MAHAGENCO
Maharashtra State Power Generation Co. LTD
CIN: U40100MH2005SGC153648
(A GOVERNMENT OF MAHARASHTRA UNDERTAKING)

CHANDRAPUR SUPER THERMAL POWER STATION
MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED
(ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 & ISO 50001:2018)
Office of: Chief Engineer, C.S.T.P.S. Urjanagar, Chandrapur – 442404
Phone: 07172 - 220155 to 220159 Fax: 07172 - 220203
Email: cegenchandrapur@mahagenco.in

CHN/Env/MoEF&CC/ 000271 Date: 30 JAN 2025

To
The Additional Principal Chief Conservator of Forests,
Ministry of Environment, Forest & Climate Change (WCZ)
Ground floor, East Wing, "New Secretary building"
Civil line Nagpur-440001

Email: eccompliance-mh@gov.in

Sub: - Submission of Six Monthly Compliance Reports of Environmental Clearances (EC) of CSTPS, Chandrapur.

Ref: - 1. CTO renewal application vide UAN No. MPCB-CONSENT-0000205221 dated 02.04.2024.
2. MPCB CONSENT vide UAN No.0000163955/CR/2307001126 dated 18.07.2023.
3. TO letter CHN/Env/MoEF&CC/002362 dated 25.07.2022
4. EC letter No. J- 13011/ 53 / 2008- IA.II (T) dated 15.06.2018.
5. EC letter No. J- 13011/ 53 / 2008- IA.II (T) dated 31.03.2016.
6. EC letter No. J- 13011 / 53 /2008- IA.II (T) dated 30.01.2009.
7. CTE No. BO/RO (P&P)/CC-485 dated 30.12.2008
8. EC letter No. J- 13011 / 15 / 87- IA.II (T) dated 03.07.1990.

Dear Sir,

With reference to subject, please find enclosed herewith the Six Monthly Compliance Reports of Environmental Clearances for the period **July-2024 to December-2024** pertain to Chandrapur Super Thermal Power Station, Chandrapur. The report comprises-

1. Environment Clearance Conditions
2. Stack Emission Measurement for July-2024 to December-2024
3. Ambient Air Quality Monitoring for July-2024 to December-2024
4. Fugitive Dust Emission for July-2024 to December-2024
5. Effluent Quality for July-2024 to December-2024
6. Ash Generation & its Utilization for July-2024 to December-2024
7. Noise Monitoring for July-2024 to December-2024
8. Ground water and soil Quality Report for July-2024 & October-2024
9. Surface water analysis Report for July-2024 to December-2024
10. Study of radioactivity & heavy metals in coal and ash
11. Environment Statement 2023-24 and Plantation report 2023-24
12. Coal ash & sulphur analysis report July-2024 to December-2024

Thanking you

Yours faithfully

05/2/25
Sr. Clerk
Regional Officer
M.P.C. Board,
Chandrapur

Chief Engineer (O&M)
CSTPS, Chandrapur

Encl.: As above.

Copy s.w. r. to:
1. The Executive Director (O&M-II/E&S), MSPGCL, Mumbai.
2. The Divisional Head-IPC-II, CPCB, Delhi.
3. Regional Officer MPCB, Chandrapur
4. Sub-Regional Officer MPCB, Chandrapur

SIX MONTHLY COMPLIANCE REPORTS

OF

ENVIRONMENTAL CLEARANCES (EC)

2920 MW (2x210+5x500) THERMAL POWER PLANT

AT

CHANDRAPUR, DISTRICT CHANDRAPUR

MAHARASHTRA

Submitted to:

Ministry of Environment, Forest & Climate Change

Central Pollution Control Board, New Delhi &

Maharashtra Pollution Control Board, Mumbai

Submitted By:

Chandrapur Super Thermal Power Station,

Chandrapur-442404, Maharashtra.

(July-2024 to December-2024)

CONTENTS

1.0 Introduction

Chandrapur Super Thermal Power Station, Chandrapur is coal based Thermal Power Plant having installed capacity 2920(2x210 +5x500) MW.

The plant site is located at Urjanagar, 10 Km away from Chandrapur city. The total factory area is 11237.05 hectare and 1117 hectare open space is available for plantation. The villages Kachrala, Gunjala, Tadali, Kawathi, Tirvanja, Chhota Nagpur, Ambhora, Khairgaon, Chargaon along with western coal field Bhatadi, Durgapur and Padmapur surrounds the plant site.

CSTPS has been granted Environmental Clearances from Ministry of Environment & Forest, Consent to Establish and Consent to Operate from Maharashtra Pollution Control Board. As of the compliance of statutory requirement, environmental quality monitoring is being done regularly at locations suggested by Regional Officer, MPCB, Chandrapur. Four numbers of Continuous Ambient Air Quality Monitoring Station have been installed at four different locations inside the plant boundary as per wind rose and suggested by RO, MPCB, Chandrapur. Also, environmental monitoring & analysis is being carried out by MoEF & CC recognized laboratory M/s. Mahabal Enviro engineers Pvt Ltd. & NABL accredited M/s. JP Associates & laboratories.

Pointwise compliance status of Environmental clearance for Chandrapur Super Thermal Power Station, Chandrapur is furnished herewith.

Compliance Status of Environmental clearance

Unit No – 7: 1x500 MW

Letter from Additional Director, MoEF Bhopal No. 4-9/92(ENV)/589 dated 24.03.2009.

MoEF New Delhi Environmental clearance Letter No. J-13011/15/87-I/(II) dated 03-07-1990.

Sr No.	EC Conditions	Compliance Status
(i)	Electrostatic precipitators having an operational efficiency of not less than 99.6% should be installed so as to ensure that particular emission are not exceeding 150 mg per cubic meter.	**Complied**. PP has installed Electrostatic precipitators (ESP) for Unit – 7 with efficiency of 99.88 %. The design of ESP for particulate emission is 150 mg/Nm^3. Also, an Ammonia flue gas conditioning system (AFGCS) was used along with ESP to reduce PM to 100 mg/Nm^3. These ESP's are regularly operated and maintained to achieve the prescribed norms
(ii)	Multi flue stack of not less than 275 meters height should be provided.	**Complied.** PP has provided a mono flue stack having a height of 275 meters, as this EC condition is only for a single unit, i.e., 1 x 500 MW.
(iii)	The plant will put up flue gas de-sulphuration unit as part of unit – 7 since the ground level concentration of SO_2 and NO_x will beyond standard prescribed.	**Being Complied.** The retendering of is installation of flue gas de-sulphuration (FGD work is in process. To control NOx emissions, PP has provided an Over Fire Air (OFA) system to unit No. 3 to 9.
(iv)	The temperature of cooling water discharged to the reservoir should not exceed 5.0°C above ambient temperature.	**Complied.** PP has provided induced draft cooling tower (IDCT) for units 3 to unit 7, where cooling water is re-circulated in a closed loop, and there is no discharge of cooling water in natural water bodies. The cooling water temperature is within range in a complete cycle. Further, cooling water blow down is treated at ETP-II, and treated water is reused for ash slurry disposal to ash bund.
(v)	The bleed off from the boiler house, from cooling towers, effluent from DM plant will be fully treated and reused so that there is no effluent discharge to the river.	**Complied.** All the effluents from power plant are treated at Effluent Treatment Plant. There is no discharge in river. The capacities of 4 ETP's are: ETP-I 1600 M^3/hr ETP – II 500 M^3/hr ETP – III 100 M^3/hr ETP - lV 675 m3/hr

(vi)	Effluent from ash pond shall be totally recirculated within the plant.	**Complied.** Ash water recovery system is operational at ash bund. Ash water recovery reused and re-circulated for ash slurry disposal to ash pond.
(vii)	Adequate number of air and water quality, including ground water, monitoring stations will be set up at different locations in and around the plant. The location of these monitoring stations should be selected in consultation with state pollution control board, India meteorological department. The monitored data on air and water quality should be furnished to these ministries and state pollution control board once in three months.	**Complied** 1) Ambient Air Quality Monitoring & fugitive dust emission monitoring is carried out at different locations in and around power station (Annexure-I). 2) Ground water quality & soil quality from 14 locations selected in consultation with state pollution control board around power station and ash bund area is monitored in all 3 seasons to assess the impact please see (Annexure - II). 3) The effluent analysis of all 4 ETP's, Boiler blow down, Cooling Tower pond blow down, DM plant waste and Ash bund is regularly analyzed from MoEF recognized agency (Annexure - III). All the industrial effluents are treated in effluent treatment plants (ETPs) and treated water is reused for Ash slurry disposal to ash bund.
(viii)	The stack will be provided with automatic monitoring instrument for measuring and recording SO2 and NOx..	**Complied** PP has installed online SO2 and NOx monitoring analyzers (OCEMS) & same is connected to the CPCB server & MPCB server.
(ix)	Adequate measures for control of noise due to various operations within different plant units should be taken. The noise levels should confirm to standards prescribed by ministry under the Environment (Protection) Act.	**Complied**. PP has taken Adequate measures for control of noise level of various plant auxiliary units and all necessary precautions have also been taken to maintain noise level. The noise level measurement for ambient noise and workplace noise is regularly monitored (by M/s Mahabal Enviro Engineers Pvt. Ltd.) (Annexure - IV).
(x)	Precautionary measures for control of fire and explosion hazards arising due to transportation, use of storage of coal and oil should be taken.	**Complied**. PP has dedicated fire services Section. Separately, PP has installed Fire alarms, fire hydrants & spray systems. All adequate measures are available for control of fire & explosion hazardous arising due to transportation, use & storage of coal and oil.

(xi)	A green belt development plan covering the entire area of the west bank thermal power station should be prepared and submitted to this ministry within 6 months time. The plant species selected should be native to the area and they should given maximum green cover. The species so selected should be sensitive as well as resistant varieties to emission SO2.	**Complied**. It is observed that PP has carried out tree plantation in and around power station. The area covered under green belt is 49.50% of open area. The present status is (Annexure- V) as below: Total Plant area: 11237.05 Hectare. Open Space available for Plantation:-1117 Hectare. Total area under tree plantation:-552.88 Hectare. Total Tree Plantation: 1326246 Nos. (including bamboo plants) Plant species such as; Acacia nilotica (babul), Lencaena Lencoephala (subabul), Shivan, Sisam, Ponogamiapinnata (karanj), Casia, Gulmohar, Petraform, Banyan, Encalyptus (Nilgiri), Neem, Albirralebback (Sirus), Neriumindicum, Jambolana, Ocimumbasiticum (Tulsi), bamboo species which are resistance to dust & gases are observed.
(xii)	They should carry out regular monitoring of flora and fauna, fisheries and bottom sediments of the reservoir to monitor the impact of any discharges from the thermal power station.	Complied Power station effluents are not discharged to any natural source. CSTPS, Chandrapur has ETPs where plant effluents are treated. Treated effluents are utilized for ash disposal to ash bund. PP has initiated an environmental assessment study to evaluate the impact of Chandrapur thermal power plant and mining activity of WCL on the Tadoba Andhari Tiger Project. A joint study is conducted by NEERI and Wll since 2020. The study is in process and PP is anticipating final report by August, 2025. (Annexure-Vl).
(xiii)	Protective and control measures in coal transportation areas and the conveyor belts system should be taken to minimize the coal dust pollution in these zones.	**Complied** Coal that is transported through trucks/wagons is covered with tarpaulin. Necessary protective and control measures for reduction and control of dust in Coal Handling Plant area are carried out. Dust Extraction, Dust Suppression system, water spraying system at conveyers and crushing section, fogger system at wagon tippler, water spraying at coal stack yard, cladding to all conveyer belts etc. are provided (Annexure-VlI).

EC letter No. J- 13011/ 53 / 2008- IA.II (T) dated 15.06.2018.
EC letter No. J- 13011/ 53 / 2008- IA.II (T) dated 31.03.2016.
EC letter No. J- 13011 / 53 /2008- IA.II (T) dated 30.01.2009.

EC Cond No.	EC Conditions	Compliance Status
(i)	No additional land shall be acquired for any activity/facility of this project	**Complied** PP has not acquired any additional land for any activity/facility of current project.
(ii)	Sulphur and ash contents in the coal to be used in the project shall not exceed 0.4% and 34% respectively at any given time.	**Complied** PP is not using high content sulfur coal.
(iii)	A bi-flue stack of 275 m height shall be provided with continuous online monitoring equipments for SOx, NOx and Particulate. Exit velocity of flue gases shall not be less than 22 m/sec.	**Complied** PP has provided a bi-flue stack of 275 m height for units 8 & and 9 with continuous online monitoring equipment for SO2, NOx, and Particulate matters & are connected to the MPCB/CPCB server. Exit velocity of flue gas are as per EC conditions.
(iv)	High efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm3	**Complied** PP has installed 72 ESP fields for each unit 8 & unit 9 with efficiency of 99.99% and installation work is completed in 2016.
(v)	Space provision shall be kept for retrofitting of FGD, if required at a later date.	**Complied** PP has provision of space for retrofitting/installation of FGD.
(vi)	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.	**Complied** PP has provided dry ash silos, dry dust extraction/suppression systems to unit 8 & unit 9. 02 out of 02 dry ash silo with Bag filters is in operation. 02 out of 02 HSCD ash silo construction, bag filter & vent blower erection completed in 2016 and system is in operation. The work of Dust Extraction system at Crusher House and bunkers area is completed and observed to be is in operation since 2016. Dry fog dust suppression system provided in wagon tippler area.

(vii)	Fly ash shall be collected in dry form and storage facility (silos) shall be provided, 100% fly ash utilization shall be ensured from day one. Unutilized fly ash, in emergency and bottom ash shall be disposed of in the ash pond in the form of slurry.	**Being Complied** Dry ash silo (02) established to collect dry ash for further utilization, unutilized fly ash and bottom ash are disposed off in the ash pond in the form of slurry with recirculation of ash water. Monthly ash generation & utilization report is enclosed (Annexure-VIII).
(viii)	Existing ash pond shall be for disposal of bottom ash. No ash pond shall be created for this expansion project.	**Complied** PP has not created any additional/separate ash pond for units 8 & 9. The existing ash pond is found to be sufficient for the disposal of bottom ash.
(ix)	Closed cycle cooling system with cooling towers shall be provided. COC of at least 6 shall be adopted and the effluent shall be treated as per the prescribed norms.	**Complied** PP has provided Natural draft cooling towers (NDCT) with a closed-water circulation system. The Cycle of Concentration (COC) is maintained as per prescribed norms. Generated blowdown effluents from the NDCT pond are treated in ETP IV and reused for ash slurry preparation.
(x)	The treated effluents conforming to the prescribed standards shall be re-circulated and reused within the plant. Arrangements shall be made that effluents and storm water do not get mixed.	**Complied** PP has installed a single ETP IV with a capacity of 675 m^3/hr catering to both Unit no.8 & 9. All the effluent treated adequately in the ETP and treated water is being reused within the plant for ash slurry disposal to the ash bund. Hence, there are no mixing plant effluents with storm water. PP has adopted a "**Zero Liquid Discharge Policy**".
(xi)	A sewage treatment plant shall be provided and the treated sewage shall be used for raising greenbelt/plantation.	**Complied** PP has provided 2 STPs with capacities of 240 m3/hour for residential colony (installed and in operation from 1986) and 1 m3/hour for unit 8 & unit 9 (installed and in operation from 2016) where sewage effluents are treated & recovered and utilizing for ash slurry disposal, gardening and plantation.
(xii)	Rainwater harvesting should be adopted. Central Groundwater Authority/ Board shall be consulted for finalization of appropriate rainwater harvesting technology within a period of three months from the date of clearance and details shall	**Complied** Total three numbers of Trapezoidal section of open bottom settling tanks/open recharge basin namely 1) RB-1- 35mx35mx3.5m

	be furnished.	2) RB-2- 35mx35mx3.5m 3) RB-3- 25mx25mx3.5m
(xiii)	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 at Bhopal.	**Complied** Ventilation system, Dust suppression system, water sprinkler system, Dry fog system and rain gun are being provided wherever required. Fire hydrant system is provided in coal stack yard and Water spray system is provided in conveyers, crusher house.
(xiv)	Storage facilities for auxiliary liquid fuel such as LDO and HFO/LSHS shall be made in the plant area where risk is minimum to the storage facilities. Disaster Management Plan shall be prepared to meet any eventually in case of an accident taking place, Mock drills shall be conducted regularly and based on the same, modifications required, if any shall be incorporated in the DMP, Sulphur content in the liquid fuel will not exceed 0.5%.	**Complied** PP has provided storage facilities for LDO/HFO located considering minimum risk. Mock Drills is conducted regularly and based on the feedback of the same, modiflcation if required, if any, shall be done. HFO/ LDO storage tank work is completed Disaster management plan is prepared (Annexure-IX).
(xv)	Regular monitoring of ground water including heavy metals (Hg, Cr, As and Pb) in and around the ash pond area shall be carried out, records maintained and six monthly reports shall be furnished to the Regional Office of this Ministry.	**Complied** PP has given work to M/s. Mahabal Enviro Engineers Pvt. Ltd. for regularly monitoring of groundwater, including heavy metals, from in and out around the ash pond area. Monitoring results submitted with six monthly reports to the Regional Officer, MPCB, and MoEF regularly. Reports are available on company's website.
(xvi)	A green belt of adequate width and density shall be developed around the plant periphery covering 34 acres of area preferably with local species.	**Complied** CSTPS has carried out massive tree plantation in and around power station. The area covered under green belt is 49.50% of open area. (Annexure – V).
(xvii)	Adequate funds shall be allocated for undertaking CSR activities.	**Being Complied**
(xviii)	First aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.	**Complied** During the construction phase, PP provided first aid and sanitation arrangements for the drivers and other contract workers. The construction phase has been completed; therefore, it is not required.
(xix)	Noise levels emanating from turbines shall	**Complied**

	be so controlled such that the noise in the work zone shall be limited to 75 db (A). 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.	PP has provided acoustic enclosures in the high noise area, including the D.G. Set, compressed air system, and turbine. Protective equipment like ear plugs has been provided. PP carried out periodic health check-ups, including audiometry tests for all employees. (Annexure-X)
(xx)	Regular monitoring of the ambient air quality in the impact zone shall be carried out and records maintained. In case the air quality levels exceed the prescribed standards, necessary corrective measures, shall be taken	**Complied** PP is carrying out regular monitoring of Ambient Air Quality by third party NABL Accredited consultant /MOEFCC reorganize agency (M/s. Mahabal Enviro Engineers Pvt. Ltd.) Please see (Annexure-I)
(xxi)	Regular monitoring of ground level concentration of SO2, NOx, SPM and RSPM 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 date shall also be put on the website of the company.	**Complied** PP is carrying out regular monitoring of ground level concentration of SO_2, NOx, SPM and RSPM in the Impact zone decided in consultation with SPCB and records are available with PP (Annexure-XI). Periodic reports are submitted to the Regional Office of this Ministry & MPCB.
(xxii)	A detailed plan for health monitoring in the area within the impact zone shall be prepared and implemented along with local administration. The plan should, besides others, also provide for monitoring of respiratory disorders. The plan should be submitted within 3 months to this Ministry and its Regional Office at Bhopal.	**Complied** Health Monitoring camp were arranged recently on 06.06.2024 for residents of Urjangar colony & nearby villages like Durgapur, Khairgaon, Ambhora at Snehbandh Sabhagruh, Urja Nagar, Chadrapur. Details of health camp & photographs are attached Please see (Annexure-XII).
(xxiii)	Provision shall be made for the housing of construction labour 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.	**Complied** PP has fulfilled the required conditions during construction phase of project. Now the project construction work is completed & handed over to O&M, hence it is not required.

(xxiv)	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	**Complied**
(xxv)	A separate environment management cell with qualified staff shall be set up for implementation of the stipulated Environmental safeguards.	**Complied** A separate environment management cell with qualified staff is already formed at CSTPS for implementation of the stipulated Environmental safeguards.
(xxvi)	Half yearly report on the status implementation of the stipulated conditions and environmental safeguards shall be submitted to his Ministry/ Regional Office/CPCB/SPCB.	**Complied** Report is submitted to Ministry/ Regional Office/CPCB/SPCB.
(xxvii)	Regional Office of the Ministry of Environment & Forests located at Bhopal 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 upload the compliance status in their website and update the same from time to time. Criteria pollutant levels (stack and ambient levels) will be displayed at the main gate of the power plant.	**Complied** Compliance status is submitted to MoEF, Regional office, Nagpur. Criteria pollutant levels (stack and ambient levels) are displayed at the main gate of the power plant. Please see (Annexure-XIII).
(xxviii)	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	**Complied** Separate funds are allocated for implementation of environmental protection measures. The year-wise expenditure is regularly reported to SPCB. Please see (Annexure-XIV).

	be reported to the Ministry.	
(xxix)	The project authority 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.	**Complied**
(xxx)	Full cooperation shall be extended to the Scientists/Officers from the Ministry/ Regional Office of the Ministry at Bhopal / the CPCB/the SPCB who would be monitoring the compliance of environmental status.	**Complied** CSTPS, Chandrapur gives full cooperation to the Scientists/Officers from the statutory bodies that would be monitoring the compliance of environmental status.
Conditions as per EC letter No. J- 13011/53/2008-IA.II(T) dated 31.03.2016		
(xxxi)	The action plan formulated by CPCB and SPCB for the Critically Polluted Area (CPA) of Chandrapur shall be strictly compiled.	**Complied**
(xxxii)	The standards stipulated by the Ministry vide Notification dated 07.12.2015 for Thermal Power Plants shall be duly compiled.	**Being Complied** CSTPS, Chandrapur compiles all the standards stipulated by the Ministry vide Notification dated 07.12.2015 & amended notification dated 05.09.2022 and Timeline for FGD installation as per MoEF&CC notification dated 30.12.2024 for Thermal Power Plants. The retendering of is installation of flue gas de-sulphuration (FGD work is in process. .
(xxxiii)	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.	**Complied** PP has already operating a 5 MW solar power plant. The status of the proposed ground-mounted solar power generation project is as; *65 MW Lakhmapur area:- Fencing work is in process, and about 60% of fencing work is completed. The board resolution for procurement/installation of the solar panel has been passed, and LoA will be placed soon. *145 MW Kachrala & Gunjala area:-LoA for fencing work is issued, and work started from October 2024. *The 105 MW floating solar power plant at Erai Dam is in the re-tendering process.
(xxxiv)	A long term study of radio activity and heavy metals contents on coal to be used shall be carried out through a reputed	**Complied** PP is regularly carrying out the radioactivity

	institute and results thereof analyzed every two year and reported along with monitoring reports. Thereafter mechanism for an in-built continuous monitoring for radioactivity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.	analysis & heavy metals analysis of Coal, fly ash & bottom ash from the Radio analytical laboratory BARC, Mumbai & M/s. Mahabal Enviro Engineers Pvt. Ltd. respectively. Please see (Annexure-XV).
(xxxv)	Fugitive emission shall be controlled to prevent impact on agricultural or non-agricultural land. In case of any proven damage to agricultural land/ crop, necessary compensation shall be paid by the PP.	**Complied** PP has provided rain guns in the coal stack yard, a water sprinkler at the wagon tippler, and a transfer point at the coal conveyor belt to control the fugitive dust emission. (Photograph attached) Please see (Annexure-XVI).
(xxxvi)	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.	**Complied** Surface water sample is daily collected from plant premises as well as plant periphery & sample is analyzed from recognized laboratory. Report is attached Please see (Annexure-XVII).
(xxxvii)	No water bodies including natural drainage system in the area shall be disturbed due to activities associated with setting up / operation of the plant.	**Complied** PP has adopted "Zero Liquid Discharge Policy", all effluent generated are treated in ETP. Treated effluent is reused for ash disposal to ash bund.
(xxxviii)	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.	**Complied** No mine void filling is undertaken as an option for ash utilization; However, Ash is utilized for cement/brick manufacturing & road construction purpose.
(xxxix)	Green belt shall also be developed around the ash pond over and above the Green Belt around the plant boundary.	**Complied** Green belt around ash pond: PP planted 82500 plants in the year 2018-2020 around the ash bund atea.

		PP has carried out tree plantation in and around the power station. The area covered under the green belt is 49.50% of the open area.
(xl)	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.	**Being Complied**
(xli)	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.	**Complied** PP has formed a CSR committee for proper and periodic monitoring of CSR activities which comprised of following members at corporate level: • Chairman and Managing Director • Executive Directors • Directors • Chief Industry Relations Officer
(xlii)	An Environment 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.	**Complied** A separate environment management cell with qualified staff is already formed at CSTPS for implementation of the stipulated Environmental regulations and social impact improvement/ mitigation measures.
(xliii)	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.	**Complied** PP have established a separate ISO cell to ensuring adherence environment management system policy ISO 14001:2015 along with ISO 9001:2015, ISO 45001:2018 & ISO 15001:2018, under Integrated Management System. Please see (Annexure-XVIII).

Conditions as per EC letter No. J- 13011/53/2008-IA.II (T) dated 15.06.2018		
i	Construction of pillars in the water bodies (Rivers & Nallahs) shall be carried out in the dry seasons only.	**Complied** Construction of pillars in the water bodies Erai river was carried out in the dry seasons & completed in 2020.
ii	Dust suppression system such as mist/dry fog jet sprinklers to be set up at the transfer points to arrest the fugitive dust emissions.	**Complied** The PP has provided the following dust suppression/ dust extraction systems at both the end of the closed pipe conveyor belt system and are found to be operational.(Annexure-XIX). Medium velocity spray system (MVSS) 1 .Equipmenl Belt Conveyor-1 (BC-l) Location- Tail end & Head end side 2. Equipmenl BC-2 Location- Tail end & Head end side 3. Equipment- Pipe conveyor Location- Tail end & Head end side 4. Equipment- BC-3 Location- Tail end & Head end side 5. Equipment- APron feeder Location- Discharge chute High-velocity spray system (HVSS) Area - wagon loading system 1 . Wagon loading station-(WLS-1) 2. WLS-2 3. WLS-3
iii	For every tree cut along the proposed route in the non-forest area, guidelines of Forest (Conservation) Act, 1980 shall be followed in consultation with the local State Forest department.	**Complied**
iv	Noise level shall be in accordance with the Noise Pollution Rule.	**Complied**

SIX MONTHLY ENVIRONMENTAL MONITORING REPORT

FOR

The Period of July-2024 to December-2024

Of

Chandrapur Super Thermal Power Station

Chandrapur

Urja Nagar, Chandrapur-442404

ANNEXURE-I

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR.

For the period of **July-2024 to December-2024**

MONTHLY AVERAGE AMBIENT AIR QUALITY MONITORING REPORT

Location	Parameters	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24
Location No.1 (Major Store Adm. Bldg.)	$PM_{2.5}$ (µg/M^3) (60)	27.50	36.50	33.63	35.50	36.25	34.63
	PM_{10} (µg/M^3)(100)	82.00	91.25	84.38	88.88	91.88	87.50
	SO_2 (µg/M^3)(80)	22.75	28.10	26.63	36.84	38.09	35.93
	NOx (µg/M^3)(80)	34.50	40.04	36.59	43.64	47.41	41.70
	Ozone (µg/ M^3)(180)	BQL	BQL	BQL	BQL	BQL	BQL
	Lead (µg/M^3)(1.0)	BQL	BQL	BQL	BQL	BQL	BQL
	CO (mg/ M^3)(4.0)	1.08	1.22	1.04	1.04	1.15	0.99
	NH_3 (µg/ M^3)(400)	29.50	32.25	30.50	31.50	30.25	30.50
	Benzene (µg/ M^3) (5.0)	BQL	BQL	BQL	BQL	BQL	BQL
	BaP (ng/ M^3)(1.0)	BQL	BQL	BQL	BQL	BQL	BQL
	Arsenic (ng/ M^3)(6.0)	BQL	BQL	BQL	BQL	BQL	BQL
	Nickel (ng/ M^3)(20.0)	BQL	BQL	BQL	BQL	BQL	BQL
Location No.2 (Colony E/M Office)	$PM_{2.5}$ (µg/M^3) (60)	18.00	21.88	18.38	17.25	23.50	19.63
	PM_{10} (µg/M^3)(100)	66.00	70.13	59.00	55.00	68.13	61.50
	SO_2 (µg/M^3)(80)	18.95	19.23	17.18	21.65	24.03	21.96
	NOx (µg/M^3)(80)	28.45	29.91	27.56	28.16	29.83	31.63
	Ozone (µg/ M^3)(180)	BQL	BQL	BQL	BQL	BQL	BQL
	Lead (µg/M^3)(1.0)	BQL	BQL	BQL	BQL	BQL	BQL
	CO (mg/ M^3)(4.0)	0.65	0.74	0.65	0.70	0.75	0.71
	NH_3 (µg/ M^3)(400)	23.50	24.50	23.13	24.50	25.38	26.13
	Benzene (µg/ M^3) (5.0)	BQL	BQL	BQL	BQL	BQL	BQL
	BaP (ng/ M^3)(1.0)	BQL	BQL	BQL	BQL	BQL	BQL
	Arsenic (ng/ M^3)(6.0)	BQL	BQL	BQL	BQL	BQL	BQL
	Nickel (ng/ M^3)(20.0)	BQL	BQL	BQL	BQL	BQL	BQL
Location No.3 (Chummery)	$PM_{2.5}$ (µg/M^3) (60)	21.00	20.50	21.63	23.88	24.50	23.00
	PM_{10} (µg/M^3)(100)	73.00	78.00	65.50	67.13	67.50	70.38
	SO_2 (µg/M^3)(80)	20.55	24.91	20.06	24.96	25.73	23.10
	NOx (µg/M^3)(80)	31.05	32.08	29.79	31.48	32.65	34.15
	Ozone (µg/ M^3)(180)	BQL	BQL	BQL	BQL	BQL	BQL
	Lead (µg/M^3)(1.0)	BQL	BQL	BQL	BQL	BQL	BQL
	CO (mg/ M^3)(4.0)	1.03	1.09	0.93	0.95	1.03	0.93
	NH_3 (µg/ M^3)(400)	26.00	27.50	27.25	29.50	28.50	28.25
	Benzene (µg/ M^3) (5.0)	BQL	BQL	BQL	BQL	BQL	BQL
	BaP (ng/ M^3)(1.0)	BQL	BQL	BQL	BQL	BQL	BQL
	Arsenic (ng/ M^3)(6.0)	BQL	BQL	BQL	BQL	BQL	BQL
	Nickel (ng/ M^3)(20.0)	BQL	BQL	BQL	BQL	BQL	BQL

Note: - ND = Not Detectable, BQL=Below Quantification Limit.

Analysis carried out by MOEF&CC recognized laboratory i.e. M/s. Mahabal Enviro Engineers Pvt Ltd.

ANNEXURE-I

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR.

For the period of **July-2024 to December-2024**

MONTHLY AVERAGE AMBIENT AIR QUALITY MONITORING REPORT

Location	Parameters	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24
Location No.4 (Railway Cabin U # 8 & 9.)	$PM_{2.5}$ (µg/M^3) (60)	23.50	30.75	28.88	28.38	23.63	30.50
	PM_{10} (µg/M^3)(100)	79.00	84.00	77.63	82.63	79.75	78.75
	SO_2 (µg/M^3)(80)	22.75	25.09	22.40	34.18	34.45	30.96
	NOx (µg/M^3)(80)	32.80	38.99	34.28	40.93	39.60	38.59
	Ozone (µg/ M^3)(180)	BQL	BQL	BQL	BQL	BQL	BQL
	Lead (µg/M^3)(1.0)	BQL	BQL	BQL	BQL	BQL	BQL
	CO (mg/ M^3)(4.0)	0.90	0.99	0.91	0.90	1.01	0.82
	NH_3 (µg/ M^3)(400)	27.00	29.50	27.50	29.50	28.50	28.50
	Benzene (µg/ M^3) (5.0)	BQL	BQL	BQL	BQL	BQL	BQL
	BaP (ng/ M^3)(1.0)	BQL	BQL	BQL	BQL	BQL	BQL
	Arsenic (ng/ M^3)(6.0)	BQL	BQL	BQL	BQL	BQL	BQL
	Nickel (ng/ M^3)(20.0)	BQL	BQL	BQL	BQL	BQL	BQL
Location No.5 (ETP U # 8 & 9)	$PM_{2.5}$ (µg/M^3) (60)	30.50	32.00	28.63	29.00	32.75	28.13
	PM_{10} (µg/M^3)(100)	84.50	87.00	72.50	84.63	89.25	83.75
	SO_2 (µg/M^3)(80)	24.40	30.21	23.21	35.19	34.21	33.56
	NOx (µg/M^3)(80)	35.20	37.74	37.99	43.01	41.91	43.90
	Ozone (µg/ M^3)(180)	BQL	BQL	BQL	BQL	BQL	BQL
	Lead (µg/M^3)(1.0)	BQL	BQL	BQL	BQL	BQL	BQL
	CO (mg/ M^3)(4.0)	0.94	1.00	0.92	0.88	1.00	0.79
	NH_3 (µg/ M^3)(400)	26.50	28.63	27.50	27.38	28.50	28.50
	Benzene (µg/ M^3) (5.0)	BQL	BQL	BQL	BQL	BQL	BQL
	BaP (ng/ M^3)(1.0)	BQL	BQL	BQL	BQL	BQL	BQL
	Arsenic (ng/ M^3)(6.0)	BQL	BQL	BQL	BQL	BQL	BQL
	Nickel (ng/ M^3)(20.0)	BQL	BQL	BQL	BQL	BQL	BQL

Note: - BQL=Below Quantification Limit.

Analysis carried out by MOEF&CC recognized laboratory i.e. M/s. Mahabal Enviro Engineers Pvt Ltd.

ANNEXURE-I

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR.

For the period of **July-2024 to December-2024**

MONTHLY AVERAGE FUGITIVE DUST EMISSION MONITORING REPORT

Location		Parameters	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24
CHP- A	Crusher House	RSPM ($\mu g/M^3$)	117.50	105.00	108.00	119.00	122.00	124.50
		SPM ($\mu g/M^3$)	136.50	116.50	120.00	130.50	138.00	139.00
		SO_2 ($\mu g/M^3$)	21.35	16.50	16.75	19.70	20.75	21.75
		Nox ($\mu g/M^3$)	31.65	22.15	23.00	26.50	36.35	37.90
	L. T. Bunker	RSPM ($\mu g/M^3$)	98.00	86.00	88.00	96.00	104.00	107.50
		SPM ($\mu g/M^3$)	122.00	101.50	105.50	115.50	121.50	121.00
		SO_2 ($\mu g/M^3$)	17.40	14.10	14.05	14.85	16.95	16.80
		Nox ($\mu g/M^3$)	26.80	18.50	19.05	19.85	21.00	25.25
	Wagon Tippler	RSPM ($\mu g/M^3$)	112.00	96.50	99.00	103.50	112.50	111.50
		SPM ($\mu g/M^3$)	124.50	107.00	114.00	124.50	123.00	125.00
		SO_2 ($\mu g/M^3$)	16.90	14.00	14.85	15.95	16.05	16.40
		Nox ($\mu g/M^3$)	26.15	18.85	21.15	24.05	23.70	24.55
	Coal Stack Yard	RSPM ($\mu g/M^3$)	123.00	103.00	112.00	121.50	123.00	124.00
		SPM ($\mu g/M^3$)	143.00	119.50	124.50	133.50	139.50	138.50
		SO_2 ($\mu g/M^3$)	18.80	15.30	16.65	17.85	20.80	22.30
		Nox ($\mu g/M^3$)	29.75	19.95	24.40	28.75	28.35	30.95
CHP-B	Crusher House	RSPM ($\mu g/M^3$)	111.0	105.00	109.00	117.00	122.50	127.00
		SPM ($\mu g/M^3$)	124.0	116.50	121.00	129.00	134.50	143.00
		SO_2 ($\mu g/M^3$)	17.8	17.85	17.50	18.45	20.35	23.70
		Nox ($\mu g/M^3$)	24.9	22.90	23.00	26.80	31.70	36.65
	Coal Stack Yard	RSPM ($\mu g/M^3$)	114.5	113.50	120.00	122.00	117.50	123.00
		SPM ($\mu g/M^3$)	126.0	125.00	126.00	129.50	128.50	135.50
		SO_2 ($\mu g/M^3$)	17.8	16.00	16.70	100.35	19.45	21.00
		Nox ($\mu g/M^3$)	26.9	22.10	23.30	28.25	31.05	35.25
	Wagon Tippler	RSPM ($\mu g/M^3$)	105.0	93.50	117.50	109.50	108.50	112.00
		SPM ($\mu g/M^3$)	123.5	115.50	125.50	126.00	128.00	131.00
		SO_2 ($\mu g/M^3$)	16.6	13.85	16.75	17.70	17.40	18.50
		Nox ($\mu g/M^3$)	22.2	17.90	24.15	23.00	22.35	29.90
	T. P. - 103	RSPM ($\mu g/M^3$)	119.5	104.00	120.50	125.50	124.00	122.50
		SPM ($\mu g/M^3$)	131.5	120.00	134.00	147.50	146.50	138.50
		SO_2 ($\mu g/M^3$)	19.8	15.55	18.30	20.35	23.25	24.55
		Nox ($\mu g/M^3$)	27.45	20.75	25.25	28.55	38.70	36.90

ANNEXURE-I

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR.

For the period of July-2024 to December-2024

MONTHLY AVERAGE FUGITIVE DUST EMISSION MONITORING REPORT

Location		Parameters	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24
CHP- D (U#8&9)	**Wagon Tippler**	RSPM ($\mu g/M^3$)	111.00	102.00	105.00	109.00	112.00	117.00
		SPM ($\mu g/M^3$)	133.00	121.00	125.00	122.00	128.00	132.00
		SO_2 ($\mu g/M^3$)	18.50	16.30	17.20	17.60	19.10	20.40
		Nox ($\mu g/M^3$)	23.10	21.70	23.50	22.80	25.50	31.50
	T. P. - 105	RSPM ($\mu g/M^3$)	124.00	119.00	121.00	123.00	127.00	131.00
		SPM ($\mu g/M^3$)	142.00	130.00	133.00	136.00	142.00	146.00
		SO_2 ($\mu g/M^3$)	21.30	18.60	19.50	20.20	21.70	22.50
		Nox ($\mu g/M^3$)	36.70	27.50	29.10	33.40	35.20	37.20
	Crusher House	RSPM ($\mu g/M^3$)	116.00	109.00	121.00	127.00	130.00	134.00
		SPM ($\mu g/M^3$)	129.00	125.00	131.00	140.00	146.00	149.00
		SO_2 ($\mu g/M^3$)	17.50	18.70	19.20	20.60	19.20	23.30
		Nox ($\mu g/M^3$)	22.30	23.30	27.40	32.10	35.40	38.70
	T. P. - 107	RSPM ($\mu g/M^3$)	120.00	112.00	117.00	121.00	125.00	129.00
		SPM ($\mu g/M^3$)	135.00	124.00	129.00	132.00	140.00	144.00
		SO_2 ($\mu g/M^3$)	20.40	18.20	17.50	18.40	20.20	21.90
		Nox ($\mu g/M^3$)	32.10	22.70	23.10	24.70	31.10	36.50
Closed pipe conveyor belt	**Bhatadi**	RSPM ($\mu g/M^3$)	104.00	89.00	103	96.00	101.00	103.00
		SPM ($\mu g/M^3$)	115.00	102.00	120	112.00	119.00	122.00
		SO_2 ($\mu g/M^3$)	13.40	14.70	16.1	14.20	15.50	16.30
		Nox ($\mu g/M^3$)	18.70	20.20	22.2	19.90	22.40	25.70
	Padmapur	RSPM ($\mu g/M^3$)	113.00	101.00	90	106.00	115.00	121.00
		SPM ($\mu g/M^3$)	131.00	117.00	108	125.00	130.00	135.00
		SO_2 ($\mu g/M^3$)	17.60	15.40	13.5	15.80	16.10	19.30
		Nox ($\mu g/M^3$)	23.50	21.30	19.3	21.7	22.2	27.1

Note :Analysis carried out by MOEF&CC recognized laboratory i.e. M/s. Mahabal Enviro Engineers Pvt Ltd.

ANNEXURE II

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR
GROUND WATER SAMPLE ANALYSIS REPORT
Samples collected on dated:- 18.07.2024

Sample numbers ->	1	2	3	4	5	6	7	UNIT
PHYSICAL PARAMETERS								
Colour	BQL	BQL	BQL	BQL	BQL	BQL	BQL	Hazen
Turbidity	1.3	4.2	2.4	5.6	2.6	4.7	2.3	NTU
CHEMICAL PARAMETERS								
pH	7.7	7.5	7.7	7.5	7.6	7.8	7.3	
Total Dissolved Solids	866	1251	1278	1244	655	620	807	mg/L
Total Suspended Solids	5	7	6	9	6	8	BQL	mg/L
Total Alkalinity	422	440	330	372	414	312	422	mg/L
Phenolphthalein Alkalinity	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as CaCO3
Total Hardness	568	580	330	458	428	334	444	mg/L as CaCO3
Carbonate Hardness	422	440	330	372	414	312	422	mg/L as CaCO3
Calcium	168	152	152	115	120	82.6	114	mg/L as Ca
Magnesium	36	48.6	29.6	41.3	31.1	31.1	38.9	mg/L as Mg
Sodium	72.9	222	255	263	59.8	90.2	105	mg/L as Na
Chlorides	151	202	400	300	55.5	56	120	mg/L as Cl
Sulphate	67.7	306	174	226	35.3	106	52.2	mg/L as SO4
Phosphate	0.393	0.313	0.447	0.245	0.554	0.618	0.425	mg/L as PO4
Ammoniacal Nitrogen	0.24	0.28	0.26	0.24	0.32	0.34	0.28	mg/L
Cyanide	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as CN
Fluorides	0.85	0.49	0.76	0.63	0.61	0.70	0.54	mg/L as F
Silica as SiO2	11.7	12.5	13.7	13.8	9.51	10.5	10.2	mg/L as SiO2
Phenolic Compound	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as C6H6OH
Free Ammonia	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
PROBABLE SALT CONCENTRATIONS								
Calcium Carbonate	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Calcium Sulphate	BQL	BQL	164	BQL	BQL	BQL	BQL	mg/L
Calcium Chloride	BQL	BQL	8	BQL	BQL	BQL	BQL	mg/L
Magnesium Carbonate	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Magnesium Sulphate	85	240	53	204	44	132	65	mg/L
Magnesium Chloride	51	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Sodium Carbonate	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Sodium Sulphate	BQL	168	BQL	93	BQL	BQL	BQL	mg/L
Sodium Chloride	185	332	648	493	91	92	197	mg/L
METALS / HEAVY METALS								
Lead	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Pb

Nickel	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Ni
Iron	0.411	BQL	0.036	0.253	0.254	0.037	0.372	mg/L as Fe
Zinc	0.056	0.115	BQL	BQL	BQL	0.028	0.055	mg/L as Zn
Copper	BQL	BQL	BQL	BDL	BDL	BQL	BQL	mg/L as Cu
Chromium	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Cr
Cadmium	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Cd
Manganese	0.039	0.078	0.028	0.253	0.027	BQL	0.038	mg/L as Mn
Arsenic	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as As
Mercury	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Hg
MICROBIOLOGICAL PARAMETERS								
Total Plate Count	35	37	33	35	39	45	36	CFU/ml
Most Probable No. Count	5.1	6.9	3.6	5.1	6.9	9.2	5.1	MPN Index/ 100 ml
Escherichia coli	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	MPN Index/ 100 ml

Note: - BQL=Below Quantification Limit.

Analysis carried out by MOEF&CC recognized laboratory i.e. M/s. Mahabal Enviro Engineers Pvt Ltd.

Locations: - (1) Tadali (Borewell)
(2) Kachrala (BoreWell)
(3) New Cargaon No. 1 (Borewell)
(4) New Chargaon No. 2 (Borewell Water)
(5) Morva (Borewell)
(6) Gunjala (Well)
(7) Saiwan Ghodpeth (Borewell)

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR
GROUND WATER SAMPLE ANALYSIS REPORT
Samples collected on dated:- 18.07.2024

Sample numbers ->	8	9	10	11	12	13	14	**UNIT**
PHYSICAL PARAMETERS								
Colour	BQL	BQL	BQL	BQL	BQL	BQL	BQL	Hazen
Turbidity	2.4	5.5	1.3	4.7	7.7	3.9	2.3	NTU
PHYSICAL PARAMETER								
pH	7.2	7.8	7.4	7.6	7.7	7.5	7.8	
Total Dissolved Solids	1172	1325	1330	717	1530	840	131	mg/L
Total Suspended Solids	8	8	BQL	8	7	8	7	mg/L
Total Alkalinity	450	472	520	314	528	440	76	mg/L
Phenophthalein Alkalinity	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as CaCO3
Total Hardness	676	614	686	424	660	480	78	mg/L as CaCO3
Carbonate Hardness	450	472	520	314	528	440	76	mg/L as CaCO3
Calcium	180	156	187	96.2	176	116	16.0	mg/L as Ca
Magnesium	54.9	54.4	53.5	44.7	53.5	46.2	9.23	mg/L as Mg
Sodium	132	218	189	65.3	280	107	13.2	mg/L as Na
Chlorides	209	286	280	89	284	148	15	mg/L as Cl
Sulphate	216	189	149	148	329	30.2	9.8	mg/L as SO4
Phosphate	0.436	0.558	0.204	0.294	0.445	0.329	0.582	mg/L as PO4
Ammonical Nitrogen	0.26	0.33	0.26	0.33	0.31	0.35	0.25	mg/L
Cyanide	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as CN
Fluorides	0.51	0.7	0.68	0.76	0.68	148	0.71	mg/L as F

Silica as SiO2	12.7	13.5	11.9	10.3	15.4	11.2	3.30	mg/L as SiO2
Phenolic Compound	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as C6H6OH
Free Ammonia	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
PROBABLE SALT CONCENTRATIONS								
Calcium Carbonate	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Calcium Sulphate	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Calcium Chloride	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Magnesium Carbonate	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Magnesium Sulphate	270	236	186	185	264	38	12	mg/L
Magnesium Chloride	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Sodium Carbonate	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Sodium Sulphate	BQL	BQL	BQL	BQL	174	18	BQL	mg/L
Sodium Chloride	336	469	460	146	466	243	25	mg/L
METALS / HEAVY METALS								
Lead as Pb	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Pb
Nickel as Ni	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Ni
Iron	0.253	0.373	0.275	0.254	0.451	0.376	0.283	mg/L as Fe
Zinc	BQL	BQL	0.041	0.027	0.061	0.079	0.041	mg/L as Zn
Copper	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Cu
Chromium	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Cr
Cadmium	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Cd
Manganese	0.027	0.038	0.029	BQL	0.14	0.079	0.029	mg/L as Mn
Arsenic	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as As
Mercury	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Hg
MICROBIOLOGICAL PARAMETERS								
Total Plate Count	35	34	40	35	38	34	30	CFU/ml
Most Probable No. Count (MPN)	6.9	3.6	5.1	3.6	6.9	5.1	6.9	MPN Index/ 100 ml
Escherichia coli	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	MPN Index/ 100 ml

Note: - BQL=Below Quantification Limit.

Analysis carried out by MOEF&CC recognized laboratory i.e. M/s. Mahabal Enviro Engineers Pvt Ltd.

Locations: - (8) Chhota Nagpur (BoreWell)
(9) Wichoda (BoreWell)
(10) Padoli (Borewell)
(11) Tirwanja (Borewell)
(12) Kawathi (Bore Well)
(13) Near Ash Bund Pump House (Borewell) (Gohane Farm)
(14) CSTPS One day Reservoir

ANNEXURE II

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR
GROUND WATER SAMPLE ANALYSIS REPORT

Samples collected on dated:- 05.10.2024

Sample numbers ->	1	2	3	4	5	6	7	UNIT
PHYSICAL PARAMETERS								
Colour	BQL	BQL	BQL	BQL	BQL	BQL	BQL	Hazen
Turbidity	1	1.3	2	0.9	4.1	3.3	1.2	NTU
CHEMICAL PARAMETERS								
pH	7.3	7.3	7.5	7.3	7.4	7.5	7.2	
Total Dissolved Solids	560	1170	1201	1338	662	644	852	mg/L
Total Suspended Solids	BQL	BQL	BQL	BQL	9	8	BQL	mg/L
Total Alkalinity	320	404	392	344	412	304	440	mg/L
Phenolphthalein Alkalinity	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as CaCO3
Total Hardness	334	480	544	424	430	338	480	mg/L as CaCO3
Carbonate Hardness	320	404	392	344	412	304	440	mg/L as CaCO3
Calcium	80.2	136	0.67	130	123	77	124	mg/L as Ca
Magnesium	32.6	34.5	35.5	24.3	29.6	32.6	41.3	mg/L as Mg
Sodium	59.2	211	219	314	64.8	95	110	mg/L as Na
Chlorides	39.5	165	320	366	56.5	60.5	121	mg/L as Cl
Sulphate	89.2	309	158	240	53.6	130	92	mg/L as SO4
Phosphate	0.113	0.108	0.097	0.091	0.117	0.692	0.086	mg/L as PO4
Ammoniacal Nitrogen	0.17	0.17	0.17	0.16	0.17	0.16	0.17	mg/L
Cyanide	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as CN
Fluorides	0.63	0.58	0.67	0.55	0.53	0.64	0.59	mg/L as F
Silica as SiO2	9.2	13.9	16.3	15.6	10.7	11.8	11.3	mg/L as SiO2
Phenolic Compound	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as C6H6OH
Free Ammonia	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
PROBABLE SALT CONCENTRATIONS								
Calcium Carbonate	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Calcium Sulphate	BQL	BQL	8	BQL	BQL	BQL	BQL	mg/L
Calcium Chloride	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Magnesium Carbonate	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Magnesium Sulphate	111	170	175	120	67	162	115	mg/L
Magnesium Chloride	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Sodium Carbonate	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Sodium Sulphate	BQL	255	18	213	BQL	BQL	BQL	mg/L
Sodium Chloride	65	273	526	601	93	99	199	mg/L

ANNEXURE II

METALS / HEAVY METALS								
Lead	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Pb
Nickel	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Ni
Iron	0.247	0.841	0.137	0.644	0.658	0.617	0.286	mg/L as Fe
Zinc	BQL	0.047	BQL	BQL	BQL	BQL	BQL	mg/L as Zn
Copper	BQL	BQL	BQL	BDL	BDL	BQL	BQL	mg/L as Cu
Chromium	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Cr
Cadmium	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Cd
Manganese	0.011	0.04	BQL	0.099	0.1	0.099	BQL	mg/L as Mn
Arsenic	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as As
Mercury	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Hg
MICROBIOLOGICAL PARAMETERS								
Total Plate Count	32	34	31	31	35	41	32	CFU/ml
Most ProbableNo. Coun	3.6	5.1	5.1	3.6	3.6	6.9	3.6	MPN Index/ 100 ml
Escherichia coli	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	MPN Index/ 100 ml

Note: - BQL=Below Quantification Limit.

Analysis carried out by MOEF&CC recognized laboratory i.e. M/s. Mahabal Enviro Engineers Pvt Ltd.

Locations: - (1) Tadali (Borewell)
(2) Kachrala (BoreWell)
(3) New Cargaon No. 1 (Borewell)
(4) New Chargaon No. 2 (Borewell Water)
(5) Morva (Borewell)
(6) Gunjala (Well)
(7) Saiwan Ghodpeth (Borewell)

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR
GROUND WATER SAMPLE ANALYSIS REPORT BY

Samples collected on dated:- 05.10.2024

Sample numbers ->	8	9	10	11	12	13	14	**UNIT**
PHYSICAL PARAMETERS								
Colour	BQL	BQL	BQL	BQL	BQL	BQL	BQL	Hazen
Turbidity	1.7	6.1	0.9	1.2	1.4	1.2	1.2	NTU
PHYSICAL PARAMETER								
pH	7	7.4	7.4	7.5	8	7.7	7.7	
Total Dissolved Solids	1000	1249	1164	698	1464	863	123	mg/L
Total Suspended Solids	BQL	9	BQL	BQL	BQL	BQL	BQL	mg/L
Total Alkalinity	380	378	492	290	580	468	70	mg/L
Phenophthalein Alkalinity	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as CaCO3
Total Hardness	542	652	576	388	638	470	74	mg/L as CaCO3
Carbonate Hardness	380	378	492	290	580	468	70	mg/L as CaCO3
Calcium	155	183	156	89	172	468	20.8	mg/L as Ca
Magnesium	37.9	47.6	45.7	40.3	50.5	41.3	5.3	mg/L as Mg
Sodium	133	190	185	84.7	274	118	15.1	mg/L as Na
Chlorides	137	31	237	90	250	160	16.5	mg/L as Cl
Sulphate	259	249	140	168	285	34.6	11.1	mg/L as SO4
Phosphate	0.127	0.097	0.231	0.103	0.74	0.203	0.163	mg/L as PO4
Ammonical Nitrogen	0.17	0.19	0.16	0.16	0.17	0.17	0.16	mg/L
Cyanide	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as CN
Fluorides	0.61	0.82	0.71	0.78	0.82	0.61	0.61	mg/L as F
Silica as SiO2	12.3	12.7	12.7	9.4	16.9	12.8	2.2	mg/L as SiO2

ANNEXURE II

Phenolic Compound	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as C6H6OH
Free Ammonia	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
PROBABLE SALT CONCENTRATIONS								
Calcium Carbonate	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Calcium Sulphate	8	76	BQL	BQL	BQL	BQL	BQL	mg/L
Calcium Chloride	BQL	25	BQL	BQL	BQL	BQL	BQL	mg/L
Magnesium Carbonate	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Magnesium Sulphate	192	235	175	199	249	43	14	mg/L
Magnesium Chloride	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Sodium Carbonate	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L
Sodium Sulphate	BQL	BQL	BQL	13	126	BQL	BQL	mg/L
Sodium Chloride	BQL	483	389	148	411	263	27	mg/L
METALS / HEAVY METALS								
Lead	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Pb
Nickel	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Ni
Iron	0.238	0.217	0.227	0.215	0.228	0.218	0.286	mg/L as Fe
Zinc	0.038	BQL	0.021	BQL	BQL	BQL	BQL	mg/L as Zn
Copper	0.012	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Cu
Chromium	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Cr
Cadmium	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Cd
Manganese	0.014	0.013	0.014	0.013	0.010	0.013	BQL	mg/L as Mn
Arsenic	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as As
Mercury	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/L as Hg
MICROBIOLOGICAL PARAMETERS								
Total Plate Count	36	32	35	32	34	36	40	CFU/ml
Most Probable No. Count (MPN)	5.1	3.6	3.6	5.1	5.1	3.6	9.2	MPN Index/ 100 ml
Escherichia coli	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	MPN Index/ 100 ml

Note: - BQL=Below Quantification Limit.

Analysis carried out by MOEF&CC recognized laboratory i.e. M/s. Mahabal Enviro Engineers Pvt Ltd.

Locations: - (8) Chhota Nagpur (BoreWell)
(9) Wichoda (BoreWell)
(10) Padoli (Borewell)
(11) Tirwanja (Borewell)
(12) Kawathi (Bore Well)
(13) Near Ash Bund Pump House (Borewell) (Gohane Farm)
(14) CSTPS One day Reservoir

ANNEXURE II

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR
SOIL SAMPLE ANALYSIS REPORT

Samples collected on dated:- 19.07.2024

Sample numbers ->	1	2	3	4	5	6	7	UNIT
PARAMETERS								
pH of 10% Suspension	8.10	8.10	8.20	7.90	8.40	8.00	8.10	
Physical Parameters								
Organic Content	1.1	1.0	1.7	0.3	2.18	1.60	0.899	%
Moisture content	21.60	19.60	20.40	23.30	15.70	19.20	21.50	%
Fixed Residue	77.30	79.40	77.90	77	82.1	79	78	%
Chemical Parameters								
Water Leachate								
Chlorides as Cl	319	142	142	70.9	106	142	159	mg/kg
Fluoride	3.59	10.20	8.93	8.45	6.92	6.53	4.30	mg/kg
Sulphate as SO4	52	30	39	36.80	45	36.00	38.00	mg/kg
Chemical Parameters (Acid Leachate)								
Lead as Pb	11.50	9.88	14.20	6.27	17.0	9.59	12.2	mg/kg
Copper as Cu	28.7	31.2	21.0	27.10	28.4	28.9	31.3	mg/kg
Nickel as Ni	23.60	28.90	26.90	47.80	48.4	31.0	31.4	mg/kg
Chromium as Cr	34.50	41.30	25.80	24.40	32.9	33.6	46.9	mg/kg
Zinc as Zn	36.70	45.00	27.1	30.80	60.3	31.1	40.5	mg/kg
Cadmium as Cd	BQL	2	BQL	BQL	BQL	BQL	BQL	mg/kg
Iron as Fe	34567	34927	24748	24684	24560	25772	43262	mg/kg
Specific Parameters								
Water retaining capacity	69.20	70.60	65.90	68.20	63.10	67.40	63.90	%
Kjeldahl Nitrogen as N	599	961	724	865	1086	556	900	%
Total Phosphate as PO4	316	524	438	537	559	504	560	%
Additional Specific Parameters								
Ammonia	--	--	--	--	--	--	--	%
Ammonium Sulphate	--	--	--	--	--	--	--	%
Ion Exchange Capacity								
Calcium as Ca	31.60	24.00	20.80	29.10	36.40	18.80	28.40	m eq/100gm
Magnesium as Mg	6.00	7.59	6.01	6.79	5.39	7.99	6.01	m eq/100gm
Sodium as Na	0.314	0.415	1.16	0.698	0.634	0.844	1.26	m eq/100gm
Potassium as K	0.439	0.62	1.96	0.18	0.299	0.42	0.43	m eq/100gm

Note: - BQL=Below Quantification Limit.

Analysis carried out by MOEF&CC recognized laboratory i.e. M/s. Mahabal Enviro Engineers Pvt Ltd.

Soil samples collected from: -

1.Tadali (near Railway line)
2.Kachrala
3 Chargaon No.1
4.Datala Pump House
5.Morwa
6. Gunjala
7. Ghodpeth Saivan

ANNEXURE II

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR
SOIL SAMPLE ANALYSIS REPORT

Samples collected on dated:- 05.10.2024

Sample numbers ->	8	9	10	11	12	13	14	UNIT
PARAMETERS								
pH of 10% Suspension	8.30	8.20	7.90	7.90	8.00	8.30	7.70	
Physical Parameters								
Organic Content	1.1	1.37	0.76	1.20	1.14	0.40	0.996	%
Moisture content	18.2	22.10	21.80	20.5	23.40	19.9	26.00	%
Fixed Residue	80.70	76.50	74.4	78.3	75.50	79.7	73.00	%
Chemical Parameters								
Water Leachate								
Chlorides as Cl	53.20	195	142	53.10	106.00	53.20	88.50	mg/kg
Fluorides	5.19	6.4	11	5.81	10.40	4.58	5.20	mg/kg
Sulphate as SO4	44	35	60	39.90	48.20	29.50	45.00	mg/kg
Chemical Parameters (Acid Leachate)								
Lead as Pb	10.7	12.60	10.9	18.8	9.29	9.31	10.1	mg/kg
Copper as Cu	25.3	32.30	23.7	35.2	33.9	34.0	24.0	mg/kg
Nickel as Ni	32.1	25.1	34.4	46.6	32.1	39.2	31.4	mg/kg
Chromium as Cr	57.9	41.2	38.4	47.1	37.6	43.2	43.0	mg/kg
Zinc as Zn	33.3	34.7	36.6	33.5	38.2	41.8	99.1	mg/kg
Cadmium as Cd	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/kg
Iron as Fe	19047	27170	27376	36779	23774	20311	28130	mg/kg
Specific Parameters								
Water retaining capacity	65.3	62.9	67.3	66.3	71.6	64.10	65.1	%
Kjeldahl Nitrogen as N	880.0	569	700	1174	836	750	1032	%
Total Phosphate as PO4	514.0	415	525	550	493	510	554	%
Additional Specific Parameters								
Ammonia	--	--	--	--	--	--	--	%
Ammonium Sulphate	--	--	--	--	--	--	--	%
Ion Exchange Capacity								
Calcium as Ca	21.20	26.00	25.20	25.20	21.60	16.80	20.00	m eq/100gm
Magnesium as Mg	8.79	2.00	5.60	9.58	5.59	4.39	4.41	m eq/100gm
Sodium as Na	0.314	0.419	0.615	0.239	0.778	0.718	0.389	m eq/100gm
Potassium as K	0.274	0.235	0.815	0.245	0.497	0.139	0.805	m eq/100gm

Note: - BQL=Below Quantification Limit.

Analysis carried out by MOEF&CC recognized laboratory i.e. M/s. Mahabal Enviro Engineers Pvt Ltd.

8. Chotta Nagpur
9. Wichoda
10. Padoli
11. Tirwanja
12. Kawathi
13. Ash bund area (Outside of Recycling Pump House)
14. CSTPS (Tulas Bagh)

ANNEXURE II

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR
SOIL SAMPLE ANALYSIS REPORT

Samples collected on dated:- 04.10.2024

Sample numbers ->	1	2	3	4	5	6	7	UNIT
PARAMETERS								
pH of 10% Suspension	8.20	8.20	8.30	7.50	8.50	8.10	8.20	
Physical Parameters								
Organic Content	0.936	0.335	1.2	BQL	0.60	0.34	1.500	%
Moisture content	12.40	7.70	7.91	1.94	11.70	4.92	13.60	%
Fixed Residue	86.60	91.90	90.90	98	87.7	94.7	84.9	%
Chemical Parameters								
Water Leachate								
Chlorides as Cl	106	106	53	53.2	124	106	106	mg/kg
Fluorides	6.02	11.10	6.10	6.45	7.78	6.94	6.94	mg/kg
Sulphate as SO4	54.7	43	50.3	46.90	51.4	32.10	42.90	mg/kg
Chemical Parameters (Acid Leachate)								
Lead as Pb	14.50	5.80	12.30	10.10	16.5	8.05	16.4	mg/kg
Copper as Cu	26.7	32.5	22.2	24.70	19.4	15.8	46.1	mg/kg
Nickel as Ni	49.90	39.40	41.30	36.80	49.8	38.3	35.3	mg/kg
Chromium as Cr	56.80	38.60	49.70	28.40	45.2	39.8	51.9	mg/kg
Zinc as Zn	40.90	47.20	38	25.20	56.9	31.0	48.7	mg/kg
Cadmium as Cd	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/kg
Iron as Fe	44666	32727	27341	31766	22970	21830	33379	mg/kg
Specific Parameters								
Water retaining capacity	65.40	61.80	64	64.70	59.60	63.90	59.20	%
Kjeldahl Nitrogen as N	557	876	571	700	1140	542	877	%
Total Phosphate as PO4	276	326	288	323	596	259	334	%
Additional Specific Parameters								
Ammonia	--	--	--	--	--	--	--	%
Ammonium Sulphate	--	--	--	--	--	--	--	%
Ion Exchange Capacity								
Calcium as Ca	33.60	38.30	25.60	36.40	26.80	23.90	27.90	m eq/100gm
Magnesium as Mg	10.40	11.60	1.99	5.20	2.00	4.40	3.99	m eq/100gm
Sodium as Na	0.249	0.353	0.20	0.228	0.329	0.390	0.994	m eq/100gm
Potassium as K	0.390	0.58	0.65	0.253	0.625	0.21	0.35	m eq/100gm

Note: - BQL=Below Quantification Limit.

Analysis carried out by MOEF&CC recognized laboratory i.e. M/s. Mahabal Enviro Engineers Pvt Ltd.

Soil samples collected from: -

1.Tadali (near Railway line)
2.Kachrala
3 Chargaon No.1
4.Datala Pump House
5.Morwa
6. Gunjala
7. Ghodpeth Saivan

ANNEXURE II

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR
SOIL SAMPLE ANALYSIS REPORT

Samples collected on dated:- 04.10.2024

Sample numbers ->	8	9	10	11	12	13	14	UNIT
PARAMETERS								
pH of 10% Suspension	8.20	7.90	8.00	8.10	8.10	7.90	7.10	
Physical Parameters								
Organic Content	0.5	1.04	0.70	0.669	0.47	BQL	3.180	%
Moisture content	18.1	11.60	3.64	7.4	13.90	4.26	19.70	%
Fixed Residue	81.40	87.40	95.7	91.9	85.60	95.4	77.10	%
Chemical Parameters								
Water Leachate								
Chlorides as Cl	70.90	106	70.8	53.10	70.80	35.40	70.8	mg/kg
Fluorides	4.26	5.9	8.77	7.99	10.00	4.44	5.58	mg/kg
Sulphate as SO4	32.1	33	84.5	40.40	43.50	29.50	40.14	mg/kg
Chemical Parameters (Acid Leachate)								
Lead as Pb	12.3	14.30	7.99	10.2	14.30	14.50	8.0	mg/kg
Copper as Cu	23.1	20.20	32.5	28.4	37.9	30.3	29.9	mg/kg
Nickel as Ni	44.2	50.8	85.9	45.6	49.3	48.5	43.8	mg/kg
Chromium as Cr	48.8	33.5	32.5	37.3	42.1	41.8	24.7	mg/kg
Zinc as Zn	30.9	30.0	41.1	37.9	45.3	35.1	74.3	mg/kg
Cadmium as Cd	BQL	BQL	BQL	BQL	BQL	BQL	BQL	mg/kg
Iron as Fe	28743	27669	37843	33479	35010	33986	28768	mg/kg
Specific Parameters								
Water retaining capacity	65.0	58.2	62.2	65.2	65.9	65.30	59.6	%
Kjeldahl Nitrogen as N	710.0	599	696	1008	895	728	965	%
Total Phosphate as PO4	441.0	313	501	591	294	370	463	%
Additional Specific Parameters								
Ammonia	--	--	--	--	--	--	--	%
Ammonium Sulphate	--	--	--	--	--	--	--	%
Ion Exchange Capacity								
Calcium as Ca	29.20	34.70	25.20	28.80	30.80	32.80	30.8	m eq/100gm
Magnesium as Mg	5.20	5.58	5.20	9.99	2.80	7.60	11.9	m eq/100gm
Sodium as Na	1.510	0.158	0.379	0.539	1.870	0.549	0.293	m eq/100gm
Potassium as K	0.664	0.194	0.267	0.211	0.680	0.205	0.439	m eq/100gm

Note: - BQL=Below Quantification Limit.

Analysis carried out by MOEF&CC recognized laboratory i.e. M/s. Mahabal Enviro Engineers Pvt Ltd.

Soil samples collected from: -

8. Chotta Nagpur
9. Wichoda
10. Padoli
11. Tirwanja
12. Kawathi
13. Ash bund area (Outside of Recycling Pump House)
14. CSTPS (Tulas Bagh)

ANNEXURE-III

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR.

For the period of **July-2024 to December-2024**

MONTHLY AVERAGE EFFLUENT WATER ANALYSIS REPORT

Month	Location of Samples	Except pH all parameters are in mg / liters											
		pH	S. S.	O&G	DO	BOD	COD	Phosphate	Free Cl_2	Copper	Iron	Zinc	Chromium
Jul-24	Ash bund weir well discharge	7.90	35	BQL	5.00	14.0	44.0	0.359	BQL	0.03	0.945	BQL	BQL
	C. T. Pond B/D	8.30	44	BQL	5.9	16	52.00	0.11	BQL	BQL	0.4	0.026	BQL
	Boiler B/D	8.10	BQL	BQL	–	3.5	11.00	0.22	BQL	0.02	0.385	0.043	BQL
	STP Effluent	7.4	BQL	BQL	5.9	8.8	28	1.07	BQL	BQL	–	0.024	BQL
Aug-24	Ash bund weir well discharge	7.60	44.0	BQL	5.00	19.0	64.00	0.5	BQL	BQL	0.324	0.023	BQL
	C. T. Pond B/D	8.20	8.00	BQL	6.1	3.80	12.00	0.08	BQL	0.011	0.5	0.024	BQL
	Boiler B/D	8.40	BQL	BQL	–	3.20	10.00	0.166	BQL	0.012	0.249	BQL	BQL
	STP Effluent	7.2	BQL	BQL	6.5	2.7	9	1.02	BQL	BQL	–	BQL	BQL
Sep-24	Ash bund weir well discharge	7.60	29.0	BQL	5.80	7.50	24.00	0.052	BQL	0.076	1.050	0.061	BQL
	C. T. Pond B/D	8.20	5.00	BQL	6.30	4.70	16.00	0.636	BQL	BQL	0.428	0.074	BQL
	Boiler B/D	8.50	BQL	BQL	–	2.70	9.00	0.460	BQL	BQL	0.259	BQL	BQL
	STP Effluent	6.9	18	BQL	5.8	12	36	0.505	BQL	BQL	–	BQL	BQL
Oct-24	Ash bund weir well discharge	7.90	7.00	BQL	5.60	4.80	16.00	0.051	BQL	BQL	0.648	BQL	BQL
	C. T. Pond B/D	8.20	5.00	BQL	6.20	3.30	11.00	0.076	BQL	BQL	0.378	BQL	BQL
	Boiler B/D	8.70	BQL	BQL	–	2.80	9.00	0.201	BQL	BQL	0.158	BQL	BQL
	STP Effluent	7.3	23	BQL	5.1	17	52	0.99	BQL	BQL		0.021	BQL
Nov-24	Ash bund weir well discharge	7.50	5.00	BQL	6.20	4.20	16.00	0.039	BQL	BQL	1.010	0.101	BQL
	C. T. Pond B/D	8.80	BQL	BQL	6.20	2.60	9.00	0.300	BQL	BQL	0.371	0.056	BQL
	Boiler B/D	8.60	BQL	BQL	–	2.30	8.00	0.498	BQL	BQL	0.434	0.042	BQL
	STP Effluent	7.6	5	BQL	6.5	5.9	20	0.055	BQL	BQL	–	0.024	BQL
Dec-24	Ash bund weir well discharge	7.40	17.0	BQL	6.60	10.0	32.00	0.314	BQL	BQL	0.617	0.044	BQL
	C. T. Pond B/D	8.70	26.00	BQL	6.6	12.00	36.00	0.305	BQL	0.011	0.587	0.056	BQL
	Boiler B/D	8.80	BQL	BQL	--	2.30	8.00	0.206	BQL	BQL	0.351	0.051	BQL
	STP Effluent	7.2	10	BQL	6.5	7.3	24	0.421	BQL	BQL	–	0.02	BQL

Note: - BQL=Below Quantification Limit.

Analysis carried out by MOEF&CC recognized laboratory i.e. M/s. Mahabal Enviro Engineers Pvt Ltd.

ANNEXURE-IV

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR.

For the period of **July-2024 to December-2024**

NOISE LEVEL MONITORING OF CSTPS, CHANDRAPUR

Month	Location													
	Time office-I		Time office-II		Power station gate		Major store		E/M colony office		Padmapur conveyor pipe		Bhatadi conveyor pipe	
	Day (75dBA)	Night (70 dBA)	Day (75 dBA)	Night (70 dBA)	Day (75 dBA)	Night (70 dBA)	Day (75 dBA)	Night (70 dBA)	Day (75 dBA)	Night (70 dBA)	Day (75 dBA)	Night (70 dBA)	Day (75 dBA)	Night (70 dBA)
Jul-24	68.5	66.3	69.1	66.5	68.9	67.2	70.5	69.3	48.7	42.4	71.6	68.3	72.4	67.4
Aug-24	69.2	66.8	69.1	66.2	68.5	67.6	71.7	70.7	57.6	54.5	71.7	68.8	72.6	68.1
Sep-24	68.6	66.3	69.8	66.7	68.1	67.2	70.5	68.3	48.6	42.7	71.4	68.2	72.3	68.2
Oct-24	67.9	65.3	68.7	66.1	68.6	66.5	70.3	68.6	48.4	43.2	71.8	68.7	72.5	68.4
Nov-24	67.5	65.1	68.3	66.8	69.3	66.6	70.6	68.3	48.8	43.7	71.3	68.1	72	68.3
Dec-24	68.3	65.5	69.5	66.2	69.6	66.3	70.2	68.7	49.6	44.7	71.5	68.7	72.1	68.4

ANNEXURE-V

MAHAGENCO
Maharashtra State Power Generation Co. LTD
CIN: U40100MH2005SGC153648
(A GOVERNMENT OF MAHARASHTRA UNDERTAKING)

CHANDRAPUR SUPER THERMAL POWER STATION
MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED
(ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 & ISO 50001:2018)
Office of: Chief Engineer, C.S.T.P.S. Urjanagar, Chandrapur – 442404
Phone: 07172 - 220155 to 220159 Fax: 07172 - 220203
Email: cegenchandrapur@mahagenco.in

CHN/ENV & COAL 003130 Date: 21 SEP 2024

To,
The Regional Officer,
Maharashtra Pollution Control Board,
Udyog Bhavan, First Floor,
Station Road, Chandrapur 442 401.

Subject: - Submission of yearly plantation statement.
Ref: Consent No: - Format 1.0/ CAC / UAN No. 0000094701/CR-2009000282 dated 07.09.2020

Dear Sir,

Please find below the yearly plantation statement for the year 2023-24 (till date) in respect of **Chandrapur Super Thermal Power Station, Chandrapur**. This is as per the consent to operate condition.

S. N	Particulars	Details	Remarks
1	Total factory area	11237.05 Hectare	Total No. of trees cannot be measured due to roaming of wild animals. The area of plantation is too large also dense due to vegetation. CSTPS has requested to MSRAC, Nagpur regarding details of plantation & area covered under plantation, report awaited from the MRSAC, Nagpur.
2	Open Space Available	1117 Hectare	
3	Total trees planted up 15th September 2024.	1326391 Nos.(Including 10000 bamboo plants)	
4	No. of Trees surviving	80-90%	
5	Cumulative area of plantation	552.88 Hectare	
6	Land area covered under plantation	49.50 % **(Statutory required 33%)**	

Thanking You.

Yours faithfully

Chief Engineer
CSTPS, Chandrapur

Copy s.w.rs.to:
The Executive Director (E&S), MSPGCL, Mumbai.
Copy f.w.cs.to:
The Sub- Regional Officer, MPCB, Chandrapur.

30/9/24 Sr. Clerk
Regional Officer
M.P.C. Board,
Chandrapur

C:\Users\00013826\Desktop\Plantation details to MPCB new.docx

Annexure VI

MAHAGENCO
CIN: U40100MH2005SGC153648
(A GOVERNMENT OF MAHARASHTRA UNDERTAKING)

CHANDRAPUR SUPER THERMAL POWER STATION
MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED
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Office of: Chief Engineer, C.S.T.P.S. Urjanagar, Chandrapur – 442404
Phone: 07172 - 220155 to 220159 Fax: 07172 - 220203
Email: cegenchandrapur@mahagenco.in

CHN/Env & Coal 0009C5 Date: 15 APR 2024

To,
The Director,
Wildlife Institute of India
Post Box # 18, Chandrabani
Dehradun 248 001

Email:- dwii@wii.gov.in

Subject: - Regarding Assessment of Impacts of CSTPS & WCL mines located adjacent to Tadoba-Andhari Tiger Reserve (TATR) on Wildlife and preparation of Management Plan–**thereof**

Ref.:- 1) This office letter No.002709 dated 25.10.2023
2) Letter from PCCF (WL), Nagpur No.1700/2020-21 dated 06.11.2020
3) This office SAP Purchase Order on WII No. 4500112033 dated 05.11.2020
4) Letter from PCCF (WL), Nagpur No.2917/2019-20 dated 05.11.2019
5) Visit of CSIR-NEERI, CSTPS & WCL officials at TATR area on dated 24.10.2019
6) Meeting held at CSIR-NEERI, Nagpur on dated 19.10.2019
7) Letter from CGM (E&S), MSPGCL No.10857 dated 11.10.2019

Dear Sir,

With reference to the subject matter & directives from MoEF&CC, Govt. of India, CSTPS Chandrapur has issued SAP Purchase Order dated 05.11.2020 to Wildlife Institute of India vide letter cited at reference 3 above regarding the study of Assessment of Impacts of CSTPS & WCL mines located adjacent to Tadoba-Andhari Tiger Reserve (TATR) on Wildlife.

However, it is observed that the work needs to expedite to achieve the milestones decided in the modalities/work order.

Further, it is to inform that as per invoices submited by CSIR-NEERI & WII time to time, this office has made the payments accordingly.

In view of above, it is requested to arrange to look into the matter for the successful completion of the study & submission of final report thereof to the appropriate authorities on top priority please.

Thanking you

Yours faithfully

Chief Engineer
CSTPS, Chandrapur

Copy s.w.rs.to:-
1) The District Collector, Chandrpaur
2) The Principal Chief Conservator of Forest (Wild Life), Nagpur
3) The Director (Op), MSPGCL, Mumbai
4) The Joint Director(APC), MPCB Mumbai
5) The Executive Director (O&M-II/E&S) MSPGCL Mumbai

Copy f w.cs.to:-
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2) Dr. Rajesh Biniwale, CSIR-NEERI, Nagpur
3) Dr. Billal Habib,WII Dehradun
4) The Gen. Manager (Env), WCL HQ Nagpur
5) The Supdt. Chemist-I, MSPGCL, Mumbai

16-04-2024
Maharashtra Pollution Control Board
Regional office
Udyog Bhavan 1st Floor Station Road
Chandrapur-442401

MAHAGENCO
Maharashtra State Power Generation Co. LTD.
CIN: U40100MH2005SGC153648
(A GOVERNMENT OF MAHARASHTRA UNDERTAKING)

CHANDRAPUR SUPER THERMAL POWER STATION
MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED
(ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 & ISO 50001:2018)
Office of: Chief Engineer, C.S.T.P.S. Urjanagar, Chandrapur – 442404
Phone: 07172 - 220155 to 220159 Fax: 07172 - 220203
Email: cegenchandrapur@mahagenco.in

CHN/Env & Coal 002709 Date: 25 OCT 2023

To,
The Director,
Wildlife Institute of India
Post Box # 18, Chandrabani
Dehradun 248 001

Email:- dwii@wii.gov.in

Subject: - Regarding Assessment of Impacts of CSTPS & WCL mines located adjacent to Tadoba-Andhari Tiger Reserve (TATR) on Wildlife and preparation of Management Plan–**thereof**

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CSTPS, Chandrapur

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Email: cegenchandrapur@mahagenco.in

CHN/Env & Coal 000906 Date: 15 APR 2024

To,
The Director,
CSIR-NEERI,
Nagpur-440020

Email:- director@neeri.res.in

Subject: - Regarding Assessment of Impacts of CSTPS & WCL mines located adjacent to Tadoba-Andhari Tiger Reserve (TATR) on Wildlife and preparation of Management Plan–**thereof**

Ref.:- 1) This office letter No.002708 dated 25.10.2023
2) Letter from PCCF (WL), Nagpur No.1700/2020-21 dated 06.11.2020
3) This office SAP Purchase Order on CSIR-NEERI No. 4500112028 dated 05.11.2020
4) Letter from PCCF (WL), Nagpur No.2917/2019-20 dated 05.11.2019
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Phone: 07172 - 220155 to 220159 Fax: 07172 - 220203
Email: cegenchandrapur@mahagenco.in

CHN/Env & Coal 0 0 2 7 0 8

Date: 2 5 OCT 2023

To,
The Director,
CSIR-NEERI,
Nagpur-440020

Email:- director@neeri.res.in

Subject: - Regarding Assessment of Impacts of CSTPS & WCL mines located adjacent to Tadoba-Andhari Tiger Reserve (TATR) on Wildlife and preparation of Management Plan–**thereof**

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5) The Supdt. Chemist-I, MSPGCL, Mumbai

Coal transportation by railway wagon with tarpaulin covering

Coal transportation by truck wagon with tarpaulin covering

Coal transportation by truck wagon with tarpaulin covering

Water sprinkling on coal transporting belt

ESP:

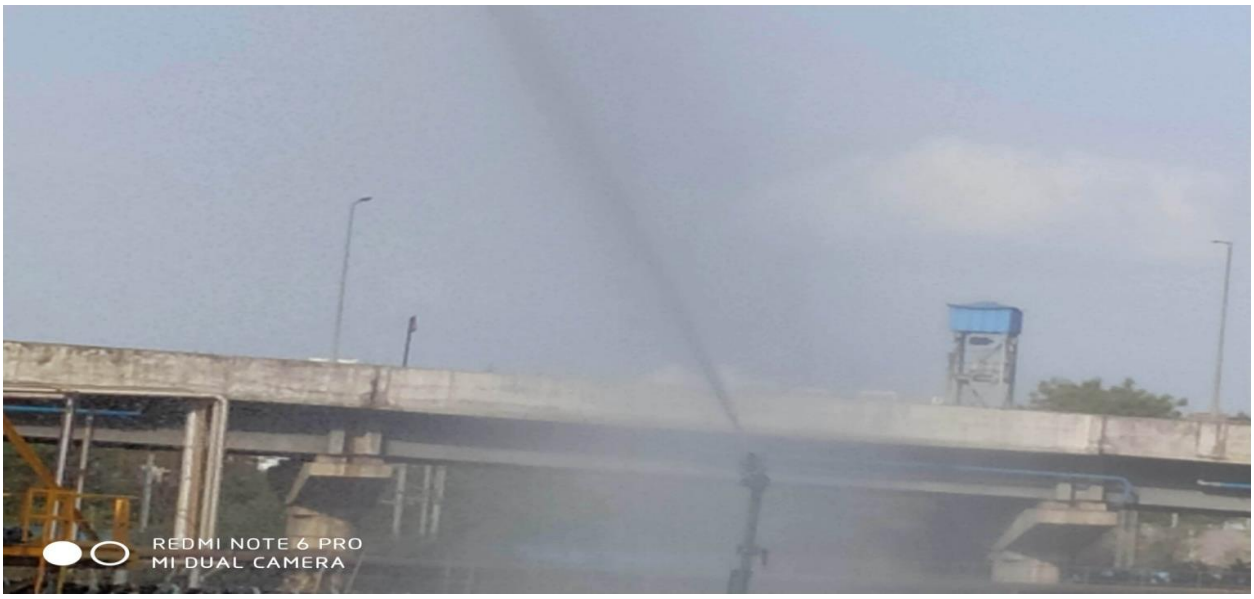

Shot on OnePlus
Powered by Quad Camera
18/04/23
11:34 am


Shot on OnePlus
Powered by Quad Camera
18/04/23
11:34 am

Ammonia Flue Gas Conditioning System (AFGCS)

Water Sprinkler at Coal Conveyor belt:

Rain guns at Coal Stack yard:



Mobile Fogger:

Dust Extraction System at CHP:

ANNEXURE- VIII

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR.

For the period of **July-2024 to December-2024**

ASH UTILIZATION OF CSTPS, CHANDRAPUR

Ash Utilization Purpose	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	TOTAL (MT)
Ash Generated (MT)	344461	386348	334228	328600	415882	406161	2215680
For Blending with Cement (ACC, Ambuja, Manikgarh & Ultratech)	96228	95276	53673	124399	130653	293980	794209
Bricks	675	8983	5140	19889	10974	24916	70577
Agriculture	0	0	0	0	0	0	0
Road / Bridge Construction	0	0	0	0	19847	118569	138416
Land filling	1484	539	914	994	3000	4340	11271
Other	0	0	0	0	0	0	0
Ash Utilization (MT)	96228	95276	53673	124399	130653	293980	794211
% Ash Utilisation	27.94	24.66	16.06	37.86	31.42	137.20	275.14

NOTE: - ACC Cement Chandrapur, Ultratech Cement Chandrapur, Ambuja Cement Chandrapur and Manikgarh Cement Chandrapur have lifted Ash with the arrangement made by them from ESP Hopper's.

With the increasing demand of electricity; more capacity addition is eminent to fulfil the gap. It is also to be noted that more emphasis is given to workman safety and minimum tolerance for pollution; as statutory norms and its enforcement are getting more stringent.

To meet the above target, more advanced technologies with higher generation capacity units are adopted, to fulfil the demand as well compliance of statutory norms.

But bigger generation capacity units, calls for increases consequence of any accident to multi folds. Also increasing usage of various chemicals, few are toxic; may lead to any severe accident, if proper care is not taken. Even after taking all necessary precautions to prevent any miss-happenings, it is also to be kept in mind, a practical solution for handling any emergency; if it arises.

Electricity has become the utmost necessity in civil life. A sudden mass failure of electricity has the ability to stall a nation's economic activity in a whole or its part thereof. Bringing back to normalcy is ~~a~~ time & effort consuming activity. Northern Grid failure on 31st July, 2012 and subsequent Eastern Grid and North-Eastern Grid failure as the Domino Effect; which stalled the activities of about 22 States and Union Territories, affecting 600 million people; a vivid example. Crisis Management Plan is an afterthought to avert such situation.

The Disaster & Crisis Management Plan for Chandrapur Super Thermal Power Station is upgraded to guide our officials and employees for effective handling of any disastrous or crisis situation, with minimum injury and loss of human life, minimum damage to plant and machinery and minimum period for restoration to normalcy.

Jayant H. Bobde

Occupier / Chief Engineer (Gen O&M)
Chandrapur Super Thermal Power Station

SUMMARY REPORT

CHANDRAPUR SUPER THERMAL POWER STATION,DIST - CHANDRAPUR

MEDICAL CHECK-UP

SECTION:- DISPENSARY

PMC CCONDUCTED ON DATED	TOTAL NO. OF EMPLOYEE	AUDIOMETRY REPORT		
		Mild Deafness	Moderate Deafness	Severe Deafness
27-03-2023 TO 12-05-2023	2325	30	62	13

GROUND LEVEL CONCENTRATION STUDY REPORT (SEPTEMBER 2024)

At

Chandrapur Super Thermal Power Station

Prepared By

Mahabal Enviro Engineers Pvt. Ltd.
Plot Nos. 13,14,17,18, Grampanchayat Bokhara, 8 km from Nagpur City,
Opp. Patel Petrol Pump, Chhindwara Road, Koradi, Dist.Nagapur-441111
Phone: 91-712-2612162 **T/Fax:** 91-712-2612212 **Email:** mahabal.nagpur@gmail.com

1. Introduction

With two units of 210 MW each and five units of 500 MW each Chandrapur Super Thermal Power Station (CSTPS) has the highest capacity of 2920 MW power generation among several power stations of Maharashtra State Power Generation Co. Ltd. CSTPS has reached its present capacity during period May 1984 to March 1998.

CSTPS is located at about 6 Km from the township of Chandrapur. Its north latitude is 19º 57’ to 20º 0’ and east longitude is 79º 15’ to 79º 20’. It is covered by toposhit no. 56M/1 – 14455 P/4-12 published by Survey of India.

Chandrapur is mineral rich district with a dense forest spread over 41.5% of total land. Based on available minerals and abundant water, industries have been set up within and in the surrounding of Chandrapur. CSTPS is located over relatively plain terrain between rivers Erai and Wardha. General slope is township SW from NE. Durgapur, Padmapur, Bhatadi and other coal mines are located towards east of CSTPS and also North-East side. Padmapur & Durgapur are of significance since huge overburden damps are visible. The mined coal is supplied to Chandrapur Super Thermal Power Station. It has coal linkage to Durgapur open cast coal mine. Coal is transported to CSTPS by rail and aerial ropeway. Urban environmental concerns in the district are air pollution due to coal burning industries and auto-exhaust. Municipal solid waste, bio-medical waste, untreated domestic sewage and also the urban sanitation area other issues of concern.

Topographical feature of core-buffer zones (5Km to 25 Km radius) are given in the **Table 1.1.**

Table 1.1: Topographical feature of core buffer zones

Area 5 Km	Villages	: Durgapur, -Ranvendli, Govindapur, Devai, Padholi, Neri, Kodi, Chandsurla, Mhasala, Shinala etc.
	Surface Drains	: Ranvendli, Motghat, Erai river, Nagpur-Chadrapur
	Others	: Coal mines at Durgapur
10 Km	Villages	: Payali, Matah, Tikhlia, Nagpur, Mokha Khutala, Patholi, Kosara, Chora, Devada, Datala, Babupeth (Chadrapur)
	Drains	: As above 5 Km, Erai dam
	Others Features	: Railway and roadway-Nagpur-Chandrapur Road
25 Km	Villages	: Ballarshah, Visapur, Bhivakund, Nandgaon, Huigtala, Bhadrati, Shevni, Marda, Dhamara, Kurla, Jevza, Itapur, Pelora, Nirli, Govapur, Sonoli, Vidsi, Modi, Pipri, Mahaakuli, Anturla, Sindur, Narpala, Wadhri, Savarala, Themur, Sengaon, Tadali, Sakharwahi, Kudara, Ghodpeth, Chargaon, Saivan, Gujala, Avada, Kachrata, Chavandla, Nunara, Ghodmivat, Chincholi, Wadgaon, Savri, Pardi, Devada, Khadala, Chorgaow, limbala, Mamal, Waygaon, etc.
	Drains	: As above and Wardha River
	Others Features	: In addition to above Ballarpur Paper Mills Ltd. and number of coal mines exist within this area.

Chandrapur super thermal power station burns large amount of coal every year which results in generation of ash. This ash is collected as bottom ash and some is arrested by electrostatic precipitator (ESP). The remaining ash escapes through stacks.

Coal burned results in the production of carbon monoxide, particulates, sulphur dioxide, hydrocarbons and oxides of nitrogen. All these pollutants of varying composition are thrown into the atmosphere in the form of gases. Thus the combustion of coal, which forms the major operations in power generation, results in the emissions that comprises of these pollutants in the form of flue gases.

Whenever any concentrated gases are released in to the atmosphere, they mix with air and get diluted. The prevailing winds transport the gases and disperse, thus diluting and reducing the concentration. The ground level concentration of a location is the concentration of particular pollutants at that location. The amount of concentration at a site is cumulative of the stack and other indicated sources. These sources include traffic on the highway and agricultural fields.

2. PROPERTIES OF THE POLLUTANTS

The emissions from the stack are composed of particulates, sulphur dioxide and oxides of nitrogen. The emission contain hydrocarbon & carbon monoxide which arise due to the incomplete combustion of petroleum products. The plant under consideration i.e. CSTPS uses furnace oil only for the initial firing of a boiler and hence emissions such as hydrocarbons are not of much concern.

The particulate matter has physical characteristics like size, mode of formation, setting characteristics and optical properties. They also possess chemical characteristics of organic nature and biological properties as well. Emissions from CSTPS stacks comprises of finally divided non-combustible particles in the flue gas after the combustion of coal. Inherent minerals and metallic substances in coal are normally expected in stack emissions. Once emitted, they will settle depending upon their sizes and tendency for agglomeration.

Optical quality of stack emissions in CSTPS is due to scattering of light. Particles of sizes 0.38 to 0.76 µm diameter would affect the visibility.

2.1 PARTICULATE MATTER:

"Particulate matter," also known as particle pollution or PM, is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulphates), organic chemicals, metals, and soil or dust particles. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope.

Particle pollution includes "inhalable coarse particles," with diameters larger than 2.5 micrometers and smaller than 10 micrometers and "fine particles," with diameters that are 2.5 micrometers and smaller. How small is 2.5 micrometers? Think about a single hair from your head. The average human hair is about 70 micrometers in diameter – making it 30 times larger than the largest fine particle.

These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, known as primary particles are emitted directly from a source, such as power plant, industries, construction sites, coal handling, unpaved roads, fields, smokestacks or fires. Others form in complicated reactions in the atmosphere of chemicals such as sulfur dioxides and nitrogen oxides that are emitted from power plants, industries and automobiles. These particles, known as secondary particles, make up most of the fine particle pollution in the country.

The size of particles is directly linked to their potential for causing health problems. Small particles less than 10 micrometers in diameter pose the greatest problems, because they can get deep into your lungs, and some may even get into your bloodstream.

Exposure to such particles can affect both your lungs and your heart. Small particles of concern include "inhalable coarse particles" (such as those found near roadways and dusty industries), which are larger than 2.5 micrometers and smaller than 10 micrometers in diameter; and "fine particles" (such as those found in smoke and haze), which are 2.5 micrometers in diameter and smaller.

The Air Act requires EPA to set air quality standards to protect both public health and the public welfare (e.g. visibility, crops and vegetation). Particle pollution affects both.

2.1.1 Health Effects:

Particle pollution - especially fine particles - contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including:

- premature death in people with heart or lung disease,
- nonfatal heart attacks,
- irregular heartbeat,
- aggravated asthma,
- decreased lung function, and
- Increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.

People with heart or lung diseases, children and older adults are the most likely to be affected by particle pollution exposure. However, even if you are healthy, you may experience temporary symptoms from exposure to elevated levels of particle pollution.

2.1.2 Environmental Effects:

Visibility impairment

Fine particles ($PM_{2.5}$) are the main cause of reduced visibility (haze) in parts of the environment, including many of our treasured national parks and wilderness areas.

Environmental damage

Particles can be carried over long distances by wind and then settle on ground or water. The effects of this settling include: making lakes and streams acidic; changing the nutrient balance in coastal waters and large river basins; depleting the nutrients in soil; damaging sensitive forests and farm crops; and affecting the diversity of ecosystems.

Aesthetic damage

Particle pollution can stain and damage stone and other materials, including culturally important objects such as statues and monuments.

2.2 SULPHUR DIOXIDES:

Sulphur dioxide (SO_2) is one of a group of highly reactive gasses known as "oxides of sulphur." The largest sources of SO_2 emissions are from fossil fuel combustion at power plants (73%) and other industrial facilities (20%). Smaller sources of SO_2 emissions include industrial processes such as extracting metal from ore, and the burning of high sulphur containing fuels by locomotives, large ships, and non-road equipment. SO_2 is linked with a number of adverse effects on the respiratory system.

Current scientific evidence links short-term exposures to SO_2, ranging from 5 minutes to 24 hours, with an array of adverse respiratory effects including bronchoconstriction and increased asthma symptoms. These effects are particularly important for asthmatics at elevated ventilation rates (e.g., while exercising or playing.)

Studies also show a connection between short-term exposure and increased visits to emergency departments and hospital admissions for respiratory illnesses, particularly in at-risk populations including children, the elderly, and asthmatics.

National Ambient Air Quality Standard for SO_2 is designed to protect against exposure to the entire group of sulphur oxides (SOx). SO_2 is the component of greatest concern and is used as the indicator for the larger group of gaseous sulphur oxides (SOx). Other gaseous sulphur oxides (e.g. SO_3) are found in the atmosphere at concentrations much lower than SO_2.

Emissions that lead to high concentrations of SO_2 generally also lead to the formation of other SOx. Control measures that reduce SO_2 can generally be expected to reduce people's exposures to all gaseous SOx. This may have the important co-benefit of reducing the formation of fine sulphate particles, which pose significant public health threats.

SOx can react with other compounds in the atmosphere to form small particles. These particles penetrate deeply into sensitive parts of the lungs and can cause or worsen respiratory disease, such as emphysema and bronchitis, and can aggravate existing heart disease, leading to increased hospital admissions and premature death.

As alone the SPM emission is hazardous but the effect of SPM together with Sulphur dioxide has more significance e.g. 200 µg/m^3 of SO_2 (24 hr average) will impair the health of the workers which intern will increase absenteeism. Normally, hairs in the nose remove all SPM over 10 µm. If the sizes vary from 2 to 10 µm then particles are carried from wind pipes to mouth from where they are swallowed. This cause suffocation and aggravation of asthma and chronic bronchitis. This leads to a condition known as “pneumoconiosis”.

2.3 NITROGEN DIOXIDES:

Nitrogen dioxide (NO_2) is one of a group of highly reactive gasses known as "oxides of nitrogen," or "nitrogen oxides (NOx)." Other nitrogen oxides include nitrous acid and nitric acid. National Ambient Air Quality Standard uses NO_2 as the indicator for the larger group of nitrogen oxides. NO_2 forms quickly from emissions from cars, trucks and buses, power plants, and off-road equipment. In addition to contributing to the formation of ground-level ozone, and fine particle pollution, NO_2 is linked with a number of adverse effects on the respiratory system.

Current scientific evidence links short-term NO_2 exposures, ranging from 30 minutes to 24 hours, with adverse respiratory effects including airway inflammation in healthy people and increased respiratory symptoms in people with asthma.

NO_2 concentrations in vehicles and near roadways are appreciably higher than those measured at monitors in the current network. In fact, in-vehicle concentrations can be 2-3 times higher than measured at nearby area-wide monitors. Near-roadway (within about 50 meters) concentrations of NO_2 have been measured to be approximately 30 to 100% higher than concentrations away from roadways.

NO_2 exposure concentrations near roadways are of particular concern for susceptible individuals, including people with asthma asthmatics, children, and the elderly

The sum of nitric oxide (NO) and NO_2 is commonly called nitrogen oxides or NOx. Other oxides of nitrogen including nitrous acid and nitric acid are part of the nitrogen oxide family. NO_2 is the component of greatest interest and the indicator for the larger group of nitrogen oxides.

NOx react with ammonia, moisture, and other compounds to form small particles. These small particles penetrate deeply into sensitive parts of the lungs and can cause or worsen respiratory disease, such as emphysema and bronchitis, and can aggravate existing heart disease, leading to increased hospital admissions and premature death.

Ozone is formed when NOx and volatile organic compounds react in the presence of heat and sunlight. Children, the elderly, people with lung diseases such as asthma, and people who work or exercise outside are at risk for adverse effects from ozone. These include reduction in lung function and increased respiratory symptoms as well as respiratory-related emergency department visits, hospital admissions, and possibly premature deaths.

Emissions that lead to the formation of NO_2 generally also lead to the formation of other NOx. Emissions control measures leading to reductions in NO_2 can generally be expected to reduce population exposures to all gaseous NOx. This may have the important co-benefit of reducing the formation of ozone and fine particles both of which pose significant public health threats.

Table 2.3: Characteristics of some important air pollutants and their effects on human beings and animals

Pollutant	Characteristics	Effects
Particulate matter	Solid particle or liquid droplets including fumes, smoke, dusts. Solid particulate can absorb various chemicals.	Respiratory diseases, toxicity from metallic dusts, silicosis and asbestosis from the specific dusts. Damage of DNA in the lungs.
Oxides of Sulphur (SOx)	SOx comprise of SO_2 (97-99%) & SO_3 (1-3%). It is colourless, heavy & water soluble gas. Rapidly diffusing, acid forming oxidizing agent. Reacts with water forming sulphuric acid.	Absorbs quickly and irritates the upper respiratory tract. The sulphuric acid formed lowers pH. Leads to bronchial spasms breathlessness and increased susceptibility for infection. Irritation of throat and eyes.
Oxides of Nitrogen (NOx)	NOx comprises of NO, NO_2 & N_2O. NO is colourless and slightly soluble in water. NO_2 can travel in the respiratory systems. It is also involved in the formation of Ozone in the atmosphere.	Forms bonds with haemoglobin and reduce the efficiency of oxygen transport. Respiratory irritation, headache, impairment of lungs, loss of appetite and corrosion of teeth.

3. AIR QUALITY MANAGEMENT

Environmental concerns for large scale of operation of CSTPS make it mandatory to monitor the pollution from power plant on regular basis. Three pollutants are being monitored to meet the statuary requirement of MPCB namely SPM, SO_2 and NOx. There are two methods for measurement of SPM viz. (i) Settle able particulates by dust fall and (ii) suspended particulates by high volume sampler.

As far as air pollution is concerned, CSTPS is having a very sound air quality management which believes in keeping the atmosphere free from any hazardous emissions from their site. MPCB have laid down limits for the stack emission monitoring at CSTPS of 100 mg/Nm^3 for SPM. Whereas, ambient air quality standards prescribed for various zones are given in **Table 3.1.**

To keep a check on the emissions, CSTPS undertaken a routine monitoring of the stacks. They are maintaining monthly reports on all the data regarding the amount of pollutants emitted from the stack.

Regular surveillance is being carried out by CSTPS and records so generated have been used in this report to find out the relation between meteorology and natural purification factors like temperature, lapse rate, stability, pressure, wind speed, direction humidity etc.

Table 3.1: The National Ambient Air Quality Standards (2009) for 24 Hrs Avg

Pollutants	**Time Weighted Average**	**Concentration in Ambient Air**		**Methods of Measurement**
		Industrial, Residential, Rural and other Areas	**Ecologically, Sensitive Area (Notified by Central Government)**	
Sulphur Dioxide (SO_2), µg/m^3	Annual * 24 Hours **	5 0 8 0	2 0 8 0	- Improved West and Gaeke Method - Ultra violet Fluorescence
Nitrogen Dioxide (NO_2), µg/m^3	Annual * 24 Hours **	40 80	3 0 8 0	- Jacob & Hochheiser modified (NaOH-NaAsO2) Method - Gas Phase Chemiluminescence
Particulate Matter (Size less than 10µm) or PM_{10}, µg/m^3	Annual * 24 Hours **	6 0 1 0 0	6 0 1 0 0	- Gravimetric - TEOM - Beta attenuation
Particulate Matter (Size less than 2.5 µm) or PM2.5, µg/m^3	Annual * 24 Hours **	40 60	40 60	- Gravimetric - TEOM - Beta attenuation

*Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

**24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98 % of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

NOTE: Whenever and w her ever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigations.

Vehicular Emissions:

The total road length in Chandrapur District is 7059 kms, road length within the municipal areas is about 730 kms. As per latest information given by RTO on different types of vehicles (August 2024), there are 635623 vehicles in Chandrapur districts. MSRTC is running the public transport in the district within a fleet of 1048 buses of which approximately 817 buses are in use on a daily basis. The contribution of these buses in the vehicular emissions in chandrapur has not been estimated so far the based on modified emission factors and the conditions of buses.

The survey conducted by RTO Chandrapur in August-2024 on the traffic load at major roads in the districts. A 24 hr traffic survey carried out on different roads indicated that about 1635 - 1850 vehicles ply on Nagpur-Chandrapur and 480 - 550 vehicles ply on Chandrapur - Tadoba roads per hours. These two routes closely touches the Chandrapur Super Thermal Power Station by two sides. About 1600-1800 vehicles ply in an hour in Chandrapur city. The main pollutants from automobile exhaust are particulate matter, hydrocarbons, carbon monoxide. NOx and some amount of SO_2.

Coal Handling:

There are several coal deposits on Nagpur-Chandrapur highway. These depots are responsible for the generation of the large coal dust emissions leading to deterioration of air quality due to suspended particulate matter in these areas. On major store gate side of power station, there is a slum area and small villages dependent on the coal as a fuel for their cooking such as Padoli, Durgapur, Lakhmapur etc. The families living in these areas are dependent on coal as a fuel for their cooking.

The coal is easily available in Chandrapur and its surrounding villages as the coal mines are covered this large area. It is generally observed that this coal is used as cheap alternative to the other fuel sources. It is mainly used in the villages nearer the coal mines and also in the slum areas for cooking and for water heating purposes. It is reported that a household using coal uses approximately 7 to 8 kgs per house of coal for domestic purposes. Further it is regularly used by hotels and dhabas on Nagpur-Chandrapur road. This burning

of hard coal is major source of air emission. This is one of the important reason for the appearance of a smog-blanket in Durgapur area and in all the villages where coal is cheaply available. The emissions from these activities contribute significantly to the local air pollution and resulting into health problems.

4. FACTORS AFFECTING GROUND LEVEL CONCENTRATIONS

The main factors governing the Ground Level Concentration of a location is the meteorological condition prevailing in and around CSTPS. Climatically Chandrapur is the hottest place in Maharashtra. Atmosphere is dump and humid / sultry. The average minimum and maximum temperature in September 2024 is 28.0ºC and 36.0°C respectively. Summer season is between middle of March to Middle of June. SW monsoon is the major rain water source and February is cold. The wind direction which is the important aspects as far as GLC is concerned is mainly between North - East and South-East. In summer the winds are basically concentrated between South – East to North - East directions with the intensity being light to moderate with some increase in speed. During the monsoon season winds are mostly in South – West direction. The winter season is from December to February. In winter, the winds are basically concentrated between South - East to North - East directions

Wind and temperature play a major role in dispersion of air pollutants. Generally temperature decreases with height, the rate of such decrease of temperature is about 6 ºC to 10 ºC per Km at the adiabatic lapse rate at a given point may be less than 6 ºC per Km or inverted. For some times of the day or nights, especially during the colder months of December, January & February in India, the air tends to stagnate.

In fact relatively stable layers of air occur at laps rates (less than 2°C per Km). These layers become increasingly stable and finally full inversion condition is attained. As far as central part of India is concerned, the inversion/stable layers extending from ground level at 100 meters to 300 meters or so are considered important for air pollution point of view. Keeping in view the effect of inversion the stack for the some industrial and Thermal Power Plant are required to be design to overcome the pollution problem.

The inversion phenomenon in India is rather favourable. The inversion do not last more than a few hrs. at a time and thus the build-up pollutant concentration is not very intense. As far as Chandrapur area concerned the inversion layers are experienced in winter on some occasions but normally the sky is clear and emissions disperse over wide range. The thick layers of inversion are normally observed within the range of 200 meter and small percentage of inversion extends beyond 600 meters.

Inversion data collected in the past at Chandrapur meteorological station. The diffusion profile of the stack emission mainly depends on the stability of the atmosphere. The condition around the stack at CSTPS experiences a super-adiabatic lapse rate particularly in summer. In such a situation the atmosphere is set to be in an unstable equilibrium. It is under such condition when the pollutants are rapidly dispersed due to considerable vertical mixing of air. At this point the mentioned regarding plume behaviour is inevitable. When super-adiabatic lapse rate occurs “looping plumes” are observed resulting in bringing high concentration of plume gases to the ground for short period.

When inversion persists then dispersion of pollutants is at minimum and a “fanning” plume can be seen at Chandrapur during cloudy days in the downwind direction. If inversions were too frequent at Chandrapur then increasing the stack heights would be justified. Low GLC values are possible if the inversion conditions exist below the stack heights, resulting in “lofting” plume. Such a plume has minimal downward mixing and pollutants are dispersed downwind without any significant GLC.

“Fumigating” plume at Chandrapur will occur only in winter in the early hours at the time when morning sun breaks up radiation inversion. This accounts for high GLC during relatively short periods in the morning. A plume can be trapped if inversion layer prevail above and below the stack.

The climatic condition around CSTPS is predominantly clear with light winds blowing from south-west to north-west in summer. This condition ensures good dispersion of the pollutants released from the stacks.

PURPOSE OF PRESENT WORK:

The main purpose of this study is to forecast the ground level concentration of the pollutants including SPM, SO_2 and NOx emitted from CSTPS in the area surrounding the power station. The study will give a clear idea about the relation between the emission from the stacks and their impact on the surrounding region.

Climate:

The Climate of this region can be classified as tropical hot climate with high range of temperature throughout the year primarily, there two prominent seasons in the district – The very hot summer and moderate winter. The summer months are very hot and prolonged while winter is short and mild. The monsoon season starts immediately after summer till late September. The southwest monsoon brings lot of rainfall during rainy season and there is no draught prone area in this district.

The temperature starts Increasing from the month of March. The daily mean temperature starts rising from the month of February and May is the peak summer month when mean maximum temperature goes up to 48^0 C and minimum temperature is 32 ^{0}C to 36^0C. In severe hot conditions temperature raises up to 48^0C. However temperature starts reducing after May due to onset of monsoon, which last from June to September when it is hot and humid. The maximum temperature recorded in the month of May 2024 is 48.0 ^{0}C and minimum temperature is 36.0 ^{0}C.

The average annual rainfall is about 22.98 mm. The rainfall recorded during the month of June, July, August, September and October 2024 are 215.3 mm 1008.40 mm, 355.60 mm, 150.60 mm and 97.00 mm respectively. Average numbers of rainy days is 75 to 90 throughout the region. The relative humidity was very high during Rainy season, it was up to 89 %. The average maximum Humidity recorded in the month of September 2024 was 82.0 %.

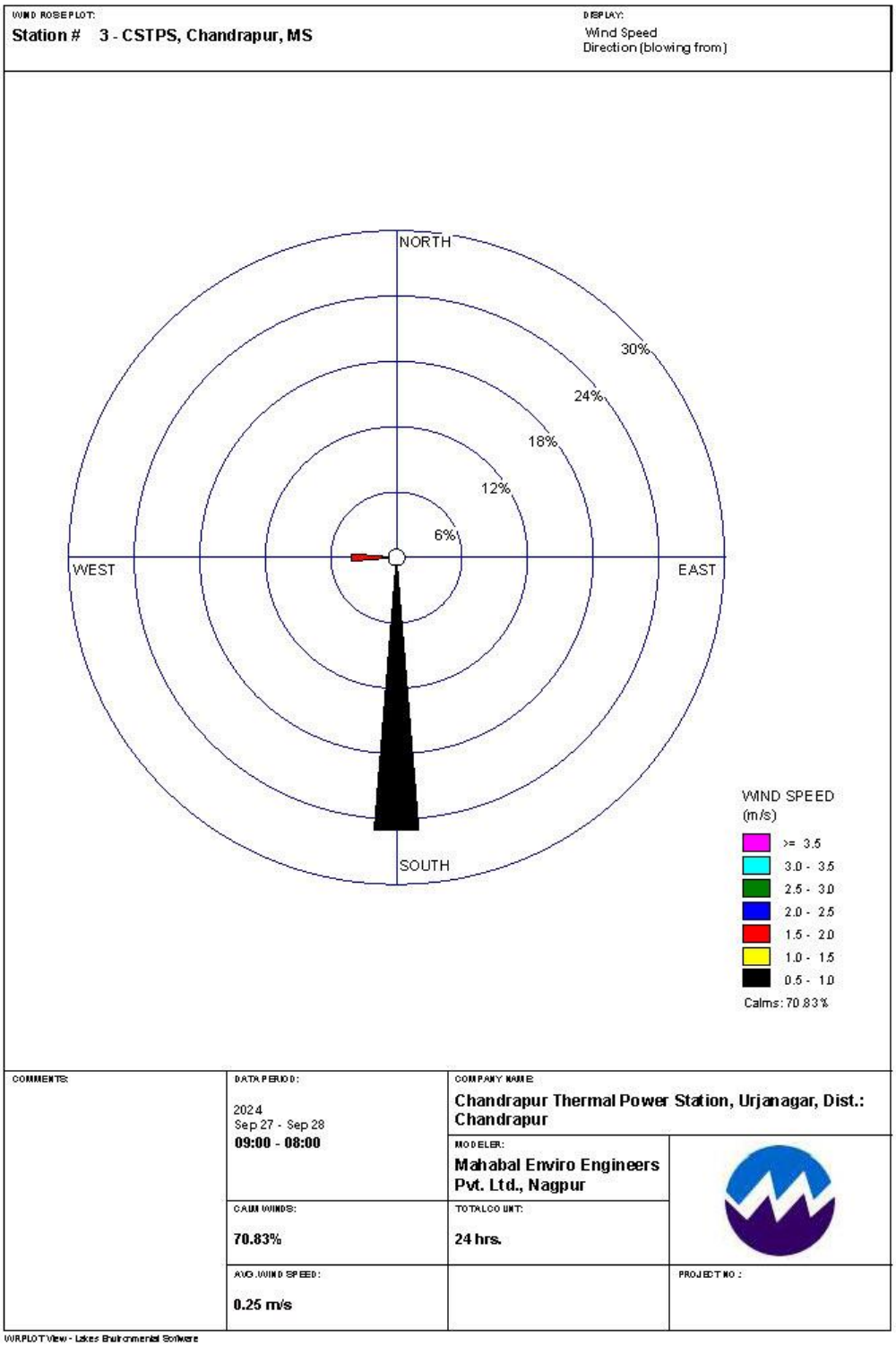


Fig.4.1: Wind Rose Diagram at CSTPS

ESTIMATION OF GLC

Major pollution loads from CSTPS are due to gaseous & particulate emissions. Impacts of these would be respectively on air, water bodies and the soil. Magnitude and significance of these impacts depend on the chemical nature of these pollutants.

Air pollutants released from stationery, mobile as fugitive sources within CSTPS area are transported due to atmospheric dispersion process. Stack emissions and fugitive emissions have more significance than mobile sources at CSTPS. Pollutants from these sources will be dispersed into atmosphere. Dispersion depends on stack emission parameters like flue gas composition, quantity, temperature, velocity and metrological conditions viz. ambient temperature & wind speed, severity of impact on receptor depends on the concentration of pollutant, its duration and nature of receptors.

Wind is the primary atmospheric transport mechanism. Wind pattern varies with season and atmospheric condition. Wind speed varies with height which is known as ‘wind shears’. Wind shear within CHP which is at ground level is different than that at stack height. Hence dispersion pattern of SPM from ground and elevated sources would be different due to varying wind shears at stack heights of units 3 - 9 at CSTPS.

Atmospheric stability is related to the rise and falling volumes of air. It is a function of temperature gradient, atmospheric turbulence, wind speed, isolation etc. Thermal gradient varies with location of the industry and the gradient indicates the actual region of the atmosphere where emissions from stacks and ambient parameters intermingle. This is confined to mixing layer. Mixing layer is at that height or regions of the atmosphere which is capped by warm air layer which would inhibit any movement past it in the upward direction. Height of mixing layer in a region affects the dispersion process.

5. ESTIMATION OF GLC AT DOWN WIND DISTANCE

In order to assess the anticipated ground level concentration of various pollutants namely SPM, SO_2 and NOx, efforts have been made to work out the concentration, using appropriate atmospheric dispersion models. The model used in the study is ISCST3 from US EPA and it has been widely accepted and validated for Indian conditions.

Forecasting requires information on maximum mixing depth (MMD). This is estimated by plotting maximum surface temperature and drawing a line parallel to the dry adiabatic temperature to the point at which the line intersects the ambient lapse rate for early morning period.

5.1. Dispersion Modeling

Dispersion of pollutants have been estimated using USEPA's dispersion model namely Industrial Source Complex (ISCST3) Dispersion Model. The geography and setting of co-ordinates are taken by assigning origin (0.0) at stack number 1. The settings are detailed in **Fig 5.1** showing aerial view of CSTPS. Meteorological data was collected and used for modeling. Stack emissions in terms of mg/Nm^3 and stack dimensions were obtained from CSTPS. ISCST3 model was run using rural terrain and since height of all stacks are much above the buildings around downwash has not been considered for the purpose of GLC calculations. The details of stacks considered in the modeling are shown in **Table 5.1** and emissions of SO_2, NOx and SPM are reported in **Table 5.2**. The ground level concentration has been predicted in the radius of 10 km. The results obtained using ISCST3 for 24 hr average concentrations at various locations are reported in **Table 5.3, 5.4 and 5.5** for SO_2, NOx and SPM respectively. The angles in first column of **Table 5.3 - 5.5** are starting from x-axis and in clockwise direction as referred in **Fig 5.1**.

Fig 5.1:
Ariel view of seven stacks at Chandrapur Super Thermal Power Station.

Table 5.1: Details of Stacks at CSTPS (SEPTEMBER-2024)

Source	Stack height (m)	Stack temp (°C)	Average exit velocity (m/sec)	Stack dia. internal (m)
STACK 3	150	135	26.77	3.32
STACK 4	150	137	26.10	3.32
STACK 5	200	136	26.49	14.099
STACK 6	200	137	26.15	14.099
STACK 7	275	132	26.33	18.524
STACK 8	275	129	26.00	6.3
STACK 9	275	S/D	S/D	6.3

Table 5.2: Emissions from each Stack (SEPTEMBER–2024)

Source	Emission rates		
	SO_2 (mg/Nm^3)	NOx (mg/Nm^3)	SPM (mg/Nm^3)
STACK 3	1297	294	87
STACK 4	1254	291	85
STACK 5	1305	288	89
STACK 6	1279	304	92
STACK 7	1303	286	94
STACK 8	1294	327	39
STACK 9	S/D	S/D	S/D

Table 5.3: 24-hr Average ground level concentrations of SO_2 predicted at various locations in 10 km radius, units of concentration µg/m^3

DIRECTION (DEGREES)	DISTANCE (METERS)						
	500	1000	2000	3000	5000	8000	10000
10	0.00013	0.00021	0.00051	0.00016	0.00000	0.00000	0.00000
20	0.00022	0.00036	0.00000	0.00000	0.00000	0.00000	0.00000
30	0.00023	0.00005	0.00000	0.00000	0.00000	0.00000	0.00000
40	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
50	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
60	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
80	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
90	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
100	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
110	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
120	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
130	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
140	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
150	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
160	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
170	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
180	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
190	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
200	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
210	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
220	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
230	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
240	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
250	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
260	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
270	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
280	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
290	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
300	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
310	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
320	0.00000	0.00000	0.00002	0.00012	0.00046	0.00065	0.00067
330	0.00000	0.00003	0.00017	0.00002	0.00000	0.00000	0.00000
340	0.00001	0.00013	0.00000	0.00000	0.00000	0.00000	0.00000
350	0.00004	0.00008	0.00000	0.00000	0.00000	0.00000	0.00000
360	0.00007	0.00002	0.00002	0.00008	0.00086	0.01065	0.03135

Table 5.4: 24-hr Average ground level concentrations of NOx predicted at various location in 10 km radius, units of concentration µg/m^3

DIRECTION (DEGREES)	DISTANCE(METERS)						
	500	1000	2000	3000	5000	8000	10000
10	0.00003	0.00005	0.00012	0.00004	0.00000	0.00000	0.00000
20	0.00005	0.00008	0.00000	0.00000	0.00000	0.00000	0.00000
30	0.00005	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000
40	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
50	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
60	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
80	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
90	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
100	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
110	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
120	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
130	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
140	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
150	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
160	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
170	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
180	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
190	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
200	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
210	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
220	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
230	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
240	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
250	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
260	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
270	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
280	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
290	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
300	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
310	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
320	0.00000	0.00000	0.00000	0.00003	0.00011	0.00015	0.00016
330	0.00000	0.00001	0.00004	0.00001	0.00000	0.00000	0.00000
340	0.00000	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000
350	0.00001	0.00002	0.00000	0.00000	0.00000	0.00000	0.00000
360	0.00002	0.00000	0.00000	0.00002	0.00020	0.00244	0.00718

Table 5.5: 24-hr Average ground level concentrations of SPM predicted at various locations in 10 km radius, units of concentration µg/m^3

DIRECTION (DEGREES)	DISTANCE(METERS)						
	500	1000	2000	3000	5000	8000	10000
10	0.00001	0.00001	0.00004	0.00001	0.00000	0.00000	0.00000
20	0.00002	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000
30	0.00002	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
40	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
50	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
60	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
80	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
90	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
100	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
110	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
120	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
130	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
140	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
150	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
160	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
170	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
180	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
190	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
200	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
210	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
220	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
230	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
240	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
250	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
260	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
270	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
280	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
290	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
300	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
310	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
320	0.00000	0.00000	0.00000	0.00001	0.00003	0.00005	0.00005
330	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00000
340	0.00000	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000
350	0.00000	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000
360	0.00001	0.00000	0.00000	0.00001	0.00006	0.00072	0.00212

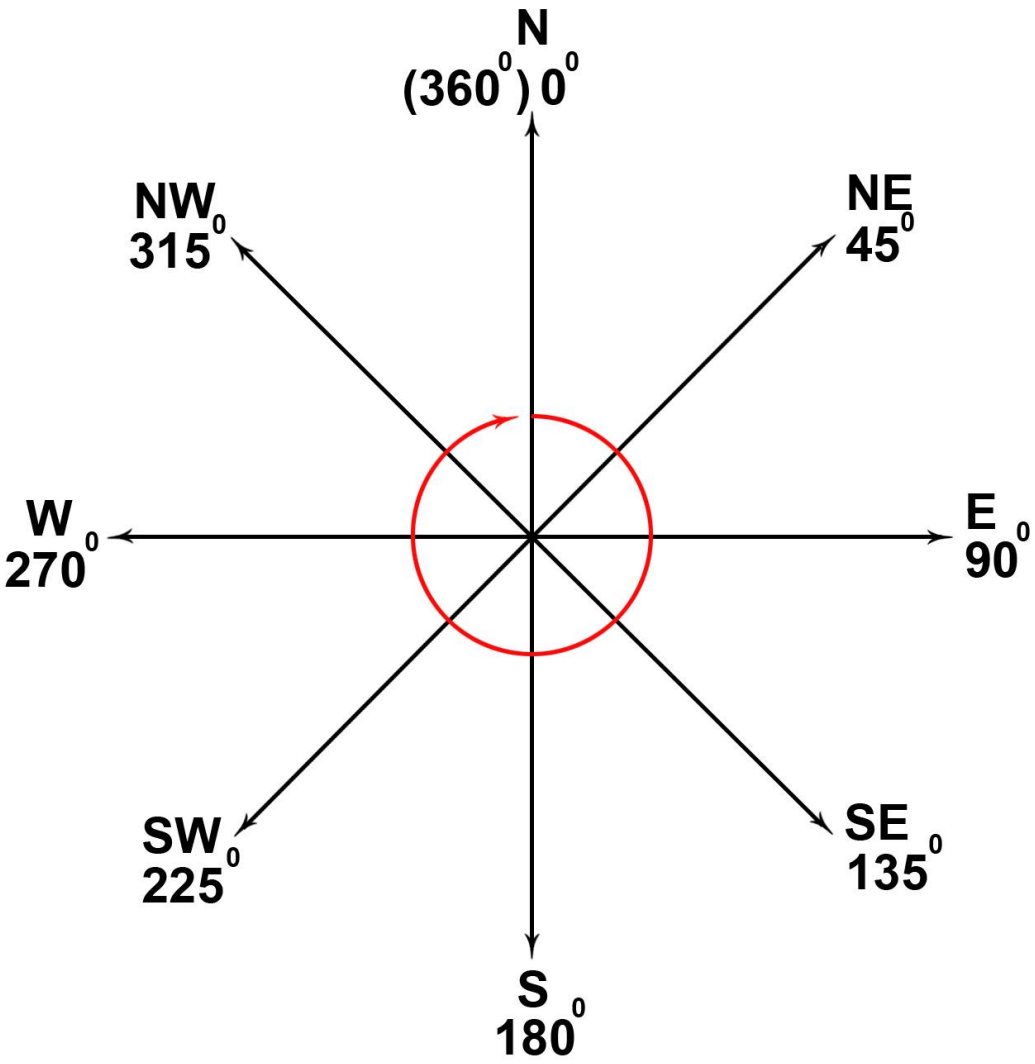
Surface plot of concentration in 10 km radius for SO_2, NOx and SPM are depicted in **Fig 5.3, 5.4 and 5.5** respectively. Mostly the concentrations of these pollutants are higher in the North direction with prevailing meteorological conditions.

The ground level concentration have been monitored at various places around CSTPS and reported in **Table 5.6**.

Table 5.6: GLC monitored at various locations

Sr. No	Date	Time in Hours	Location	Dist. From CSTPS (km)	Direction w.r.t. CSTPS	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)
1	27.09.2024	13:30	Kitadi Village	5.5	N	82	21	18.8	23.7
2	27.09.2024	13:00	Padmapur	4.7	NE	78	19	19.5	25.2
3	27.09.2024	11:10	Carmel Academy	4.5	E	94	27	18.3	25.7
4	27.09.2024	10:25	Tukum Masjid	5.6	SE	90	31	18.7	22.5
5	27.09.2024	10:00	Nice Computer	5.9	S	97	38	19.3	27.1
6	27.09.2024	09:00	Gajanan Mandir (Wadgaon)	3.8	SW	80	20	18.5	21.8
7	27.09.2024	09:30	Morwa	7.0	W	85	23	17.7	20.9
8	27.09.2024	15:15	Ash-bund	9.4	NW	75	25	17.0	20.5

Directions with respect to Degrees



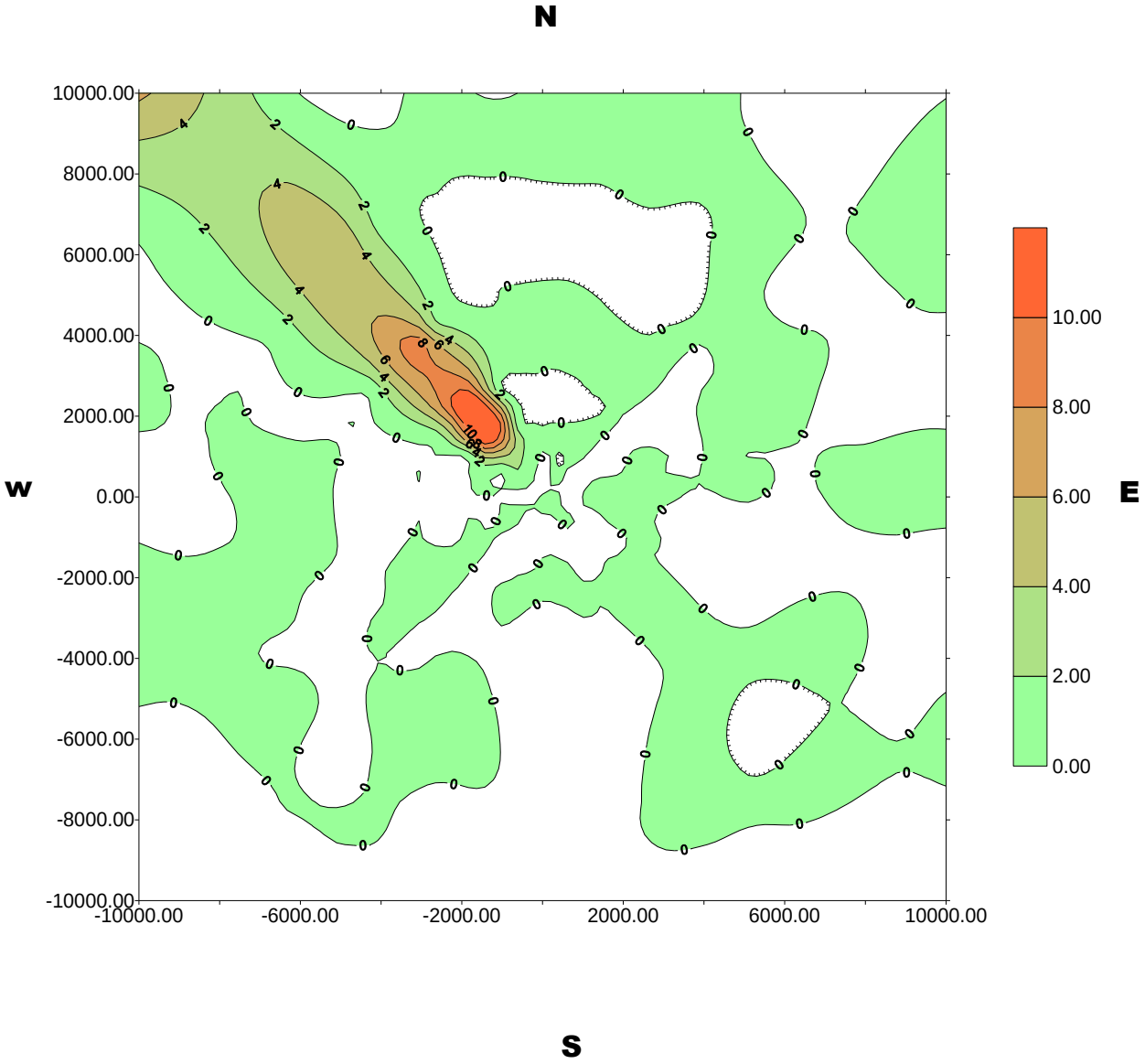


Fig. 5.3: Surface plot showing ground level concentration of SO_2 in 10 km radius

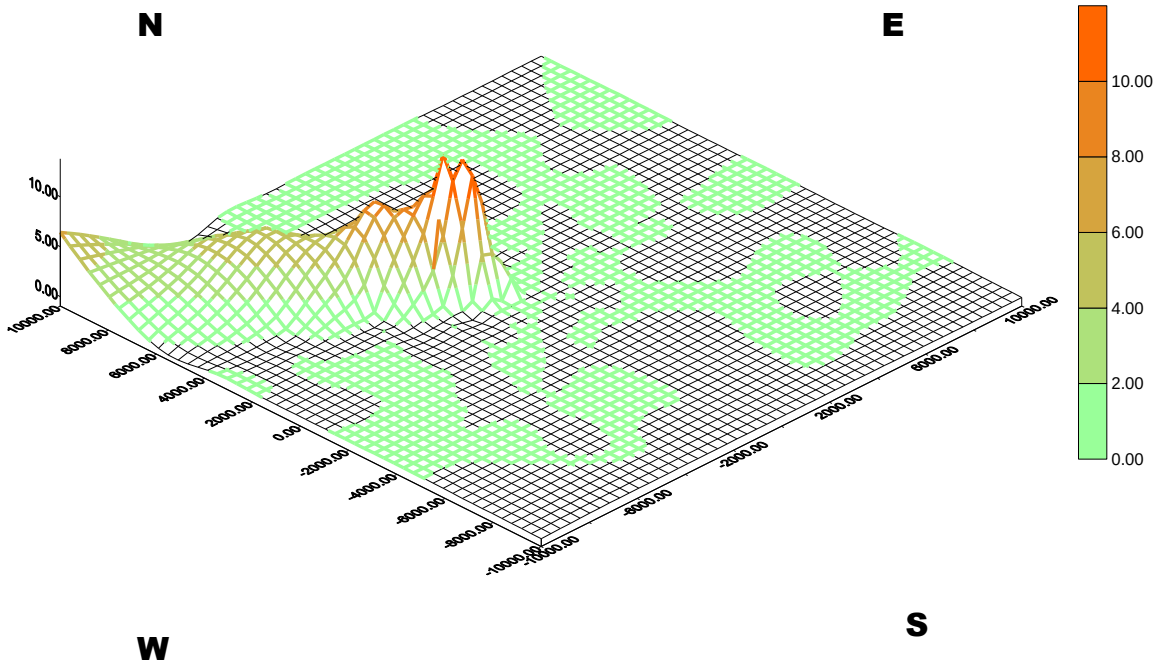


Fig 5.3 Surface Plot Showing Ground Level Concentration of SO2 in 10Km. radius

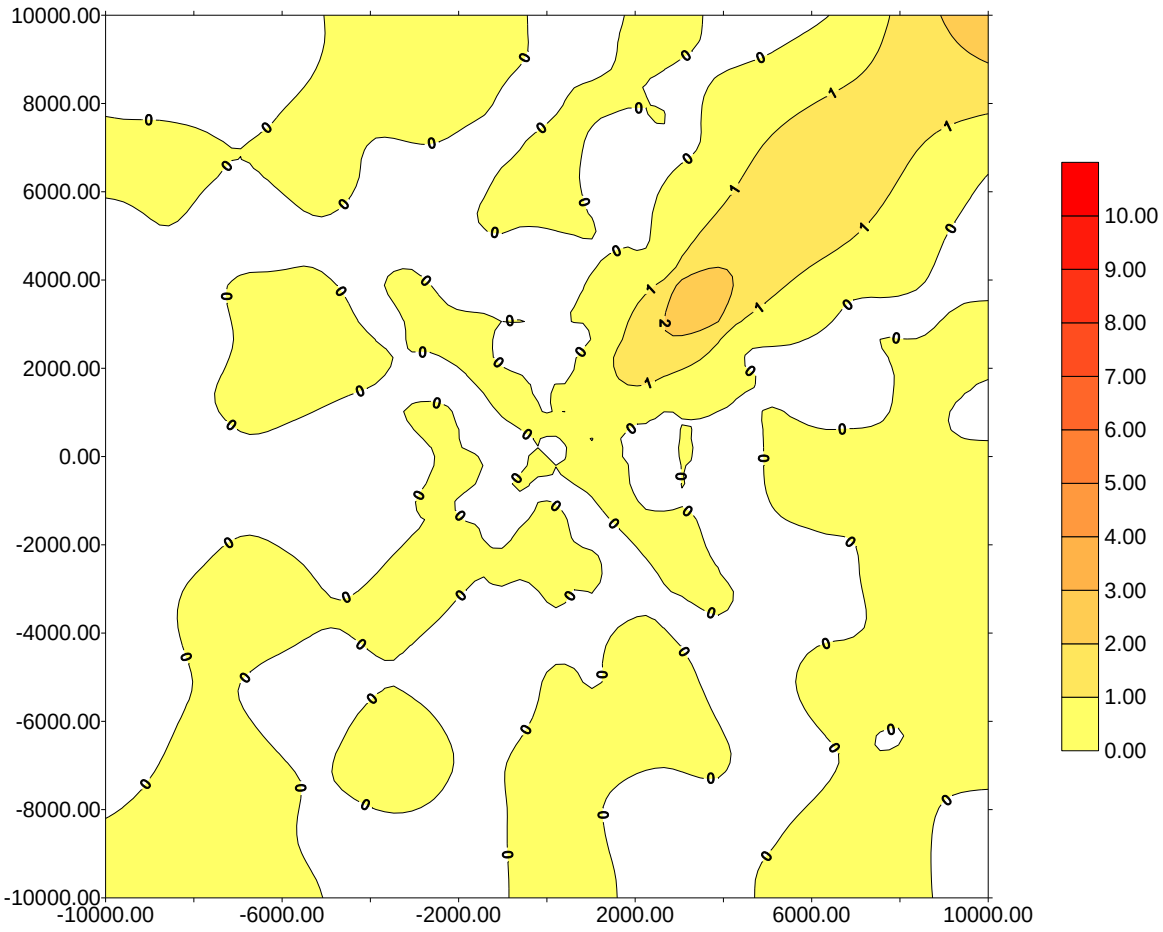


Fig. 5.4: Surface plot showing ground level concentration of NOx in 10 km radius

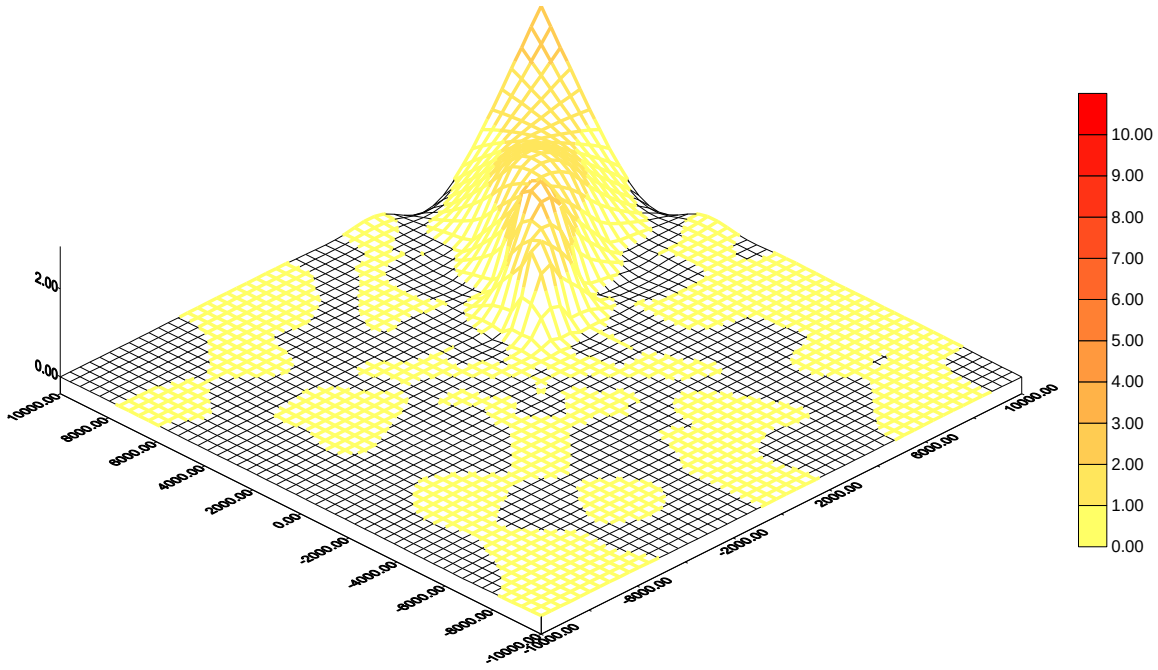


Fig 5.4 Surface Plot Showing Ground Level Concentration of NOx in 10Km. radius

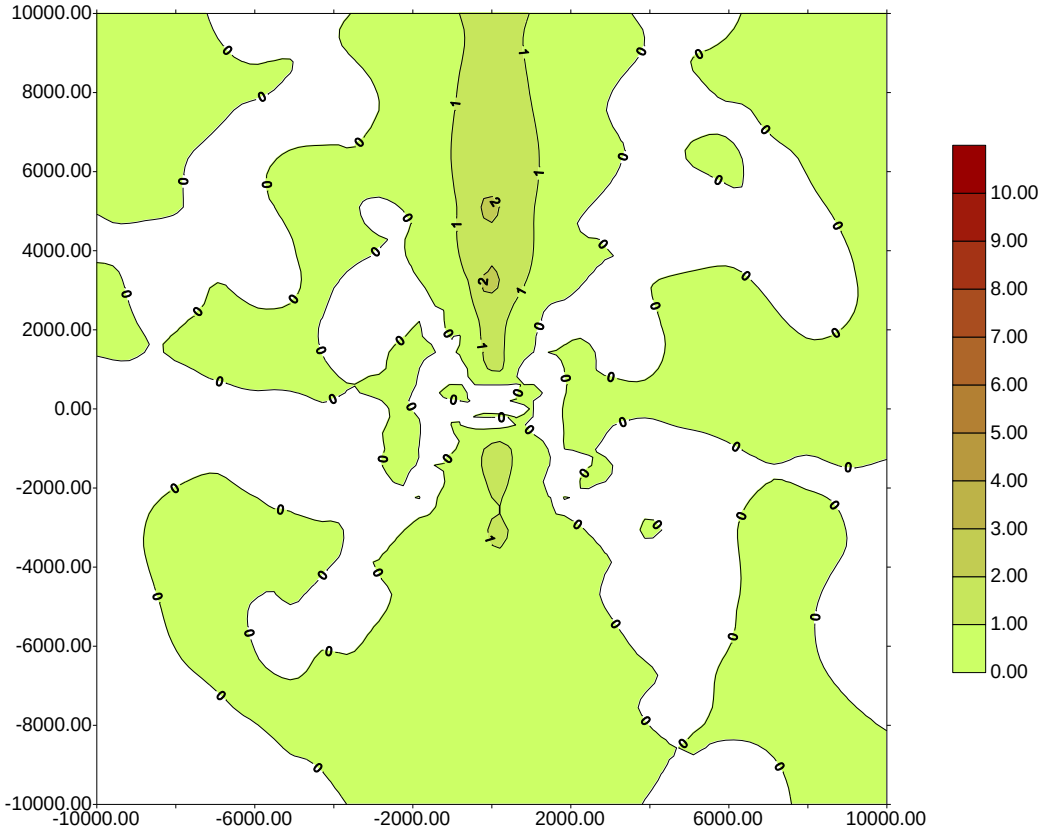


Fig. 5.5: Surface plot showing ground level concentration of PM in 10 km radius

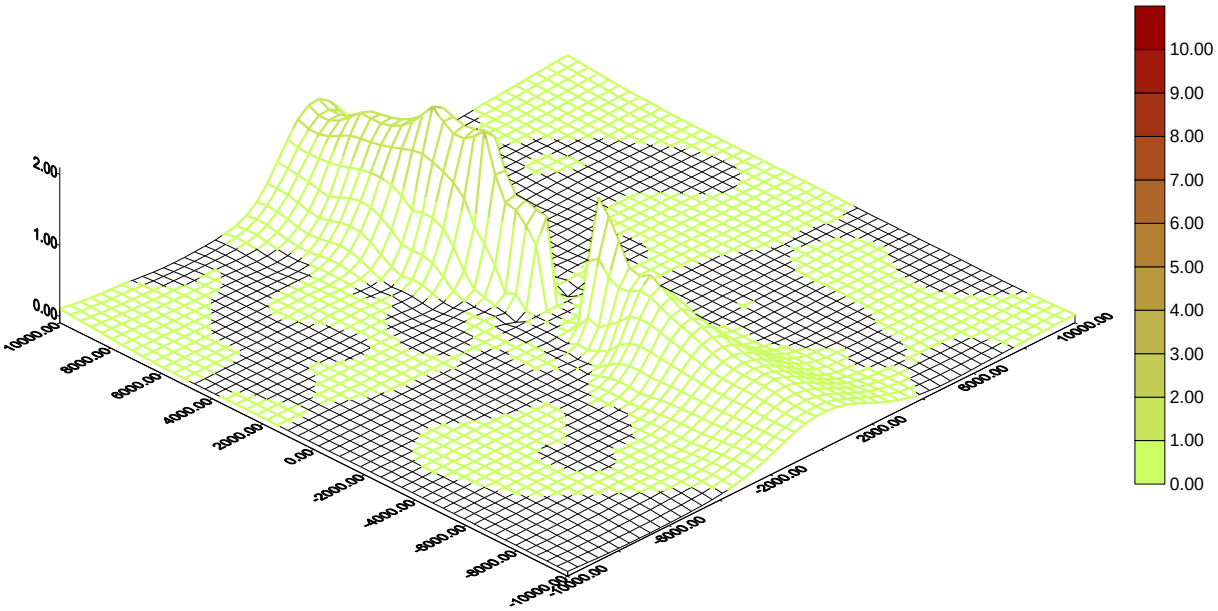


Fig 5.5 Surface Plot Showing Ground Level Concentration of SPM in 10Km. radius

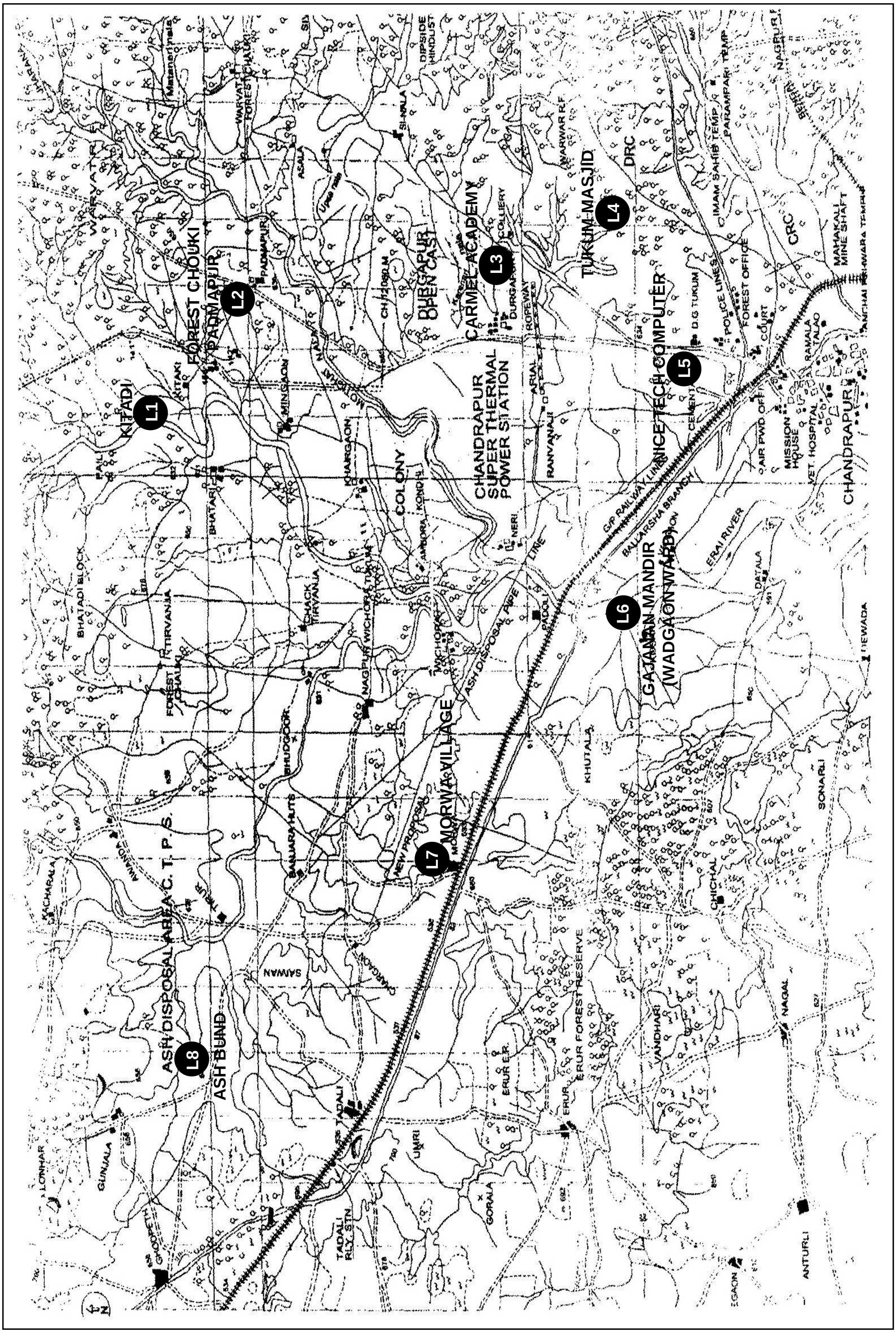
5.7 CONCLUSION

The concentrations of pollutants predicted by ISCST3 model at various locations are well within permissible limits.

During September 2024, predominant wind direction were South. The highest ground level concentrations are appearing at locations Nice Computer & Tukum Masjid from S & SE direction respectively and within distance of about 3 to 10 kms.

The locations near the source are vulnerable to pollutants up to 10 km area surrounding the source. Depending upon the wind direction from Meteorological data, surrounding area gets affected. Mostly the concentrations of these pollutants are higher in the South of the plant with prevailing meteorological conditions. However the concentrations are in within permissible limits.

Agricultural fields and tree plantation reduced the severity of concentration of pollutants. Thus concentrations are well within permissible limits.


L1
KITADI
L2
FOREST CHOUKI
PADMAPUR
L3
CARMEL ACADEMY
L4
TUKUM-MASJID
L5
NICE TECH COMPUTER
L6
GAJANAN MANDIR
(WADGAON WARD)
L7
MORWA VILLAGE
L8
ASH DISPOSAL AREA C. T. P. S.
ASH BUND
CHANDRAPUR
SUPER THERMAL
POWER STATION
DURGAPUR
OPEN CAST
DRC
CRC
CHANDRAPUR
COLONY
ERAI RIVER
ASH DISPOSAL PIPE LINE
ERUR FOREST RESERVE

ANNEXURE-XII

Health Camp at CSTPS, Chandrapur was held on dated 06.06.2024 in Conjunction with Indian Medical Association, Chandrapur and Indian Redcross Society, Chandrapur & Tata Cancer Care Foundation.

ANNEXURE-XII

ANNEXURE-XIII

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR.

For the period of **July-2024 to December-2024**

MONTHLY AVERAGE STACK MONITORING REPORT

MONTH	PARAMETERS	UNIT # 3 (210 MW)	UNIT # 4 (210 MW)	UNIT # 5 (500 MW)	UNIT # 6 (500 MW)	UNIT # 7 (500 MW)	UNIT # 8 (500 MW)	UNIT # 9 (500 MW)
Jul-24	SPM (mg/NM^3)	85	87	91	92	89	21	24
	SO_2 (mg/NM3)	1308	1321	1264	1270	1313	1281	1290
	NOx (mg/NM^3)	319	310	302	313	305	311	307
	Hg (mg/Nm3)	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	NH_3 (PPM)	2.61	2.64	2.72	2.69	2.64	NA	NA
Aug-24	SPM (mg/NM^3)	85	91	93	97	89	20	26
	SO_2 (mg/NM3)	1271	1289	1279	1313	1310	1298	1283
	NOx (mg/NM^3)	322	302	296	303	317	290	310
	Hg (mg/Nm3)	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	NH_3 (PPM)	2.61	2.67	2.86	2.78	2.75	NA	NA
Sep-24	SPM (mg/NM^3)	87	85	89	92	94	39	SD
	SO_2 (mg/NM3)	1297	1254	1312	1279	1303	1282	SD
	NOx (mg/NM^3)	294	291	288	304	286	327	SD
	Hg (mg/Nm3)	BQL	BQL	BQL	BQL	BQL	BQL	BQL
	NH_3 (PPM)	2.46	2.31	2.78	2.70	2.86	NA	NA
Oct-24	SPM (mg/NM^3)	86	90	93	88	92	47	34
	SO_2 (mg/NM3)	1305	1312	1324	1336	1345	1357	1319
	NOx (mg/NM^3)	314	297	316	322	322	329	297
	Hg (mg/Nm3)	BQL	BQL	BQL	BQL	BQL	BQL	BQL
	NH_3 (PPM)	2.52	2.49	2.72	2.83	2.82	NA	NA
Nov-24	SPM (mg/NM^3)	86	90	94	88	95	85	25
	SO_2 (mg/NM3)	1289	1280	1322	1340	1293	1336	1343
	NOx (mg/NM^3)	280	299	311	326	297	324	318
	Hg (mg/Nm3)	BQL	BQL	BQL	BQL	BQL	BQL	BQL
	NH_3 (PPM)	2.51	2.53	2.81	2.80	3.00	NA	NA
Dec-24	SPM (mg/NM^3)	84	89	96	95	94	48	22
	SO_2 (mg/NM3)	1300	1304	1307	1325	1333	1343	1339
	NOx (mg/NM^3)	294	314	330	313	291	316	319
	Hg (mg/Nm3)	BQL	BQL	BQL	BQL	BQL	BQL	BQL
	NH_3 (PPM)	2.49	2.62	2.46	2.65	2.68	NA	NA

Note: -1) ND = Not Detectable, BQL = Below Quantification Limit

Analysis carried out by MOEF&CC recognized laboratory i.e. M/s. Mahabal Enviro Engineers Pvt Ltd.

As per MPCB Consent **NH_3 : Not to exceed 50 ppm.**

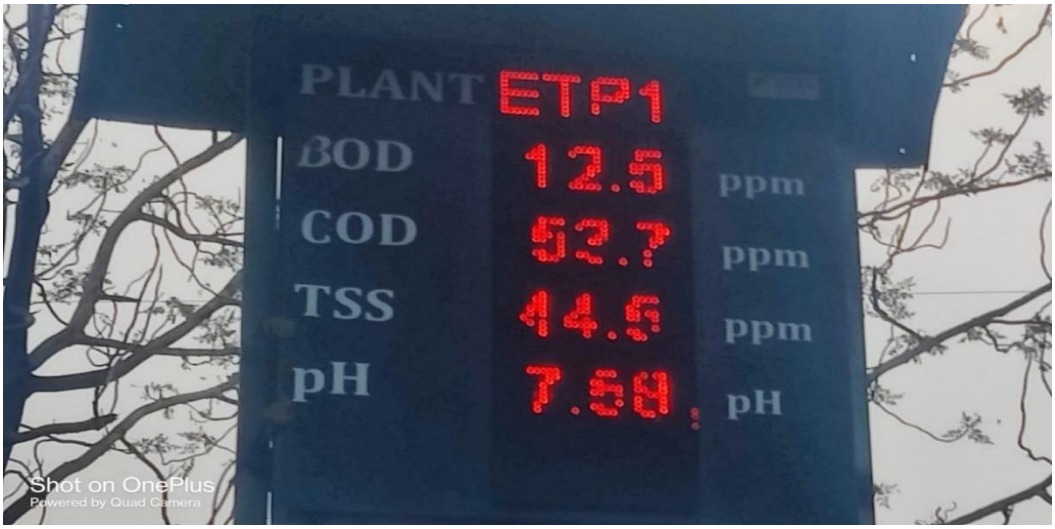
As per MPCB consent and MoEF & CC Notification effected from 07/12/2015

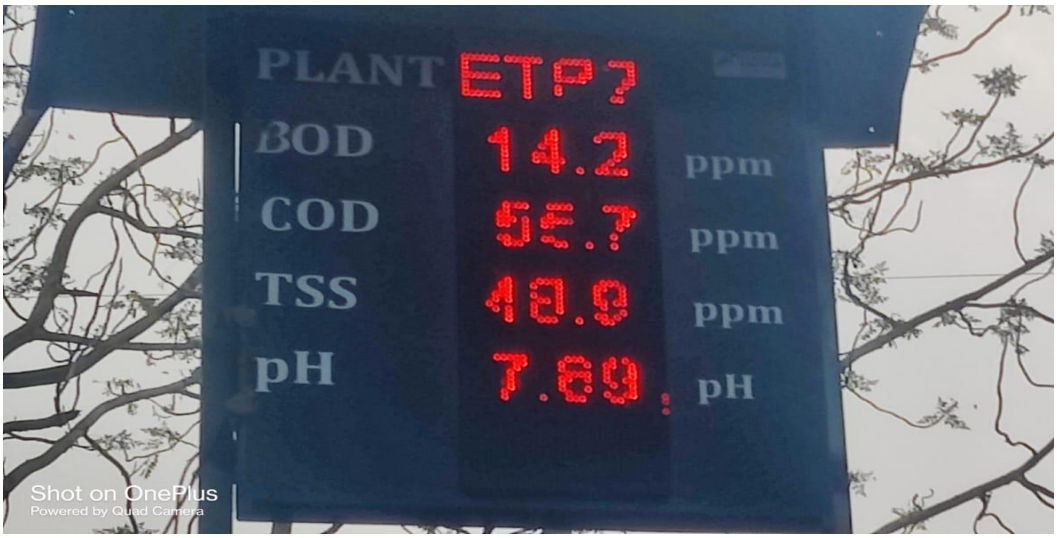
Parameter	U# 3 to 7	U#8&9
SPM (mg/NM^3)	**100**	**50**
SO_2 (mg/NM^3)	**U#3&4=600 U#5,6&7=200**	**200**
NOx (mg/NM^3)	**600**	**450 as per MoEF notification dated 19.10.2020**
Hg (mg/NM^3)	**U#3&4=N/A, U#5-7=0.03**	**0.03**

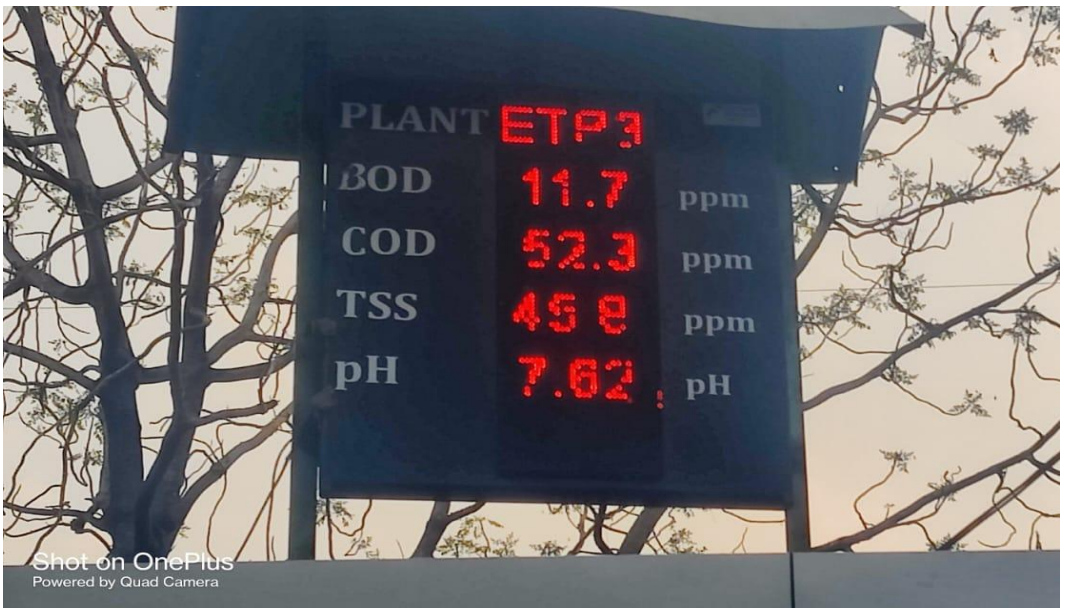
- **Display of Stack & Ambient level at main gate**

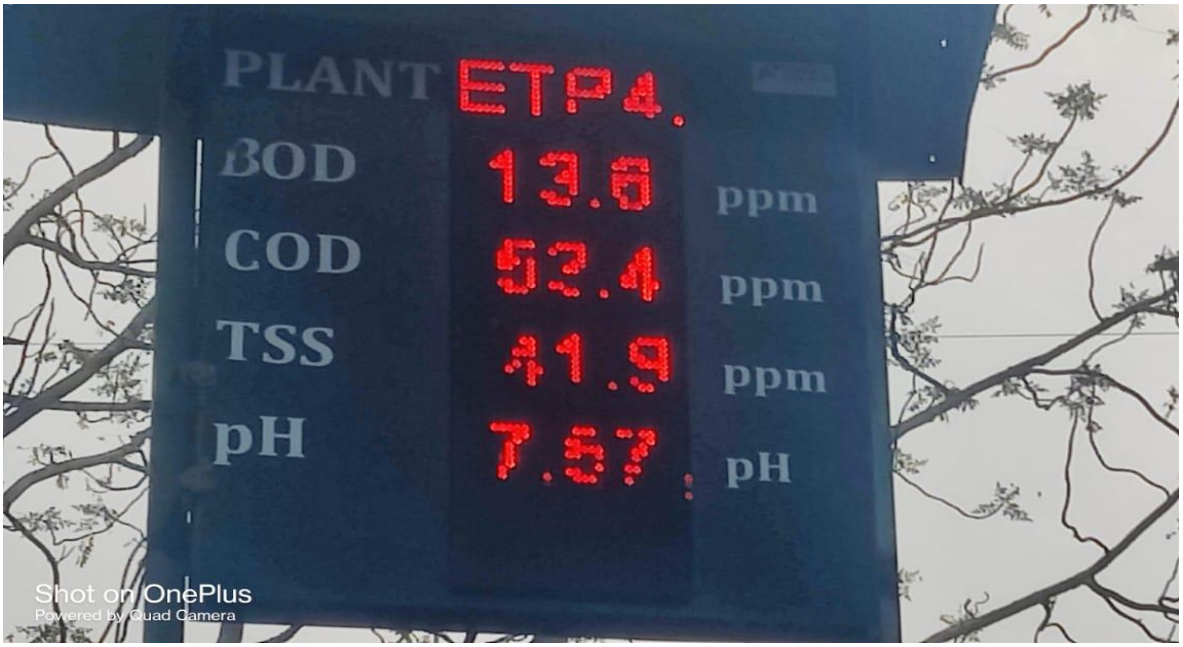
- **Display of Stack & Ambient level at Major gate**

- **Display of ETP Parameters at main gate**









- **Display of ETP Parameters at Unit 8 & 9 area.**

ANNEXURE XIV

MAHAGENCO
(A GOVERNMENT OF MAHARASHTRA UNDERTAKING)

CHANDRAPUR SUPER THERMAL POWER STATION
MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED
(ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 & ISO 50001:2018)
Office of Chief Engineer, C S T P S Urjanagar, Chandrapur – 442404
Phone 07172 - 220133 to 220139 Fax 07172 - 220203
Email cegenchandrapur@mahagenco.in

CHN/Env & Coal / ENV.Audit/ 002672 Date: 29 JUL 2024

To,
The Member Secretary,
MPCB, Kalpataru Point
Sion (East), Mumbai – 400 022

Subject: Submission of **Environmental Statement Report** in 'Form-V' for the year 2023-24.
Ref: 1) MPCB Consent UAN No. 0000163955/CR/2307001126 dated 18.07.2023
2) MPCB Consent UAN No. 0000132095/CR/2207000313 dated 06.07.2022

Dear Sir,

Please find enclosed herewith the "Environmental Statement Report" of Chandrapur Super Thermal Power Station, Chandrapur for the year 2023-24 (year ending 31st March 2024).

The "Environmental Statement Report" is prepared in prescribed Form-V as per provision of rule 14 of the Environment (Protection) (2nd Amendment) Rules 1992.

Thanking you,

Yours sincerely,

Chief Engineer
CSTPS, Chandrapur

Encl.: - As above.

Copy s.w.rs.to:
1. The Director (Op), MSPGCL, Mumbai.
2. The Joint Director (APC), MPCB, Mumbai.
3. The Executive Director (O&M-II/E&S), MSPGCL, Mumbai.
4. The Regional Officer, MPCB, Chandrapur.
5. The Sub Regional Officer, MPCB, Chandrapur.

01-08-2024
Maharashtra Pollution Control Board
Regional office
Udyog Bhavan 1st Floor Station Road
Chandrapur-442401

भारत सरकार
परमाणु ऊर्जा विभाग
विकिरण एवं आइसोटोप प्रौद्योगिकी बोर्ड

Government of India
Department of Atomic Energy
Board of Radiation & Isotope Technology

Certificate Tracking ID / CTID : 2402091
Date of Issue / DOI : 20-Jun-2024
Certificate Serial No. / CSN : ULR-TC11703240000002712F

TC-11703

Radioanalytical Laboratory

RADIOACTIVITY TEST CERTIFICATE

Ref : BRIT/RAL/DOM/1437-1476/MISC/1090-1129/23-24

To :
MSPGCL,
CHANDRAPUR SUPER THERMAL POWER STATION,
CSTPS, URJANAGAR CHANDRAPUR,
DIST. CHANDRAPUR - 442 404,
MAHARASHTRA.

This is regarding the sample of "COAL & ASH" sent for radioactivity analysis vide your letter ref.: MEEPL/GEN/2024/0015 dated 14.02.2024 which as per above letter is drawn from consignment with the following markings, as shown in italics:

NAME & ADDRESS OF THE CUSTOMER : ***MAHABAL ENVIRO ENGINEERS PVT. LTD., PLOT NOS. 13, 14, 17, 18, GRAMPANCHAYAT BOKHARA, 8 KM FROM NAGPUR CITY, OPP. PATEL PETROL PUMP, CHHINDWARA ROAD, KORADI, DIST. NAGAPUR - 441 111. MAHARASHTRA.***

SAMPLE NAME : ***1. BUNKER COAL***
2. FLY ASH
3. BOTTOM ASH
4. ASH BUND

DATE OF RECEIPT OF SAMPLE: 27.02.2024 **DATE OF COMPLETION OF TEST: 18.04.2024**

The Samples were analysed by HPGe Gamma spectrometry and the values obtained for U-238 , Ra-226, Th-232 and K-40 against each sample is shown in the table below :

Sr. No	SAMPLE NAME & LOCATION	QUANTITY	U-238 (Bq/Kg)	Th-232 (Bq/Kg)	Ra-226 (Bq/Kg)	K-40 (Bq/Kg)
1	BUNKER COAL UNIT NO.3 TO 7	1.5 KG X 1 NO. POLY BAG	27.1 ± 1.9	46 ± 1.9	15.1 ± 2.5	71.2 ± 5.5
2	BUNKER COAL UNIT NO.8	1.5 KG X 1 NO. POLY BAG	16.6 ± 1.3	27.7 ± 2.9	MDL 1.23	59.2 ± 4.6
3	BUNKER COAL UNIT NO.9	1.5 KG X 1 NO. POLY BAG	28.9 ± 2.5	48.7 ± 2.0	12.4 ± 2.1	188 ± 13.2
4	FLY ASH UNIT NO.3 TO 7	1.5 KG X 1 NO. POLY BAG	75.4 ± 3.0	125 ± 5.1	60.4 ± 6.3	351 ± 20.8
5	FLY ASH UNIT NO.8	1.5 KG X 1 NO. POLY BAG	59.3 ± 1.8	86.2 ± 1.8	52.2 ± 4.6	291 ± 15.7
6	FLY ASH UNIT NO.9	1.5 KG X 1 NO. POLY BAG	72.9 ± 2.2	111 ± 2.3	71.4 ± 6.0	388 ± 20.3
7	BOTTOM ASH UNIT NO.3 TO 7	1.5 KG X 1 NO. POLY BAG	52.5 ± 2.5	95 ± 4.3	60.9 ± 6.2	418 ± 23.2
8	BOTTOM ASH UNIT NO.8	1.5 KG X 1 NO. POLY BAG	48.1 ± 2.9	74.9 ± 6.1	23.7 ± 3.5	327 ± 20.2
9	BOTTOM ASH UNIT NO.9	1.5 KG X 1 NO. POLY BAG	29.6 ± 1.4	58.3 ± 3.0	24.± 3.2	206 ± 12.9
10	ASH BUND - FLY ASH & BOTTOM ASH	1.5 KG X 1 NO. POLY BAG	71.4 ± 3.1	121 ± 4.6	55.5 ± 5.6	308 ± 18.1

Certificate Tracking ID / CTID : 2402091
Date of Issue / DOI : 20-Jun-2024
Certificate Serial No. / CSN : ULR-TC1170324000002712F

TC-11703

Opinion: The measurement values are below the clearance level for radionuclides of natural origin in bulk solid materials, as per AERB directive 01/2010 (table-3) dated 26/11/2010.

Note: (i) The report pertains to the given sample only. (ii) The sample will be retained in this laboratory for a period of 1 month from certificate date and thereafter it will be disposed off. (iii) This report shall not be reproduced except in full, without written approval of the laboratory. (iv) The sampling is not done by this laboratory.

Checked by:
GANPAT B NAKTI
Assistant

Authorized Signatory:
AJAY NANA THAMKE
OIC, RAL

********** End of Report **********

विआप्रौबो/ बीएआरसी परिसर, सेक्टर २०, वाशी, नवी मुंबई – ४०० ७०३ (महाराष्ट्र)
BRIT/ BARC Vashi Complex, Sector 20, Navi Mumbai - 400 703 (Maharashtra)
वेबसाइट/ Website: www.britatom.gov.in; दूरभाष/ 022 2788 7002/ 7006

ANNEXURE- XVI

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR
CONTROL MEASURE TO PREVENT FUGITIVE DUST EMISSION

- Dust Suppression using water canon fogger at LT Bunker Area for 24 hrs.

- Dust Suppression at Reject Coal yard using water canon fogger.

ANNEXURE-XVII

CHANDRAPUR SUPER THERMAL POWER STATION, CHANDRAPUR.
For the period of July-2024 to December-2024
SURFACE WATER ANALYSIS REPORT

Month	Location	pH	Colour	Total Dissolved solids	Oil and Grease	Chloride (as Cl)	Dissolved Oxygen	COD	BOD	Sulphate (as SO4)
Jul-24	1	7.61	1	433	0	43	5.60	17.4	4.46	45.2
	2	7.61	1	445	0	44	5.55	17.2	4.50	45.8
	3	7.67	1	450	0	43	5.63	16.3	4.40	46.5
	4	7.57	1	457	0	44	5.64	16.5	4.38	45.8
	5	7.65	1	455	0	43	5.61	15.9	4.54	45.3
	6	7.63	1	451	0	44	5.67	16.7	4.44	44.8
	7	7.61	1	445	0	44	5.65	17.6	4.41	44.7
	8	7.64	1	440	0	44	5.61	16.4	4.49	47.1
	9	7.67	1	443	0	44	5.61	16.6	4.40	45.3
	10	7.60	1	452	0	45	5.63	17.0	4.50	46.5
	11	7.62	1	448	0	44	5.59	16.7	4.32	44.3
	12	7.65	1	453	0	43	5.62	16.2	4.42	46.4
	13	7.61	1	427	0	45	5.72	17.2	4.44	45.9
	14	7.65	1	440	0	44	5.65	16.7	4.43	45.8
	15	7.65	1	440	0	46	5.66	17.1	4.44	44.6
Aug-24	1	7.64	1	443	0	43	5.56	17.8	4.42	49.7
	2	7.60	1	463	0	43	5.51	17.2	4.46	46.1
	3	7.50	1	464	0	44	5.41	18.0	4.43	47.1
	4	7.45	1	452	0	47	5.44	17.8	4.42	46.7
	5	7.49	1	445	0	49	5.44	17.3	4.52	45.6
	6	7.47	1	456	0	52	5.50	14.9	4.59	47.6
	7	7.47	1	461	0	48	5.44	17.2	4.46	47.5
	8	7.49	1	456	0	48	5.52	16.4	4.37	49.5
	9	7.42	1	440	0	48	5.51	17.5	4.40	46.3
	10	7.56	1	434	0	46	5.52	16.0	4.39	44.8
	11	7.59	1	435	0	47	5.51	16.9	4.29	47.5
	12	7.55	1	448	0	45	5.56	15.8	4.37	46.3
	13	7.51	1	466	0	45	5.47	16.3	4.46	46.9
	14	7.40	1	450	0	44	5.57	17.5	4.39	47.2
	15	7.42	1	431	0	45	5.61	17.9	4.39	46.8
Sep-24	1	7.62	1	454	0	44	5.57	17.6	4.56	46.9
	2	7.59	1	445	0	42	5.59	16.3	4.48	48.3
	3	7.58	1	472	0	43	5.58	16.7	4.37	46.2
	4	7.50	1	432	0	44	5.51	16.3	4.30	46.2
	5	7.48	1	446	0	43	5.63	17.9	4.38	47.6
	6	7.56	1	459	0	45	5.54	15.9	4.47	47.7
	7	7.57	1	463	0	44	5.54	17.1	4.48	46.7
	8	7.58	1	442	0	44	5.59	17.0	4.47	44.6
	9	7.56	1	468	0	43	5.55	17.1	4.39	43.7
	10	7.52	1	450	0	47	5.57	17.1	4.36	47.2
	11	7.54	1	449	0	45	5.56	16.8	4.36	46.0
	12	7.61	1	444	0	45	5.60	16.1	4.57	46.8
	13	7.59	1	429	0	43	5.61	16.8	4.32	45.0
	14	7.61	1	423	0	46	5.62	16.2	4.50	44.0
	15	7.53	1	437	0	46	5.66	17.1	4.50	45.9

ANNEXURE-XVII

Oct-24	1	7.64	1	476	0	44	5.49	17.4	4.48	47.6
	2	7.64	1	476	0	46	5.51	16.5	4.51	46.5
	3	7.53	1	466	0	47	5.51	17.0	4.50	47.7
	4	7.50	1	468	0	46	5.57	16.2	4.31	46.3
	5	7.54	1	460	0	46	5.54	16.7	4.42	47.5
	6	7.55	1	457	0	46	5.58	17.0	4.36	47.0
	7	7.51	1	465	0	48	5.61	17.1	4.48	46.1
	8	7.42	1	466	0	45	5.56	17.1	4.43	46.1
	9	7.46	1	463	0	46	5.57	16.1	4.45	47.4
	10	7.54	1	467	0	43	5.56	16.7	4.42	46.0
	11	7.65	1	463	0	44	5.50	17.0	4.43	48.4
	12	7.53	1	466	0	46	5.55	16.8	4.48	47.0
	13	7.47	1	464	0	45	7.41	16.3	4.37	48.4
	14	7.54	1	472	0	46	5.47	16.9	4.33	47.6
	15	7.54	1	461	0	47	5.59	16.5	4.43	46.3
Nov-24	1	7.59	1	491	0	47	5.56	19.0	4.49	49.4
	2	7.58	1	485	0	46	5.53	16.8	4.53	48.7
	3	7.38	1	483	0	49	5.48	15.8	4.48	47.9
	4	7.37	1	478	0	50	5.40	15.6	4.46	47.8
	5	7.54	1	475	0	50	5.55	16.8	4.36	48.2
	6	7.51	1	474	0	47	5.47	17.2	4.43	49.4
	7	7.58	1	483	0	47	5.42	18.0	4.33	50.1
	8	7.49	1	497	0	48	5.49	17.5	4.44	49.9
	9	7.43	1	479	0	46	7.47	16.8	4.45	49.8
	10	7.47	1	480	0	48	5.56	16.2	4.48	50.7
	11	7.40	1	492	0	47	5.58	16.9	4.50	49.2
	12	7.48	1	483	0	50	5.50	16.7	4.44	48.2
	13	7.48	1	488	0	46	5.51	17.0	4.41	49.0
	14	7.50	1	486	0	46	5.57	17.8	4.41	50.3
	15	7.47	1	474	0	47	5.53	17.5	4.35	48.6
Dec-24	1	7.70	1	482	0	46	5.54	18.7	4.55	50.4
	2	7.55	1	490	0	45	5.52	17.2	4.44	48.2
	3	7.43	1	488	0	46	5.48	16.3	4.43	46.6
	4	7.43	1	477	0	46	5.50	16.4	4.47	48.8
	5	7.37	1	473	0	48	5.47	18.1	4.44	49.2
	6	7.41	1	478	0	48	5.57	17.6	4.46	48.7
	7	7.48	1	471	0	47	5.53	15.8	4.43	48.1
	8	7.59	1	471	0	47	5.48	17.1	4.54	50.7
	9	7.58	1	470	0	48	5.50	16.1	4.48	48.9
	10	7.45	1	469	0	46	5.59	16.9	4.43	46.6
	11	7.47	1	470	0	45	5.42	17.1	4.54	47.7
	12	7.50	1	479	0	47	5.53	17.4	4.43	47.4
	13	7.53	1	472	0	48	5.57	16.8	4.47	47.2
	14	7.39	1	479	0	49	5.54	17.1	4.43	48.0
	15	7.42	1	469	0	47	5.62	17.0	4.43	48.9

Note: - Analysis carried out by NABL recognized laboratory i.e. M/s. JP Associates & Laboratories.

Location:

1- Ravendli Nallah before Reject Coal Area (CSTPS, Chandrapur)

2- Ravendli Nallah at Reject Coal Area (CSTPS, Chandrapur)

3- After Grit filter on Ranvedli Nallah
4- Ravendli Nallah before Erai river at Nagpur Road
5- Motghat Nallah near GAD office
6- Motghat Nallah before Erai river at Ash Bund Road
7- Storm water drain coming from unit 8 and 9 before security gate Nagpur Road
8- Storm water drain coming unit from 8 and 9 at security gate Nagpur Road
9- Storm water drain coming from unit 8 and 9 before meeting to river
10- Storm water drain coming from unit 3 to 7 CHP Site
11- confluence point of Ranvendli Nallah to Erai river
12- Erai River near Datala bridge pumping station
13- Nallah at Chhota Nagpur
14- Nallah at Vichoda
15- Nallaha at Ash Bund Chowki

ANNEXURE XVIII

MAHAGENCO
Maharashtra State Power Generation Co. Ltd.

CHANDRAPUR SUPER THERMAL POWER STATION
CHANDRAPUR

"IMS: Quality, Environment, Occupational Health & Safety Policy"

ISS/REV.NO.: 02/00

Chandrapur Super Thermal Power Station of MAHAGENCO is committed to generate Economical, Reliable and Sustainable Power and continual improvement of the Integrated Management System through -

- providing environment friendly, safe & healthy working conditions for the prevention of adverse impact on quality, environment and work–related injury and ill health;
- adopting best organizational practices specific to the strategic directions through risks and opportunities analysis for all our processes;
- fulfilling legal and other requirements;
- eliminating quality issues, environmental aspects, occupational health & safety hazards to reduce risks;
- ensuring up gradation of skill, knowledge & competence of our staff and adoption of new technology;
- ensuring consultation and participation of workers/workers' representatives.

Date: 09.04.2021

Chief Engineer
CSTPS, Chandrapur

Certificate of Registration

GCPL hereby certifies that

Reg. No.: IMS110XX32022616

MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED

Chandrapur Super Thermal Power Station Urjanagar, Chandrapur,
Dist. – Chandrapur, Maharashtra, 442 404, India

has been independently assessed and is compliant with the requirement of

Integrated Management System

(ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO 50001:2018)

This certificate is applicable to the following product or service ranges:

Generation of Electricity From Coal Based Thermal Power Plant.

Initial Issue Date : 20. Nov. 2023
Expiry Date : 19. Nov. 2024

Current Issue Date : 20. Nov. 2023
Valid Period : 20. Nov. 2023 ~ 19. Nov. 2026

(Certificate validity is subject to clearing successful surveillance audit)

IMS Integrated Management Systems

Signed for and on behalf of GCPL

Globus Certifications Private Limited

To verify the validity of this certificate please visit www.gcert.co

Surveillance audits shall be conducted at least once a calendar year, except in re-certifiction years. This is to certify that the Management Systems of this company has been found to confirm to the above. If the certified client does not allow surveillance, re-certification audits, certificate should be returned to GCPL. This certificate remains the property of GCPL and this certificate is recognized by GCPL.

CERTIFICAT*CERTIFICATE*СЕРТИФИКАТ*CERTIFICATO*SERTIFIKAT

HAWK EYE
Certifications

CERTIFICATE

This is to Certify that the Management System of

MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED

CHANDRAPUR SUPER THERMAL POWER STATION URJANAGAR, CHANDRAPUR, DIST. – CHANDRAPUR-442404,MAHARASHTRA (INDIA)

has been audited and found to comply with the requirements of:

ISO 9001:2015
Quality Management System

For the scope of activities described below:

GENERATION OF ELECTRICITY FROM COAL BASED THERMAL POWER PLANT.

IAF Code: 25

Certificate No:EGQ/2311MT/1450

Date of initial registration	Date of this Certificate	Surv. audit on or before/Certificate expiry	Re-certification Due
22.11.2023	22.11.2023	21.10.2024	21.11.2026

Validity of this certificate is subject to successful completion of surveillance audit on or before due date, in case surveillance audit not conducted this certificate shall be suspended/cancelled.

Director

For verification and upated information concerning the present certificate visit to www.thehawk-eye.com
This Certificate is the property of Hawk Eye Certifications Pvt. Ltd. and shall be returned immediately when demanded.

Hawk Eye Certifications Private Limited
A-27/H, Sector-16, Noida-201301, U.P., (India)
www.thehawk-eye.com
email: admin@thehawk-eye.com

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

EGAC Accredited
QMS Certification

CERTIFICAT*CERTIFICATE СЕРТИФИКАТ*CERTIFICATO*SERTIFIKAT

HAWK EYE
Certifications

CERTIFICATE

This is to Certify that the Management System of

MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED

CHANDRAPUR SUPER THERMAL POWER STATION URJANAGAR, CHANDRAPUR, DIST. – CHANDRAPUR-442404,MAHARASHTRA (INDIA)

has been audited and found to comply with the requirements of:

ISO 45001:2018
Occupational Health & Safety Management System

For the scope of activities described below:

GENERATION OF ELECTRICITY FROM COAL BASED THERMAL POWER PLANT.

IAF Code: 25

Certificate No: EGO/2311MT/1452

Date of initial registration	Date of this Certificate	Surv. audit on or before/Certificate expiry	Re-certification Due
22.11.2023	22.11.2023	21.10.2024	21.11.2026

Validity of this certificate is subject to successful completion of surveillance audit on or before due date, in case surveillance audit not conducted this certificate shall be suspended/cancelled.

Director

For verification and upated information concerning the present certificate visit to www.thehawk-eye.com
This Certificate is the property of Hawk Eye Certifications Pvt. Ltd. and shall be returned immediately when demanded.

Hawk Eye Certifications Private Limited
A-27/H, Sector-16, Noida-201301, U.P., (India)
www.thehawk-eye.com
email: admin@thehawk-eye.com

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

EGAC Accredited
OH&S Certification
CAB # 012212

CERTIFICAT*CERTIFICATE*СЕРТИФИКАТ*CERTIFICATO*SERTIFIKAT

HAWK EYE
Certifications

CERTIFICATE

This is to Certify that the Management System of

MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED

CHANDRAPUR SUPER THERMAL POWER STATION URJANAGAR, CHANDRAPUR, DIST. – CHANDRAPUR-442404,MAHARASHTRA (INDIA)

has been audited and found to comply with the requirements of:

ISO 14001:2015
Environment Management System

For the scope of activities described below:

GENERATION OF ELECTRICITY FROM COAL BASED THERMAL POWER PLANT.

IAF Code: 25

Certificate No: EGE/2311MT/1451

Date of initial registration	Date of this Certificate	Surv. audit on or before/Certificate expiry	Re-certification Due
22.11.2023	22.11.2023	21.10.2024	21.11.2026

Validity of this certificate is subject to successful completion of surveillance audit on or before due date, in case surveillance audit not conducted this certificate shall be suspended/cancelled.

Director

For verification and upated information concerning the present certificate visit to www.thehawk-eye.com
This Certificate is the property of Hawk Eye Certifications Pvt. Ltd. and shall be returned immediately when demanded.

Hawk Eye Certifications Private Limited
A-27/H, Sector-16, Noida-201301, U.P., (India)
www.thehawk-eye.com
email: admin@thehawk-eye.com

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

EGAC Accredited
EMS Certification
CAB # 012212

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

MWFETL, CHANDRAPUR SUPER THERMAL POWER STATION, MSPGCL

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

CSTPS, URJANAGAR, CHANDRAPUR, MAHARASHTRA, INDIA

in the field of

TESTING

Certificate Number: TC-6526

Issue Date: 28/02/2024 **Valid Until:** 27/02/2026

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of thislaboratory, you may also visit NABL website www.nabl-india.org)

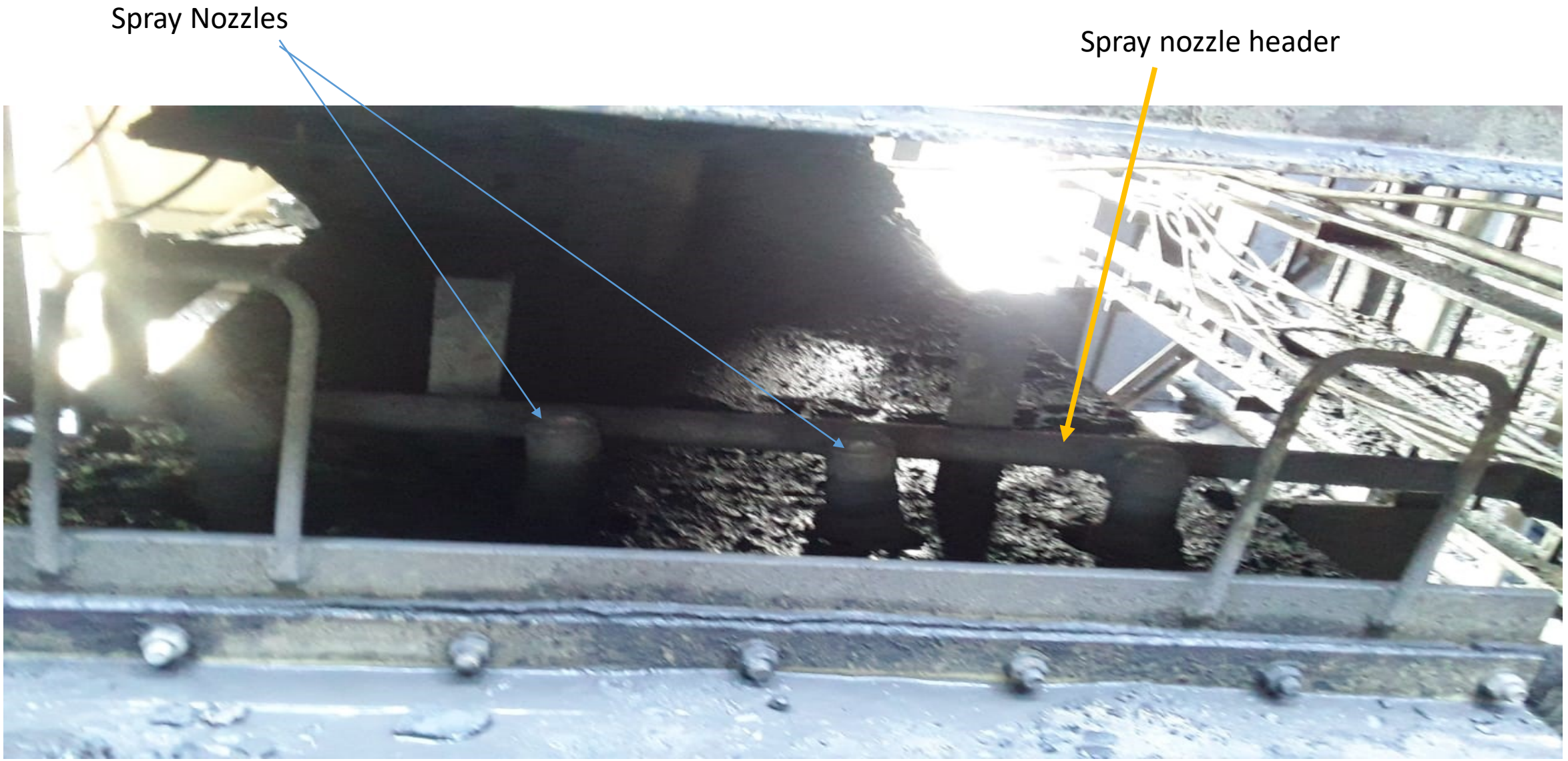
Name of Legal Entity: MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

DSS sprinklers at BC-01 Head end

DSS sprinklers at BC-01 Tail end



DSS sprinklers at PC-01 Tail end

DSS sprinklers at Apron Feeder

DSS sprinklers at BC-04 Tail end

DSS sprinklers at BC-02 Head end

DSS sprinklers at BC-02 Tail end

DSS sprinklers at PC Head end

DSS sprinklers at Reversible belt Feeder BC-03 at WLS

DSS sprinklers at WLS / Clam shell gate