TSM-CPP/MoEF&CC/TS-01/2025-05/205
November 20, 2025

The Member Secretary
State Level Environmental Impact Assessment Authority,
5RF-2/1, Unit-IX
Bhubaneswar-751022

Subject: Submission of half yearly EC compliance reports for setting up of 2x150 MW coal based TPP at M/s. Tata Steel Limited-TSM-CPP(formerly known as Angul Energy Limited), Odisha for the period from April' 2025 to September' 2025.

Reference: EC vide letter No. SEIAA/35; dated: 12.12.2009.

Dear Sir,

With reference to the captioned subject and cited reference, we are herewith submitting six monthly compliance reports for the conditions stipulated in the Environmental Clearance for setting up of 2x150 MW coal based thermal power plant at Tata Steel Limited-TSM-CPP(formerly known as Angul Energy Limited), Odisha, for the period from **April' 2025 to September' 2025**, along with monitoring reports for your kind perusal.

The soft copies of the aforesaid compliance report have also being sent through mail to roez.bsr-mef@nic.in & seiaaodisna@gmail.com for your kind information and necessary record please. Also copy of EC compliance is being uploaded on MoEF&CC web site on portal http://environmentalclearance.nic.in.

We trust that the above submissions are in line with the statutory requirements.

Thanking you

Yours faithfully,

For TSM-CPP

Rajesh Kumar Agarwal
(Factory Manager, TSM-CPP)

Encl: As above

Copy to:
1. The Deputy Director General of Forests (C), MoEF&CC, Integrated Regional Office, Chandrasekharpur, Bhubaneswar – 751023.
2. The Zonal Officer, Central Pollution Control Board, Southern Conclave Block, 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata – 700107.
3. The Member Secretary, SPCB, Parivesh Bhawan, A/118, Nilakantha Nagar, Unit-VIII, Odisha, Bhubaneswar-751012
4. The Regional Officer, State Pollution Control Board, Angul, Odisha.

SL	STIPULATED CONDITIONS	COMPLIANCE STATUS
01	The applicant (project proponent) will take necessary measures for prevention, control and mitigation of Air Pollution, Water Pollution, Noise Pollution and Land Pollution including solid waste management as mentioned in Form-I, final EIA reports and Environment Management Plan (EMP) in compliance with the prescribed statutory norms and standards.	Adequate pollution control measures such as ESPs, pneumatic ash conveying system, vent filters, mechanical road sweeping machines, wheel washing facilities, dust suppression system, Sewage Treatment Plant, enclosures & silencers, Dry collection & disposal system for waste, fly ash management were taken for the prevention and mitigation of air pollution, water pollution, noise pollution and land pollution including solid waste management.
02	The applicant will take necessary steps for socio-economic development of the people of the area Primary Socio Economic Survey of the core area on need based assessment for providing employment, education, health care, drinking water, sanitation, road and communication facilities etc. A detailed report is to be submitted to the proposal to SEIAA on 1st June & 1st December of each calendar year.	Various socio-economic development programs are being undertaken in nearby villages based on a need assessment survey. These programs encompass the provision of educational facilities, such as the Green School Project in collaboration with TERI, as well as road construction and repair. Additionally, initiatives include the provision of safe drinking water, sanitation facilities, sports, and healthcare services. These efforts represent a combination of social engineering and infrastructure projects aimed at improving the overall quality of life in the communities served. Details of the CSR initiatives over the last six months is enclosed as **Annexure- I**
03	The applicant will comply with the points concerned and issues raised by the people during public hearing on 4th February, 2009 in accordance with the commitments made.	Issues raised during the public hearing were mainly related to drinking water, wastewater management, employment and peripheral development, which had already been completed.
04	The applicant will take statutory clearance / approval / permissions from the concerned authorities in respect of the project as and when required.	Statutory approvals from concerned authorities were obtained and are being renewed from time to time.
05	For post environmental clearance monitoring, the applicant will submit half yearly compliance report in respect of the stipulated terms and conditions of this Environmental Clearance to the State	Half-yearly environmental compliance report is being submitted to SEIAA, MOEF&CC, CPCB and SPCB, Odisha at stipulated intervals. The last half yearly compliance report was submitted vide letter no. TSM-

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	Environmental Impact Assessment Authority (SEIAA), Orissa on 1st June and 1st December of each calendar year.	CPP/MoEF&CC/TS-01/2025-03/189 dated 20.05.2025
06	High efficiency Electrostatic Precipitators (ESP's) shall be installed to ensure that particulate emission does not exceed 50 mg / Nm^3.	Electrostatic Precipitators (ESPs) with 99.97% efficiency have been installed to meet the emission level below 50 mg/Nm3.
07	The proponent shall treat the flue gas through Flue Gas De-sulphurization (FGD), if SO_2 emission levels exceed the prescribed norm.	• CFBC (Circulating Fluidized Bed Combustion) coal-fired boiler has been installed, and to control SO_2 emissions, lime is being fed along with the coal. Adequate space has been provided for the installation of a lime injection system, and a lime sizing plant is currently under construction to supply sized lime for the effective reduction of SO_2 emissions. • As per the MoEF&CC notification no. G.S.R. 465 (E) dated 11 July 2025 TSM-CPP has submitted letter to OSPCB vide letter no. TSL/SPCB/TS-03/2025-22/601 to categorize TSM-CPP in Category C.
08	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.	• Dust extraction systems and dust suppression measures are actively implemented at ash silos and coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided. • A Wheel washing system is in operation to prevent fugitive dust emissions during the movement of fly ash vehicles.
09	Fly ash shall be collected in dry form and storage facility (silos) shall be provided. 100% fly ash utilization shall be ensured as per fly as notification of MoEF, Govt. of India. Unutilized fly ash and bottom ash shall be stored in the ash pond separately through high concentration slurry disposal method. Mercury levels along with other heavy metals (Pb, Cr, As etc.) should be monitored in the fly ash bottom ash, leachate and effluents emanating from the ash pond.	• Fly Ash is being collected in dry form in the ash silo. • Four silos with a capacity of 1,000 MT each and two intermediate silos with a capacity of 250 MT each have been installed. • Ash utilization is being ensured. • Leachate characteristics of ash are carried out at regular intervals. The report is enclosed as **Annexure -II**. • Annual implementation report w.r.t. fly ash generation and utilization is being submitted periodically. The last report was submitted vide letter no. TSM-CPP/SPCB/TS-06/2025-01/186

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10	The ash pond should be constructed with impervious lining and ash pond embankment should be stone pitched.	An interim ash pond is currently functioning to store fly ash for emergency scenarios. To prevent leaching, the pond has been lined with bentonite material. Additionally, adequate safety measures are already in place to protect the ash dyke from breaches.
11	The treated effluents conforming to the prescribed standards shall be re-circulated and reused within the plant. There shall be no discharge outside the plant boundary. Arrangements shall be made so that effluents and storm water do not get mixed.	• Wastewater is being treated in the Effluent Treatment Plant and recycled & reused for dust suppression and irrigation of green areas. • Rainwater collected from the plant area is being channelized through drains into a series of storage ponds for harvesting.
12	A sewage treatment plant shall be provided and the treated sewage shall be used for raising greenbelt / plantation	A sewage treatment plant with a capacity of 3000 KLD is currently in operation to treat domestic sewage. The treated water serves two primary purposes: it is reused for irrigation of green areas and for low-end applications within the plant.
13	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 be furnished to the SEIAA, Orissa.	A rainwater harvesting structure with a capacity of 650,000 m^3 has been constructed to collect surface runoff water from the plant premises. The harvested water is being utilized for various plant applications.
14	Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fires in coal yard, especially during summer season. Details of these measures to be taken along with location plant layout shall be submitted to the SEIAA, Orissa.	Adequate safety measures have been implemented in the plant area to check and minimize spontaneous fires in coal yards. The following steps have been taken: • Fire Hydrants: Installed in coal yards and coal sheds to control and extinguish fires promptly. • Gun Sprinklers: Deployed across yards to maintain surface moisture and reduce fire risk. • Coal Pile Management: Coal piles are regularly leveled by scraping and compacted by rolling to minimize air pockets that can lead to combustion. • FIFO Principle: Coal silos and bins are operated on a First In, First Out basis to prevent prolonged storage and spontaneous combustion.

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		• Emergency Preparedness: Fire tenders are kept on standby 24×7 to handle any fire emergencies immediately.
15	Storage facilities for auxiliary liquid fuel such as LDO and/HFO shall be made in the plant area where risk is minimum. On site and off site Disaster Management Plans shall be prepared to meet any eventuality 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 Disaster Management Plan (DMP). Sulphur content in the liquid fuel will not exceed 0.5%.	LDO/HSD is being stored in the plant area where the risk is minimum. There is a dyke around the storage tanks. • On-site emergency plan was prepared and approved. • Regular mock drills are being conducted. • Presently domestic coal being used having sulphur content less than 0.5 %.
16	Regular monitoring of ground water in and around the ash pond area shall be carried out, records maintained and half yearly reports shall be furnished to the SEIAA, Orissa.	Monitoring of ground water in the peripheral villages is carried out every quarter. The results are submitted to the SEIAA/IRO MoEF&CC in every six months along with the half yearly compliance report. The summarized data for ground water for peripheral village is enclosed as **Annexure III.**
17	A green belt of adequate width and density preferably with local species along the periphery of the plant & alongside roads etc shall be raised so as to provide protection against particulates and noise. It must be ensured that at least 33 % of the total land area shall be under permanent green cover. The project proponent shall ensure proper maintenance of green belt throughout the year & for this purpose they may engage professionals in this field for creation and maintenance of the green belt. An action plan for this purpose shall be prepared accordingly and submitted to the SEIAA, Orissa.	Green belt development is under progress in and around the plant complex by planting indigenous species. 33% of the area (includes Plant, R&R and CSR) has been covered under green belt development. Plantation of saplings is being done regularly based on the availability of vacant areas. A total of 26,046 nos. saplings have been planted during the period from April'25 to September'25 both inside and outside the plant premises of TSM & TSM-CPP. Proper maintenance of green coverage is ensured throughout the year.
18	First aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.	Adequate first aid and sanitation arrangements are ensured for employees and workers. This ensures a safe and healthy environment for all personnel involved in the project.
19	Noise levels emanating from turbines and air compressors shall be limited to 75 dB (A). For people working in the high noise area, requisite personal protective	• Enclosures and silencers have been provided for the primary and secondary air fans of boilers.

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	equipment's like ear plugs/earmuffs 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.	• Necessary personal protective equipment (PPE) is being supplied to workers in noisy areas, and periodic examinations are conducted for those engaged in noise-prone environments. • Noise monitoring is carried out regularly in the work zone areas. • The summary of noise monitoring report is enclosed as **Annexure-IV.**
20	Regular monitoring of ground level concentration of SO_2, NOx, SPM, RSPM and mercury shall be carried out in the impact zone and records to be maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be taken immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB, Orissa.	Ambient air quality monitoring stations have been established in nearby villages in consultation with SPCB, Odisha, to monitor monthly ground-level concentrations of 12 parameters as per the National Ambient Air Quality Standards (NAAQS). The data is submitted regularly through quarterly reports. The latest report was submitted vide letter no. TSM-CPP/SPCB/TS-03A/2025-11/200 dated 08.10.2025. The quarterly report for the period July 2025 to September 2025 is attached as **Annexure-V**. Additionally, a baseline study was conducted by a third party for the period March 2025 to May 2025. The study includes mean results of metal analysis in ambient air, covering parameters such as iron, zinc, mercury, and others. The detailed report is attached as **Annexure-VI.**
21	Provision shall be made for housing of construction laborers 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.	Adequate arrangements for housing construction workers were made during the construction phase of the plant. These same facilities are being continued during the operational phase for both employees and workers.
22	A separate environment management cell with qualified staff shall be set up for implementation of the stipulated environmental safeguards. A report is to be submitted to SEIAA, Orissa.	The Environment Management Department has been established with qualified and experienced officers to implement the stipulated environmental safeguards and control pollution. Necessary details have already been submitted to the State Environment Impact Assessment Authority (SEIAA), Odisha.

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23	Half yearly report of the status of implementation of the stipulated conditions and environmental safeguards shall be submitted to the appropriate authorities.	Half yearly environmental compliance report is being submitted to SEIAA, MOEF&CC, CPCB and SPCB, Odisha. Last compliance report was submitted vide letter no. TSM-CPP/MoEF&CC/TS-01/2025-03/189 dated 20.05.2025
24	Separate funds shall be allocated for implementation of pollution control measures along with item-wise break-up. These cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported.	The funds earmarked for pollution control measures are not diverted for any other activity. The details of expenditure made to control pollution are being submitted as part of the annual Environment Statement. The last Environment Statement was submitted in Form – V vide letter no. TSM-CPP/SPCB/TS-03/2025-02/198 dated 27.08.2025.
25	The above-mentioned stipulated conditions shall be complied in time bound manner. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of environment protection (EP) Act, 1986.	Compliance with the stipulated conditions is diligently pursued within a specified timeframe through a process of continual improvement.

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LIST OF ENCLOSURES

Sl. No.	Enclosure	Details
1.	Annexure - I	CSR initiatives
2.	Annexure - II	Leachate characteristics of ash
3.	Annexure - III	Ground Water Analysis Report
4.	Annexure - IV	Noise Monitoring Report
5.	Annexure - V	Quarterly report
6.	Annexure - VI	Mercury Monitoring Report (Ambient Air)

Annexure-I

CSR Expenditure and Activities

Around Tata Steel Ltd, Meramandali & TSM-CPP(AEL)

Period: From April'25 to September'25

PROGRAM HEAD	Expenditure in Lakh	MAJOR INTERVENTIONS/REMARKS
Agriculture	9.20	
Drinking Water	80.81	
Education	335.00	Including the 1000 school program and Axis Dil se Project
Gender & Community Enterprise	30.31	
Public Health	42.33	
Rural Infrastructure	127.00	
Sports	2.13	
Ethnicity	5.96	
TOTAL	**632.74**	

Visiontek Consultancy Services Pvt. Ltd.

(Committed For Better Environment)

ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 (OH&S), ISO/IEC 17025:2017 Certified

Ref. no: Envlab/24-25/TR-12306 **Date: 18.11.2024**

ASH ANALYSIS REPORT

1. Name of the Indus : **M/s TATA Steel Limited Meramandali, Dhenkanal**
2. Sampling Location : **S-1**: Fly Ash collected from BFPP-1
   : **S-2:** Bed Ash collected from BFPP-1
   :S-3: Fly ash collected from AEL-165
   :S-4: Bed ash collected from ASL-165
3. Date of Sampling : 11.11.2024
4. Date of Analysis : 12.11.2024 to 18.11.2024
5. Sample Collected by : VCSPL Representative

Sl. No.	Name of the Parameters	Unit	Govt. of India, MoEF & CC Schedule-II based on leachable concentration limits (TCLP) orSoluble Threshold limit Concentration (STLC), Class A2016	Analysis Results			
				S-1	S-2	S-3	S-4
01	Arsenic as As	mg/l	5.0 mg/l	0.004	0.002	0.003	0.002
02	Barium as Ba	mg/l	100.0 mg/l	BDL	BDL	BDL	BDL
03	Cadmium as cd	mg/l	1.0 mg/l	BDL	BDL	BDL	BDL
04	Chromium as Cr	mg/l	5.0 mg/l	BDL	BDL	BDL	BDL
05	Lead as Pb	mg/l	5.0 mg/l	BDL	BDL	BDL	BDL
06	Mercury as Hg	mg/l	0.2 mg/l	BDL	BDL	BDL	BDL
07	Selenium as Se	mg/l	1.0 mg/l	0.003	0.003	0.003	0.003
08	Iron as Fe	mg/l	--	0.81	0.41	0.69	0.36
09	Nickel as Ni	mg/l	20.0 mg/l	0.22	0.16	0.24	0.17
10	Zinc as Zn	mg/l	250.0 mg/l	0.48	0.35	0.49	0.33
11	Manganese as Mn	mg/l	10.0 mg/l	0.41	0.28	0.50	0.32
12	Cobalt as Co	mg/l	80.0 mg/l	BDL	BDL	BDL	BDL
13	Copper as Cu	mg/l	25.0 mg/l	0.37	0.28	0.39	0.26
14	Vanadium as V	mg/l	24.0 mg/l	BDL	BDL	BDL	BDL
15	Aluminium as Al	mg/l	--	4.7	4.3	5.3	4.8
16	Fluoride as F	mg/l	180.0 mg/l	1.79	1.31	1.89	1.36

Reviewed By: **Approved By**

Annexure - III

Ground Water Quality Analysis Report of surrounding villages

July 2025

S. No	LOCATIONS	UOM	Motanga	Galpada	Kharagprasad	Kochilamada	Charadagadia	Khaliberana	Ganthigadia	Narendrapur
	PARAMETER		VALUE	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE
1.	Colour	Hazen	3	2	2	3	3	2	2	3
2.	pH	-	7.34	6.95	7.02	6.85	7.34	7.14	7.18	6.83
3.	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4.	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5.	Turbidity	NTU	1.33	0.7	0.22	0.39	1.33	0.27	0.25	0.72
6.	Total Dissolved Solids (TDS)	mg/L	1754	986	1048	1820	1754	1045	966	1280
7.	Alkalinity as CaCO3	mg/L	820	303	492	371	820	383	488	440
8.	Total Hardness (as CaCO3)	mg/L	646	313	423	921	646	474	431	748
9.	Sulphide (as H2S)	mg/L	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)
10.	Sulphate (as SO4-2)	mg/L	186	278	170	273	186	166	114	60.4
11.	Chloride as Cl	mg/L	240	127	160	519	240	199	239	479
12.	Fluoride as F	mg/L	0.982	0.14	0.486	0.542	0.982	1.02	0.824	0.662
13.	Nitrate as NO3	mg/L	47.3	45.1	15.9	47.8	47.3	46.1	18.5	8.8
14.	Calcium as Ca	mg/L	202	83.2	111	212	202	124	108	188
15.	Ammonia (as NH3)	mg/L	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
16.	Magnesium as Mg	mg/L	56	34	42.8	86	56	40	39.1	67.5
17.	Iron (as Fe)	mg/L	0.103	0.092	0.103	0.108	0.103	0.099	0.099	0.103
18.	Aluminium (as Al)	mg/L	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)
19.	Anionic Surface-Active Agents as (MBAS)	mg/L	BDL (DL:0.025)	BDL (DL:0.025)	BDL (DL:0.025)	BDL (DL:0.025)	BDL (DL:0.025)	BDL (DL:0.025)	BDL(DL:0.025)	BDL (DL:0.025)
20.	Barium (as Ba)	mg/L	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
21.	Boron (as B)	mg/L	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)

Annexure - III

S. No	LOCATIONS	UOM	Motanga	Galpada	Kharagprasad	Kochilamada	Charadagadia	Khaliberana	Ganthigadia	Narendrapur
	PARAMETER		VALUE	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE
22.	Copper (as Cu)	mg/L	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)
23.	Free Residual Chlorine	mg/L	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
24.	Manganese (as Mn)	mg/L	0.096	BDL (DL:0.05)	BDL (DL:0.05)	0.094	0.096	BDL (DL:0.05)	BDL (DL:0.05)	0.404
25.	Phenolic Compounds (as C6H5OH)	mg/L	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL(DL:0.001)	BDL (DL:0.001)
26.	Selenium (as Se)	mg/L	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)
27.	Silver (as Ag)	mg/L	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
28.	Zinc (as Zn)	mg/L	BDL (DL:0.01)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
29.	Cadmium (as Cd)	mg/L	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL(DL:0.003)	BDL (DL:0.003)
30.	Cyanide (as CN)	mg/L	BDL (DL:0.012)	BDL (DL:0.012)	BDL (DL:0.012)	BDL (DL:0.012)	BDL (DL:0.012)	BDL (DL:0.012)	BDL(DL:0.012)	BDL (DL:0.012)
31.	Lead (as Pb)	mg/L	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)
32.	Mercury (as Hg)	mg/L	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL(DL:0.001)	BDL (DL:0.001)
33.	Nickel (as Ni)	mg/L	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)
34.	Total Arsenic (as As)	mg/L	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL(DL:0.005)	BDL (DL:0.005)
35.	Molybdenum (as Mo)	µg/L	BDL (DL: 5.00)	BDL (DL: 5.00)	BDL (DL: 5.00)	BDL (DL: 5.00)	BDL (DL: 5.00)	BDL (DL: 5.00)	BDL (DL: 5.00)	BDL (DL: 5.00)
36.	Mineral Oil	mg/L	BDL (DL: 0.01)	BDL (DL: 0.01)	BDL (DL: 0.01)	BDL (DL: 0.01)	BDL (DL: 0.01)	BDL (DL: 0.01)	BDL (DL: 0.01)	BDL (DL: 0.01)
37.	Chloramines (as Cl2)	mg/L	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)
38.	Total Chromium (as Cr)	mg/L	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)
39.	Total Coliform	-	Not Detected	Detected	Detected	Detected	Not Detected	Detected	Detected	Detected
40.	E. coli	-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

Note: BDL: Below Detectable Limit; DL: Detectable Limit, U/S: Upstream D/S: Downstream
Source: Monitoring/ Analysis report of S.K. Mitra Private Limited and Environment Laboratory of TSM.

Annexure-IV

Environment Laboratory
TATA Steel Meramandali, Odisha
Noise Monitoring Report

S. N	Name of the unit	Location	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25
			Leq					
1.	110 MW Compressor House CPP	Near Entrance Point	82.5	82.2	80.7	81.6	84.3	80.2
		Near Compressor	90.1	80.6	90	89.9	92.3	90.4
		Inside Operator office	79.4	84.4	78.4	56.8	78	70.4
2.	150 MW Ash Conveying Compressor House CPP	Near Entrance Point	84.2	58.7	84.3	84.9	85.5	84.5
		Near Compressor	92.7	91.6	91.2	91.5	92.8	92
		Inside Operator office	80.6	83.5	80.2	60.4	79.3	71.6
3.	165 MW Compressor House CPP	Near Entrance Point	82.5	82.2	80.7	81.6	84.3	80.2
		Near Compressor	90.1	80.6	90	89.9	92.3	90.4
		Inside Operator office	79.4	84.4	78.4	56.8	78	70.4
4.	300 MW CPP	CFBC Boiler-1						
		Near ID Fan-1	SD	SD	SD	84.8	83.1	84.8
		Near ID Fan-2	SD	SD	SD	84.6	84	85.1
		Near S A Fan	SD	SD	SD	90.5	91.3	90.2
		Near P.A. Fan	SD	SD	SD	91.1	91.5	91
		Near Boiler -1 Area	SD	SD	SD	84.4	83.5	83.8
		CFBC- Boiler-2						
		Near ID Fan-1	85.4	84.9	85.7	85.1	SD	SD
		Near ID Fan-2	85.8	85.1	84.8	85.2	SD	SD
		Near S A Fan	91.5	91.2	90.8	91.3	SD	SD
		Near P.A. Fan	91.6	90.5	90.6	90.8	SD	SD
		Near Boiler -2 Area	84.8	84.6	84.1	82.7	SD	SD
		CFBC- Boiler-3						
		Near ID Fan-1	85.1	85	84.7	SD	84.7	SD
		Near ID Fan-2	85.5	85.2	85	SD	85.3	SD
		Near S A Fan	91.7	91.1	90.2	SD	90.3	SD
		Near P.A. Fan	92	90.7	90.4	SD	91	SD
		Near Boiler -3 Area	85.8	84.2	84.5	SD	84.3	SD
		CFBC- Boiler-4						
		Near ID Fan-1	84.9	SD	SD	SD	SD	85.3
		Near ID Fan-2	85.6	SD	SD	SD	SD	84.9
		Near S A Fan	92.1	SD	SD	SD	SD	91.1
		Near P.A. Fan	91.8	SD	SD	SD	SD	91.8
		Near Boiler -4	85.7	SD	SD	SD	SD	83.2
5.	185 MW CPP	CFBC- Boiler-5						
		Near ID Fan-1	SD	80.2	81	80.2	80.4	80.3
		Near ID Fan-2	SD	80.3	80.4	80.7	80.1	80.1
		Near S A Fan	SD	90	89.5	91.2	90.2	90.5
		Near P.A. Fan	SD	90.1	90	90.5	91.1	90.6
		Near Boiler -5	SD	84.8	84.8	83.6	83.7	84.5
		CFBC- Boiler-6						
		Near ID Fan-1	80.2	SD	SD	80.1	80.5	80.8
		Near ID Fan-2	80.5	SD	SD	80.6	81.9	80.4
		Near S A Fan	92.7	SD	SD	91.5	90.8	91.7
		Near P.A. Fan	91.8	SD	SD	91.8	90.6	91.5
		Near Boiler -6	83.8	SD	SD	84.1	82.7	84.2
		Near Silo Area	84.2	83.7	82.6	83	83.3	83.3

Annexure-IV

Environment Laboratory
TATA Steel Meramandali, Odisha

S. N	Name of the unit	Location	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25
			Leq					
		Near 150 MW TG	89.2	88.4	89.4	87.3	88.5	86.8
		Near 165 MW TG	90.1	88.9	88.5	85.8	87.1	87
		Control Room Office	78.7	69.5	63.1	68.3	63.5	63.1
		New Control Room Office	90.1	59.2	60.5	58.2	58.2	62.5

TATA

TSM-CPP/SPCB/TS-03A/2025-11/200
October 08, 2025

The Member Secretary
State Pollution Control Board, Odisha
Parivesh Bhawan, A/118,
Nilakantha Nagar, Unit-VIII,
Bhubaneswar-751 012

Subject: Submission of quarterly monitoring reports for the period from July' 2025 to September 2025.

Reference: Board's Consent Order no. 6567/IND-I-CON-6306 dated 28.03.2025.

Dear Sir,

This has reference to the captioned subject and cited reference. We are submitting herewith the quarterly Ambient air quality, surface water quality & ground water quality monitoring reports for the period from July' 2025 to September' 2025 within 5 Km radius of M/s. Tata Steel Limited, TSM-CPP, Angul.

This is for your kind information and necessary action.

Thanking you
Yours faithfully,
For M/s. Tata Steel Limited, TSM-CPP

Rajesh Kumar Agrawal
Factory Manager

Encl: As above

Copy to: The Regional Officer, State Pollution Control Board, Odisha, Angul

M/s. TATA STEEL LIMITED, MERAMANDALI, DHENKANAL, ODISHA
(Quarterly Monitoring Report from July'2025 to September '2025)

Summary of Surface Water Quality Analysis

Annexure-I

(Period: July 2025)

#	Parameter	Unit	Kishinda Nala		Lingara Nala		Brahamani River	
			U/S	D/S	U/S	D/S	U/S	D/S
1	Colour	Hazen	7	9	3	4	28	36
2	Biochemical Oxygen Demand (BOD)	mg/l	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:1.0)	2.2	2.6
3	Chemical Oxygen Demand (COD)	mg/l	BDL (DL:4.0)	BDL (DL:4.0)	BDL (DL:4.0)	BDL (DL:4.0)	8.6	8.1
4	Fluoride as F	mg/l	1.18	0.8	0.684	1.28	0.42	0.37
5	Oil & Grease	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
6	pH	None	7.98	7.57	7.95	8.1	7.63	7.42
7	Total Suspended Solids (TSS)	mg/l	5.6	12	2.1	3.8	70.3	76
8	Conductivity	µs/cm	598	858	518	772	228	234
9	Ammoniacal Nitrogen	mg/l	1.2	1.4	BDL (DL:0.1)	0.86	1.8	1.6
10	Arsenic as As	mg/l	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)
11	Boron as B	mg/l	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)
12	Cadmium as Cd	mg/l	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)
13	Copper as Cu	mg/l	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)
14	Lead as Pb	mg/l	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)
15	Manganese as Mn	mg/l	BDL (DL:0.05)	BDL (DL:0.05)	BDL (DL:0.05)	BDL (DL:0.05)	0.098	0.106
16	Mercury as Hg	mg/l	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)
17	Nickel (as Ni)	mg/l	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)
18	Odour	None	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
19	Phenolic Compounds as C6H5OH	mg/l	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)
20	Residual Free Chlorine	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
21	Selenium as Se	mg/l	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)
22	Temperature	Deg C	28.3	28.1	29.5	28.2	28.4	28
23	Total Chromium as Cr	mg/l	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.01)	BDL (DL:0.03)

Signature Lab (I.C)

M/s. TATA STEEL LIMITED, MERAMANDALI, DHENKANAL, ODISHA
(Quarterly Monitoring Report from July'2025 to September '2025)

Summary of Surface Water Quality Analysis

24	Total Kjeldahl Nitrogen	mg/l	2	2.4	BDL (DL:1.0)	1.9	3.2	BDL (DL:1.0)
25	Zinc as Zn	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
26	Free Amonia	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
27	Sodium Absorption Ratio (SAR)	mg/l	BDL (DL:2.0)	BDL (DL:2.0)	BDL (DL:2.0)	BDL (DL:2.0)	BDL (DL:2.0)	BDL (DL:2.0)
28	Sulphate as SO^4	mg/l	96.3	129	35.1	47.6	31.4	31.9
29	Sulphide as S	mg/l	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)
30	Vanadium as V	µg/L	BDL (DL:5.0)	BDL (DL:5.0)	BDL (DL:5.0)	BDL (DL:5.0)	BDL (DL:5.0)	BDL (DL:5.0)
31	Total Coliform	MPN/100ml	$3.09x10^2$	$1.08x10^3$	7	14	$7.77x10^2$	$8.95x10^2$

Note: BDL: Below Detectable Limit; DL: Detectable Limit, U/S: Upstream D/S: Downstream,
Source: Monitoring/ Analysis report of Environment Laboratory of TSM.

Signature Lab (I.C)

M/s. TATA STEEL LIMITED, MERAMANDALI, DHENKANAL, ODISHA
(Quarterly Monitoring Report from July'2025 to September '2025)
Ground Water Quality Analysis Report of surrounding villages

(Period: July 2025)

S. No	Parameter	Unit	Motanga (Tube well)	Galpada (Open Well)	Kharagprasad (Open well)	Kochilamada (Open Well)	Charadagadia (Open Well)	Khaliberana (Open well)	Ganthigadia (Open well)	Narendrapur (Open well)
1	Colour	Hazen	3	2	2	3	3	2	2	3
2	pH	-	7.34	6.95	7.02	6.85	7.34	7.14	7.18	6.83
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	NTU	1.33	0.7	0.22	0.39	1.33	0.27	0.25	0.72
6	Total Dissolved Solids (TDS)	mg/L	1754	986	1048	1820	1754	1045	966	1280
7	Alkalinity as CaCO3	mg/L	820	303	492	371	820	383	488	440
8	Total Hardness (as CaCO3)	mg/L	646	313	423	921	646	474	431	748
9	Sulphide (as H2S)	mg/L	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)	BDL (DL:0.04)
10	Sulphate (as SO4-2)	mg/L	186	278	170	273	186	166	114	60.4
11	Chloride as Cl	mg/L	240	127	160	519	240	199	239	479
12	Fluoride as F	mg/L	0.982	0.14	0.486	0.542	0.982	1.02	0.824	0.662
13	Nitrate as NO3	mg/l	47.3	45.1	15.9	47.8	47.3	46.1	18.5	8.8
14	Calcium as Ca	mg/L	202	83.2	111	212	202	124	108	188
15	Ammonia (as NH3)	mg/L	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
16	Magnesium as Mg	mg/L	56	34	42.8	86	56	40	39.1	67.5
17	Iron (as Fe)	mg/L	0.103	0.092	0.103	0.108	0.103	0.099	0.099	0.103
18	Aluminium (as Al)	mg/L	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)
19	Anionic Surface-Active Agents as (MBAS)	mg/L	BDL (DL:0.025)	BDL (DL:0.025)	BDL (DL:0.025)	BDL (DL:0.025)	BDL (DL:0.025)	BDL (DL:0.025)	BDL (DL:0.025)	BDL (DL:0.025)

Signature Lab (I.C)

M/s. TATA STEEL LIMITED, MERAMANDALI, DHENKANAL, ODISHA
(Quarterly Monitoring Report from July'2025 to September '2025)
Ground Water Quality Analysis Report of surrounding villages

20	Barium (as Ba)	mg/L	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
21	Boron (as B)	mg/L	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)
22	Copper (as Cu)	mg/L	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)
23	Free Residual Chlorine	mg/L	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
24	Manganese (as Mn)	mg/L	0.096	BDL (DL:0.05)	BDL (DL:0.05)	0.094	0.096	BDL (DL:0.05)	BDL (DL:0.05)	0.404
25	Phenolic Compounds (as C6H5OH)	mg/L	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)
26	Selenium (as Se)	mg/L	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)
27	Silver (as Ag)	mg/L	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
28	Zinc (as Zn)	mg/L	BDL (DL:0.01)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
29	Cadmium (as Cd)	mg/L	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)
30	Cyanide (as CN)	mg/L	BDL (DL:0.012)	BDL (DL:0.012)	BDL (DL:0.012)	BDL (DL:0.012)	BDL (DL:0.012)	BDL (DL:0.012)	BDL (DL:0.012)	BDL (DL:0.012)
31	Lead (as Pb)	mg/L	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)
32	Mercury (as Hg)	mg/L	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)
33	Nickel (as Ni)	mg/L	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)
34	Total Arsenic (as As)	mg/L	BDL (DL.0.005)	BDL (DL.0.005)	BDL (DL.0.005)	BDL (DL.0.005)	BDL (DL.0.005)	BDL (DL.0.005)	BDL (DL.0.005)	BDL (DL.0.005)
35	Molybdenum (as Mo)	µg/L	BDL (DL: 5.00)	BDL (DL: 5.00)	BDL (DL: 5.00)	BDL (DL: 5.00)	BDL (DL: 5.00)	BDL (DL: 5.00)	BDL (DL: 5.00)	BDL (DL: 5.00)
36	Mineral Oil	mg/L	BDL (DL: 0.01)	BDL (DL: 0.01)	BDL (DL: 0.01)	BDL (DL: 0.01)	BDL (DL: 0.01)	BDL (DL: 0.01)	BDL (DL: 0.01)	BDL (DL: 0.01)
37	Chloramines (as Cl2)	mg/L	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)
38	Total Chromium (as Cr)	mg/L	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)	BDL (DL:0.03)
39	Total Coliform	-	Not Detected	Detected	Detected	Detected	Not Detected	Detected	Detected	Detected
40	E. coli	-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

Signature Lab (I.C)

M/s. TATA STEEL LIMITED, MERAMANDALI, DHENKANAL, ODISHA
(Quarterly Monitoring Report from July'2025 to September '2025)

AMBIENT AIR MONITORING DATA FOR THE MONTH OF JULY-2025													
S.No.	AMBIENT AIR MONITORING	PM10	PM2.5	SO_2	NO_2	NH_3	O_3	CO	Pb	Ni	As	Benzene (C_6H_6)	Benzo-(a)-Pyrene
	LOCATIONS	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	mg/m^3	$\mu g/m^3$	ng/m^3	ng/m^3	$\mu g/m^3$	ng/m^3
1	Motanga	81.1	47.5	11.8	23.1	<10.0	<20.0	<1.0	<0.002	<6.0	<2.0	<2.5	<0.5
2	Galpada	108.6	64.3	14.5	25.8	<10.0	<20.0	<1.0	0.013	<6.0	<2.0	<2.5	<0.5
3	Nalachandrapur (Nalatangra)	96.7	58.4	13.7	26.2	<10.0	<20.0	1.11	0.014	<6.0	<2.0	<2.5	<0.5
4	Narandrapur	114.2	69.8	16.1	28.6	<10.0	<20.0	1.23	0.035	<6.0	<2.0	<2.5	<0.5
5	Mangalpur	72.5	40.9	8.5	20.7	<10.0	<20.0	<1.0	<0.002	<6.0	<2.0	<2.5	<0.5
6	Khaliberana	53.7	30.2	7.3	18.8	<10.0	<20.0	<1.0	<0.002	<6.0	<2.0	<2.5	<0.5
7	Kochilamara	92.3	54.7	13.1	24.6	<10.0	<20.0	1.09	0.015	<6.0	<2.0	<2.5	<0.5
8	Itapa	97.2	59.5	14.3	31.5	<10.0	<20.0	1.26	0.031	<6.0	<2.0	<2.5	<0.5

Signature Lab (I.C)

---------- End of Report ----------

e) Trace metals in PM_{10} of Ambient Air

Samples of PM_{10} of twenty-four hours duration were collected on EPM 2000 filter papers at the ten (10) AAQ locations. The filter papers are acid digested, extracted and analysed on MP-AES instrument. For mercury, filter paper was digested and analysed on Cold Vapour Atomic Absorption Spectrophotometer (CVAAS).

The mineralogical composition of PM_{10} in terms of selected metals i.e. heavy metals were carried out in samples for all the ambient air monitoring location for Iron, Manganese, Zinc, Chromium, Cadmium Copper and mercury. The mean results of metal analysis in PM_{10} are presented in **Table 1.6.5**.

The most abundant elements found in PM_{10} in the study area are Fe, Zn & Mn in comparison to other metals. The crustal element Fe ranged from 0.679 to 2.662 µg/m^3 among the ten AAQ locations which is usually found in crustal rock and soil particles in the study area. The decreasing elemental concentration trend is as follows Fe > Zn > Mn > Cu > Cr > Cd > Hg.

High concentrations of iron (Fe) were observed at AAQ locations A3 (Birabahanpur), A10 (Kankalu), and A8 (Galapada). Manganese (Mn) concentrations ranged from 0.030 to 0.154 µg/m^3, with the highest levels recorded at A6 (Nuahata) and A3 (Birabahanpur). Zinc (Zn) concentrations varied between 0.671 and 1.215 µg/m^3.

As there are no national standards for these metals in ambient air, the results have been compared with the Ontario Ambient Air Quality Criteria (AAQC), April 2020. Elevated concentrations of Fe, Mn and Zn were observed at A6 (Nuahata), which is located ~2.8 km from the project site and close to Angul-Talcher road. The nearest inhabited location, A3 (Birabahanpur), showed slightly higher levels of multiple metals but all concentrations remained well within the Ontario AAQC limits.

Table 1.6.5: Mean Results of Metal Analysis in Ambient Air

AAQ Stn. Code	Parameters	Iron as Fe	Manganese as Mn	Zinc as Zn	Chromium as Cr	Cadmium as Cd	Copper as Cu	Mercury as Hg
	Name of Instrument used for Analysis	*MPAES*						*CVAAS*
	Unit	µg/m^3						ng/m^3
	Method sensitivity	DL:0.003	DL: 0.001	DL: 0.003	DL: 0.001	DL: 0.001	DL: 0.001	DL:0.03
A1	Sibapur	1.172	0.064	0.867	0.005	0.001	0.021	0.044
A2	Khaliberana	1.279	0.069	0.958	0.005	0.001	0.015	0.051
A3	Birabahanpur	1.672	0.134	1.192	0.005	0.001	0.028	0.070
A4	Asanabania	0.926	0.094	1.112	0.006	0.001	0.007	0.045
A5	Bhagwatpur	1.129	0.093	1.062	0.005	0.001	0.014	0.035
A6	Nuahata	2.662	0.154	0.775	0.006	0.002	0.021	0.041
A7	Kurunti Chasasahi	1.166	0.077	0.671	0.005	0.001	0.036	0.061
A8	Galapada	1.605	0.106	1.169	0.005	0.002	0.007	0.035
A9	Sanamunda	0.679	0.039	1.006	0.004	<0.001	0.096	0.046
A10	Kankalu	1.628	0.116	1.215	0.005	0.001	0.016	0.050
Ontario Ambient Air Quality Criteria, April 2020 (24 Hr.)		**4.0**	**0.2**	**120**	**0.5**	**0.025**	**50**	**2000**

Source: Primary baseline monitoring by MECON, Summer Season 2025