# M/s Tata Steel Ltd, Hooghly Met Coke Division, Haldia

Compliance to Conditions stipulated in Environmental Clearance for Coke Oven Plant (1.6 MTPA) & WHRB (120 MW) at Haldia, East Midnapur, West Bengal from MoEF, New Delhi on 29th January, 2007 vide letter# F. No. J-11011//284/07- IA II (I)

**Period –April 2014 – September 2014**

| A. | **SPECIFIC CONDITIONS** |
|---|---|
| i. | *Proper and full utilization of coke oven gases in power plant using heat recovery steam generators (WHRB) shall be ensured and no flue gas shall be discharged into the air.* |
| Com | • The coking coal is fed after crushing into Heat Recovery type coke oven batteries consisting of chambers made of refractory. The Carbonization of coal takes place at 1100 to 1250$^{o}$ C and the heat for carbonization is supplied by combustion of volatile matters evolved from the coal charged by admitting air into the chamber. The hot flue gas free from volatile matters is used to generate electric power by generating steam in waste heat recovery boiler.<br>• Presently the plant is operating at rated capacity of 1.6 MTPA coke production and with120 MW power generation at a plant load factor of 92% – 93%.<br>• From April '14 to September '14 total coke production was **801020 DMT** (Dry Metric Ton) and **446.1 Million Unit** of power generation. |

**Coke Production & Power Generation**

| Month | Coke Production (Tonnes) Dry | Power Generation (MUs) |
|---|---|---|
| **April 2014** | 1,33,693 | 75.9 |
| **May 2014** | 1,38,329 | 81.6 |
| **June 2014** | 1,32,926 | 80.0 |
| **July 2014** | 1,33,443 | 77.9 |
| **August 2014** | 1,32,456 | 70.7 |
| **September 2014** | 1,30,173 | 60.1 |
| **TOTAL** | **8,01,020** | **446.1** |

• The plant is having 352 numbers of coke oven batteries (1.6 MTPA coke capacity) equally divided into 4 rows. 11 numbers of ovens are forming one block so each row is having 8 nos of block. 2 nos. of blocks of 11 ovens each is now connected to one no. of WHRB & subsequently 2 nos. of WHRBs connected to one no. of combined stack of 70 m height. So each row has 4 numbers of WHRBs and 2 no. of stack. Total 8 nos of stacks and 16 nos of boilers are present in the entire plant. Stacks are designed for stack emission <100 mg/Nm3 of particulate matter.

| ii. | *The prescribed emission standards for coke oven plants as notified vide notification no. GSR 46 (E) dated 3rd February, 2006 shall be complied with.* |
|---|---|
| Com | • As per notification no. GSR 46(E) dated 3rd February 2006, no emission standards for Non recovery coke oven plant have been mentioned. Since this is the new unit established after the notification of 2006 published, the Non recovery / waste heat recovery technology has been adopted for coke making which is environment friendly method.<br>• The emission standard specified in the Environmental Clearance, under Specific condition (iii) for stack emission has been followed.<br>• To reduce the SPM, non recovery type technology is being used. The coal is being charged inside the oven under negative pressure for 66 hours in a temp of 950 – 1200 $^{0}$C as a result the volatiles evolved during coal carbonization is being combusted completely in presence of controlled quantity of air so emission of any particulate matter is very low. The emission from all stack are much less than 100mg/Nm3 of SPM.<br>• Regular stack monitoring is done by registered third party. Online stack monitoring system is also installed in all chimney.<br>• The Avg PM (month wise) data is as follows: |

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**Period –April 2014 – September 2014**

**STACK PM Level (mg/Nm3)**

| Month | PM (6% Co2 (V/V)) |
|---|---|
| **April 2014** | 33.25 |
| **May 2014** | 22.5 |
| **June 2014** | 22 |
| **July 2014** | 29 |
| **August 2014** | 26.25 |
| **September 2014** | 35 |
| **AVG** | **28** |

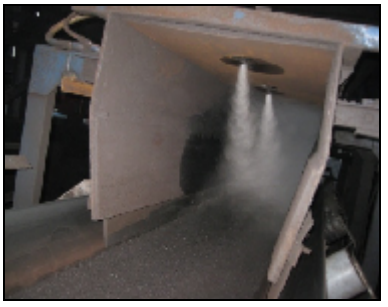
- The Stack emission report for last six month (April'14 – Sept'14 ) enclosed as **ANNEXURE - 2**

**iii.** *Continuous stack monitoring facilities for all the major stacks and adequate air pollution control systems shall be provided to control air emissions within 100 mg/Nm3 and reports submitted to the Ministry's Regional Office at the Bhubaneswar, WBPCB & CPCB.*

Com
- On-line stack monitoring, the Opacity meter has been commissioned in all Chimney.
- Regular stack monitoring is done by registered third party. The Stack emission report for last six month (April'14 – Sept'14 ) enclosed as **ANNEXURE - 2** .

**iv.** *Fugitive emissions from coal handling plant shall be controlled by sprinkling water. Dry fogging system shall be installed at all the transfer points. In-plant control measures like bag filters, de-dusting and dust suppression system shall be provided to control fugitive emissions from all the vulnerable sources including material handling areas and material transfer points.*

Com
- Besides the continuous water sprinkling at coal handling plant and all transfer point; the Dust Suppression System with Dry Fogging (DF) has been commissioned. In Wagon Tippler, Coal crusher unit and all the coal transfer points the DF and dust suppression system is operational.
- Dry fog system for coal and coke handling to restrict particulate emission to within 10 mg per cu m have been installed. The system has been installed at Wagon tippler unit, coal crusher unit, Coal / coke transfer points like Junction House # 5 (Cl#7 belt discharge pt., CL#8 belt receiving pt.); Junction House # A (WCK#1, 2 belt discharge pt. WCK#3 belt receiving pt.); Junction House # B (WCK#3 belt discharge pt. RCK#1, CK#1 belt receiving pt.); Junction House # C (WCK#5, 6 belt discharge pt. CK#7 belt receiving pt.); Junction House # D (WCK#7, RCK#3 belt discharge pt. CK#1 belt receiving pt.); Screen House. In last six month 5 numbers of DF points have been constructed in coal handling area at Junction House # 1, 2 & 2A. Regular maintenance is being done for making this system effective



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**Period –April 2014 – September 2014**

| | |
|---|---|
| | • More than 2 Kilometers of the road inside the material handling area has been paved to reduce the dust generation. The total coal yard (area of 25000 sq. Mt.) has also been concreted in order to prevent the dust generation.<br><br>• Movable water tanker with sprinkling arrangement is used for water sprinkling purpose in the road within factory and in the periphery area and also the mechanised Mobile Vacuum Cleaning system is being used regularly for arresting the fugitive emission<br><br>• All around the stock yard the boundary wall has been constructed to restrict the dust flowing outside the factory. The average height of the wall is 5 mt.<br><br>• 30 numbers of the "Rain Gun Water Sprinklers" have been installed in the coal yard to prevent the generation of fugitive emission from the coal heap. These sprinklers can rotate at $360^{O}$ and can spray the water at a radius of 15 meter. The height of the sprinklers are approx 2.6 mt.<br><br> <br><br>• The workplace air quality, as well as ambient air quality ($PM_{10}$ & $PM_{2.5}$) is being monitored at the regular intervals, summary of the same is given in subsequent paragraphs. The ambient air monitoring for 12 parameters as per National AAQ standard have also been done. The details data are enclosed as **: ANNEXURE 1** |
| **v.** | *Secondary fugitive emissions shall be controlled within the prescribed limits, regularly monitored and records maintained. Guidelines / Code of Practice issued by the CPCB in this regard shall be followed.* |
| Com | • The ovens work under the negative pressure so secondary fugitive emissions are negligible in this non recovery coke making technology<br>• All workers are being provided with PPEs for protection<br>• HMC is following the CPCB guidelines so far the non recovery coke oven plant operation is being concerned.<br>• Positive sealing arrangements has been provided in the oven doors and flue gas pipes/valves<br>• Gaseous emissions are monitored regularly; corrective action taken whenever the results found crossing the limit. |
| **vi.** | *Total requirement of the water from Haldia Development Authority for coke oven and WHRB shall not exceed 5,300 m3/day and 13,750 m3/day respectively. The effluent shall be treated in the effluent treatment plant and all the treated wastewater shall be recycled and reused either in the process or for dust suppression or green belt development. No wastewater shall be discharged outside the factory premises and 'Zero' discharge shall be adopted. Domestic effluent shall be treated in sewage treatment plant (STP) and disposed off as per norms laid down by Haldia Municipal Corporation.* |
| Com | • The average water taken from HDA as make-up water during April '14 to Sept '14 was **2090 m3/day** approximately for coke oven (Tata Steel, Hooghly Met coke) and **8694 m3/day** approximately for WHRB (Tata Power) which is within the permissible limit granted by the MOEF. The detail water consumption report is enclosed **as : ANNEXURE 3** |

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| | |
|---|---|
| | • The processed water is being tested and recycled and used for coke quenching and for green belt development within the plant.<br><br>• Initiatives taken for achieving Zero Discharge are:<br>  • A Storm water pond has been developed. The capacity of the pond is 4000 Cu mt (approx). Pipe line has been laid in all 4 rows for use the same water for coke Quenching purpose<br>  • Pump has been installed at the end of Row#4 drain final outlet to re-circulated the water in the quenching pond .<br><br>• As the unit is not having any township inside the factory premises **no domestic effluent** has been generated at the company's scope so STP has not been provided separately. The canteen waste water is being recycled in the process itself.<br><br>• The unit is being facilitated with Septic Tank , inside the factory premises for treating the waste water |
| **vii.** | *Permission for the drawl of water from Haldia Development Authority shall be obtained and recommendations implemented.* |
| Com | • HMC is purchasing the water from M/S Haldia Water Management Limited . An agreement between Haldia Development Authority and HMCPCL had taken place on 01 March 2007 , Ref no: 04AA 789559<br>• Water Cess being paid to WBPCB at regular basis (**last cess paid is up to June 2014 against the invoice raised by WBPCB)**. |
| **viii.** | *Coal and coke fines shall be recycled and reused in the process. All the other solid waste including broken refractory mass shall be properly disposed off in environment-friendly manner. The waste oil shall be properly disposed off as per the Hazardous Waste (Management & Handling) Rules, 1989 and subsequent amendments.* |
| Com | • Coal fines are reused and coke sludge is being sold (100%) to the coke manufacturer for making low graded coke.<br>• The waste oil is being sent to the authorized re-processor. The oil soaked jute/cotton waste generated from the process is being incinerated in the coke oven batteries and burnt at the temp of 1000 - 1200 $^{o}$C for 66 hours<br>• The ceramic blankets are being disposed to the authorized TSDF. |
| **ix.** | *All the environment management measures given in the EIA/EMP shall be implemented and complied with.* |
| Com | • Implementation of protection measures as indicated in the REIA are implemented. Online stack monitoring systems are being commissioned. For dust suppression DF system has been installed. Acoustic enclosures / barriers / shields are being used to reduce noise, providing the personal protective equipments like ear plugs/ muffs etc are also being provided. |
| **x.** | *As proposed, green belt shall be developed in 27 % area as per the CPCB guidelines in consultation with DFO.* |
| Com | • We have already covered almost 26% greenbelt area (nearly 31371 Trees) during till date inside the works. Every year plantation done in available space.<br>• The detail plantation done till date is enclosed as **ANNEXURE : 5**<br>• Free saplings have been distributed to District Hospital, local school. Jointly with Haldia Municipality taken part in the "Green Haldia : Clean Haldia" project and planted nearly 600 trees on the both side of the main road of Haldia. as a part of CSR activity. |

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**Period –April 2014 – September 2014**

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|---|---|
| **B.** | **GENERAL CONDITIONS** |
| **i.** | *The project authority shall adhere to the stipulations made by West Bengal Pollution Control Board (WBPCB) and State Government.* |
| Com | Complied. |
| **ii.** | *No further expansion or modification of the plant shall be carried out without prior approval of this Ministry.* |
| Com | For further expansion of the project proper application in Form 1 has been submitted to MOEF on May 2014 and TOR presentation to EAC has been done on August 2014. Further expansion will be carried out only after receiving the approval of the Ministry |
| **iii.** | *The gaseous emissions from various process units shall conform to the load/mass based standards notified by this Ministry on 19th May, 1993 and standards prescribed from time to time. The West Bengal Pollution Control Board (WBPCB) 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. Interlocking facilities shall be provided so that process can be automatically stopped in case emission level exceeds the limit.* |
| Com | Complying all the conditions stipulated by WBPCB. |
| **iv.** | *Ambient air quality monitoring stations shall be set up as per statutory requirement in consultation with the WBPCB. Ambient air quality including ambient noise levels shall not exceed the standards stipulated under EPA or by the State authorities. Monitoring of ambient air quality and shall be carried out regularly in consultation with WBPCB and data submitted to the Ministry's Regional Office at the Bhubaneswar, WBPCB & CPCB regularly. The instruments used for ambient air quality monitoring shall be calibrated time to time.* |
| Com | • Different areas have been identified within the factory premises where Ambient Air Quality is being tested at a regular basis. Beside this the Work zone air quality also being tested at a regular basis by the certified 3rd party. The summary is enclosed. **ANNEXURE 1**<br>• All the tests being carried out by third party registered by WBPCB<br>• Air monitoring for 12 mandatory parameter has been done. In every two months at different locations within the factory premises.<br>• Regular noise monitoring also been done by the accredited 3rd party.<br>• The half yearly data are being submitted to Ministry's Regional Office at the Bhubaneswar, WBPCB, Haldia office.<br>• The instruments used for ambient air quality monitoring by the accredited 3rd party is being calibrated time to time and the calibration certificates are collected from the party. |
| **v.** | *The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environmental (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).* |
| Com | • The noise level inside the plant has been recorded between specified limit<br>• The control measures such as; silencers, enclosures, hoods, rubber pads, have been provided at the appropriate places in the existing plant. The work areas where noise levels are high, earplugs and earmuffs have been provided to reduce the noise exposure.<br>• The detail report is enclosed as **ANNEXURE - 4** |

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**Period –April 2014 – September 2014**

| | |
|---|---|
| **vi.** | *Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.* |
| Com | • The health surveillance is being done as per Factory Act. Up to June, 2014, PME (Periodical Medical Examination) has been done for more than 90% of company employees (320 employees). Records are maintained at the Occupational Health Centre.<br>• Health check up for contractors persons are conducted regularly during the time of the renewal of the respective gate pass.<br>• 100% checkup happened for contractor employees and records are being maintained at the OHC. |
| **vii.** | *All the recommendations mentioned in the Corporate Responsibility for Environmental Protection (CREP) of CPCB issued for the steel plants shall be implemented* |
| Com | • The CREP has been implemented by Tata Steel - JSR works since this unit is the stand alone coke making unit only. The coke is being transferred to JSR H Blast furnace for making the steel. The integrated steel work is at Jamshedpur<br>• The company follows the Tata Steel CSR policy<br>• At HMC a separate CSR committee that executes various activities like, free medical checkup and medicine distribution camp for children, eye testing camp and free spectacle distribution, school books, teaching aids, school bags, winter cloths distribution to BPL people, infrastructure development for local school like Toilets for Girls, septic tank, water tank, boundary fencing for the school boundary, electrification arrangement and fittings, desks and chairs and tables for the students etc have been done. Regular monthly CSR activity has been planned and executed. |
| **viii.** | *The company shall undertake eco-development measures including community welfare measures in the project area.* |
| Com | • The local people nearly 256 people as permanent employee and over 1050 as contractual employees are being employed by the company on a regular basis for non core activities.<br>• Nearly Rs. 20 lakhs had been spent for CSR and welfare activity in FY14. From April 2014 more than 6 lakhs rupees have already been spent for various improvement activities like free medical health checkups for school children, eye camps, construction of toilets at local school in the neighbouring locality, electrification job etc |
| **ix.** | *The company shall develop rain water harvesting structures to harvest the rain water for utilization in the lean season besides recharging the ground water table.* |
| Com | • A Storm water pond has been developed. The capacity of the pond is 4000 Cu mt (approx). During rain, the roof water from all building like ADM building / Store / Laboratory / pump house are collected in a common storm water drain and this water is collected in the storm water pond. Pipe line has been laid in all 4 rows for using this water for coke quenching and other purposes like gardening, water spraying in the road, water sprinkling system etc. |
| **x.** | *Proper house keeping and adequate occupational health programmes shall be taken up.* |
| Com | • Separate agency has been appointed for removal of scarps and maintaining proper housekeeping within the plant and for cleaning activity.<br>• For storage of waste "COLORED BINS" have been provided at various location<br>• Impervious pit has been constructed for storing the hazardous waste<br>• Mobile vacuum cleaning machine is also being used at a regular interval for evacuating the dust particles<br>• TPM initiatives has been started by the shop floor employees in terms of improving the house keeping at shop floor. Identifying KAIZENS and conducting 1s & 2s has been initiated.<br>• Regular Housekeeping Audit is being conducted to improve the housekeeping in the plant |

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**Period –April 2014 – September 2014**

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|---|---|
| **xi.** | *A separate environmental management cell to carry out various management and monitoring functions shall be set up under the control of Senior Executive.* |
| Com | • Tata Steel Ltd's central Environment Management Department monitors the function to upkeep system. For day to day monitoring activity and other improvement activity a dedicated Environment Manager has been appointed at Hooghly Metcoke who directly reports to the General Manager of the Plant |
| **xii.** | *Adequate funds shall be allocated towards the capital cost and recurring cost/annum environmental pollution control measures and utilized judiciously to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government. The funds so provided shall not be diverted for any other purpose.* |
| Com | Separate Fund is allocated for carrying out continuous water spraying & sprinkling system, mobile vacuum cleaning system, within the plant area for controlling dust, installation & regular maintenance of DF system to control fugitive emission, installing Online Stack monitoring system etc. Fund for Green Belt development and CSR activity have also being allocated which are used in a planned manner. |

| Sl No. | Items | Amount Spent (till September 2014) |
|---|---|---|
| 1 | Water sprinkling on the road for dust suppression | Rs. 6 Lakhs |
| 2 | For cleaning/ housekeeping | Rs. 118 Lakhs |
| 3 | Installation of DF and Maintenance and spares for Dry Fog system | Rs. 6 Lakhs |
| 4 | Green belt maintenance | Rs. 18 Lakhs |
| 6 | Environment Parameters monitoring | Rs. 2 Lakhs |
| 7 | Online Opacity meter installation & commissioning | Rs. 60 lakhs |
| 7 | CSR Activities | Rs. 6.8 Lakhs |
| | **TOTAL EXPENSES** | **Rs. 216.8 Lakhs** |

| | |
|---|---|
| **xiii.** | *The Regional Office of this Ministry at Bhubaneswer / CPCB / WBPCB shall monitor the stipulated conditions. A six monthly compliance report and the monitored data alongwith statistical interpretation shall be submitted to them regularly.* |
| Com | • Environment Audit Report FY 13 –14 had been submitted to WBPCB on **26 September 2014**<br>• Six monthly environmental performance monitoring Report for October 2013 – March 2014 has also been submitted to MOEF, Regional Office, Bhubaneswar on **8 April 2014** via email and hard copy has also been couriered. The same report has been submitted to WBPCB office also. |
| **xiv.** | *The Project Authorities shall inform the 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.* |
| Com | • All required information has been intimated to WBPCB while obtaining Consent to Operate.<br>• **The validity of Consent to Operate is up to 31 May 2015.** |
| **xv.** | *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 W. B. Pollution Control Board / Committee and may also be seen at Website of the Ministry of Environment and Forests at http:/envfor.nic.in. This should 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* |

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|---|---|
| | *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 at Bhuvaneswar.* |
| Com | • Communication regarding grant of environment clearance were given to the community on 08.03.2008 through newspaper advertisements. Details of which are given below.<br>  ○ Financial Express – (English Adv.) / Aajkal – (Bengali Adv.) dated 08.03.2008.<br>• The compliance of the same was informed to MoEF (Regional Office – Bhubaneswar) through letter dated 11.03.08 by post. |

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**Period –April 2014 – September 2014**

## AMBIENT AIR QUALITY SUMMERY REPORT

## ANNEXURE - 1

**Name : M/s. Tata Steel Ltd., Hooghly Met Coke Div.**

Address : HFC Complex, Patikhali, Haldia, Purba Medinipur

### Ambient Air Quality

| Parameters | Std ($\mu g/m^3$) | LOCATIONS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Near OHC / Canteen | Roof of CCSS | Near Main Gate | Roof of CCR | Near ADM Building | Near Simplex Gate | Near Engineering Store | Near Patikhali Gate |
| $PM_{10}$ | 100 | 81.92 | 86.36 | 75.35 | 76.39 | 91.2 | 91.3 | 86.35 | 75.46 |
| $PM_{2.5}$ | 60 | 39.01 | 38.82 | 32.67 | 33.42 | 38.46 | 51.89 | 32.5 | 30.5 |
| SO2 | 80 | 16.03 | 19.29 | 18.85 | 21.09 | 17.55 | 16.44 | 19.04 | 16.67 |
| Nox | 80 | 33.84 | 29.33 | 32.17 | 27.77 | 27.22 | 28.3 | 36.45 | 32.85 |

### Work Zone Air Quality

| LOCATION | SPM | | RPM | | SO2 | | NO2 | |
|---|---|---|---|---|---|---|---|---|
| | STD. | ACTUAL | STD. | ACTUAL | STD. | ACTUAL | STD. | ACTUAL |
| Wagon Tippler | 10 mg/m3 | 0.501 | 5 mg/m3 | 0.159 | 5 mg/m3 | 0.016 | 6 mg/m3 | 0.026 |
| End Bench of Row#1 | 10 mg/m3 | 0.522 | 5 mg/m3 | 0.205 | 5 mg/m3 | 0.019 | 6 mg/m3 | 0.0.35 |
| Junction House # 8 | 10 mg/m3 | 0.827 | 5 mg/m3 | 0.315 | 5 mg/m3 | 0.015 | 6 mg/m3 | 0.031 |
| Crusher house | 10 mg/m3 | 0.708 | 5 mg/m3 | 0.215 | 5 mg/m3 | 0.014 | 6 mg/m3 | 0.032 |
| End Bench of Row#4 | 10 mg/m3 | 0.537 | 5 mg/m3 | 0.172 | 5 mg/m3 | 0.016 | 6 mg/m3 | 0.033 |
| Blending Bunker | 10 mg/m3 | 0.479 | 5 mg/m3 | 0.162 | 5 mg/m3 | 0.017 | 6 mg/m3 | 0.025 |
| End Bench of Row#3 | 10 mg/m3 | 0.503 | 5 mg/m3 | 0.192 | 5 mg/m3 | 0.017 | 6 mg/m3 | 0.0.31 |
| End Bench of Row#2 | 10 mg/m3 | 0.537 | 5 mg/m3 | 0.172 | 5 mg/m3 | 0.016 | 6 mg/m3 | 0.033 |

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## Ambient Air Monitoring for 12 Parameters

(CPCB, Emission Regulation (Part III), IS: 5182 (Part – 4) 1999, IS: 5182 (Part – 2), 2001, IS: 5182 (Part – 6), 1975, Reaffirmed 1998, UV Photometric Method, Non-Dispersive Infrared Spectrometry Method, Soxlet Extraction and GC analysis, Atomic Absorption Spectrophotometric Method & UV Photometric Method for Ozone monitoring)

### LOCATION – 1 : Near Canteen

| Time of Sampling | Concentration (µg / m³) | | | | | | | | Concentration (ng / m³) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $PM_{10}$ | $PM_{2.5}$ | $SO_2$ | $NO_2$ | Pb | Benzene | $NH_3$ | CO | Benzo(a) Pyrene | As | Ni |
| 10:30 AM to 06:30 PM | 87.61 | 34.66 | 20.24 | 33.84 | BDL | BDL | BDL | 0.4214 | BDL | BDL | BDL |
| 06:45 PM to 02:45 AM | 72.47 | 28.22 | 16.87 | 30.37 | BDL | BDL | BDL | 0.3012 | BDL | BDL | BDL |
| 03:00 AM to 11:00 AM | 79.74 | 30.23 | 18.56 | 31.24 | BDL | BDL | BDL | 0.6856 | BDL | BDL | BDL |

| Time | Concentration (µg / m³) |
|---|---|
| | Ozone as O3 (Limit = *100* µg / m³) |
| 9:30 AM to 5:30 PM | 30.14 |

### LOCATION – 2 : Near QC Lab

| Time of Sampling | Concentration (µg / m³) | | | | | | | | Concentration (ng / m³) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $PM_{10}$ | $PM_{2.5}$ | $SO_2$ | $NO_2$ | Pb | Benzene | $NH_3$ | CO | Benzo(a) Pyrene | As | Ni |
| 10:00 AM to 06:00 PM | 92.47 | 39.25 | 21.05 | 35.25 | BDL | BDL | BDL | 0.4412 | BDL | BDL | BDL |
| 06:15 PM to 02:15 AM | 82.63 | 32.74 | 18.56 | 31.23 | BDL | BDL | BDL | 0.3325 | BDL | BDL | BDL |
| 02:30 AM to 10:30 AM | 75.45 | 33.5 | 17.25 | 29.52 | BDL | BDL | BDL | 0.6985 | BDL | BDL | BDL |

| Time | Concentration (µg / m³) |
|---|---|
| | Ozone as O3 (Limit = *100* µg / m³) |
| 9:30 AM to 5:30 PM | **25.68** |

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**M/s Tata Steel Ltd, Hooghly Met Coke Division, Haldia**

Compliance to Conditions stipulated in Environmental Clearance for Coke Oven Plant (1.6 MTPA) & WHRB (120 MW) at Haldia, East Midnapur, West Bengal from MoEF, New Delhi on 29th January, 2007 vide letter# F. No. J-11011//284/07- IA II (I)

**Period –April 2014 – September 2014**

**ANNEXURE -2**

## STACK SUMMERY REPORT

**Name : M/s. Tata Steel Ltd, Hooghly Met Coke Div.**
**Address :** HFC Complex, Patikhali, Haldia, Purba Medinipur

| Date of sampling | Location | Particulate Matter | Target | PM (mg/Nm3) (6% $Co_2$ (V/V)) | Sulphur di-oxide (mg/ $Nm^3$) | NOx (mg/ $Nm^3$) |
|---|---|---|---|---|---|---|
| 04.04.2014 | **Chimney 1 AB** | **20.0 at 4.6% CO2** | **50** | **26** | **200.83** | **113.76** |
| 04.04.2014 | **Chimney 1CD** | **26.0 at 4.4% CO2** | **50** | **35** | **204.35** | **102.65** |
| 24.04.2014 | **Chimney 2 AB** | **32.0 at 4.6% CO2** | **50** | **42** | **206.46** | **105.65** |
| 24.04.2014 | **Chimney 2 CD** | **24.0 at 4.8% CO2** | **50** | **30** | **199.92** | **96.13** |
| 14.05.2014 | **Chimney 4 AB** | **25.0 at5.2% CO2** | **50** | **29** | **197.79** | **102.13** |
| 14.05.2014 | **Chimney 4CD** | **14.0 at 5% CO2** | **50** | **17** | **206.11** | **106.52** |
| 15.05.2014 | **Chimney 3 AB** | **24.0 at 5.6% CO2** | **50** | **26** | **187.38** | **103.17** |
| 15.05.2014 | **Chimney 3 CD** | **16.0 at 5.4% CO2** | **50** | **18** | **199.87** | **118.57** |
| 05.06.2014 | **Chimney 2 AB** | **15.0 at5.4% CO2** | **50** | **17** | **185.64** | **101.17** |
| 05.06.2014 | **Chimney 2CD** | **20.0 at 5.2% CO2** | **50** | **23** | **192.78** | **108.33** |
| 20.06.2014 | **Chimney 1 AB** | **20.0 at 5.6% CO2** | **50** | **21** | **209.74** | **132.89** |
| 20.06.2014 | **Chimney 1 CD** | **24.0 at 5.4% CO2** | **50** | **27** | **192** | **128.76** |
| 04.07.2014 | **Chimney 3 AB** | **35.0 at5.4% CO2** | **50** | **39** | **165.94** | **104.44** |
| 04.07.2014 | **Chimney 3CD** | **13.0 at 5.2% CO2** | **50** | **15** | **172.41** | **117.2** |
| 22.07.2014 | **Chimney 4 AB** | **20.0 at 4.5% CO2** | **50** | **25** | **205.39** | **107.02** |
| 22.07.2014 | **Chimney 4 CD** | **28.0 at 4.6% CO2** | **50** | **37** | **224.25** | **112.27** |
| 05.08.2014 | **Chimney 1 AB** | **14.0 at4.4% CO2** | **50** | **18** | **213.83** | **120.89** |
| 05.08.2014 | **Chimney 1 CD** | **22.0 at 4.6% CO2** | **50** | **29** | **205.71** | **114.61** |
| 21.08.2014 | **Chimney 2 AB** | **23.0 at 4.6% CO2** | **50** | **30** | **211.79** | **110.78** |
| 21.08.2014 | **Chimney 2 CD** | **22.0 at 4.6% CO2** | **50** | **28** | **205.68** | **117.47** |
| 11.09.2014 | **Chimney 3 AB** | **32.0 at4.6% CO2** | **50** | **42** | **202.56** | **117.04** |
| 11.09.2014 | **Chimney 3 CD** | **28.0 at 4.4% CO2** | **50** | **38** | **187.18** | **128.6** |
| 24.09.2014 | **Chimney 4 AB** | **21.0 at 4.8% CO2** | **50** | **26** | **231.42** | **118.18** |
| 24.09.2014 | **Chimney 4 CD** | **28.0 at 5% CO2** | **50** | **34** | **205.82** | **102.89** |

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**Period –April 2014 – September 2014**

## WATER SUMMERY REPORT

**ANNEXURE -3**

**Name : M/s. Tata Steel Ltd, Hooghly Met Coke Div.**

**Address :** HFC Complex, Patikhali, Haldia, Purba Medinipur

| MONTH | YEAR | WATER CONSUMED PER DAY (HMC) | WATER CONSUMED PER DAY (TPC) | WATER CONSUMED (CUBIC MTR/MONTH) | TOTAL WATER CONSUMED PER DAY (HMC & TPC) |
|---|---|---|---|---|---|
| April | 2014 | 2521 | 9483 | 372100 | 12003 |
| May | 2014 | 2484 | 9935 | 385000 | 12419 |
| June | 2014 | 2256 | 9025 | 349700 | 11281 |
| July | 2014 | 2328 | 9027 | 352000 | 11355 |
| August | 2014 | 1918 | 7672 | 297300 | 9590 |
| September | 2014 | 1035 | 7021.60 | 241696 | 7797 |

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**Period –April 2014 – September 2014**

## AMBIENT NOISE SUMMERY REPORT (DAY & NIGHT) ANNEXURE -4

**Name : M/s. Tata Steel Ltd, Hooghly Met Coke Div.**
**Address :** HFC Complex, Patikhali, Haldia, Purba Medinipur

| Location | Day Time (Limit = 75 dBA) | Night Time (Limit = 70 dBA) |
|---|---|---|
| Near Main Gate | 65.7 | 62.5 |
| In Front of New Administrative Building | 54.5 | 49.8 |
| North side of LCR#2 | 70.7 | 66.1 |
| In front of Store | 59.3 | 56.3 |
| In Front of Canteen | 62.5 | 57.1 |
| North Side of LCR # 1 | 67.4 | 71.7 |
| North Side of CCR | 64.5 | 72.3 |
| Near Simplex Gate | 62.6 | 66.5 |
| North side of CCSS | 66 | 63.8 |

## WORK ZONE NOISE SUMMERY REPORT

| Location | (Limit = 85 dBA) |
|---|---|
| Wagon Tippler | 76.3 |
| Blending Bunker | 76 |
| Crusher Motor Floor | 84.9 |
| D. G. Room | 81.4 |
| Crusher Vibrofeeder Floor | 87.7 |
| D. G. Room | 81.4 |
| End Bench of Quenching Row # 2 | 82.5 |
| End Bench of Quenching Row # 3 | 83.5 |
| Near East Side of Quenching Tower # 1 | 77.5 |

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# M/s Tata Steel Ltd, Hooghly Met Coke Division, Haldia

Compliance to Conditions stipulated in Environmental Clearance for Coke Oven Plant (1.6 MTPA) & WHRB (120 MW) at Haldia, East Midnapur, West Bengal from MoEF, New Delhi on 29th January, 2007 vide letter# F. No. J-11011//284/07- IA II (I)

**Period –April 2014 – September 2014**

## Details of Tree Plantation at HMC Site: ANNEXURE - 5

| | The Tree Plantation till date at HMC site | | |
|---|---|---|---|
| **Sl. No.** | **Location** | **Type of Tree** | **Quantity** |
| 1 | Tippler Side along the boundary wall | Swietenia macrophylla (Mehegoni) | 300 |
| | | Lambu (Malaysian Sal) | 200 |
| 2 | Patikhali canal - both side | Swietenia macrophylla (Mehegoni) | 600 |
| | | Alastonia macrophylla (Chatim) | 400 |
| | | Petrospermum Suberifolium (Kanak champa) | 200 |
| | | Terminalia Catappa (Badam) | 150 |
| | | Grevillea Robusta (Silver Oak) | 150 |
| 3 | Wagon Loader - Across boundary wall | Swietenia macrophylla (Mehegoni) | 3000 |
| | | Lambu (Malaysian Sal) | 300 |
| 4 | Simplex Gate | Swietenia macrophylla (Mehegoni) | 700 |
| | | Petrospermum Suberifolium (Kanak champa) | 35 |
| | | Alastonia macrophylla (Chatim) | 200 |
| | | Lambu (Malaysian Sal) | 800 |
| | | Sal | 150 |
| 5 | Coke Yard | Pongamia Pinnata (Koranja) | 300 |
| | | Swietenia macrophylla (Mehegoni) | 1000 |
| | | Terminalia Arjuna (Arjun) | 600 |
| | | Petrospermum Suberifolium (Kanak champa) | 300 |
| | | Swietenia macrophylla (Mehegoni) | 800 |
| 6 | Central Avenue - towards Row#1 | Terminalia Arjuna (Arjun) | 1500 |
| | | Pongamia Pinnata (Koranja) | 300 |
| | | Largerstromea (Jarul) | 200 |
| | | Lambu (Malaysian Sal) | 500 |
| 7 | Near Row#4 | Lambu (Malaysian Sal) | 2000 |
| | | Swietenia macrophylla (Mehegoni) | 900 |
| | | Largerstromea (Jarul) | 100 |
| 8 | Patikhali Main gate to watch tower | Swietenia macrophylla (Mehegoni) | 125 |
| | | Pine (Debdaru) | 75 |
| | | Gulmohar | 80 |
| 9 | Near TPC ADM building | Swietenia macrophylla (Mehegoni) | 77 |
| | | Pine (Debdaru) | 18 |
| 10 | Hooghly Road | Pine (Debdaru) | 241 |
| 11 | HMC Approaching Road from IOC gate | Alastonia macrophylla (Chatim) | 700 |
| 12 | Back side of new ADM building & loco shed | Fruit bearing trees, Debdaru, Mehegoni | 395 |
| 13 | Sampling distribution to employees, School | Fruit sampling (mango, Guava, chiku etc) | 3100 |
| 14 | Western Avenue Road both side, Patikhali along the boundary wall, south side wall and in from of CCSS | Pine (Debdaru), Swietenia macrophylla (Mehegoni) Alastonia macrophylla (Chatim) | 1700 |
| 15 | Around Storm water pond | Bakul, Gulmohor, fruit trees | 350 |
| 16 | Saplings planted jointly with Haldia Municipality for the "Green Haldia : Clean Haldia" project | Alastonia macrophylla (Chatim), Petrospermum Suberifolium (Kanak champa) | 600 |
| | | TOTAL TREE PLANTED IN FY 12 - 14 | 23146 |
| | | TREE PLANTED UPTO FY 12 | 8225 |
| | | **TOTAL TILL SEPTEMBER 2014** | **31371** |

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