Deputy Director General of Forests (C),
Ministry of Env., Forest and Climate Change,
Integrated Regional Office,
A/3, Chandrasekharpur,
Bhubaneswar – 751023
Email: roez.bsr-mef@nic.in

MD/ENV/1291/102 /2024
Date: 27.11.2024

Ref: Environmental Clearance letter no. J-11015/215/2008-IA-II (M) dated: 13.04.2023.

Sub: Submission of Half-yearly compliance status report of Environmental Clearance conditions for the period April 2024 – September 2024 in respect of Joda East Iron Mine, M/s Tata Steel Limited.

Dear Sir,

Kindly find attached herewith the half-yearly compliance status report in respect of the stipulated Environmental Clearance conditions of Joda East Iron Mine, M/s Tata Steel Limited for the period from **April 2024 – September 2024.**

We trust that the measures taken towards environmental safeguards comply with the stipulated environmental conditions. We look forward to your further guidance which shall certainly help us in our endeavor for further improve upon our Environmental Management practices.

Thanking you,

Yours faithfully,
f: M/s Tata Steel Limited

Chief (Mine planning & Projects), OMQ

Encl. : As above

Copy to : The Chairman, Central Pollution Control Board, Southern Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700107 (W. B.).
: The Member Secretary, State Pollution Control Board, Paribesh Bhawan, A/118, Nilakantha Nagar, Unit – VIII, Bhubaneswar – 751012 (Odisha).
: The Regional Officer, SPCB, College Road, Baniapata, Keonjhar – 758001 (Odisha).

Your (Environment Clearance) application has been Submitted with following details	
Proposal No	IA/OR/MIN/20472/2011
Compliance ID	72360594
Compliance Number(For Tracking)	EC/M/COMPLIANCE/72360594/2024
Reporting Year	2024
Reporting Period	01 Jun(01 Oct - 31 Mar)
Submission Date	31-05-2024
IRO Name	ARTATRANA MISHRA
IRO Email	jhk109@ifs.nic.in
State	ODISHA
IRO Office Address	Integrated Regional Offices, Bhubaneswar
Note:- SMS and E-Mail has been sent to ARTATRANA MISHRA, ODISHA with Notification to Project Proponent.	

EC COMPLIANCE REPORT PERIOD: April 2024 to September 2024

ENVIRONMENTAL CLEARANCE TO
JODA EAST IRON MINE OF TATA STEEL LIMITED

VIDE MoEF's LETTER NO. J-11015/215/2008-IA.II(M), DATED: 11.03.2013,
EC compliance vide letter no J-11015/215/2008-IA.II(M) dated: 7.09.2018 and
EC compliance vide letter no J-11015/215/2008-IA.II(M) dated: 29.07.2019

FOR PRODUCTION OF 12 MTPA (ROM) OF IRON ORE

Special Conditions

Sl. No.	EC Conditions	Compliance Status
Name of Project: Joda East Iron Mine of Tata Steel Limited. **Clearance Letter No.: J-11015/215/2008-IA.II (M), Dated: 11.03.2013.** **Period of Compliance: April 2024 to September 2024**		
1	No mining activities will be allowed in forest area for which the FC is not available.	**Being Complied With.** The present mining operation is restricted within 567.087 ha of forest land for which Forest Clearance has been obtained vide letter no. F. No. 8- 32/1993-FC(vol- II), date: 24.09.2007.
2	The project proponent shall seek and obtain approval under the FC Act for diversion of the entire forest land located within the mining lease within a period of two years w.e.f. 01.02.2013, failing which the mining lease area will be reduced to the non-forest area plus the forest area for which the project proponent has been able to obtain the FC at the end of this time period. In the case of reduction in mine lease area, the project proponent will need to get a revised mining plan approved from the competent authority for reduced area and enter into a new mining lease as per reduced lease area. The EC will be construed to be available for the mining lease area as per the revised mining lease deed.	**Complied.** Mining operation is restricted within 567.087 ha of forest area for which diversion approval has been obtained. In addition, we have also submitted fresh DRP for remaining forest area of 32.425 ha.
3	The project proponent shall abide by the guidelines dated 01.02.2013 vide no. 1 362/12012-FC put in place by the FC Division of MoEF in respect of cases of mines where at	**Complied.** MoEF and CC has issued a Guideline F. No. 11-599/2014-FC, dated: 01.04.2015 in supersession of the Guideline F. No. 11-362/2012-FC, dated: 01.02.2013.

Sl. No.	EC Conditions	Compliance Status
Name of Project: Joda East Iron Mine of Tata Steel Limited. Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013. Period of Compliance: April 2024 to September 2024		
	present the forest clearance is available to only a part of the forest land involved in the mine	
4	Environmental clearance is subject to obtaining Clearance as may be necessary under the Wildlife (Protection) Act, 1972 from the competent authority	No specific clearance under the Wildlife (Protection) Act, 1972 is required for the project.
5	The project proponent shall obtain Consent to Establish and Consent to Operate from the State Pollution Control Board., Orissa and effectively implement all the conditions stipulated therein	**Complied.** CTE has been obtained from OSPCB vide letter no. 21271/IND-II- NOC-5144, dated: 08.07.2011. CTO has also been obtained from SPCB, Orissa vide letter No. 3521/IND-I-CON- 184, dtd: 08.03.2021.
6	The Company shall submit Within 3 months their policy towards Corporate Environment. Responsibility which should inter-alia provide for (i) Standard operating process /process to bring into focus any infringement /deviation /violation of the environmental or forest norms/conditions, (ii) Hierarchical system or Administrative order of the Company to deal with the environmental issues and for ensuring compliance With the EC conditions and (iii)System of reporting of non-compliances /violations of environmental norms to the Board of Directors of the company and / or Shareholders or stakeholders.	**Complied.** Details on Tata Steel's Policy on Corporate Environment Responsibility and other requirements have been submitted to the MoEF vide letter no.MD/ENV/233A/102/2 Dated. 8th June, 2013.
7	The mining operations shall be restricted to above ground water table and it should not intersect the groundwater table. In case of working below the ground water table, prior approval of the Ministry of Environment and Forests and the Central Ground Water Authority shall be obtained, for which a detailed hydrogeological study shall be carried out.	**Complied.** The mining operation is restricted to above GW table. The lowest working depth of our mine pits is at 580m RL, whereas the presence of ground water table has been estimated to be at 498.30m RL.

Sl. No.	EC Conditions	Compliance Status
Name of Project: Joda East Iron Mine of Tata Steel Limited. **Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013.** **Period of Compliance: April 2024 to September 2024**		
8	The project proponent shall ensure that no natural watercourse and/or water resources shall be obstructed due to any mining operations.	**Being Complied With.** No natural watercourse or water resources are obstructed due to our mining operations. Further, no first order or the second order streams are emanating.
9	The top soil, if any shall temporarily be stored at earmarked site(s) only and it should not be kept Unutilized for long. The topsoil shall be used for land reclamation and plantation.	**Being Complied With.** Since there is very little lateral expansion of mining operations topsoil generation is minimal. Topsoil generated before was stacked at earmarked place and has already been used for plantation purpose. Topsoil being generated is being used concurrently for plantation purpose.
10	As part of Ambient Air Quality monitoring during operational phase of the project the air samples shall also be analysed for their mineralogical composition and records maintained.	**Being Complied With.** As a part of Ambient Air Quality monitor during operational phase of the project the air is also analyzed for mineralogical composition. The report is maintained periodically.
11	The water recovery and spill way system shall be so designed that the natural water resources are not affected and that no spill water from the plant goes into the Kundra nallah or any other water body	**Being Complied With.** The slime is stored in the zero-discharge slime pond. The decanted water from the slime pond is completely recycled back to beneficiation plant within the mine, ensuring zero outside discharge.
12	The filter cake shall be disposed at the earmarked site, which shall be above highest water table and shall be lined to prevent any leaching from the filter cake disposal site into groundwater. Efforts shall also be made to gainfully utilize the filter	There is no filter cake generation in our operations.

Sl. No.	EC Conditions	Compliance Status
Name of Project: Joda East Iron Mine of Tata Steel Limited. Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013. Period of Compliance: April 2024 to September 2024		
	cake so generated in an environmentally compatible manner	
13	Effective safeguard measures such as conditioning of ore with water, regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around crushing and screening plant, loading and unloading point and transfer points. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.	**Being Complied With.** The detailed report on the compliance is attached as **Annexure- 1.**
14	The over burden (OB) generated during the mining operation shall be stacked at earmarked dump site(s) only and should not be kept active for long period. There shall be one external OB dump having maximum projected height of 30m with three terraces of 10m each. The overall slope of the dump shall not exceed 27°. The OB dump should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles shall be undertaken for stabilization of the dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of	**Being Complied With.** The detailed compliance to the condition is attached as **Annexure- 2.**

Sl. No.	EC Conditions	Compliance Status
Name of Project: Joda East Iron Mine of Tata Steel Limited. Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013. Period of Compliance: April 2024 to September 2024		
	Environment and Forests and its Regional Office Located at Bhubaneswar on six monthly basis.	
15	Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from mine working, 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 particularly after monsoon and maintained properly. Garland drain of appropriate size, gradient and length shall be constructed for both mine pit and OB dump and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of the garland drains and designed at regular intervals.	**Being Complied With.** Adequate catch drains and siltation ponds were provided. The photographs are attached as **Annexure- 3.** The project proponent shall practice suitable rainwater harvesting.
16	Dimension of the retaining wall at the toe of dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.	**Being Complied With.** Toe wall of adequate length and height has been constructed at all dumps and product stockpile to prevent any runoff. This is being effective to meet the purpose even during peak rainfall. Photographs of the same is attached as **Annexure- 4.**
17	Plantation shall be raised in an area of 11 ha including a 7.5m wide green belt in the safety zone around the mining lease by planting the native species around OB dump, reclaimed area, mine benches, along the roads etc. in consultation with the local DFO/Agriculture Department.	**Being Complied With.** Plantation has already been raised in an area of 11 ha including a 7.5m wide green belt in the safety zone around the mining lease by planting the native species around OB dump, reclaimed area etc. in consultation with the local DFO/Agriculture Department.

Sl. No.	EC Conditions	Compliance Status
Name of Project: Joda East Iron Mine of Tata Steel Limited. **Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013.** **Period of Compliance: April 2024 to September 2024**		
18	Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around crushing and screening plant loading and unloading point and transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.	**Being Complied With.** Effective measures are taken. The monitoring report attached as **Annexure- 5.**
19	The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with Regional Director, Central Ground Water Board.	**Complied.** The detailed compliance to the condition is attached as **Annexure- 6.**

Sl. No.	EC Conditions	Compliance Status
Name of Project: Joda East Iron Mine of Tata Steel Limited. **Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013.** **Period of Compliance: April 2024 to September 2024**		
20	Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The periodic monitoring (at least four times in a year – pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) once in in each season) shall be carried out in consultation with the State Ground Water Board/ Central Ground Water Authority and the data thus collected may be sent regularly to the Ministry of Environment and Forests and its Regional Director, Central Ground Water Board. If at any stage, it is observed that the ground water table is getting depleted due to the mining activity, necessary corrective measures shall be carried out	**Being Complied With.** Regular monitoring is done and reports are submitted. The report is attached as **Annexure- 7.**
21	The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water required for the project.	**Complied.** Joda East Iron mine has current surface water drawl permission of 8531 KLD which was granted from Office of Tahasildar: Barbil via Order No. 423/Dated Barbil the 16th Feb'1996.
22	The safeguard measures as suggested by the Central Ground Water Board vide letter No. 21-4(231)/CGWA/SER/2010-1010 dated 11.06.2010 shall be effectively implemented.	**Complied.** The safeguard measures as suggested by the Central Ground Water Board vide letter No. 21-4(231)/CGWA/SER/21010, dated: 11.06.2010 has been effectively implemented.

Sl. No.	EC Conditions	Compliance Status
Name of Project: Joda East Iron Mine of Tata Steel Limited. **Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013.** **Period of Compliance: April 2024 to September 2024**		
23	The project proponent shall practice suitable rainwater harvesting measures on long term basis and work out a detailed scheme for rainwater harvesting, in consultation with the Central Ground Water Authority and submit a copy of the same to the Ministry of Environment and Forests and its Regional Office, Bhubneswar.	**Complied.** The detailed compliance is attached as **Annexure- 8.**
24	Vehicular emission shall be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of minerals. The vehicles should be covered with a tarpaulin and shall not be overloaded.	**Being Complied With.** Regular vehicular emission testing is being conducted once in every 6 months. The vehicles those who do not meet the emission standard, are withdrawn from operation and maintained properly.
25	No blasting shall be carried out after the sunset. Blasting operation shall be carried out only during the daytime. Controlled blasting shall be practices. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.	**Being Complied With.** Blasting is carried out during daytime only. Controlled Blasting is carried out for control of ground vibrations and to arrest fly rocks, as per the recommendations of CIMFR, Dhanbad.
26	Drills shall either be operated with the dust extractors or equipped with water injection system.	**Complied.**

Sl. No.	EC Conditions	Compliance Status
Name of Project: Joda East Iron Mine of Tata Steel Limited. Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013. Period of Compliance: April 2024 to September 2024		
		Wet drilling is in practice and all drills are also provided with dust suppression system.
27	Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and Unloading area including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.	**Being Complied With.** Effective and high efficiency dust extraction systems are in place at the mineral handling plant. Loading and unloading areas including transfer points have been provided with dust suppression facility.
28	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for the Workshop and wastewater generated during the mining Operation.	**Complied.** The detailed compliance is attached as **Annexure-9.**
29	Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.	**Being Complied With.** Pre-placement medical examination and periodical examination of the workers engaged are being conducted and record maintained.

Sl. No.	EC Conditions	Compliance Status
Name of Project: Joda East Iron Mine of Tata Steel Limited. Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013. Period of Compliance: April 2024 to September 2024		
30	Provision shall be made for the housing of construction labour within the site with necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may in the form of temporary structures to be removed after the completion of the project.	All constructional activities for the project have been completed and there was no requirement for construction of temporary housing since the mine has permanent infrastructural facilities.
31	The project proponent shall take all precautionary measures during mining operation for conservation and Protection of endangered fauna namely elephant, sloth bear etc. spotted in the study area. All the safeguard measures brought out in the Wildlife Conservation Plan so prepared specific to this project site and approved by the Chief Conservator of Forest, (Wildlife) shall be effectively implemented. A copy of Wildlife Conservation Plan shall be submitted to the Ministry of Environment and Forest and its Regional Office Bhubaneswar.	**Being Complied With.** The detailed report of the compliance is attached as **Annexure- 10.**
32	The critical parameters such as RSPM (Particulate matter with size less than 10 micron i.e., PM10) and NO in the ambient air within the impact zone, peak particle Velocity at 300m distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further, quality of discharged water shall also be monitored [(TDS, DO, pH and total suspended solids (TSS)]. The monitored data shall be uploaded on the website of the Company as well as display on a display board at the project site at a suitable location near the main gate of the Company in public domain. The Circular No. J-20012/1/2006-IA.II(M) dated 27.05.2009 issued by Ministry of Environment and Forest which is available on the website of the Ministry	**Being Complied With.** The detailed compliance is attached as **Annexure-11.**

Sl. No.	EC Conditions	Compliance Status
Name of Project: Joda East Iron Mine of Tata Steel Limited. Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013. Period of Compliance: April 2024 to September 2024		
	www.envfor.nic.in shall also be referred in this regard for its compliance.	
33	A Final Mine closure Plan along with detail of Corpus fund shall be submitted to the Ministry of Environment and Forests 5 years in advance of final mine closure for approval.	**Being Complied With.** A progressive mine closure plan approved by IBM is in place. The final mine closure plan along with details of Corpus fund shall be submitted to the Ministry 5 years in advance.

General Conditions

Sl. No.	Condition	Compliance
Name of Project: Joda East Iron Mine of Tata Steel Limited. Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013. Period of Compliance: April 2024 to September 2024		
1	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment and Forests	**Being Complied With.** We are operating as per the approved mining technology and scope of working mentioned in EC granted to us and no change in mining technology and scope shall be done.
2	No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.	**Being Complied With.** Calendar plan (IBM Approved Mining Plan) prepared for the mine is being strictly adhered to and we are well within the limits specified in Mining Plan as well as EC and CTO granted capacity.

Sl. No.	Condition	Compliance
Name of Project: Joda East Iron Mine of Tata Steel Limited. **Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013.** **Period of Compliance: April 2024 to September 2024**		
3	At least four ambient air quality-monitoring stations should be established in the core Zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10 micron i.e. PM10) and NOx monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	**Complied.** Ambient air quality monitoring is regularly being carried out at four different stations within the core zone. The stations were located in consultation with the visiting officers of SPCB. AAQ monitoring report is attached as **Annexure- 12.**
4	Data on Ambient Air Quality (RSPM(particulate matter with size less than 10 micron i.e. PM10) and NOx] should be regularly submitted to the Ministry including its Regional office located at Bhubaneshwar and the State Pollution Control Board / Central Pollution Control Board once in six months	**Being Complied With.** The Ambient Air Quality reports are submitted to Regional office, MoEF, Bhubaneswar and SPCB Orissa, monthly and also once in every six months with this report as **Annexure- 13.**
5	Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points should be provided and properly maintained.	**Being Complied With.** Effective water sprinkling is being done on haul roads and at loading and unloading points. Dust suppression systems in the drills have been provided for effective functioning.
6	Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc should be provided with ear plugs / muffs	**Being Complied With.** High noise areas are earmarked and people working there are provided with ear protection equipment's and the system is ensured by certification to ISO 45001 and regular field audits.
7	Industrial waste water (workshop and waste water from the mine) should be properly collected, treated so as to conform to the	**Being Complied With.**

Sl. No.	Condition	Compliance
Name of Project: Joda East Iron Mine of Tata Steel Limited. **Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013.** **Period of Compliance: April 2024 to September 2024**		
	Standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	Oil & Grease separation pits have been provided to take care of effluents from the workshop. The same water quality is monitored regularly, and the parameters meet the prescribed standard.
8	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 program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.	**Being Complied With.** Adequate dust masks are provided to employees engaged in dusty areas. The employees are also given regular awareness training on safety and health aspects as part of implementation process of ISO 45001 systems.
9	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 Organization	**Complied.** A separate environmental management cell is in place with the people having relevant qualification or environmental science. The Head of the environmen department reports to General Manager.
10	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 the Ministry and its Regional Office located at Bhubaneswar.	**Being Complied With.** Funds allocated for environmental management are spent only for environment related purposes and not diverted to any other purpose.
11	The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closing and final	This is a running mine. No specific date for start of land development work can be assigned. However, the copy of the EC has been sent to the, RO, MoEF & CC, BBSR for kind information.

Sl. No.	Condition	Compliance
Name of Project: Joda East Iron Mine of Tata Steel Limited. Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013. Period of Compliance: April 2024 to September 2024		
	approval of the project by the concerned authorities and the date of start of land development work.	
12	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the Officer (s) of the Regional office by furnishing the requisite data / information / monitoring reports.	We extend full co- operation to the officers of the Regional Office during their visit and furnish the required data, information and monitoring reports.
13	The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office Bhubneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board. The proponent shall upload the status of compliance of the environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the Ministry of Environment and Forests, Bhubneswar, the respective Zonal Officer of CPCB and the SPCB.	**Being Complied With.** The reports on six monthly compliance is submitted religiously to the concerned offices.
14	A copy of the clearance letter shall be sent by the proponent to Concerned Panchayat, Zila Parisad / Municipal Corporation Urban Local Body and the Local NGO, if any, from whom suggestions/ representations if any, were received while processing the proposal. The Clearance letter shall also be put on the website of the Company by the proponent.	**Complied.** A copy of EC was given to MS, OSPCB and Addl. PCCF was given vide letter MD/ENV/104/102/2013 and MD/ENV/105/102/2013 respectively. EC also given to President, ZP Keonjhar and Chairman, Joda.

Sl. No.	Condition	Compliance
Name of Project: Joda East Iron Mine of Tata Steel Limited. **Clearance Letter No.: J-11015/215/2008-IA.II(M), Dated: 11.03.2013.** **Period of Compliance: April 2024 to September 2024**		
15	The State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and the Collector's office/ Tehsildar's Office for 30 days.	**Complied.** Compiled from State Pollution Control Board, Odisha.
16	The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Office of the Ministry of Environment and Forests, Bhubaneswar by email.	**Being Complied With.** The Annual Environmental statement is submitted religiously and also displayed on company website.
17	The project authority should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue 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 also at web site of the Ministry of Environment and Forests at http://envfor.nic.in and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar	Details of Environmental Clearance about Joda East Iron Mine was published in local newspapers (English Daily, New Indian Express and in oriya (Dainik Jagran) on 16.03.2013.

EC compliance vide letter no J-11015/215/2008-IA.II(M) dated: 7.09.2018

Sl. No.	EC Condition	Compliance Status
Name of Project: Joda East Iron Mine of Tata Steel Limited. Clearance Letter No.: J-11015/215/2008-IA.II(M) dated: 7.09.2018. Period of Compliance: April 2024 to September 2024		
1	The Environmental Clearance will not be operational till such time the project proponent complies with all the statutory requirements and judgement of Hon'ble Supreme Court dated the 2nd August 2017 in Writ Petition (Civil)No.114 of 2014 in the matter of common cause verses Union of India and Ors.	**Noted and is complied**
2	Department of Mining and Geology, State govt shall ensure that mining operation shall not commence till the entire compensation levied, for illegal mining paid by the project proponent through their respective department of mining geology in strict compliance of judgement of Hon'ble Supreme Court dated the 2nd August 2017 in Writ petition(Civil) No. 114 of 2014 in the matter of common cause versus union of India and Ors.	**Noted**
3	Monitoring of ambient air quality to be carried out based on the 2009 notification, as amended from time to time by the central pollution control board.	**Noted and is complied**
4	The pollution due to transportation load on the environment will be effectively controlled and water sprinkling will also be done regularly. Vehicles with PUCC only will be allowed to ply. The mineral transportation shall be carried out through covered trucks only and the vehicles carrying the mineral shall not be overloaded. Project should obtain PUC certificate for all the vehicles from authorized pollution testing center; washing of all transport vehicle should be done inside the mining lease.	**Not applicable** as 100 % mineral transportation is done through rails. And mineral transportation from mines to Railway wagon is done through closed conveyers.
5	The activities and budget earmarked for Environmental Responsibility (CER) shall be as per Ministry's O.M No. 22-65/2017-IA.II(M) dated 01.05.2018 and the action plan on the activities proposed under CER shall be submitted to the Regional Office of the Ministry and State Pollution Control Board.	**Not applicable.**

EC compliance vide letter no J-11015/215/2008-IA.II(M) dated: 29.07.2019

Sl. No.	EC Conditions	Compliance Status
Name of Project: Joda East Iron Mine of Tata Steel Limited. **Clearance Letter No.: J-11015/215/2008-IA.II(M) dated: 29.07.2019.** **Period of Compliance: April 2024 to September 2024**		
I	The mining activity will be restricted to the mine lease area for which the earlier EC is granted (i.e. (567.9087 ha (Forest Clearance available) + 62.187 ha= 629.274 ha.). Furthermore, no mining activity will be allowed in remaining forest land (41.819 ha) till PP get the forest clearance.	The present mining operation is restricted within 567.087 ha of forest land for which Forest Clearance has been obtained under the Forest (Conservation) Act, 1980 vide letter no. F. No. 8-32/1993-FC (vol-II), date: 24.09.2007
ii	PP mentioned that the processing of ore at beneficiation plant (old and proposed) will be same as the existing EC capacity (12 MTPA). Three beneficiation units shall be operated at maximum capacity of 5 MTPA for dry processing and 7 MTPA for wet processing (i.e. existing 2.4 MTPA capacity for processing high quality grade of ROM and proposed 4.6 MTPA capacity for processing low quality grade of ROM), respectively, in order, ensure that at any given time, the total beneficiation capacity from all three plants (old dry + old wet + proposed) should not exceed the granted EC capacity of 12 MTPA.	It is being ensured that at any given time, the total beneficiation capacity from all three plants (old dry + old wet + proposed) should not exceed the granted EC capacity of 12 MTPA.
iii	PP should submit an undertaking through affidavit that the total beneficiation capacity from all the three units shall not exceed the granted EC capacity of 12 MTPA at any given time. The operation of this EC amendment is subjected to submission of said affidavit.	This has been noted and complied. The undertaking through affidavit that the total beneficiation capacity from all the three units shall not exceed the granted EC capacity of 12 MTPA at any given time has been submitted.

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iv	State Pollution Control Board should ensure that the processing capacity of beneficiation plants (all three units) should not exceed the granted EC capacity of 12 MTPA at any given time.	**Noted and Agreed Upon.**
V	The amendment in EC shall be operational after submission of an undertaking through affidavit to MoEFandCC within 15 days of receipt of this letter, for compliance of all the conditions prescribed herein and mentioned in EC dated 11.03.2013 and 07.09.2018.	An undertaking through affidavit has been sent to MoEFandCC.

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1.	Project Proponent and Department of Steel Mines, Govt. of Odisha shall ensure the implementation of recommendations of carrying capacity study report conducted by CSIR-NEERI w.r.t mining proposal of Iron Ore and/or Manganese in the State of Odisha.	All efforts are being made to ensure the implementation of recommendations of carrying capacity study report conducted by CSIR-NEERI. Compliance status has been uploaded to i3ms website as well.
2.	Department of Steel and Mines, Govt. of Odisha should prepare 5 years regional plan for annual iron ore requirement from the state, which in turn shall be met from different mines/zones (e.g. Joda, Koira.) in the state. Accordingly, sustainable annual production (SAP) for each zone/mine may be followed adopting necessary environmental protection measures.	**Noted.**
3.	Project Proponent shall construct the cement concrete road from mine entrance and exit to the main road with proper drainage system	**Complied**.

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	and green belt development along the roads and also construction of road minimum 300 m inside the mine. This should be done within one year for existing mines and new mine should have since beginning. The Department of Steel and Mines, Govt. of Odisha should ensure the compliance and should not issue the Mining Permits, if mine lease holder has not constructed proper cement concrete road as suggested above.	Black top road from mine entrance and exit to the main road with proper drainage system and green belt development along the roads has already been constructed and also road minimum 300 m inside the mine is present.
4.	The Committee observed that as per the recommendations of NEERI report the PP need to ensure Regular vacuum cleaning of all mineral carrying roads aiming at "Zero Dust Resuspension" within 3 months for existing roads .	**Complied.** Since the Ore dispatch from mining lease is 100% through railway siding only hence, we don´t have any mineral carrying road other than the mining haul road. Regular water sprinkling through fixed and mobile water sprinklers are carried out on haul roads to minimize dust resuspension.
5.	Project Proponent shall monitor the environmental quality parameters as per EC and CTE/CTO conditions, and implementation of suggested measures for control of road dust and air pollution. Odisha State Pollution Control has to ensure the compliance of CTE/CTO. Regional office of the MOEFandCC, Bhubaneshwar shall monitor the compliance of the EC Conditions. Regional office of Indian Bureau of Mines (IBM) shall monitor the compliance of mining plan and progressive mine closure plan. Any violation by mine lease holder may invite actions per the provisions of the applicable acts.	**Complied** Continuous monitoring of different environmental quality parameters as per EC and CTE/CTO conditions with respect to air, noise, water (surface and ground water) and soil quality is already being done via third party agency and monthly reports are submitted to SPCB RO office.
6.	Project Proponent shall ensure the compliance of Suggested Ore Transport Mode (SOTM) with association of the State Government of Odisha. All existing Mines should ensure adoption of SOTM within the	**Complied** EC Capacity based Suggested Ore Transport Mode (SOTM) is 100% by private railway siding which is already in action.

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	next 5 years. New Mines or Mines seeking expansion should incorporate provisions of SOTM in the beginning itself and should have system in place within the next 5 years.	
7.	The State Govt. of Odisha shall ensure dust free roads in mining areas wherever the road transportation of mineral is involved. The road shoulder shall be paved with fence besides compliance with IRC guidelines. All the roads should have proper drainage system and apart from paving of entire carriage width the remaining right of way should have native plantation (dust capturing species). Further, the regular maintenance should also be ensured by the Govt. of Odisha. Progress on development of dust free roads, implementation of SOTM, increased use of existing rail network, development of additional railway network/conveyor belt/ pipelines etc. shall be submitted periodically to Regional Office of the MOEFandCC.	**Noted**
8.	Project Proponent shall develop the parking plazas for trucks with proper basic amenities/ facilities inside the mine. This should be done within one year for existing mines and new mines should have since beginning.	Not applicable as we don't have truck dispatch. All the dispatch is through railway siding only.
9.	Department of Steel andMine shall ensure the construction of NH 215 as minimum 4 lane road with proper drainage system and plantation and subsequent regular maintenance of the road as per IRC guidelines. Construction of other mineral carrying roads with proper width and drainage system along with road side	**Noted.**

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	plantation to be carried out. This shall be completed within 2 years.	
10.	Regular vacuum cleaning of all mineral carrying roads aiming at "Zero Dust Resuspension" shall be adopted by PWD / NHAI/ Mine Lease Holders within the time Period of3 months for existing roads.	**Complied.** Since the Ore dispatch from mining lease is 100% through railway siding only hence we don't have any mineral carrying road other than the mining haul road. Regular water sprinkling through fixed and mobile water sprinklers are carried out on haul roads to minimize dust resuspension.
11.	In case the total requirement of iron ore exceeds the suggested limit for that year, permission for annual production by an individual mine may be decided depending on approved EC capacity (for total actual dispatch) and actual production rate of individual mine during last year or any other criteria set by the State Govt., i.e. Dept. of Steel and Mines. Department of Steel and Mines in consultation with Indian Bureau of Mines-RO should prepare in advance mine- wise annual production scenario as suggested in Table, so that demand for iron ore can be anticipated, and actual production/dispatch does not exceed the suggested annual production.	**Noted**.
12.	RandD studies towards utilization of low- grade ore should be conducted through research/academic institutes like IMMT, Bhubaneswar, NML, Jamshedpur, and concerned metallurgical departments in IITs, NITs etc., targeting full utilization of low-grade iron ore (Fe content upto 45% by 2020 and upto 40% by 2025). In fact, life cycle assessment of whole process including environmental considerations should be done for techno-economic and	**Complied.** RandD studies are already going for commercial utilization of low grade ore. We are also in process of installation of 4.6 MTPA Low Grade iron ore Beneficiation plant for which the Environmental Clearance has been granted.

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	environmental viability. RandD studies utilization of mine wastewater having high concentration of Fe content for different commercial applications in industries such as cosmetics, pharmaceutical, paint industry should also be explored. Responsibility: IBM, Dept. of Steel and Mines, Individual Mine Lease Holders	
13.	The mining activity in Joda-Koira sector is expected to continue for another 100 years, therefore, it will be desirable to develop proper rail network in the region. Rail transport shall not only be pollution free mode but also will be much economical option for iron ore transport. The rail network and/or conveyor belt system upto public railway siding needs to be created. The total length of the conveyor belt system/ rail network to be developed from mines to nearest railway sidings by 11 mines in Joda region is estimated to be about 64 km. Similarly, in Koira region, total length of rail network/ conveyor system for 8 mines (under SOTM 1 and 2) is estimated to be around 95 km. Further, it is suggested to develop a rail network connecting Banspani (Jodaregion) and Roxy railway sidings in Koira region. Responsibility: Dept. of Steel and Mines, Govt. of Odisha and Concerned Mines along with Indian Railways. Time Period: Maximum 7 years (by 2025). The Department of Steel and Mines, Govt. of Odisha should follow-up with the concerned Departments and railways so that proposed proper rail network is in place by 2025.	**Noted.**

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14.	State Govt. of Odisha shall make all efforts to ensure exhausting all the iron and manganese ore resources in the existing working mines and from disturbed mining leases/zones in Joda and Koira region. The criteria suggested shall be applicable while suggesting appropriate lease area and sustainable mining rate. Responsibility: Dept. of Steel and Mines, Govt. of Odisha	**Noted and Agreed Upon**.
15.	**Mining Operations/Process Related:** Project Proponent shall implement the following mitigation measures: (i) Appropriate mining process and machinery (viz. right capacity, fuel efficient) should be selected to carry out various mining operations that generate minimal dust/air pollution, noise, wastewater and solid waste. e.g. drills should either be operated with dust extractors or equipped with water injection system. (ii) After commencement of mining operation, a study should be conducted to assess and quantify emission load generation (in terms of air pollution, noise, waste water and solid waste) from each of the mining activity (including transportation) on annual basis. Efforts should be made to further eliminate/ minimize generation of air pollution/dust, noise, wastewater, solid waste generation in successive years through use of better technology. This shall be ensured by the respective mine lease holders. (iii) Various machineries/equipment selected (viz. dumpers, excavators, crushers, screen plants etc.) and transport means should have optimum fuel/power	**Complied**

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	consumption, and their fuel/power consumption should be recorded on monthly basis. Further, inspection and maintenance of all the machineries/ equipment/ transport vehicles should be followed as per manufacturer's instructions/ recommended time schedule and record should be maintained by the respective mine lease holders. (iv) Digital processing of the entire lease area using remote sensing technique should be carried out regularly once in 3 years for monitoring land use pattern and mining activity taken place. Further, the extent of pit area excavated should also be demarcated based on remote sensing analysis. This should be done by ORSAC (Odisha Space Applications Centre, Bhubaneswar) or an agency of national repute or if done by a private agency, the report shall be vetted/ authenticated by ORSAC, Bhubaneswar. Expenses towards the same shall be borne by the respective mine lease holders.	
16)	**Air Environment Related**: Project Proponent shall implement the following mitigation measures: (i) Fugitive dust emissions from all the sources should be controlled regularly on daily basis. Water spraying arrangement on haul roads, loading and unloading and at other transfer points should be provided and properly maintained. Further, it will be desirable to use water fogging system to minimize water consumption. It should be ensured that the ambient air quality parameters conform to the norms prescribed by the CPCB in this regard.	**Applicable conditions are being Complied With.**

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	(ii) The core zone of mining activity should be monitored on daily basis. Minimum four ambient air quality monitoring stations should be established in the core zone for SPM, PM10, PM2.5, SO2, NOx and CO monitoring. Location of air quality monitoring stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board (based on Emission Load Assessment Study). The number of monitoring locations may be more for larger capacity mines and working in larger area. Out of four stations, one should be online monitoring station in the mines having more than 3 MTPA EC Capacity. (iii) Monitoring in buffer zone should be carried out by SPCB or through NABET accredited agency. In addition, air quality parameters (SPM, PM10, PM2.5, SO2, NOx and CO) shall be regularly monitored at locations of nearest human habitation including schools and other public amenities located nearest to source of the dust generation as applicable. (iv) Emissions from vehicles as well as heavy machinery should be kept under control and regularly monitored. Measures should be taken for regular maintenance of vehicles used in mining operations and in transportation of mineral. (v) The vehicles shall be covered with a tarpaulin and should not be overloaded. Further, possibility of 3 using closed container trucks should be explored for direct to destination movement of iron ore.	

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	Air quality monitoring at one location should also be carried out along the transport route within the mine (periodically, near truck entry and exit gate)	
17.	**Noise and Vibration Related**: Project Proponent shall implement the following mitigation measures: (i) Blasting operation should be carried out only during daytime. Controlled blasting such as Nonel, should be practiced. The mitigation measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented. (ii) Appropriate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs/muffs. (iii) Noise levels should be monitored regularly (on weekly basis) near the major sources of noise generation within the core zone. Further, date, time and distance of measurement should also be indicated with the noise levels in the report. The data should be used to map the noise generation from different activities and efforts should be made to maintain the noise levels with the acceptable limits of CPCB (CPCB, 2000) (iv) Similarly, vibration at various sensitive locations should be monitored at least once in month and mapped for any significant changes due to successive mining operations.	**Being Complied With.**
18.	**Water/Wastewater Related:** Project Proponent shall implement the following mitigation measures	**Being Complied With.**

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	(i) In general, the mining operations should be restricted to above ground water table and it should not intersect groundwater table. However, if enough resources are estimated below the ground water table, the same may be explored after conducting detailed geological studies by GSI and hydro-geological studies by CGWB or NIH or institute of national repute, and ensuring that no damage to the land stability/ water aquifer system shall happen. The details/ outcome of such study may be reflected/incorporated in the EIA/EMP report of the mine appropriately. (ii) Natural watercourse and/or water resources should not be obstructed due to any mining operations. Regular monitoring of the flow rate of the springs and perennial nallas should be carried out and records should be maintained. Further, regular monitoring of water quality of nallas and river passing thorough the mine lease area (upstream and downstream locations) should be carried out on monthly basis. (iii) Regular monitoring of ground water level and its quality should be carried out within the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring should be carried out on monthly basis. (iv) In order to optimize water requirement, suitable conservation measures to augment ground water resources in the area should be undertaken in consultation with Central Ground Water Board (CGWB). (v) Suitable rainwater harvesting measures on long term basis should be planned and	

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	implemented in consultation with CGWB, to recharge the ground water source. Further, CGWB can prepare a comprehensive plan for the whole region. (vi) Appropriate mitigation measures (viz. ETP, STP, garland drains, retaining walls, collection of runoff etc.) should be taken to prevent pollution of nearby river/other water bodies. Water quality monitoring study should be conducted by State Pollution Control Board to ensure quality of surface and ground water sources on regular basis. The study can be conducted through NABL/ NABET approved water testing laboratory. However, the report should be vetted by SPCB. (vii) Industrial wastewater (workshop and wastewater from the mine) should be properly collected, treated in ETP so as to conform to the discharge standards applicable. viii) Oil and grease trap should be installed before discharge of workshop effluents. Further, sewage treatment plant should be installed for the employees/colony, wherever applicable. (ix) Mine lease holder should ensure that no silt originating due to mining activity is transported in the surface water course or any other water body. Appropriate measures for prevention and control of soil erosion and management of silt should be undertaken. Quantity of silt/soil generated should be measured on regular basis for its better utilization. (x) Erosion from dumps site should be protected by providing geo-textile matting	

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	or other suitable material, and thick plantation of native trees and shrubs should be carried out at the dump slopes. Further, dumps should be protected by retaining walls. (xi) Trenches / garland drain should be constructed at the foot of dumps to arrest silt from being carried to water bodies. Adequate number of check dams should be constructed across seasonal/perennial nallas (if any) flowing through the mine lease areas and silt be arrested. De-silting at regular intervals should be carried out and quantity should be recorded for its better utilization, after proper soil quality analysis. (xii) The water so collected in the reservoir within the mine should be utilized for the sprinkling on hauls roads, green belt development etc. (xiii) There should be zero waste water discharge from the mine. Based on actual water withdrawal and consumption/ utilization in different activities, water balance diagram should be prepared on monthly basis, and efforts should be made to optimize consumption of water per ton of ore production in successive years. Responsibility: Individual Mine Lease Holders, SPCB and CGWB.	
19.	**Land/ Soil/ Overburden Related:** Project proponent shall implement the following mitigation measures: (i) The top soil should temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long (not more than 3 years or as per provisions mentioned in the	**Being Complied With.**

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	mine plan/ scheme). The topsoil should be used for land reclamation and plantation appropriately. (ii) Fodder plots should be developed in the non-mineralised area in lieu of use of grazing land, if any. (iii) Over burden/ low grade ore should be stacked at earmarked dump site(s) only and should not be kept active for long period. The dump height should be decided on case to case basis, depending on the size of mine and quantity of waste material generated. However, slope stability study should be conducted for larger heights, as per IBM approved mine plan and DGMS guidelines. The OB dump should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles should be undertaken for stabilization of the dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Proper records should be maintained regarding species, their growth, area coverage etc. "(iv) Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from mine operation, soil, OB and mineral dumps. The water so collected can be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly de-silted, particularly after monsoon and should be maintained properly. Appropriate documents should be maintained. Garland drain of appropriate size, gradient and length should be constructed for mine pit, soil. OB and mineral dumps and sump capacity should be	

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	designed with appropriate safety margin based oEXn long term rainfall data. Sump capacity should be provided for adequate retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of the garland drains and de-silted at regular intervals." (v) Backfilling should be done as per approved mining plan/scheme. There should be no OB dumps outside the mine lease area. The backfilled area should be afforested, aiming to restore the normal ground level. Monitoring and management of rehabilitated areas should continue till the vegetation is established and becomes self-generating. (vi) Hazardous waste such as, waste oil, lubricants, resin, and coal tar etc. should be disposed off as per provisions of Hazardous Waste Management Rules, 2016, as amended from time to time. Responsibility: Individual Mine Lease Holder.	
20.	**Ecology/Biodiversity (Flora-Fauna) Related**: Project Proponent shall implement the following mitigation measures. (i) All precautionary measures should be taken during mining operation for conservation and protection of endangered fauna namely elephant, sloth bear etc. spotted in the study area. Action plan for conservation of flora and fauna should be prepared and implemented in consultation with the State Forest and Wildlife Department within the mine lease area, whereas outside the mine lease area, the same should be maintained by State Forest Department.	**Being Complied With.** All precautionary measures towards conservation and protection of endangered flora and fauna is being taken.

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	(ii) Afforestation is to be done by using local and mixed species saplings within and outside the mining lease area. The reclamation and afforestation is to be done in such a manner like exploring the growth of fruit bearing trees which will attract the fauna and thus maintaining the biodiversity of the area. As afforestation done so far is very less, forest department needs to identify adequate land and do afforestation by involving local people in a time bound manner. (iii) Green belt development carried out by mines should be monitored regularly in every season and parameters like area under vegetation/plantation, type of plantation, type of tree species /grass species/scrubs etc., distance between the plants and survival rate should be recorded. (iv) Green belt is an important sink of air pollutants including noise. Development of green cover in mining area will not only help reducing air and noise pollution but also will improve the ecological conditions and prevent soil erosion to a greater extent. Further, selection of tree species for green belt should constitute dust removal/dust capturing plants since plants can act as efficient biological filters removing significant amounts of particulate pollution. Thus, the identified native trees in the mine area may be encouraged for plantation. Tree species having small leaf area, dense hair on leaf surface (rough surface), deep channels on leaves should be included for plantation.	

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	(v) Vetiver plantation on inactive dumps may be encouraged as the grass species has high strength of anchoring besides medicinal value. (vi) Details of compensatory afforestation done should be recorded and documented by respective forest divisions, and State Forest Department should present mine-wise annual status, along with expenditure details. Responsibility: Individual Mine Lease Holders and State Forest and Wildlife department.	
21	**Socio-Economic Related:** Project Proponent shall implement the following mitigation measures: (i) Public interaction should be done on regular basis and social welfare activities should be done to meet the requirements of the local communities. Further, basic amenities and infrastructure facilities like education, medical, roads, safe drinking water, sanitation, employment, skill development, training institute etc. should be developed to alleviate the quality of life of the people of the region. (ii) Land outees and land losers/affected people, if any, should be compensated and rehabilitated as per the national/state policy on Resettlement and Rehabilitation. (iii) The socio-economic development in the region should be focused and aligned with the guidelines/initiatives of Govt. of India/ NITI Aayog / Hon'ble Prime Minister's Vision centring around prosperity, equality,	**Being Complied With.**

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	justice, cleanliness, transparency, employment, respect to women, hope etc. This can be achieved by providing adequate and quality facilities for education, medical and developing skills in the people of the region. District administration in association with mine lease holders should plan for "Samagra Vikas" of these blocks well as other blocks of the district. While planning for different schemes in the region, the activities should be prioritized as per Pradhan Mantri Khanij Kshetra Kalyan Yojna (PMKKKY). Notified by Ministry of Mines, Govt. of India, vide letter no. 16/7/2017- M.VI part dated September 16, 2015. Responsibility: District Administration and Individual Mine lease holder.	
22.	**Road Transport Related:** Project Proponent shall implement the following mitigation measures: (i) All the mine lease holders should follow the suggested ore transport mode (SOTM), based on its d (ii) The mine lease holders should ensure construction of cement road of appropriate width from and to the entry and exit gate of the mine, as suggested in Chapter 10. Further, maintenance of all the roads should be carried out as per the requirement to ensure dust free road transport. (iii) Transportation of ore should be done by covering the trucks with tarpaulin or other suitable mechanism so that no spillage of ore/dust takesplace. Further, air quality in terms of dust, PM10 should be monitored near the roads towards entry and exit gate on	**Complied.**

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	regular basis, and be maintained within the acceptable limits**.** **Responsibility:** Individual Mine Lease Holders and Department of Steel and Mines.	
23.	Occupational Health Related: Project Proponent shall implement the following mitigation measures (i) 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 periodically. (ii) Occupational health surveillance program for all the employees/workers (including casual workers) should be undertaken periodically (on annual basis) to observe any changes due to exposure to dust, and corrective measures should be taken immediately, if needed. (iii) Occupational health and safety measures related awareness programs including identification of work-related health hazard, training on malaria eradication, HIV and health effects on exposure to mineral dust etc., should be carried out for all the workers on regular basis. A full-time qualified doctor should be engaged for the purpose. Periodic monitoring (on 6 monthly basis) for exposure to respirable minerals dust on the workers should be conducted, and record should be maintained including health record of all the workers. Review of impact of various health measures undertaken (at an interval of 3 years or less) should be conducted followed by follow-up of actions, wherever required. Occupational health	**Being Complied With.**

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	centre should be established near mine site itself. Responsibility: Individual Mine Lease Holders and District Administration (District Medical Officer).	

List of Annexures enclosed

Sr. No.	Annexures
1.	Annexure- 1- Air Quality Management
2.	Annexure- 2- OB Dump Management
3.	Annexure- 3- Photographs of Catch drain and Siltation pond
4.	Annexure- 4- Photographs of Toe Walls, Garland drains and Settling Pits
5.	Annexure- 5- Air quality monitoring report core-buffer zone
6.	Annexure- 6- Ground Water Augmentation
7.	Annexure- 7- Groundwater quality report
8.	Annexure- 8- Rain Water Harvesting
9.	Annexure- 9- Sewage treatment plant
10.	Annexure- 10- Conservation of flora and fauna
11.	Annexure- 11- Air quality display board
12.	Annexure- 12- Air quality monitoring report core-buffer zone
13.	Annexure- 13- Air quality monitoring report core-buffer zone
14.	Annexure- 14- Annexure-14- Environment Expenditure

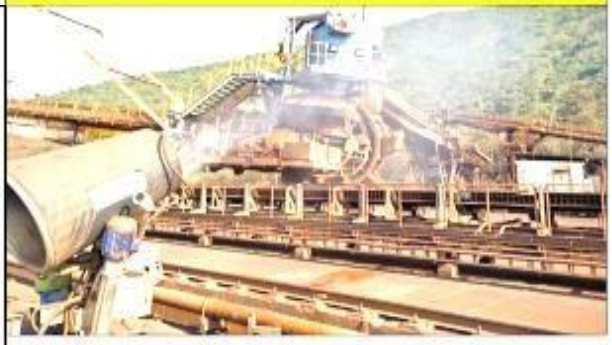
Annexure- 1

Air Quality Management: JEIM

Effective safeguard measures such as conditioning of ore with water, regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around crushing and screening plant, loading and unloading point and transfer points. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.	**Being Complied With.** For dust Suppression effective safeguard measures such as regular water sprinkling on the haul roads, loading & unloading points is being done. Fixed water sprinklers of cumulative length over 3 Km have been installed on main and arterial haul roads and in addition two Komatsu HD 465-7 Water Carts of capacity 50 KL & one 28 KL Water Cart of Caterpillar make have been pressed into service for suppression of fugitive dust. Dust suppressants are added to sprinkling water for effective dust suppression. Photographs of Mobile and Fixed water sprinklers, mist canon is attached. All transfer points are equipped with dry fog water sprinkling arrangement. Ambient Air Quality is monitored regularly, and the results are well within the limits prescribed. The results are also sent to the OSPCB office, reports are also attached**.** Results are also sent to the OSPCB office, Bhubaneswar once in every month.

Use of fixed water sprinklers at haul roads for dust suppression

Use of water Mist Canon for dust suppression



Use of Dry fog system at all transfer points in plants

Use of mobile tankers for water sprinkling on haul roads

JODA EAST IRON MINE

AVERAGE AIR QUALITY REPORT (CORE ZONE)

Month	Manmora Slime Dam					Near Rainwater Harvesting					Near Magazine					Near Equipment Maintenance				
	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO
Apr 24	69.4	26.4	11.8	23.0	BDL	60.0	21.4	10.6	19.5	BDL	65.9	28.8	12.0	27.0	BDL	64.4	27.9	12.1	20.7	BDL
May 24	67.9	23.9	12.4	21.6	BDL	61.6	22.2	11.2	20.7	BDL	67.7	27.6	11.6	22.9	BDL	63.6	28.8	11.7	25.0	BDL
Jun 24	62.1	23.2	11.2	22.2	BDL	59.2	20.3	9.6	20.3	BDL	63.9	25.6	11.5	23.4	BDL	59.9	24.2	11.0	21.0	BDL
Jul 24	55.6	21.5	11.1	20.5	BDL	51.2	21.4	10.1	20.3	BDL	55.7	21.9	11.2	20.2	BDL	58.4	22.0	10.3	18.7	BDL
Aug 24	60.2	22.7	10.5	20.6	BLQ	50.9	20.2	11.6	19.2	BLQ	50.9	20.2	11.6	19.2	BLQ	59.4	24.9	11.3	20.7	BLQ
Sept 24	59.3	24.6	11.6	22.7	BLQ	51.8	18.6	10.9	19.0	BLQ	60.0	23.6	13.1	23.1	BLQ	54.3	22.4	11.3	21.6	BLQ

BDL - BDL (DL-0.5)

AVERAGE AIR QUALITY REPORT (BUFFER ZONE)

Month	Baneikela					Lohanda					Khuntpani					Joda Hospital				
	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO
Apr 24	60.1	18.0	7.2	16.1	BDL	60.6	19.9	12.1	18.2	BDL	59.8	17.9	10.4	17.1	BDL	54.9	18.1	7.5	17.8	BDL
May 24	60.0	18.1	8.0	17.1	BDL	60.5	20.0	11.0	17.6	BDL	60.0	20.5	9.0	17.8	BDL	52.2	17.9	7.9	18.8	BDL
Jun 24	57.3	16.9	7.6	18.4	BDL	55.2	16.9	10.1	16.9	BDL	55.7	16.3	7.0	16.5	BDL	51.1	17.0	7.2	18.9	BDL
Jul 24	49.2	17.5	8.2	17.1	BDL	49.6	17.7	9.1	16.3	BDL	50.1	17.0	8.2	16.0	BDL	49.4	17.7	10.3	17.0	BDL
Aug 24	46.1	16.3	7.9	16.9	BLQ	51.0	18.0	8.9	16.7	BLQ	50.6	16.3	7.0	15.4	BLQ	51.1	18.0	10.4	17.0	BLQ
Sept 24	49.6	17.2	8.9	17.0	BLQ	49.2	16.9	7.2	16.2	BLQ	49.3	17.1	7.2	15.1	BLQ	50.5	18.1	10.9	17.8	BLQ

Unit of measurement for all parameters except CO is µg/m^3. Co is in mg/m^3

Manager Environment
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Manage (Environment), OMQ

OB Dump Management: JEIM

The over burden (OB) generated during the mining operation shall be stacked at earmarked dump site(s) only and should not be kept active for long period. There shall be one external OB dump having maximum projected height of 30m with three terraces of 10m each. The overall slope of the dump shall not exceed 27°. The OB dump should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles shall be undertaken for stabilization of the dump. Monitoring and management of rehabilitated areas 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 six monthly basis.	**Being Complied With.** The OB and mineral rejects are being dumped as per the approved mining plan and at earmarked dumping area only. The slopes of the OB dumps are terraced and the overall slope is maintained so as to not exceed 27°. The inactive dump slopes are vegetated with native species. In critical areas, use of geo textiles has been undertaken for stabilization of the dump. The compliance status report is regularly sent to the Regional office, MoEF, Bhubaneswar and SPCB, Orissa once in every six months. OB dump Plantation has been shown.

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Garland Drains, Toe Walls, Settling Pits: JEIM

Shubham
Manager Environment
JEIM
TATA STEEL LTD.

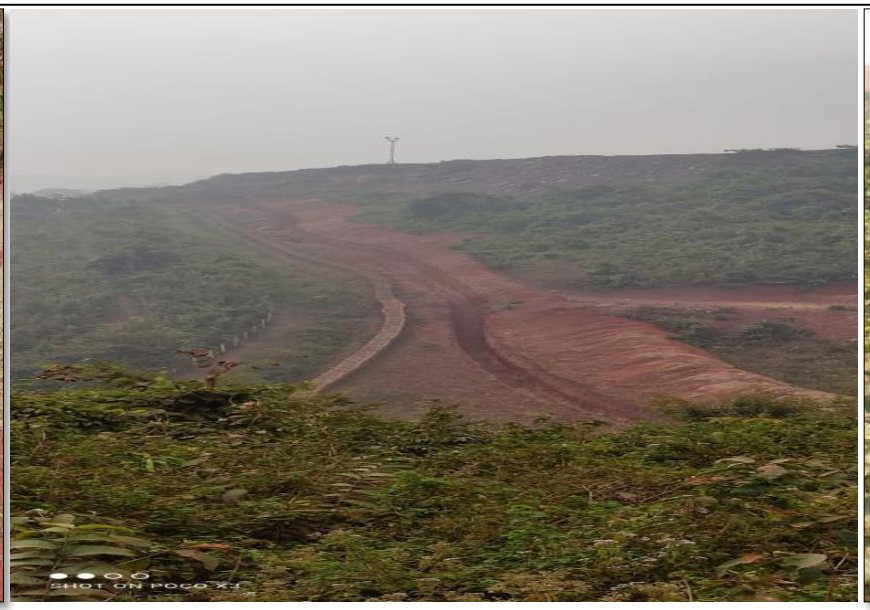
Garland Drains, Toe Walls, Settling Pits: JEIM

Annexure- 4

Settling pit

Garland Drain

Toe wall



Annexure- 5

JODA EAST IRON MINE

AVERAGE AIR QUALITY REPORT (CORE ZONE)

Month	Manmora Slime Dam					Near Rainwater Harvesting					Near Magazine					Near Equipment Maintenance				
	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO
Apr 24	69.4	26.4	11.8	23.0	BDL	60.0	21.4	10.6	19.5	BDL	65.9	28.8	12.0	27.0	BDL	64.4	27.9	12.1	20.7	BDL
May 24	67.9	23.9	12.4	21.6	BDL	61.6	22.2	11.2	20.7	BDL	67.7	27.6	11.6	22.9	BDL	63.6	28.8	11.7	25.0	BDL
Jun 24	62.1	23.2	11.2	22.2	BDL	59.2	20.3	9.6	20.3	BDL	63.9	25.6	11.5	23.4	BDL	59.9	24.2	11.0	21.0	BDL
Jul 24	55.6	21.5	11.1	20.5	BDL	51.2	21.4	10.1	20.3	BDL	55.7	21.9	11.2	20.2	BDL	58.4	22.0	10.3	18.7	BDL
Aug 24	60.2	22.7	10.5	20.6	BLQ	50.9	20.2	11.6	19.2	BLQ	50.9	20.2	11.6	19.2	BLQ	59.4	24.9	11.3	20.7	BLQ
Sept 24	59.3	24.6	11.6	22.7	BLQ	51.8	18.6	10.9	19.0	BLQ	60.0	23.6	13.1	23.1	BLQ	54.3	22.4	11.3	21.6	BLQ

BDL - BDL (DL-0.5)

AVERAGE AIR QUALITY REPORT (BUFFER ZONE)

Month	Baneikela					Lohanda					Khuntpani					Joda Hospital				
	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO
Apr 24	60.1	18.0	7.2	16.1	BDL	60.6	19.9	12.1	18.2	BDL	59.8	17.9	10.4	17.1	BDL	54.9	18.1	7.5	17.8	BDL
May 24	60.0	18.1	8.0	17.1	BDL	60.5	20.0	11.0	17.6	BDL	60.0	20.5	9.0	17.8	BDL	52.2	17.9	7.9	18.8	BDL
Jun 24	57.3	16.9	7.6	18.4	BDL	55.2	16.9	10.1	16.9	BDL	55.7	16.3	7.0	16.5	BDL	51.1	17.0	7.2	18.9	BDL
Jul 24	49.2	17.5	8.2	17.1	BDL	49.6	17.7	9.1	16.3	BDL	50.1	17.0	8.2	16.0	BDL	49.4	17.7	10.3	17.0	BDL
Aug 24	46.1	16.3	7.9	16.9	BLQ	51.0	18.0	8.9	16.7	BLQ	50.6	16.3	7.0	15.4	BLQ	51.1	18.0	10.4	17.0	BLQ
Sept 24	49.6	17.2	8.9	17.0	BLQ	49.2	16.9	7.2	16.2	BLQ	49.3	17.1	7.2	15.1	BLQ	50.5	18.1	10.9	17.8	BLQ

Unit of measurement for all parameters except CO is µg/m^3. Co is in mg/m^3

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Annexure- 6

Ground water Augmentation: JEIM

The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with Regional Director, Central Ground Water Board.	**Complied.** We have submitted Rainwater Harvesting Scheme to CGWB vide letter no. MD/ENV/214/102/2013, dated: 31.05.2013 and same was forwarded to CGWA by CGWB for necessary action vide letter no. 5-22/SER/CGWA/2013-539, dated: 17.06.2013. Rainwater harvesting structures has been constructed at the mine site by the engagement of expertise of M/s. KRG Rainwater Foundation, Chennai and is operational. Photograph of Rain water harvesting pond at JEIM and Joda town is attached**.**

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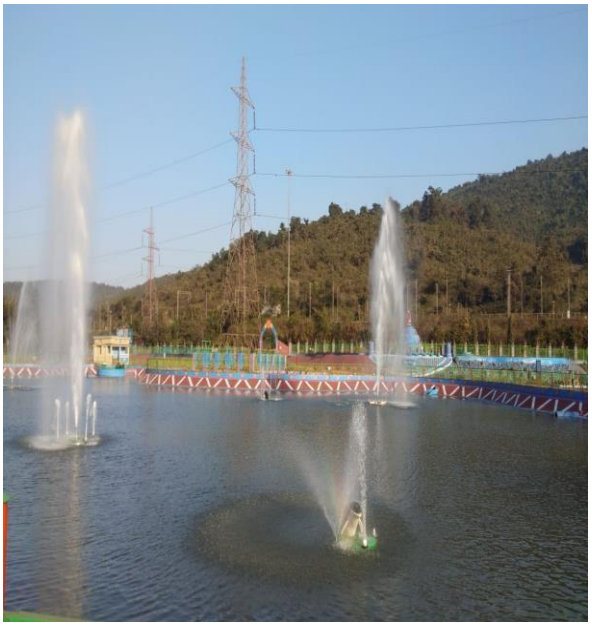
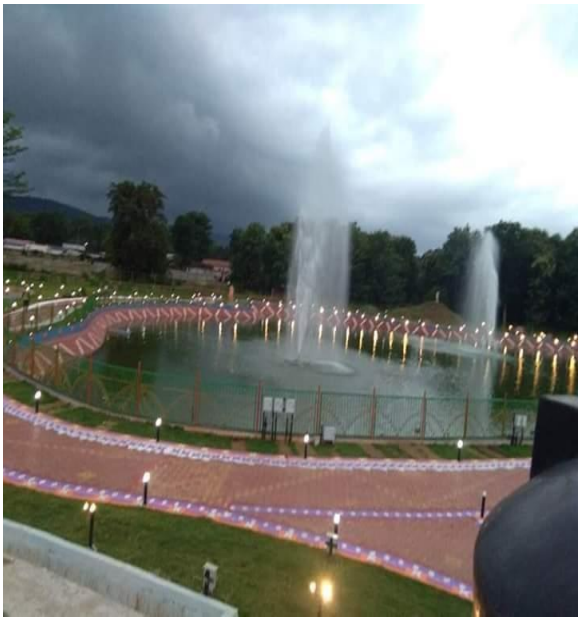
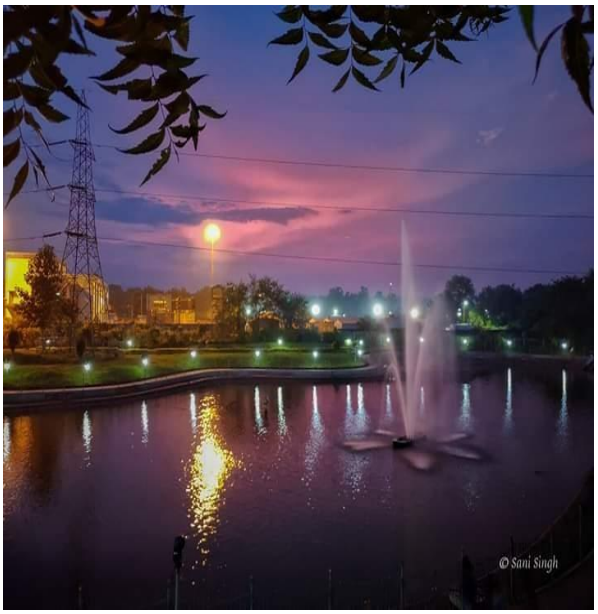
TATA STEEL LTD.

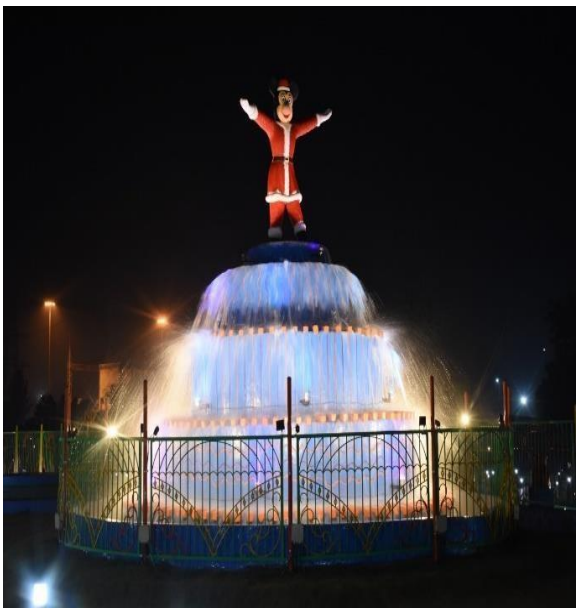
Rain Water Harvesting Structure Developed

Joda East Iron Mine, Tata Steel Ltd









GROUND WATER QUALITY REPORT (APRIL 2024 TO SEPTEMBER 2024) ANNEXURE-7

JODA EAST IRON MINE

May 2024

	Prameter	Komar Joda Village (Nr. Road Side)	Banaikala Village (Gov.)	Hudi Sahi Village (Mr. Jagbandhu Nayak)	Ramjan Hutting Basti	Khuntapani Village (Nr. School)	JEIM - Nr. Chief Office	JEIM - Nr. RC Gate
I	**Biological Testing 1.Water**							
1	*Escherichia coli*	Absent	Absent	Absent	Absent	Absent	Absent	Absent
II	**Chemical Testing 1.Water**							
2	Total Alkalinity (as $CaCO_3$)	143.52	138.92	161.82	156.39	184.39	197.26	157.81
3	Anionic surface active agents (as MBAS)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
4	Colour	1	1	1	1	1	1	1
5	Cyanide (as CN)	BDL (DL – 0.005)	BDL (DL – 0.005)	BDL (DL – 0.005)	BDL (DL – 0.005)	BDL (DL – 0.005)	BDL (DL – 0.005)	BDL (DL – 0.005)
6	Chloride (as Cl)	21.94	23.58	26.43	21.43	26.59	32.58	26.43
7	Calcium (as Ca)	43.58	51.29	43.71	49.26	52.17	52.61	48.39
8	Free residual chlorine	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)
9	Fluoride (as F)	0.16	0.18	0.21	0.18	0.16	0.27	0.21
10	Magnesium (as Mg)	12.68	13.67	12.58	11.64	13.27	13.94	14.52
11	Nitrate (as NO_3)	4.71	BDL(DL-2)	BDL(DL-2)	BDL(DL-2)	BDL(DL-2)	BDL(DL-2)	5.93
12	Odor	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
13	pH	8.16	7.93	6.87	7.21	7.18	7.31	7.28
14	Phenolic compounds (as C6H5OH)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)
15	Sulphate (as SO_4)	12.68	9.52	9.36	11.46	9.17	11.64	13.68
16	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
17	Total dissolved solids	471	451	471	428	468	487	487
18	Turbidity	0.7	0.3	BDL (DL – 0.1)	0.7	0.4	0.6	0.3
19	Total hardness (as $CaCO_3$)	161.02	184.36	160.94	170.95	184.92	188.77	180.61
II	**Chemical Test 2. Residues In Water**							
20	Arsenic (as As)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
21	Aluminum (as Al)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)
22	Barium (as Ba)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)
23	Boron (as B)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)
24	Copper (as Cu)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)
25	Cadmium (as Cd)	BDL (DL - 0.002)	BDL (DL - 0.002)	BDL (DL - 0.002)	BDL (DL - 0.002)	BDL (DL - 0.002)	BDL (DL - 0.002)	BDL (DL - 0.002)
26	Iron (as Fe)	0.26	0.13	0.28	0.09	0.28	0.26	0.18
27	Lead (as Pb)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
28	Manganese (as Mn)	BDL (DL – 0.02)	BDL (DL – 0.02)	BDL (DL – 0.02)	BDL (DL – 0.02)	BDL (DL – 0.02)	BDL (DL – 0.02)	BDL (DL – 0.02)
29	Mercury (as Hg)	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)

Manager Environment
JEIM
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GROUND WATER QUALITY REPORT (APRIL 2023 TO SEPTEMBER 2023)
JODA EAST IRON MINE
May 2024

Parameter		Komar Joda Village (Nr. Road Side)	Banaikala Village (Gov.)	Hudi Sahi Village (Mr. Jagbandhu)	Ramjan Hutting Basti	Khuntapani Village (Nr. School)	JEIM - Nr. Chief Office	JEIM - Nr. RC Gate
29	Selenium (as Se)	BDL (DL-0.01)	BDL (DL-0.01)	BDL (DL-0.01)	BDL (DL-0.01)	BDL (DL-0.01)	BDL (DL-0.01)	BDL (DL-0.01)
31	Total Chromium (as Cr)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)
32	Zinc (as Zn)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)
33	Polynuclear aromatic hydrocarbon PAH	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)
34	Mineral Oil	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)
II	**Pesticide Residues Organochlorine**							
i	Alpha-HCH	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
ii	Beta HCH	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
iii	Gamma - HCH (Lindane)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
iv	Delta- HCH	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
v	Alachlor	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
vi	Aldrin	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
vii	Dieldrin	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
viii	Butachlor	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
ix	p,p´-DDE	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
x	o,p´-DDE	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xi	p,p´-DDD	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xii	o,p´-DDD	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xiii	o,p´- DDT	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xiv	p,p´- DDT	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xv	Monocrotophos	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xvi	Atrazine	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xvii	Parathion Methyl	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xviii	Paraoxon methyl	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xix	Malathion	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xx	Malaoxon	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xxi	Ethion	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xxii	Chlorpyrifos	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)

Manager Environment
JEIM
TATA STEEL LTD.

GROUND WATER QUALITY REPORT (APRIL 2023 TO SEPTEMBER 2023)

JODA EAST IRON MINE

August 2024

	Prameter	Komar Joda Village (Nr. Road Side)	Banaikala Village (Gov.)	Hudi Sahi Village (Mr. Jagbandhu Nayak)	Ramjan Hutting Basti	Khuntapani Village (Nr. School)	JEIM - Nr. Chief Office	JEIM - Nr. RC Gate
I	**Discipline : Biological**							
1	*Escherichia coli*	Absent	Absent	Absent	Absent	Absent	Absent	Absent
II	**Discipline : Chemical**							
2	Total Alkalinity (as $CaCO_3$)	182.94	156.29	162.94	176.31	152.91	147.68	191.26
3	Anionic surface active agents (as MBAS)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)
4	Colour	2	BLQ (LOQ-1)	2	1.8	1.7	BLQ (LOQ-1)	2
5	Cyanide (as CN)	BLQ (LOQ-0.005)	BLQ (LOQ-0.005)	BLQ (LOQ-0.005)	BLQ (LOQ-0.005)	BLQ (LOQ-0.005)	BLQ (LOQ-0.005)	BLQ (LOQ-0.005)
6	Chloride (as Cl)	32.64	28.43	28.46	27.93	21.47	21.53	32.67
7	Calcium (as Ca)	51.29	47.36	47.39	51.37	52.61	43.91	47.39
8	Free residual chlorine	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)
9	Fluoride (as F)	0.26	0.18	0.18	0.16	0.16	0.17	0.14
10	Magnesium (as Mg)	12.68	11.37	11.64	9.57	8.27	12.64	12.67
11	Nitrate (as NO_3)	4.17	BDL(DL-2)	5.17	7.24	4.3	6.27	7.21
12	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
13	pH	7.82	6.92	8.16	7.21	7.91	7.18	6.91
14	Phenolic compounds (as C6H5OH)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)
15	Sulphate (as SO_4)	9.21	8.24	9.31	8.41	8.37	7.39	12.64
16	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
17	Total dissolved solids	428	453	462	437	416	417	472
18	Turbidity	0.4	0.3	0.6	0.3	0.6	0.7	0.6
19	Total hardness (as $CaCO_3$)	180.30	165.09	166.28	167.73	165.49	161.68	170.51
III	**Discipline : Chemical**							
20	Arsenic (as As)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)
21	Aluminium (as Al)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)
22	Barium (as Ba)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)
23	Boron (as B)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)
24	Copper (as Cu)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)
25	Cadmium (as Cd)	BLQ (LOQ-0.002)	BLQ (LOQ-0.002)	BLQ (LOQ-0.002)	BLQ (LOQ-0.002)	BLQ (LOQ-0.002)	BLQ (LOQ-0.002)	BLQ (LOQ-0.002)
26	Iron (as Fe)	0.21	0.18	0.26	0.23	0.24	0.16	0.24
27	Lead (as Pb)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)
28	Manganese (as Mn)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)

Manager Environment
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GROUND WATER QUALITY REPORT (APRIL 2024 TO SEPTEMBER 2024)
JODA EAST IRON MINE
AUGUST 2024

	Prameter	Komar Joda Village (Nr. Road Side)	Banaikala Village (Gov.)	Hudi Sahi Village (Mr. Jagbandhu)	Ramjan Hutting Basti	Khuntapani Village (Nr. School)	JEIM - Nr. Chief Office	JEIM - Nr. RC Gate
29	Mercury (as Hg)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)
30	Selenium (as Se)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)
31	Total Chromium (as Cr)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)
32	Zinc (as Zn)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)
33	Polynuclear aromatic hydrocarbon (PAH)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
IV	**Discipline : Chemical**							
34	Mineral Oil	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)
V	**Discipline : Chemical**							
i	Alpha-HCH	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)
ii	Beta HCH	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
iii	Gamma - HCH (Lindane)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
iv	Delta- HCH	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
v	Alachlor	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
vi	Aldrin	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
vii	Dieldrin	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
viii	Butachlor	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
ix	p,p´-DDE	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
x	o,p´-DDE	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xi	p,p´-DDD	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xii	o,p´-DDD	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xiii	o,p´- DDT	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xiv	p,p´- DDT	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xv	Monocrotophos	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xvi	Atrazine	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xvii	Parathion Methyl	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xviii	Paraoxon methyl	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xix	Malathion	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xx	Malaoxon	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xxi	Ethion	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xxii	Chlorpyrifos	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)

Manager Environment
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Annexure- 8

Rainwater Harvesting: JEIM

The project proponent shall practice suitable rainwater harvesting measures on long term basis and work out a detailed scheme for rainwater harvesting, in consultation with the Central Ground Water Authority and submit a copy of the same to the Ministry of Environment and Forests and its Regional Office, Bhubaneswar.	**Complied.** After getting NOC from CGWA for ground water withdrawal vide letter no. 21-4(343)/CGWA/SER/2011-956, dated: 27.07.2011, we have submitted Rain Water Harvesting Scheme to CGWB vide letter no. MD/ENV/214/102/2013, dated: 31.05.2013 and same was forwarded to CGWA by CGWB for necessary action vide letter no. 5-22/SER/CGWA/2013-539, dated: 17.06.2013. We have the current NOC of Rainwater harvesting structures has been constructed at the mine site by the engagement of expertise of M/s. KRG Rainwater Foundation, Chennai and is now operational. Photograph of Rain water harvesting pond at JEIM and Joda town is attached

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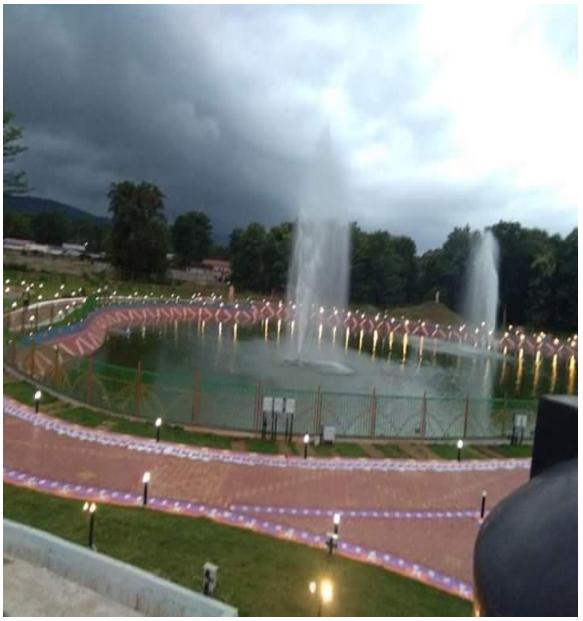
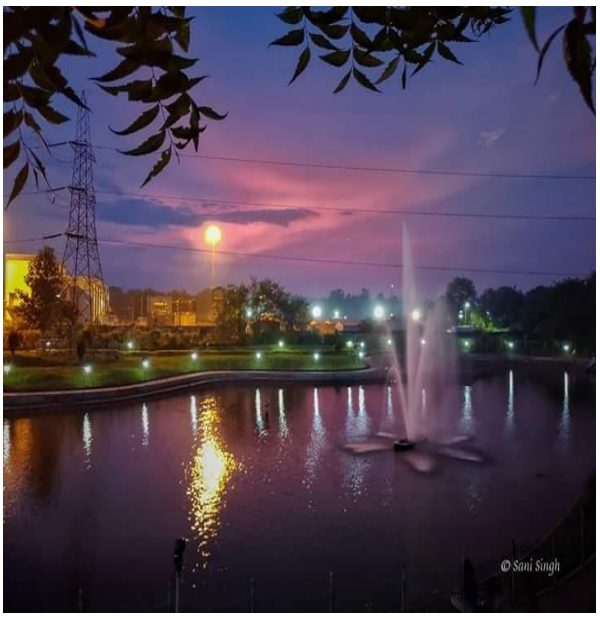
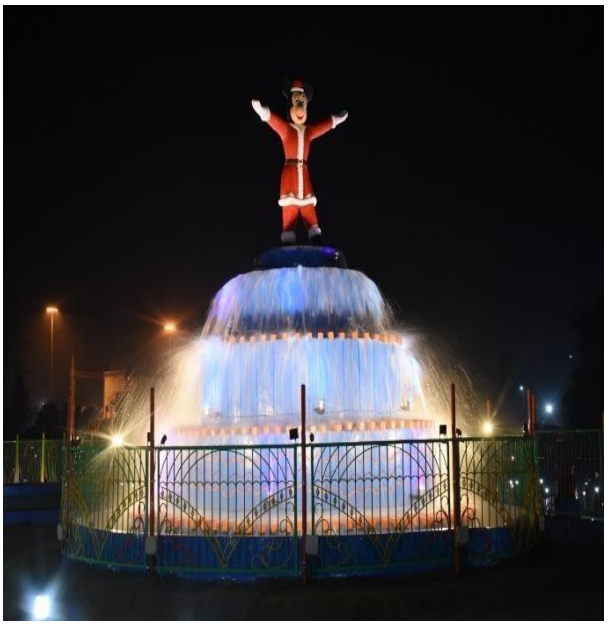
Rain Water Harvesting Structure Developed

Joda East Iron Mine, Tata Steel Ltd







Shubham
Manager Environment
JEIM
TATA STEEL LTD.

Annexure-9

STP: JEIM

Sewage treatment plant shall be installed for the colony. ETP shall also be provided for the Workshop and wastewater generated during the mining Operation.	**Complied.** 6 nos. of Sewage treatment plant have been constructed with capacity 10 KLD, 50 KLD and 630 KLD in residential colony. Further two more STP with 150 KLD is constructed for community. Apart from these STPs in residential colony, Soak pits have been provided inside the mining area because STP constructed in not feasible in the hilly topography of the mine. A 10 KLD ETP has been installed in JEIM for treatment of wastewater generated. The oil catchment pit has also been constructed inside mining area. Photographs of the STPs and Oil catchment pit are shown here.

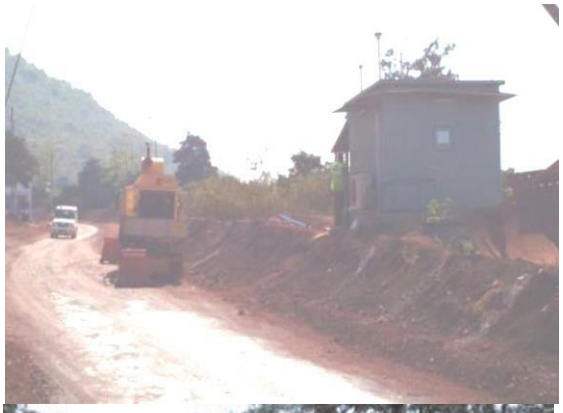
Annexure- 10

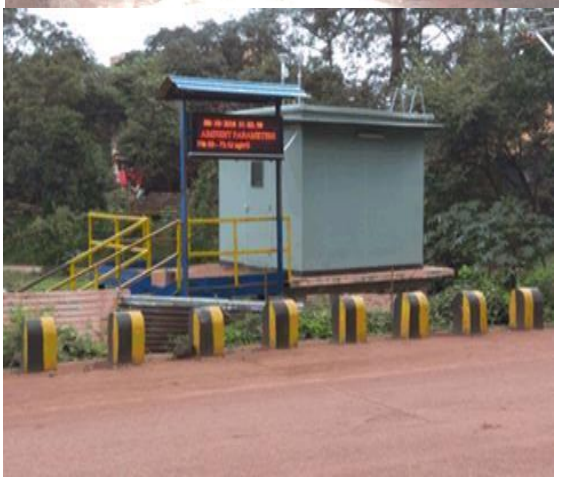
Conservation of Flora & Fauna: JEIM

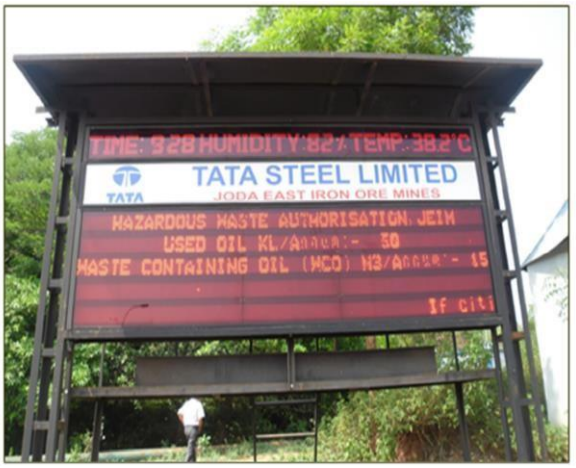
The project proponent shall take all precautionary measures during mining operation for conservation and Protection of endangered fauna namely elephant, sloth bear etc. spotted in the study area. All the safeguard measures brought out in the Wildlife Conservation Plan so prepared specific to this project site and approved by the Chief Conservator of Forest, (Wildlife) shall be effectively implemented. A copy of Wildlife Conservation Plan shall be submitted to the Ministry of Environment and Forest and its Regional Office Bhubaneswar.	**Being Complied With.** Tata Steel is taking all precautionary measures towards conservation and protection of endangered flora and fauna. We have also deposited a sum of Rs. 1,00,66,395/- with the forest department for implementation of the wildlife management plan in order to protect them within our mine and its periphery. Besides that, the mine had prepared Site Specific Wild Life Conservation Plan and it has been approved by the Principle Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden vide letter no. 3195/1WL-SSP-97/2016, dated: 25.04.2016.

Information Display for Public: JEIM Annexure- 11

The critical parameters such as RSPM (Particulate matter with size less than 10 micron i.e., PM10) and NO in the ambient air within the impact zone, peak particle Velocity at 300m distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further, quality of discharged water shall also be monitored [(TDS, DO, pH and total suspended solids (TSS)]. The monitored data shall be uploaded on the website of the Company as well as display on a display board at the project site at a suitable location near the main gate of the Company in public domain. The Circular No. J-20012/1/2006-IA.II(M) dated 27.05.2009 issued by Ministry of Environment and Forest which is available on the website of the Ministry www.envfor.nic.in shall also be referred in this regard for its compliance.	**Being Complied With.** Ambient Air Quality is monitored regularly, and the results are submitted to OSPCB, CPCB & MoEFCC**.** No water is discharged out of the mine premises. Monitoring data is being uploaded on the Company's website www.tatasteelindia.com as part of this report and displayed on a display board at the main entrance gate of the mine. The photograph of display board is attached.







Annexure- 12

JODA EAST IRON MINE

AVERAGE AIR QUALITY REPORT (CORE ZONE)

Month	Manmora Slime Dam					Near Rainwater Harvesting					Near Magazine					Near Equipment Maintenance				
	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO
Apr 24	69.4	26.4	11.8	23.0	BDL	60.0	21.4	10.6	19.5	BDL	65.9	28.8	12.0	27.0	BDL	64.4	27.9	12.1	20.7	BDL
May 24	67.9	23.9	12.4	21.6	BDL	61.6	22.2	11.2	20.7	BDL	67.7	27.6	11.6	22.9	BDL	63.6	28.8	11.7	25.0	BDL
Jun 24	62.1	23.2	11.2	22.2	BDL	59.2	20.3	9.6	20.3	BDL	63.9	25.6	11.5	23.4	BDL	59.9	24.2	11.0	21.0	BDL
Jul 24	55.6	21.5	11.1	20.5	BDL	51.2	21.4	10.1	20.3	BDL	55.7	21.9	11.2	20.2	BDL	58.4	22.0	10.3	18.7	BDL
Aug 24	60.2	22.7	10.5	20.6	BLQ	50.9	20.2	11.6	19.2	BLQ	50.9	20.2	11.6	19.2	BLQ	59.4	24.9	11.3	20.7	BLQ
Sept 24	59.3	24.6	11.6	22.7	BLQ	51.8	18.6	10.9	19.0	BLQ	60.0	23.6	13.1	23.1	BLQ	54.3	22.4	11.3	21.6	BLQ

BDL - BDL (DL-0.5)

AVERAGE AIR QUALITY REPORT (BUFFER ZONE)

Month	Baneikela					Lohanda					Khuntpani					Joda Hospital				
	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO
Apr 24	60.1	18.0	7.2	16.1	BDL	60.6	19.9	12.1	18.2	BDL	59.8	17.9	10.4	17.1	BDL	54.9	18.1	7.5	17.8	BDL
May 24	60.0	18.1	8.0	17.1	BDL	60.5	20.0	11.0	17.6	BDL	60.0	20.5	9.0	17.8	BDL	52.2	17.9	7.9	18.8	BDL
Jun 24	57.3	16.9	7.6	18.4	BDL	55.2	16.9	10.1	16.9	BDL	55.7	16.3	7.0	16.5	BDL	51.1	17.0	7.2	18.9	BDL
Jul 24	49.2	17.5	8.2	17.1	BDL	49.6	17.7	9.1	16.3	BDL	50.1	17.0	8.2	16.0	BDL	49.4	17.7	10.3	17.0	BDL
Aug 24	46.1	16.3	7.9	16.9	BLQ	51.0	18.0	8.9	16.7	BLQ	50.6	16.3	7.0	15.4	BLQ	51.1	18.0	10.4	17.0	BLQ
Sept 24	49.6	17.2	8.9	17.0	BLQ	49.2	16.9	7.2	16.2	BLQ	49.3	17.1	7.2	15.1	BLQ	50.5	18.1	10.9	17.8	BLQ

Unit of measurement for all parameters except CO is µg/m³. Co is in mg/m³

Manager Environment
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Annexure- 13

JODA EAST IRON MINE

AVERAGE AIR QUALITY REPORT (CORE ZONE)

Month	Manmora Slime Dam					Near Rainwater Harvesting					Near Magazine					Near Equipment Maintenance				
	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO
Apr 24	69.4	26.4	11.8	23.0	BDL	60.0	21.4	10.6	19.5	BDL	65.9	28.8	12.0	27.0	BDL	64.4	27.9	12.1	20.7	BDL
May 24	67.9	23.9	12.4	21.6	BDL	61.6	22.2	11.2	20.7	BDL	67.7	27.6	11.6	22.9	BDL	63.6	28.8	11.7	25.0	BDL
Jun 24	62.1	23.2	11.2	22.2	BDL	59.2	20.3	9.6	20.3	BDL	63.9	25.6	11.5	23.4	BDL	59.9	24.2	11.0	21.0	BDL
Jul 24	55.6	21.5	11.1	20.5	BDL	51.2	21.4	10.1	20.3	BDL	55.7	21.9	11.2	20.2	BDL	58.4	22.0	10.3	18.7	BDL
Aug 24	60.2	22.7	10.5	20.6	BLQ	50.9	20.2	11.6	19.2	BLQ	50.9	20.2	11.6	19.2	BLQ	59.4	24.9	11.3	20.7	BLQ
Sept 24	59.3	24.6	11.6	22.7	BLQ	51.8	18.6	10.9	19.0	BLQ	60.0	23.6	13.1	23.1	BLQ	54.3	22.4	11.3	21.6	BLQ

BDL - BDL (DL-0.5)

AVERAGE AIR QUALITY REPORT (BUFFER ZONE)

Month	Baneikela					Lohanda					Khuntpani					Joda Hospital				
	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NOX	CO	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO
Apr 24	60.1	18.0	7.2	16.1	BDL	60.6	19.9	12.1	18.2	BDL	59.8	17.9	10.4	17.1	BDL	54.9	18.1	7.5	17.8	BDL
May 24	60.0	18.1	8.0	17.1	BDL	60.5	20.0	11.0	17.6	BDL	60.0	20.5	9.0	17.8	BDL	52.2	17.9	7.9	18.8	BDL
Jun 24	57.3	16.9	7.6	18.4	BDL	55.2	16.9	10.1	16.9	BDL	55.7	16.3	7.0	16.5	BDL	51.1	17.0	7.2	18.9	BDL
Jul 24	49.2	17.5	8.2	17.1	BDL	49.6	17.7	9.1	16.3	BDL	50.1	17.0	8.2	16.0	BDL	49.4	17.7	10.3	17.0	BDL
Aug 24	46.1	16.3	7.9	16.9	BLQ	51.0	18.0	8.9	16.7	BLQ	50.6	16.3	7.0	15.4	BLQ	51.1	18.0	10.4	17.0	BLQ
Sept 24	49.6	17.2	8.9	17.0	BLQ	49.2	16.9	7.2	16.2	BLQ	49.3	17.1	7.2	15.1	BLQ	50.5	18.1	10.9	17.8	BLQ

Unit of measurement for all parameters except CO is µg/m^3. Co is in mg/m^3

Shubham
Manager Environment
JEIM
TATA STEEL LTD.