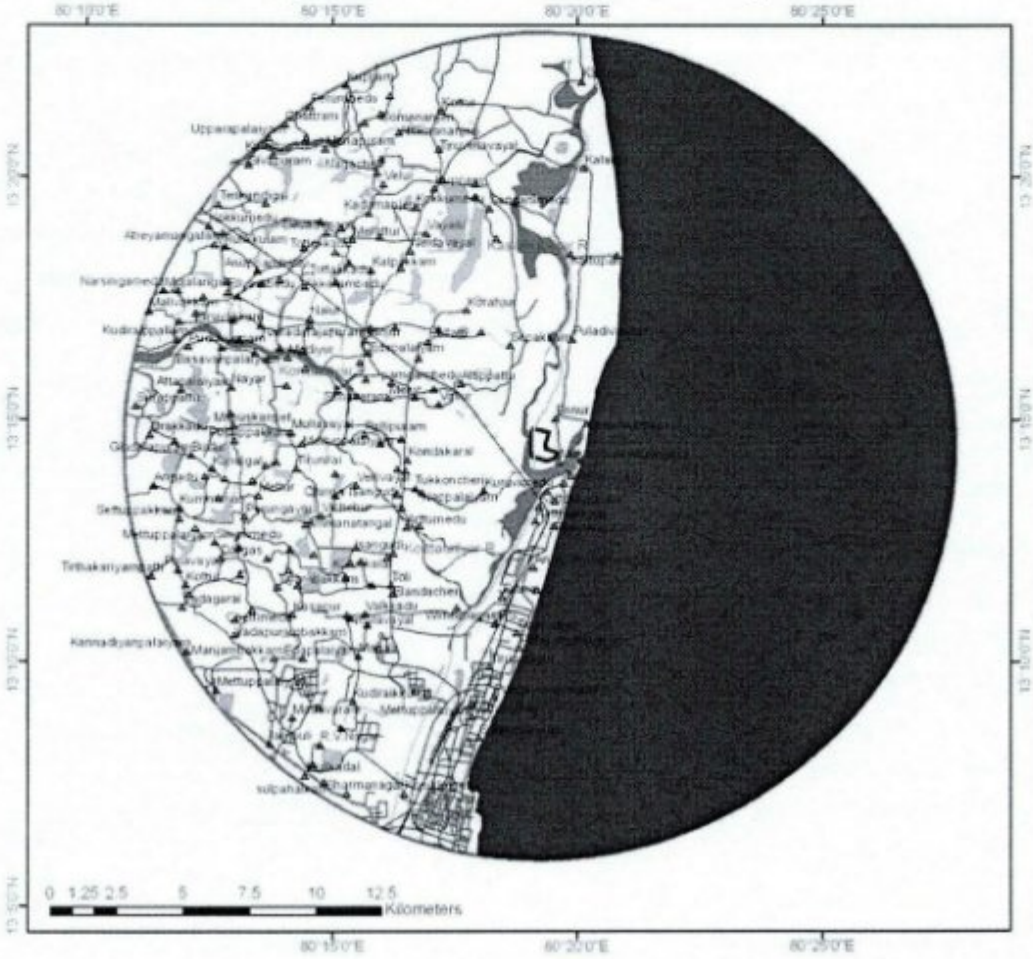


Figure 1.2: 10 km radius toposheet map



1.3 OBJECTIVE & SCOPE OF THE STUDY

The primary objective of the present study is to prepare the Additional Impact Assessment (AIA) and revised EMP report for change of coal use for obtaining amendment in EC by reviewing the revised project configuration for change in the layout and EMP due to increase in coal handling area, coal dust control measures, ESP, FGD, ash pond requirement, water usage scenario for ash conditioning and slurry transport, flue gas quantities, increase in thermal pollution if any.

Developing a detailed comparative statement on the emissions and air pollution control systems (Indian coal vs imported coal). Prediction of impacts due to change in type of coal in emission from the boiler due to higher coal consumption and comparing the GLCs with the earlier results obtained for 100 % imported coal.

Prediction of impacts due to increase in fugitive coal dust emissions due to increase in coal handling quantities, impacts due to additional ash generation.

Preparation of ash disposal and fly ash utilisation plan. Preparation of EMP for the changed

coal mix scenario and submitting to MoEF&CC for obtaining amendment in EC.

2.1 TYPE OF THE PROJECT

Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) has proposed to develop 1X800 MW supercritical coal based Thermal Power Plant (NCTPP Stage-III) within the available NCTPS complex using the existing infra structure facilities viz., cooling water channel/ coal conveyors for which EC and CRZ Clearance were already secured from Expert Appraisal Committee (EAC-Thermal Power), MoEF&CC, New Delhi based on use of 100% Imported coal. Now, TANGEDCO is planning to change from use of 100% Imported coal to use a mix of Indian coal as well as Imported coal in ratio of 50% - 50% proportion.

In previous OM of MoEF&CC dated 11th Nov. 2020, it was directed that all the thermal power plants including CPP having prior Environmental Clearance can change coal source (from imported to domestic, domestic to domestic and domestic to imported) including Lignite, sourced directly through e-auctions/short term linkage/long term linkage/other linkage options on the Ministry of Coal or any organization recognized for allocating coal linkage to without seeking amendment in Environmental clearance subjected to following conditions:

a. **From domestic to domestic**
b. **From domestic to domestic (blended with imported coal upto 30% content of imported coal)**
c. **From imported to imported (blended with domestic coal upto 10% content of domestic coal)**
d. **From imported to domestic (where the GCV of the domestic coal is of the same grade as of imported coal)**

In the recent MoEF&CC OM dated 6th Dec. 2023 related to amendment in EC for change in coal source by Thermal Power Plants; the Ministry has directed that ***"All the Thermal Power Plants (Including Captive Power Plants) having prior environmental clearance and going into change in the coal source other than those falling in the aforementioned category of change in coal source shall approach the Ministry for amendment in EC along with a study on Additional Impact Assessment with revised EMP based on the change in the source of coal".***

In compliance of the said OM; the application for amendment in EC has been submitted to Expert Appraisal Committee (EAC-Thermal Projects) with Additional Impact Assessment and revised EMP report.

2.2 PLANT LAYOUT

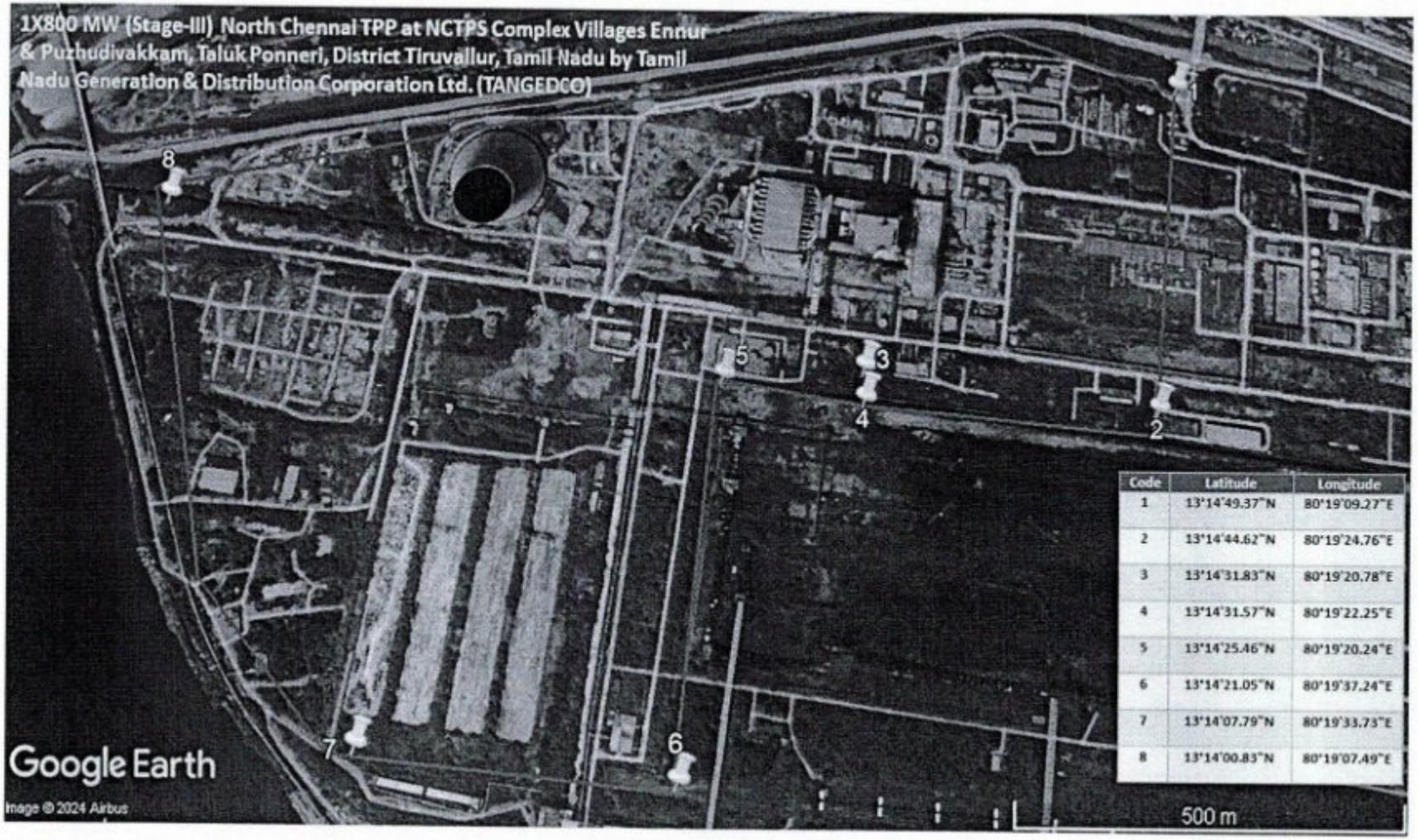
The plant layout has been designed by considering various aspects like operational convenience and cost economics. The power plant equipments are suitably located at appropriate places such that operation of the respective equipment is well carried out

without any hindrance to other nearby activities. Google image showing Plant boundary coordinates on google image is down in **Figure 2.1.** Plant layout showing the details of location of equipment proposed is shown as **Figure 2.2.** The GPS readings of plant boundary are given in **Table: 2.1.** Present photographs of project site is shown in **Figure 2.3.**

Table 2.1: GPS Coordinates of Plant Boundary

S. no.	Code	Latitude	Longitude
1.	A	13°14'49.37"N	80°19'09.27"E
2.	B	13°14'44.62"N	80°19'24.76"E
3.	C	13°14'31.83"N	80°19'20.78"E
4.	D	13°14'31.57"N	80°19'22.25"E
5.	E	13°14'25.46"N	80°19'20.24"E
6.	F	13°14'21.05"N	80°19'37.24"E
7.	G	13°14'07.79"N	80°19'33.73"E
8.	H	13°14'00.83"N	80°19'07.49"E

Figure 2.1: Plant Boundary Coordinates on Google image



Code	Latitude	Longitude
1	13°14'49.37"N	80°19'09.27"E
2	13°14'44.62"N	80°19'24.76"E
3	13°14'31.83"N	80°19'20.78"E
4	13°14'31.57"N	80°19'22.25"E
5	13°14'25.46"N	80°19'20.24"E
6	13°14'21.05"N	80°19'37.24"E
7	13°14'07.79"N	80°19'33.73"E
8	13°14'00.83"N	80°19'07.49"E

Figure 2.2: Plant Layout Map

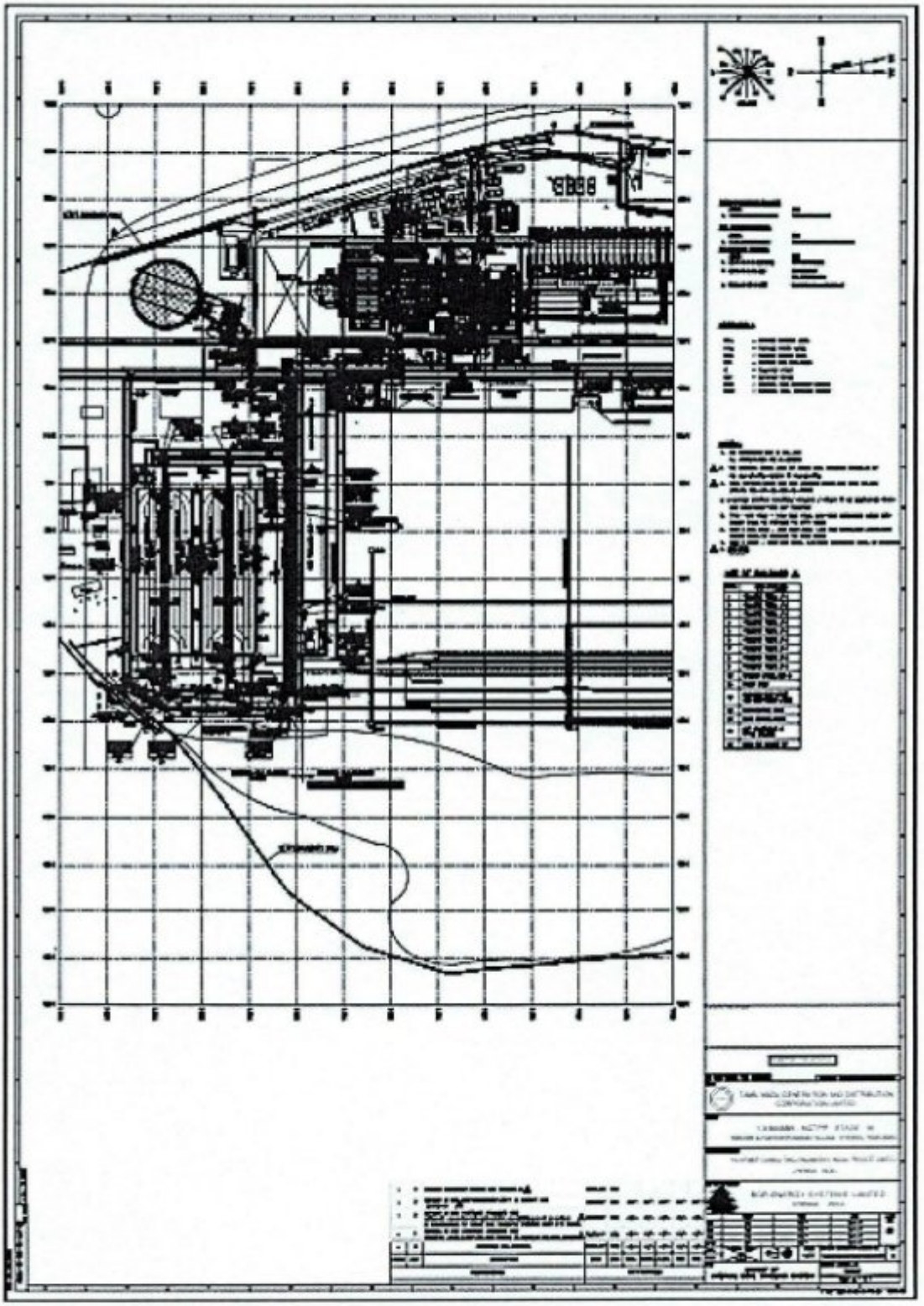
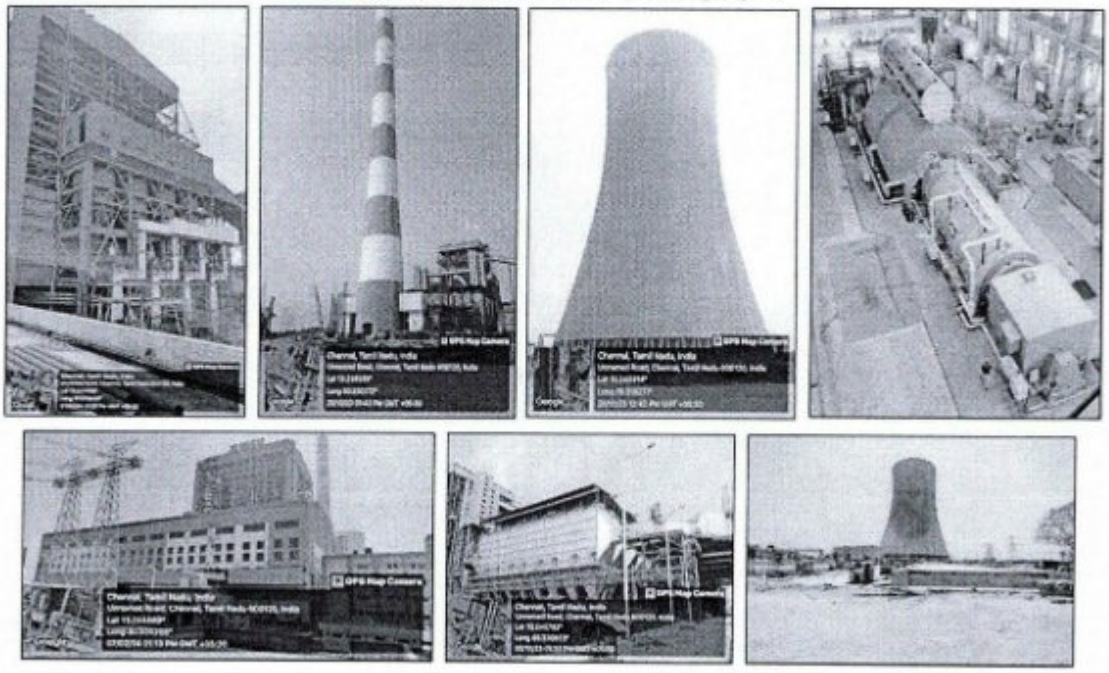


Figure 2.3: Present site photographs



2.3 LAND AREA

The detailed breakup of the land required for various activities proposed in the TPP are given in **Table 2.2.** Due to proposed change in the fuel composition from imported coal to 50% Indian and 50% imported coal there will not be any change in the land area.

Table 2.2: Details of the Land break

S. no.	Description	Area		
		acres	Ha	%
1.	Main Plant Area	25	10.12	13.2
2.	Water system area including cooling tower, Raw water & fire water	15	6.07	7.9
3.	Misc. buildings & ware house area	20	8.09	10.5
4.	Vacant land for FGD Plant	5	2.02	2.6
5.	Coal stock yard area	20	8.09	10.5
6.	Pre-assembly/ storage yard area*	10	4.05	5.3
7.	Green belt	45	18.21	23.7
8.	Roads, drains and others	5	2.02	2.6
9.	Internal corridor (cooling water & coal conveyor)	15	6.07	7.9
10.	Switch yard	20	8.09	10.5
11.	External corridor (sea water & coal conveyor)**	10	4.05	5.3
	Total	**190**	**76.88**	**100**

*On completion of job this area will be utilized for green belt.
** leased from EPL (Ennore Port Ltd).
Note: No change in the land area due to change in fuel mix composition.

2.4 WATER REQUIREMENT & AVAILABILITY

The main source of water for TPP is sea water from Bay of Bengal. The sea water will be drawn from the Ennore Port basin, which is about 3.0 km away from site. The existing cooling water channel of 2x600 MW NCTPS Stage II will be used for proposed project. The cooling water system envisaged for the plant is re-circulating type system with induced draft or natural draft cooling towers using sea water as make up water. Desalination plant will be established to obtain raw water for the plant purposes. The potable water required for the construction of project will be met from Chennai Metro Water Supply & Sewerage Board (CMWSSB) for about 2 MGD (9092 m^3). For operation purpose, potable water will be produced from sea water by treating in RO based desalination plant. There will not be change in the water requirement as well as water source and sea water requirement or portable water requirement due to change in coal use.

The capacity of the cooling water channel is given in **Table 2.3**. The detailed break up of water required for various activities is given in **Table 2.4** and **2.5.**

Due to proposed change in the fuel composition there will not be any change in the water source and sea water requirement or portable water requirement.

Table 2.3: Details of the Cooling water channel

S. no.	Details	Cumecs (m^3/s)	m^3/day
1	Channel Capacity	65	5616000
2	Water required for NCTPS Stage II	55	4752000
3	Spare capacity	10	864000
4	Water required for Ennore SEZ TPP (2 x 800 MW)	3.83	330960
5	Water required for Proposed project (1 x 800 MW)	1.92	165600

Table 2.4: Sea Water Requirement

S.no.	Description	Estimated Quantity	
		m^3/hr	m^3/day
1.	Condenser cooling water system	90065	2161560
2.	ACW cooling water system (Secondary)	4800	115200
3.	Ash water system & Coal Handling system	2250	54000
4.	Cooling water pumps	94865	2276760
5.	Cooling water system blow down	4700	112800
	One Time Requirement – Total	**196680**	**4720320**
6.	Cooling water make up requirement	6120	146880
7.	Sea water requirement for Desalination plant	780	18720
	Daily Requirement - Total	**6900**	**165600**
Cycles of Concentration (COC) Ratio 1:3			

Table 2.5: Potable Water (for Sweet water) Requirements

S.no.	Item	Estimated Quantity	
		M^3/hr	M^3/day
1.	To cycle make up	100	2400
2.	RO/DM plant	70	1680
3.	CHP dust suppression system	73	1752
4.	Plant potable water requirement	7	168
5.	Service water system	125	3000
	Total	**375**	**9000**

2.5 POWER REQUIREMENT (CONSTRUCTION PERIOD)

The power requirement during construction phase will be met from the nearby 33/11kV substation from the North Chennai Thermal Power Project (Stage II). There will not be any additional power requirement during construction of the requited infrastructure to accommodate the changed coal requirement.

2.6 MAN POWER REQUIREMENT

The man power required for the project will be sourced from nearby areas to the maximum extent in case of non-availability of skilled persons, they will be engaged from neighbouring areas. The details of the manpower required during construction and operation are given **Table 2.6.** No additional manpower will be required for proposed change in the coal composition.

Table 2.6: Details of the Manpower

S.no	Phase	Permanent	Contract/ Temporary	Total
1	Construction	50	125	175
2	Operation & maintenance	350	200	550

2.7 COAL REQUIREMENT & AVAILABILITY

Earlier the project was based on the use of Imported coal of 2.09 MTPA which was planned to source from MMTC, New Delhi. FSA/MoU for imported coal was signed between MMTC Limited and TANGEDCO on 25th May, 2015 for supply of 2.51 MTPA of coal for the project. Now, TANGEDCO is planning to change from use of 100% imported coal to use of Indian as well as Imported coal in the equal proportion. Details of coal characteristics as well as consumption are given in **Table 2.7.** The typical analysis of the coal is given as **Table 2.8.**

Table 2.7: Details of Coal Characteristics & consumption

S. no.	Details	Units	Imported 100%	Imported 50%, Indian 50%	Indian coal
1	Coal consumption	TPH	280	361	442

S. no.	Details	Units	Imported 100%	Imported 50%, Indian 50%	Indian coal
		TPD	6720	8664	10608
		MTPA	2.09	2.69	3.29
2	Ash	%	12	25.5	34
3	Sulphur	%	0.80	0.65	0.55
4	Gross Calorific value	Kcal/kg	6000	4654	3800

Table 2.8: Typical coal analysis

S. no.	Parameters	Indian Coal %	Imported Coal %	Remarks
1	Total Moisture	14	10	Proximate Analysis
2	Ash Content	34	12	
3	Volatile matter	21	30	
4	Fixed Carbon	31	48	
Total		**100**	**100**	
1	Carbon	42.80	59.0	Ultimate Analysis
2	Hydrogen	2.79	4.2	
3	Nitrogen	0.84	1.1	
4	Sulphur	0.55	0.8	
5	Oxygen	5.02	12.9	
6	Moisture	14	10.0	
7	Ash	34	12.0	
Total		**100**	**100**	
8	Gross Calorific Value (Kcal/kg)	3800	6000	

Indian coal will be made available from the Kalinga block of Talcher, Mahanadhi, IB Valley Coal Fields. Imported coal will be arranged from foreign countries (Indonesia) through M/s. MMTC, New Delhi. At present the facilities available in Ennore port, cater to the requirement of NCTPS Stage I & II, existing ETPS & Mettur TPS Stage I & II through coal berth 1 & 2. A comprehensive proposal has been evolved with an additional coal berth 3 (CB 3) at Ennore port so as to meet the overall requirement of coal of including 3x500 MW Vallur TPP and upcoming projects viz. 660 MW ETPS Expansion (Annexe), 2x660 MW Ennore SEZ and proposed 1x800 MW NCTPS Stage III.

The required infrastructure for feeding coal from CB 3 to this 1x800 MW TPP is being developed. Transportation of coal from CB 3 to the plant site shall be by use of belt conveyors by providing necessary transfer points, conveyor galleries, etc.

Transfer point will be provided at every change of direction of the conveyors and at all elevation change points. This will have structural steel frame work with RCC roof and floors. Cladding shall be of metal sheeting.

Overhead conveyor galleries are proposed will be of structural steel frame with coated 0.6 mm galvanium sheets roofing and cladding. Walkways will be provided at sides and in between conveyors. The galleries will be supported on steel trestles which will have RCC foundation. The conveyer system will be routed through the land (of TANGEDCO) available at Ennore Port Limited.

2.8 COAL HANDLING PLANT

It is proposed to get coal for this project through a new coal Berth (CB 3) to be developed at Ennore port. A set of new conveyors will be installed from the CB 3 to convey coal at the rate of 2000 TPH to the new coal yard formed at the NCTPS Stage-III site. Two numbers (1W+1S) new secondary coal crushers of capacity 2000 TPH conveyors from the proposed JT at EPL installed to convey coal at the rate of 2000 TPH to the proposed Plant site. A stacker cum reclaimer is also proposed in the coal storage yard for the proposed plant as the coal stockpile height considered is 10 m. The earlier proposal was for use of 100% imported coal whereas TANGEDCO is planning to change from use of 100% Imported coal to use a mix of Domestic coal as well as Imported coal in ratio of 50% - 50% proportion. An area of 8.09 Ha is available within the site for stacking of Indian as well as imported coal. Details of the same is already shown in the plant layout.

2.9 ELECTROSTATIC PRECIPITATORS (ESPs)

The steam generators are provided with electrostatic precipitators to achieve 30 mg/Nm^3, as prescribed for the ongoing TANGEDCO project. ESP shall be designed to take care of the above requirements even after change in the cool use from 100 % imported coal to use of Indian as well as imported coal in equal proportion. High efficiency electrostatic precipitators with 99.98% would be installed to control the emission of ash particles. The ESPs would be so designed that the particulate emission is limited to the above requirement under all design conditions. To ensure the safe and optimum operation of ESPs, the flue gas stream would be supervised and monitored by a microprocessor based rapper control EP Management system.

2.10 CHIMNEY (STACK)

For proper dispersion of SO_2 emissions and to meet the TNPCB guidelines, a chimney of 275 m height is provided. The Chimney is provided with personal access for regular monitoring of stack emissions. The minimum stack height prescribed by the CPCB for units of generation capacity 500 MW and more is 275 m. Hence the stack height of the 800 MW units under consideration will also be 275 m.

For minimizing the NOx emissions from the steam generator, coal burners of proven, advanced design to reduce NOx production will be used, and the boiler furnace will be provided with over fire air ports to further reduce NOx production. Flue Gas De Sulphurization system (FGD) is provided which will help to control the SO_2 as well as NO_x. The design and layout of steam generator and its auxiliaries would be such that a dry FGD system will installed. Selective Catalytic Reduction (SCR) will also be installed in the future as per requirement.

As per MoEF&CC notification dated 28th June 2018, the stack height for 100 MW and above TPP with wet flue gas desulphurization (FGD) should be 100 m minimum.

2.11 ASH HANDLING PLANT

The ash handling system envisages dry extraction and disposal of bottom ash and fly ash. Provision shall be kept to extract entire bottom ash in wet form for disposal in ash dyke as an emergency measure. No additional ash dyke is proposed due to change in the use of coal from imported coal to Indian as well as imported coal in equal proportion. Due to proposed change in the fuel composition there will be change in the ash generation quantity, comparative details of quantity of fly ash as well as bottom ash is given in following **Table no. 2.9.**

Table 2.9: Comparison of ash quantity generation

Type of coal	Coal quantity (TPH)	% of Ash content	Total Ash Quantity (TPH)	Fly Ash Quantity (TPH)	Bottom Ash Quantity (TPH)
Imported Coal	280	12.0	33.60	23.52	10.08
Mixed Coal (Imported 50%, Indian 50%)	361	25.5	92.06	64.44	27.62
Note: Due to change in composition of the coal, the ash quantity will increase					

2.11.1 Fly ash Handling System

Pneumatic conveying system either vacuum or pressure system shall be employed for extraction of Fly ash from the ESP hoppers in dry form. This dry ash is usually sent to buffer hoppers or to the wetting head/ collector tank units. The dry ash buffer hoppers and wetting head collector tank units shall be located adjacent to ESPs. Dry ash from buffer hoppers shall be transported to maintain storage silos to be located near the plant boundary. Silo area shall be provided with fencing, office block, gate complex and passage for entry/ exit of vehicles. There shall be three numbers of ash silos. The storage capacity of each silo shall be provided for 24 hrs production of Fly ash based on the performance coal analysis of unit. The user industries shall take the dry Fly ash from these silos either in closed tankers or in open tankers. For wet disposal of dry ash extracted from various ESP

hoppers, the same shall be diverted to wetting head/ collector tank units (by passing buffer hoppers meant for handling ash in dry form).

2.11.2 Bottom Ash Handling System

Dry type bottom ash hoppers shall be used in case of the submerged scraper chain conveyor system. In case of emergency conditions bottom ash extraction system involving submerged scrapper chain conveyors, the bottom ash is led to an adjacent bottom ash slurry transportation pump house, from where it is transported to the slurry sump of ash slurry disposal pump house using centrifugal slurry duty pumps and pipelines.

In case of the intermittently operating jet pump system, the jet pumps would convey the bottom ash slurry from water impounded bottom ash hoppers to the slurry sump of the ash slurry disposal pump house. Bottom ash hopper in this case shall be of inkpot shape to avoid placement of equipment below +0.00 m level.

2.12 OTHER SALIENT FEATURES OF THE PLAN

- The plant has latest state of the art control and instrumentation system based on max DNA or only other improved technology.
- Separate control arrangement in control room.
- The steam generators are provided with ESPs to achieve 30 mg/Nm^3 of outlet dust emission.
- A flue chimney of 275 m height is provided for the unit.
- The plants have crushed coal capacity of 30 days and raw water reservoir capacity of 7 days.
- The plant water system has been designed to keep the consumptive water requirement at an optimum level.
- All waste water effluent from the plant is discharged at one point at the plant boundary.

2.13 CLEAN DEVELOPMENT MECHANISM

The U.N. Framework Convention on Climate Change (UNFCCC) was adopted in June 1992 at the Earth Summit in Rio de Janeiro and the objective of the convention is to achieve stabilization of Green House Gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The adjunct to the convention, the Kyoto protocol, was hammered out in December 1997, setting individual targets for developed countries to reduce yearly emissions of GHGs to a minimum of 5 percent below their 1990 levels in the first commitment period, 2008-2012. India has ratified the Kyoto Protocol in 2002.

The Clean Development Mechanism (CDM), one of the flexible mechanisms under the Kyoto Protocol encourages development of GHG emission reduction projects in developing countries like India for achieving sustainable development and also earn carbon credits.

The amount of carbon emission saved by such project is required to be certified by the CDM Executive Board. The certificate specifying carbon reduction in tones can be sold to developed countries which are signatories to the protocol. One tonne of CO_2 reduced through CDM project in a developing country when certified by the CDM Executive Board becomes a tradable CER (Certified Emission Reduction).

To get a project registered under CDM, it has to run through an approval procedure, including the host country approval & validation, administered by the UNFCCC. The Ministry of Environment, Forests and Climate Change (MoEF&CC), GoI is the Designated National Authority (DNA) in India for according hosts country approval.

TANGEDCO intends to construct a new supercritical coal fired power project of capacity 1x800 MW NCTPP Stage III with CDM intent. Adopting supercritical technology results in enhanced plant efficiency resulting in reduced coal consumption. The specific CO_2 emissions per MWh of generated electricity of a new supercritical coal fired power plant are lower than the emissions of the existing sub critical power plants operating in India. Thus the implementation of a new supercritical coal fired power project contributes to the overall reduction of greenhouse gas emission making it eligible under CDM. The methodology for such projects has already been approved by the CDM Executive Board vide ACM 0013. This project can generate tradable carbon credits under CDM thus improving the financial viability of the project.

2.14 COMPARISON OF VARIOUS CHANGES OF EXISITING AND PROPOSED FUEL COMPOSITION

Changes expected due to proposed change in fuel composition are listed in **Table 2.10,** from the table it can be seen that there will be not be any major change in project infrastructure requirement, resources, except in ash generation.

Table 2.10: Cost & Infrastructure Comparison

S. no.	Requirement	Units	Existing (100% Imported Coal)	Proposed (Indian 50%: Imported 50%)	Remark
1	**Total area**	Ha	76.88	76.88	No change
2	**Water requirement**				No change
	One Time Requirement – Total	m^3/day	4720320	4720320	
	Daily Requirement - Total	m^3/day	165600	165600	
	Cycles of concentration	Ratio	1:3	1:3	
3	**Manpower**				
	Construction:	Nos	125	125	No change
	Operation:	Nos	550	550	
4	**Coal**	TPD	6720	8664	Quantity increased
	Ash	%	12	25.5	

S. no.	Requirement	Units	Existing (100% Imported Coal)	Proposed (Indian 50%: Imported 50%)	Remark
	Total Ash	TPD	806.9	2209.32	
	Fly Ash	TPD	645.12	1767.45	
	Bottom Ash	TPD	161.28	441.86	
5	**Fuel Oil consumption**	KL/Year	7500	7500	
6	**CHP**	-	CB-3	CB-3	
7	**FGD system**	-	Yes	Yes	No change. SILO no. increased
8	**ESPs**	-	Yes	Yes	
9	**No. of SILO**	Nos	2	3	
10	**Compressed Air System** 50 Nm^3/min capacities	Nos	2	2	
11	**Boiler Parameters**				
	SH outlet steam flow at 100% BMCR	T/hr	2575	2575	No change
	SH outlet steam pressure at 100% BMCR	ata	256	256	
	SH outlet steam temperature at 100% BMCR	°C	568	568	
	RH outlet steam temperature at 100% BMCR	°C	595	595	
12	**System Parameters**				
	Regenerative cycle		8 heater cycle comprising of 4 LP heaters, 3 HP heaters & De-aerator	8 heater cycle comprising of 4 LP heaters, 3 HP heaters & De-aerator	No change
	Main Steam pressure	ata	247	247	
	Main Steam temperature	°C	565	565	
	Reheat temperature	°C	592	592	
	Final feed water temperature	°C	290	290	
	Cooling water temperature	°C	33	33	
13	Project capital cost	Crores	4800	7803.4	Amount increased
	EMP capital cost	Crores	480	1,185.21	
	EMP recurring cost	Crores	48	98	

Note: FGD cost was not included when EC obtained during 2016, Whereas now FGD its cost is included, hence there is change in capital cost and EMP cost

3.1 SUMMARY OF ENVIRONMENTAL BASELINE STUDIES

The results of the baseline studies conducted during Sep. 2022 to Oct. 2022 considering pre-monsoon season by M/s. Cholamandalam MS Risk Services Limited, Chennai for preparation of EIA report seeking EC and CRZ amendment for laying of ash slurry and recovery water pipelines from NCTPP Stage III to NCT42'PS ash dyke was given by the TANGEDCO for using in preparation of AIA and revised EMP for seeking desired EC amendment as the data collected is within 3 years' period. The baseline data collected earlier in respect to the EIA of same project in year 2012 by Re Sustainability Solutions Pvt. Ltd. (RSSPL) as well as other nearby project were compared for finding the changes in the environmental quality due course of time. The baseline studies include detailed characterization of environmental components such as Meteorological conditions, Ambient Air Quality, Noise Levels, Water Quality (Surface water + Ground water) and Soil Quality. Summary of data collected related to Ecology & Biodiversity as well as Socio-Economic condition is also summarized in this report.

3.1.1 Meteorology

Meteorological information of the study area contains wind speed, wind direction, temperature, relative humidity and Rainfall. The data were collected from Indian Meteorological Department (IMD), Pune for Chennai (Nungambakkam) as well as Tiruvallur District Statistical Handbook (2017-18) was referred.

a. Temperature

Minimum temperature observed is 21.2°C and maximum temperature observed is 37.1°C. Details of monthly maximum & minimum temperature recorded from 1981 to 2010 at Chennai (Nungambakkam) published by IMD, Pune is given below **Table 3.1.**

Table 3.1: Temperature details of the area

Month	Mean Temperature (°C)	
	Daily Minimum	Daily Maximum
Jan	21.2	29.3
Feb	22.2	30.9
Mar	24.2	32.9
Apr	26.6	34.5
May	28.0	37.1
Jun	27.5	37.0
Aug	25.9	34.7
Sep	25.6	34.2
Oct	24.6	32.1
Nov	23.1	29.9
Dec	21.9	28.9
Annual	24.8	33.1

Source: Climatological Normal -1981-2010, IMD, Pune

b. Humidity

Humidity is the quantity of water vapor in the atmosphere. From the "Climatological Normals" published by the Indian Meteorological Department (IMD) for a consolidated 30 years (1981–2010) at Nungambakkam (Chennai) station, an annual average humidity of 76% was reported throughout the year. The average monthly values of humidity are 63% in June and 83% in November.

c. Rainfall

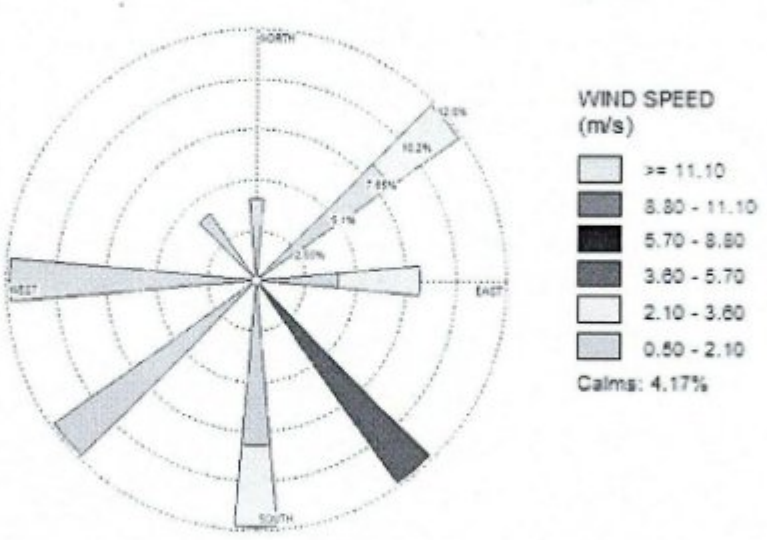
As per the Tiruvallur district statistical hand book data for 2017-18, Rainfall of Tiruvallur district is contributed by both southwest and northeast monsoons. Invariability, northwest monsoon is the significant contributor of the rainfall compared to southwest monsoon. Winter and Summer season barely has any influence on the overall rainfall received in the district.

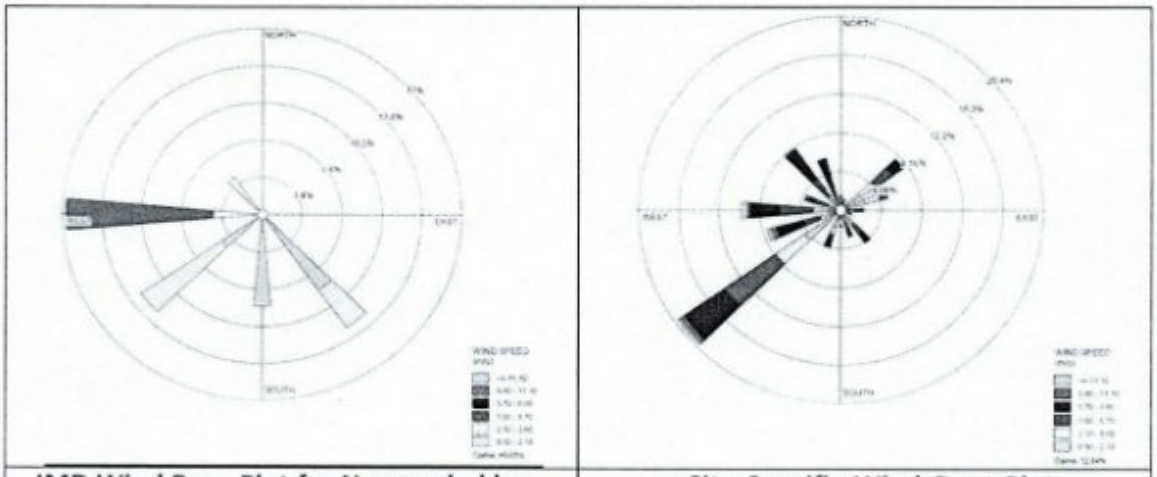
From the data it can be interpreted that historically in northwest monsoon year 2015-16 received highest rainfall of 1466.7 mm and minimum rainfall of 342 mm received in 2013-14.

d. Wind speed

The predominant wind direction is West during south-west monsoon and North-East to North-West in north-east monsoon. The average annual wind speed is 6.2 kmph, minimum avg. wind speed is 4.7 kmph observed in October and maximum avg. wind speed is 7.9 kmph observed in June. The annual wind rose plot is presented in **Figure 3.1.** The wind rose plot for the months of September and October as per IMD data and Site Specific Data has been plotted and presented in **Figure 3.2.**

Figure 3.1: IMD wind rose plot for Nungambakkam (Annual)





IMD Wind Rose Plot for Nungambakkam (September - October)	Site Specific Wind Rose Plot (September - October)

Figure 3.2: IMD Wind Rose Plot for Nungambakkam (September October)

3.1.2 Ambient Air Quality (AAQ)

Ambient Air Quality Monitoring stations located at 9 locations falling in the study area were considered for data analysis. The AAQ locations were falling in downwind, cross wind and upwind direction of the project location were selected. The details of the monitoring stations are given in **Table 3.2.** AAQ monitoring locations are represented in the **Figure 3.3.**

Results and Interpretation

Ambient Air Quality (AAQ) results of study area are given in **Table 3.3.** Summary of the same is discussed below:

Table 3.2: Details of AAQ monitoring stations

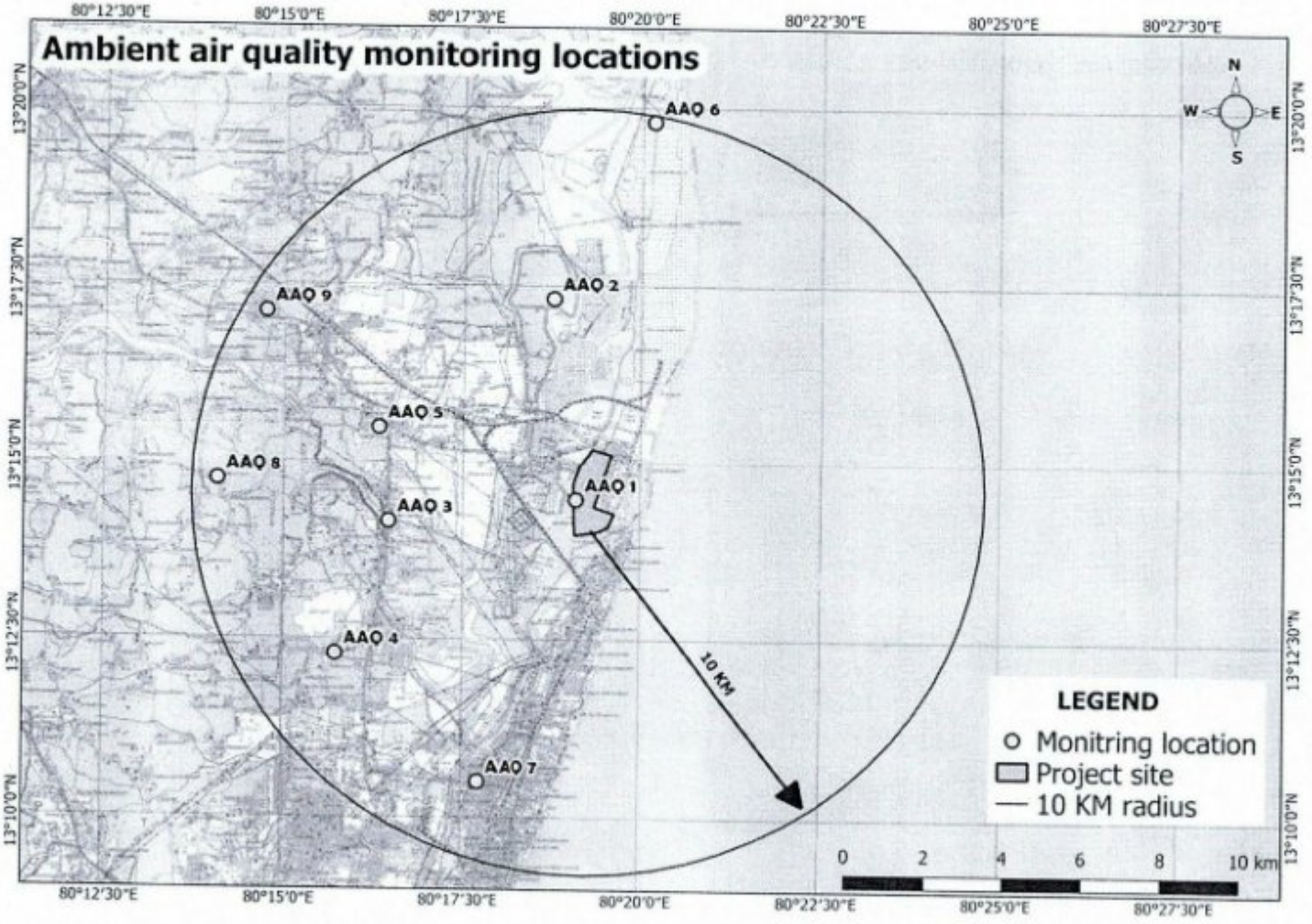
Station Code	Location Name	Latitude (N)	Longitude (E)	Type of area	Wind Direction
AAQ 1	Within NCTPP Stage 3	13°14'28.49"	80°19'06.57"	Industrial	Project Site
AAQ 2	Within Ennore SEZ STPP Area	13°17'18.89"	80°18'47.02"	Industrial	Project Site
AAQ 3	Vallur near Ashok Leyland Technical Center	13°14'09.75"	80°16'28.42"	Commercial	Upwind
AAQ 4	Vichoor Village	13°12'17.78"	80°15'44.44"	Industrial	Upwind
AAQ 5	Nandiambakkam	13°15'29.23"	80°16'19.84"	Residential	Upwind
AAQ 6	Kalanji North of Adani Katupalli Port	13°19'48.09"	80°20'10.06"	Residential	Downwind
AAQ 7	Kalaignar Nagar, Tiruvottiyur	13°10'30.74"	80°17'44.15"	Residential	Cross wind
AAQ 8	Periyamullaivoyal	13°14'44.73"	80°14'03.93"	Residential	Upwind
AAQ 9	Kesavapuram, Minjur near Kesavapuram Park - Volleyball ground	13°17'07.19"	80°14'44.41"	Residential	Upwind

Table 3.3: Analyzed Results of Ambient Air Quality

Station	PM10 (µg/m³)			PM2.5 (µg/m³)			SO2 (µg/m³)			NO2 (µg/m³)			O3 (µg/m³)			Pb (µg/m³)		
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
AAQ1	68.4	104	81.85	32.2	57.5	41.53	12.5	20.1	14.84	24.6	35.2	29.47	28.6	55.6	40.27	0.105	0.142	0.12
AAQ2	72.3	120	96.49	34.5	87.5	54.38	12.5	25.1	20.02	26.2	42.6	33.98	34.5	66.2	50.70	0.101	0.226	0.14
AAQ3	56.3	96.2	72.88	25.4	50.6	35.49	8.5	16.2	12.16	19.5	34.2	26.81	26.4	45.5	34.16	0.106	0.11	0.11
AAQ4	57.5	82.5	68.16	26.4	40.1	32.28	9.1	15.2	11.79	17.6	37.5	26.20	21.2	44.5	33.01	BDL(DL :0.1)		
AAQ5	42.5	74.5	58.42	19.8	35.1	25.86	7.5	14.6	10.49	16.2	28.6	21.91	15.1	32.5	23.84	BDL(DL :0.1)		
AAQ6	38.4	54.7	45.78	17.5	23.1	19.98	3.3	6.4	4.49	7.6	12.2	9.66	7.2	16.2	11.42	BDL(DL :0.1)		
AAQ7	50.1	92.4	68.98	23.0	48.5	32.58	7.3	18.2	12.08	16.5	41	27.34	20.6	51.2	33.26	BDL(DL :0.1)		
AAQ8	39.4	56.7	47.24	16.8	25.1	21.27	4.1	10.2	6.37	9.2	23.4	15.06	18.6	30.4	22.88	BDL(DL :0.1)		
AAQ9	47.9	67.5	54.70	20.1	32.1	24.78	6.4	12.2	8.43	15.1	25.5	19.42	18.2	37.5	27.06	BDL(DL :0.1)		
Standards (24 or 8 hr)	100			60			80			80			100			0.5		

Station	CO (mg/m³)			NH3 (µg/m³)			C6H6 (µg/m³)			BaP (ng/m³)			As (ng/m³)			Ni(ng/m³)		
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
AAQ1	BDL(DL:1.15)			28.5	65.1	44.16	BDL(DL:1.0)			BDL(DL:0.5)			BDL(DL:1.0)			5.1	12.2	7.78
AAQ2	BDL(DL:1.15)			28.9	66.0	52.86	BDL(DL:1.0)			BDL(DL:0.5)			BDL(DL:1.0)			BDL(DL:5.0)		
AAQ3	BDL(DL:1.15)			27.5	53.2	41.36	BDL(DL:1.0)			BDL(DL:0.5)			BDL(DL:1.0)			5.2	6.7	5.95
AAQ4	BDL(DL:1.15)			32.0	62.0	49.46	BDL(DL:1.0)			BDL(DL:0.5)			BDL(DL:1.0)			BDL(DL:5.0)		
AAQ5	BDL(DL:1.15)			20.4	41.2	29.06	BDL(DL:1.0)			BDL(DL:0.5)			BDL(DL:1.0)			BDL(DL:5.0)		
AAQ6	BDL(DL:1.15)			7.5	19.2	10.94	BDL(DL:1.0)			BDL(DL:0.5)			BDL(DL:1.0)			BDL(DL:5.0)		
AAQ7	BDL(DL:1.15)			28.4	57.6	39.08	BDL(DL:1.0)			BDL(DL:0.5)			BDL(DL:1.0)			BDL(DL:5.0)		
AAQ8	BDL(DL:1.15)			10.6	22.5	15.59	BDL(DL:1.0)			BDL(DL:0.5)			BDL(DL:1.0)			BDL(DL:5.0)		
AAQ9	BDL(DL:1.15)			18.5	35.2	27.49	BDL(DL:1.0)			BDL(DL:0.5)			BDL(DL:1.0)			BDL(DL:5.0)		
Standards (24 or 8 hr)	**2**			**400**			**24 hr Std. not available**											

Figure 3.3: AAQ Monitoring location



a) Particulate matter (PM_{10} & $PM_{2.5}$)

The 98th percentile of $PM_{2.5}$ within the study area were in the range of 16.8 to 87.5 µg/m³ and the 98th percentile of PM_{10} within the study area were in the range of 38.4 to 120.0 µg/m³. The 24-hourly average values of $PM_{2.5}$ and PM_{10} were compared with the NAAQ Standards. PM_{10} Values at AAQ-1 & AAQ-2 found exceeding from the limit whereas $PM_{2.5}$ Value is exceeding at AAQ-2 due to ongoing construction activities in nearby areas.

b) Sulfur Dioxide

The 98th percentile of SO_2 within the study area was in the range of 3.3 to 25.1 µg/m³. The 24-hourly average values of SO_2 were compared with the NAAQS and it was found that the values were much lower than the applicable limit of 80 µg/m³ prescribed for residential and rural areas.

c) Oxides of Nitrogen

Oxides of Nitrogen (NOx) are also inorganic gaseous pollutants like SO_2. NOx is expected to be emitted wherever combustion at high temperatures takes place. The 98th percentile of NOx within the study area was in the range of 7.6 to 42.6 µg/m³. The 24-hourly average values of NOx were compared with the NAAQS and it was found that the values were much lower than the applicable limit of 80 µg/m³ prescribed for residential and rural area.

e) Ozone (O_3)

Ozone (O_3) or Trioxygen, is a triatomic molecule, consisting of three oxygen atoms. It is an allotrope of oxygen that is much less stable than the diatomic allotrope (O_2). Ozone is present in low concentrations throughout the earth's atmosphere. Ozone values from all the location are observed 7.2 to 66.2 µg/m³. The 8-hour average values of ozone compared with the NAAQS revealed that the values were within the applicable limits.

f) Carbon Monoxide (CO)

It is a colorless, odorless and tasteless gas that is slightly less dense than air. It is toxic to humans and animals when encountered in higher concentrations, although it is also produced in normal animal metabolism in low quantities, and is thought to have some normal biological functions. The 8 hourly average values of CO were compared with the NAAQS and it was found that all the values are much lower than the applicable limit of 2000 µg/m³ or residential and rural areas. CO value found in the study are below detectable limit (BDL) at all the locations.

g) Benzo (a) Pyrene

Benzo (a) pyrene is a pale yellow, crystalline solid or powder with a faint aromatic odor. In its pure form it is used as a laboratory reagent. It also forms as a gaseous by-product when certain carbon substances burn, such as coal tar chemicals.

The averaged concentrations of monitored parameters are within NAAQ Standards. Due to the ongoing construction activities and other industrial activities the concentration of few parameters in some locations close to power plants was relatively high compared to the samples near village areas. No real contributor to gaseous matter in the study area is noticed.

Comparison with existing data

Air quality at seven locations are taken for comparison with earlier EIA studies of projects namely:

1. TANGEDCO (1X800) MW TPP Stage-III (June 2012 to Aug. 2012)
2. TANGEDCO (2X800) MW TPP (Mar. 2010 to Apr. 2010)
3. Kamarajar port limited phase-III Facility-Jan, 2017
4. Establishing 1 MLD RO Desalination Plant in Kamarajar Port, Chennai-Dec, 2021
5. CPCB: CAAQM location at Gandhi Nagar, Ennore, Chennai – TNPCB, Sep-Nov, 2022

Average value reported during the earlier study is summarized with current study at NCTPP Stage - III and Ennore SEZ thermal power plant projects.

Table 3.4: AAQ data comparison with earlier Published EIAs

S. No.	Location	Monitoring season/month	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SOx (µg/m³)	NOx (µg/m³)	O_3 (µg/m³)
1	Ennore- (SEZ)	March to April-2010	63	36	15.2	20.0	34.5
	(1X800) MW Thermal Power Project Stage-III	June to August-2012	51.5	23.9	9.7	20.6	7.1
	Ennore village (KPL-2017)	Pre monsoon- 2016	78.2	38.3	11.0	12.9	--
		Post monsoon- 2016	63.0	36.5	7.3	9.2	--
	KPL main gate (KPL-2021)	May,2020	61.76	29.73	11.98	21.97	--
	CPCB- Gandhi Nagar Ennore, Chennai – TNPCB	Sep to Nov, 2022	82.4	37.9	33.5	30.4	5.7
	NCTPP Stage-III Project site- AAQ1	**Sep. and Oct., 2022**	**82.59**	**41.97**	**14.84**	**29.47**	**40.27**
2	(2X800) MW Thermal Power Project site - (SEZ)	March to April-2010	71	41	17.4	24.7	33.4
	Ennore SEZ Area Project site -AAQ2	**Sep. and Oct., 2022**	**98.1**	**56.90**	**20.02**	**33.98**	**50.70**
3	Vallur – (Stage-III)	June to August-2012	79.5	48.8	12.8	30.7	8.0
	Vallur near Ashok Leyland Technical Center-AAQ3	**Sep. and Oct., 2022**	**72.88**	**35.49**	**12.16**	**26.81**	**34.16**
4	Vichoor – (Stage-III)	June to August-2012	68.0	28.2	12.0	29.4	6.8
	Vichoor Village-AAQ5	Sep. and Oct., 2022	68.16	32.28	11.79	26.20	33.01
5	Nandiambakkam (KPL-2017)	Pre monsoon- 2016	46.2	24.1	7.9	9.6	--
		Post monsoon- 2016	45.5	21.2	10.1	12.6	--
	Nandiambakkam- AAQ5	**Sep. and Oct., 2022**	**58.42**	**25.86**	**10.49**	**21.91**	**23.84**
6	Katipalli Kuppam -- (SEZ)	March to April-2010	31	18	7.9	11.6	33.5
	Katupalli village-(KPL-2017)	Pre monsoon- 2016	46.7	27.2	5.6	8.0	--
		Post monsoon- 2016	49.0	23.0	4.1	7.45	--
	Kalanji North of Adani Katupalli Port –AAQ6	**Sep. and Oct., 2022**	**48.33**	**21.99**	**4.89**	**10.88**	**9.56**
7	Minjur-- (SEZ)	March to April-2010	62	36	14.4	18.4	33.7

S. No.	Location	Monitoring season/month	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SOx ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)
	Kesavapuram, Minjur near Kesavapuram Park - Volleyball ground –AAQ9	Sep. and Oct., 2022	54.70	24.78	8.43	19.42	27.06
NAAQ Standards (24 or 8 hr)			100	60	80	80	100

From the above comparison results, it is evident that the parameters PM_{10}, $PM_{2.5}$ concentrations were reported higher to the previous results at locations AAQ1, AAQ2 and AAQ5. These higher values are the result of ongoing construction activities and surrounding thermal power plants and other industries in the study area.

SO_2 concentrations were slightly higher than previously at AAQ2, AAQ5 and AAQ6 while NOx values were higher at AAQ2, AAQ5, AAQ6 and AAQ7. This could be attributed to power plants and vehicular movement.

At AAQ1, AAQ2 and AAQ3 the Ozone concentrations recorded were higher than previous concentrations. The Ozone concentration is the results of industrial activities in the area.

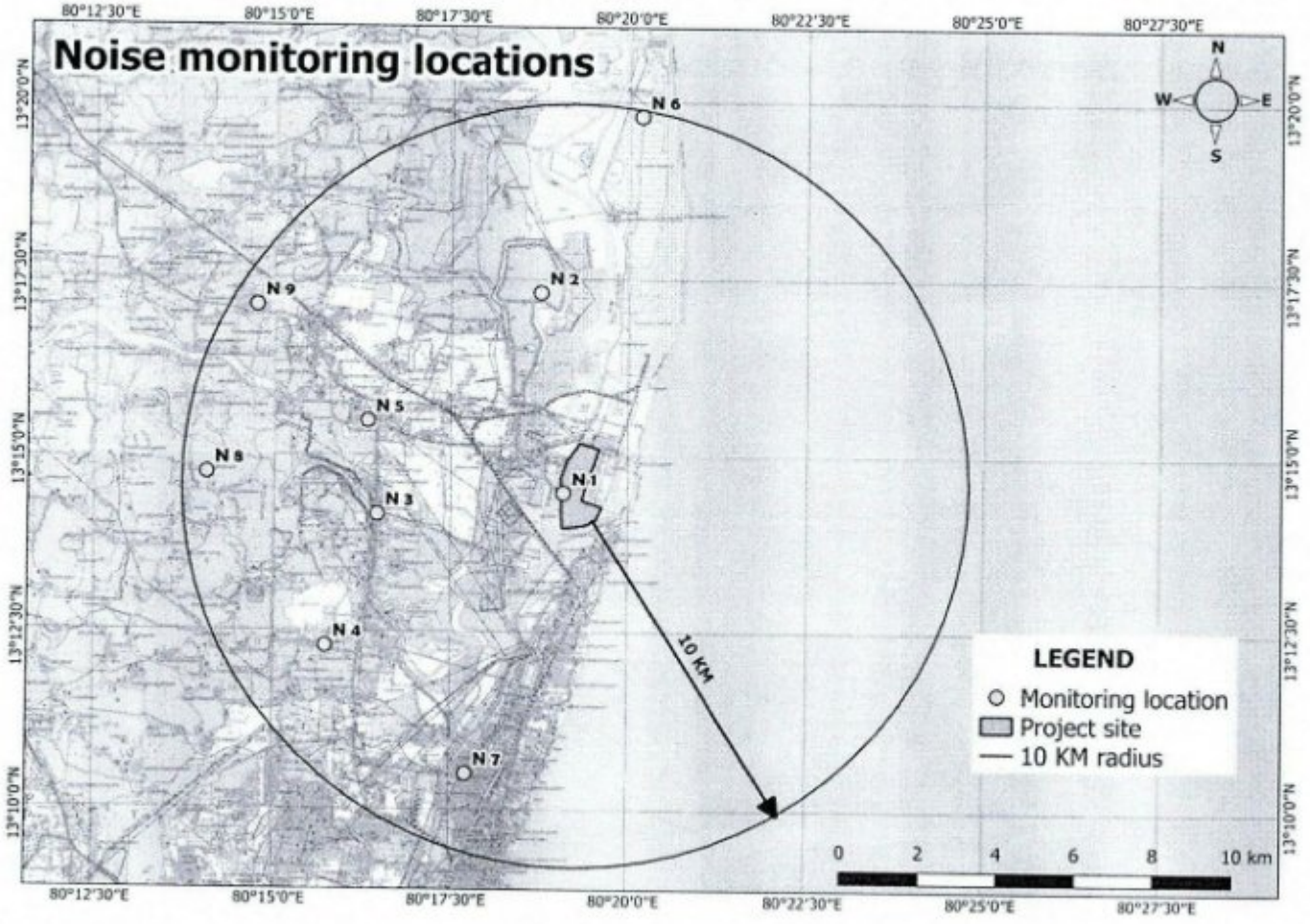
3.1.3 Noise Environment

Baseline noise levels of 9 locations falling within the study zone were used for this studies. The noise level measurement locations were identified for assessment of existing noise level status, keeping in view the land use pattern, residential areas in villages, schools, bus stands, etc., the day levels of noise have been monitored during 6 AM to 9 PM and the night levels during 9 PM to 6 AM. Following are the noise monitoring stations given in **Table 3.5.** Noise monitoring location map is presented in **Figure 3.4.**

Table 3.5: Details of Noise Monitoring Locations

Station Code	Name of the Location	Type of area	Geographic Coordinates	
			Latitude (N)	Longitude (E)
N 1	Within NCTPP stage 3	Industrial	13°14'28.49"	80° 19'06.57"
N2	Within NCTPS SEZ Area	Industrial	13°17'18.89"	80°18'47.02"
N 3	Vallur near Ashok Leyland Tec Center	Commercial	13°14'09.75"	80°16'28.42"
N 4	Vichoor Village	Industrial	13°12'17.78"	80°15'44.44"
N 5	Nandiambakkam	Residential	13°15'29.23"	80°16'19.84"
N 6	Kalanji North of Adani Katupalli Port	Residential	13°19'48.09"	80°20'10.06"
N 7	Kalaignar Nagar, Tiruvottiyur	Residential	13°10'30.74"	80°17'44.15"
N 8	Periyamullaivoyal	Residential	13°14'44.73"	80°14'03.93"
N 9	Kesavapuram, Minjur near Kesavapuram Park - Volleyball ground	Residential	13°17'07.19"	80°14'44.41"

Figure 3.4: Noise monitoring locations



Results and Interpretation

Noise level results are given in **Table 3.6.** From the below results it is evident that noise in the study area across all the locations were within respective noise levels stipulated by CPCB.

Table 3.6: Noise quality results

Station	Name of the Location	Area type	Results dB (A)	
			Day Time (6 am to 10 pm)	Night Time (10 pm to 6 am)
N1	Within NCTPP stage 3	Industrial	54.0	45.2
N2	Within NCTPS SEZ Area	Industrial	48.9	42.8
N3	Vallur near Ashok Leyland Tec Center	Commercial	56.1	43.6
N4	Vichoor Village	Industrial	55.6	44.8
N5	Nandiambakkam	Residential	54.6	42.5
N6	Kalanji North of Adani Katupalli Port	Residential	47.9	42.1
N7	Kalaignar Nagar, Tiruvottiyur	Residential	49.6	42.3
N8	Periyamullaivoyal	Residential	46.6	37.1
N9	Kesavapuram, Minjur near Kesavapuram Park -Volleyball ground	Residential	48.6	40.9
CPCB Standards				
Residential Area			**55**	**45**
Commercial Area			**65**	**55**
Industrial Area			**75**	**70**
Silence Zone			**50**	**40**

High noise levels observed in some of the rural areas are primarily because of vehicular traffic, other anthropogenic activities. The day equivalents during the study period ranged between 46.6 to 56.1 dB (A) whereas the night equivalents were in the range of 37.1 to 45.2 dB (A). The results are compared with AAQ standards in respect of Noise SO 123 (E) dated on 14th Feb 2000 for Silent, Residential, Commercial and Industrial area. From the results it can be seen that the day equivalents and night equivalents were within the specified standards in the respective areas.

Comparison with earlier data

Noise levels were monitored at locations in the earlier EIA study (same as indicated for the air quality). Noise quality at six locations are taken for comparison with earlier EIA studies namely TANGEDCO (1X800) MW Thermal Power Project Stage-III (June to August-2012) and TANGEDCO (2X800) MW Thermal Power Project (March to April, 2010). LDay and Lnight values reported during the earlier studies summarized with current study at NCTPP stage -III and Ennore SEZ thermal power plant projects. LDay and LNight value reported during the study is summarized in the **Table 3.7**.

Table 3.7: Noise Data comparison with earlier Published EIAs

S.no.	Location	Monitoring season/month	Area type	LDay	LNight
1	(1X800) MW NCTPP Project Stage-III	June to August-2012	Industrial	56.3	46.2
	Ennore - (SEZ) TPP	March to April-2010	Residential	48.4	41.0
	NCTPP Stage-III Project site-N1	**Sep. to Nov., 2022**	**Industrial**	**48.9**	**42.8**
2	Ennore SEZ TPP(2X800) MW Thermal Power Project site –(SEZ)	March to April-2010	Industrial	54.3	42.5
	NCTPS SEZ Area Project site -N2	**Sep. to Nov., 2022**	**Industrial**	**54.0**	**45.2**
3	Vallur– (Stage-III)	June to August-2012	Residential	53.7	43.3
	Vallur near Ashok Leyland Technical Center-N3	**Sep. to Nov., 2022**	**Commercial**	**56.1**	**43.6**
4	Vichoor – (Stage-III)	June to August-2012	Residential	53.7	42.6
	Vichoor Village-N4	**Sep. to Nov., 2022**	**Industrial**	**55.6**	**44.8**
5	Katipalli Kuppam–(SEZ)	March to April-2010	Residential	50.6	49.0
	Kalanji North of Adani Katupalli Port –N6	**Sep. to Nov., 2022**	**Residential**	**47.9**	**42.1**
6	Minjur–(SEZ)	March to April-2010	Residential	51.4	40.0
	Kesavapuram, Minjur near Kesavapuram Park - Volleyball ground –N9	**Sep. to Nov., 2022**	**Residential**	**48.6**	**40.9**
CPCB Standards					
Industrial Area				**75**	**70**
Commercial Area				**65**	**55**
Residential Area				**55**	**45**
Silence Zone				**50**	**40**

The current study's values are lower than previously recorded values at N2 and N6 whereas found slightly increasing at N1, N3, N4 and N9 due to increase in ongoing construction activities.

3.1.4 Water Quality assessment

Ground water samples were collected from 9 locations whereas Surface water samples were collected from 7 locations falling within the study area were considered for this report. Details of the same are given below:

Ground Water

The ground water samples were drawn from the hand pumps, Tap and Bore well being used by the villagers for their domestic needs. The details of the locations are given in **Table 3.8.** Ground Water sampling location is shown in **Figure 3.5.**

Table 3.8: Ground water Monitoring locations with coordinates

Code	Name of the Location	Type of source	Geographic coordinates	
			Latitude	Longitude
GW1	Ennore	Open well	13°12'37.85" N	80°18'56.02" E
GW2	Athipattu	Bore well	13°15'37.39" N	80°18'18.23" E
GW3	Vallur (Near Ashok Leyland Technical Centre)	Bore well	13°13'21.73" N	80°16'24.72" E
GW4	Vichoor	Bore well	13°12'13.01" N	80°16'04.33" E
GW5	Nandiyambakkam	Bore well	13°15'51.39" N	80°16'43.10" E
GW6	Kalanji (North Of Adani Kattupalli)	Bore well	13°19'47.86" N	80°20'09.56" E
GW7	Kalaingar Nagar - Thiruvottiyur	Bore well	13°10'09.47" N	80°17'38.06" E
GW8	Periyamullaivayal / Thirunilai	Bore well	13°14'44.98" N	80°13'58.52" E
GW9	Kesavapuram Minjur (Near Kesavapuram Park Volleyball Ground)	Open well	13°17'07.22" N	80°14'44.36" E

Table 3.9: Ground Water results

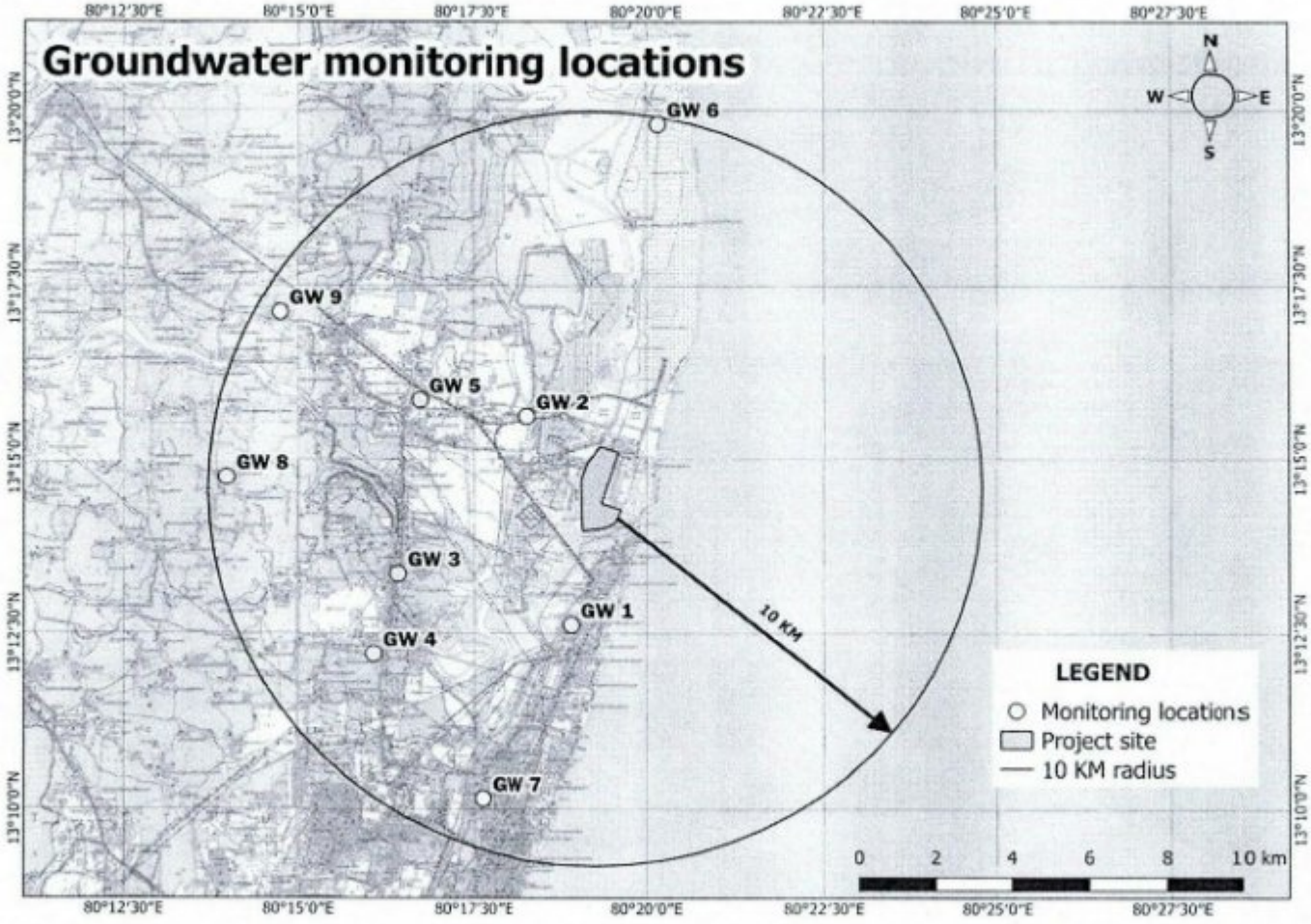
Sample Description			GW - 1	GW – 2	GW – 3	GW – 4	IS 10500:2012 Standards	
S. no.	Parameters	Units	Results				Acceptable limit	Permissible limit
1.	Colour	HU	2	25	2	5	5	15
2.	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3.	Taste	-	Disagreeable	Disagreeable	Disagreeable	Disagreeable	Agreeable	Agreeable
4.	Turbidity	NTU	10	324	3	14	-	-
5.	Total Hardness as $CaCO_3$	mg/l	50	417	234	202	200	600
6.	Chloride as Cl-	mg/l	21	945	226	152	250	1000
7.	Salinity	ppt	0.11	3.02	0.67	0.59	-	-
8.	Total Suspended Solids	mg/l	14	422	6	27	-	-
9.	pH @ 25°C	-	7.7	8.1	8.3	8.3	6.5-8.5	6.5-8.5
10.	Conductivity @ 25°C	µs/cm	192	5034	1116	984	-	-
11.	Dissolved Oxygen	mg/l	6.7	6.1	6.7	6.5	-	-
12.	P. Alkalinity as $CaCO_3$	mg/l	Nil	43	11	11	-	-
13.	M-Alkalinity as $CaCO_3$	mg/l	30	323	129	129	-	-
14.	Total Alkalinity as $CaCO_3$	mg/l	30	366	140	140	200	600
15.	BOD 3 days @ 27°C	mg/l	< 2	< 2	< 2	< 2	-	-
16.	COD	mg/l	< 4	18	< 4	< 4	-	-
17.	Total Dissolved Solids	mg/l	114	1450	670	590	500	2000
18.	Oil & Grease	mg/l	< 2	< 2	< 2	< 2	-	-
19.	Total Residual Chlorine	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)		

Sample Description			GW - 1	GW – 2	GW – 3	GW – 4	IS 10500:2012 Standards	
S. no.	Parameters	Units	Results				Acceptable limit	Permissible limit
20.	Nitrate as NO_3	mg/l	1.4	7.4	32	22	45	45
21.	Fluoride as F	mg/l	BDL (DL:0.1)	1.2	0.51	0.38	-	-
22.	Sulphate as SO_4	mg/l	16	483	69	116	200	400
23.	Silica as SiO_2	mg/l	19	28	13.6	12.4	-	-
24.	Iron as Fe	mg/l	1.26	54	0.42	1.22	0.3	0.3
25.	Calcium as Ca	mg/l	17	114	69	53	75	200
26.	Sodium as Na	mg/l	8	732	146	112	-	-
27.	Potassium as K	mg/l	Nil	60	7	12	-	-
28.	Magnesium as Mg	mg/l	2	97	15	17	30	100
29.	Copper as Cu	mg/l	BDL (DL:0.02)	0.05	BDL (DL:0.02)	BDL (DL:0.02)	0.05	1.5
30.	Lead as Pb	mg/l	BDL (DL:0.005)	0.11	BDL (DL:0.005)	BDL (DL:0.005)	0.01	0.01
31.	Zinc as Zn	mg/l	BDL (DL:0.08)	0.21	BDL (DL:0.08)	BDL (DL:0.08)	5	15
32.	Manganese as Mn	mg/l	BDL (DL:0.01)	0.78	0.04	0.08	0.1	0.3
33.	Nickel as Ni	mg/l	BDL (DL:0.01)	0.14	BDL (DL:0.01)	BDL (DL:0.01)	0.02	0.02
34.	Total Coliform	MPN/ 100ml	< 2	< 2	< 2	12	Shall not be detectable in any 100 ml sample	Shall not be detectable in any 100 ml sample

Sample Description		Units	GW – 5	GW – 7	GW – 7	GW – 8	GW - 9	IS 10500:2012 Standards	
S. no.	Parameters		Results					Acceptable limit	Permissible limit
1.	Colour	Hazen Units	2	2	15	2	2	5	15
2.	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3.	Taste	-	Disagreeable	Disagreeable	Disagreeable	Disagreeable	Disagreeable	Agreeable	Agreeable
4.	Turbidity	NTU	7	< 1	156	< 1	1	-	-
5.	Total Hardness as $CaCO_3$	mg/l	329	192	296	507	756	200	600
6.	Chloride as Cl-	mg/l	316	112	404	532	692	250	1000
7.	Salinity	ppt	0.91	0.34	1.25	1.53	1.67	-	-
8.	Total Suspended Solids	mg/l	11	< 2	276	< 2	2	-	-
9.	pH @ 25°C	-	8.2	7.3	8.2	7.6	7.5	6.5-8.5	No relaxation
10.	Conductivity @ 25°C	µs/cm	1520	568	2120	2602	2770	-	-
11.	Dissolved Oxygen	mg/l	6.7	7.2	5.6	6.7	6.8	-	-
12.	P. Alkalinity as $CaCO_3$	mg/l	22	Nil	22	Nil	Nil	-	-
13.	M-Alkalinity as $CaCO_3$	mg/l	236	54	311	403	258		
14.	Total Alkalinity as $CaCO_3$	mg/l	258	54	333	403	258	200	600
15.	BOD 3 days @ 27°C	mg/l	< 2	< 2	6	< 2	< 2	-	-
16.	COD	mg/l	< 4	< 4	44	< 4	< 4	-	-
17.	Total Dissolved Solids	mg/l	910	340	1252	1530	1675	500	2000
18.	Oil & Grease	mg/l	< 2	< 2	< 2	< 2	< 2	-	-
19.	Total Residual Chlorine	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	-	-
20.	Nitrate as NO	mg/l	19	12.3	21.1	11.7	31	45	No relaxation
21.	Fluoride as F	mg/l	0.86	0.24	3.5	0.25	0.37	1	1.5

Sample Description		Units	GW – 5	GW – 7	GW – 7	GW – 8	GW -9	IS 10500:2012 Standards	
S. no.	Parameters		Results					Acceptable limit	Permissible limit
22.	Sulphate as SO_4	mg/l	61	58	140	142	158	200	400
23.	Silica as SiO_2	mg/l	30.8	3.8	4.3	38	36	-	-
24.	Iron as Fe	mg/l	1.15	0.22	37.8	0.15	0.25	0.3	No relaxation
25.	Calcium as Ca	mg/l	74	57	74	144	176	75	200
26.	Sodium as Na	mg/l	193	36	293	354	316	-	-
27.	Potassium as K	mg/l	15	2	28	13.3	24	-	-
28.	Magnesium as Mg	mg/l	35	12	27	36	77	30	100
29.	Copper as Cu	mg/l	0.03	BDL (DL:0.02)	0.03	BDL (DL:0.02)	0.04	0.05	1.5
30.	Lead as Pb	mg/l	BDL (DL:0.005)	BDL (DL:0.005)	0.08	BDL (DL:0.005)	BDL (DL:0.005)	0.01	No relaxation
31.	Zinc as Zn	mg/l	BDL (DL:0.08)	BDL (DL:0.08)	0.25	BDL (DL:0.08)	BDL (DL:0.08)	5	15
32.	Manganese as Mn	mg/l	0.18	0.04	0.28	0.03	0.06	0.1	0.3
33.	Total Coliform	MPN/ 100ml	< 2	< 2	30	< 2	23	Shall not be detectable in any 100 ml sample	Shall not be detectable in any 100 ml sample

Figure 3.5: Ground water sampling location



Results and Interpretation

- As per IS: 10500-2012 standards the pH limit fixed for drinking water is 6.5 to 8.5. Beyond this range, water will affect the mucus membrane and water supply system. pH in the study area varied from 7.3 to 8.3 showing that values are within the acceptable range.
- The acceptable limit for TDS as per IS: 10500-2012 Standards is 500 mg/l whereas the permissible limits in absence of alternate source are 2000 mg/l. Beyond this, palatability decreases and may cause gastro intestinal irritation. In the ground water samples collected from the study area, the TDS varied from 114 to 1675 mg/l. The sample collected from the sources are within the permissible limits.
- The acceptable limit for chloride is 250 mg/l as per IS: 10500-2012 Standards whereas the permissible limit of the same is 1000 mg/l. Beyond this limit, taste, corrosion and palatability are affected. The chloride levels in the ground water samples collected in the study area ranged from 21 to 945 mg/l. The samples collected from the sources are within the permissible limits.
- The acceptable limit of Total Hardness as $CaCO_3$ according to IS:10500-2012 Standards is 200 mg/l whereas the permissible limit for the same is 600 mg/l. Beyond this limit, encrustation in water supply structures and adverse effects on domestic use will be observed. The hardness values for the ground water samples collected from the study area varied from 50 mg/l to 756 mg/l. TH value of GW samples collected are well within the permissible limit except GW9.

- Fluoride is another important parameter, which has an acceptable limit of 1 mg/l and permissible limit of 1.5 mg/l. However, the optimum content of Fluoride in the drinking water is <0.6 mg/l to 1.5 mg/l. If the Fluoride content is less than 0.6 mg/l it causes dental carries, above 1.5 mg/l. it causes staining of tooth enamel, higher concentration in range of 3 - 10 mg/l causes Fluorosis. In the ground water samples of study area, the Fluoride value was in the range from BDL to 0.86 mg/l.

Results of ground water analysis in the study area follow a similar trend in comparison to earlier conducted studies. Parameters like taste and Colour indicates unsuitability of ground water for drinking purpose. Additionally, hardness levels were found to be comparatively higher so that water can be used for drinking purpose only after suitable treatment

Surface Water

Surface water sampling was conducted to evaluate the quality of surface water bodies in the study area. Total 7 SW sampling locations selected for sample collection as detailed below in **Table 3.10**. Surface water sampling locations are shown in **Figure 3.6**:

Table 3.10: Surface water locations

Locations Code	Name of the Location	Type of water body	Geographic coordinates	
			Latitude (N)	Longitude (E)
SW1	Vichoor Main Road Manali New Town	Pond	13°12'20.46"	80°15'09.93"
SW2	Mahatuvambedu (Mouthambedu) Voyalur	Pond	13°16'46.84"	80°17'36.44"
SW3	Pattamandhiri	Pond	13°15'16.52"	80°16'55.93"
SW4	Singasamy Nagar, Kattoor Road	Pond	13°17'12.10"	80°15'40.02"
SW5	Thirunilai/Chinnamullaiva yal	Pond	13°13'56.43"	80°14'04.08"
SW6	Kalaignar Nagar - Thiruvottiyur	Pond	13°10'06.49"	80°17'57.46"
SW7	Pudunagar Vali	Pond	13°13'48.91"	80°15'55.00"

Figure 3.6: Surface water sampling location

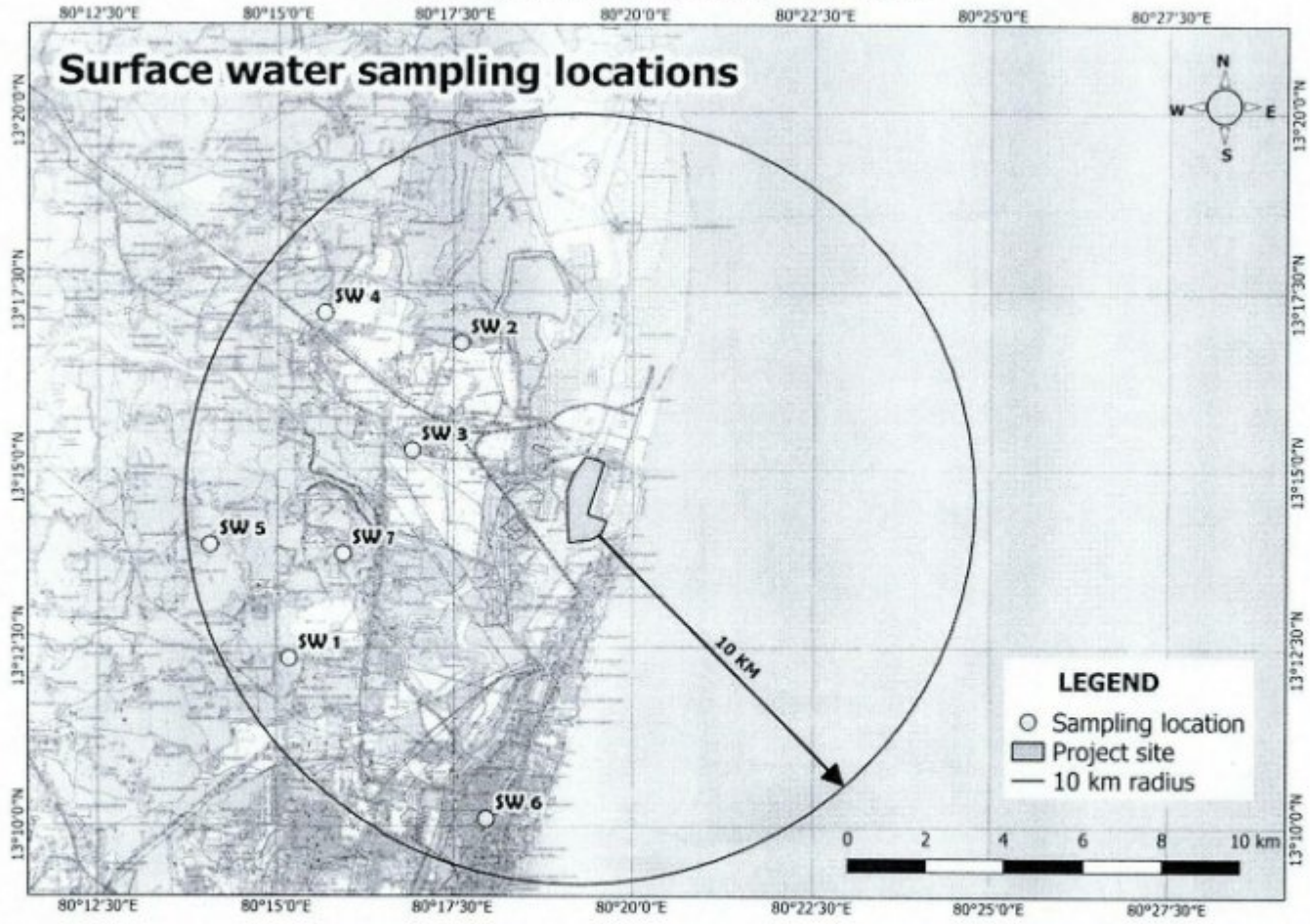


Table 3.11: Surface water results

Sample Description			SW-1	SW2	SW3	SW -4	SW -5	SW6	SW7
S. no.	Parameters	Units	Results						
1.	Colour	HU	10	100	10	10	2	20	10
2.	Odour	-	Agreeable	Disagreeable	Agreeable	Disagreeable	Agreeable	Agreeable	Agreeable
3.	Taste	-	Disagreeable	Disagreeable	Disagreeable	Disagreeable	Disagreeable	Disagreeable	Disagreeable
4.	Turbidity	NTU	7	312	9	13	< 1	7	11
5.	Total Hardness as $CaCO_3$	mg/l	73	90	182	418	46	121	102
6.	Chloride as Cl-	mg/l	56	22	143	480	31	163	75
7.	Salinity	ppt	0.18	0.22	0.410	1.160	0.12	0.440	0.298
8.	Total Suspended Solids	mg/l	11	524	17	18	< 2	11	8
9.	pH @ 25°C	-	7.8	6.9	8.2	7.1	7.2	7.7	7.7
10.	Conductivity @ 25°C	µs/cm	302	370	684	1950	204	734	496
11.	Dissolved Oxygen	mg/l	6.2	5.2	6.4	6.2	6.7	6.3	6.3
12.	P. Alkalinity as $CaCO_3$	mg/l	Nil	Nil	11	Nil	Nil	Nil	Nil
13.	M- Alkalinity as $CaCO_3$	mg/l	69	39	107	204	53	108	86
14.	Total Alkalinity as $CaCO_3$	mg/l	69	39	118	204	53	108	86
15.	BOD 3 Days @ 27°C	mg/l	4	13	3	4	2	3	2
16.	COD	mg/l	20	62	12	20	10	14	8
17.	Total Dissolved Solids	mg/l	180	222	410	1160	120	440	298
18.	Oil & Grease	mg/l	< 2	< 2	< 2	< 2	< 2	< 2	< 2
19.	Total Residual Chlorine	mg/l	BDL(DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
20.	Nitrate as NO3	mg/l	2.6	1.0	7.8	15.2	0.50	19.3	6.65
21.	Fluoride as F	mg/l	0.11	3.8	0.27	0.24	BDL(DL:0.1)	0.35	0.52

Sample Description			SW-1	SW2	SW3	SW -4	SW -5	SW6	SW7
S. no.	Parameters	Units	Results						
22.	Sulphate as SO4	mg/l	8.4	74	27	102	12	24	50
23.	Silica as SiO2	mg/l	5.7	13.6	15	5.4	3	1.2	2.7
24.	Iron as Fe	mg/l	0.67	16.5	1.22	0.88	BDL(DL:0.01)	0.92	1.26
25.	Calcium as Ca	mg/l	16	23	53	90	12	37	26
26.	Sodium as Na	mg/l	28	18	60	268	19.3	100	54
27.	Potassium as K	mg/l	2	4	5	18	2.4	8	4
28.	Magnesium as Mg	mg/l	8	8	12	47	4	7	9
29.	Mineral oil	mg/l	Absent	Absent	Absent	Absent	Absent	Absent	Absent
30.	Copper as Cu	mg/l	BDL (DL:0.02)	0.11	BDL (DL:0.02)	0.04	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)
31.	Lead as Pb	mg/l	BDL (DL:0.005)	0.11	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)
32.	Zinc as Zn	mg/l	BDL(DL:0.08)	0.27	BDL(DL:0.08)	BDL(DL:0.08)	BDL(DL:0.08)	BDL(DL:0.08)	BDL(DL:0.08)
33.	Manganese as Mn	mg/l	0.18	0.38	0.16	0.14	BDL (DL:0.01)	0.10	0.12
34.	Total Coliform	MPN/100ml	240	300	500	500	500	300	500

*Note - **Class A**: Drinking water source without conventional treatment but after disinfection; **Class B**: Outdoor bathing (organized); **Class C**:Drinking water source with conventional treatment followed by disinfection; **Class D**: Propagation of wild life, fisheries. Class E: Irrigation, industrial cooling, controlled waste disposal.*

Results and Interpretation

- pH of the surface water collected in the study area ranges between 6.9 to 8.2. As per CPCB designated best use water quality criteria as updated on 23rd October, 2019. Class A, B and D waters PH values are 6.5 to 8.5, Class C waters pH value is 6.0 to 9.0 and Class E is 6.0 to 8.5.
- The DO values for all the samples collected in the study area during study period were in the range of 5.2 to 6.7 mg/l. As per CPCB designated best use water quality criteria as updated on 23rd October, 2019 Class C and D waters DO values should be >4 mg/l, for Class A and Class B, the DO values should be > 6 mg/l and >5 mg/l respectively, for Class E the limit is not specified.
- The BOD values for all the samples collected in the study area during study period were below 2 to 13 mg/l. As per CPCB designated best use water quality criteria as updated on 23rd October, 2019 Class B and C waters BOD values should be <3 mg/l, for Class-A, the BOD values should be <2 mg/l, for Class D and E the limit is not specified.
- Total Hardness is ranging from 46 to 418 mg/l whereas TDS level is ranging from 12 to 1160 mg/l. Chloride values from all the selected locations were ranging from 22 to 480 mg/l whereas Lead is ranging from BDL to 0.11 mg/l.

3.1.5 Soil Quality

Soil sampling results of 8 different locations within the study area were considered for the studies. Details of the soil sampling locations are given in **Table 3.12**. The soil analysis results are shown in **Table 3.13.** Soil sampling location is shown in **Figure 3.7.**

Table 3.12: Details of Soil Sampling Locations

Locations code	Name of the Location	Sampling Coordinates		Type
		Latitude (N)	Longitude (E)	
S 1	Ennore	13°12'36.72"	80°18'57.55"	Coastal land
S 2	Athipattu	13°15'36.91"	80°18'6.96"	Barren land
S3	Vallur (Near Ashok Leyland Technical Centre)	13°14'17.72"	80°16'28.42"	Barren land
S 4	Vichoor	13°12'20.32"	80°15'23.72"	Barren land
S 5	Nandiyambakkam	13°15'51.37"	80°16'34.00"	Barren land
S 6	Kalaingar Nagar - Thiruvottiyur	13°10'30.74"	80°17'44.15"	Barren land
S 7	Periyamullaivayal/ Thirunilai	13°14'43.65"	80°13'58.89"	Barren land
S 8	Kesavapuram Minjur (Near Kesavapuram Park Volleyball Ground)	13°17'7.22"N	80°14'44.36"	Barren land

Figure 3.7: Soil sampling map

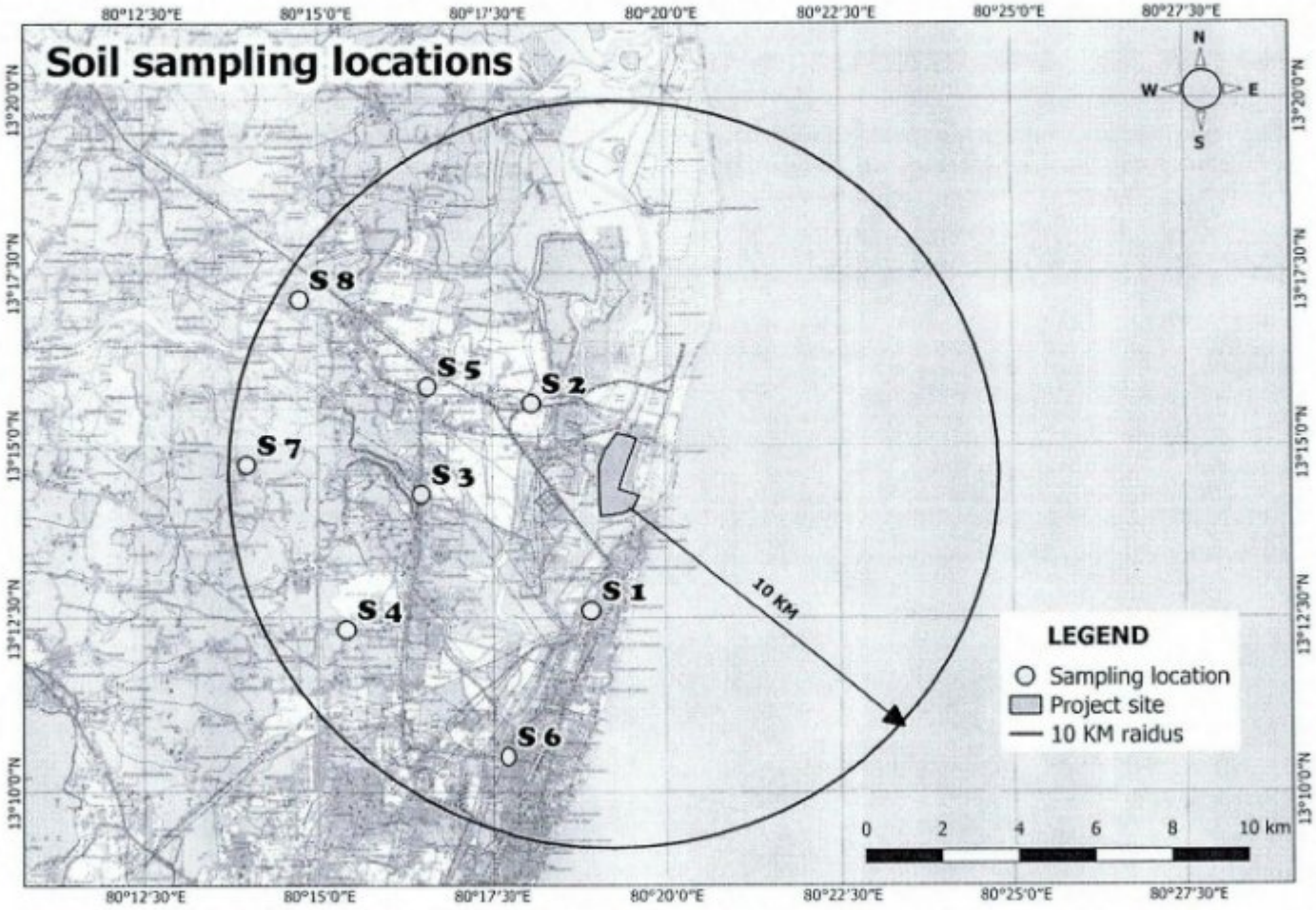


Table 3.13 Soil quality results

S. No	Parameters	Units	S1	S2	S3	S4	S5	S6	S7	S8	Remarks	
1	Texture:											
	Sand	%	83.4	4.3	14.8	5.4	19.7	17.5	25.1	92.1	Dominated by sandy texture	
	Silt	%	9.5	16.2	19.7	10.8	23.0	69.7	57.4	5.2		
	Clay	%	7.01	69.4	65.3	83.6	57.1	12.6	17.4	2.6		
2	pH	-	8.2	9.1	7.8	7.9	7.1	8.8	7.3	7.8	< 6.5	Acidic[9]
											6.5 -7.8	Neutral
											7.8 – 8.5	Alkaline
											>8.5	Alkali
3	Moisture	%	21.4	11.7	13.7	39.1	16.5	11.7	11.2	16.5	Low moisture content. Soil in the area is relatively dry.	
4	Conductivity	µs/cm	140	129	1055	463	194	121	1680	1207	0 – 800	Normal[10]
											800-1600	Slightly saline
											1600-3200	Injurious to most crops
											>3200	Critically injurious
5	Specific gravity	-	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	Specific gravity of sandy soil range between2.65 – 2.67[11].	
6	Porosity	%	32	40	42	44	48	40	36	32	Typical coarse sand has a porosity range of35 – 46%.	
7	Sodium as Na	mg/kg	132	146	524	213	240	172	584	410	-	
8	Available Nitrogen	mg/kg	294	746	770	854	870	532	274	912	Low[12]	<240 kg/ha
											Medium	240 – 480 kg/ha
											High	>480 kg/ha
9	Nitrate Nitrogen	mg/kg	20	27	12	25	18	22	28	20	-	
10	Available Phosphorus as P	mg/kg	12	38	27	44	26	38	56	40	Low	<11 kg/ha
											Medium	11 - 22 kg/ha
											High	>22 kg/ha
11	Calcium as Ca	mg/kg	38	39	194	82	84	64	400	216	-	
12	Magnesium as Mg	mg/kg	10	58	58	39	21	16	110	68	-	
13	Acidity as $CaCO_3$	mg/kg	Nil	Nil	20	12	44	Nil	15	14	-	

S. No	Parameters	Units	S1	S2	S3	S4	S5	S6	S7	S8	Remarks	
14	Alkalinity as $CaCO_3$	mg/kg	112	123	172	155	86	120	174	156	-	
15	Sulphate Sulphur as S	mg/kg	46	38	167	80	42	32	162	138	-	
16	Boron as B	mg/kg	1.8	1.4	2.1	1.1	1.2	1.2	2.2	1.1	-	
17	Total Organic Carbon	%	0.18	0.62	0.57	0.77	0.68	0.53	0.45	0.14	Low	<0.5
											Medium	0.5-0.75
											High	>0.75
18	Chloride as Cl	mg/kg	104	92	446	301	126	90	268	172	-	
19	Sodium absorption Ratio	-	1.66	3.07	9.6	3.43	2.08	0.19	5.77	7.26	-	
20	Bulk Density	g/cm^3	1.52	1.44	1.42	1.42	1.48	1.46	1.52	1.56	Fine to medium soils has a bulk density range of 1.0 -1.6[13]	
21	Water Holding Capacity	%	28	45	36	38	34	36	28	20	Sandy soils are porous and permeable.	
22	Available Potassium	mg/kg	173	385	243	190	131	98	210	176	Low	<110 kg/ha
											Medium	110 – 280 kg/ha
											High	>280 kg/ha
23	Permeability	cm/hr	2.4	0.8	1.6	0.6	0.9	1.6	1.1	2.3	0.5-2.0 comes under moderately slowpermeability soil class[14]	
24	Iron as Fe	%	0.782	0.877	0.924	0.843	0.886	1.067	1.23	0.924	-	
25	Cadmium as Cd	mg/kg	BDL (DL:2.0)	BDL (DL:2.0)	BDL (DL:2.0)	BDL (DL:2.0)	BDL (DL:2.0)	BDL (DL:2.0)	BDL (DL:2.0)	BDL (DL:2.0)		
26	Chromium as Cr	mg/kg	BDL (DL:5.0)	23.84	28.2	15.72	26.07	BDL (DL:5.0)	31.8	19.18	Low value. Within Dutch intervention standards of 380 mg/kg[15]	
27	Manganese as Mn	mg/kg	138.7	165.7	210.9	189.5	148.6	154.7	213.6	203.5	-	
28	Lead as Pb	mg/kg	BDL (DL:5.0)	5.26	8.43	6.12	8.07	BDL (DL:5.0)	12.7	6.75	Low value. Within Dutch intervention standards of 530 mg/kg	
29	Zinc as Zn	mg/kg	33.48	48.87	74.08	62.13	65.26	41.78	98.32	82.13	Low value. Within Dutch intervention standards of 720 mg/kg	
30	Copper as Cu	mg/kg	5.94	9.84	13.8	6.29	12.4	14.35	32.4	21.8	Low value. Within Dutch intervention standards of 190 mg/kg	
31	Mercury as Hg	mg/kg	BDL (DL:0.5)	BDL (DL:0.5)	BDL (DL:0.5)	BDL (DL:0.5)	BDL (DL:0.5)	BDL (DL:0.5)	BDL (DL:0.5)	BDL (DL:0.5)	Not detected. Dutch intervention value: 10mg/kg.	

Results and Interpretation

The Analysis results for all the samples collected from different locations are compared with standard soil classification, Handbook of Agriculture, Indian Council of Agricultural Research, New Delhi, 2012.

- The pH of soil is an important property as plants cannot grow in low and high pH soils. The pH of soils in the range 6.0 to 8.5 is called normal to saline soils. Most of the essential nutrients like N, P, K, Cl and SO_4 are available for plants at neutral pH, except for Fe, Mn and Al which are available at low pH range. Soils having pH below 7 are considered to be acidic from the practical standpoint, those with pH less than 5.5 and which respond to liming may be considered as acid soils. On the basis of pH measurements, the degree of soil acidity may be indicated. The pH values in the study area varied from 7.1 to 9.1 which is Normal-Saline to Alkaline in nature.

- Based on the electrical conductivity, the soils are classified into 4 groups (Normal, Critical for germination, Critical for growth of the sensitive crops, Injurious to most crops). The electrical conductivity in the study area varied from 121 to 1680 µS/cm.

- The Total Organic carbon in the study area varied from 0.14 to 0.77 % indicating that three samples are in low level, four samples in medium level and one is in high level. Other important parameters for characterization of soil for irrigation are Nitrogen, Phosphorus and Potassium which are known as primary nutrients whereas Calcium, Magnesium and Sulphur are known as secondary nutrients. The primary and secondary nutrient elements are known as major elements. This classification is based on their relative abundance and not on their relative importance.

- Nitrogen encourages the vegetative development of plants by imparting a healthy green colour to the leaves. It also controls, to some extent, the efficient utilization of phosphorus and potassium. Its deficiency retards growth and root development, turns the foliage yellowish or pale green, hastens maturity, causes the shriveling of grains and lowers crop yield. The older leaves are affected first. An excess of nitrogen produces leathery (and sometimes crinkled) dark green leaves and succulent growth. It also delays the maturation of plants, impairs the quality of crops like barley, potato, tobacco, sugarcane and fruits increases susceptibility to diseases and causes "lodging" of cereal crops by inducing an undue lengthening of the stem internodes. The available nitrogen as N in the study area varies from 274 to 912 kg/Ha indicating that two samples show medium level whereas remaining all samples are falling under low category.

- Phosphorus influences the vigour of plants and improves the quality of crops. It encourages the formation of new cells, promotes root growth (particularly the development of fibrous roots) and hastens leaf development, the emergence of ears, and

the formation of grains and maturation of crops. It also increases resistance to disease and strengthens the stems of cereal plants, thus reducing their tendency to lodge. It offsets the harmful effects of excess nitrogen in the plant. When applied to leguminous crops it hastens and encourages the development of nitrogen fixing bacteria. If phosphorus is deficient in the soil, plants fail to make a quick start, do not develop a satisfactory root-system, remain stunted, and sometimes develop a tendency to show a reddish or purplish de-colouration of stem and foliage owing to an abnormal increase in the sugar content and the formation of anthocyanin. However, the deficiency of this element is not so easily recognized as that of nitrogen. It has also been observed that cattle feeding on the produce of phosphorus deficient soils become dwarfed, develop stiff joints and lose the velvety feel of the skin. Such animals show an abnormal craving for eating bones and even soil itself. In the study area available phosphorus varies from 12 to 56 kg/Ha indicating that one sample shows medium value whereas remaining 6 samples shows the high value.

- Potassium enhances the ability of the plants to resist diseases, insect attacks, cold and other adverse conditions. It also plays an essential part in the formation of starch and production and translocation of sugars. It is of special value to carbohydrate rich crops e.g. sugarcane, potato and sugar beet. The available potassium in the study area is varies between 98 to 385 kg/Ha indicating one sample is falling under Low category, 6 samples are falling in medium category and one sample is falling under high category.

Comparison with Earlier EIA Data

Soil quality at four locations I.e. S1, S3, S4 & S8 are taken for comparison with earlier EIA studies namely TANGEDCO (1X800) MW Thermal Power Project Stage- III (June to August-2012) and TANGEDCO (2X800) MW Thermal Power SEZ Project (March to April, 2010). Some important soil parameters reported earlier studies summarized with current study at NCTPP stage -III and Ennore SEZ thermal power plant projects.

Table 3.14: Soil data comparison with earlier Published EIAs

Sample Description			Ennore		Vallur		Vichoor		Minjur	
Sampling location			Soil - 1	SEZ March to April-2010	Soil – 3	Stage 3 June to August-2012	Soil – 4	Stage 3 June to August-2012	Soil - 8	SEZ March to April-2010
S. no.	Parameters	Units	Results							
1.	pH	-	8.2	7.3	7.8	7.8	7.9	7.9	7.8	7.4
2.	Moisture	%	21.42	0.7	13.76	-	39.19	-	16.5	1.5
3.	Conductivity	µs/c m	140	850	1055	265	463	144	1207	97
4	Bulk Density	g/cm^3	1.52	1.31	1.42	1.35	1.42	1.62	1.56	1.40
5	Calcium as Ca	mg/kg	38	210	194	1200	82	560	216	32
6	Chloride as Cl	mg/kg	104	32	446	-	301	-	172	27
7	Total Organic Carbon	%	0.18	0.65	0.57	0.27	0.77	0.24	0.14	0.36
8	Zinc as Zn	mg/kg	33.48	4.80	74.08	-	62.13	-	82.13	4.70
9	Manganese asMn	mg/kg	138.7	28.0	210.9	-	189.5	-	203.5	9.0
10	Lead as Pb	mg/kg	BDL (DL:5.0)	10.51	8.43	13.7	6.12	16.07	6.75	5.6
11	Cadmium asCd	mg/kg	BDL (DL:2.0)	-	BDL (DL:2.0)	0.71	BDL (DL:2.0)	0.17	BDL (DL:2.0)	-
12	Mercury asHg	mg/kg	BDL (DL:0.5)	-	BDL (DL:0.5)	0.55	BDL (DL:0.5)	0.11	BDL (DL:0.5)	-

pH values have been increased in few locations. Bulk density has been increased in two locations whereas in remaining two locations its decreased from previous results. Organic matter also decreases due to rapid industrialization process.

3.1.6 Land use/ Land cover details

The satellite based remote sensing is a sustainable global information system because it has the potential to meet the needs and demands of the present and future. The synoptic Average, which provides capability for integration of real time information on regional and global scales, is a unique characteristic of this information system. Its versatility lies in its inherent capability to conceptualize situation to give clear perceptions for defining short term and long term objectives.

An activity could bring about changes in the Land use and Land cover in the vicinity. A data base on Land use and land cover indicates ecosystems existing in and around the center of an economic activity, to safeguard to allow comparison at a future date to draw conclusions on the nature. The study reported here is with the honest intention of building such a database on Land use and land cover in an area within about 10 km radius of the proposed project.

Methodology

The methodology adopted in analysis and interpretation of FCC-Liss III data of Indian Remote Sensing Satellite (IRS – IC) covering the study area. The data was analyzed adopting a man-machine interactive approach through an interactive process of combining field observations and data interpretation. The image processing software "ERDAS Imagine 9.2 V "was used for the Image Analysis and Map Composition.

The base map information such as major roads, railways network and drainage networks were extracted from the available survey of India (SOI) Toposheets on 1: 50,000 scale vectorized using "ARC/INFO" (Geographic Information System) Software.

LULC map of the area is given in **Figure 3.8.** The Geo-coded false color composite of Liss-III multispectral data with 23.5 m resolution covering the entire study area is given in **Figure 3.9.** The geographical coordinates of the proposed project are $13^{O}17'$ to $13^{O}18'$ N latitude and $80^{O}18'$ to $80^{O}19'$ E longitude. The nearest habitats are Vayalur Village, nearest railway station is Athipattu railway station. The Chennai city is located at 35 km towards south direction. The land utilization pattern in 10 km radius study area is given in **Table 3.15.**

Table No 3.15: Land Utilization Pattern of the study area (area in Ha.)

Sl. No.	LULC DESCRIPTION	AREA-HA	AREA-%
1	Built-Up	8989.8	11.9
2	Agricultural	9899.0	13.1
3	Current Fallow	7985.7	10.6
4	Plantation	1777.3	2.4
5	Open Forest	268.1	0.4
6	Scrub Forest	951.6	1.3
7	Waste Land	2677.9	3.6
8	Scrub Forest	2725.4	3.6
9	Water Body	3470.4	4.6
10	River	1689.0	2.2
11	Sea	34931.0	46.3
	TOTAL	**75365.27**	**100**

Figure No 3.8: Land Use Land Cover

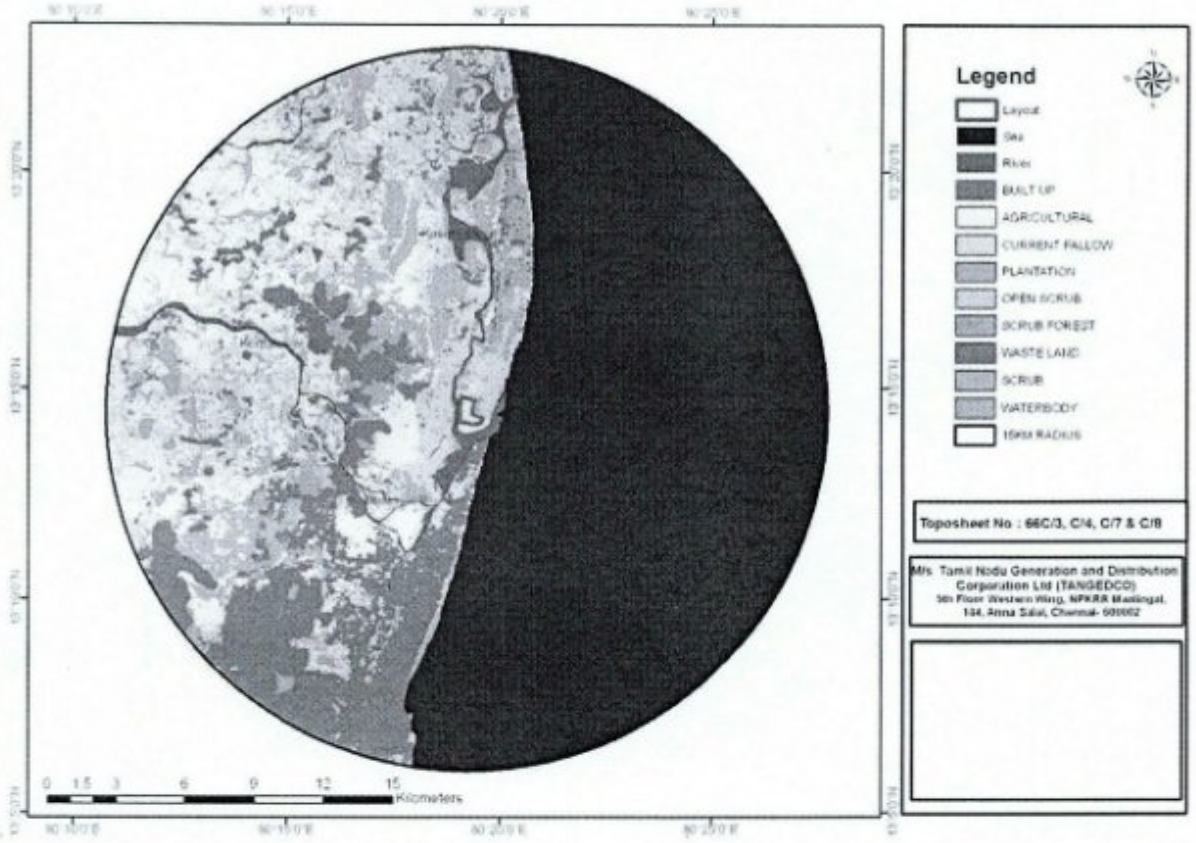
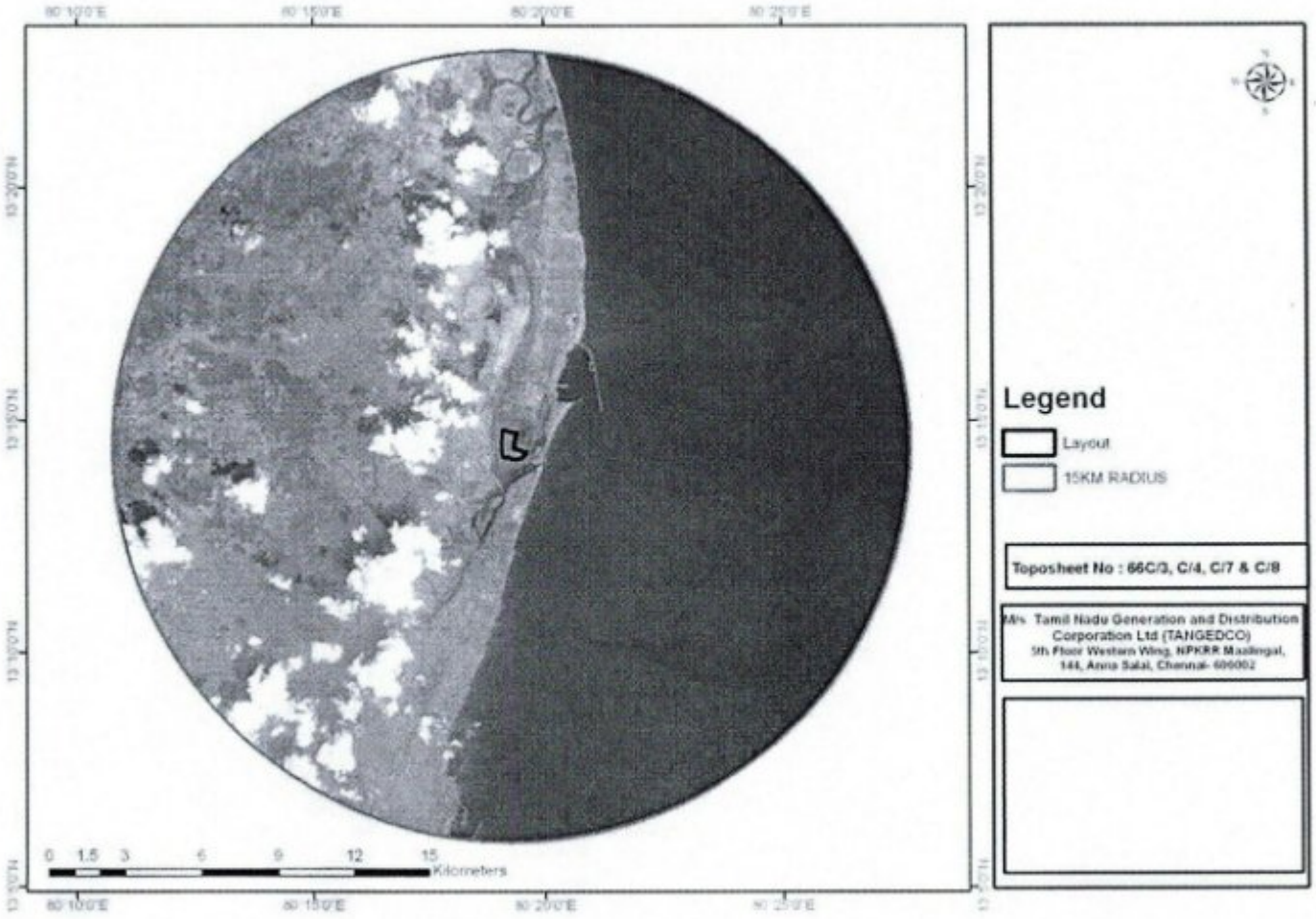


Figure: 3.9: Satellite Imagery Shown in FCC -IRS LIS 3 (2010)



3.1.7 Ecology & Biodiversity

There are no National Parks/ Wildlife Sanctuaries /Reserve forests within 10 Km radius of the project site. The buffer zone includes Bay of Bengal, creeks, Industrial areas as well as a few residential areas. Along the creek side inhabited by sparse to dense mangroves *Avicennia marina*. Most of the areas are colonized by *Prosopis juliflora. Azadirachta indica, Cocos nucifera, Borassus flabellifer, Moringa oleifera, Casuarina equsetifoliafolia and Thespesia populnea, Tectona grandis, Terminalia cadappa* are the most common trees in the entire buffer zone. *Calotropis procera, Ricinus communis and Vitex negundo* were found widely scattered in most vacant places including road sides. *Acacia auriculiformis, Pithecellobium dulce, Peltophorum pterocarpum, Azadirachta indica, Cassia siamia, Eucalyptus sp., Leucana leucophila, Sizygium cumini and Ficus religiosa, Ficus benghalensis and Ficus hispida* were observed commonly in the core area.

Overall, 29 species of birds were recorded from entire study area during this survey period. In the agriculture areas, numbers of Bee-eaters, Mynas, Lapwings, Kites and Drongos were observed. Black Drongo, Indian Roller, Bush Quail were observed in dry land. House sparrow, Common crow, and Baya Weaver were seen near villages. Predators and accipiter like Black Kite, were occasionally seen near farms and water bodies. Species like Painted Stork, Glossy Ibis, Black Ibis, Black Headed Ibis, Coot and Little Grebes were observed near water bodies while species like Little Egret, Cattle Egret, Pond Heron, Little Cormorant, and Kingfishers were commonly observed near creek.

Villagers in the buffer area confirmed the presence of Indian Fox (*Vulpes bengalensis*), Common Bonnet monkey (*Macaca radiata*), Wild Hare (*Lepus nigricollis*), and Grey Mongoose (*Herpestes edwardsii*). Other major reptiles are Cobra, Commom Krait, Vipers, and Rat Snake.

The dominant fish groups found in the Ennore coastal waters are Seerfish (*Scomberomorus guttatus*), Little tuna (*Euthynnus affinis*), Ribbonfish (*Trichiurus lepturus*), Sardines (*Sardinella gibbosa, S.longiceps*), Russel's Scad (*Decapterus russelli*) and Indian mackerel (*Rastrelliger kanagurta*).

3.1.8 Socio-Economic Profile of Study Area

The study area comprises of 26 census villages, 2 Census Town (CT) and 2 Municipalities (M) falling in two sub-districts Ponneri and Mathavaram in Tiruvallur district.

The total population of the study area is 3,96,942 belonging to 1,01,726 households with an average family size of four. Out of total population in the study area, 50.24% are males and 49.767% are females. The overall sex ratioin the study area is 990 females per 1,000 males.

Child Population (0-6 age group) in the study area has been worked out to 11% of the total

population of study area. Of the total child population, 51.40% are boys and 48.60% are girl child. The child sex ratio in the age group is 945 girls per 1000 boys.

The total Scheduled Tribes population in the study area is worked out to be only 0.70% of the total population. Out of these, 50.14% are male and 49.86% are female. The sex ratio among the Scheduled Tribe population is 994.

The share of Scheduled Castes population to the total population is estimated about 21.76%. Out of this, 49.88% are male and remaining 50.12% are female. The sex ratio among the Scheduled Caste population is 1005 females per 1,000 males.

The literacy rate in the project area was 88.5%, which was higher than the state (80.09%) and Tiruvallur District (84.03%). The male literacy rate works out to be 90.73% and the female literacy rate is 81.06, which shows the importance of education and social change in the study area.

The total working population constitutes 38.71% of the total population of the study area. Out of the total working population, 77.44% are males and 22.56% are females. The gender gap in work participation rate is significantly high with 54.88%.

As per marine fisheries census 2010, the study area having 10 fishing villages covering in Ponneri and Ambathur thaluks in Thuruvallur district. There were 3,046 marine fishermen households (HH) with a total population of 11,729, in which 2,814 fishermen HH comes under Ambathur taluk most of them are fishing in Ennore creek and Kosasthalaiyar river and other 232 HH are from Ponneri thaluk. The males constituted about 5,952 and females 5,777. The average family size was 3.73 with the female to male ratio was 971 for 1000. There were 3045 (99.9%) families below poverty line.

About 46% of the fisherfolk had primary level education, 35% had secondary level, 5% had above secondary level education and the rest 14% of the population was unschooled.

There were 3,845 fisherfolk engaged in fishing allied activities, such as active fishermen (69.10%), marketing (15.68%), labourers (0.21%), peeling (0.03%), others (0.10%) and other than fishing (14.88%). Women outweighed men in marketing of fish, peeling and labour. A total of 6,034 were having membership in fisheries co-operative societies. There were 726 crafts owned by fisherfolk, of which 20 were mechanized, 513 outboard and 193 non-motorized.

As per census 2011 record, in the study area there are numerous educational institutions functioning including Pre-Primary Schools, Primary Schools, Middle Schools, Secondary Schools, Senior Secondary Schools. The Degree Colleges for pursuing higher education in Art, Science & Commerce subjects and Polytechnics colleges re available at Minjur, Thiruvottiyur and Nalur.

In the study area Mobile Medical Units have been provided under the control of the PHC

Patient Welfare Societies. Services rendered by Mobile Medical Units; especially routine immunization/dropout immunization are being strictly monitored. The other routine services (Ante Natal Care, Post Natal Care, Family Welfare Services, Lab Services, Adolescent Care, Referral Services and Counselling Services) rendered by the MMU team are linked with the Village Health and Nutrition (VHN) day if the MMU visits the village on the same day.

For enhancement in water supply to enhancing the Sustainability of the drinking water sources, recharge structures like Check Dam, Percolation Pond, Defunct Bore Well Recharge, Recharge Shaft, etc., are being implemented in the district and study area as well by the Tamil Nadu Water Supply and Drainage Board (TWAD Board) under various State and Central Government assistance.

The present proposal is for securing amendment in the EC letter to the proposed 1X800 MW TPP (Unit-III). The amendment in EC is called for changing the use of coal from 100% Imported coal to use of Indian Coal as well as Imported Coal in equal proportion. The change in coal in the planning will have the impact on the environmental in term of change Air quality due, increase in in the generation of Ash due to change in coal configuration. The possible impacts on the environmental components due to change in the use of coal have been assessed and provided in the subsequent section.

4.1 IMPACT PREDICTION

The present section contains the information related to prediction of impacts on the Environmental components due to proposed change from use of 100% Imported coal to use a mix of Indian coal as well as Imported coal in ratio of 50% - 50% proportion in the proposed Thermal Power Project of NCTPP 1X800 MW (Stage-III).

As the present proposal is only change in configuration and quantity of coal; there may be the impact on the environmental components during operation of the project in term of change in the Ground Level Concentration (GLC) in the Air Quality, increase in the quantity of ash generation. Considering this; the impact prediction was performed on both the components i.e. impact on Air quality and quantity of ash generation and associated impacts. There will not be any considerable change in other environmental components as there is no change in the process, manpower requirement, power and water input, technology alteration etc.

4.2 IMPACT ON THE AIR QUALITY

The major source of air pollution from proposed power plant is emissions from chimney. The basic fuel for thermal power plant is domestic and imported coal the ratio's are as follows (a) 100% Imported (b) 70:30, (c) 30:70, (d) 100% domestic and (e) 50:50 ratio (**Presently proposed**). Following the coal configuration based on the said combination is given in **Table 4.1.**

Table 4.1: Coal Options

S. no.	Coal Option	GCV of coal (Kcal/kg)	Qty. Required (MTPA)	Ash Content (TPD)
Selected option in EC Amendment				
1	**50% (Indian coal): 50% (Imported coal)**	**4654**	**2.69**	**2209**
Option with EC Granted				
2	100% Imported coal	6000	2.09	806.4
Other Options considered in previous EIA report				
3	70% (Indian coal): 30% (Imported coal)	4460	2.812	2477
4	30% (Indian coal): 70% (Imported coal)	5340	2.35	1563
5	100% Indian Coal	3800	3.3	4350

The important air pollutants generated from thermal power plant are Particulate Matter (PM_{10}, $PM_{2.5}$), Sulphur dioxide (SO_2) and Oxides of Nitrogen (NO_x).

4.2.1 Emission Details

a) Particulate Matter

Particulate Matter is the complex mixture of small particles and they are made up of number of components, like organic chemicals, metals and dust etc. The sizes of the particles potentially cause health problems. The sizes are Suspended Particulate Matter (SPM) which are above 10 microns and while PM_{10}, $PM_{2.5}$ are Respirable particulate matter. These fine

particulates are found in smoke burnt from coal, oil and etc.

For this project Indian Coal and Imported Coal is proposed to be used as Raw material in 50%:50% proportion then the ash content will be lower when compared to 100 % Indian option. In the thermal power plants, generally the ash emissions are 30 % bottom ash and 70 % is fly ash. In order to control the fly ash emissions and to meet the MoEF&CC notification 7th Dec 2015 of 30 mg/Nm^3 for all TPPs to be installed from 1st Jan 2017, ESP's with efficiency of 99.98% will be installed to collect fly ash from the flue gas.

b) Sulphur dioxide

Sulphur dioxide (SO_2) emission from the boiler is due to burning of coal containing in the options of 100% imported coal 0.8% of sulphur content, and 0.65 in a mixture of 50%: 50% of Indian and Imported Coal. In order to control the Sulphur dioxide emissions and to meet the MoEF&CC notification 7th Dec 2015 of 100 mg/Nm^3 for all TPPs to be installed from 1st Jan 2017, dry Flue Gas Desulfurization (FGD) unit using dry sorbents to absorb pollutants is proposed, which generates lower water usage and reduced waste generation.

c) Oxides of Nitrogen

Oxides of nitrogen are one of the major pollutants in the thermal power plants and to reduce the NOx emissions, steam generator would be provided with advanced low NOx burners. In order to control the NOx emissions and to meet the MoEF&CC notification 7th Dec 2015 of 100 mg/Nm^3 for all TPPs to be installed from 1st Jan 2017, steam generators are provided with advanced low NO_x burners. Selective Catalytic Reduction (SCR) is also in the proposal and will be installed in future as per requirement.

4.4.2 Simulation Model for Prediction – (US EPA AERMOD)

The pollutants released into the atmosphere will disperse in the down wind direction and finally reach the ground at farther distance from the source. The ground level concentrations mainly depend upon the strength of the emission source and meteorology of the study area.

In order to estimate the ground level concentrations due to the emission from the proposed power plant, EPA approved Air Dispersion Model AERMOD 12.0 has been used. AERMOD 12.0 Air Dispersion Model provides option to model emissions from a wide range of sources that are present at a typical industrial source complex. The model considers the sources and receptors in undulated terrain as well as plain terrain and combination of both. The basis of the model is the straight line steady state Gaussian Plume Equation, with modifications to model simple point source emissions from stacks, emissions from stack that experience the effect of aerodynamic down wash due to nearby buildings, isolated vents, multiple vents, storage piles etc.

AERMOD Air dispersion model with the following options has been used to predict the cumulative ground level concentrations due to the proposed emissions.

1. Predictions have been carried out to estimate concentration values over radial distance of 10 km around the sources
2. A combination of Uniform Cartesian and Polar receptor network has been considered
3. Emission rates from the sources were considered as constant during the entire period
4. The GLC computed were as is basis without any consideration of decay coefficient
5. Calm winds recorded during the study period were also taken into consideration
6. 24-hour mean meteorological data extracted from the meteorological data collected during the study period as per guidelines of IMD/CPCB has been used to compute the mean GLC to study the impact on study area.

4.2.3 Model inputs and results

The inputs used to run the model are stack details, emission details, and twenty-four hours mean meteorological data. The stack & emission details for Indian Coal as well as Imported Coal in 50%:50% proportion and use of 100% Imported Coal is shown in the following **Table 4.1** and **4.2** respectively. Stack emission details of the thermal power plants within 10 km radius of the proposed project site are given in **Table 4.3.** The 24 hours meteorological data for period of Sep to Oct 2022 is shown in the **Table 4.4.**

The Predicted Maximum GLC of 24 Hour average PM_{10}, SO_2 and NO_x concentrations considering 24 hour mean meteorological data of study season are superimposed on the maximum baseline concentrations obtained during the study period to estimate the post project scenario, which would prevail at the post operational phase. The overall scenario with predicted concentrations over the maximum baseline concentrations is shown in the following **Table 4.5** by considering the proposed TPP 1x 800 MW with proposed fuel of 50 %: 50 % Indian and Imported coal and **Table 4.6** by considering all three TPPs of NCTPS Stage I, Stage II and Stage III and **Table 4.7** by considering all the existing TPPs in 10 km radius of the proposed power plant.

The Isopleths for PM, SO_2 and NOx with considering control measures and taking into consideration of out let standards for proposed TPP of NCTPP 1x800MW Stage III are given in **Figure 4.1 to 4.3** and Isopleths for PM and SO_2 without control measures are shown in the **Figure 4.4 to 4.5.** The Isopleths for PM, SO_2 and NOx with considering control measures and taking into consideration of out let standards for all TPPs with 10km radius of the proposed NCTPP 1x800 MW Stage III are given in **Figure 4.6 to 4.8** and Isopleths for PM and SO_2 without control measures are shown in the **Figure 4.9 to 4.10.**

Table 4.1: Stack design details of proposed plant (Capacity - 800 MW)

Details	Units	Description
Type of fuel	-	Coal
Internal diameter of stack	m	7
Temperature of flue gas	°C	140
Height of the stack	m	275
Ambient temperature	°C	36
Velocity of flue gas	m/s	25
Volumetric flow rate	m^3/s	963

Table 4.2 Stack emissions details of proposed plant (Different coal proportions)

Details	Units	Description	
		100% Imported	50% (Indian coal): 50% (Imported coal)
Coal consumption	TPD	6720	8664
Ash content (worst case)	%	12	25.5
Sulphur content (worst case)	%	0.8	0.65
PM emission (with control)	g/s	20.8	20.8
PM emission (without control)	g/s	7467	21416
Sulphur dioxide (with control)	g/s	69.5	69.5
Sulphur dioxide (without control)	g/s	1244	1513
Emission rates for outlet standard			
PM emission	g/s	20.8	20.8
Sulphur dioxide	g/s	69.5	69.5
Oxides of nitrogen	g/s	69.5	69.5
Emission Standard (mg/Nm^3)			

PM	SO_2	NOx
30	100	100

Table 4.3: Stack Emission details of Thermal power plants within 10 km study

Details	NCTPS Stage- III (Under execution)	NCTPS Stage-II	NCTPS Stage- I	Ennore SEZ TPP (Under execution)	Vallur TPP
	Indian: 50%: Imported: 50%	Domestic & Imported(70:30)	Domestic	Imported	Domestic & Imported(70:30)
Plant capacity (MW)	1x 800	2x600	3x210	2x660	3x500
Raw material consumption (TPD)	8664	17,280	10,500	12,226	18,955
Height of the stack (m)	275	275	275	275	275
Temp of flue gas (K)	413	413	407	407	413
Velocity of flue gas (m/s)	25	22	20	22	21
Volumetric flow rate(m^3/s)	963	847	297	799	763
Ash content (%)	25.5	27.4	34.0	7.99	27.4
Sulphur content (%)	0.65	0.6	0.5	0.8	0.6
PM emissions (g/s)(with control)	20.8	30.5	21.7	17.6	16.5
PM emissions (g/s) (without control)	21416	43840	33,056	9,045	48090
SO_2 emissions (g/s) (with control)	69.5	122	130	58.5	55.1
SO_2 emissions (g/s) (without control)	1513	2400	1215	2264	2633
Emission standards					
PM emission (mg/Nm^3)	30	50	100	30	30
Sulphur dioxide (mg/Nm^3)	100	200	600	100	100
Oxides of nitrogen (mg/Nm^3)	100	300	600	100	100
Emission rates for outlet standards					
PM emission (g/s)	20.8	30.5	21.7	17.6	16.5
Sulphur dioxide (g/s)	69.5	122	130	58.5	55.1
Oxides of nitrogen (g/s)	69.5	183	130	58.5	55.1

Table 4.4 Mean meteorological data of 24 hrous period (Sep to Oct-2022) used for modelling

Hour	Temperature (°C)	Relative humidity (%)	Wind direction (Degree)	Wind speed (m/s)	Stability class
1	24.6	86	225	1.85	6
2	23.8	88	240	1.95	6
3	22.2	91	45	1.56	6
4	21.9	95	225	1.45	6
5	20.1	96	270	1.25	6
6	23.3	94	225	2.03	6
7	25.3	90	240	2.23	5
8	27.3	87	180	2.34	5
9	28.5	85	270	2.67	4
10	30.1	79	225	2.73	3
11	33.2	73	225	3.24	2
12	35.5	68	270	3.34	1
13	37.4	62	270	3.42	1
14	36.5	64	225	2.73	1
15	34.8	66	240	2.83	1
16	33.7	68	270	2.65	2
17	32.8	70	290	2.51	2
18	32.2	72	200	2.48	3
19	30.2	73	225	2.49	3
20	28.9	75	270	2.61	4
21	28.1	76	45	2.52	5
22	27.4	78	315	2.72	6
23	26.4	81	240	1.92	6
24	25.5	84	225	1.78	6

Table 4.5: Post project scenario of proposed plant stage –III (800 MW)

Particulars	Concentration (µg/m³)		
	Indian: 50%:Imported: 50%		
	PM	SO_2	NO_X
Baseline scenario (Avg) Max	96.49	25.1	42.6
Predicted GLC with control	0.32	1.08	1.08
Overall scenario (Worst case)	**96.81**	**26.18**	**43.68**
Predicted GLC without control	332	23.4	-
Overall scenario (Worst case)	**428.49**	**48.5**	**-**
NAAQ Standards (24hr)	**100**	**80**	**80**
Maximum PM value recorded at project site is 120 µg/m³ due to ongoing construction activities hence average maximum value is considered for Air modelling.			

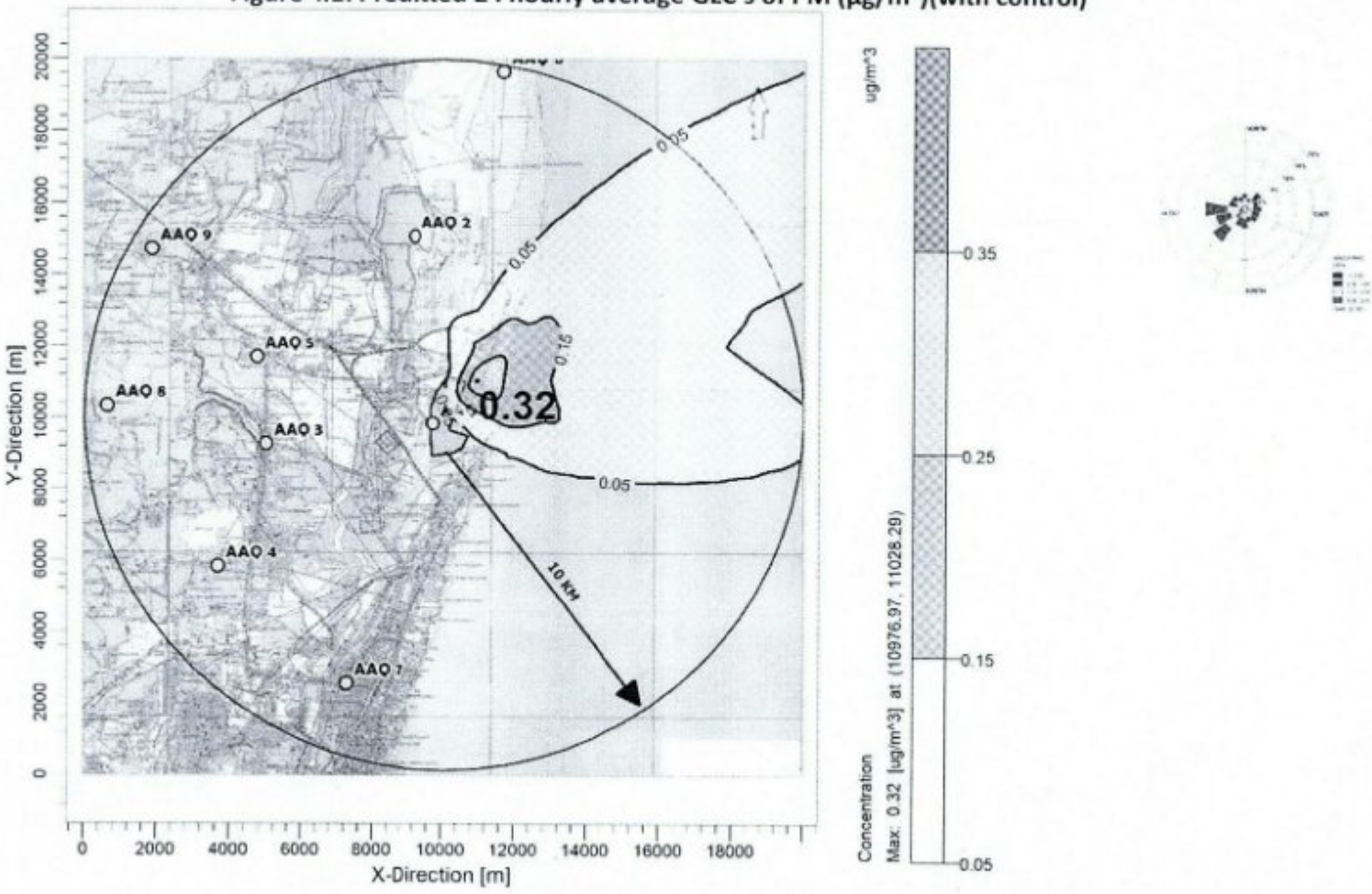
Table 4.6: Post project scenario of NCTPS all stages – I,II &III (Cumulative)

Particulars	Concentration (µg/m³)		
	PM	SO_2	NO_X
Baseline scenario (Avg) Max	96.49	25.1	42.6
Predicted GLC with control	1.2	5.1	6.4
Overall scenario (Worst case)	**97.69**	**30.2**	**49.0**
Predicted GLC without control	1618	81.5	-
Overall scenario (Worst case)	**1,714.49**	**106.6**	**-**
NAAQ Standards (24hr)	**100**	**80**	**80**
Maximum PM value recorded at project site is 120 µg/m³ due to ongoing construction activities hence average maximum value is considered for Air modelling.			

Table 4.7: Post project scenario in all TPPs in 10 km radius (Cumulative stacks)

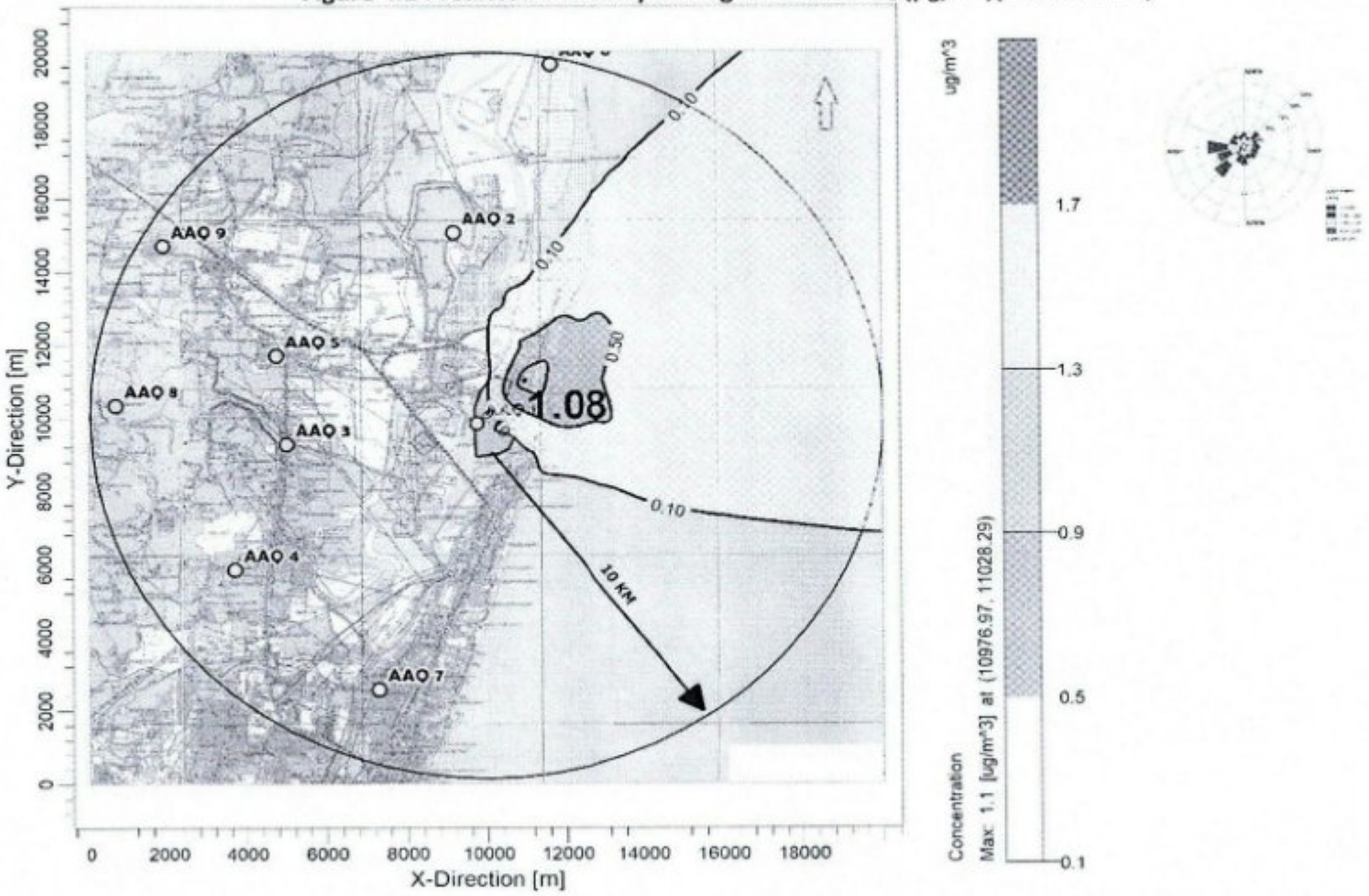
Particulars	Cumulative coal based (µg/m³)		
	PM_{10}	SO_2	NO_X
Baseline scenario (Avg) Max	96.49	25.1	42.6
Predicted GLC with control	1.6	7.1	8.0
Overall scenario (Worst case)	**98.09**	**32.2**	**50.6**
Predicted GLC without control	2341	**135**	**-**
Overall scenario (Worst case)	**2,437.49**	**160.1**	**-**
NAAQ Standards (24hr)	**100**	**80**	**80**
Maximum PM value recorded at project site is 120 µg/m³ due to ongoing construction activities hence average maximum value is considered for Air modelling.			

Figure 4.1: Predicted 24 hourly average GLC's of PM (µg/m³)(with control)



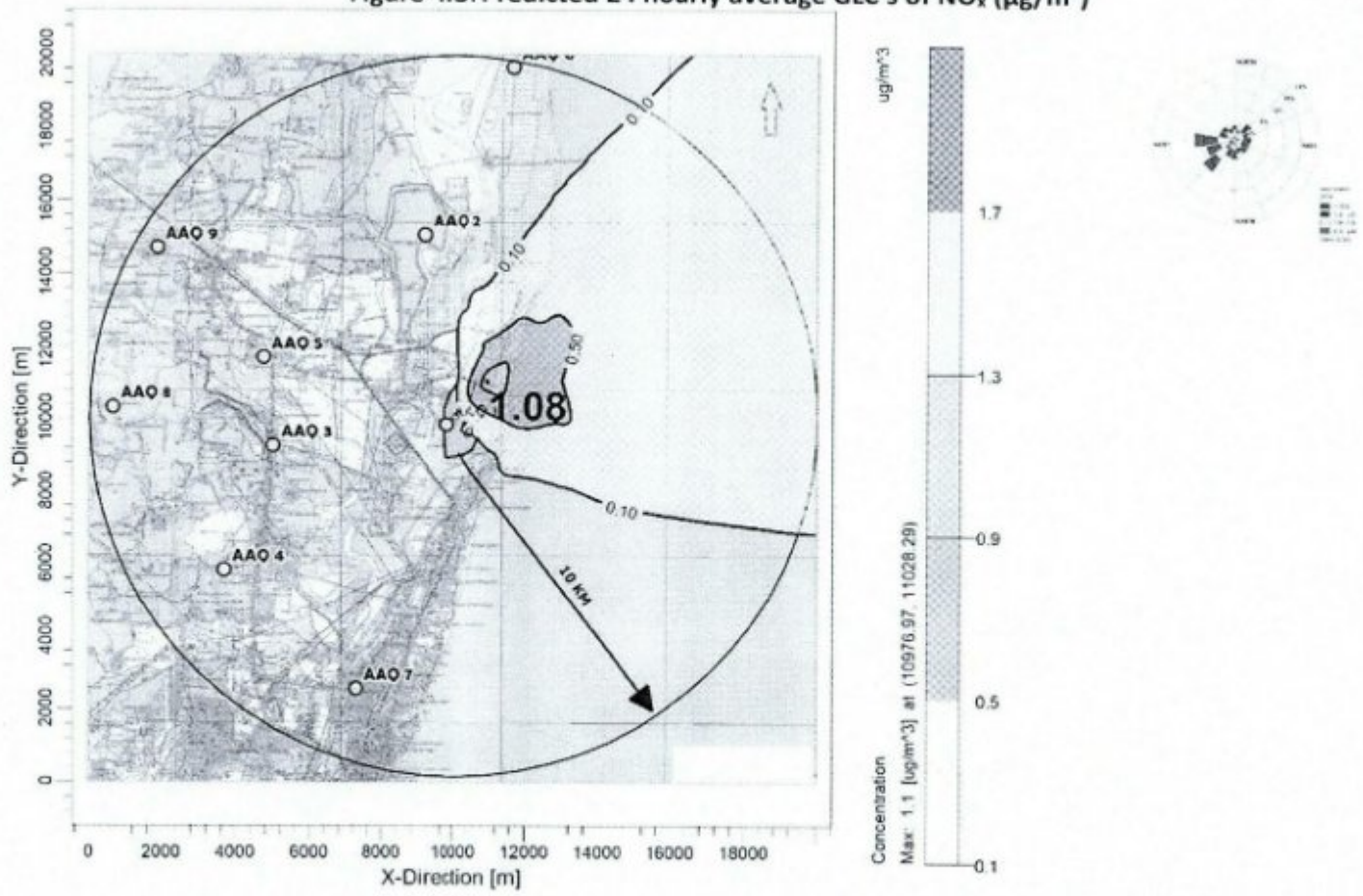
Max concentration PM is 0.32 µg/m³ @ 1.8 km in NE direction

Figure 4.2 Predicted 24 hourly average GLC's of SO_2 (µg/m³)(with control)



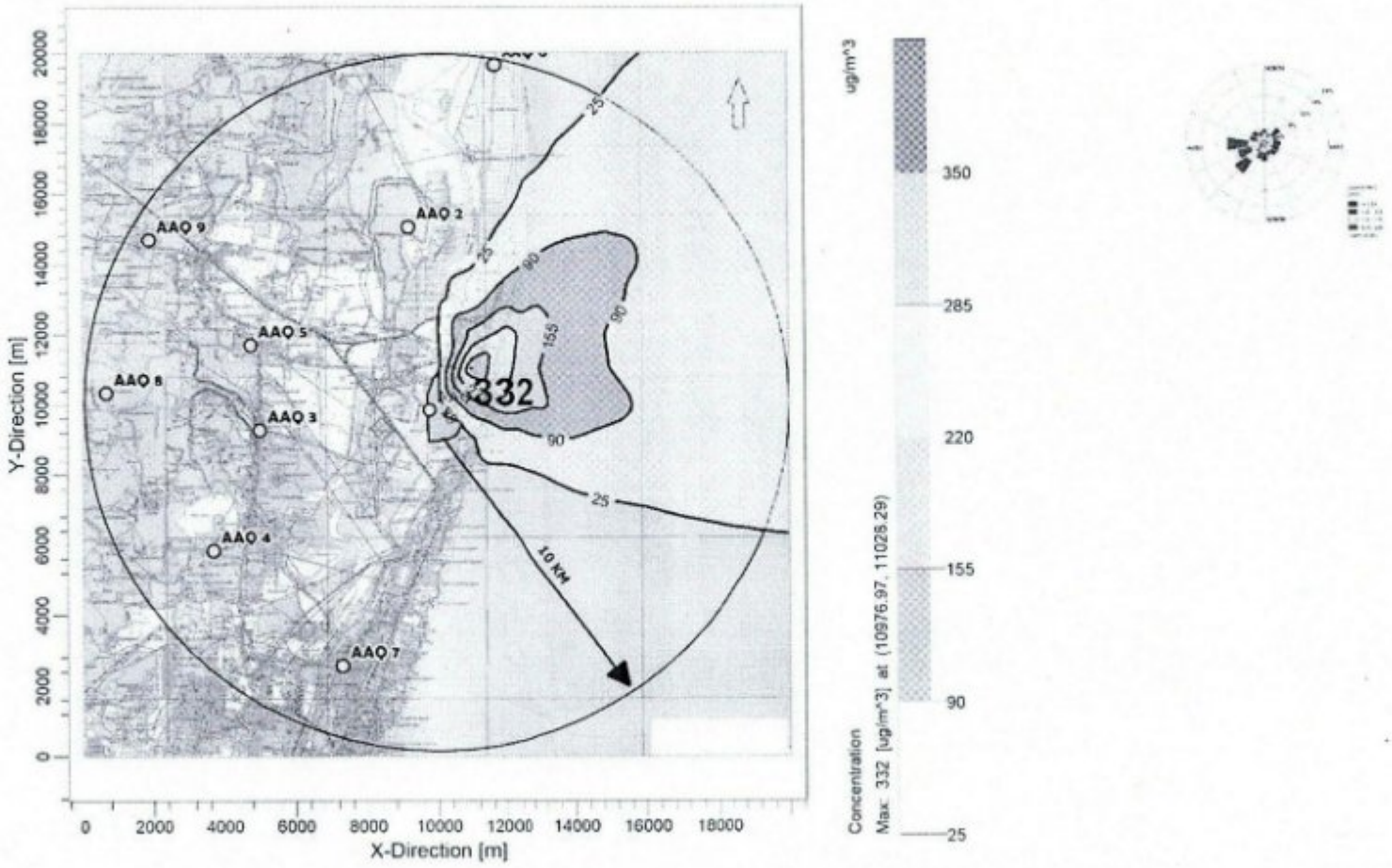
Max concentration SO_2 is 1.08 µg/m³ @ 1.8 km in NE direction

Figure 4.3: Predicted 24 hourly average GLC's of NO_x (µg/m³)



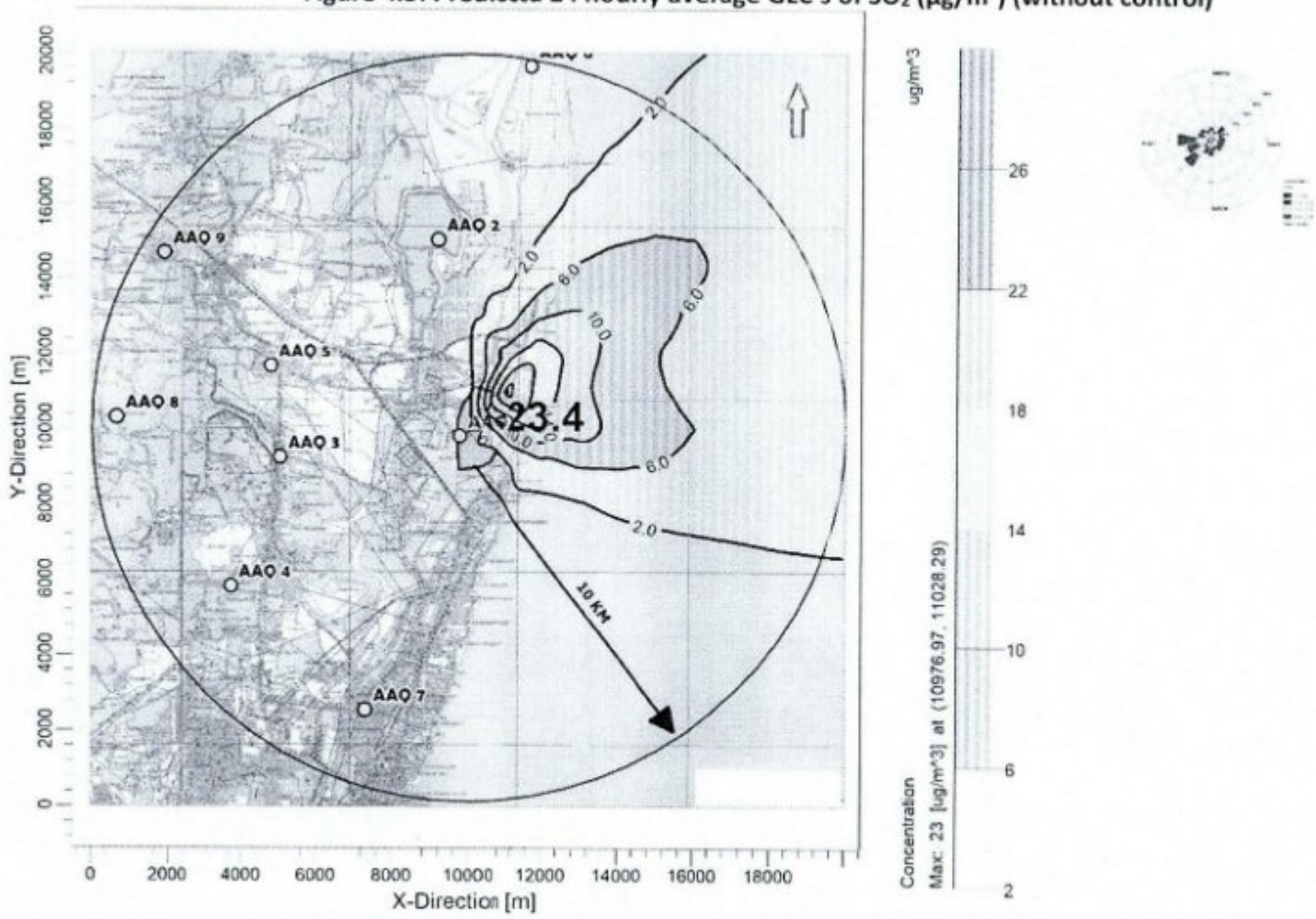
Maximum NOx Concentration 1.08 µg/m³ @ at 1.8 km in NE direction

Figure 4.4: Predicted 24 hourly average GLC's of PM (µg/m³)(without control)



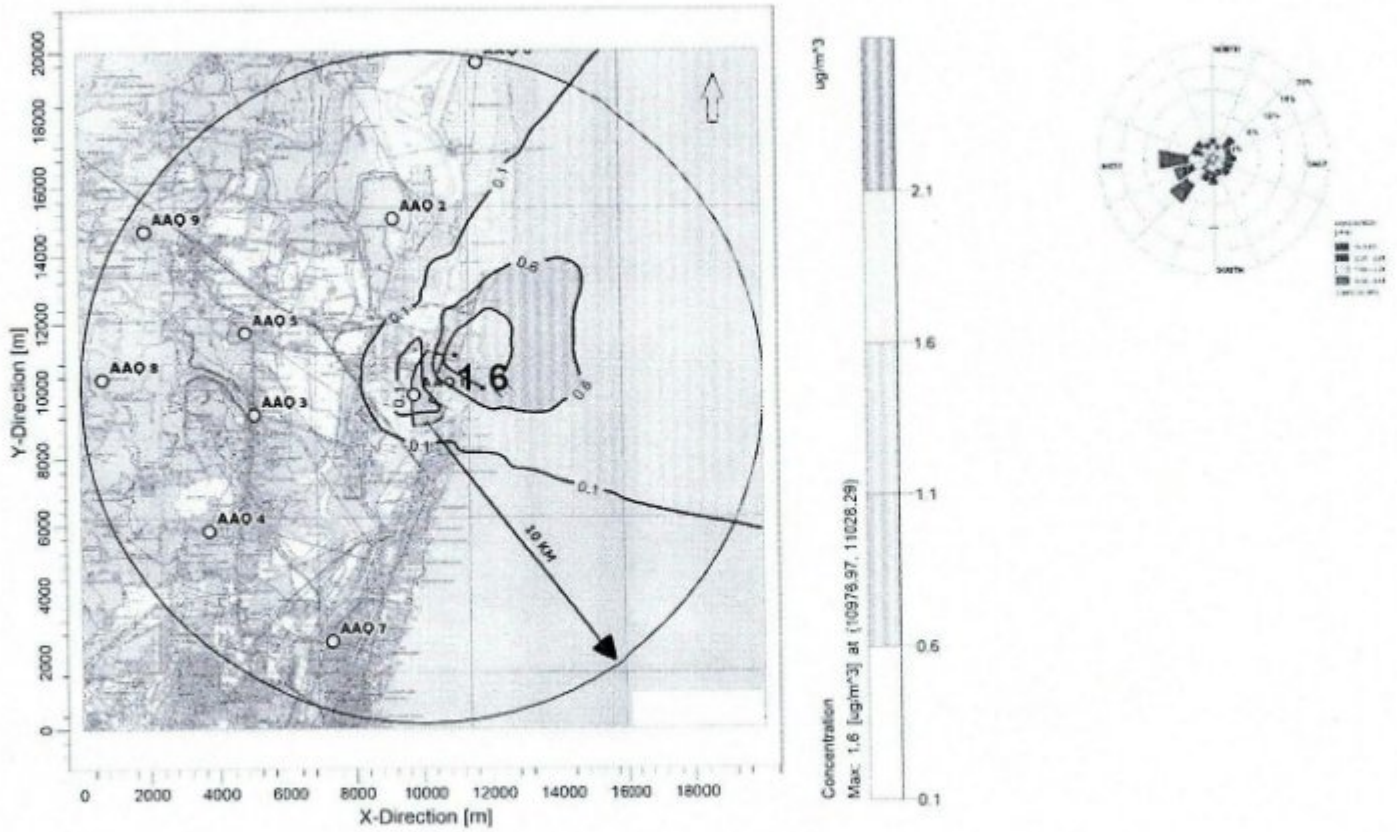
Max concentration PM is 332 µg/m³ @ 1.8 km in NE direction

Figure 4.5: Predicted 24 hourly average GLC's of SO_2 (µg/m³) (without control)



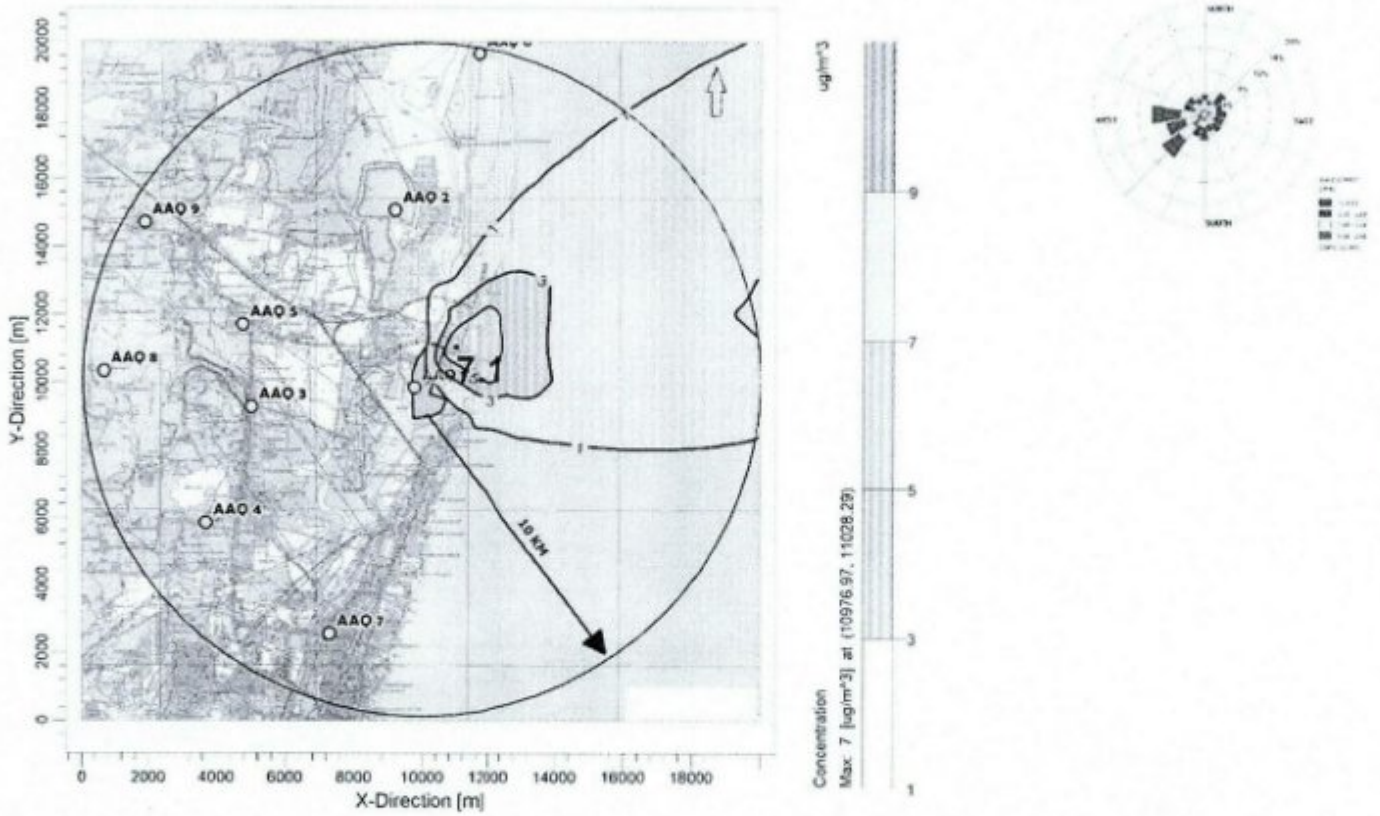
Max concentration SO_2 is 23.4 µg/m³ @ 1.8 km in NE direction

Figure 4.6 Predicted 24 hourly average GLC's of PM (µg/m³) (with control) consider all TPPs in 10 km radius (Cumulative stacks)



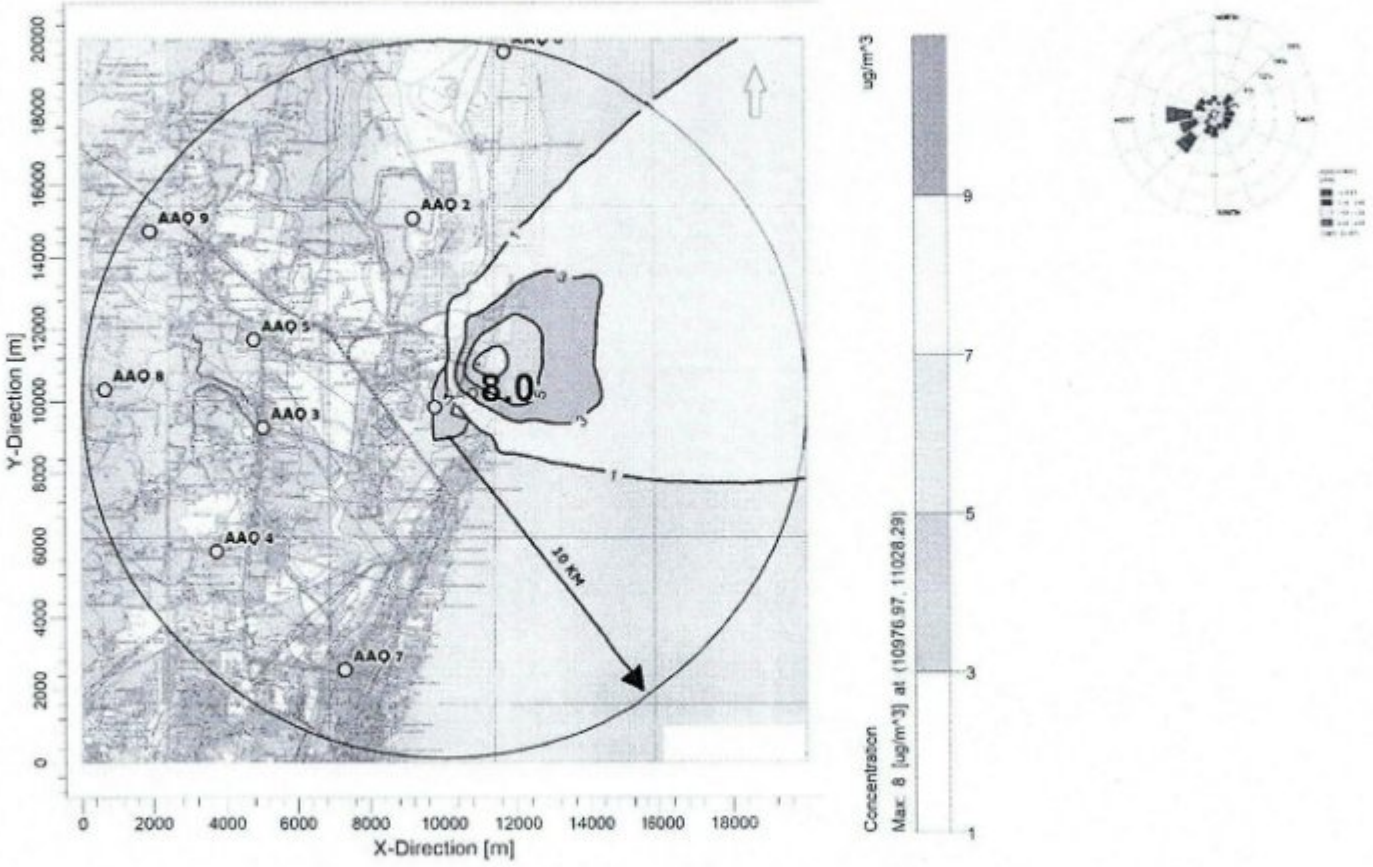
Max concentration PM is 1.6 µg/m³ @ 1.4 km in NE direction

Figure 4.7 Predicted 24 hourly average GLC's of SO_2 (µg/m³)(with control) consider all TPPs in 10 km radius (Cumulative stacks)



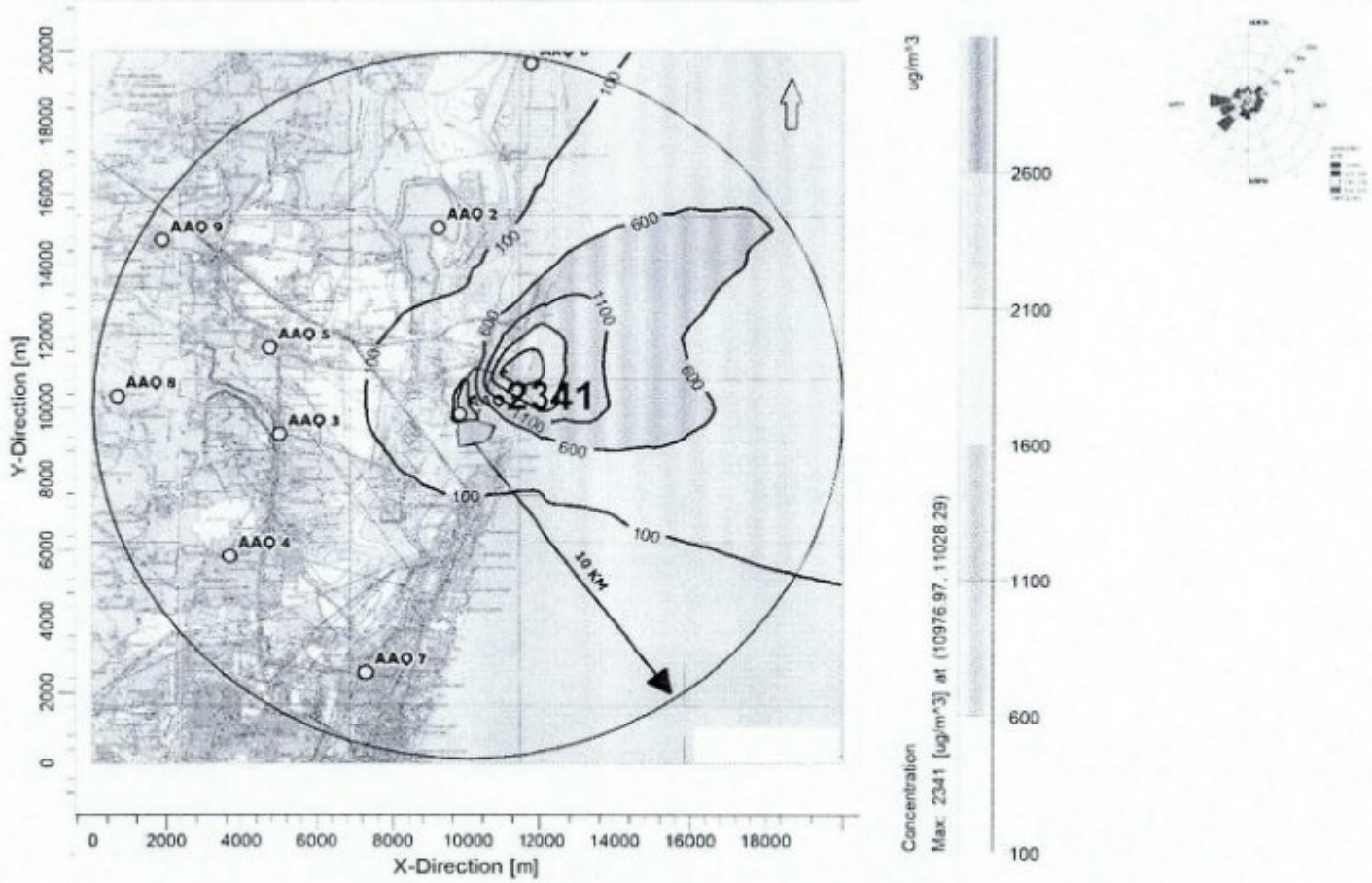
Max concentration SO_2 is 7.1 µg/m³ @ 1.4 km in NE direction

Figure 4.8 Predicted 24-Hourly Average GLCs of NO_x (µg/m³) consider all TPPs in 10 km radius (Cumulative stacks)



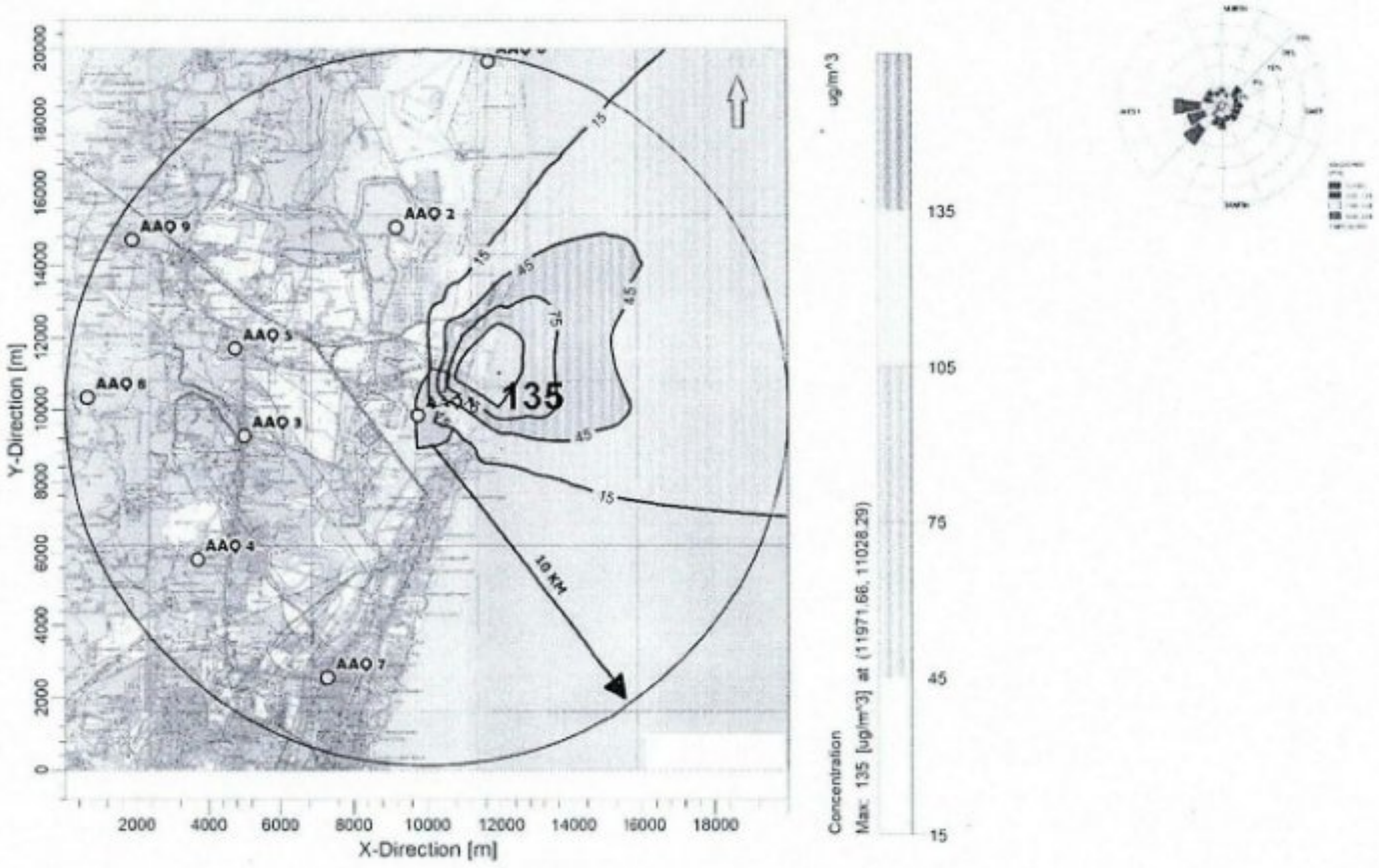
Maximum NOx Concentration 8.0 µg/m³ @ at 1.4 km in NE direction

Figure 4.9 Predicted 24 hourly average GLC's of PM (µg/m³)(without control) consider all TPPs in 10 km radius (Cumulative stacks)



Max concentration PM is 2341 µg/m³ @ 1.4 km in NE direction

Figure 4.10 Predicted 24 hourly average GLC's of SO_2 (µg/m³) (without control) consider all TPPs in 10 km radius (Cumulative stacks)



Maximum SO_2 Concentration 135 µg/m³ @ at 1.4 km in NE direction

Results & discussion

While comparison of the results with proposed change in fuel composition by mixing 50 %: 50 % Indian and imported coal it is observed that future predicted GLC's of the pollutants like SO_2 & NO_x are within the prescribed limits as per the NAAQ standards, whereas PM is near the standard as the baseline value is near NAAQ standards.

However, when compared with the stack standard emissions:

- **Particulate matter (PM):** PM baseline emissions are recorded as 96.49 $\mu g/m^3$ and predicted GLC values are 0.32 $\mu g/m^3$. The total future predicted concentration is 96.81 ug/m^3 which is near the limits as per NAAQ standards. The maximum of 120 $\mu g/m^3$ recorded in Ennore SEZ TPP site since the project is proposed over abandoned ash dyke. The, contribution of PM from TPPs within NCTPS complex is 1.2 $\mu g/m^3$ and the contribution all the TPPs with 10 km radius is 1.6 $\mu g/m^3$. To reduce the PM emissions Electrostatic precipitators (ESP's) with an efficiency of 99.98% has been installed to limit the PM below 30 mg/Nm^3 (meeting the stack standard).

- **Sulphur dioxide (SO_2):** SO_2 baseline emissions are recorded as 25.1 $\mu g/m^3$ and predicted GLC values are 1.08 $\mu g/m^3$. The total future predicted concentration is 26.18 $\mu g/m^3$ which is well within the limits as per NAAQ standards. The contribution of SO_2 from TPPs within NCTPS complex is 5.1 $\mu g/m^3$ and the contribution all the TPPs with 10 km radius is 7.1 $\mu g/m^3$. Dry FGD is has been installed to meet the revised emission norms of MoEF&CC for Sulphur dioxide (SO_2) i.e. 100 mg/Nm^3 will be followed.

- **Oxides of nitrogen (NOx):** NOx baseline emissions are recorded as 42.6 $\mu g/m^3$ and predicted GLC values are 1.08 $\mu g/m^3$. The total future predicted concentration is 43.68 $\mu g/m^3$ which is well within the limits as per NAAQ standards. The contribution of NOx from TPPs within NCTPS complex is 6.4 $\mu g/m^3$ and the contribution all the TPPs with 10 km radius is 8.01 ug/m^3. To reduce the emissions Low NOx burner has been provided. SCR will also be installed in future as per requirement to limit the NOx emission to as per MoEF&CC norms i.e. 100 mg/Nm^3.

4.2.4 Mitigation Measures

The major air pollutants generated from the proposed thermal power plant are given below.

1 Dust particulates in flue gas from chimney
2 Sulphur dioxide (SO_2) in flue gas
3 Nitrogen oxides (NO_x) in flue gas
4 Coal dust particles due to handling of coal
5 Fly ash dust particles from ash silos and ash disposal area

a) Coal handling area

- Dust suppression/extraction facilities will be provided to mitigate the dust generated at coal conveying area, transfer points and coal stockyard.
- Enclosed galleries will be provided to arrest the coal dust generated at all the conveyor points.
- Dust collection system will be provided in coal bunkers to evacuate dust and hazardous gases like methane from the coal bunkers.
- Collected dust would be returned to either the associated belt conveyors or to the coal bunkers. The coal dust from coal transfer points would be restricted to 5mg/Nm^3.

b) Ash handling area

In order to restrict the fly ash dust particles in the ash handling areas, vent filters will be installed on top of intermediate silos & main fly ash silos to restrict the escape of fly ash into the atmosphere during its unloading from ESP hoppers to silos.

The following pollution control measures would be installed for ash disposal:

- 100% dry fly ash extraction, storage and disposal facilities are proposed for utilization of 100% fly ash in dry form. Closed trucks & containers would be used for this purpose.
- To reduce the dust nuisance while loading the ash into the open trucks from fly ash silos, the fly ash would be conditioned with water spray.

It is proposed to cover the ash in the open trucks with tarpaulin to prevent flying of fine ash during transportation.

c) Particulate matter

To control the particulate matter in the flue gas, an electrostatic precipitator with an efficiency of 99.98% is installed. Electrostatic precipitator is proposed to limit the particulate emissions to 30 mg/Nm^3. The emission standards of particulate matter for thermal power plant are presented in **Table 4.8.**

Table 4.8: Thermal power plant emission standards {Environment (Protection) 1986, Amendment Rules, 2015} – Notification dt 07.12.2015

Industry	Parameter	Standards
Thermal Power Plant	**TPPs (units) installed before 31st December, 2003***	
	Particulate matter	100mg/Nm^3
	Sulphur dioxide (SO_2)	600 mg/Nm^3(Units Smaller than 500 MW capacity units) 200 mg/Nm^3 (for units having capacity of 500MW and above)
	Oxides of nitrogen (NOx)	600 mg/Nm^3

Industry	Parameter	Standards
	Mercury (Hg)	0.03 mg/Nm^3 (for units having capacity of 500 MW and above)
	TPPs (units) installed after 1st January,2003, upto 31st December,2016*	
	Particulate matter	50 mg/Nm^3
	Sulphur dioxide (SO_2)	600 mg/Nm^3 (Units Smaller than 500 MW capacity units)
	Oxides of nitrogen (NOx)	300 mg/Nm^3
	Mercury (Hg)	0.03 mg/Nm^3
	TPPs (units) to be installed from 1st January, 2017**	
	Particulate matter	30 mg/Nm^3
	Sulphur dioxide (SO_2)	100 mg/Nm^3
	Oxides of nitrogen(NOx)	100 mg/Nm^3
	Mercury (Hg)	0.03 mg/Nm^3
Source: MoEF&CC notification Dated 7th December, 2015 (Published in the Gazette of India on 8th December, 2015) * TPPs (units) shall meet the limits within two years from date of publication of this notification. ** Includes all the TPPs (units) which have been accorded environmental clearance and are		

d) Sulfur dioxide

For proper dispersion of the flue gases into the atmosphere MoEF&CC has suggested stack heights of 275 m for thermal power plants 500 MW and above generation capacity. The stacks are recommended for thermal power plants of different power generation capacities to control SO_2 through dispersion are given in **Table 4.9**. In proposed project to minimize the SO_2 emissions dry FGD is proposed. The revised emissions norms of MoEF&CC will be followed for Sulphur dioxide (SO_2) & Oxides of nitrogen (NO_x) i.e. 100 mg/Nm^3.

Flue-gas desulfurization (FGD) is a set of technologies used to remove sulfur dioxide (SO_2) from exhaust flue gases of fossil-fuel power plants, and from the emissions of other sulfur oxide emitting processes.

Dry Flue Gas Desulfurization (FGD) systems are innovative technologies designed to reduce emissions of sulfur dioxide (SO_2) and other pollutants from flue gases without the use of liquid sorbents. These systems offer distinct advantages over wet FGD systems and have found widespread application in various industries seeking efficient and environmentally friendly solutions for emission control. The working principle of dry FGD systems involves the use of dry sorbents, such as hydrated lime/ Lime store or sodium-based compounds, to absorb pollutants from the flue gas stream. The sorbents are injected into the gas flow, where they chemically react with the acidic gases, like SO_2, forming solid byproducts. The solid byproducts are then collected through electrostatic precipitators, efficiently removing the pollutants

from the flue gases. One of the significant advantages of dry FGD systems is their lower water usage. Unlike wet FGD systems that require a substantial amount of water for the sorbent reaction, dry FGD systems operate without the need for a liquid sorbent, significantly reducing water consumption. This not only conserves water resources but also eliminates the need for wastewater treatment and disposal, making dry FGD environmentally friendly. Additionally, dry FGD systems offer reduced waste generation. Wet FGD systems produce a wet slurry as a byproduct, which requires proper handling and disposal. In contrast, dry FGD systems generate dry solid byproducts, reducing the amount of waste and simplifying disposal procedures.

e) Oxides of nitrogen

The NOx emissions would be checked for ground level concentrations as per Indian emission standards i.e. 100 mg/Nm^3. In order to reduce the NO_x emissions, Low NOx burner will be provided. FGD also provided which is also capable to control the NOx emission. SCR is also in proposal and will be installed in future as per requirement.

Table 4.9: Thermal power plants with wet flue gas desulphurization (FGD)– stack heights

Generation Capacity	Stack Height (meters)
100MW and above	$H=6.902(QX0.277)^{0.555}$ or 100 m minimum
Less than 100MW	$H=6.902(QX0.277)^{0.555}$ or 30 m whichever is the more
Q=Emission rate of So_2 in Kg/hr*,H=Physical stack height in meter *total of all connected to stack Source: MoEF&CC Notification: GSR 593€ date 28-07-2018	

f) Control measures – coal handling area

The coal dust is generated generally at the conveyor transfer points, coal unloading area and coal stockpile area. To mitigate the dust generation, coal transfer points and coal stockyard would be provided with dust suppression/ dust extraction facilities. In order to arrest the coal dust generation, all conveyors would be provided with enclosed galleries. The bottom portion of all the conveyor galleries would be provided with seal plates within the power plant area and at road crossings.

Dust collection system is also provided in coal bunkers to evacuate dust and hazardous gases like methane from the coal bunkers. Collected dust would be returned to either the associated belt conveyor or to the coal bunker. The dust collector outlet emission would be restricted to 5mg/Nm^3.

g) Control measures – ash handling area

To control fly ash generation at ash handling areas, fly ash evacuation from the ESP collecting hoppers would be done in closed pipelines by pneumatic means. At the time of unloading fly ash to the silos, some ash laden air would get vented out. In order to restrict the fly ash dust

particles to the limits of 100 mg/Nm^3, a vent filter would be installed on top of each of the fly ash silos at the vents. The following pollution control measures would be installed for ash disposal.

100% utilization of fly ash in dry form is envisaged. Closed trucks & containers would be used for this purpose, as far as possible to reduce the dust nuisance while loading the ash into the open trucks from fly ash silos, the fly ash would be conditioned with water spray. It is proposed to cover the ash in the open trucks with tarpaulin to prevent flying of fine ash during transportation.

Ash Utilization plan

Fly ash and bottom ash would be collected and stored in the silos and given to end users for manufacturing cement and bricks. TANGEDCO would put maximum efforts and ensure bottom ash utilization. 100% ash utilization will be achieved as per MoEF&CC new notification dated 03-11-2009. There will be increase in the quantity of bottom as well as fly ash generation due to change in the use type and quantity of Coal which will be managed through pre planed measures.

4.3 Solid & Hazardous Waste management

Fly ash and bottom ash will be the main solid waste being generated from the TPP. The ash handling system envisages dry extraction and disposal of bottom ash and fly ash. Provision shall be kept to extract entire bottom ash in wet form for disposal in ash dyke as an emergency measure. Quantity of fly as well as bottom ash is given in following **Table 4.4.**

Table 4.4: Ash quantity

S. no.	Type of coal	Coal quantity (TPH)	% of Ash content	Total Ash Quantity (TPH)	Total Fly Ash Quantity (TPH)	Total Fly Ash Quantity (TPH)	Remark
1	Imported Coal	280	12	33.6	23.5	10.08	Ash content is increased due to change in fuel mix
2	Mixed Coal (Imported 50%, Indian 50%)	361	25.5	92.06	64.44	27.62	

4.3.1 Fly ash Handling System

Pneumatic conveying system either vacuum or pressure system shall be employed for extraction of fly ash from the ESP hoppers in dry form. This dry ash is usually sent to buffer hoppers or to the wetting head/ collector tank units. The dry ash buffer hoppers and wetting head collector tank units shall be located adjacent to ESPs. Dry ash from buffer hoppers shall be transported to maintain storage silos to be located near the plant boundary. Silo area shall be provided with fencing, office block, gate complex and passage for entry/ exit of vehicles. There shall be three numbers of ash silos. The storage capacity of each silo shall be provided

for 24 hrs production of fly ash based on the performance coal analysis of unit. The user industries shall take the dry fly ash from these silos either in closed tankers or in open tankers. For wet disposal of dry ash extracted from various ESP hoppers, the same shall be diverted to wetting head/collector tank units (by passing buffer hoppers meant for handling ash in dry form). To meet the MoEF&CC guidelines of 100% fly ash utilization all necessary efforts will be made to utilize the fly ash generated. Necessary industries will be identified in and around the proposed project area for utilization of the fly ash.

4.3.2 Bottom Ash Handling System

Dry type bottom ash hoppers shall be used in case of the submerged scraper chain conveyor system. In case of emergency conditions bottom ash extraction system involving submerged scrapper chain conveyors, the bottom ash is led to an adjacent bottom ash slurry transportation pump house, from where it is transported to the existing ash dyke of NCTPS.

5.1 ENVIRONMENTAL MANAGEMENT PLAN

The industrial development needs to be intertwined with utilization of natural resources within the limits of permissible assimilative capacity. The Environmental Management Plan (EMP) is required to ensure sustainable development in the area of the proposed Power Plant site. Hence, it needs proper EMP to meet these objectives.

The management action plan aims at controlling pollution at the source level to maximum possible extent with the available and affordable technology followed by treatment measures before they are discharged. It encompasses the mitigation measures that are proposed in order to synchronize the economic development of the study area with the environmental protection of the region.

The following mitigation measures and management plan are proposed based on the change in use of coal from 100% Imported coal to use of Indian coal and Imported coal in equal proportion. The previous section already discussed about the components will be impacted due to change in use of coal I.e. impact on the Air quality and Ground Level Concentration (GLC) as well as increase in the generation of Ash content.

Revised EMP has been prepared as a supplementary management plan in addition to other management plan proposed in the previous EIA/EMP prepared for securing Environmental Clearance for proposed 1X800 MW (Stage III) at NCTPS Complex Villages Ennore & Puzhudivakkam by TANGEDCO.

5.2 ENVIRONMENTAL MANAGEMENT DURING CONSTRUCTION

The impact during construction phase has been already addressed in the EIA report for the project during EC considering each relevant environmental component. As part of additional impact assessment and revised EMP; Air Quality Impacts Mitigation and Management Plan and Solid & Hazardous Waste management plan have been addressed considering the proposed change in the configuration of coal use.

5.2.1 Air Quality Mitigation Measures

To accommodate the increased quantity of coal, an area of 8.09 Ha area has been identified which is readily available within the total plan premises.

Most of the construction dust will be generated from the movement of construction vehicles on unpaved roads. Unloading and removal of soil material shall also act as a potential source for dust nuisance. The control measures proposed to be taken up are given below.

Regular water sprinkling on main haul roads in the project area will be carried out at least twice a day, if need arises frequency will be increased on windy days. In this way around 50% reduction on the dust contribution from the exposed surface will be achieved.

1. The duration of stockpiling will be as short as possible as most of the material will be used as backfill material for the open cut trenches for road development.
2. Temporary tin sheets of sufficient height (3 m) will be erected around the site of dust generation or all around the project site as barrier for dust.
3. Tree plantations around the project boundary will be initiated at the early stages by plantation of 2 to 3 years old saplings using drip irrigation so that the area will be moist for most part of the day.
4. All the vehicles carrying raw materials will be covered with tarpaulin/ plastic sheet, unloading and loading activity will be stopped during windy period.
5. To reduce the dust movement from civil construction site to the neighbourhood the external part of the building will be covered by plastic sheets.

Given the implementation of proper control measures for dust suppression, no adverse impacts are expected and compliance with the Ambient Air Quality is achieved at ASR's (Air pollution Sensitive Receivers) at all time.

5.2.2 Solid Waste Mitigation Measures

Construction and demolition waste does not create chemical or biochemical pollution. Hence maximum effort would be made to reuse and recycle them. The most of the solid waste material can be used for filing/ levelling of low-lying areas. All attempts will be made to stick to the following measures.

1. All the construction waste shall be stored within the site itself. A proper screen will be provided so that the waste does not get scattered.
2. Attempts will be made to keep the waste segregated into different heaps as far as possible so that their further gradation and reuse is facilitated.
3. Materials, which can be reused for purpose of construction, levelling, making roads/ pavement will also be kept in separate heaps from those which are to be sold or land filled.
4. The local body or a private company will be arranged to provide appropriate number of skip containers/ trolleys on hire.

The use of the construction material basically depends on their separation and conditions of the separated material. A majority of these materials are durable and therefore, have a high potential for reuse. It would, however, be desirable to have quality standards for the recycled materials. Construction waste can be used in the following manner.

1. Reuse of bricks, tiles, stone slabs, timber, piping railings etc. to the extent possible and depending upon their conditions.
2. Sale/ auction of materials which cannot be used at the site due to design constraint.
3. Plastics, broken glass, scrap metal etc. can be sent for recycling in the industries.
4. Rubble/ brick bats can be used for building activity, such as levelling, under coat of

lanes where the traffic does not constitute heavy moving loads.

5. Larger unusable pieces can be sent for filing up low laying areas.
6. Fine material such as sand, dust, etc. can be used as cover material.
7. The unearthed soil can be used for levelling as well as for lawn development.
8. The broken pieces of the flooring material can be used for levelling in the building or can be given to authorized waste management agency.
9. The unused or remaining paints/ varnishes/ wood can either be reused or can be authorized waste management agency to authorized waste management agency.

5.3 ENVIRONMENTAL MANAGEMENT DURING OPERATION

All the environmental components have been addressed in the existing EIA/EMP prepared for the project to secured the Environmental Clearance comprising Air Pollution Management, Water & Waste Water management, Noise pollution management, Solid & Hazardous waste management including Ash management system, Greenbelt Development Plan, Drainage management plan and Rain water harvesting plan, Risk assessment and Disaster Management Plan as well as community development plan (Corporate Environmental Responsibility).

As the present proposal is only for seeking amendment in EC for changing in the use of Coal from 100% Imported coal to use of Indian as well as Imported coal in the equal proportion (50%:50%). The change is coal use may impact on the two main components during operation phase of the project i.e. change in the Air quality and Ground Level Concentration (GLC) as well as increase in the Ash generation. Both the issues are addressed in the following section.

5.3.1 Air Quality Management

a) Reduction of emissions at source

The following elements which are generated from the Thermal Power Plant which cause air pollution are as follows:

- Dust particulates in flue gas from Chimney
- Nitrogen oxide in flue gas
- Sulphur-di-oxide in the flue gas
- Coal dust particles due to handling of coal
- Fly ash dust particles from ash silos and ash disposal area

The increased GLC due to change in the coal configuration will be within the emission norms as well as NAAQS. Whereas following methods of abatement will be employed for the air pollution control.

- To control & limit Particulate matter to 30 mg/Nm^3 in the flue gas, highly efficient (99.98%) ESPs are proposed.
- Dry FGD is proposed to limit the SO_2 emissions to less than 100 mg/Nm^3
- Chimney of 275 m height will be provided for proper dispersion of sulphur dioxide and oxides of nitrogen.

- To reduce NOx emission to less than 100 mg/Nm^3, Low NOx burner will be provided. The NOx emissions would be checked for Ground Level Concentrations (GLC's) as per Indian Emission Regulations.
- Coal dust would be generated generally at the conveyor transfer points, coal unloading area and coal stock pile area. Hence, coal transfer points and coal stock yard would be provided with dust suppression/dust extraction facilities. Further, in order to arrest the coal dust generation, all conveyors would be provided with enclosed galleries. The bottom portion of all the conveyor galleries would be provided with seal plates within the power plant area and at road crossings.
- Dust collection system would also be provided in coal bunkers to evacuate dust and hazardous gases like Methane from the coal bunkers. Collected dust would be returned to either the associated belt conveyor or to the coal bunker. The dust collector outlet emission would be restricted to 150 mg/Nm^3.
- Regular water sprinkling will be carried in coal storage yard to suppress the coal dust.
- Internal roads will be concreted/ asphalted to reduce fugitive emissions.
- 100% fly ash utilization will be carried as MoEF&CC guidelines.
- 100% dry fly ash will be collected in dry form in silos and will be given to the industrial use like in Cement industries.
- Regular Air Quality monitoring will be done as per Monitoring plan.
- 33% of total plant area will be developed under Greenbelt.

b) Pollution Monitoring and Surveillance Systems

The emission and gas monitoring systems proposed for this project consist of the following:

i) Flue Gas O_2 and CO Monitoring

These would be measured at the economizer outlet. In addition, O_2 would be monitored at the air pre heater outlet. For this purpose, CO and O_2 monitor probes and analyzers would be installed separately.

ii) Stack Emissions

Flue gas exiting into the atmosphere would be monitored for CO_2, NOx, SO_2 and Opacity. Stack emission readings would be sent to the DCS for monitoring. For this purpose, probes, associated gas analyzers and support equipment, sample lines and Opacity sensor/ transmitters would be installed. The opacity sensors would be equipped with a blower to protect the optics from coating by flue gas particles.

The system operation would be continuous. Stack gas analysis for SO_2, CO_2, and NOx would be performed by extracting a gas sample from the following stream in the stack, filtering to remove particulate droplets, diluting with scrubbed instrument air and conveying the sample to the analyzers. One sampling system per unit would be provided.

The Laboratory attached to the Power Plant will be equipped with the necessary instruments for carrying out air quality monitoring. It is also proposed to monitor the particulate emission

at the stack to keep a continuous check on the performance of the ESP. Adequate sampling openings will be provided in the stack.

Air Monitoring Stations (AMS) would be set up to monitor the air quality in the neighboring villages. The parameters to be monitored are suspended Particulate Matter (SPM), Respirable Particulate Matter (PM_{10} & $PM_{2.5}$), Sulphur dioxide (SO_2), Nitrogen Oxide (NOx), Carbon Monoxide (CO) and Hydro Carbons (HC). The air quality monitoring would be carried out continuously.

iii) Meteorological Observations

The dry bulb temperature, wet bulb temperature, wind speed, wind direction, cloud cover, rainfall and solar radiation will be recorded daily.

5.3.2 Solid Waste Management

Fly Ash Dust Particles from Ash Silos and Ash Disposal Area

Fly ash evacuated from the ESP collecting hoppers would be transported in closed pipelines by pneumatic means. At the time of unloading fly ash to the silos, some ash laden air would get vented out. In order to restrict the fly ash dust particles to the limits of 100 mg/Nm^3, a vent filter would be installed on top of each of the fly ash silos at the vents. The following pollution control measures would be installed for ash disposal:

- 100% utilization of fly ash in dry form is envisaged. Closed trucks & containers would be used for this purpose, as far as possible.
- To reduce the dust nuisance while loading the ash into the open trucks from fly ash silos, the fly ash would be conditioned with water spray.
- It is proposed to cover the ash in the open trucks with tarpaulin to prevent flying of fine ash during transportation.

Fly ash and bottom ash would be collected and stored in the silos and given to end users for manufacturing cement and bricks. TANGEDCO would put maximum efforts and ensure bottom ash utilization. 100% ash utilization will be achieved as per MoEF&CC notification dated 03-11-2009. Comparison table for utilization of 100% Ash in both the combination of use of Coal is given below in **Table 5.1 & 5.2.** Ash pond area calculation is given in **Table 5.3.**

Table 5.1: Year Wise Ash Generation and Utilization (as per 100% Imported coal)

S. no	Year	Generation TPA	Utilization TPA	Ash Pond (Max) TPA	%
1	1st Year	250186	125092.8	125093	50%
2	2nd year	250186	175129.9	75056	70%
3	3rd Year	250186	225167	25019	90%
4	4th Year	250186	250185.6	0	100%
Total		**1000742**	**775575.4**	**225167**	

Table 5.2: Year Wise Ash Generation and Utilization (as per 50%:50% Coal proportion)

S. No	Year	Generation TPA	Utilization TPA	Ash Pond (Max) TPA	%
1	1st Year	685422	342711	342711	50%
2	2nd year	685422	479795.4	205626.6	70%
3	3rd Year	685422	616879.8	68542.2	90%
4	4th Year	685422	685422	0	100%
Total		**2741688**	**2124808.2**	**616879.8**	-
Considering 310 days/year operation					

Table 5.3: Ash Pond Area Calculation

Particular	Unit	100% Imported Coal	Indian Coal 50%: Imported Coal 50%	Remark
Days in a Year	Days	8	8	Assuming 1.1 Ton ash requires 1 m^3 of land, ash dump height assumed to be 5 m.
Life time of the Plant	Years	25	25	
Total days Assumed	Days	200	200	
Ash Generated During Emergency Period	Tons	161280	441864	
Total Ash to Pond	Tons	386447	1058739	
Area Required	Ha	7	19.25	
Area Required	Acres	17	48	

It is proposed to supply the entire ash to the cement industries that are presently lifting fly ash from NCTPS, since there is huge demand in Tami Nadu for fly ash from thermal stations.

Commercial Utilization of Ash

It is proposed to supply the entire ash to the cement industries that are presently lifting fly ash from NCTPS, since there is huge demand in Tami Nadu for fly ash from thermal stations. Problems of disposal of ash, both bottom ash and fly ash from the solid fossil fuel fired boilers are attracting attention of environmentalists as well as technologists all over the globe. Bottom ash which has a relatively large size, finds a ready use in construction of roads, embankments in rural areas, land filling etc. Considerable research and development work under taken during the past decades throughout the world, resulted in opening various avenues of commercial utilization of fly ash.

Fly ash is an amorphous ferro-alumina silicate compound of spherical crystalline shape with particle sizes ranging between 2 to 50 microns. Fly ash has good pozzolonic property, good flow ability and low permeability, which facilitate myriad utilization of fly ash. Ash generated from the station would have sizable quantum of inert oxides and carbonates of silica, alumina, magnesium, etc. Some of the commercially viable uses of such fly ash are as follows:

a) Fill material in cement

b) Mine fill
c) Building blocks
d) Light Weight aggregates
e) Partial cement replacement
f) Road sub base
g) Grouting material
h) Filler in asphalt mix for roads
i) Partial replacement of lime aggregate in concrete work
j) Road embankment
k) Land filling material
l) Recovery of minerals namely Aluminum and Iron

Review of the various application areas of fly ash reveals that some usage of ash generated in the proposed station can be explored as mentioned below:

a) As fill materials in cement plant.
b) For construction of village roads.
c) As land fill in lower lying areas and for dyke/ bund construction.

100% dry ash system is envisaged and fly ash will be disposed-off to the nearby cement plants and it is proposed to utilize the existing ash dyke of NCTPS for bottom ash disposal in case of emergency only.

Necessary ash management plan would be adopted in an environment friendly manner to contain the fugitive ash emission in the nearby areas to minimum. An extensive green belt development plan around the ash dump area would be undertaken to contain ash dust induced pollution to the neighboring areas.

5.3.3 Risk management Plan

- Adequate number of fire detectors and toxic gas detectors will be put in place for early warning at all potential locations where accidents can occur, with the provision for alarms.
- A coal dust explosion may occur if the coal dust is present in the concentration between Upper Explosive Limit & Lower Explosive Limits i.e., 30-2000 gm/m^3 of air and also a source of ignition like sparks caused by friction or static electricity. However, measures are adopted to prevent the chances of explosion in the design state itself. To prevent the accumulation of the same, dust suppression and dust extraction systems are proposing at strategic locations.
- For protection against fire, all yard equipment and plant equipment will be protected by a combination of hydrant system; automatic sprinkler spray system (emulsifier system); fixed foam system for oil handling areas; automatic high velocity and medium velocity sprinkler spray system; auto-modular inert gas based system for control rooms apart from

portable and mobile fire extinguishers located at strategic areas of plant buildings and adequate Passive Fire Protection measures.

- All coal conveyors would be provided with the sprinkler system against fire hazard. Quartz old bulb and Fusible plug heat detectors would be provided at the tips of each pipe covered.
- The systems will be designed as per the recommendations of NFPA or approved equals in accordance with the Tariff Advisory Committee of the Insurance Association of India stipulations.
- For scenarios involving toxic gas release adequate numbers of face masks and isolation chambers with oxygen supply will be proved at strategic locations within the plant premises.
- Along with the above stated measures Emergency Management plan will be out in place along with the provision for carrying out regular safety exercises and work permit system.
- portable and mobile fire extinguishers would be installed at all locations of the plant including Main Plant, control rooms, Switch Gear rooms, Laboratories, Off site Administration building etc.

5.4 Cost of EMP

In order to comply with the environmental protection measures as suggested in the above sections, Management has set aside budgetary provision for Environmental Protection and Safety measures. Cost towards Environmental Mitigation Measures is given in **Table 5.4.**

Table 5.4: Cost towards Environmental Mitigation Measures

S. No	Particulars	100% Imported Coal		Indian Coal 50%: Imported Coal 50%		Remark
		Capital Cost (Rs. in Crores)	Recurring Cost (Rs. in Crores)	Capital Cost (Rs. in Crores)	Recurring Cost (Rs. in Crores)	
1	Dust Control System i) ESP ii) Dust suppression system for coal handling	192.00 3.50	48.0	192 3.50	98	No change
2	Chimney	88.90		88.90		
	FGD, De NOx burners etc.	0		615		Increased
3	Water treatment plant including clarifier, UF, RO, DM, Electrical and Instrumentation	42.24		42.24		
4	Effluent Treatment Plant	3.50		3.50		No change
5	Dense phase, pneumatic Ash Handling Plant including bottom ash & fly ash silos, conveying compressors and other	106.56		106.56		

S. No	Particulars	100% Imported Coal		Indian Coal 50%: Imported Coal 50%		Remark
		Capital Cost (Rs. in Crores)	Recurring Cost (Rs. in Crores)	Capital Cost (Rs. in Crores)	Recurring Cost (Rs. in Crores)	
	equipment					
6	Development of Greenbelt	3.84		3.84		
7	Sewage System	1.44		1.44		
8	Chemical dosing and Chlorination Plant	9.70		9.70		
9	Pollution monitoring instruments/ equipment	14.16		14.16		
10	Other unforeseen items	14.16		14.16		
	Total	**480.0**	**48.0**	**1185.21**	**98**	**Cost increased**

6.0 CONCLUSION

NCTPP 1X800 MW (Stage III) unit has obtained EC from MoEF&CC with a condition of use of Imported coal requirement of 2.09 MTPA sourced through MMTC, New Delhi. Presently, TANGEDCO is planning to change from use of 100% Imported coal to use a mix of Domestic coal as well as Imported coal in ratio of 50% - 50% proportion. For which TANGEDCO is applying for amendment in Environmental Clearance (EC) as per MoEF&CC OM dated 6th December, 2023 and previous OM dated 11th November, 2020.

Due do change in the configuration of coal; there will be change in the Ambient Air quality and Ground Level Concertation as well as increase in the Ash quantity as compared to the Imported coal. An area of 8.09 Ha is already available within the premises for stacking of Indian as well as Imported coal.

The ESPs has been proposed for management of Air Pollution. Ash generated from the plant will be sent to the cement manufacturing industries. No additional ash pond will be developed in the proposal. Environmental monitoring will be implemented. Total Rs 480.0 Cr was earlier secured as Environmental Management Plan Cost which will revised to RS. 1,185.21 Cr after changing the type of coal. The main increase is due to proposed FGD for control of SO_2 and NOx emissions to meet the new MoEF&CC standards.

The cost of raw material will considerably reduce shifting the use of 100% imported coal to Indian and Imported coal in 50%:50% proportion. There will not be any addition of land other than the existing land of the project. 33% of the total plant area will be developed under thick greenbelt which will control the Air pollution and also help to reduce the overall temperature of the plant premises and noise level.

ANNEXURE-1

Environmental Clearance

J-13012/14/2012-IA.II (T)

Government of India

Ministry of Environment, Forest and Climate Change

Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, New Delhi-110003.

Dated: 20.01.2016

To

M/s Tamil Nadu Generation & Distribution Corporation Ltd.
(A successor entity of TNEB),
5th Floor Western Wing, NPKRR Maaligai,
144, Anna Salai, Chennai-2,
Telefax: - 044-28520878; E.mail:- cepn@tnebnet.org

Sub: Environmental Clearance for Expansion by addition of 1x800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities at Villages Ennore & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu by M/s Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO).

Sir,

This has reference to your online application dated 26.05.2015 and additional information/documents submitted vide letter dated 18.11.2015 & 20.11.2015 w.r.t the aforesaid project. This Ministry has examined the proposal. It is inter-alia, noted that the ToR for preparation of EIA/EMP report was accorded by the Ministry on 28.05.2012 and the validity of TOR was extended upto 27.05.2015 on 08.09.2014. Public Hearing was conducted on 05.03.2015. The State level CZMA in its meeting dated 19.05.2015 has recommended the CRZ clearance for foreshore facilities.

2. The land requirement for the proposed expansion is 76.9 Ha (190 acres), which is located inside the NCTPS complex. Entire land is under possession of TANGEDCO. There are no R&R issues. No further expansion is envisaged. There are no National Parks, Sanctuaries, Elephant/Tiger Reserves, Migratory Routes/Wildlife Corridors within 10 km of the project site. The site is 500 m away from High Tide Line (HTL) of Sea and 100 m away from the HFL of canal. The project site is a graded area with necessary drains developed during execution of NCTPS Stage I project (3x210 MW). The capital and recurring cost towards EMP is Rs. 480 Crores and 48 Crores respectively.

3. The imported coal requirement of 2.09 MTPA will be sourced through MMTC, New Delhi. FSA/MoU for Imported Coal MoU has been signed between MMTC limited, a GOI Enterprise and TANGEDCO on 25.05.2015 for supply of 2.51 MTPA of Coal for proposed NCTPS Stage III (1x800 MW) plant. The maximum sulphur and ash contents of the imported coal shall be 0.8% and 8% respectively. Ennore Port is establishing Coal Berth 3 (CB 3) exclusively for the use of TANGEDCO in addition to existing Coal Berth 1 & 2. It is proposed to transport coal from CB 3 to the NCTPS Stage III plant site through closed belt conveyors since the coal conveyor route is well within Port and Power plant area alone. Kamarajar Port Limited (erstwhile Ennore Port Limited) vide letter dated 28.07.2015 has consented for handling of imported coal for the proposed expansion TPP. Radio activity and heavy metal contents of coal to be sourced have been tested and the parameters are well within limits.

4. The potable water of about 9 MLD required for the plant will be met by treating sea water in R.O. based desalination plant. The sea water (1,65,600 KLD)

will be sourced Ennore port basin via existing intake channel of NCTPS Stage II. COC of 1.3 has been proposed to optimize water usage. The domestic wastewater from plant and service wastewater will be collected and treated and reused for greenbelt, dust suppression, etc. and zero discharge will be maintained. As sea water is proposed for cooling purpose, the same will be discharged into sea through the existing pre cooling channel of NCTPS.

5. The following facilities will be in CRZ area:

i. Coal conveyor having length of 3.5 km and elevation of 6 m for coal transportation form Ennore Port to NCTPS Stage-III TPP.
ii. Supporting trestles (Steel frames) for coal conveyor at about 6 m/8 m from ground level.
iii. Sea water intake from forebay of NCTPS stage-II intake & outlet pipe to pre cooling channel of NCTPS for discharge with intake pipe length of 3 km and outlet pipe length of 1.5 km.
iv. GRP (Glass Reinforced Plastic) pipes on the ground level for cooling water inlet and coolant water outlet.

6. Fly ash and bottom ash would be collected and stored in the silos and supplied to cement/brick industries for manufacturing cement and bricks. 100% Dry Fly ash Collection will be done by providing Pressurized Dry Fly ash Collection System. The fly ash from the existing Units is being sold by e-auction and the same is proposed for the instant Unit. An MOU is executed with M/s Dalmia Cements (Bharat) Ltd, Dalmiapuram, Tamilnadu for off take of fly ash from the proposed NCTPS Stage III (1x800MW). Ash pond water will be collected, treated and reused for slurry making.

7. Based on the information, clarification, documents submitted and presentations made by you and your consultant, viz. Ramky Enviro Engineers Ltd., Hyderabad, before the *Expert Appraisal Committee (EAC - Thermal Power) in its 38th & 46th Meetings held during 25th-26th June, 2015 & 26th-27th November, 2015, respectively and EAC (CRZ) in its 150th Meeting held during 29th-31st July, 2015,* the Ministry hereby accords environmental clearance to the above power plant under the provisions of EIA Notification dated September 14, 2006 & subsequent amendments therein and CRZ clearance for foreshore facilities under the provisions of CRZ Notification, 2011 & subsequent amendments therein subject to compliance of the following Specific and General conditions:

A. Specific Conditions:

(i) *Explore the feasibility of multiple distributing point for the discharge of cooling water into pre-cooling channel and also the widening of the pre-cooling channel.*

(ii) *PP shall endeavor to enter into MoUs with NHAI, Associations of Cement Industries and Municipal Authorities for ensuring full ash utilization.*

(iii) *As committed, FGD shall be installed to ensure emission below threshold limits.*

(iv) *Coal conveyance shall take place in closed conveyor and that there shall be no open stacking of the coal in the CRZ area.*

(v) *The intake water pipeline shall be laid as per provisions of CRZ Notification, 2011.*

(vi) *Disposal of hot water shall meet Tamil Nadu Pollution Control Board (TNSPCB) norms.*

(vii) *Water temperature shall be monitored at outlets of each of the unit (3 phases) and also at pre-cooling channel joining Ennore creek.*

(viii) *All the recommendations and conditions specified by Tamil Nadu Coastal Zone Management Authority (TNCZMA) vide letter No.10173/EC.3/2015-1 dated 16.06.2015, shall be complied with.*

(ix) *Explore to develop Green belt along the conveyor.*

(x) *Periodical monitoring of the sea water at the discharge point shall be done and report be submitted along with the six monthly monitoring reports.*

(xi) *Construction activity shall be carried out strictly as per the provisions of CRZ Notification, 2011. No construction work other than those permitted in Coastal Regulation Zone Notification shall be carried out in Coastal Regulation Zone area.*

(xii) Vision document specifying prospective plan for the site shall be formulated and submitted to the Regional Office of the Ministry within **six months**.

(xiii) Harnessing solar power within the premises of the plant particularly at available roof tops shall be carried out and status of implementation including actual generation of solar power shall be submitted along with half yearly monitoring report.

(xiv) *The sulphur and ash content of coal shall not exceed 0.8 % and 8 % respectively. In case of variation of quality at any point of time, fresh reference shall be made to the Ministry for suitable amendments to the environmental clearance.*

(xv) A long term study of radio activity and heavy metals contents on coal to be used shall be carried out through a reputed institute and results thereof analyzed every two year and reported along with monitoring reports. Thereafter mechanism for an in-built continuous monitoring for radio activity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.

(xvi) High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 30 mg/Nm^3. Adequate dust extraction system such as cyclones/bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided along with an environment friendly sludge disposal system.

(xvii) Adequate dust extraction system such as cyclones/ bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.

(xviii) The SO_2, NOx and Hg emissions shall not exceed 100 mg/Nm^3, 100 mg/Nm^3 and 0.03 mg/Nm^3 respectively.

(xix) The specific water consumption shall not exceed 2.5 m^3/MWh and zero waste water discharge shall be achieved.

(xx) COC of atleast 1.3 shall be adopted.

(xxi) Monitoring of surface water quantity and quality shall also be regularly conducted and records maintained. The monitored data shall be submitted to the Ministry regularly. Further, monitoring points shall be located between the plant and drainage in the direction of flow of ground water and records maintained. Monitoring for heavy metals in ground water shall also be undertaken and results/findings submitted along with half yearly monitoring report.

(xxii) A well designed rain water harvesting system shall be put in place within six months, which shall comprise of rain water collection from the built up and open area in the plant premises and detailed record kept of the quantity of water harvested every year and its use.

(xxiii) No water bodies including natural drainage system in the area shall be disturbed due to activities associated with the setting up / operation of the power plant.

(xxiv) Wastewater generated from the plant shall be treated before discharge to comply limits prescribed by the SPCB/CPCB.

(xxv) Explore the commercial utilization of brine instead of discharging into sea.

(xxvi) Disposal of solid/liquid from Desalination plant shall comply with the prescribed standards and if need be, environmental safeguard measures by providing balancing/neutralizing tank may be set up and operated regularly & efficiently.

(xxvii) Sea water quality shall be continuously monitored for salinity, turbidity and temperature at selective sites across the impacted zone including estuarine waters. Mitigative measures shall be undertaken through institutes such as Annamalai University for continuous preservation of mangroves and their ecology. The monitoring data shall be uploaded on the company's website and also submit to Regional Office of the Ministry every six months.

(xxviii) To minimize entrapment of even small marine flora and fauna, state of the art low aperture intake screens with high effectiveness for impingement and entrainment and fishnet around intake shall be installed.

(xxix) Fish catch along the impacted zone of sea should be monitored periodically by the Department of Fisheries, Government of Gujarat. The project proponent shall accordingly take up the matter with the Fishery Dept., Govt. of Gujarat from time to time.

(xxx) The project proponent shall upload environmental quality monitored data on a regular basis on its website.

(xxxi) Marginalized section of society particularly traditional fishermen communities shall be identified based on 2011 population census data and socio-economic study of the various strata of families such as those carrying out subsistence fishing, commercial fishing etc. shall be carried out and impact on their livelihoods shall be assessed separately. Accordingly, sustainable welfare scheme/measures shall be undertaken and status of implementation shall be submitted to the Regional Office of the Ministry within six months.

(xxxii) A state-of-the-art environmental laboratory at the project site shall be established such that the laboratory has facilities for long term monitoring of sea water quality and sediment in the impacted zone over and above and ambient air, soil quality analysis of the area. The proponent shall undertake mitigative measures if there are any negative impacts.

(xxxiii) Additional soil for leveling of the proposed site shall be generated within the sites (to the extent possible) so that natural drainage system of the area is protected and improved.

(xxxiv) Fugitive emission of fly ash (dry or wet) shall be controlled such that no agricultural or non-agricultural land is affected. Damage to any land shall be mitigated and suitable compensation provided in consultation with the local Panchayat.

(xxxv) Fly ash shall not be used for agricultural purpose. No mine void filling will be undertaken as an option for ash utilization without adequate lining of mine with suitable media such that no leachate shall take place at any point of time. In case, the option of mine void filling is to be adopted, prior detailed study of soil characteristics of the mine area shall be undertaken from an institute of repute and adequate clay lining shall be ascertained by the State Pollution Control Board and implementation done in close co-ordination with the State Pollution Control Board.

(xxxvi) Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Mercury and other heavy metals (As, Hg, Cr, Pb etc.) shall be monitored in the bottom ash. No ash shall be disposed off in low lying area.

(xxxvii) Green Belt consisting of three tiers of plantations of native species all around plant and at least 50 m width shall be raised. Wherever 50 m width is not feasible a 20 m width shall be raised and adequate justification shall be submitted to the Ministry. Tree density shall not be less than 2500 per ha with survival rate not less than 80 %.

(xxxviii) Green belt shall also be developed around the Ash Pond over and above the Green Belt around the plant boundary.

(xxxix) An Environmental Cell comprising of at least one expert in environmental science/ engineering, ecology, occupational health and social science, shall be created preferably at the project site itself and shall be headed by an officer of appropriate superiority and qualification. It shall be ensured that the Head of the Cell shall directly report to the Head of the Plant who would be accountable for implementation of environmental regulations and social impact improvement/mitigation measures.

(xl) The project proponent shall formulate a well laid Corporate Environment Policy and identify and designate responsible officers at all levels of its hierarchy for ensuring adherence to the policy and compliance with the conditions stipulated in this clearance letter and other applicable environmental laws and regulations.

(xli) CSR schemes identified based on need based assessment shall be implemented in consultation with the village Panchayat and the District Administration starting from the development of project itself. As part of CSR prior identification of local employable youth and eventual employment in the project after imparting relevant training shall be also undertaken.

Company shall provide separate budget for community development activities and income generating programmes.

(xlii) For proper and periodic monitoring of CSR activities, a CSR committee or a Social Audit committee or a suitable credible external agency shall be appointed. CSR activities shall also be evaluated by an independent external agency. This evaluation shall be both concurrent and final.

B) General Conditions:

(i) The treated effluents conforming to the prescribed standards only shall be re-circulated and reused within the plant. Arrangements shall be made that effluents and storm water do not get mixed.

(ii) A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising greenbelt/plantation.

(iii) Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fires in coal yard, especially during summer season. Copy of these measures with full details along with location plant layout shall be submitted to the Ministry as well as to the Regional Office of the Ministry.

(iv) Storage facilities for auxiliary liquid fuel such as LDO/ HFO/LSHS shall be made in the plant area in consultation with Department of Explosives, Nagpur. Sulphur content in the liquid fuel will not exceed 0.5%. Disaster Management Plan shall be prepared to meet any eventuality in case of an accident taking place due to storage of oil.

(v) First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.

(vi) Noise levels emanating from turbines shall be so controlled such that the noise in the work zone shall be limited to 85 dB(A) from source. For people working in the high noise area, requisite personal protective equipment like earplugs/ear muffs etc. shall be provided. Workers engaged in noisy areas such as turbine area, air compressors etc shall be periodically examined to maintain audiometric record and for treatment for any hearing loss including shifting to non noisy/less noisy areas.

(vii) Regular monitoring of ambient air ground level concentration of SO_2, NOx, $PM_{2.5}$ & PM_{10} and Hg shall be carried out in the impact zone and records maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be provided immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional Office of this Ministry. The data shall also be put on the website of the company.

(viii) Utilization of 100% Fly Ash generated shall be made from **4th** year of operation. Status of implementation shall be reported to the Regional Office of the Ministry from time to time.

(ix) Provision shall be made for the housing of construction labour (as applicable) within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care,

crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

(x) The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned within seven days from the date of this clearance letter, informing that the project has been accorded environmental clearance and copies of clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Website of the Ministry of Environment and Forests at http://envfor.nic.in.

(xi) A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad / Municipal Corporation, urban local Body and the Local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.

(xii) The proponent shall upload the status of compliance of the stipulated environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; SPM, RSPM ($PM_{2.5}$ & PM_{10}), SO_2, NO_x (ambient levels as well as stack emissions) shall be displayed at a convenient location near the main gate of the company in the public domain.

(xiii) The environment statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of the Ministry by e-mail.

(xiv) **The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment and Forests, its Regional Office, Central Pollution Control Board and State Pollution Control Board. The project proponent shall upload the status of compliance of the environmental clearance conditions on their website and update the same periodically and simultaneously send the same by e-mail to the Regional Office, Ministry of Environment and Forests.**

(xv) Regional Office of the Ministry of Environment & Forests will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental Impact Assessment Report and Environment Management Plan along with the additional information submitted from time to time shall be forwarded to the Regional Office for their use during monitoring. Project proponent will up-load the compliance status in their website and up-date the same from time to time at least six monthly basis. **Criteria pollutants levels including NO_x (from stack & ambient air) shall be displayed at the main gate of the power plant.**

(xvi) Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These cost shall be included as part of the project cost. The funds earmarked for the environment

protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.

(xvii) The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the project by the concerned authorities and the dates of start of land development work and commissioning of plant.

(xviii) Full cooperation shall be extended to the Scientists/Officers from the Ministry / Regional Office of the Ministry / CPCB/ SPCB who would be monitoring the compliance of environmental status.

C) An as built or as completed report on EMP to be submitted stating the scope/extent of work envisaged in the EIA along with estimated cost vis-à-vis the actual completed works and cost incurred. A certificate/completion certificate accordingly, shall have to be submitted before commissioning of the TPP.

8. The Ministry reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction. The Ministry may also impose additional environmental conditions or modify the existing ones, if necessary.

9. The environmental clearance for the power plant **shall be valid for a period of 7 years** from the date of issue of this letter to start operations by the power plant. The CRZ clearance for foreshore facilities **shall be valid for a period of 5 years** from the date of issue of this letter for commencement of construction & operation of foreshore facilities.

10. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

11. In case of any deviation or alteration in the project proposed including coal transportation system from those submitted to this Ministry for clearance, a fresh reference should be made to the Ministry to assess the adequacy of the condition(s) imposed and to add additional environmental protection measures required, if any.

12. The above stipulations would be enforced among others under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and rules there under, Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008 and its amendments, the Public Liability Insurance Act, 1991 and its amendments.

13. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

Yours faithfully,

(B. B. Barman)
Scientist 'F'

Copy to:

1. The Secretary, Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi 110001.

2. The Secretary (Environment), Environment Department, Government of Tamil Nadu.
3. The Chairman, Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi-110066.
4. The Chairman, Tamil Nadu Pollution Control Board, No. 76, Mount Road, Mount Salai, Guindy, Chennai - 600 032
5. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi- 110032.
6. The Additional Principal Chief Conservator of Forests (C), Regional Office (SEZ), 1st and IInd Floor, Handloom Export Promotion Council, 34, Cathedral Garden Road, Nungambakkam, Chennai- 34.
7. The District Collector, Thiruvallur District, Govt. of Tamil Nadu
8. Guard file/Monitoring file.
9. Website of MoEF&CC

(B. B. Barman)
Scientist 'F'

ANNEXURE-2

Consent to Establish

TAMIL NADU POLLUTION CONTROL BOARD

CONSENT ORDER NO. 170124499798 DATED: 13/04/2017.

PROCEEDINGS NO.T8/TNPCB/F.0791AMB/RL/AMB/A/2017 DATED: 13/04/2017

SUB: TNPC Board-Consent for Establishment-M/s. NORTH CHENNAI THERMAL POWER STATION STAGE III (1X800MW) , S.F. No. 177 - 187, 235 - 240, ENNORE village, Ponneri Taluk and Tiruvallur District - for the establishment or take steps to establish the industry under Section 21 of the Air(Prevention and control of Pollution)Act,1981, as amended in 1987(Central Act. 14 of 1981)-Issued -Reg.

REF: 1. Unit's application through OCMMS No. 4499798 dated 19.05.2016
2. IR.No : F.0791AMB/RL/JCEE-M/AMB/2017 dated 03/04/2017
3. Minutes of the 146th Technical Sub-Committee meeting held on 06.04.2017 (Item No. 146-2)

Consent to establish or take steps to establish is hereby granted under Section 21 of the Air (Prevention and control of Pollution) Act,1981, as amended in 1987 and the Rules and Orders made there under to

,
M/s . NORTH CHENNAI THERMAL POWER STATION STAGE III (1X800MW)
S.F No.177 - 187, 235 - 240,
ENNORE Village,
Ponneri Taluk,
Tiruvallur District.

Authorizing occupier to establish or take steps to establish the industry in the site mentioned below:

S.F No. 177 - 187, 235 - 240,
ENNORE Village,
Ponneri Taluk,
Tiruvallur District.

This Consent to establish is valid upto **April 12, 2024**, or till the industry obtains consent to operate under Section 21 of the Air (Prevention and control of Pollution) Act, 1981, as amended in 1987 whichever is earlier subject to special and general conditions enclosed.

Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

To

,
M/s.NORTH CHENNAI THERMAL POWER STATION STAGE III (1X800MW),
Ennore & Puzhudhivakkam Villages, Ponneri Taluk, Thiruvallur District,Tiruvallur District
Pin: 600120

Copy to:

1.The Commissioner, MEENJUR-Panchayat Union, Ponneri Taluk, Tiruvallur District .
2. The District Environmental Engineer, Tamil Nadu Pollution Control Board, AMBATTUR.
3. The JCEE-Monitoring, Tamil Nadu Pollution Control Board, Chennai.
4. File

SPECIAL CONDITIONS

1. This consent to establish is valid for establishing the facility for the manufacture of products/ byproducts (Col. 2) at the rate (Col 3) mentioned below. Any change in the product/byproduct and its quantity has to be brought to the notice of the Board and fresh consent has to be obtained.

Sl. No.	Description	Quantity	Unit
	Product Details		
1.	Electric Power	800	MW

2. This consent to establish is valid for establishing the facility with the below mentioned emission/noise sources along with the control measures and/or stack .Any change in the emission source/control measures/change in stack height has to be brought to the notice of the Board and fresh consent has to be obtained if necessary.

I	**Point source emission with stack :**			
Stack No.	**Point Emission Source**	**Air pollution Control measures**	**Stack height from Ground Level in m**	**Gaseous Discharge in Nm3/hr**
1	Boiler 2575TPH	ESP with stack	275	2704320
II	**Fugitive/Noise emission :**			
Sl. No.	**Fugitive or Noise Emission sources**	**Type of emission**	**Control measures**	
1.	Coal yard	Fugitive	Dust suppression system/Foggi ng system	
2.	Ash collection	Fugitive	Water sprinkler system	

3. **Additional Conditions:**

1. High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 30 mg /Nm3. Adequate dust extraction system such as cyclones / bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided along with an environment friendly sludge disposal system.
2. Adequate dust extraction system such as cyclones / bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.
3. The SO2, NOx and Hg emissions shall not exceed 100 mg / Nm3, 100 mg / Nm3 and 0.03 mg / Nm3 respectively.
4. Fugitive emission of fly ash (dry or wet) shall be controlled such that no agricultural or non-agricultural land is affected. Damage to any land shall be mitigated and suitable compensation provided in consultation with the local Panchayat.
5. Fly ash shall not be used for agricultural purpose. No mine void filling will be undertaken as an option for ash utilization without adequate lining of mine with suitable media such that no leachate shall take place at any point of time. In case, the option of mine void filling is to be adopted, prior detailed study of soil characteristics of mine area shall be undertaken from an institute of repute and adequate clay lining shall be ascertained by the State Pollution Control Board and implementation done in close co-ordination with State Pollution Control Board.
6. Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Mercury and other heavy metals (As, Hg, Cr, Pb etc) shall be monitored in the bottom ash. No ash shall be disposed off in low lying area.
7. Green Belt consisting of three tiers of plantations of native species all around plant and at least 50 m width shall be raised. Wherever 50 m width is not feasible a 20 m width shall be raised and adequate justification shall be submitted to the Ministry. Tree density shall not be less than 2500 per ha with survival rate not less than 80%.
8. The unit shall provide OLMS for effluent & emission with connectivity to WQW & CAC, TNPCB respectively before commissioning.

Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

GENERAL CONDITIONS

1. This consent to establish cannot be construed as consent to operate and the unit shall not commence the operation without obtaining the Consent to operate.
2. The applicant shall make a request for grant of consent to operate at least thirty days, before the commissioning of trial production.
3. Any Change in the details furnished in the conditions has to be brought to the notice of the Board and got approved by the Board, before obtaining consent to operate under the said Act.
4. The unit has to comply with the provisions of Public Liability Insurance Act, 1991 to provide immediate relief in the event of any hazard to human beings, other living creatures/plants and properties while handling and storage of hazardous substances (wherever applicable).
5. Consent to operate will not be issued unless the unit complies with the conditions of consent to establish.
6. The unit shall provide adequate water sprinklers for the control of dust emission during the loading and unloading of construction material so as to minimize the dust emission.
7. The unit shall provide water sprinklers along the temporary roads inside the premises to avoid fugitive dust emission during the vehicle movements.
8. The unit shall develop green belt of adequate width around the premises.
9. In case there is any change in the management, the unit shall inform the change with relevant documents immediately.

Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

** This consent order is computer generated by OCMMS of TNPCB and no signature is needed**

TAMIL NADU POLLUTION CONTROL BOARD

CONSENT ORDER NO. 170114499798 DATED: 13/04/2017.

PROCEEDINGS NO.T8/TNPCB/F.0791AMB/RL//AMB/W/2017 DATED: 13/04/2017

SUB: TNPC Board-Consent for Establishment-M/S NORTH CHENNAI THERMAL POWER STATION STAGE III (1X800MW) S.F No. 177 - 187, 235 - 240, ENNORE Village, Ponneri Taluk, Tiruvallur District - for the establishment or take steps to establish the industry under Section 25 of the Water (Prevention and control of Pollution)Act,1974, as amended in 1988(Central Act 6 of 1974)- Issued- Reg.

REF: 1. Unit's application through OCMMS No. 4499798 dated 19.05.2016
2. IR.No : F.0791AMB/RL/JCEE-M/AMB/2017 dated 03/04/2017
3. Minutes of the 146th Technical Sub-Committee meeting held on 06.04.2017 (Item No. 146-2)

Consent to establish or take steps to establish is hereby granted under Section 25 of the Water (Prevention and control of Pollution) Act,1974, as amended in 1988(Central Act 6 of 1974) (hereinafter referred to as 'The Act') and the Rules and Orders made there under to

NORTH CHENNAI THERMAL POWER STATION STAGE III (1X800MW)

Authorizing occupier to establish or take steps to establish the industry in the site mentioned below:

S.F. No.177 - 187, 235 - 240,
ENNORE Village,
Ponneri Taluk,
Tiruvallur District.

This Consent to establish is valid upto **April 12, 2024**, or till the industry obtains consent to operate under Section 25 of the Water (Prevention and control of Pollution) Act, 1974, as amended in 1988 whichever is earlier subject to special and general conditions enclosed.

Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

To

M/s.NORTH CHENNAI THERMAL POWER STATION STAGE III (1X800MW),
Ennore & Puzhudhivakkam Villages, Ponneri Taluk, Thiruvallur District,
Pin: 600120

Copy to:

1.The Commissioner, MEENJUR-Panchayat Union, Ponneri Taluk, Tiruvallur District .
2. The District Environmental Engineer, Tamil Nadu Pollution Control Board, AMBATTUR.
3. The JCEE-Monitoring, Tamil Nadu Pollution Control Board, Chennai.
4. File

SPECIAL CONDITIONS

1. This consent to establish is valid for establishing the facility for the manufacture of products/ byproducts (Col. 2) at the rate (Col 3) mentioned below. Any change in the product/byproduct and its quantity has to be brought to the notice of the Board and fresh consent has to be obtained.

Sl. No.	Description	Quantity	Unit
	Product Details		
1.	Electric Power	800	MW

2. The unit shall provide Sewage Treatment Plant and /or Effluent Treatment Plant as indicated below.

a	**Sewage Treatment Plant:**		
Treatment status: Septic Tank and SP/DT			
SL. No.	Name of the Treatment Unit	No. of Units	Dimensions in metres
1.	Common Collection Sump	1	10m3
2.	Screen Chamber	1	1 m/s
3.	Oil & Grease trap	1	3.5 m3/h
4.	Equalization Tank	1	3.5 m3/h
5.	FAB reactor	1	3.5 m3/h
6.	Secondary Settler	1	3.5 m3/h
7.	Dual media filter	1	3.5 m3/h
8.	Activated Carbon Filter	1	3.5 m3/h
9.	Treated water tank	1	3.5 m3/h
b	**Effluent Treatment Plant:**		
Treatment status: Individual ETP			
SL. No.	Name of the Treatment Unit	No. of Units	Dimensions in metres
1.	Ash Silo Area Sump	1	10 m3
2.	Coal mill oily waste sump	1	5 m3
3.	Power house oily water sump	1	10 m3
4.	Fuel oil area sump	1	10 m3
5.	Fuel oil overflow water sump	1	10 m3
6.	condenser waste water sump	2	5 m3
7.	Pre settling pit	1	10 m3
8.	PSP overflow sump	1	5 m3
9.	API separator	1	10 m3/h
10.	TPI separator	1	20 m3/h
11.	Guard Pond	1	2000 m3
12.	Tube settler	1	125 m3/h
13.	Central Monitoring Basin	1	24 hrs retention
14.	Neutralization Tank	1	1.5 times waste gen

3. This consent to establish is valid for establishing the facility with the below mentioned outlets for the discharge of sewage/trade effluent. Any change in the outlets and the quantity has to be brought to the notice of the Board and fresh consent has to be obtained.

Outlet No.	Description of Outlet	Maximum daily discharge in KLD	Point of disposal
Effluent Type : Sewage			
1.	STP	151.0	On land for gardening
Effluent Type : Trade Effluent			
1.	Cooling water blowdown	112985.0	Marine Coastal areas
2.	Desalination plant reject	9720.0	Marine Coastal areas
3.	DM plant reject	168.0	Marine Coastal areas
4.	waste water from service water system	555.0	On land for gardening

4. **Additional Conditions:**

1. The unit shall furnish the under taking for the following.
a) Control measures for the mercury emission
b) Commitment made with MoEF&CC, GoI, New Delhi for attaining water consumption standards 2.5 m3 / MWhr.
c) Fugitive emission control system for the collection and transportation of Fly Ash and bottom ash.
d) Action taken report on the news published in the daily paper recently.

2. The unit shall comply with all the conditions stipulated in the EC and CRZ clearance issued vide MoEF letter Dt.20.01.2016.
3. The unit shall provide ETP to treat the trade effluent generated from the unit from all the streams except cooling water.
4. The unit shall ensure that the temperature of discharge shall not exceed 5 degree above the ambient water temperature of receiving body.
5. The specific water consumption shall not exceed 2.5M3/MWh by installing suitable ETP and reusing of waste water generated from the unit other than cooling water and oil handling streams.
6. The unit shall install FGD (Flue Gas Desulphurisation) as committed to ensure emission standards prescribed by the Board.
7. The unit shall endeavour to enter into MoUs with NHAI, Associations of Cement Industries and Municipal Authorities for ensuring full ash utilization.
8. Coal conveyance shall take place in closed conveyor and that there shall be no open stacking of the coal in the CRZ area.
8. Construction activity shall be carried out strictly as per the provisions of CRZ Notification, 2011. No construction work other than those permitted in Coastal Regulation Zone Notification shall be carried out in Coastal Regulation Zone area.

Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

GENERAL CONDITIONS

1. This consent to establish cannot be construed as consent to operate and the unit shall not commence the operation without obtaining the Consent to operate.
2. The applicant shall make a request for grant of consent to operate at least thirty days, before the commissioning of trial production.
3. Any Change in the details furnished in the conditions has to be brought to the notice of the Board and got approved by the Board, before obtaining consent to operate under the said Act.
4. The unit has to comply with the provisions of Public Liability Insurance Act, 1991 to provide immediate relief in the event of any hazard to human beings, other living creatures/plants and properties while handling and storage of hazardous substances (wherever applicable).
5. Consent to operate will not be issued unless the unit complies with the conditions of consent to establish.
6. The unit shall provide adequate water sprinklers for the control of dust emission during the loading and unloading of construction material so as to minimize the dust emission.
7. The unit shall provide water sprinklers along the temporary roads inside the premises to avoid fugitive dust emission during the vehicle movements.
8. The unit shall develop green belt of adequate width around the premises.
9. In case there is any change in the management, the unit shall inform the change with relevant documents immediately.

Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

** This consent order is computer generated by OCMMS of TNPCB and no signature is needed**

सत्यमेव जयते

File No.: J-13012/14/2012-IA.II(T)
Government of India
Ministry of Environment, Forest and Climate Change
IA Division
****

Dated **08/03/2025**

To,

Sh. Gnanapalan Packiadhas
M/s Tamil Nadu Generation & Distribution Corporation Ltd (TANGEDCO)
144, Anna Salai,Chennai , Chennai, Tamil Nadu, Near LIC, Anna Salai, 600002
E-mail: cepr@tnebnet.org

Subject: **1x800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities by M/s. Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO) at NCTPS Complex, Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu – Grant of Amendment in EC & CRZ regarding change of coal source from 100% Imported coal to use a mix of domestic coal as well as Imported coal in ratio of 50%-50% proportion – regarding.**

Sir/Madam,

This is in reference to your application submitted to MoEF&CC vide proposal number IA/TN/THE/475354/2024 dated 14/06/2024 and subsequent reply to the additional information uploaded on Parivesh on 19/10/2024 for grant of amendment in prior Environmental Clearance (EC) accorded by the Ministry vide letter no. J-13012/14/2012-IA. II (T) dated 20th Jan. 2016, under the provisions of the EIA Notification, 2006 for the project mentioned above.

2. The particulars of the proposal are as below :

(i) EC Identification No.	EC24A0601TN5388860A
(ii) File No.	J-13012/14/2012-IA.II(T)
(iii) Clearance Type	Amendment in EC
(iv) Category	A
(v) Schedule No./ Project Activity	1(d) Thermal Power Plants
(vi) Sector	Thermal Projects
(vii) Name of Project	Amendment of Environmental Clearance for 1X800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities at Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu by M/s. Tamil Nadu Generation & Distribution Corporation Ltd.

	(TANGEDCO).
(viii) Location of Project (District, State)	THIRUVALLUR, TAMIL NADU
(ix) Issuing Authority	MoEF&CC
(x) EC Date	20/01/2016
(xi) Applicability of General Conditions	NO
(xiii) Status of implementation of the project	

3. M/s Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO) has made an online application vide proposal no. IA/TN/THE/475354/2024 dated 14.06.2024 along with the application in prescribed format - Form 4 (CAF, Form – I Part A, B and C) and sought for amendment in Environment Clearance accorded by the Ministry vide F.No. J-13012/14/2012-IA. II (T) dated 20th Jan. 2016 for the project titled "1x800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities by M/s. Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO) at NCTPS Complex, Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu".

4. The instant proposal was considered during the 11th meeting of the EAC (Thermal) held during 27-28th June 2024 and further reconsidered in its 18th meeting held on 24/01/2025. The project/activity is covered under category A of item 1(d) 'Thermal Power Plants' of the Schedule to the Environmental Impact Assessment (EIA) Notification, 2006, as amended as the power generation capacity of the proposed expansion is beyond the threshold capacity of 500MW i.e. 800 MW and requires appraisal at Central level by the sectoral EAC in the Ministry. The minutes of the meeting and all the project documents are available on PARIVESH portal which can be accessed at https://parivesh.nic.in.

5. The amendment sought in the EC&CRZ clearance dated 20/01/2016 is detailed as below:

Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
Point no. 3	The Imported Coal requirement of 2.09 MTPA will be sourced through MMTC, New Delhi.	The coal requirement is 2.69 MTPA in the ratio of Imported Coal 1.04 MTPA and domestic Coal 1.65 MTPA. The Imported and domestic coal will be sourced from MMTC, New Delhi and Kalinga block of Talcher, Mahanadhi, IB Valley Coal Fields, respectively.	TANGEDCO is planning to change from use of 100% Imported coal to use a mix of domestic coal and Imported coal in the ratio of 50%-50% proportion, which is in compliance of MoEF&CC OM dated 6th Dec. 2023 and previous OM dated 11th Nov. 2020 regarding Amendment in Environmental Clearance for change in coal source by Thermal Power Plants.

6. Protected Area: The PP reported that there are no national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. Kosasthalaiyar River is flowing at 218.8 m, Buckingham Canal is at 42.7 m and Boat Canal is at 41.45 m from the project site. No Schedule-I species sighted in the study area.

7. Ash Pond area: The existing ash pond of NCTPS complex located 5Kms away from the project site will be utilised for dumping of bottom ash from this proposed power plant at the time of emergency only, since, this power plant is proposed with the 100% disposal of bottom ash also.

8. Water Requirement: The potable water required for the construction of project will be met from Chennai Metro Water Supply & Sewerage Board (CMWSSB) for about 2 MGD (9092 m3). For operation purpose, potable water will be produced from sea water by treating in RO based desalination plant, proposed within the power plant.

9. Details of Coal Linkage: Environmental Clearance for the project was issued based on the use of Imported coal of 2.09 MTPA which was planned to source from MMTC, New Delhi. FSA/MoU for imported coal was signed between MMTC Limited and TANGEDCO on 25th May, 2015 for supply of 2.51 MTPA of coal for the project. Now, TANGEDCO is planning to change from use of 100% imported coal to use of domestic coal as well as Imported coal in the equal proportion. Domestic coal will be made available from the Kalinga block of Talcher, Mahanadhi, IB Valley Coal Fields.

Total 2.69 MTPA of mixed coal will be required for the project.

10. Details of CCR: Details of Certified compliance report submitted by RO, MoEF&CC: Certified Copy of EC Compliance is secured Vide Diary No 046 dated 13.01.2023.

11. Ash management details:

S.No.	Information sought	Details
i.	Concrete figures about the quantum of additional fly ash likely to be generated per year over and above that already approved under the previous EC	A) **Ash content for100% Foreign coal** - 12% Ash quantity -806.9 TPD Already Proposed Silo - 3nos (2 No for fly ash , 1 No for bottom ash) B) **Ash content for Foreign (50%) & domestic coal (50%) - 25.5%** Total Ash quantity generated- 2209.32 TPD **Excess Ash generated- 1402.42 TPD**
ii.	Ash management plan	The existing ash handling system could cater to the enhanced ash generation quantity as detailed below. **A. Ash handling** Now constructed Silos- 3 Nos (2 Nos for fly ash , 1 No for bottom ash) i) Fly Ash Silo capacity- 2 x 2520=5040 MT Fly ash evacuation is through vacuum system from ESP hopper and will be stored in fly ash silos of capacity (2x2520=5040MT) which will be having capacity for 24 hours storage each. ii) Bottom Ash Silo capacity-1 x 1800=1800 MT Bottom ash evacuation is dry type initially through closed conveyor system up to intermediate silo and from there up to bottom ash silo of capacity (1x1800=1800 MT) is by pipe line. **B. Ash utilization** The ash will be sold to cement / brick industries through E-auction as being followed in NCTPS Stage 1&2. The fly ash will be loaded in closed trucks / bulkers through telescopic spout assembly of Fly ash Silo and transported to cement/Brick companies. The bottom ash will be conditioned by quenching with water (18m^3/hour) and will be loaded in truck and covered with tarpaulin for transporting. Hence, 100% ash Utilization will be achieved as per MOEF &CC Notification 31.12.2021. **C. Ash disposal in case of emergency** In case of emergency, both fly and bottom ash will be made as slurry and transported to existing NCTPS ash dyke through existing ash pipelines of NCTPS. Water required for making slurry will be around 8082 m^3/day , which will be sourced from CT blow down pump and guard pond water (reject sea water). 12 Nos piezometric wells are already available in and around the existing ash dyke of NCTPS. It is assured that the ash slurry pipelines will be monitored to avoid any leakages to protect the nearby area.

12. The Ennore project site of M/s. TANGEDCO inter-alia project site of instant proposal under consideration was inspected by the sub-committee of EAC during 13-14th March, 2024. The recommendations of the site visit report of the sub-committee of EAC relevant to the proposal under consideration and its compliance status is furnished as below:

S.No.	Recommendations of the sub-committee of EAC	Compliance by the project proponent
i.	The EIA report including carrying capacity of existing ash	The EIA report, including details of the carrying capacity of the existing ash pond, has been submitted to MOEF&CC.

S.No.	Recommendations of the sub-committee of EAC	Compliance by the project proponent
	pond along with remedial measures to avoid pollution wherein ash from Stage I and Stage II is being disposed and emergency ash disposal of Stage III is proposed shall be prepared.	The report was prepared by M/s Cholamandalam MS Risk Services Ltd, Chennai. The pipelines will transfer ash slurry from Stage III to the designated ash dyke pond of NCTPS. The ash dyke pond covers ~133 hectares (328 acres), representing a permanent land footprint. The pond falls within the NCTPS land area and is already used for ash disposal by Stage I & II plants.
ii.	Design report of the ash slurry pipeline corridor for the Stage III NCTPS power plant and exploring the feasibility of using the existing ash slurry pipelines of Stage I and Stage II NCTPS plant for the proposed Stage III shall be prepared by NCTPS.	The design report for the ash slurry pipeline of NCTPP Stage III is submitted. It has been decided to use the existing ash slurry pipelines of NCTPS Stage I & II instead of constructing new pipelines. This decision was made to minimize environmental impact. NCTPP Stage III will dispose of ash slurry only in emergencies, as both fly ash and bottom ash are disposed of in dry form.
iii.	Adequacy report from Competent Authority on existing ash dyke capacity to accommodate the proposed ash slurry from stage III NCTPS shall be submitted.	The existing ash pond of NCTPS is sufficient as wet ash will be disposed of promptly to brick industries and other works. Details of the ash pond: Area: 328 acres. (133 Ha) Capacity: 57.5 lakh m^3 (at a height of 5m). Current stock: 29 lakh m^3. Remaining capacity: 28.5 lakh m^3.

13. Court cases:

A. Original Application No.122 of 2021 (SZ) with Original Application No.162 of 2021 (SZ)

The Hon'ble NGT(SZ) in Original Application No.122 of 2021 (SZ) with Original Application No.162 of 2021 (SZ) vide its judgement dated 31/01/2022 directed the proponent not to proceed with the work of laying the pipeline through the CRZ zone and also in the other area in violation of the Environment Clearance and CRZ Clearance granted to them in 20/01/2016, without getting necessary further clearances in this respect by filing afresh application in accordance with law. Besides, the Hon'ble NGT also imposed a compensation of Rs. 50 lakhs which has been paid by them to TNPCB on 30/3/2022. In compliance to the said judgment, proponent filed amendment proposal bearing No: IA/TN/THE/442379/2023 was submitted to the Ministry seeking for amendment in the EC & CRZ dated 20/01/2016 for the ash slurry pipeline for stage III project. The proposal was considered by the EAC in its meeting held on 04/09/2023 and 31/10/2023 wherein the proposal was deferred and EAC recommended for site visit by a sub-committee. During the site visit, it was informed by M/s. TANGEDCO that they have decided to utilize the existing spare lines of NCTPS Stage – I & II to reduce the environment impact. In view of this, PP informed the EAC that no new ash slurry pipelines are envisaged for the stage III project and the proposal no. IA/TN/THE/442379/2023 has already been withdrawn by the project proponent.

B. OA No 8 of 2016 titled as R.Ravimaran (Died) & Ors. vs Union of India & Ors. tagged with OA No 198 of 2016 titled as Meenava Thanthai K.R. Selvaraj Kumar vs The Chief Secretary Government of Tamil Nadu

An OA No 8 of 2016 titled as R.Ravimaran (Died) & Ors. vs Union of India & Ors. tagged with OA No 198 of 2016 titled as Meenava Thanthai K.R. Selvaraj Kumar vs The Chief Secretary Government of Tamil Nadu, Chennai & Ors. was filed before the Hon'ble Tribunal (SZ), Chennai regarding illegal dumping of ash slurry and violation of conditions of Environmental Clearance and CRZ Clearance granted by dumping fly ash and draining the wastewater into the Buckingham Canal and Kosasthalaiyar River respectively. In this regard, the Hon'ble Tribunal vide its judgment dated 05/07/2022 passed the following directions for compliance by the PP:

i. To carry on their activities strictly in accordance with law and complying with the conditions imposed in the

Environmental Clearance and the Consent granted by the State Pollution Control Board.

ii. To replace the old ash slurry carrying pipes as undertaken by them within the time frame fixed and also take all necessary precautions of providing necessary sensor system to detect the leak immediately and also the mechanism by which production and pumping of ash slurry through the damaged pipeline can be stopped immediately, so that further pumping can be avoided so as to minimize the leak if at all if it happens in future.

iii. To pay the compensation already assessed by the State Pollution Control Board on various occasions for the violations noticed by them and also compensation directed to be paid by this Tribunal in other related connected matters viz., Original Application Nos.122 of 2021 (SZ) and 162 of 2021 (SZ) which were already disposed of this Tribunal by giving certain directions.

iv. To pay environmental compensation which is likely to be assessed on the basis of the study to be conducted by the agency which is going to conduct study for remediation process, apart from the compensation already imposed by various proceedings of the Tamil Nadu Pollution Control Board and directed to be paid by this Tribunal.

v. To bear the expenses for conducting the study through the agency to be identified for preparation of DPR and also the expenses for remediation.

vi. To undertake the remediation process and complete the same at the earliest possible time, as delay in implementation will result in further damage to the environment.

vii. To carry out the recommendations made by the Joint Expert Committee regarding creating green cover, including plantation of mangroves and other species suggested which are conducive to environment and that will not affect the riverine and coastal zone ecology.

viii. To take immediate steps to remove the fly ash already deposited in that area due to the breach of fly ash slurry carrying pipes without delay and after removal of the same, soil analysis will have to be conducted by the CPCB and SPCB and if further remediation will have to be conducted or further steps are required for removal of further fly ash deposit found in that area, then that also will have to be carried out by the PP.

On the above, the PP has informed that the compliance of the aforesaid order is under process.

Deliberations of the Committee

14. The EAC noted the following:

i. The EAC noted that the proposal is for the grant of amendment in Environmental Clearance to the project 1X800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities at Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu by M/s. Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO).

ii. The committee noted that the Environmental Clearance (EC) and Coastal Regulation Zone (CRZ) Clearance were accorded by MoEF&CC Vide File No. J-13012/14/2012-IA. II (T) dated 20th January. 2016 with use of Imported coal of 2.09 MTPA sourced through MMTC, New Delhi. The FSA/MoU for Imported coal was signed between MMTC Limited and TANGEDCO on 25th May, 2015. The Consent to Establish (CTE) issued from TNPCB Vide Order No. 170124499798 under Air (Prevention and control of Pollution) Act, 1981, as amended in 1987 and vide order No.170114499798 under Water (Prevention and control of Pollution) Act,1974, as amended in 1988 on 13th April, 2017.

iii. Now, PP has submitted the proposal for obtaining amendment in existing EC for change in fuel composition from 100% Imported coal to mixture of 50% Indian coal & 50% Imported coal in compliance of MoEF&CC OM dated 6th Dec, 2023 and previous OM dated 11th Nov, 2020.

iv. The EAC reviewed the present average ambient air quality data and observed that PM10 values were on higher side and it was noted that the proposed change in fuel composition from 100% Imported coal to mixture of 50% Indian coal &

50% Imported coal which may increase PM10 emissions in the environment. PP in this regard submitted that this is a temporary increase due to ongoing construction activities at site.

v. The EAC also added that as there is change in fuel, PP shall not ask in the future for additional ash pond and additional water requirement. Further, EAC noted that the total area of plant is 76.88 Ha of which only 18.21 Ha is a green belt area which accounts to 23.7% of the total area. Therefore, PP are advised to conduct power plantation in the upcoming monsoon season.

vi. The Committee observed that as per OM dated 11.11.2020 & 06.12.2023, proposal of PP is not falling under category (a) to (d) mentioned in para 3 of OM dated 6.12.2023 and hence required amendment in EC. Further, it has mentioned in the same OM that "All the Thermal Power Plants (including Captive Power Plants) having Prior Environmental Clearance and going in for change in the coal source other than those falling in the aforementioned category of change in coal source shall approach the Ministry for amendment in environmental clearance along with a study on additional impact assessment and revised EMP based on the change in Source of coal". The Committee observed that PP has submitted the additional impact assessment and revised EMP report of May 2024, along with this proposal.

vii. The EAC noted that PP submitted that FSA/MoU for Imported coal was signed between MMTC Limited and TANGEDCO on 25th May, 2015. No additional water will be required due to change in coal use. No additional power required due to change in coal. No additional Coal Handling Plant (CHP) will be required and the area of 8.09 Ha is available within the site for stacking of Indian as well as imported coal.

viii. PP submitted that Coal characteristics & consumption as under:

S. no.	Details	Units	Imported 100%	Imported 50% Indian 50%	Indian coal
1.	Coal consumption	TPH	280	361	442
		TPD	6720	8664	10608
		MTPA	2.09	2.69	3.29
2.	Ash	%	12	25.5	34
3.	Sulphur	%	0.80	0.65	0.55
4.	Gross Calorific Value	Kcal/kg	6000	4654	3800

Type of coal	Coal quantity (TPH)	Ash content (%)	Total Ash Quantity (TPH)	Fly Ash Quantity (TPH)	Bottom Ash Quantity (TPH)
Imported coal	280	12.0	33.60	23.52	10.08
Mixed coal (Imported 50%, Indian 50%)	361	25.5	92.06	64.44	27.62
Note: Due to change in composition of the coal, the ash quantity will increase					

ix. The committee observed that there is a increase in ash content further as per the EIA the level of pollutant are increasing and on higher side. In this regard PP submitted that-

• Particulate matter (PM): PM value: 96.49 g/m3, predicted GLC: 0.32 g/m3. Resultant GLC: 96.81 ug/m3 which is near the limits as per NAAQ standards. The max. value of PM10 120 g/m3 recorded in Ennore SEZ TPP site since the project is proposed over abandoned ash dyke. The contribution of PM from TPPs within NCTPS complex is 1.2 g/m3 and the contribution all the TPPs with 10 km radius is 1.6 g/m3. To reduce the PM emissions ESP's with an efficiency of 99.98% has been installed to limit the PM below 30 mg/Nm3.

• Sulphur dioxide (SO2): SO2 value: 25.1 g/m3 , predicted GLC: 1.08 g/m3. Resultant GLC: 26.18 g/m3 which is well with in the limits as per NAAQ standards. The contribution of SO2 from TPPs within NCTPS complex is 5.1 g/m3 and the contribution all the TPPs with 10 km radius is 7.1 g/m3. Dry FGD has been installed to meet the revised emission norms of MoEF&CC for Sulphur dioxide (SO2) i.e. 100 mg/Nm3.

• Oxides of nitrogen (NOx): NOx value: 42.6 g/m

^{3}, predicted GLC: 1.08 g/m^3. Resultant GLC is 43.68 g/m^3 which is well with in the limits as per NAAQ standards. The contribution of NOx from TPPs within NCTPS complex is 6.4 g/m^3 and the contribution all the TPPs with 10 km radius is 8.01 ug/m3. To reduce the emissions Low NOx burner will be provided. SCR will also be installed in future as per requirement to limit the NOx emission to as per MoEF&CC norms i.e. 100 mg/Nm^3.

x. The committee observed that for managing the air pollution PP has proposed that i) Dust suppression/ extraction system will be provided to mitigate the dust generated at coal conveying area, transfer points and coal stockyard, ii) Dust collection system will be provided in coal bunkers to evacuate dust and hazardous gases like methane from the coal bunkers, iii) Collected dust would be returned to either the associated belt conveyors or to the coal bunkers. The coal dust from coal transfer points would be restricted to 5 mg/Nm3, iv) 100 % dry fly ash extraction, storage and disposal facilities are proposed for utilization of 100 % fly ash. Closed trucks & containers would be used for this purpose, v) ESP with an efficiency of 99.98 % is proposed to control Particulate Matter, vi) To minimize the SO2 emissions, dry FGD system is proposed and vii)To reduce the NOX emissions, Low NOx burners has been provided whereas Selective Catalytic Reduction (SCR) system will be installed in future as per requirement.

xi. Additionally, the committee observed that for managing the ash PP has proposed that i) 100% utilization of fly ash in dry form is envisaged. Closed trucks & containers would be used for this purpose, ii) To reduce the dust nuisance while loading the ash into the open trucks from fly ash silos, the fly ash would be conditioned with water spray, iii) It is proposed to cover the ash in the open trucks with tarpaulin to prevent flying of fine ash during transportation, iv) TANGEDCO would put max efforts and ensure bottom ash utilization. 100% ash utilization will be achieved as per MoEF&CC notification dt. 3rd Nov. 2009, v) Proposed to supply entire ash to cement industries that are presently lifting fly ash from NCTPS, since there is huge demand in Tami Nadu for fly ash from thermal stations and vi) MoU between TANGEDCO & M/s. Dalmia Cement (Bharat) Limited was already made on 14th Oct. 2015 for utilization of Fly ash.

xii. The committee observed that EMP cost proposed by the PP is Rs. 1185.21 cr and recurring cost is Rs 98 Cr. The details are as under:

S. No	Particulars	100% Imported Coal		Indian Coal 50%: Imported Coal 50%		Remark
		Capital Cost (Rs. in Crores)	Recurring Cost (Rs. in Crores)	Capital Cost (Rs. in Crores)	Recurring Cost (Rs. in Crores)	
1	Dust Control System i) ESP ii) Dust suppression system for coal handling	192.00 3.50		192.0 3.50		No change
2	Chimney	88.90		88.90		
	FGD, De NOx burners etc.	0		615.0		Increased
3	Water treatment plant including clarifier, UF, RO, DM, Electrical and Instrumentation	42.24		42.24		
4	Effluent Treatment Plant	3.50		3.50		
5	Dense phase, pneumatic Ash Handling Plant including bottom ash & fly ash silos, conveying compressors and other equipment	106.56	48.0	106.56	98	No change
6	Development of Greenbelt	3.84		3.84		
7	Sewage System	1.44		1.44		
8	Chemical dosing and Chlorination Plant	9.70		9.70		
9	Pollution monitoring instruments/ equipment	14.16		14.16		
10	Other unforeseen items	14.16		14.16		
	Total	**480.0**	**48.0**	**1,185.21**	**98**	Increased

xiii. Based on the discussion held the committee recommended that in the para 3 of EC dated 20.01.2016 the phrase "The Imported Coal requirement of 2.09 MTPA will be sourced through MMTC, New Delhi" shall be read as "The coal requirement is 2.69 MTPA in the ratio of 50% Imported Coal (1.04 MTPA) and 50% Indian Coal (1.65 MTPA). Imported coal sourced through MMTC, New Delhi and Indian Coal sourced from Kalinga block of Talcher, Mahanadhi, IB Valley Coal Fields."

xiv. The Committee also noted that there are two court cases with respect to existing project of NCTPS and the proposal no. IA/TN/THE/442379/2023 of M/s. TANGEDCO has been withdrawn by the project proponent.

Recommendations of the Committee

15. The EAC after detailed deliberation on the information submitted and as presented during the meeting **recommended** the proposal for grant of amendment in Environmental Clearance dated 20th January 2016 to the project 1X800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities at Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu by **M/s. Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO)** for change in the use of Coal from 100% Imported Coal to use of Indian Coal and Imported Coal in equal proportion as mentioned at above Para 5, subject to compliance of the additional specific environmental safeguard conditions (**Annexure-I**), in addition to the conditions in the EC letter dated 20.01.2016.

Decision of MoEF&CC

16. The undersigned is directed to inform that Ministry of Environment, Forest and Climate Change has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the Expert Appraisal Committee (Thermal) hereby decided for amendment in Environment Clearance accorded by the Ministry vide F. no. J-13012/14/2012-IA.II (T) dated 20.01.2016 to the project 1X800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities at Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu by **M/s. Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO)** for change in the use of Coal from 100% Imported Coal to use of Indian Coal and Imported Coal in equal proportion as mentioned at above **Para 5**, subject to compliance of the additional specific environmental safeguard conditions (**Annexure-I**).

17. All other terms and conditions mentioned in the EC & CRZ letter number J-13012/14/2012-IA.II (T) dated 20.01.2016 shall remain unchanged.

18. The project proponent shall obtain fresh Environment Clearance in case of change in scope of the project, if any.

19. This issues with the approval of the Competent Authority.

Yours faithfully,

(Sundar Ramanathan)
Scientist 'F'
Tel: 011- 20819378
Email- r.sundar@nic.in;

Copy To

1. The Secretary, Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi 110001.
2. The Chairman, Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi-110066.
3. Deputy Director General of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (SEZ), Ist and IInd Floor, Handloom Export Promotion Council, 34, Cathedral Garden Road, Nungambakkam, Chennai – 34.
4. Member Secretary, Central Ground Water Authority, Jamnagar House, 18/11, Man Singh Road Area, New Delhi, Delhi 110001

5. Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai- 600 032, Tamil Nadu.
6. The District Collector, Thiruvallur, State Government of Tamil Nadu.
7. Guard file/Monitoring file/PARIVESH Portal

Annexure 1

Specific EC Conditions for (Thermal Power Plants)

1. Additional Specific Condition

S. No	EC Conditions
1.1	Project proponent shall comply with all the directions passed by the Hon'ble National Green Tribunal vide its judgement dated 05/07/2022 in OA No 8 of 2016 titled as R.Ravimaran (Died) & Ors. vs Union of India & Ors. tagged with OA No 198 of 2016 titled as Meenava Thanthai K.R. Selvaraj Kumar vs The Chief Secretary Government of Tamil Nadu, Chennai & Ors. Compliance status in this regard shall be submitted to the concerned Regional Office of the MoEF&CC along with the six monthly compliance report.
1.2	PP shall obtain the amendment in CTO from SPCB as applicable in the instant case for the proposed amendments
1.3	PP shall implement the protective measures proposed in EMP in a time-bound manner. The budget earmarked for the same is Rs 1,185.21crores (Capital) and Rs 98 crores(recurring) and should be kept in separate accounts and audited annually. The implantation status along with the amount spent with documentary proof shall be submitted to the concerned Regional Office for the activities carried out during the previous year.
1.4	Regular monitoring of Fly Ash Pond shall be carried out and inspection should be done to avoid any chance of failure of bunds or leakage from the Ash Pond. The Pipe line carrying the fly ash shall also be inspected for any leakage at regular intervals. In case of any leakage immediate corrective measures needs to be taken and concerned authorities shall be informed. PP shall also keep a record of inspection.
1.5	Fly ash handling shall be done strictly as per extent rules/regulations of the Ministry/CPCB issued from time to time including Ministry's Notification No. S.O.5481(E) dated 31st December, 2021. No coal shall be transported through road shall be allowed.
1.6	The transportation of Ash from the Thermal Power Plant to other Industries (Cement/brick) shall be through closed bulkers only.
1.7	Water Sprinkling on roads shall be done in at regular interval on the roads atleast within 1 km range approaching the plant. A logbook shall be maintained for the activity and be in six monthly compliance report.
1.8	PP shall ensure that roads for transportation shall be maintained and keep in good condition to avoid fugitive emissions.
1.9	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.
1.10	PP shall provide regular health monitoring services and health services free of cost to people living

S. No	EC Conditions
	in 10 km radius.
1.11	PP shall establish an Environment Management Cell and ensure to engage sufficient staff having environment related qualification for its smooth its functioning.
1.12	Environment Audit of plant shall be done annually and report shall be submitted to Regional office of the Ministry.
1.13	Use of Diesel operated transportation vehicles shall be avoided as far as possible and BS-VI complaint vehicle shall be purchased and preference shall be given to EV/CNG/LNG based trucks for transportation raw materials, coal and disposal. Change to EV/CNG/LNG be done in a time bound manner.
1.14	PP shall ensure that all types of plastic waste generated from the plant shall be stored separately in isolated area and disposed of strictly adhering to the Plastic Waste Management Rules 2016 (as amended). In pursuant to the Ministry's OM dated 18/07/2022 PP shall also create awareness among the people working in the project area as well as in its surrounding area on the ban on Single Use Plastic(SUP) in order to ensure compliance of Ministry's Notification published by the Ministry on 12/08/2021. A report along with photograph on the measures taken shall also be included in the six monthly compliance report being submitted by PP.
1.15	Monitoring for heavy metals and fluoride in ground water and surface water shall be undertaken along with the regular monitoring and results/findings submitted along with half yearly monitoring report.
1.16	PP is advised to implement the 'Ek Ped Maa Ke Naam' Campaign which was launched on 5th June 2024 on the occasion of the World Environment Day to increase the forest cover across the Country. This plantation drive is other than Green belt development. An action plan in this regard shall be submitted to the concerned Regional Office of the Ministry.

सत्यमेव जयते

File No.: J-13012/14/2012-IA.II(T)
Government of India
Ministry of Environment, Forest and Climate Change
IA Division
****

Dated **08/03/2025**

To,

Sh. Gnanapalan Packiadhas
M/s Tamil Nadu Generation & Distribution Corporation Ltd (TANGEDCO)
144, Anna Salai,Chennai , Chennai, Tamil Nadu, Near LIC, Anna Salai, 600002
E-mail: cepr@tnebnet.org

Subject: **1x800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities by M/s. Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO) at NCTPS Complex, Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu – Grant of Amendment in EC & CRZ regarding change of coal source from 100% Imported coal to use a mix of domestic coal as well as Imported coal in ratio of 50%-50% proportion – regarding.**

Sir/Madam,

This is in reference to your application submitted to MoEF&CC vide proposal number IA/TN/THE/475354/2024 dated 14/06/2024 and subsequent reply to the additional information uploaded on Parivesh on 19/10/2024 for grant of amendment in prior Environmental Clearance (EC) accorded by the Ministry vide letter no. J-13012/14/2012-IA. II (T) dated 20th Jan. 2016, under the provisions of the EIA Notification, 2006 for the project mentioned above.

2. The particulars of the proposal are as below :

(i) EC Identification No.	EC24A0601TN5388860A
(ii) File No.	J-13012/14/2012-IA.II(T)
(iii) Clearance Type	Amendment in EC
(iv) Category	A
(v) Schedule No./ Project Activity	1(d) Thermal Power Plants
(vi) Sector	Thermal Projects
(vii) Name of Project	Amendment of Environmental Clearance for 1X800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities at Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu by M/s. Tamil Nadu Generation & Distribution Corporation Ltd.

	(TANGEDCO).
(viii) Location of Project (District, State)	THIRUVALLUR, TAMIL NADU
(ix) Issuing Authority	MoEF&CC
(x) EC Date	20/01/2016
(xi) Applicability of General Conditions	NO
(xiii) Status of implementation of the project	

3. M/s Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO) has made an online application vide proposal no. IA/TN/THE/475354/2024 dated 14.06.2024 along with the application in prescribed format - Form 4 (CAF, Form – I Part A, B and C) and sought for amendment in Environment Clearance accorded by the Ministry vide F.No. J-13012/14/2012-IA. II (T) dated 20th Jan. 2016 for the project titled "1x800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities by M/s. Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO) at NCTPS Complex, Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu".

4. The instant proposal was considered during the 11th meeting of the EAC (Thermal) held during 27-28th June 2024 and further reconsidered in its 18th meeting held on 24/01/2025. The project/activity is covered under category A of item 1(d) 'Thermal Power Plants' of the Schedule to the Environmental Impact Assessment (EIA) Notification, 2006, as amended as the power generation capacity of the proposed expansion is beyond the threshold capacity of 500MW i.e. 800 MW and requires appraisal at Central level by the sectoral EAC in the Ministry. The minutes of the meeting and all the project documents are available on PARIVESH portal which can be accessed at https://parivesh.nic.in.

5. The amendment sought in the EC&CRZ clearance dated 20/01/2016 is detailed as below:

Para of EC issued by MoEF&CC	Details as per the EC	To be revised/ read as	Justification/ reasons
Point no. 3	The Imported Coal requirement of 2.09 MTPA will be sourced through MMTC, New Delhi.	The coal requirement is 2.69 MTPA in the ratio of Imported Coal 1.04 MTPA and domestic Coal 1.65 MTPA. The Imported and domestic coal will be sourced from MMTC, New Delhi and Kalinga block of Talcher, Mahanadhi, IB Valley Coal Fields, respectively.	TANGEDCO is planning to change from use of 100% Imported coal to use a mix of domestic coal and Imported coal in the ratio of 50%-50% proportion, which is in compliance of MoEF&CC OM dated 6th Dec. 2023 and previous OM dated 11th Nov. 2020 regarding Amendment in Environmental Clearance for change in coal source by Thermal Power Plants.

6. Protected Area: The PP reported that there are no national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. Kosasthalaiyar River is flowing at 218.8 m, Buckingham Canal is at 42.7 m and Boat Canal is at 41.45 m from the project site. No Schedule-I species sighted in the study area.

7. Ash Pond area: The existing ash pond of NCTPS complex located 5Kms away from the project site will be utilised for dumping of bottom ash from this proposed power plant at the time of emergency only, since, this power plant is proposed with the 100% disposal of bottom ash also.

8. Water Requirement: The potable water required for the construction of project will be met from Chennai Metro Water Supply & Sewerage Board (CMWSSB) for about 2 MGD (9092 m3). For operation purpose, potable water will be produced from sea water by treating in RO based desalination plant, proposed within the power plant.

9. Details of Coal Linkage: Environmental Clearance for the project was issued based on the use of Imported coal of 2.09 MTPA which was planned to source from MMTC, New Delhi. FSA/MoU for imported coal was signed between MMTC Limited and TANGEDCO on 25th May, 2015 for supply of 2.51 MTPA of coal for the project. Now, TANGEDCO is planning to change from use of 100% imported coal to use of domestic coal as well as Imported coal in the equal proportion. Domestic coal will be made available from the Kalinga block of Talcher, Mahanadhi, IB Valley Coal Fields.

Total 2.69 MTPA of mixed coal will be required for the project.

10. Details of CCR: Details of Certified compliance report submitted by RO, MoEF&CC: Certified Copy of EC Compliance is secured Vide Diary No 046 dated 13.01.2023.

11. Ash management details:

S.No.	Information sought	Details
i.	Concrete figures about the quantum of additional fly ash likely to be generated per year over and above that already approved under the previous EC	A) **Ash content for100% Foreign coal** - 12% Ash quantity -806.9 TPD Already Proposed Silo - 3nos (2 No for fly ash , 1 No for bottom ash) B) **Ash content for Foreign (50%) & domestic coal (50%) - 25.5%** Total Ash quantity generated- 2209.32 TPD **Excess Ash generated- 1402.42 TPD**
ii.	Ash management plan	The existing ash handling system could cater to the enhanced ash generation quantity as detailed below. **A. Ash handling** Now constructed Silos- 3 Nos (2 Nos for fly ash , 1 No for bottom ash) i) Fly Ash Silo capacity- 2 x 2520=5040 MT Fly ash evacuation is through vacuum system from ESP hopper and will be stored in fly ash silos of capacity (2x2520=5040MT) which will be having capacity for 24 hours storage each. ii) Bottom Ash Silo capacity-1 x 1800=1800 MT Bottom ash evacuation is dry type initially through closed conveyor system up to intermediate silo and from there up to bottom ash silo of capacity (1x1800=1800 MT) is by pipe line. **B. Ash utilization** The ash will be sold to cement / brick industries through E-auction as being followed in NCTPS Stage 1&2. The fly ash will be loaded in closed trucks / bulkers through telescopic spout assembly of Fly ash Silo and transported to cement/Brick companies. The bottom ash will be conditioned by quenching with water (18m^3/hour) and will be loaded in truck and covered with tarpaulin for transporting. Hence, 100% ash Utilization will be achieved as per MOEF &CC Notification 31.12.2021. **C. Ash disposal in case of emergency** In case of emergency, both fly and bottom ash will be made as slurry and transported to existing NCTPS ash dyke through existing ash pipelines of NCTPS. Water required for making slurry will be around 8082 m^3/day , which will be sourced from CT blow down pump and guard pond water (reject sea water). 12 Nos piezometric wells are already available in and around the existing ash dyke of NCTPS. It is assured that the ash slurry pipelines will be monitored to avoid any leakages to protect the nearby area.

12. The Ennore project site of M/s. TANGEDCO inter-alia project site of instant proposal under consideration was inspected by the sub-committee of EAC during 13-14th March, 2024. The recommendations of the site visit report of the sub-committee of EAC relevant to the proposal under consideration and its compliance status is furnished as below:

S.No.	Recommendations of the sub-committee of EAC	Compliance by the project proponent
i.	The EIA report including carrying capacity of existing ash	The EIA report, including details of the carrying capacity of the existing ash pond, has been submitted to MOEF&CC.

S.No.	Recommendations of the sub-committee of EAC	Compliance by the project proponent
	pond along with remedial measures to avoid pollution wherein ash from Stage I and Stage II is being disposed and emergency ash disposal of Stage III is proposed shall be prepared.	The report was prepared by M/s Cholamandalam MS Risk Services Ltd, Chennai. The pipelines will transfer ash slurry from Stage III to the designated ash dyke pond of NCTPS. The ash dyke pond covers ~133 hectares (328 acres), representing a permanent land footprint. The pond falls within the NCTPS land area and is already used for ash disposal by Stage I & II plants.
ii.	Design report of the ash slurry pipeline corridor for the Stage III NCTPS power plant and exploring the feasibility of using the existing ash slurry pipelines of Stage I and Stage II NCTPS plant for the proposed Stage III shall be prepared by NCTPS.	The design report for the ash slurry pipeline of NCTPP Stage III is submitted. It has been decided to use the existing ash slurry pipelines of NCTPS Stage I & II instead of constructing new pipelines. This decision was made to minimize environmental impact. NCTPP Stage III will dispose of ash slurry only in emergencies, as both fly ash and bottom ash are disposed of in dry form.
iii.	Adequacy report from Competent Authority on existing ash dyke capacity to accommodate the proposed ash slurry from stage III NCTPS shall be submitted.	The existing ash pond of NCTPS is sufficient as wet ash will be disposed of promptly to brick industries and other works. Details of the ash pond: Area: 328 acres. (133 Ha) Capacity: 57.5 lakh m^3 (at a height of 5m). Current stock: 29 lakh m^3. Remaining capacity: 28.5 lakh m^3.

13. Court cases:

A. Original Application No.122 of 2021 (SZ) with Original Application No.162 of 2021 (SZ)

The Hon'ble NGT(SZ) in Original Application No.122 of 2021 (SZ) with Original Application No.162 of 2021 (SZ) vide its judgement dated 31/01/2022 directed the proponent not to proceed with the work of laying the pipeline through the CRZ zone and also in the other area in violation of the Environment Clearance and CRZ Clearance granted to them in 20/01/2016, without getting necessary further clearances in this respect by filing afresh application in accordance with law. Besides, the Hon'ble NGT also imposed a compensation of Rs. 50 lakhs which has been paid by them to TNPCB on 30/3/2022. In compliance to the said judgment, proponent filed amendment proposal bearing No: IA/TN/THE/442379/2023 was submitted to the Ministry seeking for amendment in the EC & CRZ dated 20/01/2016 for the ash slurry pipeline for stage III project. The proposal was considered by the EAC in its meeting held on 04/09/2023 and 31/10/2023 wherein the proposal was deferred and EAC recommended for site visit by a sub-committee. During the site visit, it was informed by M/s. TANGEDCO that they have decided to utilize the existing spare lines of NCTPS Stage – I & II to reduce the environment impact. In view of this, PP informed the EAC that no new ash slurry pipelines are envisaged for the stage III project and the proposal no. IA/TN/THE/442379/2023 has already been withdrawn by the project proponent.

B. OA No 8 of 2016 titled as R.Ravimaran (Died) & Ors. vs Union of India & Ors. tagged with OA No 198 of 2016 titled as Meenava Thanthai K.R. Selvaraj Kumar vs The Chief Secretary Government of Tamil Nadu

An OA No 8 of 2016 titled as R.Ravimaran (Died) & Ors. vs Union of India & Ors. tagged with OA No 198 of 2016 titled as Meenava Thanthai K.R. Selvaraj Kumar vs The Chief Secretary Government of Tamil Nadu, Chennai & Ors. was filed before the Hon'ble Tribunal (SZ), Chennai regarding illegal dumping of ash slurry and violation of conditions of Environmental Clearance and CRZ Clearance granted by dumping fly ash and draining the wastewater into the Buckingham Canal and Kosasthalaiyar River respectively. In this regard, the Hon'ble Tribunal vide its judgment dated 05/07/2022 passed the following directions for compliance by the PP:

i. To carry on their activities strictly in accordance with law and complying with the conditions imposed in the

Environmental Clearance and the Consent granted by the State Pollution Control Board.

ii. To replace the old ash slurry carrying pipes as undertaken by them within the time frame fixed and also take all necessary precautions of providing necessary sensor system to detect the leak immediately and also the mechanism by which production and pumping of ash slurry through the damaged pipeline can be stopped immediately, so that further pumping can be avoided so as to minimize the leak if at all if it happens in future.

iii. To pay the compensation already assessed by the State Pollution Control Board on various occasions for the violations noticed by them and also compensation directed to be paid by this Tribunal in other related connected matters viz., Original Application Nos.122 of 2021 (SZ) and 162 of 2021 (SZ) which were already disposed of this Tribunal by giving certain directions.

iv. To pay environmental compensation which is likely to be assessed on the basis of the study to be conducted by the agency which is going to conduct study for remediation process, apart from the compensation already imposed by various proceedings of the Tamil Nadu Pollution Control Board and directed to be paid by this Tribunal.

v. To bear the expenses for conducting the study through the agency to be identified for preparation of DPR and also the expenses for remediation.

vi. To undertake the remediation process and complete the same at the earliest possible time, as delay in implementation will result in further damage to the environment.

vii. To carry out the recommendations made by the Joint Expert Committee regarding creating green cover, including plantation of mangroves and other species suggested which are conducive to environment and that will not affect the riverine and coastal zone ecology.

viii. To take immediate steps to remove the fly ash already deposited in that area due to the breach of fly ash slurry carrying pipes without delay and after removal of the same, soil analysis will have to be conducted by the CPCB and SPCB and if further remediation will have to be conducted or further steps are required for removal of further fly ash deposit found in that area, then that also will have to be carried out by the PP.

On the above, the PP has informed that the compliance of the aforesaid order is under process.

Deliberations of the Committee

14. The EAC noted the following:

i. The EAC noted that the proposal is for the grant of amendment in Environmental Clearance to the project 1X800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities at Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu by M/s. Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO).

ii. The committee noted that the Environmental Clearance (EC) and Coastal Regulation Zone (CRZ) Clearance were accorded by MoEF&CC Vide File No. J-13012/14/2012-IA. II (T) dated 20th January. 2016 with use of Imported coal of 2.09 MTPA sourced through MMTC, New Delhi. The FSA/MoU for Imported coal was signed between MMTC Limited and TANGEDCO on 25th May, 2015. The Consent to Establish (CTE) issued from TNPCB Vide Order No. 170124499798 under Air (Prevention and control of Pollution) Act, 1981, as amended in 1987 and vide order No.170114499798 under Water (Prevention and control of Pollution) Act,1974, as amended in 1988 on 13th April, 2017.

iii. Now, PP has submitted the proposal for obtaining amendment in existing EC for change in fuel composition from 100% Imported coal to mixture of 50% Indian coal & 50% Imported coal in compliance of MoEF&CC OM dated 6th Dec, 2023 and previous OM dated 11th Nov, 2020.

iv. The EAC reviewed the present average ambient air quality data and observed that PM10 values were on higher side and it was noted that the proposed change in fuel composition from 100% Imported coal to mixture of 50% Indian coal &

50% Imported coal which may increase PM10 emissions in the environment. PP in this regard submitted that this is a temporary increase due to ongoing construction activities at site.

v. The EAC also added that as there is change in fuel, PP shall not ask in the future for additional ash pond and additional water requirement. Further, EAC noted that the total area of plant is 76.88 Ha of which only 18.21 Ha is a green belt area which accounts to 23.7% of the total area. Therefore, PP are advised to conduct power plantation in the upcoming monsoon season.

vi. The Committee observed that as per OM dated 11.11.2020 & 06.12.2023, proposal of PP is not falling under category (a) to (d) mentioned in para 3 of OM dated 6.12.2023 and hence required amendment in EC. Further, it has mentioned in the same OM that "All the Thermal Power Plants (including Captive Power Plants) having Prior Environmental Clearance and going in for change in the coal source other than those falling in the aforementioned category of change in coal source shall approach the Ministry for amendment in environmental clearance along with a study on additional impact assessment and revised EMP based on the change in Source of coal". The Committee observed that PP has submitted the additional impact assessment and revised EMP report of May 2024, along with this proposal.

vii. The EAC noted that PP submitted that FSA/MoU for Imported coal was signed between MMTC Limited and TANGEDCO on 25th May, 2015. No additional water will be required due to change in coal use. No additional power required due to change in coal. No additional Coal Handling Plant (CHP) will be required and the area of 8.09 Ha is available within the site for stacking of Indian as well as imported coal.

viii. PP submitted that Coal characteristics & consumption as under:

S. no.	Details	Units	Imported 100%	Imported 50% Indian 50%	Indian coal
1.	Coal consumption	TPH	280	361	442
		TPD	6720	8664	10608
		MTPA	2.09	2.69	3.29
2.	Ash	%	12	25.5	34
3.	Sulphur	%	0.80	0.65	0.55
4.	Gross Calorific Value	Kcal/kg	6000	4654	3800

Type of coal	Coal quantity (TPH)	Ash content (%)	Total Ash Quantity (TPH)	Fly Ash Quantity (TPH)	Bottom Ash Quantity (TPH)
Imported coal	280	12.0	33.60	23.52	10.08
Mixed coal (Imported 50%, Indian 50%)	361	25.5	92.06	64.44	27.62
Note: Due to change in composition of the coal, the ash quantity will increase					

ix. The committee observed that there is a increase in ash content further as per the EIA the level of pollutant are increasing and on higher side. In this regard PP submitted that-

• Particulate matter (PM): PM value: 96.49 g/m3, predicted GLC: 0.32 g/m3. Resultant GLC: 96.81 ug/m3 which is near the limits as per NAAQ standards. The max. value of PM10 120 g/m3 recorded in Ennore SEZ TPP site since the project is proposed over abandoned ash dyke. The contribution of PM from TPPs within NCTPS complex is 1.2 g/m3 and the contribution all the TPPs with 10 km radius is 1.6 g/m3. To reduce the PM emissions ESP's with an efficiency of 99.98% has been installed to limit the PM below 30 mg/Nm3.

• Sulphur dioxide (SO2): SO2 value: 25.1 g/m3 , predicted GLC: 1.08 g/m3. Resultant GLC: 26.18 g/m3 which is well with in the limits as per NAAQ standards. The contribution of SO2 from TPPs within NCTPS complex is 5.1 g/m3 and the contribution all the TPPs with 10 km radius is 7.1 g/m3. Dry FGD has been installed to meet the revised emission norms of MoEF&CC for Sulphur dioxide (SO2) i.e. 100 mg/Nm3.

• Oxides of nitrogen (NOx): NOx value: 42.6 g/m

^{3}, predicted GLC: 1.08 g/m^3. Resultant GLC is 43.68 g/m^3 which is well with in the limits as per NAAQ standards. The contribution of NOx from TPPs within NCTPS complex is 6.4 g/m^3 and the contribution all the TPPs with 10 km radius is 8.01 ug/m3. To reduce the emissions Low NOx burner will be provided. SCR will also be installed in future as per requirement to limit the NOx emission to as per MoEF&CC norms i.e. 100 mg/Nm^3.

x. The committee observed that for managing the air pollution PP has proposed that i) Dust suppression/ extraction system will be provided to mitigate the dust generated at coal conveying area, transfer points and coal stockyard, ii) Dust collection system will be provided in coal bunkers to evacuate dust and hazardous gases like methane from the coal bunkers, iii) Collected dust would be returned to either the associated belt conveyors or to the coal bunkers. The coal dust from coal transfer points would be restricted to 5 mg/Nm3, iv) 100 % dry fly ash extraction, storage and disposal facilities are proposed for utilization of 100 % fly ash. Closed trucks & containers would be used for this purpose, v) ESP with an efficiency of 99.98 % is proposed to control Particulate Matter, vi) To minimize the SO2 emissions, dry FGD system is proposed and vii)To reduce the NOX emissions, Low NOx burners has been provided whereas Selective Catalytic Reduction (SCR) system will be installed in future as per requirement.

xi. Additionally, the committee observed that for managing the ash PP has proposed that i) 100% utilization of fly ash in dry form is envisaged. Closed trucks & containers would be used for this purpose, ii) To reduce the dust nuisance while loading the ash into the open trucks from fly ash silos, the fly ash would be conditioned with water spray, iii) It is proposed to cover the ash in the open trucks with tarpaulin to prevent flying of fine ash during transportation, iv) TANGEDCO would put max efforts and ensure bottom ash utilization. 100% ash utilization will be achieved as per MoEF&CC notification dt. 3rd Nov. 2009, v) Proposed to supply entire ash to cement industries that are presently lifting fly ash from NCTPS, since there is huge demand in Tami Nadu for fly ash from thermal stations and vi) MoU between TANGEDCO & M/s. Dalmia Cement (Bharat) Limited was already made on 14th Oct. 2015 for utilization of Fly ash.

xii. The committee observed that EMP cost proposed by the PP is Rs. 1185.21 cr and recurring cost is Rs 98 Cr. The details are as under:

S. No	Particulars	100% Imported Coal		Indian Coal 50%: Imported Coal 50%		Remark
		Capital Cost (Rs. in Crores)	Recurring Cost (Rs. in Crores)	Capital Cost (Rs. in Crores)	Recurring Cost (Rs. in Crores)	
1	Dust Control System i) ESP ii) Dust suppression system for coal handling	192.00 3.50		192.0 3.50		No change
2	Chimney	88.90		88.90		
	FGD, De NOx burners etc.	0		615.0		Increased
3	Water treatment plant including clarifier, UF, RO, DM, Electrical and Instrumentation	42.24		42.24		
4	Effluent Treatment Plant	3.50		3.50		
5	Dense phase, pneumatic Ash Handling Plant including bottom ash & fly ash silos, conveying compressors and other equipment	106.56	48.0	106.56	98	No change
6	Development of Greenbelt	3.84		3.84		
7	Sewage System	1.44		1.44		
8	Chemical dosing and Chlorination Plant	9.70		9.70		
9	Pollution monitoring instruments/ equipment	14.16		14.16		
10	Other unforeseen items	14.16		14.16		
	Total	**480.0**	**48.0**	**1,185.21**	**98**	Increased

xiii. Based on the discussion held the committee recommended that in the para 3 of EC dated 20.01.2016 the phrase "The Imported Coal requirement of 2.09 MTPA will be sourced through MMTC, New Delhi" shall be read as "The coal requirement is 2.69 MTPA in the ratio of 50% Imported Coal (1.04 MTPA) and 50% Indian Coal (1.65 MTPA). Imported coal sourced through MMTC, New Delhi and Indian Coal sourced from Kalinga block of Talcher, Mahanadhi, IB Valley Coal Fields."

xiv. The Committee also noted that there are two court cases with respect to existing project of NCTPS and the proposal no. IA/TN/THE/442379/2023 of M/s. TANGEDCO has been withdrawn by the project proponent.

Recommendations of the Committee

15. The EAC after detailed deliberation on the information submitted and as presented during the meeting **recommended** the proposal for grant of amendment in Environmental Clearance dated 20th January 2016 to the project 1X800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities at Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu by **M/s. Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO)** for change in the use of Coal from 100% Imported Coal to use of Indian Coal and Imported Coal in equal proportion as mentioned at above Para 5, subject to compliance of the additional specific environmental safeguard conditions (**Annexure-I**), in addition to the conditions in the EC letter dated 20.01.2016.

Decision of MoEF&CC

16. The undersigned is directed to inform that Ministry of Environment, Forest and Climate Change has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the Expert Appraisal Committee (Thermal) hereby decided for amendment in Environment Clearance accorded by the Ministry vide F. no. J-13012/14/2012-IA.II (T) dated 20.01.2016 to the project 1X800 MW (Stage-III), North Chennai TPP and CRZ Clearance for foreshore facilities at Villages Ennur & Puzhudivakkam, Taluk Ponneri, District Thiruvallur, Tamil Nadu by **M/s. Tamil Nadu Generation & Distribution Corporation Ltd. (TANGEDCO)** for change in the use of Coal from 100% Imported Coal to use of Indian Coal and Imported Coal in equal proportion as mentioned at above **Para 5**, subject to compliance of the additional specific environmental safeguard conditions (**Annexure-I**).

17. All other terms and conditions mentioned in the EC & CRZ letter number J-13012/14/2012-IA.II (T) dated 20.01.2016 shall remain unchanged.

18. The project proponent shall obtain fresh Environment Clearance in case of change in scope of the project, if any.

19. This issues with the approval of the Competent Authority.

Yours faithfully,

(Sundar Ramanathan)
Scientist 'F'
Tel: 011- 20819378
Email- r.sundar@nic.in;

Copy To

1. The Secretary, Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi 110001.
2. The Chairman, Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi-110066.
3. Deputy Director General of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (SEZ), Ist and IInd Floor, Handloom Export Promotion Council, 34, Cathedral Garden Road, Nungambakkam, Chennai – 34.
4. Member Secretary, Central Ground Water Authority, Jamnagar House, 18/11, Man Singh Road Area, New Delhi, Delhi 110001

5. Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai- 600 032, Tamil Nadu.
6. The District Collector, Thiruvallur, State Government of Tamil Nadu.
7. Guard file/Monitoring file/PARIVESH Portal

Annexure 1

Specific EC Conditions for (Thermal Power Plants)

1. Additional Specific Condition

S. No	EC Conditions
1.1	Project proponent shall comply with all the directions passed by the Hon'ble National Green Tribunal vide its judgement dated 05/07/2022 in OA No 8 of 2016 titled as R.Ravimaran (Died) & Ors. vs Union of India & Ors. tagged with OA No 198 of 2016 titled as Meenava Thanthai K.R. Selvaraj Kumar vs The Chief Secretary Government of Tamil Nadu, Chennai & Ors. Compliance status in this regard shall be submitted to the concerned Regional Office of the MoEF&CC along with the six monthly compliance report.
1.2	PP shall obtain the amendment in CTO from SPCB as applicable in the instant case for the proposed amendments
1.3	PP shall implement the protective measures proposed in EMP in a time-bound manner. The budget earmarked for the same is Rs 1,185.21crores (Capital) and Rs 98 crores(recurring) and should be kept in separate accounts and audited annually. The implantation status along with the amount spent with documentary proof shall be submitted to the concerned Regional Office for the activities carried out during the previous year.
1.4	Regular monitoring of Fly Ash Pond shall be carried out and inspection should be done to avoid any chance of failure of bunds or leakage from the Ash Pond. The Pipe line carrying the fly ash shall also be inspected for any leakage at regular intervals. In case of any leakage immediate corrective measures needs to be taken and concerned authorities shall be informed. PP shall also keep a record of inspection.
1.5	Fly ash handling shall be done strictly as per extent rules/regulations of the Ministry/CPCB issued from time to time including Ministry's Notification No. S.O.5481(E) dated 31st December, 2021. No coal shall be transported through road shall be allowed.
1.6	The transportation of Ash from the Thermal Power Plant to other Industries (Cement/brick) shall be through closed bulkers only.
1.7	Water Sprinkling on roads shall be done in at regular interval on the roads atleast within 1 km range approaching the plant. A logbook shall be maintained for the activity and be in six monthly compliance report.
1.8	PP shall ensure that roads for transportation shall be maintained and keep in good condition to avoid fugitive emissions.
1.9	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.
1.10	PP shall provide regular health monitoring services and health services free of cost to people living

S. No	EC Conditions
	in 10 km radius.
1.11	PP shall establish an Environment Management Cell and ensure to engage sufficient staff having environment related qualification for its smooth its functioning.
1.12	Environment Audit of plant shall be done annually and report shall be submitted to Regional office of the Ministry.
1.13	Use of Diesel operated transportation vehicles shall be avoided as far as possible and BS-VI complaint vehicle shall be purchased and preference shall be given to EV/CNG/LNG based trucks for transportation raw materials, coal and disposal. Change to EV/CNG/LNG be done in a time bound manner.
1.14	PP shall ensure that all types of plastic waste generated from the plant shall be stored separately in isolated area and disposed of strictly adhering to the Plastic Waste Management Rules 2016 (as amended). In pursuant to the Ministry's OM dated 18/07/2022 PP shall also create awareness among the people working in the project area as well as in its surrounding area on the ban on Single Use Plastic(SUP) in order to ensure compliance of Ministry's Notification published by the Ministry on 12/08/2021. A report along with photograph on the measures taken shall also be included in the six monthly compliance report being submitted by PP.
1.15	Monitoring for heavy metals and fluoride in ground water and surface water shall be undertaken along with the regular monitoring and results/findings submitted along with half yearly monitoring report.
1.16	PP is advised to implement the 'Ek Ped Maa Ke Naam' Campaign which was launched on 5th June 2024 on the occasion of the World Environment Day to increase the forest cover across the Country. This plantation drive is other than Green belt development. An action plan in this regard shall be submitted to the concerned Regional Office of the Ministry.

Signature Not Verified

Digitally Signed by : Sundar Ramanathan
Member Secretary, MoEFCC (EC)

Date: 08/03/2025