TSM/MoEF&CC/BS-29/2022-02/211
31st May,2022

The Deputy Director General
Ministry of Environment, Forests and Climate Change,
Regional Office (EZ),
A/3, Chandrasekharpur,
Bhubaneswar-751023

Subject: Submission of Six-monthly EC compliance reports of 256 MW captive power plant of Tata Steel Ltd., Meramandali for the period Oct'21 to Mar'22.
Reference: EC vide letters no.J-13012/77/2011-IA-II (I), dated 12.02.2015

Dear Sir,

This has reference to the captioned subject and cited references. It is to inform that we are herewith submitting six monthly compliance reports for the conditions stipulated in the Environment Clearance of 256 MW captive power plant of Integrated Steel Plant of Tata Steel Ltd. Meramandali for the period from October 2021 – March 2022 along with monitoring data report for your kind consideration.

The copy of above compliance report is also being sent in soft format through email (roez.bsr-mef@nic.in) for your kind perusal. Also copy of EC compliance is being uploaded on MoEFCC website on portal http:// environmentalclearance .nic.in.

Hope the above are in line with the statutory requirements.

Thanking you,

Yours faithfully,
For Tata Steel Limited

Anoop Srivastava

Anoop Srivastava
Head-Environment
Encl: As above
Copy to:

1. The Member Secretary, CPCB, Parivesh Bhawan, East Arjun Nagar, Delhi-110032
2. The Member Secretary, SPCB, Parivesh Bhawan, A/118, Nilakahanta Nagar, Unit-VIII, Odisha, Bhubaneswar-751012.

HALF YEARLY COMPLIANCE REPORT

Oct'21 to Mar'22

Environment clearance of 256 MW power plant
Letter no.: J-13012/77/2011-I-A. II (T) dated 12.02.2015 & its amendment dated 13.09.2021

SL.	STIPULATED CONDITIONS	COMPLIANCE STATUS
i	Vision document specifying prospective plan for the site shall be formulated and submitted to the RO of the Ministry within six months.	• Vision, Mission and Environment Policy statements have been submitted to the Regional Office, MoEF&CC, BBSR along with the compliance report.
ii	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.	• Power is co-generated utilizing waste heat from DRI units through WHRBs. • Additionally, coke oven and blast furnace gases are also used for generating green power through gas fired boilers utilizing renewal energy source. • TERI has been engaged to carryout feasibility study for installation of solar power.
iii	Sulphur and ash contents in the imported coal to be used in the project shall not exceed 0.3% and 6% respectively at any given time. In case of variation of coal quality at any point of time, fresh reference shall be made to the Ministry for suitable amendments to environment clearance condition wherever necessary.	• Not applicable • Presently only gas fired boilers (60TPH, 125TPH & 250TPH capacities) are being operated which do not consume coal and no ash generation. • Amendments in environment clearance has been made from MoEF&CC on 13th Aug'21 for switching of fuel from 50% Coal & 50% Mixed gas from steel plant to 100 % mixed gas from Steel Plant.
iv	A long term study of radioactivity and heavy metals contents in coal to be used shall be carried out through a reputed institute and results thereof analyzed every two years 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.	• Not applicable • Presently only gas fired boilers (60TPH, 125TPH & 250TPH capacities) are being operated which do not consume coal and no ash generation. • Hence, no need no monitor Radioactivity and heavy metals contents in coal and ash
v	A stack of 220 meter height shall be provided with continuous online monitoring equipments for SO_x, NO_x, PM_{10} and $PM_{2.5}$. Exit velocity of flue	• Installation of gas fired boiler instead of CFBC boiler have been done. A common stack of height 70 m is attached to 60TPH & 125TPH and another stack of height 40 m is

	gases shall not be less than 22 m / sec. Mercury emissions from stack shall also be monitored on periodic basis.	attached to 250 TPH gas fired boiler. Online monitoring system has been installed for SOx and NOx in the stacks Online data is transmitted to SPCB and CPCB servers through RT-DAS.
vi	High efficiency ESPs shall be installed to ensure that particulate emission does not exceed 50 mg / Nm^3. Adequate dust extraction system such as cyclones/bag filters and water spraying system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.	• Not applicable • Presently only gas fired boilers (60TPH, 125TPH & 250TPH capacities) are being operated which do not consume coal and no particulate emission. Hence, no need to install ESPs.
vii	Adequate dust extraction system such as cyclones / bag filters and water spraying system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.	• Not applicable • Presently only gas fired boilers (60TPH, 125TPH & 250TPH capacities). Hence, no coal and ash handling and dust extraction system such as cyclones / bag filters and water spraying system not required.
viii	COC of at least 5.0 shall be adopted	• COC in the range of 7 -8 is maintained.
ix	Monitoring of surface water quantity and quality shall also be regularly conducted and records maintained. The monitoring data shall be submitted to the Ministry regularly. Further, monitoring points shall be located between the plant and drainage in the direction of the 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.	• Monitoring of surface water and ground water is being carried out regularly. Monthly monitoring reports are being submitted to the SPCB, Odisha. Last monitoring report was submitted on May 10th, 2022. • The summarized data is enclosed as **Annexure - I.**
x	A well designed rainwater harvesting system shall be put in place within six months, which shall comprise of rain water collection from the built up and open area in the plant premises and detailed records kept of the quantity of water harvested every year and its use.	• Lagoons and HDPE pond have been created to store rainwater. This water is reused in the process when required. However, recently detailed scientific study has been carried out for management of surface runoff & rainwater harvesting. During the period Oct'21 to Mar'22, 22475 m3 of rainwater has been utilized in process.

		• RWH potential has been studied by engaging an expert M/s. KRG Foundation, Chennai & the suggested projects are being implemented in phases. In the first phase 50000 Cum capacity storage pond has been constructed in the year 2021.
xi	No water bodies including natural drainage system in the area shall be disturbed due to activities associated with the setting up / operation of the power plant.	• No water body or natural drainage system is disturbed.
xii	Hydrogeology of the area shall be reviewed annually from an institute / organization of repute to assess impact of surface water and ground regime (especially around ash dyke). In case any deterioration is observed, specific mitigation measures shall be undertaken and report / data of water quality monitored regularly and maintained shall be submitted to the Regional Office of the Ministry.	• Hydrogeology study is being carried out by engagement of National Institute of Technology Rourkela. No deterioration of ground water level and quality have been observed from the last hydrogeology study.
xiii	Waste water generated from the plant shall be treated before discharge to comply limits prescribed by the SPCB / CPCB.	• Wastewater generated from the plant is being treated in Effluent Treatment Plant • Treated water is reused in slag granulation, greenery development and low end application in Blast Furnace & Sinter Plant etc. • The water quality parameters are well within the limit as per the prescribed standard.
xiv	Additional soil for leveling of the proposed site shall be generated within the site (to the extent possible) so that natural drainage system of the area is protected and improved.	• No additional soil is required for leveling the site.
xv	Prior approval of the Ministry shall be obtained for Mine Void and abandoned stone quarry filling of fly ash based on the outcome of the pilot study for which permission was accorded to the existing units by the Ministry on 05.09.2013 subject to Hon'ble NGT's Order.	• Not applicable. • Presently only gas fired boilers (60TPH, 125TPH & 250TPH capacities) are being operated which do not consume coal and no ash generation.

xvi	Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Unutilized fly ash shall be disposed off in the ash pond in the form of slurry. Mercury and other heavy metals (As, Cr, Pb etc) will be monitored in the bottom ash as also in the effluents emanating from the existing ash pond. No ash shall be disposed off in low lying areas.	• Not applicable • Presently only gas fired boilers (60TPH, 125TPH & 250TPH capacities) are being operated which do not consume coal and no ash generation.
xvii	Fugitive emission of fly ash (dry or wet) shall be controlled such that no agricultural or non-agricultural land is affected. Damage to any land shall be mitigated and suitable compensation provided in consultation with the local panchayat.	• Not applicable • Presently only gas fired boilers (60TPH, 125TPH & 250TPH capacities) are being operated which do not consume coal, no ash generation and no fugitive dust emission
xviii	Ash pond shall be lined up with HDPE/LDPE lining or any other suitable material impermeable media such that no leachate takes place at any point of time. Adequate safety measures shall also be implemented to protect the ash dyke from getting breached.	• Not applicable • Presently only gas fired boilers (60 TPH and 125 TPH & 250TPH capacities) are being operated which do not consume coal and no ash generation.
xix	Green belt consisting of three tire of plantation of native species around plant and at least 50 m width shall be raised. Wherever 50 m width is not feasible a 20 m width shall be raised and adequate justification shall be submitted to the Ministry. Tree density shall not be less than 2500 trees per ha with survival rate not less than 80%. Only native species shall be planted and the green belt development shall be expedited.	• Green belt development is under progress in and around the plant complex by planting indigenous species as per CPCB guidelines. till Mar'22, 33.66% area (this includes Plant, R&R and CSR plantation) has been covered under green belt. Rapid afforestation using MiyaWaki method in consultation with IIT, Kharagpur has been initiated. • Wherever feasible, green areas are being developed in and around the plant premises using mainly native plant species to ensure survival rate of about 90%. • Plantation of saplings are done regularly based on the availability of vacant area.
xx	CSR schemes identified based on Public Hearing issues and need based assessment shall be implemented in consultation with the village panchayat and the District administration starting	• The peripheral development is being carried out based on socio economic survey and need based assessment. Based on this, TSBSL has provided the facilities of sanitation, drinking water, education, health

	from the development of the 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 program.	care, road and communication facilities etc in surrounding villages. • Various socio-economic development programs covering education, safe drinking water, sports and health care etc are undertaken in nearby villages. • Details breakup of CSR initiatives are enclosed as **Annexure-II**
xxi	As committed, a minimum amount of Rs. 40.00 crore shall be earmarked for CSR activities for next five years. 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	• CSR department has been established to monitor the CSR activities. The CSR activities are based on need based assessment.
xxii	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.	• As per the revised companies Act, 2013 and its amendment, CSR committee has been formed. Evaluation of each specific CSR intervention/activities is monitored & evaluated by the CSR Committee. • Evaluation of the Impact of Corporate Social Responsibility Projects has been carried out by XIMB, Bhubaneswar.
xxiii	An Environmental Cell comprising of at least one expert in environment 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.	• Environment Management Department has been established for implementation of stipulated environmental safeguards and control of pollution. • The head of the Environment department and other officers are having Environmental Science/Engineering qualification and adequate experience.

A	**General Conditions:**	
i	Space for FGD shall be provided for future installation as may be required.	• Presently only gas fired boilers (60TPH, 125TPH & 250TPH capacities) are being operated. Hence, FGD is not required.
ii	The treated effluents conforming to the prescribed standards only shall be re-circulated and re-used within the plant. Arrangements shall be made that effluents and storm water do not get mixed	• Waste water is treated in ETP • The treated effluent, conforming to the prescribed standards, are recycled and reused for slag granulation, dust suppression and green area development.
iii	A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising greenbelt / plantation.	STP of 100 m3 per day has been installed near Blast Furnace-I.
iv	Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fire in coal yard especially during summer season. Copy of these measures with full details along with location on plant layout shall be submitted to the Ministry as well as to the Regional Office of the Ministry.	• Not applicable • Presently only gas fired boilers (60TPH, 125TPH & 250TPH capacities) are being operated which do not consume coal.
v	Storage facility for auxiliary liquid fuel such as LDO/HFO/LSHS shall be made in the plant area in consultation with the Department of Explosives, Nagpur. Sulphur content in the liquid fuel will not exceed 0.5%. Disaster Management Plan shall be prepared to meet any eventuality in case of an accident taking place due to storage of oil.	• Not applicable. LDO/HFO/LSHS is not using for startup activities
vi	First aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.	• Adequate First aid and sanitation arrangements were made during construction phase of the plant and similar facilities are being maintained during operational phase also for the workers and employees.
vii	Noise level emanating from turbines shall be so controlled such that the noise in the work zone shall be limited to 85 dB(A) from the source. For people	• Silencers have been provided at boilers to control noise during steam venting. • Necessary PPEs are being provided to all the workers working in noisy areas and periodic

	working in the high noised areas, requisite PPEs like ear plugs/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 records and for treatment for any hearing loss including shifting to non-noisy/less noisy areas.	examination is being conducted for the workers engaged in noisy areas. • Noise monitoring is carried out regularly in the work zone areas and reports are enclosed as **Annexure-III.**
viii	Regular monitoring of ambient air ground level concentration of SO_2, NO_x, $PM_{2.5}$, PM_{10} and Hg shall be carried out in the impact zone and records maintained. If at any stage levels are found to exceed the prescribe limits, necessary control measures shall be provided immediately. The locations 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 the Ministry. The data shall also be put on the website of the Company.	• Five ambient air quality monitoring stations have been set up in nearby villages for measuring ground level concentrations of PM_{10}, SO_2 and NOx in consultation with SPCB. Odisha.
ix	Utilization of 100 % fly ash generated shall be made from 4th year of operation. Status of implementation shall be reported to the Regional Office of the Ministry from time to time.	• Not applicable • Presently only gas fired boilers (60TPH, 125TPH & 250TPH capacities) are being operated which do not consume coal and no ahs generation.
x	Provision shall be made for the housing of contractor workers (as applicable) within the site with all necessary infrastructure facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc.	• Adequate arrangements of housing for construction workers were made during construction phase of the plant and same facilities are being maintained during operational phase also for employees and workers.
xi	The project proponent shall advertise in at least two local news papers 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	• Advertisements were circulated in The Telegraph (English daily) dated 15.02.2015 and the Samaya (Oriya daily) dated 15.02.2015. • A copy of the same was submitted to MoEF&CC vide our letter no. BSL/MoEF/BS-02/2015-09 dated 21.02.2015.

	that the project has been accorded environment clearance and copies of the clearance letters are available with the SPCB/Committee and may also be seen at website of the Ministry of Environment and Forests at http://envfor.nic.in	
xii	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad / Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the Company by the Proponent.	• Copy of the environment clearance was submitted to the concerned panchayat, Zila Parishad, District Industry Centre etc.
xiii	The proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of measured data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MoEF, the respective zonal office of CPCB and the SPCB. The criteria pollutant levels namely SPM, RSPM (PM_{10} and $PM_{2.5}$) SO_2, NO_x (ambient as well as stack emission) shall be displayed at a convenient location near the main gate of the Company in the public domain.	• Status of compliance of the stipulated environment clearance conditions are being uploaded on website and are being sent to the Ministry, CPCB and SPCB. Results of online air quality monitoring are displayed electronically near the main gate. The last half yearly compliance report was submitted vide letter no. TSL/MoEF&CC/BS-26/2021-03/133 dated 29.11.2021.
xiv	The environment statement for each financial year ending 31st March in Firm-V as is mandated to be submitted by the project proponent to the concerned SPCB as prescribed under the Environment (Protection) Rules 1986, as amended subsequently, shall also be put on the website of the Company along with the status of compliance of environment clearance conditions and	• The environment statement in Form-V for each financial year ending 31st March is submitted to the Regional Office of the Ministry, CPCB and SPCB. • Last environment statement was submitted vide letter no. TSBSL/SPCB/BS-03/2021-15/97, dated. 29.09.2021.

	shall also be sent to the respective Regional Office of the Ministry by e-mail.	
xv	The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of environment and Forests, its Regional Office, CPCB and SPCB. The project proponent shall upload the status of compliance of the environmental clearance conditions on their website and update the same periodically and simultaneously send the same by e-mail to the Regional office of MoEF.	• Six monthly reports on status of the implementation of the stipulated environmental safeguards are being submitted. • Status of compliance with the environmental clearance conditions is being uploaded on the Company's website at http://www.tatasteel.com.
xvi	Regional office of the MoEF will monitor the implementation of the stipulated conditions. A complete set of documents including Environment 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 at least six monthly basis. Criteria pollutants levels including NOx (from stack and ambient air) shall be displayed at the main gate of the power plant.	• All the required documents have been already submitted to the Regional Office and will be made available during inspection. • Compliance status is uploaded on the website and updated in every six months.
xvii	Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.	• Adequate funds are being provided by the management for pollution control and to meet recurring costs. Environmental requirements are given top priority for fund allocation and approval of capital projects. • The funds earmarked for environment pollution control measures are not diverted for any other purpose.

		• The company has invested adequate capital expenditure to improve mix of clean power & also reduction of carbon emissions
xviii	The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the project by the project authorities and the dates of land development work and commissioning of plant.	• Financial closure and financial approval will be communicated to the regional office and the Ministry of MoEF&CC.
xix	Full cooperation shall be extended to the Scientists/Officers from the Ministry / Regional Office / CPCB / SPCB who would be monitoring the compliance on environmental status.	• Full cooperation is extended to the Scientists/Officers from the Ministry / Regional Office / CPCB / SPCB who would be monitoring the compliance on environmental status.
Environment clearance of 256 MW power plant Letter no.: J-13012/77/2011-I-A. II (T) (Pt.) dated 10.02.2020 and its EC transfer M/s Bhushan Steel Limited to Tata Steel BSL Limited		
SL	**ADDITIONAL CONDITION**	**COMPLIANCE STATUS**
i.	M/s Tata Steel BSL Ltd. (new incumbent) shall submit an application for amendment in EC for switching from 50% coal & 50% mix gases from Steel plant to 100% mix gases from steel plant for stipulation of adequate conditions on pollution control measures by the Ministry.	• Amendment EC has been obtained for switching from 50% coal & 50% mix gases from Steel plant to 100% mix gases.
ii	The revised emission standards and specific water consumption as per the Ministry's Notification vide S.O.33.5 dated 17.12.2015 and subsequent amendments shall be complied with. The progress of implementation of new emission standards as per the extended timelines given by CPCB vide Order dated 16.04.2018 shall be submitted as part of compliance report.	• The revised emission standards and specific water consumption as per the Ministry's Notification vide S.O.33.5 dated 17.12.2015 and subsequent amendments is being complied with.
iii	Details of quantity of water consumption, power generation and Specific water consumption shall be submitted as part of compliance report.	• Water consumption , power generation and specific water consumption being submitted as part of compliance.

iv	The status of case (CC case No.16/2014) filed before Hon'ble Sub Divisional Judicial Magistrate, Dhenkanal against Shri Neeraj Singhal,M/s Bhushan Steel Ltd. shall also be communicated to the Ministry.	• Case is pending for Supply of Prosecution Report.
Amendment Environment clearance of 256 MW power plant Letter no.: J-13012/77/2011-I-A. II (T) dated 13.08.2021		
SL	**ADDITIONAL CONDITION**	**COMPLIANCE STATUS**
7	PP shall submit Compliance report of Ministry Regional office within 6 months.	• Certificate of compliance has already been communicated vide letter No.TSL/MoEF &CC/BS-26/2022-02/202 dtd. 13.05.22.

Annexure-I

Summary of Surface Water Quality Analysis

Period: From Oct'21 to Mar'22

S.N	Parameter	Unit	Lingala Nala		Kishinda Nala		Standard as per Class C -IS 2296 /CPCB
			U/S	D/S	U/S	D/S	
1	pH Value	-	7.39 - 7.79	7.69 – 7.9	7.43 – 8.3	7.65 – 8.9	6.0-9.0
2	Colour	Hazen	0.26 - 2.3	0.53 – 2.6	0.85 – 4.6	0.75 – 4.9	300 (max)
3	Electrical Conductivity	µs/cm	424 - 498	385 - 484	599 – 658	458 – 611	--
4	Total Dissolved Solids	mg/l	342 -369	285 - 356	419 - 486	336 – 423	1500 (max)
5	Dissolved Oxygen	mg/l	5.6 - 6.3	5.9 – 7.1	5.9 – 7.4	6.8 – 6.9	4 (min)
6	BOD , 3days at 27°C	mg/l	0.9 - 1.5	1.1 – 1.4	1.2 – 1.8	1.6 – 1.7	3 (max)
7	Chlorides as Cl	mg/l	18.7- 41.5	20.1 – 29.0	29.4 – 37.5	26.7 - 43	600 (max)
8	Fluoride as F-	mg/l	0.8 – 1.2	0.7 – 1.0	3.2 – 6.5	1.8 – 5.1	1.5 (max)
9	Sulphate mg/l	mg/l	10.0 – 21.6	11.6 – 29.8	24.9 – 78.4	33 – 71.6	400 (max)
10	Nitrate as NO3-	mg/l	9.86 – 15.6	12.3 – 16.8	10.5 – 23.6	9.8 – 28.4	50 (max)
11	Hexa Chromium as Cr +6	mg/l	0.021 – 0.042	0.015 – 0.029	0.012 – 0.042	0.013 – 0.036	0.05
12	Cyanide as CN	mg/l	<0.03	<0.03	<0.03	<0.03	0.05 (max)
13	Copper as Cu	mg/l	0.031 – 0.045	0.028 – 0.063	0.007 – 0.018	0.01 – 0.025	1.5 (max)
14	Iron as Fe	mg/l	0.269 – 0.437	0.01 – 0.175	0.074 – 0.089	0.086 – 0.169	0.5 (max)
15	Cadmium as Cd	mg/l	0.003 – 0.009	0.005 – 0.009	0.004 – 0.01	0.004 – 0.01	0.01 (max)
16	Selenium as Se	mg/l	<0.001	<0.001	<0.001	<0.001	0.05 (max)
17	Arsenic as As As	mg/l	0.003 – 0.008	0.005 – 0.009	0.001 – 0.005	0.001 – 0.008	0.2 (max)
18	Lead as Pb(max)	mg/l	<0.001 - <0.01	<0.001 – 0.01	0.01 – 0.007	0.004 – 0.01	0.1 (max)
19	Zinc as Zn(max)	mg/l	0.022 – 0.096	0.027 – 0.152	0.056 – 0.152	0.074 – 0.196	15 (max)
20	Sodium Absorption Ratio	-	5.45-6.2	4.77-5.71	7.44-9.05	5.34-8.03	--
21	T. Hardness(as CaCO3)	mg/l	192 - 213	170 - 198	238 – 260.3	200.1 - 220	200
22	Calcium as Ca	mg/l	39.8 – 45.7	34.3 – 48.1	35.1 – 62.5	38.7 – 62.5	75
23	Magnesium as Mg	mg/l	18.9 - 26	17 – 28.4	19.9 – 43.1	15.5 – 26.6	30
24	Manganese as Mn,	mg/l	<0.001 – 0.024	<0.001 – 0.055	<0.001-0.045	<0.001 – 0.023	0.1
25	Sodium as Na,	mg/l	31.0-36.3	25.4-32.6	47.7-58.11	31.2-50.15	$
26	Potassium as K,	mg/l	2.0-2.6	2.7-3.16	1.6-3.8	2.0-3.3	$
27	Nickel as Ni	mg/l	<0.001-0.006	<0.001-0.017	<0.001-0.006	<0.001	0.02
28	Chemical Oxygen Demand	mg/l	36 - 56	28 - 36	26 - 42	24 - 32	$
29	Free Ammonia	mg/l	<0.01	<0.01	<0.01	<0.01	0.5
30	Boron as B	mg/l	0.009 – 0.025	0.01 – 0.029	0.026 – 0.032	0.018 – 0.028	0.5
31	Total alkalinity as (as CaCO3)	mg/l	190 - 228	166 - 214	248 - 253	174 - 212	200

Note: $ - No specific standards, ND - Not detected, U/S: Upstream D/S: Downstream

Source: IMMT, Bhubaneswar

Summary of ground water level monitoring report inside plant premises

Period: From Oct'21 to Mar'22

S.N	Location with description	Depth of Bore Well	Longitude	Latitude	Water level in mtr bgl	
					Dec-21	March-22
1	Near CRM	163ft	20°47.956'	85°15.076'	2.11	2.58
2	Colony near STP	165ft	20°49.045'	85°15.734'	1.68	3.48
3	RMHS Near Wagon Tippler	300ft	20°47.752'	85°15.993'	3.12	4.86
4	Near Blast Furnace-2	162ft	20°47.25'	85°15.613'	1.50	3.0
5	Near Gate no-10	166ft	20°48.653'	85°15.754'	2.16	3.82
6	Near Railway bridge	156ft	20°48.920'	85°15.858'	2.88	4.59

Ground Water Quality Analysis

S.N	Parameter	Unit	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	Standard as per IS-10500-2012 (Acceptable Limit)	Standard as per IS-10500-2012 (Permissible Limit)
1	p H	-	7.36	7.88	8.02	7.68	7.52	7.60	6.5-8.5	6.5-8.5
2	Colour	Hazen	Colourless	Colourless	Colourless	Colourless	Colourless	Colourless	5	15
3	Odour	-	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Agreeable
4	T. Hardness (as $CaCO_3$)	mg/l	226	388	452	320	402	352	200	600
5	Calcium as Ca	mg/l	54.5	93.8	109.0	76.9	97.0	85.0	75	200
6	Magnesium as Mg	mg/l	21.9	37.5	43.9	31.2	39.0	34.2	30	100
7	Iron as Fe	mg/l	0.11	0.13	0.14	0.10	0.15	0.11	0.3	0.3
8	Chlorides as Cl	mg/l	69.58	171.8	231.46	173.95	215.84	167.56	250	1000
09	Fluoride as F^-	mg/l	0.92	0.82	0.78	0.66	0.79	0.60	1.0	1.5
10	Dissolved solids	mg/l	318	468	566	424	492	480	500	2000
11	Nitrate as NO_3^-	mg/l	1.4	1.8	3.6	2.2	2.1	2.7	45	45
12	Chromium as Cr^{+6}	mg/l	0.01	0.014	0.02	0.016	0.012	0.013	0.05	0.05
13	Alkalinity as CaCO3	mg/l	48	60	65	56	51	57	200	600
14	Phosphate as PO4	mg/l	0.48	0.72	0.80	0.66	0.64	0.70	$	$

N.B-GW-1-Near colony STP, GW-2-Near CRM, GW-3-Near Wagon Tippler are, GW-4- Near BF-2, GW-5-Near Gate Number-1,GW-6- Near Railway Bridge at material road.

Ground Water Level

Period: Oct'21 to Mar'22

S.N	Location	Sample Code	Longitude	Latitude	Water Level in mtr bgl	Water Level in mtr bgl
					Dec-21	March-22
1	Kharagprasad	GW-01	20^0 49.299'	85^0 18.923'	2.68	2.58
2	Charadagadia	GW-02	20^0 47.768'	85^0 17.083'	3.77	3.48
3	Sibpur	GW-03	20^0 46.941'	85^0 14.394'	3.6	4.86
4	Kochilamara	GW-04	20^0 47.541'	85^0 16.802'	2.88	3.0
5	Galpada	GW-05	20^0 48.142'	85^0 18.600'	4.1	3.82
6	Motonga	GW-06	20^0 48.143'	85^0 18.599'	2.88	4.59
7	Asanabania	GW-07	20^0 47.534'	85^0 16.802'	4.96	2.58
8	Narendrapur	GW-08	20^0 49.483'	85^0 15.530'	3.77	3.48
9	Khaliberena	GW-09	20^0 46.946'	85^0 14.396'	3.45	4.86
10	Ganthigadia	GW-10	20^0 48.501'	85^0 15.118'	4.07	3.0

Ground Water Quality Analysis Report of surrounding villages

December-2021

S. N	Parameter	GW-01	GW-02	GW-03	GW-04	GW-05	GW-06	GW-07	GW-08	GW-09	GW-10	Drinking water desirable limits IS-10500-2012(permissible limit)
1	pH	6.89	7.30	7.65	7.72	7.13	7.38	7.80	7.49	7.55	7.67	6.5-8.5
2	Conductivity µs/cm	459	1948	406	1143	389	1054	978	820	799	784	-
3	TDS mg/l	225	952	198	561	191	632	485	405	502	715	2000
4	Total Hardness as CaCO3 mg/l	190	662	180	410	168	432	232	296	490	520	600
5	Calcium Hardness as CaCO3 mg/l	114	398	108	246	102	260	140	178	294	312	-
6	Magnesium Hardness as CaCO3 mg/l	76	264	72	164	66	172	92	118	196	208	-
7	Total. Alkalinity	68	84	62	112	48	136	92	77	122	172	600
8	P. Alkalinity as CaCO3 mg/l	0	0	0	0	0	0	0	0	+0	0	-
9	Chloride mg/l	56.8	124.9	34.08	73.8	34.08	85.2	79.5	65.32	56.8	113.6	1000
10	Fluoride mg/l	0.35	1.1	1.2	1.2	0.30	0.67	1.2	0.60	0.55	1.1	1.5
11	Total Phosphate as P mg/l	0.56	0.66	0.36	0.55	0.32	0.72	0.48	0.68	0.52	0.84	-
12	Nitrate NO3 -2 mg/l	2.6	4.8	1.5	2.2	1.6	2.7	1.8	2.1	3.6	3.9	45
13	Iron as Fe mg/l	0.12	0.10	0.13	0.11	0.10	0.12	0.14	0.14	0.13	0.12	0.3

March-2022

S. N	Parameter	GW-01	GW-02	GW-03	GW-04	GW-05	GW-06	GW-07	GW-08	GW-09	GW-10	Drinking water desirable limits IS-10500-2012(permissible limit)
1	pH	7.60	7.35	7.63	7.32	7.81	7.42	7.93	7.93	7.41	7.66	6.5-8.5
2	Conductivity µs/cm	692	1969	364	1081	390	1293	1134	946	892	1477	-
3	TDS mg/l	339.5	965.4	230	577.6	195.4	629.2	492	462.4	432	732.1	2000
4	Total Hardness as CaCO3 mg/l	252	660	160	378	186	412	376	310	378	542	600
5	Calcium Hardness as CaCO3 mg/l	176	408	100	210	104	250	225	180	228	320	-
6	Magnesium Hardness as CaCO3 mg/l	76	252	60	168	82	162	151	130	150	222	-
7	Total. Alkalinity	75	125	80	195	90	190	105	105	195	268	600
8	P. Alkalinity as CaCO3 mg/l	0	0	0	0	0	0	0	0	0	0	-
9	Chloride mg/l	41.5	120	41.5	46.1	34.08	83.1	46.1	46.1	46.1	83	1000
10	Fluoride mg/l	0.2	1.0	0.5	0.59	0.33	0.9	1.1	0.94	1	1.1	1.5
11	Total Phosphate as P mg/l	0.37	0.32	0.38	0.47	0.44	0.41	0.43	0.32	0.32	0.66	-
12	Nitrate NO3 -2 mg/l	3.1	11	0.21	0.8	1.1	2.1	0.4	2.3	1.8	5.5	45
13	Iron as Fe mg/l	0.15	0.17	0.14	0.12	0.18	0.14	0.17	0.15	0.14	0.17	0.3

CSR Expenditure and Activity highlights

PROGRAM HEAD	2021-22	MAJOR INTERVENTIONS/REMARKS
Health & drinking water	668.92	Mobile Medical Unit; Dengue/Malaria control; Maternal health; Adolescent empowerment; Drinking Water; **Includes COVID Response- Covid Hospital**; **Relief and other works on COVID.**
Education	36.86	School infrastructure; Education project: QUEST
Livelihood	126.52	WEE Project; Other livelihood activities
Infrastructure & misc.	365.30	Construction & repair of road; Installation of solar lights
Sports	16.09	Volleyball coaching; Sports tournaments
Environment	0	Plantation done through Horticulture Dept. hence charged to that dept. in FY'19, '21 & '22)
TOTAL	**1213.69**	

Note: Environment: plantation done in villages and school, saplings being provided by TSL, Meramandali, Horticulture dept. So no expenditure.

Annexure-III

SUMMARY OF WORK ZONE NOISE MONITORING

TATA STEEL LIMITED, MERAMANDALI

PERIOD: From October'21 to March'22

S.N	Name of the unit	Location	Noise level in d B(A) at 3mtr	Standard as per Factory Rule Govt of Odisha 1950(8 Hrs)
			Range	
1	Gas fired Boiler 60 TPH	Near ID fan -1 area	82.6-85.3	90.0
		Near ID fan -2 area	81.2-84.8	
		Near FD fan -1 area	82.5-85.9	
		Near FD fan -2 area	81.3-85.8	
		Near Boiler area	82.8-84.9	
2	Gas fired Boiler 125 TPH	Near ID fan -1 area	84.7-87.0	
		Near ID fan -2 area	85.4-86.8	
		Near FD fan -1 area	85.1-87.3	
		Near FD fan -2 area	85.4-86.4	
		Near Boiler area	84.2-85.4	
3	Gas fired Boiler 250 TPH	Near ID fan -1/2 area	84.2-85.2	
		Near FD fan -1/2 area	85.2-86.2	
		Near Boiler area	84.8-85.4	