



The Additional P.C.C.F. (Central)
Eastern Regional Office
Ministry of Environment & Forests
Government of India
A/3, Chandrashekharpur,
Bhubaneswar – 751 023, Odisha

KPO/Env/C-05/103/2016
Date: 24.05.2016

Dear Sir,

Sub.: Six Monthly Compliance Report for October-15 to March-16 for Environmental Clearances in respect of 6.0 MTPA Integrated Steel Plant of Tata Steel at Kalinganagar Industrial Complex, Duburi, Dist. Jajpur, Odisha.

Ref.: EC Granted by MoEF vide Letter No. J-11011/7/2006-IA-II(I) dated 7.11.2006.
; Amendments in EC granted by MoEF vide Letters No. J-11011/7/2006-IA-II (I) dated 10.12.2012 and 13.05.2015

Kindly find enclosed Six Monthly Compliance Report for the period from October 2015 to March 2016 for the conditions stipulated in Environmental Clearance including amendments granted in EC to 6.0 MTPA Integrated Steel Plant of Tata Steel Limited at Duburi, Dist. Jajpur, Odisha for your kind considerations.

Copy of the compliance report is also being sent in soft format through e-mail (mef@ori.nic.in) for your kind perusal.

We trust the information furnished is in line with your requirement.

Thanking you,

Yours faithfully,

U S Parkhi
Head, Environment, KPO

Encl. a/a

Copy to MS, OSPCB, Bhubaneswar / CPCB Kolkata



TATA STEEL LIMITED

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Tel 91 22 66658282 Fax 91 22 66657724
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Six Monthly Environment Compliance Report

October 2015 to March 2016

For
Integrated Steel Plant Project of Tata Steel
At
Duburi, Dist. Jajpur, Odisha



Environment Department
Tata Steel Limited
Kalinganagar Industrial Complex
Duburi- 755026
Dist Jajpur, Odisha

Six Monthly Compliance Status (Oct'15 to Mar'16) of Environmental Clearance including Amendment in EC for 6.0 MTPA Integrated Steel Plant at Kalinganagar, Duburi, District-Jajpur, Odisha by M/s Tata Steel Ltd vide MoEF & CC's Letters No. EC No-J-11011/7/2006-IA.II(I) dated 7th Nov 2006, 10th Oct 2012 and 13th May 2015

Additional Safeguards vide letter dated 13.5.2015		Status as on date
2i)	Project proponent should install 24x7 air and water monitoring devices to monitor the air emission and effluent discharge, as provided by Central Pollution Control Board (CPCB) and submit the report to Ministry and its Regional office	<ul style="list-style-type: none"> On-line stack monitoring systems for stacks have installed for Coke Battery 1 & 2, CPP1, SP, BF, SMS and HSM. Water monitoring device as per CPCB guidelines has been installed at the outlet of BOD plant of Coke Oven Unit and CETP unit.
2ii)	For Wet quenching: permission to start the coke ovens with wet quenching till CDQ is stabilized by June 2016, thereafter maintain wet quenching as a standby and use for 20 days (3 weeks) in a year or per annum for maintenance or operation exigencies	<ul style="list-style-type: none"> Wet quenching system for Battery No.1 & 2 is under operating conditions. CDQ unit for Battery No. 1 & 2 is also under construction and is being expedited
2iii)	For LDO: Use of LDO for generation of power in power plants and DG set till Blast Furnace gas is available for power generation in power plants and there after maintain LDO as "Standby" and use for 15 days(two weeks) per annum for maintenance or operational exigencies.	BF Gas generated is used in the CPP-1 for power generation. LDO is being maintained as standby.
Additional Conditions vide letter dated 10.10.2012		Status as on date
i)	The company shall install low NOx burners to mitigate NOx emissions from captive power plant.	Low NOx burners, 8 Nos for each boiler for all the three boilers of captive power plant have been installed to control NO _x emissions.
ii)	Data on ambient air, stack and fugitive emission shall be regularly submitted online to Ministry's Regional Office at Bhubaneswar and Central Pollution Control Board as well as hard copy once in six months and display data on PM10, SO2 and NOx outside the premises at the appropriate place for the general public.	<ul style="list-style-type: none"> Six Monthly compliance reports are sent in hard as well as soft copies to MoEF/ OSPCB. The same is also available at company web site. Latest AAQ Monitoring data being monitored in & around the site on 24 hourly basis at 7 locations is summarized as follows: PM10 : 24.0 to 71.3 µg/m³ PM2.5 : 13.5 to 41.1 µg/m³ SO2 : 7.4 to 13.5 µg/m³ NOx : 9.5 to 16.7 µg/m³ CO : 0.13 to 0.4 mg/m³ AAQ data is displayed at the entrance of the Plant (Plant's Main Gate) for information to general public through Electronic display board Out of 7, 4 No's of Online Continuous Ambient Air Quality Monitoring stations (CAAQMS) were proposed for Phase-1 Project. All the four CAAQMS (Two Nos. inside and Two Nos. outside plant premises) have been installed and are in operation.
iii)	The National Ambient Air Quality Standard issued by the Ministry vide GSR No. 826(E) dated 16th November, 2009 shall be followed.	Air Quality standards conforming to NAAQS vide GSR 826 (E) has been referred for air quality monitoring and review.
Additional Conditions vide letter dated 10.10.2012		Status as on date
iv)	The project proponent shall also submit six monthly reports on the status of the compliances of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and SPCB. The Regional Office of the Ministry at Bhubaneswar/CPCB/SPCB shall monitor the stipulated conditions.	We are submitting the six-monthly compliance report in stipulated time. Last Six-monthly compliance reports for the period Apr'15 to Sep'15 was submitted to MoEF/ OSPCB Regional Office both in hard as well as soft copy on 23.11.15.

Six Monthly Compliance Status (Oct'15 to Mar'16) of Environmental Clearance including Amendment in EC for 6.0 MTPA Integrated Steel Plant at Kalinganagar, Duburi, District-Jajpur, Odisha by M/s Tata Steel Ltd vide MoEF & CC's Letters No. EC No-J-11011/7/2006-IA.II(I) dated 7th Nov 2006, 10th Oct 2012 and 13th May 2015

v)	The environmental statement for each financial year ending 31 march in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (protection Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliances of environmental conditions and shall also be sent to the respective Regional Offices of the MoEF by e-mail.	<ul style="list-style-type: none"> • Environment Statement for 2014 -15 was submitted to OSPCB on 26 Sept 2015 and the same for 2015-16 will be submitted before 30.09.2016 • Both, Environment Statement and Status of Compliance of EC conditions have been uploaded on company's website. (www.tatasteelindia.com)
vi)	The company shall submit within three months their policy towards Corporate Environment Responsibility which should inter-alia address (i) Standard operating process/ procedure to being into focus any infringement/ deviation/ violation of the environmental or forests norms/ conditions, (ii) Hierarchical system or Administrative order of the Company to deal with environmental issues and ensuring compliances to the environmental clearances conditions and (iii) system of reporting of noncompliance/ violation of environmental norms to the Board of Directors of the Company and/or shareholders.	<ul style="list-style-type: none"> • Corporate Environmental Policy was submitted to MoEF, New Delhi vide our letter no. TSL/DEL/805/2013 dated 8.1.2013. • Copy of the same was also submitted to MoEF, Bhubaneswar Office.
A	Specific Conditions as per EC dated 7.11.2006	Status as on date
i)	The gaseous emissions from various process units shall conform to the load/mass based standards notified by this Ministry on 19 th May, 1993 and standards prescribed from time to time. The state Boards may specify more stringent standards for the relevant parameters keeping in view the nature of the industry and its size and location. At no time, the emission level shall go beyond the prescribed standards. On-line continuous monitoring system shall be installed in stacks to monitor SPM and interlocking facilities shall be provided so that process can be automatically stopped in case emission level exceeds the limit. Nox burners shall be installed to control NOx levels. VOCs from the coke oven shall be monitored and controlled as per CPCB guidelines. The new standards prescribed by the CPCB for coke oven plants shall be strictly followed.	<ul style="list-style-type: none"> • Process units such as Coke Plant, Sinter Plant, Blast Furnaces, SMSs, and Mills have been designed conforming to the load/mass standards notified by the Ministry in order to have the gaseous emissions under control and below the prescribed limits. • Online stack monitoring systems have been installed at all the major stacks of Coke Plant Battery 1 & 2, Sinter Plant, BF, SMS, HSM etc. to monitor online continuous SPM emission levels. • VOC from coke plant is controlled by On-main charging by HPLA, Hydraulic doors, Door sealing, Door frame cleaner, etc. as per CPCB guidelines and the systems for both the Battery No. 1 & 2 • Low NOx burners are installed at CPP1 (8 Nos for each boilers in all three boilers) and in HSM reheating furnace (84 Nos) • New standards prescribed by CPCB for coke ovens are being followed.

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A	Specific Conditions as per EC dated 7.11.2006	Status as on date
ii.	<p>In-plant control measures for checking fugitive emissions from all the vulnerable sources like coke oven area, Sinter Plant, BF case house, BF stack house, and BOF shop etc. shall be provided. Further, specific measures like water sprinkling and dry fogging (DF) shall be carried out at the stock piles of raw materials, stacker reclaimer, conveyor transfer points and vibrating screens etc. Dust extraction system and bag filter shall be provided for room air cleaning such as sinter plant stock house, BF stock house and BF cast house, BOF shop and Ferro-alloys handling area in steel melting shop etc. Fume extraction system in steel refining units shall also be provided. Centralized de-dusting system i.e. collection of fugitive emissions through suction hood and subsequent treatment through bag filter or any other device and finally emitted through a stack of appropriately designed and height conforming to the standards for induction furnaces in the industry shall be provided. Fugitive emissions shall be controlled, regularly monitored and records maintained.</p>	<p>Control measures for road dust :</p> <ul style="list-style-type: none"> ○ For suppression of fine dusts, specially designed vehicle for mist type sprinkling of water (through movable High Pressure Mechanized Water jet) is in use. ○ Water sprinkling on construction roads is being done by truck mounted water tankers to control dust emission. ○ About 26 km of roads are metalled, out of total 32 kms internal roads of plant and remaining is under progress. ○ Speed limits are enforced for movement of vehicles at the site as per the factory limits ● For control of Fugitive emissions, at all the vulnerable points, Dry Fog dust suppression(DFDS), Dust Extraction Systems (DES), Fume extractions systems, etc. have been installed as applicable in Raw Material Handling System, Coke Plant, BF Stock & Cast Houses, BOF Shops, Lime Plant, etc. ● Centralized de-dusting system i.e. collection of fugitive emissions through suction hood and subsequent treatment through ESP is installed in Sinter Plant. ● All the stacks have been designed and installed to meet the requirement of stack heights as per guidelines, for proper dispersion and dilution of pollutants.
iii.	<p>ESP shall be provided to sinter plant and blast furnace. New standards prescribed by the CPCB for coke oven shall be strictly followed. The Company shall install Waste Heat Recovery Boilers (WHRB) to recover the waste heat and generate power from the steam produces by the WHRB. The particulate emissions from the WHRB shall be controlled by installation of ESP as per CPCB specification and particulate emissions shall not exceed 50mg/Nm³. Further, the company shall install bag filter, After Burner Chamber (ABC), suction hood, dust extraction device and fume extraction system to control gaseous emissions from the WHRB.</p>	<ul style="list-style-type: none"> ● ESPs with higher efficiency have been provided to Sinter plants, Blast Furnaces, SMS etc. ● Coke oven plant is designed to comply with new standards prescribed by CPCB for Coke Oven. ● Waste Heat Recovery Boilers have been installed to recover waste heat which in turn shall be used for in-house power generation from the steam produces by WHRB. ● Pollution Control Systems have been designed as per CPCB guidelines to control PM emissions < 50 mg/Nm³. ● Particulate emissions will be less than 50 mg/Nm³.
iv.	<p>Total requirement of the water from Brahamani /Kharsua river shall not exceed 26.5 MGD. No ground water shall be drawn and used for the plant. The effluent quantity into the industrial drain leading to the Gonda Nalla shall not exceed 92m³/hr and shall conform to the prescribed standards. Ammonia, phenol and cyanide in the effluent should be treated separately and discharged only after meeting the norms prescribed by the OSPCB/CPCB/Ministry under E(P) Act. Cyanide shall meet the standard of 0.2 ppm. TDS in the effluent discharged shall not be more than 2,100 mg/l. The domestic wastewater after treatment in STP shall be used for green belt development.</p>	<ul style="list-style-type: none"> ● Make up water requirement for the plant is < 26.5 MGD. ● No groundwater used for plant operations. ● Total effluent discharge envisaged is < 92m³/hr and it meets the standards prescribed by MoEF/ CPCB/OSPCB before discharge into Gonda Nalla. ● Ammonia, Phenol, Cyanide from Coke Oven plant are treated separately in BOD plant meant for the treatment of effluent generated from Coke Plant. The BOD plant is under stabilization. ● Domestic wastewater shall be treated in the centralized STP and treated water shall be utilized for plantation purposes. For treatment of domestic effluents generated from temporary offices/ colonies, septic tanks & soak pits are provided.

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v.	Ground water monitoring around the solid waste disposal site/secured landfill (SLF) shall be carried out regularly and report submitted to the Ministry's Regional Office at Bhubaneswar, CPCB and OPCB.	<ul style="list-style-type: none"> • Base line data regarding ground water level & quality is available. • Ground water monitoring points are identified; the same are being monitored regularly. (Ref Annexure-I)
A	Specific Conditions as per EC dated 7.11.2006	Status as on date
vi.	BF slag shall be sold to the cement manufacturers after granulation. Non-granulated BF slag shall be used in road making. BOF slag shall not be dumped anywhere except used for making cement and road etc. proposed in EIA/EMP. Ammonia and tar shall be recovered and remaining solid waste shall be burnt. Gas cleaning plant sludge and mill scales shall be reused in the sinter plant. Char generated shall be used in FBC boiler. The kiln accretions shall be utilized for filling low lying areas. The entire quantity of fly ash generated during the process shall be utilized for making brick. ESP fly ash shall be made available to the cement plants and brick making plants whereas bottom ash shall be disposed off in a suitably designed landfill as per CPCB guidelines to prevent leaching to the sub-soil and underground aquifer.	<ul style="list-style-type: none"> • Online slag granulation process (RASA) for BF slag is in operation. Slag is sold to cement manufacturers. • For transporting slag to cement units, wagon loading facilities are used. • Non-granulated BF slag shall be used for road making; non-granulated BOF slag will be used for road making and cement making. • In COBPP, we have provision of Tar and Sulphur recovery systems, Tar recovered as by-product is sold outside. • Gas cleaning plant is in operation in BF & SMS. • Provision for recycling of mill scales from mills to sinter plant has also been made.
vii.	The company shall develop surface water harvesting structures to harvest the rain water for utilization in the lean season besides recharging the ground water table.	<ul style="list-style-type: none"> • Reservoirs have been constructed to collect and store the Surface run-off during the monsoon under rain water harvesting schemes. • Storm water pond with necessary pumping arrangement of storm water in raw water system is completed. • Rain water harvesting structures are being planned in RCC buildings as well as in low lying areas.
viii.	Green belt shall be developed in at least 33% area within and around the plant premises as per the CPCB guidelines in consultation with DFO.	<ul style="list-style-type: none"> • Green Belt cover is being continuously developed within and around the project site, as well as outside the plant premises (rehabilitation colonies). Details of tree saplings planted: 2009-10: 792 nos. . 2013-14: 29888 nos 2010-11: 1130 nos. . 2014-15: 35437 nos 2011-12: 4800 nos. 2015-16: 78730 nos. 2012-13: 12622 nos. . • Avenue plantation is being taken up at Jajpur town, Kalinganagar and Bhubaneswar. • During the monsoon period of 2016-17, we propose to plant about 1 lakh trees.
ix.	Occupational Health Surveillance of the workers shall be done on a regular basis and records maintained as per the factories Act.	<ul style="list-style-type: none"> • Initial & Periodic medical check-up for workers are being done and records for the same are maintained as per the Factories Act. • To strengthen the Occupational Health Surveillance, a system has been made, in which, employee's Gate Pass is issued only after ensuring the initial medical check-up.
x.	Recommendations made in the CREP guidelines issued for the steel plants shall be implemented.	<ul style="list-style-type: none"> • CREP recommendations are being implemented at KPO and summarized below: 1. Coke Ovens: Fugitive emission control system is in place. All the batteries are new one and having coal stamp cum charging car technology 2. SMS: Secondary fume extraction system has

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		<p>been installed.</p> <p>3. BF: Pulverized Coal injection facilities have been installed in Blast Furnaces of KPO. TRT, Tar Free Runners, Cast House DE system, etc are also provided.</p> <p>4. Specific water consumption is envisaged to be less than 8 m³/t of flat product.</p> <p>5. Online monitoring facilities have been provided.</p> <p>6. Waste management systems are being implemented.</p>
A	Specific Conditions as per EC dated 7.11.2006	Status as on date
xii.	Rehabilitation and Resettlement plan shall be implemented as per the revised R&R policy and in collaboration with the State Government in a time bound manner and report submitted to the Ministry, its Regional Office at Bhubaneswar and OPCB.	<ul style="list-style-type: none"> • 1112 out of 1234 families have been rehabilitated within the framework of "Tata Steel Parivaar" concept as per R & R policy of Odisha Govt. in consultation with the local administration. A dedicated team is working to facilitate the rehabilitation of balance families effectively as per progress of project.
xii.	The environmental clearance for the mining project and forest clearance for the forest land involved in the mining project shall be obtained from the Ministry prior to operation of the integrated Steel Plant. In case, environmental clearance for the mining proposal from State Govt/Govt. of India is not available, Ministry shall be regularly informed about the source of ore and coal.	<ul style="list-style-type: none"> • The matter is being pursued with State and Central Government. • Coal is being imported. • Source of iron ore is mainly from the mines of Tata Steel in Odisha.
B.	General Conditions as per EC dated 7.11.2006	Status as on date
i.	The project authorities must strictly adhere to the stipulations made by the Orissa Pollution Control Board (OPCB) and the State Government	<ul style="list-style-type: none"> • During project execution and subsequent operation phases TSL will strictly adhere to stipulation made by OSPCB and the state Government
ii.	No further expansion or modification in the plant should be carried out without prior approval of the Ministry of Environment and Forests.	<ul style="list-style-type: none"> • Amendments in the Environmental Clearance were granted by MoEF on 10.10.2012 and on 13.05.2015 vide letters no. J-11011/7/2006-IA.II.(I).
iii.	At least four ambient air quality-monitoring stations should be established in the downward direction as well as where maximum ground level concentration of SPM, SO ₂ and NO _x are anticipated in consultation with the OPCB. Data on ambient air quality and stack emission should be regularly submitted to this Ministry including its Regional Office at Bhopal and the OPCB/CPCB once in six months.	<ul style="list-style-type: none"> • Latest AAQ data as monitored in and around the site on 24 hourly basis at more than four locations is as follows; <ul style="list-style-type: none"> PM10 : 24.0 to 71.3 µg/m³ PM2.5 : 13.5 to 41.1 µg/m³ SO₂ : 7.4 to 13.5 µg/m³ NO_x : 9.5 to 16.7 µg/m³ CO : 0.13 to 0.4 mg/m³
iv.	Industrial waste water shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 dated 19 th May, 1993 and 31 st December, 1993 or as amended from time to time. The treated wastewater shall be utilized for plantation purpose.	<ul style="list-style-type: none"> • Individual units such as Coke plant, HSM, SMS have their own effluent treatment plants for recovery & reuse. • Excess treated water from individual treatment plant will be sent to Central Effluent Treatment Plant (CETP). CETP under commissioning with tertiary treatment for recycle and re-use of treated water. • Treated wastewater will be also be used for plantation, dust suppression & other uses.
v.	The overall noise levels in and around the plant area shall be kept well within the standards (85dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules,	<ul style="list-style-type: none"> • Low noise prone rotary equipment and vibration dampening has been one of the design aspects as a control measure for noise pollution. • Provision of acoustic hoods, silencers in steam ejectors as well as sound proof enclosures have also

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	1989 viz. 75 dBA (daytime) and 70 dBA (nighttime).	<p>been made at various internal sites.</p> <ul style="list-style-type: none"> • Ambient Noise levels are measured at various locations and noise levels observed during the reporting period are <ul style="list-style-type: none"> < 53.79 dBA in day time < 46.28 dBA in night time 									
B.	General Conditions as per EC dated 7.11.2006	Status as on date									
vi.	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc.	<ul style="list-style-type: none"> • Environmental protection measures as proposed in the EIA and EMP report is being implemented. • Various socio-economic developmental activities in the area of Health, Women Empowerment, Education, Sports & culture, Infrastructure development etc. are on-going in 28 villages surrounding the project site. 5 medical mobile units are in service for immediate treatment to the local people. • Multi-specialty, 23 bedded hospital (Medica TS) was started. This is functioning since Nov'15, close to the plant for facilitating health service to the community. 									
vii.	The project authorities shall utilize Rs.1,525.00 Crores earmarked for the environmental pollution control measures judiciously to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purpose.	Funds earmarked for the environmental pollution control measures are being utilized only for the said purpose.									
viii.	The Regional Office of this Ministry at Bhopal/CPCB/OPCB will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.	<p>Six monthly compliance reports are being submitted regularly.</p> <p>Last Report Sent on 23.11.2015.</p>									
ix.	The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the OPCB/Committee and may also be seen at Website of the Ministry of Environmental and Forests at http://envfor.nic.in . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional office.	<p>Complied.</p> <p>Paper advertisement Details:</p> <table border="1"> <thead> <tr> <th><u>Newspaper</u></th> <th><u>Language</u></th> <th><u>Date</u></th> </tr> </thead> <tbody> <tr> <td>New Indian Express</td> <td>English</td> <td>13.06.06</td> </tr> <tr> <td>Sambad</td> <td>Odia</td> <td>13.06.06</td> </tr> </tbody> </table>	<u>Newspaper</u>	<u>Language</u>	<u>Date</u>	New Indian Express	English	13.06.06	Sambad	Odia	13.06.06
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New Indian Express	English	13.06.06									
Sambad	Odia	13.06.06									
X	Project authorities should inform Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	Complied.									

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Steel Plant: A Glance

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Cyclone and ESP installed at SMS



Sintering Machine



BOF Converter



Finishing Mill at HSM

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Continuous Ambient Air Quality Monitoring Station



De-dusting ESP at Blast Furnace



Water sprinkling on internal roads through mist type sprinkler



Metaled roads inside plant premises with separate path for bi-cycle

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**Shri Naveen Patnaik, Hon'ble Chief Minister of Odisha,
During dedication ceremony of Tata Steel Limited on 18.11.2015.**



Green belt inside premises

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A. AMBIENT AIR QUALITY MONITORING REPORT

S.N	Parameters	Unit	AAQ Monitoring Mar'16							CPCB Standard
			Locations							
			Khandi aposhi	Khuranti	Bhitara manika	Jakha pura	Trijanga	Belahari	Gobar ghati Medical	
1	Particulate Matter size<10 µm (PM ₁₀)	µg /m ³	63.00	58.00	41.88	69.00	64.00	54.89	66.00	100 (24 Hrs.)
2	Particulate Matter size<2.5 µm (PM _{2.5})	µg /m ³	35.20	32.70	24.74	38.40	37.10	31.39	37.40	60 (24 Hrs.)
3	SO ₂ (Sulphur Dioxide)	µg / m ³	12.90	12.30	9.70	13.70	13.20	10.48	10.70	80 (24 Hrs.)
4	NO _x (Oxides of Nitrogen)	µg / m ³	16.50	14.20	10.91	16.60	15.30	12.10	13.90	80 (24 Hrs.)
5	CO (carbon monoxide)	mg / m ³	0.29	0.24	0.17	0.36	0.56	0.24	0.26	2 (8 Hrs.)
6	O ₃ Ozone	µg/m ³	9.35	10.50	9.63	10.50	10.23	10.68	8.49	100 (8 Hrs.)
7	Lead(Pb)	µg/m ³	0.06	0.05	0.06	0.03	0.02	0.01	0.04	1 (24 Hrs.)
8	NH ₃ Ammonia	µg/m ³	17.15	23.58	26.43	12.35	11.60	10.85	16.53	400 (24 Hrs.)
9	Benzene	µg / m ³	0.94	1.08	0.98	1.11	1.03	1.02	0.86	05 (Annual)
10	Benzo(a)pyrene	ng /m ³	BDL	BDL	BDL	0.13	0.08	0.07	BDL	01 (Annual)
11	As(Arsenic)	ng /m ³	BDL	BDL	BDL	BDL	BDL	BDL	BDL	06 (Annual)
12	Ni (Nickel)	ng /m ³	0.88	0.34	BDL	0.63	BDL	BDL	0.79	20 (Annual)

B. STACK EMISSIONS MONITORING REPORT

S.N	Locations	Monitoring period			CPCB Norms for PM mg/Nm ³
		Jan'16	Feb'16	Mar'16	
		PM (mg/Nm ³)			
1	Chimney-2 at Coke Oven Plant	43.1	37.1	44	50
2	Chimney-2 at Dedusting Unit of Coke Oven Plant	21.5	29.4	35.7	50
3	CPP-1	38.2	34.6	33.9	50
4	DG-1 8000 KW	-	49	-	75
5	DG-1 8000 KW	-	53	-	75
6	DG-1 8000 KW	-	58	-	75
7	DG-1 8000 KW	-	64	-	75
8	DG-1 8000 KW	-	55	-	75

C. SURFACE WATER MONITORING REPORT

Monitoring Location: Downstream of Kharsua River at Jokodha (Confluence point of Ganda Nalla)

Sl. No	Parameter	Unit	Standards as per IS-2296 Class 'C'	Oct'15	Nov'15	Dec.'15	Jan.'16	Feb.'16	March.'16
1	pH Value	--	6.5-8.5	7.2	7.2	7.1	7.1	7.1	7.2
2	Dissolved Oxygen (minimum)	mg/l	4	7.3	7.3	7.4	7.5	7.3	7.3
3	BOD(3) days at 27 ⁰ C (max)	mg/l	3	1.2	1.49	1.18	1.1	1	1.22
4	Total Coliform	MPN/ 100 ml	5000	479	470	570	510	460	610
5	Colour (max)	Hazen	300	CL	CL	CL	CL	CL	CL
6	Fluoride as F (max)	mg/l	1.5	0.14	0.15	0.12	0.11	0.1	0.14
7	Cadmium as Cd (max)	mg/l	0.01	BDL	BDL	BDL	BDL	BDL	BDL
8	Chloride (max)	mg/l	600	13.7	17.6	15.8	14.8	12.7	16
9	Hexa Chromium as Cr ⁺⁶	mg/l	0.05	0.016	0.004	0.007	0.01	0.014	0.008
10	Cyanide as CN (max)	mg/l	0.05	BDL	BDL	BDL	BDL	BDL	BDL
11	Total Dissolved Solids	mg/l	1500	198	159	147	165	144	152
12	Selenium as Se (max)	mg/l	0.05	BDL	BDL	BDL	BDL	BDL	BDL
13	Sulphates (SO ₄) (max)	mg/l	400	19.7	15.9	14.9	15.5	14.2	15.2
14	Lead as Pb(max)	mg/l	0.1	BDL	BDL	BDL	BDL	BDL	BDL
15	Copper as Cu (max)	mg/l	1.5	BDL	BDL	BDL	BDL	BDL	BDL
16	Arsenic as As	mg/l	0.2	BDL	BDL	BDL	BDL	BDL	BDL
17	Iron as Fe (max)	mg/l	50	0.65	0.59	0.53	0.48	0.4	0.57
18	Phenolic Compounds as C ₆ H ₅ OH (max)	mg/l	0.005	BDL	BDL	BDL	BDL	BDL	BDL
19	Zinc as Zn(max)	mg/l	15	0.29	0.1	0.28	0.21	0.34	0.31
20	Nitrate as NO ₃ , (max)	mg/l	50	0.32	0.25	0.28	0.31	0.27	0.3

D. GROUND WATER MONITORING REPORT

Monitoring Location: Tube Well at Duburi Junction

Sl. No.	Parameter	Oct'15	Nov'15	Dec.'15	Jan.'16	Feb.'16	March.'16
1	pH Value	6.9	6.9	6.8	6.6	6.8	6.9
2	Colour	CL	CL	CL	CL	CL	CL
3	Odour	U/O	U/O	U/O	U/O	U/O	U/O
4	Taste	AL	AL	AL	AL	AL	AL
5	Turbidity (NTU), max	0.83	0.66	0.53	0.93	0.64	0.53
6	Anaionic Detergents, mg/l, max	ND	ND	ND	ND	ND	ND
7	Aluminium as Al, mg/l, max	BDL	BDL	BDL	BDL	BDL	BDL
8	Alkalinity , mg/l, max	76	67	52	59	48	49
9	Total Hardness (as CaCO ₃), mg/l, max	72	64.2	67.6	75.4	68.5	64.7
10	Electrical Conductivity at 25 ^o C, µmho/cm	301	255	243	255	230	241
11	Calcium (as Ca), mg/l, max	12.9	10.2	11.4	13.8	11.5	11.1
12	Magnesium as Mg, mg/l, max	9.8	8.1	9.3	10.1	9.9	9
13	Sodium as Na, mg/l, max	7.7	6.7	7.5	8.1	7.7	7.2
14	Potassium as K, mg/l, max	0.39	0.29	0.25	0.31	0.27	0.22
15	Copper (as Cu), mg/l, max	BDL	BDL	BDL	BDL	BDL	BDL
16	Iron (as Fe), mg/l, max	0.19	0.14	0.16	0.18	0.21	0.15
17	Manganese (as Mn), mg/l, max	BDL	BDL	BDL	BDL	BDL	BDL
18	Chloride (as Cl), mg/l, max	16.3	14.7	15.6	16.1	14.8	15.1
19	Sulphate (as SO ₄), mg/l, max	33.8	28.1	31.4	33.6	29.5	30.9
20	Nitrate (as NO ₃), mg/l, max	0.37	0.26	0.28	0.35	0.3	0.26
21	Fluoride (as F), mg/l, max	0.21	0.16	0.19	0.21	0.19	0.17
22	Phenolic Compounds (as C ₆ H ₅ OH), mg/l, max	BDL	BDL	BDL	BDL	BDL	BDL
23	Mercury (as Hg), mg/l, max	BDL	BDL	BDL	BDL	BDL	BDL
24	Cadmium (as Cd), mg/l, max	BDL	BDL	BDL	BDL	BDL	BDL
25	Selenium (as Se), mg/l, max	BDL	BDL	BDL	BDL	BDL	BDL
26	Arsenic (as As), mg/l, max	BDL	BDL	BDL	BDL	BDL	BDL
27	Cyanide (as CN), mg/l, max	BDL	BDL	BDL	BDL	BDL	BDL
28	Lead (as Pb), mg/l, max	BDL	BDL	BDL	BDL	BDL	BDL
29	Zinc (as Zn), mg/l, max	0.43	0.32	0.29	0.43	0.38	0.26
30	Nickel as Ni, mg/l, max	BDL	BDL	BDL	BDL	BDL	BDL
31	Total Chromium as Cr, mg/l, max	0.36	0.25	0.21	0.38	0.26	0.19
32	Chromium (as Cr+6), mg/l, max	BDL	BDL	BDL	BDL	BDL	BDL
33	Mineral Oil, mg/l, max	ND	ND	ND	ND	ND	ND
34	Total Coliform, MPN/ 100 ml	ND	ND	ND	ND	ND	ND
35	E-coli , MPN/ 100 ml	ND	ND	ND	ND	ND	ND
36	Total Dissolved Solids, mg/l, max	202	171	163	171	154	161
37	Residual, free Chlorine, mg/l, min	ND	ND	ND	ND	ND	ND
38	Boron mg/l , max	BDL	BDL	BDL	BDL	BDL	BDL