

**Compliance Status
of
Environmental Clearance
of
West Bokaro Opencast Coal Mine
(EC No. J-110115/108/2206-IA.II(M), dated 17th May 2007)**



Parks & Garden

Tata Steel Ltd.
(April – September 2016)

A. Specific Conditions

- (i) *No mining operations shall be undertaken in the forestland until clearance has been obtained under the provisions of FC Act, 1980.*

Being complied with. However, different forest diversion proposals for mining are made and are in advanced stage of clearances.

- (ii) *The embankment along the River Bokaro shall be designed taking into account the highest flood level, based on past data, along the quarry area at the mine boundary along the River Bokaro so as to guard against mine inundation. The slope of the embankment shall at least 2:1 towards the ML and shall be stabilized by plantation. The height of the embankment shall be at least 5 m higher than the HFL.*

The height of the embankment along the Bokaro River is more than 5 m higher than the HFL. The HFL observed was 336 mts while the lower most level of quarry boundary is 346 mts. At the same time 30 mts solid surface has also been left from river to avoid any ingress of water in the mine pit. The slope of embankment is being maintained in the ratio of 2:1 along with plantation for stabilization.

- (iii) *Topsoil should be stacked properly with proper slope at earmarked site(s) and should not be kept active and shall be used for reclamation and development of green belt.*

Complied with, top soil is removed during excavation of coal, is being stacked separately in available mining area, which is being used for spreading on overburden dump surface for plantation and greenbelt development. Currently no top soil is being generated since mine is progressed in broken up area.

- (iv) *No new external OB dumps shall be created for storing OB. Monitoring and management of existing reclaimed dumpsites should continue until the vegetation becomes self sustaining. Compliance status should be submitted to the Ministry of Environment & Forests and its Regional office located at Bhubaneswar on and yearly basis.*

No further new external OB dumps will be created for storing of OB. Since the mined out area in the operating mines are available which is being used for in-pit dumping. The existing reclaimed dump site is being monitored & maintained to sustain vegetation. All the external OB dumps have stabilized over the years and more over, retaining wall has also been provided for further stability. Abandoned dump area has been identified and taken up for reclamation. As per modified mine plan, all existing dump are temporary and will be re-handled as mine advances.



Plantation in OB dump

- (v) *Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, green belt development, etc. The drains should be regularly de silted and maintained properly.*

Garland drains (size, gradient and length) and sump capacity should be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity should also provided adequate retention period to allow proper settling of silt material.

To arrest the silt and sediment flow from soil, catch drains silt ponds were constructed in the dump area. The water collected in siltation pond is reused in gardening and dust suppression in mines area. Construction of garland drain is a regular practice to take care of run-off water in the mining operation. The details of garland drain are top width varies in between 6m to 10m & bottom width is kept at 3m. Depth varies from 2m to 7m. The sump capacity is in order of 48-120 million gallons considering maximum rainfall depending upon the catchment area. Accumulated mine pit water being used in industrial and domestic purpose after necessary treatment. One of the de coaled area of Query E site is being used as rain water, catchment water storage area.



Abandoned mine pit as RWH pond



Garland Drain

- (vi) *Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.*

Complied with. All the dumps are covered with toe wall and garland drains. All the drains are regularly being maintained for silt removal.



Toe wall & garland drain in the area

- (vii) *Crushers at the CHP should be operated with high efficiency bag filters, water sprinkling system should be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc.*

Crusher houses and CHP areas are equipped with dry fog dust suppression system, fixed type dust suppression system are installed at all conveyor networks, haulage roads, & various mineral transfer points. Conventional coal stock yards are replaced with concrete silos for dust controls. Mobile & fixed water sprinklers (pressurized water tankers) are used in mine haul roads.



Use of Fixed & mobile water sprinklers in area

(viii) *Drills should be wet operated.*

All the drills are wet operated and interlocked with drill operations.

(ix) *Controlled blasting should be practiced only during day time with use of delay detonators. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders should be implemented.*

Blasting in mines area is regularly being practiced in day time only. Controlled blasting is practiced in the close proximity of structure, continuous monitoring along with data collection is being practiced. Delay detonators are used to minimize vibration, dust & formation of fly rocks. However, at regular intervals scientific study is also been conducted from reputed & recognized organizations.

(x) *Area brought under afforestation shall not be less than 1260 ha which includes reclaimed external OB dump (85 ha), backfilled area (974 ha), along ML boundary, along roads, green belt (201 ha), in undisturbed areas and in colony within the mine lease area by planting native species in consultation with the local DFO/ Agriculture Department. The density of the trees should be around 2500 plants per ha.*

Progressive afforestation is practiced as per plan in the area. Last year about 70,000 nos. of saplings planted to cover an additional area of approximately 35 ha. This year a thrust is given for green belt development along the safety zone in the area, about 1 lakhs sapling of local and native species is being planted, including OB dumps, lease boundary, residential colonies, and coal dispatch area. Voluntary afforestation in & around villages is also being done with local communities.

TATA Steel is committed to conserve, enhance & restore the biodiversity in its areas of operations and made a biodiversity policy to achieve no net loss of biodiversity over a period of time. In this regard, International Union for Conservation of Nature (IUCN) agency was engaged for assessing the biodiversity in the area and developing an integrated biodiversity management plan for all its mining clusters. Various initiatives are taken to conserve and restore the bio-diversity in the area in consultation with IUCN & forest officials. This year a niche nesting project, an artificial nest of wooden boxes are being placed in & around areas for birds to enhance the population in the area is done along with water feeders.



Plantation activities



Biodiversity study & initiatives

- (xi) *A Progressive Closure Plan shall be implemented by reclamation of quarry area of 974 ha which shall be backfilled and afforested by planting native plant species in consultation with the local DFO/ Agriculture Department. The density of the trees should be around 2500 plants per ha. The balance 20 ha of de-coaled area being converted into a water reservoir shall gently slope along the upper benches and stabilized and reclaimed with plantation.*

The revised mine plan & mine closure plan had submitted to Ministry of Coal for approval, which includes all plantation details. Afforestation & reclamation of de-coaled area will be done by planting native species in consultation with DFO / Agriculture departments as per prevailing guidelines. As per revised mine plan, all dumps will be re-handled as the mine progress, however to stabilize the dumps, this year reclamation by lemon grass & mulberry plantation is done with additional area.

Lemon grass plantation in Overburden dump

One of the out pit dump area is taken up for lemon grass plantation for stabilization.



Lemon grass in the dump

Mulberry plantation in OB dump

In one of the OB dump area, mulberry plantation is done for development of greenery & stabilization of dumps.



Plantation of mulberry in dump for stabilization & reclamation

- (xii) *A Conservation Plan for endangered species found in and around the project area shall be formulated and for the medicinal plants (in-situ and ex-situ) shall be prepared and implemented in consultation with the State Forest and Wildlife Departments. Separate funds shall be earmarked for implementation of the various activities there under and the status thereof shall be regularly reported to this Ministry and the MoEF Regional Office, Bhubaneswar.*

The project area doesn't have any endangered species found in and around area. However, some of the plants of having medicinal values are conserved by developing an area. Separate fund has been earmarked for implementation of conservation plan along with State Forest and Wildlife Department (if any). Some of the species of medicinal importance are as:



Datura (Datura stramonium)



Sarpagandha (Rauwolfia serpentine)



Tulsi (Ocimum sanctum)



Periwinkle (Catharanthus roseus)



Ghrith Kumari (*Aloe vera*)



Coleus aromaticus (*Plectranthus amboinicus*)



Ginger (*Zingiber officinalis*)



Adosa (*Adhatoda vasica*)



Lemongrass (*Cymbopogon citratus*)



Kadi patta (*Murraya koenigii*)

To conserve, restore and enhance the medicinal plants in the area, a separate medicinal garden also being prepared at one of the OB dump. Besides above several medicinal plants such as Bael (*Aegle marmelos*), Neem (*Azadirachta indica*), Avla (*Phyllanthus emblica*), Karanj (*Millettia pinnata*), Ber (*Ziziphus mauritiana*), Sarifa (*Annona squamosa*) were also planted in the area.

(xiii) No groundwater shall be used for the mining/project activities. Additional water required, if any, shall be met by recycling/reuse of the water from the existing activities and from rainwater harvesting measures.

It is being complied and regularly practiced; no ground water is used for mining & other project activities. All the plants are operated at Zero Liquid Discharge (ZLD) and entire processed water is recycled and reused. An abandoned mine pit is converted into rain water harvesting (RWH) pond. Check dams, rain water harvesting structures are also being constructed in surrounding villages. A separate RWH cum drinking

water project is constructed in the area and about 7500 villagers were benefited through pipeline drinking water at doorstep in village.



RWH cum drinking water project at Duni village



Rainwater harvesting structures

- (xiv) *Regular monitoring of groundwater level and quality should be carried out by establishing a network of existing wells and construction of new peizometers. The monitoring for quantity should be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality in May. Data thus collected should be submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly within one month of monitoring.*

Regular monitoring of ground water level of existing well is being carried out. The data collected for the month of May 2016 and August 2016 are as follows:

Sl. No.	LOCATION	MONTH	
		May 2016	August 2016
01.	RAJIV NAGAR	3'9"	3'2"
02.	JAIRAM HOTEL	5'7"	4'0"
03.	SHOPING COMPLEX	5'5"	5'3"
04.	JAGARNATH GOPE	8'9"	7'4"
05.	HOUSING	6'5"	3'11"
06.	MUKUND BERA	13'6"	3'2"
07.	DRIVER HUT	9'1"	5'4"
08.	2 NO WELL	5'2"	2'10"
09.	9 NO WELL	3'1"	2'10"
10.	PUNDI	32'2"	5'6"
11.	DUNI	20'7"	9'10"

Sl. No.	LOCATION	MONTH	
		May 2016	August 2016
12.	BANJI	DRY	10'2"
13.	KEDLA ROAD	12'8"	9'8"
14.	JHARMA BASTI	7'0"	2'7"
15.	BIRHOR VILLAGE (New location)	--	7'3"
16.	BELGADA VILLAGE (New location)	--	3'3"

- (xv) *The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource. The project authorities should meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.*

The ground water recharge measures are continuously being taken up. In this year thrust has already been put up to streamline drinking water projects, which includes construction of ponds, bore well, check dams etc. in and around our leasehold areas. The projects also include construction of rain water harvesting structures, installation of water filtration plant, in surrounding villages.



Artificial ground water recharge pit (Bore well) in Birlor village



Drinking Water system at Atna village

- (xvi) *ETP should also be provided for workshop, coal washery and CHP. There shall be zero discharge of wastewater from CHP and the coal washeries. Effluents from the tailings pond shall be treated to conform to prescribed standards in case of discharge into any water course outside the lease.*

Zero liquid discharge (ZLD) is being maintained at Coal Washery, CHP, workshops & power plant; the effluent generated is completely recycled & reused. In addition to above, mechanical tailing dewatering system is installed for Washery & CHP area and Oil traps are installed for workshops. The water from tailing pond after proper de-silting of tailings is recycled back to washeries to maintain zero discharge. Also the quality of water is being analyzed regularly (monthly). The tailing slurry is handled through high frequency screen and belt press to produce dry tailings and recover water for recycling. To address the undulated topography and to recover & recycle water a detailed study is under progress from external agency.



Mechanical tailings de-watering system



Coal transport by conveyor belt

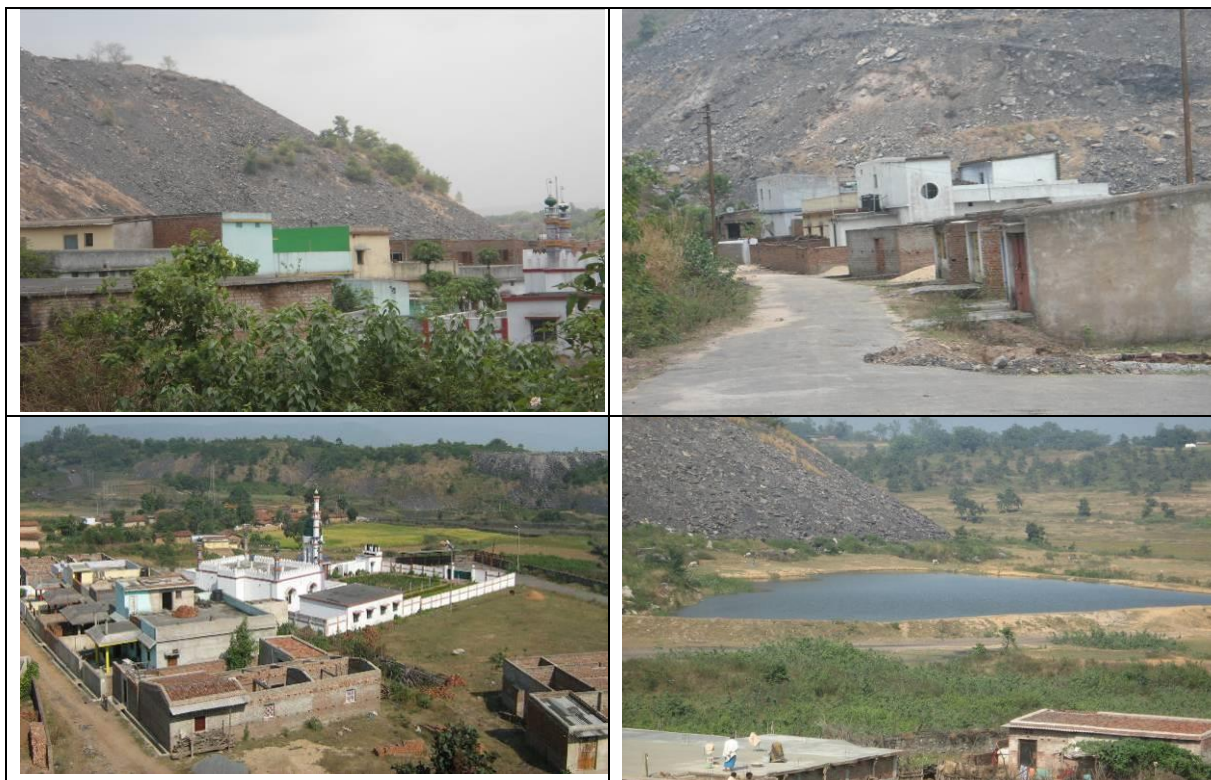
Effluent recycling in washery

- (xvii) *An STP shall be provided for the township/colony to treat the domestic effluents to prescribed standards and for their reuse in project activities.*

Sewage Treatment Plant (STP) of 0.24MLD is already installed in one of the residential block, treated water reused in dust suppression of road. For other areas a detailed feasibility study is under finalization from ISM Dhanbad.

- (xviii) *R&R shall be based on norms laid down by the State Government and shall not be inferior than that in the National R&R Policy and shall be completed within a specified time - frame.*

The R&R policy designed for the project affected families is adequate & having additional benefits. As a part of R&R policy some of the measures taken are as follows:



R & R facility provided in the area

- (xix) *For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted to MoEF and its Regional office at Bhubaneswar.*

Land use maps are under preparation for core and buffer zone for this year after completion of study report will be submitted to ministry office.

- (xx) *A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests for approval 5 years in advance of final mine closure for approval.*

It will be complied five years in advance of final mine closure plan for approval. An adequate fund has been provided separately for final mine closure activity.

- (xxi) *Consent to operate shall be obtained before expanding mining operations.*

Consent to operate is being obtained regularly.

B. General Conditions

- (i) *No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment and Forests.*

No change in mining technology is done.

- (ii) *No change in the calendar plan including excavation, quantum of mineral coal and waste should be made.*

Complied with

- (iii) *Four ambient air quality monitoring stations should be established in the core zone as well as in the buffer zone for SPM, RPM, SO₂ and NO_x monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the SPCB.*

Consulted with Regional Officer of Pollution Control Board, by considering the predominate wind direction, base line study and Air modeling one station in buffer zone, and 04 station in core zone has been suggested.

- (iv) *Fugitive dust emissions (SPM and RPM) from all the sources should be controlled regularly monitored and data recorded properly. Water spraying arrangement on haul roads, wagon loading, dump trucks (loading and unloading) points should be provided and properly maintained.*

All the strategic locations of operating plants where the possibilities of fugitive dust emissions, has been provided with adequate enclosures, side skirt, chute, seal plate, sealing of transfer points along with adequate dust suppression system. All the sites are monitored regularly (once in a month) and data is kept for record. The haul road, loading and unloading points are provided with pressurized water tanker for water spraying along with chemical dosing, wagon loading does not require any water spraying since the coal is in moist condition.



Fixed and mobile water suppression system

- (v) *Data on ambient air quality (SPM, RPM, SO₂ and NO_x) should be regularly submitted to the Ministry including its Regional Office at Bhubneshwar and to the State Pollution Control Board and to the Central Pollution Control Board once in six months.*

Being complied with, All monitoring details are attached as annexure-I.

Continuous online ambient air quality monitoring system (CAAQMS) is installed at division and being operational. All the parameters such as PM₁₀, PM_{2.5}, NO, NO₂, NO_x, CO, SO₂, Wind Speed (in m/s), and Wind Direction (in degree) are recorded on every 15 minutes interval, all parameters were measured by analyzers equipped in mobile van. A displayed unit is also, installed at main entrance of division. All the instruments including mobile van is supplied by CPCB authorized agency & approved from USEPA. The data connectivity with CPCB server & transmission facility is being installed.



Continuous Ambient Air Quality machine (CAAQMS) for data monitoring system

Environmental monitoring data is attached as an annexure-I & external monitoring report from NABL accredited laboratory is attached as annexure-II.

Online emission monitoring for FBC based 2x10MW captive power plant is installed at for PM, SO₂ & NO_x monitoring in stack and continuously being transmitted to JSPCB server. Electro Static Precipitator (ESP) is attached with the power plant and is regularly being maintained. The quality & quantity of emission is maintained well within limit as per standard. The approval for data connectivity permission to CPCB is recently granted to vendor. All the data of PM, SO_x & NO_x are working smoothly.



Continuous Emission Monitoring for Power House for PM, Sox & NOx data

(vi) *Adequate measures should be taken for control of noise levels below 85 db(A) in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc should be provided with ear plugs/ muffs.*

Control measures are being taken up to keep noise level well within limit in working environment by providing adequate enclosure/ separation to the various high noise sources, proper maintenance, provision of control room, operator's a/c cabin etc. In addition all the persons are provided with PPEs such as ear plug/ muff during work. Warning signs in local language are also displayed at various areas in mines & plant. An adequate green belt is also maintained in the area.

New FD Fan with Silencer leads to significant reduction in noise generation

यहाँ निम्नलिखित PPE पहनना अनिवार्य है

- जूता
- सेफ्टी हेलमेट
- सेफ्टी चश्मा
- दस्ताना
- फ्लोरीसेन्ट जैकेट

Physiographic Barrier

Noise control measures in the area

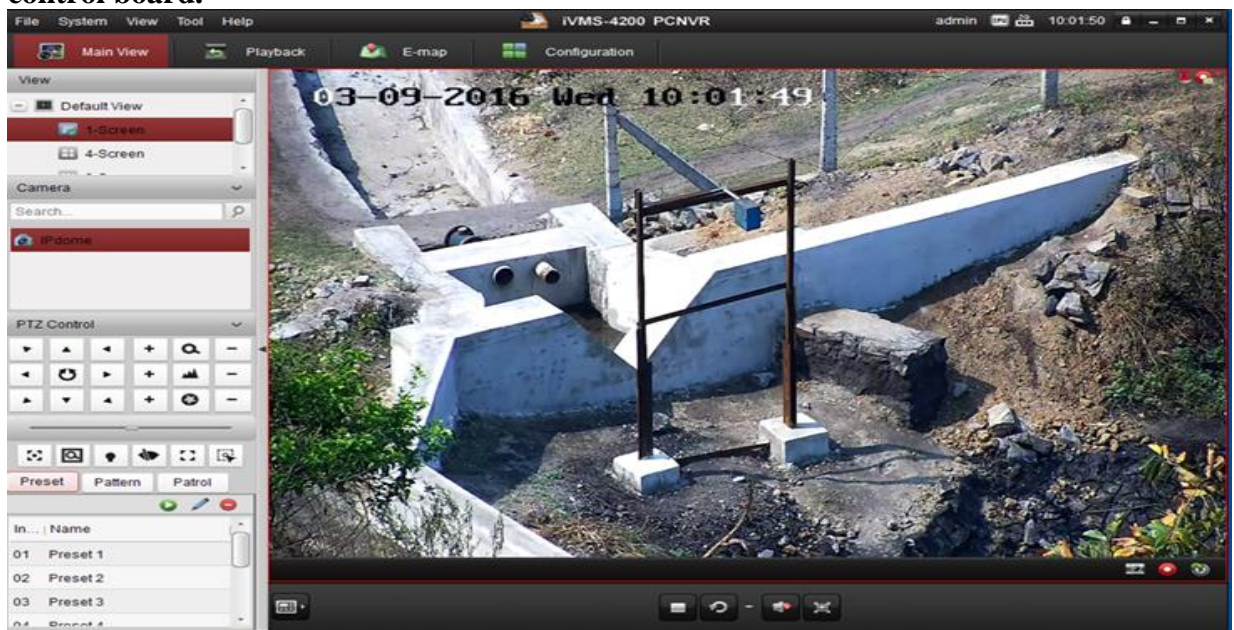
- (vii) Industrial wastewater (workshop and wastewater from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap should be installed before discharge of workshop effluents.

The Industrial wastewaters generated from various operations are handled through effluent management system provided in all operational dept. with the objective to treat the effluent and recycle the clear water. The HEMM maintenance shops have been provided with oil trap arrangement to recover the oil during washing of equipments. The recovered used oil during washing is sold to authorized recycler as per guideline and the effluent generated is checked for quality and recycled -reused in the system.



Oil trap in mines

Zero Effluent Discharge (ZLD) being maintained at all units including captive power plant (2x10MW FBC). A web camera (ip: 117.244.160.6) along with flow meter is installed at discharge end and all data being regularly submitted to state pollution control board.



Live web camera footage installed at discharge point



Online Effluent Monitoring System installed at site (Power Plant)

- (viii) *Vehicular emissions should be kept under control and regularly monitored. Vehicles used for transporting the mineral should be covered with tarpaulins and optimally loaded.*

Vehicular emission is kept under control by regularly monitoring & maintenance of vehicles. Overloading of vehicles is avoided during mineral transport. All the vehicles during transport of material covered with tarpaulin sheet. In future, the mineral transportation will be done by Pipe conveyor.



Introduced upgraded mode of transportation- Pipe conveyor to eliminate spillage/dust/unsafe condition



Transportation of mineral

- (ix) *Environmental laboratory should be established with adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board.*

A full-fledged Environmental laboratory is functioning with adequate number of pollution monitoring and analysis instruments. Accreditation of laboratory from State Pollution Control Board & NABL is under process.

- (x) *Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects. Occupational health surveillance programme of the workers should be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed.*

All dusty areas such as crushers etc are provided with dry fog system and fixed dust sprinklers so as to eliminate dust from source. All haul roads, are equipped with fixed and mobile dust sprinklers. All drill operations are wet only. The operators of various HEMM being operated inside the mines are provided with air-condition cabins. In addition dust mask has been provided to the personnel working in dusty area. The persons have been imparted necessary training on safe work practices and appraised

the adverse consequences on health in case of any violation of the practices. Occupation health surveillance programme is being conducted on regular basis in our Hospital for health check up as per the coal mines rule. The health awareness programme is also being conducted regularly in all the departments.

- (xi) *A separate environmental management cell with suitable qualified personnel should be set up under the control of a Senior Executive, who will report directly to the Head of the company.*

A separate Environment Management Cell is in place with qualified person reporting to Top management.

- (xii) *The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year-wise expenditure should be reported to this Ministry and its Regional Office at Bhubaneswar.*

The Environmental Management Cell of West Bokaro division having separate fund for environmental protection measures / compliance to legal requirement. Besides above all other departments are having budgetary provision for environmental protection measures in their working area. The year wise expenditure on the above subject is reported to State pollution control Board. The expenditure occurred during the financial year 2015-2016 is approx. Rs. 1500.00 Lakh.

- (xiii) *The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/information/monitoring reports.*

Being complied with.

- (xiv) *A copy of the clearance letter will be marked to concerned Panchayat/ local NGO, if any, from whom any suggestion/representation has been received while processing the proposal.*

Complied with.

- (xv) *State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's Office/ Tehsildar's Office for 30 days.*

Complied with.

- (xvi) *The Project authorities should advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution control Board and may also be seen at the website of the ministry of Environment & Forests at <http://envfor.nic.in>.*

Complied with.

Annexure-I

Ambient Air Quality Monitoring

(As National Ambient air quality monitoring standard dated 18th November, 2009)

West Bokaro Colliery, Banji village

Location	Date of Sampling (24 hrs.)	PM ₁₀	PM _{2.5}	SO ₂	NO _x
Near Banji	04-05 April 16	70	38	10	23
	07-08 April 16	68	35	12	23
	11-12 April 16	65	34	12	25
	14-15 April 16	66	34	19	25
	18-19 April 16	68	35	21	24
	21-22 April 16	62	32	21	32
	25-26 April 16	64	34	18	24
	29-30 April 16	60	31	16	32
	03-04 May 16	68	35	21	24
	06-07 May 16	70	38	24	38
	10-11 May 16	62	34	15	39
	13-14 May 16	60	32	10	22
	16-17 May 16	58	36	22	34
	19-20 May 16	61	34	21	38
	24-25 May 16	55	31	17	22
	27-28 May 16	64	33	21	40
	30-31 May 16	63	38	19	42
	03-04 June 16	68	34	23	44
	07-08 June 16	62	33	19	37
	09-10 June 16	66	37	12	32
	14-15 June 16	70	38	19	36
	17-18 June 16	65	35	22	42
	20-21 June 16	62	33	17	32
	23-24 June 16	60	31	22	38
	27-28 June 16	62	34	16	42
	30-01 Jun-July 16	64	33	24	44
Maximum		70	38	24	44
Average		64	34	18	32
Limit		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³

Name of Industry: **West Bokaro Colliery, Banji village**

Location	Date of Sampling (24 hrs.)	PM₁₀	PM_{2.5}	SO₂	NO_x
Near Banji	01-02 July 2016	58	25	13	17
	11-12 July 2016	54	26	12	16
	18-19 July 2016	52	28	10	2
	22-23 July 2016	48	30	14	24
	25-26 July 2016	50	32	16	26
	28-29 July 2016	48	30	14	22
	01-02 Aug. 2016	50	35	15	28
	19-20 Aug. 2016	48	32	14	26
	23-24 Aug. 2016	44	30	12	2
	27-28 Aug. 2016	42	28	14	26
	30-31 Aug. 2016	44	30	12	30
	14-15 Sep. 2016	52	36	16	36
	16-17 Sep. 2016	50	30	14	34
	21-22 Sep. 2016	48	28	16	30
	23-24 Sep. 2016	46	30	12	32
	27-28 Sep. 2016	49	32	14	34
	29-30 Sep. 2016	47	30	12	32
	Maximum		58	36	16
Average		49	30	14	25
Limit		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³

AMBIENT AIR QUALITY REPORT

(As National Ambient air quality monitoring standard dated 18th November, 2009)

West Bokaro Colliery, Pundi village

Location	Date of Sampling (24 hrs.)	PM ₁₀	PM _{2.5}	SO ₂	NO _x
Near Pundi	04-05 April 16	55	30	15	37
	07-08 April 16	50	32	18	34
	11-12 April 16	52	29	13	22
	14-15 April 16	44	23	10	25
	18-19 April 16	47	24	16	33
	21-22 April 16	42	26	18	25
	25-26 April 16	35	22	10	17
	29-30 April 16	40	24	13	23
	03-04 May 16	60	32	18	34
	06-07 May 16	58	28	13	22
	10-11 May 16	52	22	12	32
	13-14 May 16	48	23	14	22
	16-17 May 16	49	25	10	30
	19-20 May 16	47	22	12	27
	24-25 May 16	44	20	13	19
	27-28 May 16	55	25	15	35
	30-31 May 16	63	41	17	41
	03-04 June 16	59	35	14	33
	07-08 June 16	52	31	12	38
	09-10 June 16	55	25	10	30
	14-15 June 16	54	22	13	40
	17-18 June 16	50	23	11	32
	20-21 June 16	42	20	14	44
	23-24 June 16	45	20	11	37
	27-28 June 16	62	34	16	42
	30-01 July 16	64	33	24	44
Maximum		63	41	18	44
Average		50	26	13	31
Limit		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³

Name of Industry: **West Bokaro Colliery, Pundi village**

Location	Date of Sampling (24 hrs.)	PM₁₀	PM_{2.5}	SO₂	NO_x
Near Pundi	01-02 July 2016	42	22	12	11
	11-12 July 2016	44	24	10	16
	18-19 July 2016	46	28	12	20
	22-23 July 2016	50	30	14	24
	25-26 July 2016	48	28	12	26
	28-29 July 2016	46	26	10	28
	01-02 Aug. 2016	54	42	32	11
	19-20 Aug. 2016	52	40	30	14
	23-24 Aug. 2016	50	36	28	18
	27-28 Aug. 2016	48	32	14	22
	30-31 Aug. 2016	46	29	12	20
	14-15 Sep. 2016	57	40	30	12
	16-17 Sep. 2016	54	30	24	16
	21-22 Sep. 2016	52	28	20	20
	23-24 Sep. 2016	49	26	12	22
	27-28 Sep. 2016	47	28	10	24
	29-30 Sep. 2016	48	27	12	22
	Maximum		57	42	32
Average		49	30	17	19
Limit		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³

AMBIENT AIR QUALITY REPORT

(As National Ambient air quality monitoring standard dated 18th November, 2009)

West Bokaro Colliery, Mukundabera village

Location	Date of Sampling (24 hrs.)	PM ₁₀	PM _{2.5}	SO ₂	NO _x
Near Mukundabera	04-05 April 16	63	44	17	40
	06-07 April 16	65	38	19	44
	11-12 April 16	72	46	17	38
	14-15 April 16	78	45	13	46
	18-19 April 16	70	48	12	52
	21-22 April 16	66	42	13	37
	25-26 April 16	74	49	17	42
	29-30 April 16	69	40	12	33
	02-03 May 16	70	48	15	44
	06-07 May 16	74	50	12	43
	10-11 May 16	65	43	19	49
	13-14 May 16	68	47	16	37
	16-17 May 16	76	52	13	32
	19-20 May 16	62	44	11	39
	24-25 May 16	70	48	14	43
	27-28 May 16	72	51	18	49
	06-07 June 16	66	43	10	44
	08-09 June 16	61	44	17	43
	14-15 June 16	63	42	15	49
	17-18 June 16	71	47	19	47
	20-21 June 16	74	54	16	39
	23-24 June 16	68	41	11	44
	27-28 June 16	78	48	13	47
29-30 June 16	69	40	16	41	
Maximum		78	54	19	52
Average		69	46	15	43
Limit		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³

Name of Industry: **West Bokaro Colliery, Mukundabera village**

Location	Date of Sampling (24 hrs.)	PM₁₀	PM_{2.5}	SO₂	NO_x
Near Mukundabera	01-02 July 2016	67	44	10	34
	11-12 July 2016	54	32	12	30
	18-19 July 2016	52	30	10	28
	22-23 July 2016	48	28	14	22
	25-26 July 2016	44	26	16	24
	28-29 July 2016	42	24	14	22
	01-02 Aug. 2016	55	36	19	42
	19-20 Aug. 2016	52	32	16	30
	23-24 Aug. 2016	49	30	14	28
	27-28 Aug. 2016	46	28	12	26
	30-31 Aug. 2016	44	26	10	28
	14-15 Sep. 2016	52	35	21	40
	16-17 Sep. 2016	50	30	16	28
	21-22 Sep. 2016	48	28	12	26
	23-24 Sep. 2016	46	26	10	28
	27-28 Sep. 2016	42	30	12	30
	29-30 Sep. 2016	46	28	14	32
	Maximum		67	44	21
Average		49	30	14	29
Limit		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³

AMBIENT AIR QUALITY REPORT

(As National Ambient air quality monitoring standard dated 18th November, 2009)

West Bokaro Colliery, Duni village

Location	Date of Sampling (24 hrs.)	PM ₁₀	PM _{2.5}	SO ₂	NO _x
Near Duni	01-02 April 16	65	30	12	21
	07-08 April 16	68	33	13	22
	08-09 April 16	64	29	14	30
	14-15 April 16	61	31	12	36
	20-21 April 16	63	33	17	40
	22-23 April 16	58	30	19	37
	27-28 April 16	60	29	22	32
	29-30 April 16	67	40	11	40
	02-03 May 16	66	42	13	47
	09-10 May 16	54	38	17	41
	11-12 May 16	60	44	15	40
	18-19 May 16	58	48	11	37
	20-21 May 16	51	33	13	22
	23-24 May 16	57	39	17	28
	25-26 May 16	67	34	14	25
	30-31 May 16	61	38	10	29
	06-07 June 16	71	42	10	33
	10-11 June 16	54	49	16	44
	13-14 June 16	64	48	12	43
	15-16 June 16	62	37	14	49
	17-18 June 16	69	34	13	38
	21-22 June 16	54	31	13	39
	24-25 June 16	66	30	12	33
27-28 June 16	57	29	11	32	
Maximum		71	49	22	49
Average		62	36	14	55
Limit		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³

Name of Industry: **West Bokaro Colliery, Duni village**

Location	Date of Sampling (24 hrs.)	PM₁₀	PM_{2.5}	SO₂	NO_x
Near Duni	01-02 July 2016	59	45	10	32
	11-12 July 2016	54	32	10	30
	18-19 July 2016	52	30	12	28
	22-23 July 2016	49	28	14	26
	25-26 July 2016	47	30	12	28
	28-29 July 2016	45	29	10	30
	01-02 Aug. 2016	48	36	20	40
	19-20 Aug. 2016	46	32	16	34
	23-24 Aug. 2016	45	30	12	30
	27-28 Aug. 2016	42	28	10	28
	30-31 Aug. 2016	44	30	12	26
	14-15 Sep. 2016	46	37	22	38
	16-17 Sep. 2016	44	30	12	32
	21-22 Sep. 2016	46	28	10	30
	23-24 Sep. 2016	48	30	12	28
	27-28 Sep. 2016	46	28	10	26
	29-30 Sep. 2016	44	26	12	29
	Maximum		59	37	20
Average		47	31	13	30
Limit		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³

AMBIENT AIR QUALITY REPORT

(As National Ambient air quality monitoring standard dated 18th November, 2009)

Name of Industry: **West Bokaro Colliery, Atna village Near Railway siding Chainpur**

Location	Date of Sampling (24 hrs.)	PM ₁₀	PM _{2.5}	SO ₂	NO _x
Near Railways siding, Atna Village	01-02 April 16	74	49	17	42
	07-08 April 16	69	40	12	33
	08-09 April 16	70	48	15	44
	14-15 April 16	71	50	12	43
	20-21 April 16	65	43	19	49
	22-23 April 16	68	47	16	37
	27-28 April 16	76	52	13	32
	29-30 April 16	62	44	11	39
	02-03 May 16	55	30	15	37
	09-10 May 16	50	32	18	34
	11-12 May 16	52	29	13	22
	18-19 May 16	74	23	10	25
	20-21 May 16	57	24	16	33
	23-24 May 16	62	26	18	25
	25-26 May 16	52	22	10	17
	30-31 May 16	40	24	13	23
	06-07 June 16	66	37	12	32
	10-11 June 16	70	38	19	36
	13-14 June 16	65	35	22	42
	15-16 June 16	62	33	17	32
	17-18 June 16	60	31	22	38
	21-22 June 16	62	34	16	42
	24-25 June 16	64	33	24	44
	27-28 June 16	60	35	14	38
Maximum		76	52	24	49
Average		63	36	16	35
Limit		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³

Name of Industry: **West Bokaro Colliery, Atna village Near Railway siding Chainpur**

Location	Date of Sampling (24 hrs.)	PM₁₀	PM_{2.5}	SO₂	NO_x
Near Railways siding, Atna Village	01-02 July 2016	67	36	12	43
	11-12 July 2016	54	28	10	34
	18-19 July 2016	50	24	10	30
	22-23 July 2016	48	22	12	28
	25-26 July 2016	52	26	10	30
	28-29 July 2016	50	24	12	32
	01-02 Aug. 2016	60	39	14	37
	19-20 Aug. 2016	53	30	10	33
	23-24 Aug. 2016	51	29	12	29
	27-28 Aug. 2016	49	28	10	27
	30-31 Aug. 2016	47	26	12	26
	14-15 Sep. 2016	58	38	35	15
	16-17 Sep. 2016	54	30	16	32
	21-22 Sep. 2016	52	28	14	30
	23-24 Sep. 2016	50	27	12	28
	27-28 Sep. 2016	48	26	12	26
	29-30 Sep. 2016	46	28	10	28
	Maximum		67	39	35
Average		52	29	13	30
Limit		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³

AIR QUALITY REPORT AT WORK PLACE

(As per GSR 742 (E), dated 25th Sept 2009)

Name of Industry: **West Bokaro Colliery**

No. of sampling points: **(05)**

Sampling position: **Mines**

1. Q-SEB

Location	Date of Sampling (24 hrs.)	SO ₂	NO _x	RPM	SPM
Q-SEB	01-02 April 2016	15	37	108	480
	02-03 May 2016	18	45	110	460
	01-02 June 2016	17	46	166	437
	01-02 July 2016	20	49	98	230
	01-02 Aug. 2016	12	32	105	322
	01-02 Sep.2016	15	36	129	365
Maximum		20	49	166	480
Average		16	41	119	382
Limit (µg/ m³)		120	120	300	700

2. Q-AB

Location	Date of Sampling (24 hrs.)	SO ₂	NO _x	RPM	SPM
Q-AB	04-05 April 2016	23	45	103	398
	03-04 May 2016	26	48	108	370
	02-03 June 2016	11	38	176	432
	04-05 July 2016	12	34	96	310
	02-03 Aug.2016	17	32	89	225
	05-06 Sep.2016	24	38	108	312
Maximum		26	48	176	432
Average		19	39	113	341
Limit (µg/ m³)		120	120	300	700

AIR QUALITY REPORT AT WORK PLACE

(As per GSR 742 (E), dated 25th Sept 2009)

Name of Industry: **West Bokaro Colliery**

No. of sampling points: **(05)**

Sampling position: **Mines**

3. Q-E

Location	Date of Sampling (24 hrs.)	SO₂	NO_x	RPM	SPM
Q-E	05-06 April 2016	27	48	88	201
	04-05 May 2016	37	37	90	220
	03-04 June 2016	12	23	106	375
	05-06 July 2016	15	23	74	224
	04-05 Aug. 2016	19	27	110	230
	05-06 Sep. 2016	22	28	122	242
Maximum		37	48	122	375
Average		22	31	98	249
Limit (µg/ m³)		120	120	300	700

Sampling position: **Washery Complex**

4. Washery-II & Washery-III

Location	Date of Sampling (24 hrs.)	SO₂	NO_x	RPM	SPM
Washery Complex, (W-II & W-III)	06-07 April 2016	21	40	138	360
	05-06 May 2016	24	40	112	350
	06-07 June 2016	10	40	156	495
	06-07 July 2016	10	32	116	445
	04-05 Aug. 2016	15	38	98	415
	06-07 Sep. 2016	18	42	126	466
Maximum		24	42	156	495
Average		16	39	124	422
Limit		120 µg/ m³	120 µg/ m³	300 µg/ m³	700 µg/ m³

AIR QUALITY REPORT AT WORK PLACE

Name of Industry: **West Bokaro Colliery**

No. of sampling points: **(05)**


Sampling position: **Logistics (Dispatch)**

5. Chainpur Rly. Siding

Location	Date of Sampling (24 hrs.)	SO ₂	NO _x	RPM	SPM
Logistics, (Dispatch)	07-08 April 2016	19	39	98	428
	06-07 May 2016	19	37	100	398
	07-08 June 2016	16	42	170	408
	06-07 July 2016	12	48	71	320
	05-06 Aug. 2016	20	41	110	330
	07-08 Sep. 2016	22	44	115	367
Maximum		22	48	170	428
Average		18	42	111	375
Limit (µg/ m³)		120	120	300	700

AMBIENT NOISE MONITORING

LOCATION		NOISE LEVELS dB(A)			
		DURING DAY TIME		DURING NIGHT TIME	
		LIMIT	ACTUAL	LIMIT	ACTUAL
Mines area	SE	75	61-65	70	46-48
	ACD	75	62-68	70	49-54
	E	75	59-63	70	37-43
Washery Complex	W-II	75	64-66	70	60-62
	W-III	75	68-70	70	61-66
Power House		75	63-68	70	55-60
Railway siding Logistics (Dispatch)		75	60-65	70	54-56


Sr. Manager (Env. & Ergo.)
West Bokaro
Tata Steel

Stack Emission Monitoring Report

(2 x 10 MW FBC Power Plant & 5 MWA DG set, West Bokaro Division, TATA Steel Ltd)

Sl. No.	PARAMETERS	DETAILS	CPCB Limit: 100 mg/Nm³
01	Name of industry	Power House	
02	Production capacity	2x10 MW	
03	Date of sampling	17.09.2016	
04	Weather condition	Normal dry	
05	Stack No if any	Boiler No. 02	
06	Stack height from ground meter	38	
07	Stack dia at sampling point (m)	2.28	
08	Area of stack (m ²)	4.085	
09	Height of sampling port (meter)	18.3	
10	Atmospheric temperature (deg C)	34	
11	Stack gas temperature (deg C)	105	
12	Velocity of gas (m/s)	24.53	
13	Quantity of gas flow (Nm ³ /hr)	231049	
14	Dust concentration (mg/Ncu.m)	60.0	
15	Concentration of SOx	110	
16	Concentration of NOx	164	
17	Details of Pollution Control Device attached	Electro Static Precipitator	
18	Name of fuel & quantity used	Rejects coal 700 T/Day	

Note:

1. Online stack monitoring system (PM, Sox & NOx) is installed for both chimneys / stack of Power plant.
2. Continuous monitoring of stack data is uploaded at JSPCB/CPCB server.
3. All the values are within limit.



Sr. Manager (Env. & Ergo.)
West Bokaro
Tata Steel

EFFLUENT QUALITY

SAMPLING DATE: 01,02,05 Sep.2016

LOCATION		LEVELS			
		pH	TSS	COD	Oil & Grease
Mines area	SE	7.7	20	32	<1.0
	ACD	7.8	18	64	<1.0
	E	7.9	16	32	<1.0
LIMIT		5.5-9.0	100 mg/L	250 mg/L	05 mg/L

SAMPLING DATE: 06th & 20th September 2016

LOCATION		LEVELS					
		pH	TSS	COD	BOD	Oil & Grease	Phenolic
Washery-II, TP-8		7.8	18	128	7.8	<1.0	<1.0
Washery-III, Effluent Pond		8.0	24	64	8.4	<1.0	<1.0
LIMIT		5.5-9.0	100 mg/L	250 mg/L	30 mg/L	05 mg/L	1.0 mg/L

Note: 1. Zero liquid discharge (ZLD) is maintained at Washery.
2. All values are well within limits.

SAMPLING DATE: 12th September 2016

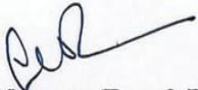
LOCATION	LEVELS OF POLLUTANTS								
	Temp in C	Color	pH	TSS	TDS	TS	COD	BOD	Oil & Grease
SEB ash pond	-	Colorless	8.0	20	810	830	128	8.0	<1.0
LIMIT	5 C difference	colorless	6.5-8.5	100 mg/L	2100 mg/L	2200 mg/L	250 mg/L	30 mg/L	05 mg/L

Note: 1. Zero liquid discharge (ZLD) is being maintained at Power House.
2. Online effluent monitoring system (web camera & flow meter) is installed
3. All values are well within limits.

SAMPLING DATE: 07th Sep. 2016

LOCATION		LEVELS					
		pH	TSS	COD	BOD	Oil & Grease	Phenolics
QLC		7.9	16	64	7.8	<1.0	<1.0
LIMIT		5.5-9.0	100 mg/L	250 mg/L	30 mg/L	05 mg/L	1.0 mg/L

Note: 1. Zero liquid discharge (ZLD) is being maintained at Dispatch (Railway siding).
2. Oil tarp is installed at HEMM washing area.
3. All values are well within limits.


Sr. Manager (Env. & Ergo.)
West Bokaro
Tata Steel

Annexure-II

Environmental Monitoring Report: West Bokaro Colliery

Environmental monitoring from NABL accredited laboratory attached as per following details:

Parameters	Location	Test Report	Date of sampling	Results	Limits
Ambient Air Monitoring values in $\mu\text{g}/\text{m}^3$ (24 hrs)	1. Barughatu village near Environment Office	C/16-17/124	29-30 April 2016	PM ₁₀ : 88 PM _{2.5} : 51 SO ₂ : 6.5 NO _x : 27.4	PM ₁₀ : 100 $\mu\text{g}/\text{m}^3$ PM _{2.5} : 60 $\mu\text{g}/\text{m}^3$ SO ₂ : 80 $\mu\text{g}/\text{m}^3$ NO _x : 80 $\mu\text{g}/\text{m}^3$
	2. Parsabeda village	C/16-17/128	01-02 May 2016	PM ₁₀ : 96 PM _{2.5} : 50 SO ₂ : 6.6 NO _x : 28.6	
	3. Dhuni Village	C/16-17/127	30-01 May 2016	PM ₁₀ : 85 PM _{2.5} : 45 SO ₂ : 5.0 NO _x : 24.7	
	4. Banji (Fakudih) Village	C/16-17/129	01-02 May 2016	PM ₁₀ : 94 PM _{2.5} : 48 SO ₂ : 5.2 NO _x : 25.3	
	5. Pundi Village	C/16-17/125	29-30 April 2016	PM ₁₀ : 84 PM _{2.5} : 44 SO ₂ : 5.2 NO _x : 26.5	
	6. Atna Basti	C/16-17/126	30-01 May 2016	PM ₁₀ : 65 PM _{2.5} : 34 SO ₂ : 4.6 NO _x : 19.8	
Stack monitoring	1. Boiler No-II unit	C/16-17/122	28-April 2016	PM : 67 SO ₂ : 349 NO ₂ : 171.5	PM : 100 mg/Nm ³ SO ₂ : 600 mg/Nm ³ NO ₂ : 600 mg/Nm ³
	2. DG set no-II	C/16-17/123	30-April 2016	PM : 36 SO ₂ : 24.3 NO ₂ : 112.6	PM : 75 mg/Nm ³
Noise Monitoring value in dB(A) Leq (24 hrs)	1. Barughatu village near EMC Office	C/15-16/132	02-03 May 2016	Day : 54.9 Night : 44.8	DAY : 55 LeqdB(A) NIGHT : 45 LeqdB(A)
	2. Parsabeda village	C/15-16/130	28-29 April 2016	Day : 53.5 Night : 44.6	
	3. Dhuni Village	C/ 15-16/131	29-30 April 2016	Day : 53.9 Night : 44.8	
	4. Banji (Fakudih) village	C/15-16/134	02-03 May 2016	Day : 54.9 Night : 44.8	
	5. Pundi Village	C/15-16/135	03-04 May 2016	Day : 54.4 Night : 45.0	
	6. Atna Basti	C/15-16/133	01-02 May 2016	Day : 54.7 Night : 44.1	

Mitra S. K. Private Limited

3, Pagladanga Road, P-48,
Udayan Industrial Estate,
Kolkata 700015.
Tel. : 91 33 23230072. Fax : 91 33 23230078.
Email : mitrasklab@yahoo.com
Web : www.mitrask.com

Doc No MSK/GEN/19/0



TEST REPORT

Name & Address of the Customer :

Tata Steel Limited,
West Bokaro Division, Ghatotand,
Jharkhand, Pin No-825314.

Report No. : C/16-17/124
Date : 10.05.2016
Sample No. : MSK/KOL/ENV/A/16-17/124
Date of receipt of sample : 05.05.2016
Date(s) of performance : 05.05.2016-10.05.2016
Ref. No. & Date : NA

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	: Ambient Air
2.	Sample Mark (if any, given by the customer)	: NA
3.	Date of sampling	: 29/30.04.2016 (09.00 hr-09.00 hr.)
4.	Place of sampling	: Environment Office-Barughatu
5.	Environmental conditions during sampling	: See the 2 nd page
6.	Sampling Plan & Procedures used	: See the 2 nd page

Report prepared by:

Signature :
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature :
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

- The results relate only to the item(s) tested.
- This Test Report shall not be reproduced except in full, without the permission of Mitra S.K. Private Limited.
- The reserved part of sample(s), except perishable sample(s), shall be retained for 15 days & 1 year (Air) from the date of issue of the Test Report.
- Microbiological sealed pack water sample(s) shall be retained for 15 days & food sample(s) shall be retained for 10 days after analysis.

Mitra S. K. Private Limited

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Udayan Industrial Estate,
Kolkata 700015.
Tel. : 91 33 23230072. Fax : 91 33 23230078.
Email : mitrasklab@yahoo.com
Web : www.mitrask.com



Report No. : C/16-17/124
Sample No. : MSK/KOL/ENV/A/16-17/124

Analysis Result

Location: Environment Office-Barughatu		Date of sampling: 29/30.04.2016 (09.00 hr-09.00 hr.)		
Sampling Done by: T.Mondal/A.Roy		Sampling done as per : CPCB Guidelines (Volume-1)		
Environmental Condition :				
1) Temperature : 27-39 °C		2) Barometric Pressure: 737 mm of Hg		3) Rain Fall : Nil
Sl. No.	POLLUTANT	RESULT	LIMIT	METHOD OF TEST REFERENCE
1	Particulate matter (<10µm) in µg/m ³	88	100	IS 5182 : Part.23-2006
2	Particulate matter (<2.5µm) in µg/m ³	51	60	USEPA CFR-40, Part-50 Appendix L
3	Sulphur di oxide (SO ₂) in µg/m ³	6.5	80	IS 5182 : Part.2-2001
4	Nitrogen di oxide (NO ₂) in µg/m ³	27.4	80	IS 5182 : Part.6-2006
NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality				
Remarks : The above sampling is done by using the following Machines				
Sr no.	Calibration Validity	Model/ Make No./ID		
434-DTK-2005,2133-DTE-2002	23.07.2016	APM-460BL (Envirotech)/BL-18		
140-DTL-2014	17.12.2016	APM -550, PM2.5/10 (Envirotech)/FDS-16		

Report prepared by:

Signature : *Alans*
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : *Pradip Bag*
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

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
**TEST REPORT**

Name & Address of the Customer :	Report No.	: C/16-17/128
Tata Steel Limited,	Date	: 10.05.2016
West Bokaro Division, Ghatotand,	Sample No.	: MSK/KOL/ENV/A/16-17/128
Jharkhand, Pin No-825314.	Date of receipt of sample	: 05.05.2016
	Date(s) of performance	: 05.05.2016-10.05.2016
	Ref. No. & Date	: NA


We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	: Ambient Air
2	Sample Mark (if any, given by the customer)	: NA
3	Date of sampling	: 01/02.05.2016 (10.0 hr-10.0 hr.)
4	Place of sampling	: Parsabeda Village
5	Environmental conditions during sampling	: See the 2 nd page
6	Sampling Plan & Procedures used	: See the 2 nd page

Report prepared by:

Signature : 
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : 
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

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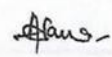


Report No. : C/16-17/128
Sample No. : MSK/KOL/ENV/A/16-17/128


Analysis Result

Location: Parsabeda Village		Date of sampling: 01/02.05.2016 (10.0 hr-10.0 hr.)		
Sampling Done by: T.Mondal/A.Roy		Sampling done as per : CPCB Guidelines (Volume-1)		
Environmental Condition :				
1) Temperature : 28-39 °C		2) Barometric Pressure: 738 mm of Hg		3) Rain Fall : Nil
Sl. No.	POLLUTANT	RESULT	LIMIT	METHOD OF TEST REFERENCE
1	Particulate matter (<10µm) in µg/m ³	96	100	IS 5182 : Part.23-2006
2	Particulate matter (<2.5µm) in µg/m ³	50	60	USEPA CFR-40, Part-50 Appendix L
3	Sulphur di oxide (SO ₂) in µg/m ³	6.6	80	IS 5182 : Part.2-2001
4	Nitrogen di oxide (NO ₂) in µg/m ³	28.6	80	IS 5182 : Part.6-2006
NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality				
Remarks : The above sampling is done by using the following Machines				
Sr no.	Calibration Validity	Model/ Make No./ID		
428-DTK-2005,2698-DTK-2005	17.12.2016	APM-460BL (Envirotech)/BL-12		
134-DTJ-2014	08.10.2016	APM -550, PM2.5/10 (Envirotech)/FDS-11		

Report prepared by:

Signature : 
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : 
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory



Maghadanga Road, P-48,
Bokaro Industrial Estate,
Bokaro 700015.

Phone : 91 33 23230072. Fax : 91 33 23230078.
Email : mitrasklab@yahoo.com
Web : www.mitrask.com



TEST REPORT


Name & Address of the Customer :
Mitsubishi Steel Limited,
Bokaro Division, Ghatotand,
Bokaro, Pin No-825314.

Report No. : C/16-17/127
Date : 10.05.2016
Sample No. : MSK/KOL/ENV/A/16-17/127
Date of receipt of sample : 05.05.2016
Date(s) of performance : 05.05.2016-10.05.2016
Ref. No. & Date : NA


we hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

Description of sample (As declared by customer)	: Ambient Air
Sample Mark (if any, given by the customer)	: NA
Date of sampling	: 30.04/01.05.2016 (10.20 hr-10.20 hr.)
Place of sampling	: Dhuni Village
Environmental conditions during sampling	: See the 2 nd page
Sampling Plan & Procedures used	: See the 2 nd page

Report prepared by:

Name : 
Designation : Asim Kumar Jana
Office Assistant

for Mitra S. K. Private Limited

Signature : 
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

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Udayan Industrial Estate,
Kolkata 700015.
Tel. : 91 33 23230072. Fax : 91 33 23230078.
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Web : www.mitrask.com

Doc No MSK/GEN/



Report No. : C/16-17/127
Sample No. : MSK/KOL/ENV/A/16-17/127

Analysis Result

Location: Dhuni Village		Date of sampling: 30.04/01.05.2016 (10.20 hr-10.20 hr.)		
Sampling Done by: T.Mondal/A.Roy		Sampling done as per : CPCB Guidelines (Volume-1)		
Environmental Condition :				
1) Temperature: 28-40 °C		2) Barometric Pressure: 736 mm of Hg		3) Rain Fall : Nil
Sl. No.	POLLUTANT	RESULT	LIMIT	METHOD OF TEST REFERENCE
1	Particulate matter (<10µm) in µg/m ³	85	100	IS 5182 : Part.23-2006
2	Particulate matter (<2.5µm) in µg/m ³	45	60	USEPA CFR-40, Part-50 Appendix L
3	Sulphur di oxide (SO ₂) in µg/m ³	5.0	80	IS 5182 : Part.2-2001
4	Nitrogen di oxide (NO ₂) in µg/m ³	24.7	80	IS 5182 : Part.6-2006
NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality				
Remarks : The above sampling is done by using the following Machines				
Sr no.	Calibration Validity	Model/ Make No./ID		
434-DTK-2005,2133-DTE-2002	23.07.2016	APM-460BL (Envirotech)/BL-18		
140-DTL-2014	17.12.2016	APM -550, PM2.5/10 (Envirotech)/FDS-16		

Report prepared by:

Signature : *Asim*
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited
Signature : *Pradip*
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

Head Office: Shraichi Centre (5th floor), 74B, A.J.C. Bose Road, Kolkata - 700 016, West Bengal, India.
Tel. : 91 33 40143000 / 22650006 / 22650007 Fax : 91 33 22650008
Email : info@mitrask.com. Website: www.mitrask.com

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3, Pagladanga Road, P-48,
Udayan Industrial Estate,
Kolkata 700015.
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Web : www.mitrask.com

Doc No MSK/GEN/19/04



TEST REPORT

Name & Address of the Customer :

Tata Steel Limited,
West Bokaro Division, Ghatotand,
Jharkhand, Pin No-825314.

Report No. : C/16-17/129
Date : 10.05.2016
Sample No. : MSK/KOL/ENV/A/16-17/129
Date of receipt of sample : 05.05.2016
Date(s) of performance : 05.05.2016-10.05.2016
Ref. No. & Date : NA

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	: Ambient Air
2.	Sample Mark (if any, given by the customer)	: NA
3.	Date of sampling	: 01/02.05.2016 (10.50 hr-10.50 hr.)
4.	Place of sampling	: Banji(Fakundih)
5.	Environmental conditions during sampling	: See the 2 nd page
6.	Sampling Plan & Procedures used	: See the 2 nd page

Report prepared by:

Signature : *Asim*
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : *Pradip*
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

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Udayan Industrial Estate,
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Doc No MSK/GEN/19/04

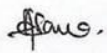


Report No. :C/16-17/129
Sample No. :MSK/KOL/ENV/A/16-17/129


Analysis Result

Location: Banji(Fakundih)		Date of sampling: 01/02.05.2016 (10.50 hr-10.50 hr.)		
Sampling Done by: T.Mondal/A.Roy		Sampling done as per : CPCB Guidelines (Volume-1)		
Environmental Condition :				
1) Temperature : 28-39 °C		2) Barometric Pressure: 738 mm of Hg		3) Rain Fall : Nil
Sl. No.	POLLUTANT	RESULT	LIMIT	METHOD OF TEST REFERENCE
1	Particulate matter (<10µm) in µg/m ³	94	100	IS 5182 : Part.23-2006
2	Particulate matter (<2.5µm) in µg/m ³	48	60	USEPA CFR-40, Part-50 Appendix L
3	Sulphur di oxide (SO ₂) in µg/m ³	5.2	80	IS 5182 : Part.2-2001
4	Nitrogen di oxide (NO ₂) in µg/m ³	25.3	80	IS 5182 : Part.6-2006
NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality				
Remarks : The above sampling is done by using the following Machines				
Sr no.	Calibration Validity	Model/ Make No./ID		
434-DTK-2005,2133-DTE-2002	23.07.2016	APM-460BL (Envirotech)/BL-18		
140-DTL-2014	17.12.2016	APM -550, PM2.5/10 (Envirotech)/FDS-16		

Report prepared by:

Signature : 
Name :Asim Kumar Jana
Designation :Office Assistant

for Mitra S. K. Private Limited

Signature : 
Name :Pradip Bag
Designation :Executive Chemist
Authorized Signatory

Mitra S. K. Private Limited

3, Pagladanga Road, P-48,
Udayan Industrial Estate,
Kolkata 700015.
Tel. : 91 33 23230072. Fax : 91 33 23230078.
Email : mitrasklab@yahoo.com
Web : www.mitrask.com

Doc No MSK/GEN/19/04



TEST REPORT

Name & Address of the Customer :
Tata Steel Limited,
West Bokaro Division, Ghatotand,
Jharkhand, Pin No-825314.

Report No. : C/16-17/125
Date : 10.05.2016
Sample No. : MSK/KOL/ENV/A/16-17/125
Date of receipt of sample : 05.05.2016
Date(s) of performance : 05.05.2016-10.05.2016
Ref. No. & Date : NA

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	: Ambient Air
2.	Sample Mark (if any, given by the customer)	: NA
3.	Date of sampling	: 29/30.04.2016 (09.45 hr-09.45 hr.)
4.	Place of sampling	: Pundi Village
5.	Environmental conditions during sampling	: See the 2 nd page
6.	Sampling Plan & Procedures used	: See the 2 nd page

Report prepared by:

Signature :
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature :
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

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Udayan Industrial Estate,
Kolkata 700015.
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Email : mitrasklab@yahoo.com
Web : www.mitrask.com

Doc No MSK/GEN



Report No. : C/16-17/125
Sample No. : MSK/KOL/ENV/A/16-17/125

Analysis Result

Location: Pundi Village		Date of sampling: 29/30.04.2016 (09.45 hr-09.45 hr.)		
Sampling Done by: T.Mondal/A.Roy		Sampling done as per : CPCB Guidelines (Volume-1)		
Environmental Condition :				
1) Temperature : 27-39 °C		2) Barometric Pressure: 737 mm of Hg		3) Rain Fall : Nil
Sl. No.	POLLUTANT	RESULT	LIMIT	METHOD OF TEST REFERENCE
1	Particulate matter (<10µm) in µg/m ³	84	100	IS 5182 : Part.23-2006
2	Particulate matter (<2.5µm) in µg/m ³	44	60	USEPA CFR-40, Part-50 Appendix L
3	Sulphur di oxide (SO ₂) in µg/m ³	5.2	80	IS 5182 : Part.2-2001
4	Nitrogen di oxide (NO ₂) in µg/m ³	26.5	80	IS 5182 : Part.6-2006
NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality				
Remarks : The above sampling is done by using the following Machines				
Sr no.	Calibration Validity	Model/ Make No./ID		
428-DTK-2005,2698-DTK-2005	17.12.2016	APM-460BL (Envirotech)/BL-12		
134-DTJ-2014	08.10.2016	APM -550, PM2.5/10 (Envirotech)/FDS-11		

Report prepared by:

Signature : *Asim*
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : *Pradip*
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

Head Office: Shrachi Centre (5th floor), 74B, A.J.C. Bose Road, Kolkata - 700 016, West Bengal, India.
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TEST REPORT


Name & Address of the Customer :
Tata Steel Limited,
West Bokaro Division, Ghatotand,
Jharkhand, Pin No-825314.

Report No. : C/16-17/126
Date : 10.05.2016
Sample No. : MSK/KOL/ENV/A/16-17/126
Date of receipt of sample : 05.05.2016
Date(s) of performance : 05.05.2016-10.05.2016
Ref. No. & Date : NA


We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	: Ambient Air
2.	Sample Mark (if any, given by the customer)	: NA
3.	Date of sampling	: 30.04/01.05.2016 (09.30 hr-09.30 hr.)
4.	Place of sampling	: Atna Basti
5.	Environmental conditions during sampling	: See the 2 nd page
6.	Sampling Plan & Procedures used	: See the 2 nd page

Report prepared by:

Signature : 
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : 
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

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Doc No MSK/GE

TESTING • INSPECTION





Report No. : C/16-17/126
Sample No. : MSK/KOL/ENV/A/16-17/126

Analysis Result

Location: Atna Basti		Date of sampling: 30.04/01.05.2016 (09.30 hr-09.30 hr.)		
Sampling Done by: T.Mondal/A.Roy		Sampling done as per : CPCB Guidelines (Volume-1)		
Environmental Condition :				
1) Temperature : 28-40 °C		2) Barometric Pressure: 736 mm of Hg		3) Rain Fall : Nil
Sl. No.	POLLUTANT	RESULT	LIMIT	METHOD OF TEST REFERENCE
1	Particulate matter (<10µm) in µg/m ³	65	100	IS 5182 : Part.23-2006
2	Particulate matter (<2.5µm) in µg/m ³	34	60	USEPA CFR-40, Part-50 Appendix L
3	Sulphur di oxide (SO ₂) in µg/m ³	4.6	80	IS 5182 : Part.2-2001
4	Nitrogen di oxide (NO ₂) in µg/m ³	19.8	80	IS 5182 : Part.6-2006
NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality				
Remarks : The above sampling is done by using the following Machines				
Sr no.	Calibration Validity	Model/ Make No./ID		
428-DTK-2005,2698-DTK-2005	17.12.2016	APM-460BL (Envirotech)/BL-12		
134-DTJ-2014	08.10.2016	APM -550, PM2.5/10 (Envirotech)/FDS-11		

Report prepared by:

Signature : 
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited
Signature : 
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

Head Office: Shrachi Centre (5th floor), 74B, A.J.C. Bose Road, Kolkata - 700 016, West Bengal, India.
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
**TEST REPORT**


Name & Address of the Customer :	Report No.	: C/16-17/122
Tata Steel Limited,	Date	: 10.05.2016
West Bokaro Division, Ghatotand,	Sample No.	: MSK/KOL/ENV/A/16-17/122
Jharkhand, Pin No-825314.	Date of receipt of sample	: 05.05.2016
	Date(s) of performance	: 05.05.2016-10.05.2016
	Ref. No. & Date	: Not Applicable

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	: Stack Emission
2.	Sample Mark (if any, given by the customer)	: Not Applicable
3.	Date of sampling	: 28.04.2016 at 3.58 P.M
4.	Place of sampling	: Boiler Unit # II
5.	Environmental conditions during sampling	: Not Applicable
6.	Sampling Plan & Procedures used	: See the 2 nd page

Report prepared by:

Signature : 
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited
Signature : 
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

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Email : mitrasklab@yahoo.com
Web : www.mitrask.com

LDC (NO 145)



Report No. : C/16-17/122
Sample No. : MSK/KOL/ENV/A/16-17/122

Analysis Result

Date & Time of Sampling : 28.04.2016 at 3.58 P.M		Stack Analysis Report No. : 122	
Sampling done by : Mr. P. Singhdeo		Sampling Procedures : EPA/IS	
A : GENERAL INFORMATION ABOUT STACK :			
1 Stack connected to		: Boiler Unit # II	
2 Emission due to		: Burning of Coal	
3 Material of construction of Stack		: M.S.	
4 Shape of Stack		: Circular	
5 Whether stack is provided with permanent platform		: Yes	
6 Generation Capacity		: 10 MW	
B : PHYSICAL CHARACTERISTICS OF STACK :			
1 Height of Stack from ground level		: 38.0 m	
2 Diameter of Stack at bottom		: ---	
3 Diameter of Stack at sampling point		: 2.28 m	
4 Height of the sampling point from ground level		: 18.3 m	
5 Area of Stack		: 4.085 m ²	
C : ANALYSIS/CHARACTERISTIC OF STACK :			
1 Fuel used : Coal		2. Fuel consumption : 680 MT/day	
D : RESULTS OF SAMPLING & ANALYSIS OF GASEOUS EMISSION:			
		RESULT	METHOD
1 Temperature of emission (°C)		: 102	EPA Part 2
2 Barometric pressure (mm of Hg)		: 738	EPA Part 2
3 Velocity of gas (m/sec)		: 17.28	EPA Part 2
4 Quantity of gas flow (Nm ³ /hr)		: 187009	EPA Part 2
5 Concentration of Carbon monoxide(%v/v)		: Below 0.2	IS:13270-1992, Reaf : 2009
6 Concentration of Carbon dioxide(%v/v)		: 9.2	IS:13270-1992, Reaf : 2009
7 Concentration of Sulphur di oxide (mg/Nm ³)		: 349.0	EPA Part-6
8 Concentration of Nitrogen di oxide (mg/Nm ³)		: 171.5	EPA Part-7
9 Concentration of Particulate Matters (mg/Nm ³)		: 67	EPA Part 5
E : POLLUTION :			
Details of pollution control devices attached with the stack		: ESP	
F : REMARKS : Nil			
Note: 1) Equipment Name/ID		: Stack Sampler & Velocity Monitor	
2) Model No		: APM-620, APM-602	
3) Make-		: Envirotech	
4) SI No-		: 898-DTG-08, 820-DTG-05	
5) Calibration valid Up to		: 19.07.2016	

Report prepared by:

Signature : *Asim*
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : *Pradip*
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory



TEST REPORT

Name & Address of the Customer :	Report No.	: C/16-17/123
Tata Steel Limited,	Date	: 10.05.2016
West Bokaro Division, Ghatotand,	Sample No.	: MSK/KOL/ENV/A/16-17/123
Jharkhand, Pin No-825314.	Date of receipt of sample	: 05.05.2016
	Date(s) of performance	: 05.05.2016-10.05.2016
	Ref. No. & Date	: Not Applicable

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	: Stack Emission
2.	Sample Mark (if any, given by the customer)	: Not Applicable
3.	Date of sampling	: 30.04.2016 at 10.45 A.M.
4.	Place of sampling	: DG -2
5.	Environmental conditions during sampling	: Not Applicable
6.	Sampling Plan & Procedures used	: See the 2 nd page

Report prepared by:

Signature :

Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature :

Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

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Email : mitrasklab@yahoo.com
Web : www.mitrask.com



Report No. : C/16-17/123
Sample No. : MSK/KOL/ENV/A/16-17/123

Analysis Result

Date & Time of Sampling : 30.04.2016 at 10.45 A.M.		Stack Analysis Report No. :	
Sampling done by : Mr. P. Singhdeo.		Sampling Procedures : EPA	
A : GENERAL INFORMATION ABOUT STACK :			
1 Stack connected to	:	DG -2	
2 Emission due to	:	Burning of HSD	
3 Material of construction of Stack	:	M.S.	
4 Shape of Stack	:	Circular	
5 Whether stack is provided with permanent platform	:	Yes	
6 Generation Capacity	:	2.5 MW	
B : PHYSICAL CHARACTERISTICS OF STACK :			
1 Height of Stack from ground level	:	13.8 m (Approx.)	
Diameter of Stack at bottom	:	---	
3 Diameter of Stack at sampling point	:	0.59 m	
4 Height of the sampling point from ground level	:	9.5 m	
5 Area of Stack	:	0.2735 m ²	
C : ANALYSIS/CHARACTERISTIC OF STACK :			
1 Fuel used : HSD	:	2. Fuel consumption : 450 L./hr.	
D : RESULTS OF SAMPLING & ANALYSIS OF GASEOUS EMISSION:			
		RESULT	METHOD
1 Temperature of emission (°C)	:	126	EPA Part 2
2 Barometric pressure (mm of Hg)	:	739	EPA Part 2
3 Velocity of gas (m/sec)	:	7.78	EPA Part 2
4 Quantity of gas flow (Nm ³ /hr)	:	5567	EPA Part 2
5 Concentration of Carbon monoxide(%v/v)	:	Below 0.2	IS:13270-1992, Reaf : 200
6 Concentration of Carbon dioxide(%v/v)	:	4.8	IS:13270-1992, Reaf : 200
7 Concentration of Sulphur di oxide (mg/Nm ³)	:	24.3	EPA Part-6
8 Concentration of Nitrogen di oxide (mg/Nm ³)	:	112.6	EPA Part-7
9 Concentration of Particulate Matters (mg/Nm ³)	:	36	EPA Part 5
E : POLLUTION :			
Details of pollution control devices attached with the stack	:	Nil	
F : REMARKS : Nil			
Note: 1) Equipment Name/ID	:	Stack Sampler & Velocity Monitor	
2) Model No	:	APM-620, APM-602	
3) Make-	:	Envirotech	
4) SI No-	:	898-DTG-08, 820-DTG-05	
5) Calibration valid Up to	:	19.07.2016	

Report prepared by:

Signature : *Asim*
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : *Pradip*
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory



TEST REPORT

Name & Address of the Customer :
Tata Steel Limited,
West Bokaro Division, Ghatotand,
Jharkhand, Pin No-825314.

Report No. : C/15-16/132
Date : 10.05.2016
Sample No. : MSK/KOL/ENV/A/15-16/132
Date of receipt of sample : 05.05.2016
Date(s) of performance : 05.05.2016-10.05.2016
Ref. No. & Date : NA

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	:Noise
	Sample Mark (if any, given by the customer)	:NA
3	Date of sampling	: 30.04/01.05.2016
4	Place of sampling	: Env. Office, Barughatu
5	Environmental conditions during sampling	:NA
6	Sampling Plan & Procedures used	: IS: 9876-1981(Reff: 2001)

Analysis Result

Sampling done by: Ashis Roy & Torab Mandal				Sampling done as per IS: 9876-1981(Reff: 2001)			
Sample Code	Location Name	Date of Monitoring	Type of area	Day time Leq dB (A)	Night time Leq dB (A)	Permissible limits as per SPCB/ CPCB Standards	
						Day time Leq dB(A)	Night time Leq dB(A)
132	Env. Office, Barughatu	30.04/01.05.2016	Residential Area	53.6	45.0	55	45
Time : Day time 06.00 Hr-22.00 Hr. Night time: 22.00 hr. - 6.00 hr.							
Machine Details							
Sr. No.		Calibration Validity up to		Model & Make No./ID			
L238037		13.07.2016		4001 (Lutron)/SLM -04			

Report prepared by:

Signature :
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited
Signature :
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

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- Microbiological sealed pack water sample(s) shall be retained for 15 days & food sample(s) shall be retained for 10 days after analysis.

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Kolkata 700015.
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Email : mitrasklab@yahoo.com
Web : www.mitrask.com



TEST REPORT

Name & Address of the Customer :
Tata Steel Limited,
West Bokaro Division, Ghatotand,
Jharkhand, Pin No-825314.

Report No. : C/15-16/130
Date : 10.05.2016
Sample No. : MSK/KOL/ENV/A/15-16/130
Date of receipt of sample : 05.05.2016
Date(s) of performance : 05.05.2016-10.05.2016
Ref. No. & Date : NA

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	:Noise
	Sample Mark (if any, given by the customer):	:NA
3	Date of sampling	: 28/29.04.2016
4	Place of sampling	: Pursabedu Village
5	Environmental conditions during sampling	:NA
6	Sampling Plan & Procedures used	: IS: 9876-1981(Reff: 2001)

Analysis Result

Sampling done by: Ashis Roy & Torab Mandal				Sampling done as per IS: 9876-1981(Reff: 2001)			
Sample Code	Location Name	Date of Monitoring	Type of area	Day time Leq dB (A)	Night time Leq dB (A)	Permissible limits as per SPCB/ CPCB Standards	
						Day time Leq dB(A)	Night time Leq dB(A)
130	Pursabedu Village	28/29.04.2016	Residential Area	53.5	44.6	55	45
Time : Day time 06.00 Hr-22.00 Hr. Night time: 22.00 hr. - 6.00 hr.							
Machine Details							
Sr. No.		Calibration Validity up to			Model & Make No./ID		
I.238037		13.07.2016			4001 (Lutron)/SLM -04		

Report prepared by:

Signature : *[Signature]*
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : *[Signature]*
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

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Udayan Industrial Estate,
Kolkata 700015.
Tel. : 91 33 23230072. Fax : 91 33 23230078.
Email : mitrasklab@yahoo.com
Web : www.mitrask.com

Doc No MSK/GEN/19/04



TEST REPORT

Name & Address of the Customer :
Tata Steel Limited,
West Bokaro Division, Ghatotand,
Jharkhand, Pin No-825314.

Report No. : C/15-16/131
Date : 10.05.2016
Sample No. : MSK/KOL/ENV/A/15-16/131
Date of receipt of sample : 05.05.2016
Date(s) of performance : 05.05.2016-10.05.2016
Ref. No. & Date : NA

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	:Noise
	Sample Mark (if any, given by the customer)	:NA
3	Date of sampling	: 29/30.04.2016
4	Place of sampling	: Dhuni Village
5	Environmental conditions during sampling	:NA
6	Sampling Plan & Procedures used	: IS: 9876-1981(Reff: 2001)

Analysis Result

Sampling done by: Ashis Roy & Torab Mandal				Sampling done as per IS: 9876-1981(Reff: 2001)			
Sample Code	Location Name	Date of Monitoring	Type of area	Day time Leq dB (A)	Night time Leq dB (A)	Permissible limits as per SPCB/ CPCB Standards	
						Day time Leq dB(A)	Night time Leq dB(A)
131	Dhuni Village	29/30.04.2016	Residential Area	53.9	44.4	55	45
Note: : Day time 06.00 Hr-22.00 Hr. Night time: 22.00 hr. - 6.00 hr.							
Machine Details							
Sr. No.		Calibration Validity up to			Model & Make No./ID		
I.238037		13.07.2016			4001 (Lutron)/SLM -04		

Report prepared by:

Signature :
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited
Signature :
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

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Tel. : 91 33 40143000 / 22650006 / 22650007 Fax : 91 33 22650008
Email : info@mitrask.com. Website: www.mitrask.com

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Mitra S. K. Private Limited



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Kolkata 700015.
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Email : mitrasklab@yahoo.com
Web : www.mitrask.com

**TEST REPORT**

Name & Address of the Customer :
Tata Steel Limited,
West Bokaro Division, Ghatotand,
Jharkhand, Pin No-825314.

Report No. : C/15-16/134
Date : 10.05.2016
Sample No. : MSK/KOL/ENV/A/15-16/134
Date of receipt of sample : 05.05.2016
Date(s) of performance : 05.05.2016-10.05.2016
Ref. No. & Date : NA

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	:Noise
	Sample Mark (if any, given by the customer)	:NA
3	Date of sampling	: 02/03.05.2016
4	Place of sampling	: Banji (Fakudih) Village
5	Environmental conditions during sampling	:NA
6	Sampling Plan & Procedures used	: IS: 9876-1981(Reff: 2001)

Analysis Result


Sampling done by: Ashis Roy & Torab Mandal				Sampling done as per IS: 9876-1981(Reff: 2001)			
Sample Code	Location Name	Date of Monitoring	Type of area	Day time Leq dB (A)	Night time Leq dB (A)	Permissible limits as per SPCB/ CPCB Standards	
						Day time Leq dB(A)	Night time Leq dB(A)
134	Banji (Fakudih) Village	02/03.05.2016	Residential Area	54.9	44.8	55	45


Note: : Day time 06.00 Hr-22.00 Hr. Night time: 22.00 hr. - 6.00 hr.

Machine Details

Sr. No.	Calibration Validity up to	Model & Make No./ID
1.238037	13.07.2016	4001 (Lutron)/SLM -04

Report prepared by:

Signature : 
Name :Asim Kumar Jana
Designation :Office Assistant

for Mitra S. K. Private Limited
Signature : 
Name :Pradip Bag
Designation :Executive Chemist
Authorized Signatory

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TEST REPORT

Name & Address of the Customer :
Tata Steel Limited,
West Bokaro Division, Ghatotand,
Jharkhand, Pin No-825314.

Report No. : C/15-16/135
Date : 10.05.2016
Sample No. : MSK/KOL/ENV/A/15-16/135
Date of receipt of sample : 05.05.2016
Date(s) of performance : 05.05.2016-10.05.2016
Ref. No. & Date : NA

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	:Noise
2.	Sample Mark (if any, given by the customer)	:NA
3.	Date of sampling	: 03/04.05.2016
4.	Place of sampling	: Pundi Village
5.	Environmental conditions during sampling	:NA
6.	Sampling Plan & Procedures used	: IS: 9876-1981(Reff: 2001)

Analysis Result

Sampling done by: Ashis Roy & Torab Mandal				Sampling done as per IS: 9876-1981(Reff: 2001)			
Sample Code	Location Name	Date of Monitoring	Type of area	Day time Leq dB (A)	Night time Leq dB (A)	Permissible limits as per SPCB/ CPCB Standards	
						Day time Leq dB(A)	Night time Leq dB(A)
135	Pundi Village	03/04.05.2016	Residential Area	54.4	45.0	55	45
Note : Day time 06.00 Hr-22.00 Hr. Night time: 22.00 hr. - 6.00 hr.							
Machine Details							
Sr. No.		Calibration Validity up to		Model & Make No./ID			
I.238037		13.07.2016		4001 (Lutron)/SLM -04			

Report prepared by:

Signature : *Ashis*
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : *Pradip*
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

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Mitra S. K. Private Limited

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Kolkata 700015.
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Email : mitrasklab@yahoo.com
Web : www.mitrask.com

**TEST REPORT**

Name & Address of the Customer :	Report No.	: C/15-16/133
Tata Steel Limited,	Date	: 10.05.2016
West Bokaro Division, Ghatotand,	Sample No.	: MSK/KOL/ENV/A/15-16/133
Jharkhand, Pin No-825314.	Date of receipt of sample	: 05.05.2016
	Date(s) of performance	: 05.05.2016-10.05.2016
	Ref. No. & Date	: NA


We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	: Noise
2.	Sample Mark (if any, given by the customer):	: NA
3.	Date of sampling	: 01/02.05.2016
4.	Place of sampling	: Atna Basti
5.	Environmental conditions during sampling	: NA
6.	Sampling Plan & Procedures used	: IS: 9876-1981(Reff: 2001)


Analysis Result

Sampling done by: Ashis Roy & Torab Mandal				Sampling done as per IS: 9876-1981(Reff: 2001)			
Sample Code	Location Name	Date of Monitoring	Type of area	Day time Leq dB (A)	Night time Leq dB (A)	Permissible limits as per SPCB/ CPCB Standards	
						Day time Leq dB(A)	Night time Leq dB(A)
133	Atna Basti	01/02.05.2016	Residential Area	54.7	44.1	55	45
Note: : Day time 06.00 Hr-22.00 Hr. Night time: 22.00 hr. - 6.00 hr.							
<u>Machine Details</u>							
Sr. No.		Calibration Validity up to		Model & Make No./ID			
L238037		13.07.2016		4001 (Lutron)/SLM -04			

Report prepared by:

Signature : 
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : 
Name : Pradip Bag
Designation : Executive Chemist
Authorized Signatory

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Annexure-II

Environmental Monitoring Report: West Bokaro Colliery

Environmental monitoring from NABL accredited laboratory attached as per following details:

Parameters	Location	Test Report	Date of sampling	Results	Limits
Effluent monitoring	Q-SEB mine water	C/16-17/30	30 th April 2016	pH :7.69 TSS :5.3 TDS :835 BOD :<2.0 COD :<4.0 O &G : <1.4 Phenol: <0.001	pH: 5.5-9.0 TSS: 100 mg/l TDS: --- BOD: 30 mg/l COD: 250 mg/l O &G: 10 mg/l Phenol: 1.0mg/l
	Tailling Pond (Washery-2 & 3)	C/16-17/28	30 th April 2016	pH :7.02 TSS :68mg/l TDS :2361mg/l BOD :10.7mg/l COD :47.4mg/l O &G : <1.4mg/l Phenol: <0.001mg.l	
	Ash Pond –Power House	C/16-17/29	30 th April 2016	pH :7.31 TSS :65 TDS :955 BOD :<2.0 COD :8.0 O &G : <1.4 Phenol: <0.001	
	Chainpur	C/16-17/31	30 April 2016	pH :7.59 TSS :8.9 TDS :923 BOD :<2.0 COD :7.97 O &G : <1.4 Phenol: <0.001	

3, Pagladanga Road, P-48,
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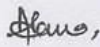
TEST REPORT

Name & Address of the Customer :	Report No.	: C/16-17/30
Tata Steel Limited,	Date	: 13.05.2016
West Bokaro Division, Ghatotand,	Sample No.	: MSK/KOL/ENV/P&E/16-17/30
Jharkhand, Pin No-825314.	Date of receipt of sample	: 06.05.2016
	Date(s) of performance	: 06.05.2016-13.05.2016
	Ref. No. & Date	: Not Applicable


We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	: Effluent Water
2.	Sample Mark (if any, given by the customer)	: NA
3.	Date of sampling	: 30.04.2016
4.	Place of sampling	: Quari SEB Mine Water
5.	Environmental conditions during sampling	: NA
6.	Sampling Plan & Procedures used	: APHA 22 nd Edition 1060 B,C

Report prepared by:

Signature : 
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : 
Name : Bodhisatta Maiti
Designation : Executive Chemist
Authorized Signatory

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 Web : www.mitrask.com



Report No. : C/16-17/30
 Sample No. : MSK/KOL/ENV/P&E/16-17/30

Analysis Result

Serial No.	Test Parameter	Test Method	Result
1.	pH at 27°C	APHA 22 nd edition, 4500-H+B	7.69
2.	TSS in mg/l	APHA 22 nd edition, 2540D	5.3
3.	TDS in mg/l	APHA 22 nd edition, 2540C	835
4.	BOD in mg/l	APHA 22 nd edition, 5210B	<2.0
5.	COD in mg/l	APHA 22 nd edition, 5220B	<4.0
6.	Oil & Grease in mg/l	APHA 22 nd edition, 5520B	<1.4
7.	Phenol in mg/l	APHA 22 nd edition, 5530C	<0.001

Report prepared by:

Signature : *Asim*
 Name : Asim Kumar Jana
 Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : *Bodhisatta*
 Name : Bodhisatta Maiti
 Designation : Executive Chemist
Authorized Signatory

Mitra S. K. Private Limited

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TEST REPORT

Name & Address of the Customer :
Tata Steel Limited,
West Bokaro Division, Ghatotand,
Jharkhand, Pin No-825314.

Report No. : C/16-17/28
Date : 13.05.2016
Sample No. : MSK/KOL/ENV/P&E/16-17/28
Date of receipt of sample : 06.05.2016
Date(s) of performance : 06.05.2016-13.05.2016
Ref. No. & Date : Not Applicable

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results.

1.	Description of sample (As declared by customer)	: Effluent Water
2.	Sample Mark (if any, given by the customer)	: NA
3.	Date of sampling	: 30.04.2016
4.	Place of sampling	: T.P Washery 2 & 3
5.	Environmental conditions during sampling	: NA
6.	Sampling Plan & Procedures used	: APHA 22 nd Edition 1060 B,C

Report prepared by:

Signature :
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature :
Name : Bodhisatta Maiti
Designation : Executive Chemist
Authorized Signatory

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 Email : mitrasklab@yahoo.com
 Web : www.mitrask.com



Report No. : C/16-17/28
 Sample No. : MSK/KOL/ENV/P&E/16-17/28

Analysis Result

Serial No.	Test Parameter	Test Method	Result
1.	pH at 27°C	APHA 22 nd edition, 4500-H+B	7.02
2.	TSS in mg/l	APHA 22 nd edition, 2540D	68
3.	TDS in mg/l	APHA 22 nd edition, 2540C	2361
4.	BOD in mg/l	APHA 22 nd edition, 5210B	10.7
5.	COD in mg/l	APHA 22 nd edition, 5220B	47.4
6.	Oil & Grease in mg/l	APHA 22 nd edition, 5520B	<1.4
7.	Phenol in mg/l	APHA 22 nd edition, 5530C	<0.001

Report prepared by:

Signature : *Asim*
 Name : Asim Kumar Jana
 Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : *Bodhisatta*
 Name : Bodhisatta Maiti
 Designation : Executive Chemist
Authorized Signator

Mitra S. K. Private Limited

3, Pagladanga Road, P-48,
Udayan Industrial Estate,
Kolkata 700015.
Tel. : 91 33 23230072. Fax : 91 33 23230078.
Email : mitrasklab@yahoo.com
Web : www.mitrask.com

ISO 9001:2008 CERTIFIED



TEST REPORT

Name & Address of the Customer :
Tata Steel Limited,
West Bokaro Division, Ghatotand,
Jharkhand, Pin No-825314.

Report No. : C/16-17/29
Date : 13.05.2016
Sample No. : MSK/KOL/ENV/P&E/16-17/29
Date of receipt of sample : 06.05.2016
Date(s) of performance : 06.05.2016-13.05.2016
Ref. No. & Date : Not Applicable

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	:Effluent Water
2.	Sample Mark (if any, given by the customer)	:NA
3.	Date of sampling	: 30.04.2016
4.	Place of sampling	: Ash Pond Power House
5.	Environmental conditions during sampling	:NA
6.	Sampling Plan & Procedures used	:APHA 22 nd Edition 1060 B,C

Report prepared by:

Signature :

Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature :

Name : Bodhisatta Maiti
Designation : Executive Chemist
Authorized Signatory

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- Microbiological sealed pack water sample(s) shall be retained for 15 days & food sample(s) shall be retained for 10 days after analysis.

Head Office: Shrachi Centre (5th floor), 74B, A.J.C. Bose Road, Kolkata - 700 016, West Bengal, India.
Tel. : 91 33 40143000 / 22650006 / 22650007 Fax : 91 33 22650008
Email : info@mitrask.com. Website: www.mitrask.com

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Mitra S. K. Private Limited

3, Pagladanga Road, P-48,
Udayan Industrial Estate,
Kolkata 700015.
Tel. : 91 33 23230072. Fax : 91 33 23230078.
Email : mitrasklab@yahoo.com
Web : www.mitrask.com

**Report No. : C/16-17/29****Sample No. : MSK/KOL/ENV/P&E/16-17/29****Analysis Result**

Serial No.	Test Parameter	Test Method	Result
1.	pH at 27°C	APHA 22 nd edition, 4500-H+B	7.31
2.	TSS in mg/l	APHA 22 nd edition, 2540D	6.5
3.	TDS in mg/l	APHA 22 nd edition, 2540C	955
4.	BOD in mg/l	APHA 22 nd edition, 5210B	<2.0
5.	COD in mg/l	APHA 22 nd edition, 5220B	7.97
6.	Oil & Grease in mg/l	APHA 22 nd edition, 5520B	<1.4
7.	Phenol in mg/l	APHA 22 nd edition, 5530C	<0.001

Report prepared by:

Signature : *Asim*
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : *Bodhisatta*
Name : Bodhisatta Maiti
Designation : Executive Chemist
Authorized Signatory

3, Pagladanga Road, P-48,
Uralyan Industrial Estate,
Kolkata 700015.
Tel. : 91 33 23230072. Fax : 91 33 23230078.
Email : mitrasklab@yahoo.com
Web : www.mitrask.com



TEST REPORT

Name & Address of the Customer :	Report No.	: C/16-17/31
Tata Steel Limited,	Date	: 13.05.2016
West Bokaro Division, Ghatotand,	Sample No.	: MSK/KOL/ENV/P&E/16-17/31
Jharkhand, Pin No-825314.	Date of receipt of sample	: 06.05.2016
	Date(s) of performance	: 06.05.2016-13.05.2016
	Ref. No. & Date	: Not Applicable

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1.	Description of sample (As declared by customer)	: Effluent Water
2.	Sample Mark (if any, given by the customer)	: NA
3.	Date of sampling	: 30.04.2016
4.	Place of sampling	: Chainpur
5.	Environmental conditions during sampling	: NA
6.	Sampling Plan & Procedures used	: APHA 22 nd Edition 1060 B,C

Report prepared by:

Signature : *Asim*
Name : Asim Kumar Jana
Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : *Bodhisatta*
Name : Bodhisatta Maiti
Designation : Executive Chemist
Authorized Signatory

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Report No. : C/16-17/31
 Sample No. : MSK/KOL/ENV/P&E/16-17/31

Analysis Result

Serial No.	Test Parameter	Test Method	Result
1.	pH at 27°C	APHA 22 nd edition, 4500-H+B	7.59
2.	TSS in mg/l	APHA 22 nd edition, 2540D	8.9
3.	TDS in mg/l	APHA 22 nd edition, 2540C	923
4.	BOD in mg/l	APHA 22 nd edition, 5210B	<2.0
5.	COD in mg/l	APHA 22 nd edition, 5220B	7.97
6.	Oil & Grease in mg/l	APHA 22 nd edition, 5520B	<1.4
7.	Phenol in mg/l	APHA 22 nd edition, 5530C	<0.001

Report prepared by:

Signature : *Asim*
 Name : Asim Kumar Jana
 Designation : Office Assistant

for Mitra S. K. Private Limited

Signature : *Bodhisatta*
 Name : Bodhisatta Maiti
 Designation : Executive Chemist
Authorized Signatory