



**Compliance**

to

**Environmental Clearance Conditions**

of

**Joda East Iron Ore Mine**  
**M/s. Tata Steel Limited**

**For the period: April' 13 – September' 13**

**Environment Clearance letter No. J-11015/215/2008-IA.II(M), Dated 11<sup>th</sup> March 2013, of Joda East Iron Mine, for production of 12.00 MTPA (ROM) of Iron Ore.**

**HALF YEARLY COMPLIANCE REPORT FOR THE PERIOD : April to Sept' 13**

**A. Specific conditions**

<b>Sl. No</b>	<b>Specific Condition</b>	<b>Compliance status</b>
(i)	No mining activities will be allowed in forest area for which the FC is not available.	<ul style="list-style-type: none"> <li>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.</li> </ul>
(ii)	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.	<ul style="list-style-type: none"> <li>At present, mining operation is restricted within 567.087 ha of forest area for which due approval for diversion has already been obtained.</li> <li>In addition, we have also submitted fresh DRP for remaining forest area of 32.425 ha (leaving a total forest area of 9.394 ha for safety zone).</li> </ul>
(iii)	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 present the forest clearance is available to only a part of the forest land involved in the mine.	<ul style="list-style-type: none"> <li>As per guidelines of letter vide no. 1-362/12012-FC dated 01.02.2013 the mine has applied for diversion of entire forest area.</li> </ul>
(iv)	Environmental clearance is subject to obtaining Clearance as may be necessary under the Wildlife (Protection) Act, 1972 from the competent authority.	<ul style="list-style-type: none"> <li>No specific clearance under the Wildlife (Protection) Act, 1972 is required for the project.</li> </ul>
(v)	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.	<ul style="list-style-type: none"> <li>Consent to Establish has been obtained from OSPCB vide letter no. 21271/IND-II-NOC-5144, dated. 8<sup>th</sup> July, 2011.</li> <li>Consent to Operate has also been obtained from State Pollution Control Board, Orissa vide letter No. 4763/IND-I-CON-184, dated 16<sup>th</sup> March' 2013 and the consent order is valid till 31<sup>st</sup> March' 2014.</li> </ul>
(vi)	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.	<ul style="list-style-type: none"> <li>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/102/2013, Dated. 8<sup>th</sup> June, 2013.</li> </ul>

Sl. No	Specific Condition	Compliance status
(vii)	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 hydro-geological study shall be carried out.	<ul style="list-style-type: none"> <li>• The mining operation is restricted above the ground water table. There has been no intersection of ground water table.</li> <li>• The lowest working depth of our mine pits is at 612 m RL, whereas the presence of ground water table has been estimated to be at 492 m RL.</li> <li>• A detailed hydro-geological study was carried out for the purpose.</li> </ul>
(viii)	The project proponent shall ensure that no natural watercourse and/or water resources shall be obstructed due to any mining operations.	<ul style="list-style-type: none"> <li>• No natural watercourse or water resources are obstructed due to our mining operations.</li> <li>• Further, no first order or the second order streams are emanating from the mine lease area.</li> </ul>
(ix)	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.	<ul style="list-style-type: none"> <li>• There has been no generation of top soil during the period. Whatever top soil generated before, has already been used for plantation purpose.</li> <li>• Soil quality report for the mine is attached as <b><u>Annexure- VII.</u></b></li> </ul>
(x)	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.	<ul style="list-style-type: none"> <li>• As a part of ambient air quality monitoring, R&amp;D department has been engaged for the analysis of mineralogical composition.</li> </ul>
(xi)	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.	<ul style="list-style-type: none"> <li>• The water recovery and spill way system has been designed such that the natural water resources are not affected and no spill water from the mine goes beyond the lease boundary.</li> <li>• 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.</li> </ul>
(xii)	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 cake so generated in an environmentally compatible manner.	<ul style="list-style-type: none"> <li>• There is no filter cake generation in our operations.</li> </ul>
(xiii)	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.	<ul style="list-style-type: none"> <li>• Regular water sprinkling is done on the haul roads, loading &amp; unloading points for effective dust suppression.</li> <li>• Fixed water sprinklers have been put into operation on the main haul road of length 1600m and dust suppressants are added into the sprinkling water for effective dust suppression.</li> <li>• Ambient air quality is monitored regularly and the results are well within the limit prescribed. The results are also sent to the OSPCB office, Bhubaneswar once in every month.</li> </ul>

Sl. No	Specific Condition	Compliance status
(xiv)	<p>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 &amp; Forests and its Regional Office located at Bhubaneswar on six monthly basis.</p>	<ul style="list-style-type: none"> <li>• The OB and minerals rejects are being dumped as per the mining plan and at earmarked dumping area only.</li> <li>• The slopes of the OB dumps are terraced and the overall slope is maintained within the 27 degree.</li> <li>• The inactive dump slopes are vegetated with native species.</li> <li>• The compliance status report is regularly sent to the Regional office, MoEF, Bhubaneswar and SPCB, Orissa once in every six months.</li> </ul>
(xv)	<p>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 desilted particularly after monsoon and maintained properly.</p> <p>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.</p>	<ul style="list-style-type: none"> <li>• Garland drains of running meterage of 2010 meters with settling pits, have been constructed all along the OB dumps to prevent run off of water and flow of sediments directly into the natural stream.</li> <li>• Sedimentation pits of total 10 Nos. have been constructed at the corner of the garland drains to take care of runoff water even during peak rain fall and they are desilted regularly before and after monsoon.</li> </ul>
(xvi)	<p>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.</p>	<ul style="list-style-type: none"> <li>• Retaining walls of dimension 1m x 1m x 0.6m and running meterage of 2030 meters have been provided at the toe of over burden dumps to check run-off.</li> <li>• This is being effective to meet the purpose even during peak rain fall.</li> </ul>
(xvii)	<p>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.</p>	<ul style="list-style-type: none"> <li>• Reclamation and rehabilitation programme have been established. Till Sept, 2013, we have planted about 5,58,566 nos. of plants over an area of 115.75 ha with native species and 8000 Nos. as gap filling at old plantation area. The density has been maintained at the rate of over 4825 plants per ha.</li> <li>• Moreover, vetiver plantation is being carried out over 1 ha with 1,00,000 slips. The photograph of Vetiver plantation is given as <b>Annexure – X</b>.</li> <li>• Plantation over an area of 606.229 ha shall be achieved gradually at the time of post mine closure (Conceptual land use).</li> </ul>

Sl. No	Specific Condition	Compliance status
(xviii)	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.	<ul style="list-style-type: none"> <li>• Regular water sprinkling is done on the haul roads, loading &amp; unloading points for effective dust suppression.</li> <li>• Fixed water sprinklers have been put into operation on the main haul road of length 1600m and dust suppressants are added into the sprinkling water for effective dust suppression.</li> <li>• Ambient air quality is monitored regularly and the results are well within the limit prescribed. The results are also sent to the OSPCB office, Bhubaneswar once in every month.</li> </ul>
(xix)	The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.	<ul style="list-style-type: none"> <li>• As a step towards conservation of ground water, it is not used for mining operation purpose.</li> <li>• Further, the rain water collected in the mine pits during monsoon is not pumped out. Rather, it is allowed to be collected in the lowest level sumps to augment the ground water resources gradually.</li> <li>• However, rain water harvesting ponds and ground water recharge structures have been constructed and now they are operational. The rain water harvesting system has been approved by the CGWB, Bhubaneswar.</li> </ul>
(xx)	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and installing new piezometers during the 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 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 Forest and its Regional Office Bhubaneswar, the Central Ground Water Authority, and the Regional Director, Central Ground Water Board. If at any stage, it is observed that the ground table is getting depleted due to the mining activity, necessary corrective measures shall be carried out.	<ul style="list-style-type: none"> <li>• Ground water quality is monitored regularly by engagement of the expertise of IIT, Kharagpur during four times a year.</li> <li>• The results are sent to Regional Office, MoEF and SPCB, Bhubaneswar once in every six months.</li> <li>• The monitoring results of Ground water quality &amp; Ground water level are annexed as <b><u>Annexure – I &amp; II.</u></b></li> </ul>
(xxi)	The project Proponent shall Obtain necessary prior permission of the competent authority for drawl of requisite quantity of surface water, if any, required for the Project.	<ul style="list-style-type: none"> <li>• As a step towards conservation of ground water, it is not used for mining operation purpose. At present, we have permission for drawl of 8531 KL/ day of surface water and our operation is now being managed within that quantity.</li> <li>• However, for increased requirement of 9000 KL / day of water, we have applied to Department of water Resources, Govt. of Odisha for obtaining drawl permission.</li> </ul>

Sl. No	Specific Condition	Compliance status
(xxii)	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.	<ul style="list-style-type: none"> <li>• 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 has been effectively implemented.</li> </ul>
(xxiii)	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.	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Rainwater harvesting system has been approved by the CGWB, Bhubaneswar. A copy of the approved plan shall be sent to the Ministry of Environment and Forests and its Regional Office, Bhubaneswar.</li> </ul>
(xxiv)	Vehicular emissions 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.	<ul style="list-style-type: none"> <li>• Regular vehicular emission testing is being conducted once in every 6 months.</li> <li>• The vehicles those who do not meet the emission standard, are withdrawn from operation and maintained properly.</li> <li>• A vehicle is kept abeyance from operation till it does not meet the emission standard. Also the vehicles are not run overloaded.</li> <li>• Overloading of trucks is avoided to prevent spillage of material.</li> </ul>
(xxv)	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.	<ul style="list-style-type: none"> <li>• Blasting is carried out during day time only.</li> <li>• Controlled Blasting is carried out for control of ground vibrations and to arrest fly rocks, as per the recommendations of CIMFR, Dhanbad.</li> </ul>
(xxvi)	Drills shall either be operated with the dust extractors or equipped with water injection system.	<ul style="list-style-type: none"> <li>• Wet drilling is in practice.</li> <li>• All drills are also provided with dust suppression system.</li> </ul>
(xxvi i)	Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and Unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.	<ul style="list-style-type: none"> <li>• 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 facilities.</li> </ul>
(xxvi ii)	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for the Workshop and wastewater generated during the mining Operation.	<ul style="list-style-type: none"> <li>• As per topography of the residential area, installation of a Sewage Treatment Plant has not been feasible.</li> <li>• Further study is in progress and plan has been made to install small STPs at different locations.</li> <li>• Presently, at two locations STPs have been installed and it shall be extended to other locations to treat all sewage water generated from the colony.</li> <li>• For waste water from workshop, oil and grease separation pits are provided. Further, no waste water is generated from our mining operation and hence requires no treatment.</li> </ul>

Sl. No	Specific Condition	Compliance status
(xxix)	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.	<ul style="list-style-type: none"> <li>• Pre-placement medical examination and periodical examination of the workers engaged are being conducted &amp; record maintained.</li> <li>• The schedule of Periodical Medical Examination is once in every 3 years for the employees of age more than 40 years and once in 5 years for the employees of age less than 40 years.</li> <li>• The concentration of respirable dust at different locations is monitored and the results are enclosed as <b>Annexure– III</b>. The employees are also given regular awareness training on safety and health aspects as part of implementation process of OHSAS – 18001 systems.</li> </ul>
(xxx)	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, creche etc. The housing may in the form of temporary structures to be removed after the completion of the project.	<ul style="list-style-type: none"> <li>• 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.</li> </ul>
(xxxi)	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.	<ul style="list-style-type: none"> <li>• Tata Steel is taking all precautionary measures towards conservation and protection of endangered flora and fauna.</li> <li>• 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.</li> <li>• Besides that, the mine had prepared site specific Wild Life Conservation Plan and it was submitted for authentication by the Chief Wild Life Warden. But as per advise of DFO, Keonjhar, the plan is now reprepared in revised format and shall be submitted for necessary approval.</li> </ul>
(xxxi i)	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 <a href="http://www.envfor.nic.in">www.envfor.nic.in</a> shall also be referred in this regard for its compliance.	<ul style="list-style-type: none"> <li>• RSPM &amp; NO<sub>x</sub> in ambient air is monitored regularly and the results are given as <b>Annexure– IV</b>.</li> <li>• Peak particle velocity at the time of blasting is also monitored regularly at 300m distance.</li> <li>• Monitoring data is being uploaded on the Company's website <a href="http://www.tatasteel.com">www.tatasteel.com</a> as part of this report and also displayed on a display board at the main entrance gate of the mine.</li> </ul>

Sl. No	Specific Condition	Compliance status
(xxxii)	A Final Mine closure Plan along with detail of Corpus fund shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	<ul style="list-style-type: none"> <li>• A progressive mine closure plan approved by IBM is in place.</li> <li>• The final mine closure plan along with details of Corpus fund shall be submitted to the Ministry of Environment &amp; Forests 5 years in advance.</li> </ul>

## B. General Conditions

Sl No.	General Conditions	Compliance Status/ Action Plan															
(i)	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	<ul style="list-style-type: none"> <li>• No change in mining technology and scope of working has been made.</li> </ul>															
(ii)	No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.	<ul style="list-style-type: none"> <li>• Calendar plan is being strictly adhered to. The excavation details for the year 2012-13 are as given in the following table.</li> </ul> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Plan</th> <th>Actual</th> </tr> </thead> <tbody> <tr> <td><b>ROM</b></td> <td>12.00</td> <td>6.54</td> </tr> <tr> <td><b>OB &amp; Waste</b></td> <td>0.52</td> <td>0.34</td> </tr> <tr> <td><b>Sub-grade</b></td> <td>2.66</td> <td>1.39</td> </tr> <tr> <td><b>Total Excavation</b></td> <td><b>15.18</b></td> <td><b>8.27</b></td> </tr> </tbody> </table> <p style="text-align: center;"><i>The figures are in MTPA</i></p>		Plan	Actual	<b>ROM</b>	12.00	6.54	<b>OB &amp; Waste</b>	0.52	0.34	<b>Sub-grade</b>	2.66	1.39	<b>Total Excavation</b>	<b>15.18</b>	<b>8.27</b>
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(iii)	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.	<ul style="list-style-type: none"> <li>• 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 State Pollution control Board, Orissa.</li> <li>• The ambient air quality reports are submitted to Regional office, MoEF, Bhubaneswar and SPCB, Orissa, once in every six months. Please find enclosed the monitoring details in <b><u>Annexure- IV</u></b>. All the parameters are within the prescribed limit.</li> </ul>															
(iv)	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 Bhubneswar and the State Pollution Control Board / Central Pollution Control Board once in six months.	<ul style="list-style-type: none"> <li>• The ambient air quality reports are submitted to Regional office, MoEF, Bhubaneswar and SPCB, Orissa, once in every six months. Please find enclosed the monitoring details in <b><u>Annexure- IV</u></b>. All the parameters are within the prescribed limit.</li> </ul>															



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(v)	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.	<ul style="list-style-type: none"> <li>•Effective water sprinkling is being done on haul roads and at loading and unloading points.</li> <li>•Dust suppression systems in the drills have been provided for effective functioning.</li> <li>•The report on dust fall is attached as <b><u>Annexure- VIII.</u></b></li> </ul>
(vi)	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.	<ul style="list-style-type: none"> <li>•High noise areas are earmarked and people working there are provided with ear protection equipments and the system is ensured by certification to OHSAS 18001 and regular field audits.</li> <li>•Noise monitoring data is attached as <b><u>Annexure- V.</u></b></li> </ul>
(vii)	Industrial waste water (workshop and waste water from the mine) should be properly collected, treated so as to conform to the Standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	<ul style="list-style-type: none"> <li>•Oil &amp; 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. The result of the workshop effluent is enclosed as <b><u>Annexure - VI.</u></b></li> <li>•There is no waste water generation from the mines.</li> </ul>
(viii)	<p>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.</p> <p>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.</p>	<ul style="list-style-type: none"> <li>•Adequate dust masks are provided to employees engaged in dusty areas. It is also ensured that they use the same. Respirable dust survey at different locations is done regularly and the report is attached as <b><u>Annexure– III.</u></b></li> <li>•The employees are also given regular awareness training on safety and health aspects as part of implementation process of OHSAS–18001 systems.</li> <li>•Further, employees undergo Lung Function Tests during the Periodical Medical Examination.</li> <li>•Periodical Medical Examination of employees and contractor workers are organised regularly to observe any contractions due to exposure to dust and other occupational hazards.</li> </ul>
(ix)	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.	<ul style="list-style-type: none"> <li>•A separate environmental management cell is in place with the people having relevant qualification on environmental science.</li> <li>•The Head of the environment department reports to General Manager i.e. the head of the organization.</li> </ul>

Sl No.	General Conditions	Compliance Status/ Action Plan
(x)	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.	<ul style="list-style-type: none"> <li>• Funds allocated for environmental management are spent only for environment related purposes and not diverted to any other purpose.</li> <li>• During the year 2012-13 an amount of Rs. 505.89 lakhs (approx) was spent towards environmental protection measures at Khondbond Iron Mine. Details are given in <b><u>Annexure- IX</u></b>.</li> </ul>
(xi)	The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closing and final approval of the project by the concerned authorities and the date of start of land development work.	<ul style="list-style-type: none"> <li>• This is a running mine. No specific date for start of land development work can be assigned. However, the copy of the Environmental Clearance has been sent to the Regional Office, MoEF, Bhubaneswar for kind information.</li> </ul>
(xii)	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.	<ul style="list-style-type: none"> <li>• We extend full co-operation to the officers of the Regional Office during their visit and furnish the required data, information and monitoring reports.</li> </ul>
(xiii)	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 Central Pollution Control Board and the State Pollution Control Board.	<ul style="list-style-type: none"> <li>• Six monthly compliance reports are being submitted regularly to the MoEF, its Regional Office Bhubaneswar, Central Pollution Control Board Kolkata and State Pollution Control Board.</li> <li>• Further, the six monthly compliance report along with the monitoring results are uploaded in Tata Steel's website <a href="http://www.tatasteel.com">www.tatasteel.com</a> and updated periodically.</li> </ul>
(xiv)	A copy of the clearance letter shall be sent by the proponent to Concerned Panchayat, Zila Parishad / 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.	<ul style="list-style-type: none"> <li>• A A copy of the clearance letter was sent to the Chairman, Joda Municipality on 16.03.2013, the President, Zila Parishad, Keonjhar on 16.03.2013, Addl. PCCF (Central), Eastern Regional Office, Bhubaneswar on 14.03.2013 and Member Sect.,OSPCB, Bhubaneswar on 14.03.2013.</li> <li>• EC letter has been uploaded on the Tata Steel website, <a href="http://www.tatasteel.com">www.tatasteel.com</a>.</li> </ul>

SI No.	General Conditions	Compliance Status/ Action Plan
(xv)	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.	<ul style="list-style-type: none"> <li>Complied by OSPCB.</li> </ul>
(xvi)	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, Bhubneswar by e-mail.	<ul style="list-style-type: none"> <li>The environmental statement for financial year 2012-13 has been submitted to the State Pollution Control Board on 18<sup>th</sup> Sept, 2013 and the same has been hosted on company's website <a href="http://www.tatasteel.com">www.tatasteel.com</a>.</li> <li>Further, half-yearly compliance status of environmental clearance conditions for financial year 2012-13 has been sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail on 31<sup>st</sup> May, 2013.</li> </ul>
(xvii )	The project authorities should advertise at least in two local newspapers at the District or State in which the project is located and 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 <a href="http://envfor.nic.in">http://envfor.nic.in</a> and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubneswar.	<ul style="list-style-type: none"> <li>Details of Environmental Clearance with regard to Joda East Iron Mine was published in local newspapers (English Daily, New Indian Express &amp; in oriya (Dainik Jagran) on 16.03.2013.</li> </ul>

## Annexure - I

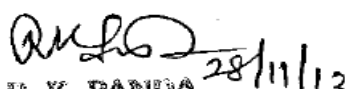
Page 01 of 02

**Ground Water Quality Report at some locations around**  
**JODA EAST IRON MINE**  
**TATA STEEL**  
**(As per BIS 10500: 1991)**

**Date of Sampling: 24<sup>th</sup> May 2013**

Sl No.	Parameter	Permissible Limits	OW* Khuntpani (J3)	OW* Banspani (J4)
1	pH	6.5-8.5	7.51	7.38
2	Chloride, ppm	250	15.13	23.87
3	Iron, ppm	0.3	0.28	0.16
4	Fluoride, ppm	0.6-1.2	0.68	0.63
5	TDS, g/l	500	27.65	25.62
6	EC, ms/m	600	214.26	158.34
7	Sulphate	400	15.62	12.11
8	Nitrate	45	16.31	22.58
9	Calcium, ppm	200	12.24	14.15
10	Magnesium, ppm	30	12.53	11.75
11	Arsenic, ppm	0.05	0.004	0.005
12	Manganese, ppm	0.30	0.051	0.033
13	Zinc, ppm	5	0.012	0.016
14	Chromium, ppm	0.05	0.015	0.043
15	Lead, ppm	0.05	0.011	0.008
16	Microbial count (CFU/ml) after 24 h	10	Nil	Nil

**\*OW: Open well**

  
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## Annexure - I

Page 02 of 02

**Ground Water Quality Report at some locations around**  
**JODA EAST IRON MINE**  
**TATA STEEL**  
**(As per BIS 10500: 1991)**

**Date of Sampling: 25<sup>th</sup> August 2013**

Sl No.	Parameter	Permissible Limits	OW* Khuntpani (J3)	OW* Banspani (J4)
1	pH	6.5-8.5	7.23	7.16
2	Chloride, ppm	250	16.25	25.67
3	Iron, ppm	0.3	0.26	0.19
4	Fluoride, ppm	0.6-1.2	0.71	0.68
5	TDS, g/l	500	24.65	3.27
6	EC, ms/m	600	31.26	32.52
7	Sulphate	400	14.83	12.36
8	Nitrate	45	15.63	21.76
9	Calcium, ppm	200	11.66	9.83
10	Magnesium, ppm	30	11.58	10.35
11	Arsenic, ppm	0.05	0.008	0.006
12	Manganese, ppm	0.30	0.043	0.012
13	Zinc, ppm	5	0.021	0.018
14	Chromium, ppm	0.05	0.013	0.027
15	Lead, ppm	0.05	0.009	0.006
16	Copper, ppm	0.05	ND	ND
17	Cadmium, ppm	0.01	0.004	0.001
18	Mercury, ppm	0.001	ND	ND
19	Selenium, ppm	0.01	ND	ND
20	Microbial count (CFU/ml) after 24 h	10	Nil	Nil

**\*OW: Open well**

  
**Dr. R. K. PARIDA** 28/11/13

Professor

Dept. of Agricultural & Food Engg.

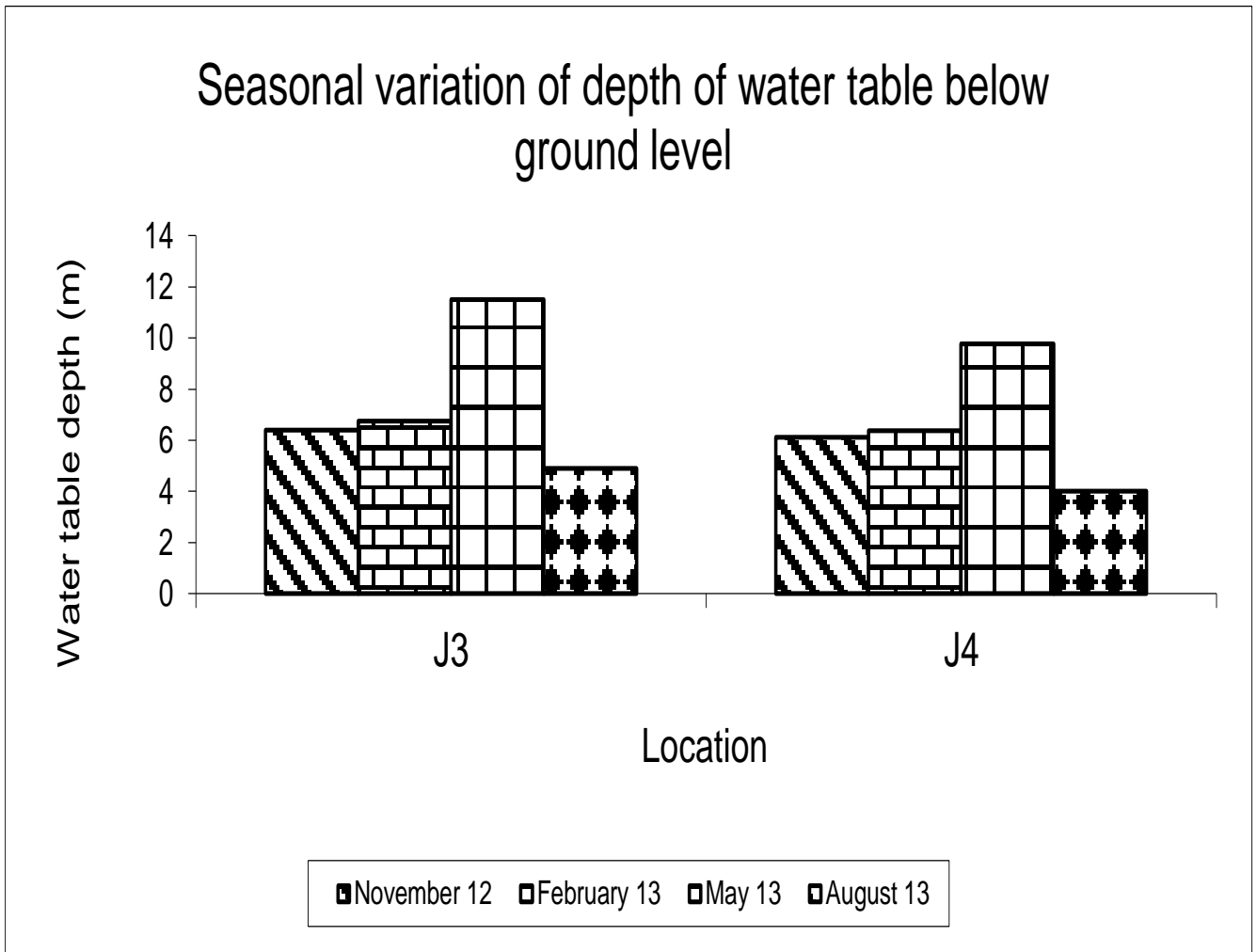
Indian Institute of Technology

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Annexure-II

Ground Water Level

Joda East Iron Mine  
**TATA STEEL LIMITED**



**J3 – Well at Khuntpani**

**J4 – Well Banspani (Mangal Munda House)**

## Annexure – III

### Respirable Dust Survey

Mine : Joda East Iron Mine      Summer 2013

(Respirable Dust assessed with Gravimetric Dust Sampler)  
(100% cut off at 7 microns unit density spheres)

Date	Sl No	Location	Level mg/cu.m	Standard as prescribed by DGMS	Remarks
05.03.13	01	Primary Crusher	1.98	3.00 mg/cu.m	Within limit
12.03.13	02	Primary Control room	0.62	3.00 mg/cu.m	Within limit
18.03.13	03	Secondary crusher	2.07	3.00 mg/cu.m	Within limit
25.03.13	04	Tertiary Crusher floor	1.83	3.00 mg/cu.m	Within limit
04.04.13	05	C-3 floor	1.80	3.00 mg/cu.m	Within limit
12.04.13	06	Drill 1 meter away	1.60	3.00 mg/cu.m	Within limit
17.04.13	07	Shovel 1m away	1.58	3.00 mg/cu.m	Within limit
07.05.13	08	Dumper (cabin)	0.46	3.00 mg/cu.m	Within limit
14.05.13	09	Loading Station control room	0.59	3.00 mg/cu.m	Within limit

Lab-in-charge

**Annexure - IV**

**Average Air Quality Report  
JODA EAST IRON MINE**

Month	Industrial area																		Residential area					
	South of Primary crusher						Mining area						Electrical sub-station						Near Triveni housing					
	PM <sub>10</sub>	PM <sub>2.5</sub>	SPM	SO <sub>2</sub>	NO <sub>x</sub>	CO	PM <sub>10</sub>	PM <sub>2.5</sub>	SPM	SO <sub>2</sub>	NO <sub>x</sub>	CO	PM <sub>10</sub>	PM <sub>2.5</sub>	SPM	SO <sub>2</sub>	NO <sub>x</sub>	CO	PM <sub>10</sub>	PM <sub>2.5</sub>	SPM	SO <sub>2</sub>	NO <sub>x</sub>	CO
Apr 13	55.8	37.4	182.0	9.55	9.73	ND	54.4	34.9	177.8	9.44	9.64	ND	46.1	27.9	149.0	8.61	8.80	ND	42.4	24.0	139.8	8.24	8.43	ND
May13	58.4	39.6	200.8	9.84	9.99	ND	55.9	37.8	192.5	9.59	9.78	ND	48.3	29.8	162.0	8.83	9.06	ND	43.3	24.6	149.8	8.45	8.46	ND
Jun 13	48.1	29.6	165.8	8.81	9.01	ND	46.9	28.4	156.8	8.69	8.89	ND	44.8	26.3	143.8	8.48	8.68	ND	42.3	24.0	138.6	8.23	8.31	ND
Jul 13	44.9	26.0	147.3	8.49	8.69	ND	42.9	24.5	141.3	8.29	8.49	ND	38.3	19.8	126.0	7.83	8.03	ND	35.0	16.6	115.3	7.50	7.61	ND
Aug 13	41.0	22.6	133.8	7.95	8.15	ND	40.3	21.4	129.5	7.88	8.08	ND	34.9	16.5	118.8	7.50	7.70	ND	31.3	13.1	109.5	6.89	7.07	ND
Sep 13	42.4	23.8	133.0	8.24	8.43	ND	40.9	22.8	124.8	8.14	8.33	ND	36.8	18.5	112.8	7.68	7.88	ND	34.5	16.4	107.8	7.45	7.57	ND

*Unit of measurement for all parameters except CO is µg/m<sup>3</sup>. Co is in mg/m<sup>3</sup>*

Lab-in-charge



## Annexure – V

### Ambient Noise Quality At Joda East Iron Mine

AVERAGE OCT' 12 TO MAR' 13

	Location	Day Time 8.00 am to 10.00 pm	Limits in dB(A) Leq	Night Time 8.00 am to 10.00 pm	Limits in dB(A) Leq
Residential area	Hospital Premises	53.80	55.00	42.22	45.00
	Training Centre	51.90		41.43	
	Township	54.07		42.55	
Industrial area	Chief Office	51.97	75.00	51.20	70.00
	Mining area	69.12		62.00	
	Plant area	74.17		67.13	

Lab-in-charge

**Annexure– VI**

**Workshop Effluent Quality**

Apr 13 – Sep 13

**Joda East Iron Mine**

Parameter	Joda East Equipment Maintenance	Limit
pH	6.43	5.5 – 9.0
Suspended Solids mg/l	64.70	100.00
Oil & Grease mg/l	7.13	10.00

Lab-in-charge

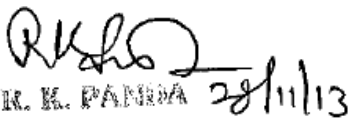
**Annexure- VII**

**Soil Quality Report**  
**Joda East Iron Mine**  
**TATA STEEL LTD**  
**(As per BIS 10500: 1991)**

**Date of Sampling: 24<sup>th</sup> May 2013**

Sl No	Parameter (Unit: ppm)	Near Mining Face (Joda East) J*
1	Chloride	5.13
2	Iron	0.311
3	Fluoride	0.35
4	Sulphate	28.96
5	Nitrate	6.85
6	Calcium	30.64
7	Magnesium	23.51
8	Arsenic	0.002
9	Manganese	0.026
10	Zinc	0.014
11	Chromium	0.002
12	Lead	0.043

**\* No permissible limit is there for surface soil**

  
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**Annexure- VIII**

**Joda East Iron Mine  
TATA STEEL LTD.  
Dust Fall Quality Report**

<b>Sl.No.</b>	<b>Parameters</b>	<b>Unit</b>	<b>May-June 2013</b>
1	Cu	%	0.163
2	Mn	%	0.041
3	Nickel	%	0.017
4	Cadmium	%	0.001
5	Cobult	%	0.002
6	Lead	%	0.023
7	Zinc	%	0.014
8	Arsenic	%	0.335
9	Selenium	%	0.010
10	Iron	%	45.88

**Total dust fall during May-June 2013 = 9.83 t/km<sup>2</sup>/month**

## Annexure- IX

### Annual Environmental Expenditure of Joda East Iron Mine 2012-13

SI No	Heads	Amount (in lakhs)
01	Fixed water sprinkler installation and maintenance cost	24.50
02	Dry fog system installation and maintenance	12.00
03	Dust ban chemical for dust suppression	36.00
04	Expenses for mobile water sprinkler	24.70
05	Wet drill maintenance	10.00
06	Reduction of specific water consumption - wet plant	06.00
07	Flocculant/ chemical used in thickener/ slime dam	35.00
08	Slime dam maintenance	44.00
09	Recycling of slime water	02.00
10	Initiative taken for slime loss reduction	60.00
11	Construction of toe wall, garland drain & settling pit	75.00
12	Use of Fuel additives to reduce diesel consumption	25.00
13	Use of solar Light pipes in Repair shed , DG Shed and Primary shed	06.00
14	Rain water harvesting construction / maintenance cost	07.49
15	Horticulture & plantation activities	16.52
16	Fruit garden maintenance	03.00
17	Plantation of Vetiver	39.72
18	Celebration of MEMC week & Environment day	02.60
19	AVM project at Banspani to reduce vibrations	18.00
20	Energy audit by PCRA	02.00
21	Environment monitoring	07.20
22	Ground Vibration Study	32.96
23	Installation / Maintenance of electronic display board	01.20
24	Measures taken to reduce noise by using PU,TIRO pannels etc.	15.00
	<b>Total:</b>	<b>505.89</b>

Annexure - X

**Vetiver System for Dump Slope Stabilization and Erosion Control**  
**Joda East Iron Mine**

