



**The Member Secretary
State Pollution Control Board, Odisha
Paribesh Bhawan
A/118, Nilakantha Nagar, Unit - VIII
Bhubaneswar - 751012**

MD/ ENV/ 346 /120/2019
Date: 25th September 2019

**Sub: Environmental Statement of Joda East Iron Mine, TATA Steel Ltd. for
2018-19.**

Dear Sir

Kindly find attach herewith the Environmental Statement in the prescribed format (FORM V) as per "Environmental (Protection) Amendment Rules 1992" of our Joda East Iron Mine for your kind perusal.

Thanking you,

Yours faithfully
f: Tata Steel Limited

Head (Planning), OMQ

Encl: As above

**Copy to: The Regional Officer,
State Pollution Control Board, At: Baniapata, College Road
Keonjhar - 758001, Odisha**

TATA STEEL LIMITED

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ENVIRONMENT STATEMENT 2018-19



JODA EAST IRON MINE

TATA STEEL LIMITED

September 2019

FORM - V
(See Rule -14)

ENVIRONMENT STATEMENT FOR THE FINANCIAL YEAR ENDING THE 31st MARCH, 2019

JODA EAST IRON MINE, TATA STEEL LIMITED

PART-A

1	Name and address of the owner/ occupier of the industry, operation or process	:	Mr Rajesh Kumar, Chief (Joda) Joda East Iron Mine, TATA Steel Limited PO: Joda, Dist.- Keonjhar, Odisha – 758034 Mr D Vijayendra, Mines Manager (Joda East) Joda East Iron Mine, TATA Steel Limited Joda, Dist.- Keonjhar, Odisha – 758034
	Nominated Owner	:	Mr. Atul Bhatnagar, General Manager, OMQ division, Administrative Building, Noamundi Iron Mine, TATA Steel Limited PO.: Noamundi, Dist.-West Singhbhum Jharkhand – 833217 Mr T V Narendran, Managing Director & CEO, Tata Steel Ltd, PO: Jamshedpur, Dist.: East Singhbhum, Jharkhand-831001
2	Industry Category	:	Opencast Iron mine with beneficiation plant & dispatch facility (Major)
3	Production Capacity	:	Mine: 12.0 MTPA Iron Ore Beneficiation & Dispatch – 12 MTPA
4	Year of Establishment	:	1956
5	Date of last Environmental Statement submitted.	:	25 th September 2018, vide letter no. MD/ENV/277/120/2018 for the year 2017-18

PART-B

Water and Raw Material Consumption

(i) Water Consumption:

Consumption Head:	2017-18 (in cu.m/day) (Annual Average)	2018-19 (in cu.m/day) (Annual Average)
Process	4225.00	3057.06
Spraying in mine pit, services	237.00	220.79
Domestic	Nil *	
Name of the product	Process water consumption per product output (m³/MT)	
Iron Ore	0.14	0.10

*The colony of Joda East Iron Mine is situated outside the mining lease area. The domestic water consumption is shown by other adjacent Manganese Mine of separate unit.

ii) Raw Material Consumption

The following items have been consumed/ utilized:

Name of Raw Materials		Name of Product	Consumption of Raw Material	
			During previous financial year (2017-18)	During current financial year (2018-19)
High Speed Diesel		Iron Ore of steel grade	55,91,964 Litre	60,47,741 Litre
Lubricants			3,56,146 Litre	3,17,520 Litres
Grease			25, 380 kg	20,748 kg
Explosive	Slurry explosives		Small dia (up to 32mm)- 6896 Kg	Small dia (up to 32mm)- 7602 Kg
	Detonators		Large dia. (above 32 mm)-2858562 Kg	Large dia. (above 32 mm)-2974665 Kg
	Detonating Fuse		Ordinary- 43708 nos. Electrical- 887 nos.	Ordinary- 49852 nos. Electrical-1376 nos.
Gas			49455 Mts.	26670 Mts.
Tyres			10,155 cum	8782 cum
Drill rods			86 nos.	65 nos.
Electric Power in KWH			604 nos.	589 nos.
Consumed		Iron Ore of steel grade	2,62,68,513	2,87,86,887
Generated			14,459	19,974

PART-C

POLLUTION DISCHARGED TO ENVIROMENT/ UNIT OF OUTPUT
(Parameters as specified in the consent issued)

Pollutants	Quantity of Pollutants discharged (mass / day)	Concentration of Pollutants discharges (mass / day)	Percentage of variation from prescribed standards with reasons
a) Water	<p>The Joda East Iron Mine with the processing plant is a zero effluent discharge unit; all the effluent generated from the processing of iron ore is collected from slime pond and recycled & reused by 100% in various activities including dust suppression and iron ore processing.</p> <p>Six sewage treatment plant (STP) of (One -630 KLD, One -270 KLD, Two -150KLD, Two-50KLD, Two -10KLD) are installed and operated smoothly. The treated water is recycled & reused for plantation and gardening purpose.</p> <p>Two Effluent treatment plant (ETP) of 10 KLD are installed & operational in Hospital & Canteen area and treated water is used in horticulture activities.</p> <p>The water quality results of ETP & STP are attached herewith in annexure-1. Apart from above some additional ETP & STP are also under construction.</p>		
b) Air	<p>The Joda East Iron Mine is an opencast iron mine with processing plant & dispatch unit. The air quality in the form of fugitive, dust fall, ambient, respirable is been measured and monitored regularly.</p>		

Pollutants	Quantity of Pollutants discharged (mass / day)	Concentration of Pollutants discharges (mass / day)	Percentage of variation from prescribed standards with reasons
	<p>All the dust generating points such as loading -unloading devices are equipped with dust arresting system such as dry fog, fixed & mobile water sprinklers, mist spray, dust extractors -bag filters, water scrubbers etc.</p> <p>There are two stationary point sources such as stack of dust extractor from crushing unit & DG set used for emergency powers. Bothe are designed as per standards and regular monitoring is been done.</p> <p>Three continuous ambient air quality monitoring stations are installed in core & buffer area and operated with PM₁₀, PM_{2.5}, SO_x, NO_x, (NO₂ & NO) & CO parameters are continuously been monitored with online data connectivity at Odisha state Pollution Control Board server.</p> <p>A thick & dense vegetation is also placed in all surrounding the mines area which significantly reduced the pollution load.</p> <p>The results of air quality monitoring is attached as annexure-2.</p>		

PART-D

HAZARDOUS WASTES

As specified under the Hazardous & Other Waste (Management & Trans boundary Movement) Rules, 2016 and amendment thereof)

Hazardous Wastes	Total Quantity	
	During previous financial year (2017-18)	During current financial year (2018-19)
i) From Process <ul style="list-style-type: none"> • Used Oil • Waste containing Oil (Jute etc) • Lead Bering residues (Batteries etc) • Discarded containers (drums) 	81.960 MT Nil 110 nos. Nil	59.310 MT Nil 79 nos. 1056 nos.
ii) From Pollution Control Facility <ul style="list-style-type: none"> • Waste oil from oil & grease separation pit • Sludge from oil and grease separation pit 	Nil (Included in process above) All the Hazardous waste generated are disposed as per law.	

PART-E SOLID WASTES

Solid wastes from Joda East Iron Mine is been categories in two parts i.e. Overburden/rejects removed during mining operations and slime/tailings generated from beneficiation / processing of Iron Ore. All the materials overburden and tailings are stocked in designated place inside the mine. However, other solid waste (such as scrap material, used conveyor belts,

tyres, scrap machines etc) is also being generated from mining and processing / beneficiation activity.

Sources	During previous financial year (2017-18)	During current financial year (2018-19)
a) From Process <ul style="list-style-type: none"> • From mining as Overburden • From processing plant as Tailing 	1759398 Tonne 582267 Tonne	1848800 Tonne 577858
b) From Pollution Control Facility		
c) i. Quantity recycled or reutilized within the unit		
ii. Quantity sold		
iii. Quantity disposed <ul style="list-style-type: none"> • Mining overburden 	1151258 Tonne	11721206 Tonne

The tailings /slime generated from the beneficiation plant has a potential mineral value thus stored for future use in designated place.

PART-F

PLEASE SPECIFY THE CHARACTERISTICS (IN TERMS OF COMPOSITION AND QUANTUM) OF HAZARDOUS AS WELL AS SOLID WASTES AND INDICATE DISPOSAL PRACTICE ADOPTED FOR BOTH THESE CATEGORIES OF WASTES

The Joda East Iron Mine and processing / beneficiation generate hazardous waste mainly in the form of used oil due to HEMM operation & maintenance. The collected used oil disposed to authorized agency via sale for recycling and reuse. During maintenance of HEMM, the oil-soaked materials (jute etc) is been kept and disposed in impervious pit. The hazardous waste such as used batteries is sold to authorized agency.

The other solid waste in the form of overburden, sub-grade mineral and slime/tailings are stocked in designated place.

PART-G

IMPACT OF POLLUTION ABATEMENT MEASURES TAKEN ON CONSERVATION OF NATURAL RESOURCES AND ON THE COST OF PRODUCTION

- Joad East Iron Mine is continuously a star rated iron mine as per Sustainable Development Framework (SDF) by Indian Bureau of Mines, Ministry of Mines, Govt. of India and has won various prestigious prizes in Environment, Health & Safety field and become a best sustainable mine of area.
- Various mineral conservation techniques are operated by mine including use of low-grade ore, blending of waste / subgrade materials, etc as per steel plant quality requirements.
- For conservation of natural resources, high efficiency HEMM are used with adequate maintenance to reduce the fuel consumption. Zero effluent discharge is been maintained &

- For ground water augmentation, various rain water harvesting structures are made, which harvest ~ 3 million m³ per year. Various ground water augmentation structures are also been developed in surrounding villages also.
- Various Solar Power based illumination such as high mass tower light etc & other measures are made at mine such as solar light pipes, solar street lights, solar geezers etc.

PART-II

ADDITIONAL MEASURES/ INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION INCLUDING ABATEMENT OF POLLUTION, PREVENTION OF POLLUTION

- Joda East Iron Mine has installed & operated various ETP & STP's in colony & Plant area. The treated water is recycled & reused.
- Various water augmentation structures are made with new rain water harvesting structure made in year FY-19 with an expense of ₹5. Cr.
- Fixed and mobile water sprinkler facilities are extended for dust suppression by adding two new 50 KL water tanker in mines of ₹4.2. Cr.
- For biodiversity conservation, various projects are implemented at Joda. An inhouse nursery of ~1 Lakh sapling developed in area and only local trees are planted.

PART-I

ANY OTHER PARTICULARS FOR IMPROVING THE QUALITY OF THE ENVIRONMENT

- Joda East Iron Mine of TATA Steel Ltd. is a captive mine and is certified for the Integrated Management System (ISO-9001:2015, ISO-14001:2015 & OHSAS-18001:2007 and SA:8000) from last two decades. The unit has obtained various prestigious accolades from various agencies.
- The unit is having a full-fledged Environmental Management department with well qualified personnel from environmental background to take care of all aspects relating to mines and processing plant of unit.
- Various awareness programs throughout the year conducted in the area which included celebration of World Environment Day, World Water Day, Mine Environment & Mineral Conservation Week, World Bio-diversity Week, Joda Festival etc. In which environment conservation models, current & future proposals are made, environment messages through Nukkad natak, poems, slogans, swachhata drive is been done every year.
- The mine has established a plantation in mine out area, for conservation of biodiversity various initiatives are placed in area, Butterfly Park, Medicinal Park, Botanical Park etc. developed in area. The mines have performed various examples of mineral conservation, upgradation of low-grade mineral by various unique techniques, strengthening the social progress by various skill development and job orientation of programmes for stakeholders.
- All above efforts make the mine clean – green and sustainable. In the year 2018-19, Rs 6.35Cr are spent on various environmental activities from Joda East Iron Mine.

Lalit Yadav
 Manager (Environment), OMQ

WATER QUALITY DATA 2018-19
Joda East Iron Mine
(Annual Average)

Parameters	SEWAGE TREATMENT PLANT										Standard
	50 KLD Inlet	50 KLD Outlet	10 KLD Inlet	10 KLD Outlet	630 KLD Inlet	630 KLD outlet	150 KLD Inlet	150 KLD Outlet	150 KLD Inlet	150 KLD Outlet	
	Joda East Colony		Joda West Hospital		Joda West Hospital		Hanuman Hating		Santinary Park		
pH*	6.47	7.19	6.65	7.27	6.54	7.00	6.48	7.15	6.52	7.11	5.5-9.0
TSS (mg/l)	205.58	28.75	192.67	24.00	205.83	26.28	230.00	26.67	215.83	19.53	100
BOD 5 days (mg/l)	31.33	7.80	29.18	6.59	21.02	6.64	27.70	6.51	30.75	5.83	30
COD (mg/l)	248.43	37.23	143.98	31.07	159.58	27.63	147.33	25.80	147.50	25.02	250
Oil & Grease (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.0
Faecal Coliform	157.93	175.0	208.75	168.6	170.0	143.6	220.3	163.0	223.5	145.3	MPN/100 ml

Note: BDL – Below detection limit.

WATER QUALITY DATA 2018-19
Joda East Iron Mine

Parameters	EFFLUENT TREATMENT PLANT		Standard
	10 KLD Inlet	10 KLD Outlet	
pH*	6.53	7.36	5.5-9.0
TSS (mg/l)	121.13	19.88	100
BOD 5 days (mg/l)	37.00	5.69	30
COD (mg/l)	226.38	22.75	250
Oil & Grease (mg/l)	ND	ND	10.0
Faecal Coliform	193.8	<1.8	MPN/100 ml

Note: BDL – Below detection limit.

WATER QUALITY DATA 2018-19
Joda East Iron Mine
(Annual Average)

Parameters	SURFACE WATER		Standard
	Kundra Nallah Upstream	Kundra Nallah Downstream	
pH*	7.29	7.34	5.5–9.0
TSS (mg/l)	33.50	38.75	100
BOD 5 days (mg/l)	2.60	2.85	30
COD (mg/l)	16.75	17.90	250
Iron (mg/l)	0.37	0.42	3.0

Note: BDL – Below detection limit.

AIR QUALITY DATA 2018-19
Annual Average Air quality of Noamundi Iron Mine of FY'19

Pollutants	Concentration of pollutants ($\mu\text{g}/\text{m}^3$)	Standards ($\mu\text{g}/\text{m}^3$)
Manmora Slime Dam		
1. PM ₁₀	1. PM ₁₀	1. PM ₁₀
2. PM _{2.5}	2. PM _{2.5}	2. PM _{2.5}
3. SO ₂	3. SO ₂	3. SO ₂
4. NO _x	4. NO _x	4. NO _x
Near Rain Water Harvesting		
1. PM ₁₀	1. PM ₁₀	1. PM ₁₀
2. PM _{2.5}	2. PM _{2.5}	2. PM _{2.5}
3. SO ₂	3. SO ₂	3. SO ₂
4. NO _x	4. NO _x	4. NO _x
Near Magazine		
1. PM ₁₀	1. PM ₁₀	1. PM ₁₀
2. PM _{2.5}	2. PM _{2.5}	2. PM _{2.5}
3. SO ₂	3. SO ₂	3. SO ₂
4. NO _x	4. NO _x	4. NO _x
Near Equipment Maintenance		
1. PM ₁₀	1. PM ₁₀	1. PM ₁₀
2. PM _{2.5}	2. PM _{2.5}	2. PM _{2.5}
3. SO ₂	3. SO ₂	3. SO ₂
4. NO _x	4. NO _x	4. NO _x