



**The Addnl. PCCF
Eastern Regional Office
Ministry of Environment, Forests & Climate Change,
Govt. of India
A/3, Chandrasekharpur
Bhubaneswar-751 013 (Odisha)**

MD/ENV/192/106/16
Date: 24.05.2016

Ref : Environmental clearance letter No. J-11015/888/2007-IA.II(M), dated: 21.12.2011

Sub: Half-yearly compliance status report of environmental clearance conditions for the period Oct'15-March'16 in respect of Khondbond Iron & Manganese Mine.

Dear Sir,

We are herewith submitting the six monthly compliance report in respect of the stipulated environmental clearance conditions of Khondbond Iron & Manganese Mine for the period from **Oct'15-March'16** as per EIA Notification, 2006. We are also sending you the soft copy of the report to your good office on email: mef.or@nic.in for your ready reference.

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: TATA Steel Limited

Head (Planning)-OMQ

Encl: As above

Copy to : The Chairman, Central Pollution Control Board, Southernd 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, Nilkanta Nagar, Unit – VIII, Bhubaneswar – 751012 (Odisha)
: The Regional Officer, State Pollution Control Board, College Road, At/PO-Baniapat, Keonjhar – 758001 (Odisha)

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COMPLIANCE REPORT PERIOD: OCTOBER'2015 - MARCH'2016

**ENVIRONMENTAL CLEARANCE TO
KHONDBOND IRON & MANGANESE MINE OF TATA STEEL LIMITED
VIDE MoEF's LETTER NO. J-11015/888/2007.IA.II (M), DATED: 21.12.2012
FOR PRODUCTION OF 8 MTPA (ROM) OF IRON ORE & 0.1 MTPA MANGANESE ORE**

Specific Condition:

Sl. No.	Condition	Compliance
1	No mining shall be carried out in the forestland without obtaining requisite prior forestry clearance under the Forest (Conservation) Act, 1980 for forestland involved in the project. The environmental clearance is subject to grant of forestry clearance.	The present mining operation is restricted within 453.150 ha of forest land for which forest clearance has been obtained under the Forest (Conservation) Act, 1980 vide letter no. F.No. 8-98/2004/FC dated: 09.08.2006 (317 ha. fresh + 136.15 ha broken prior to 1980).
2	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.	Consent to Establish has been obtained vide OSPCB's letter No. 21730/IND-II-NOC-5093, dated: 23.12.2011. Similarly Consent to Operate has also been obtained from State Pollution Control Board, Orissa vide letter No. 4814/IND-I-CON-1127, dated: 18.03.2016 and the consent order is valid till 31.03.2017.
3	The environmental clearance is co-terminus to mining lease and the proponent shall obtain fresh Environmental Clearance at the time of renewal of mine lease in accordance with the provisions of the EIA Notification, 2006 as amended subsequently.	Fresh EC shall be obtained at the time of next lease renewal as per EIA Notification, 2006 and its subsequent
4	The mining operations shall be restricted to above ground water table in the iron ore zone and it should not intersect the ground water table. In case of working below the ground water table in the iron ore zone, 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.	At present, the lowest working depth of the mine is at 624 mRL in the Iron ore zone. Hydro-geological study was carried out for the mining lease area and it has been estimated that, the presence of ground water table is at a depth of 555 mRL during post-monsoon. The condition of Environmental Clearance for the mine restricts mining operation above the ground water table for Iron ore zone and it is strictly adhered to.

Sl. No.	Condition	Compliance
5	The Company shall submit within 3 month their policy towards Corporate Environment Responsibility which should inter- alia address (i) Standard Operating process/ procedure to bring into focus any infringements/ deviation/ violation of environmental or forest norms/conditions, (ii) Hierarchical system or Administrative order of the company to deal with environmental issues and ensuring compliance EC conditions and (iii) System of reporting of noncompliance/ violation environmental norms to the Board of Director of the company and/ or stake holders or shareholders.	Details as required, were submitted to the Ministry within 3 months of grant of Environmental Clearance vide letter No. MD/ENV/775 /106/2012, Dated. 20.03.12.
6	A safety zone of 50m shall be left as no mining zone and no waste shall be dumped within this safety zone along the side of Suna Nadi (Kundra Nallah) & the Kakrapani nallah following adjacent to the mine lease area.	Before this condition was given, there exists an old waste dump within the 50m distance from Kundra nallah and that has been stabilized by plantation. However, at present no mining activity is being carried out within the safety zone of 50m along the side of Kundra nallah.
7	The project proponent shall ensure that no natural watercourse and / or water resources shall be obstructed due to any mining operations. Adequate measures shall be taken for conservation and protection of the first order and the second order streams, if any, emanating from the mine lease area during the course of mining operation.	No natural watercourse or water resources are obstructed due to our mining operations. Further, no first order and the second order streams are emanating from the mine lease area.
8	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.	An area of 0.50 ha has been identified for storage of top soil. Further, generation of top soil is very minimal and whatever top soil is used they are stored in the earmarked area and subsequently used for plantation. Photographs of the same is attached as Annexure-I.
9	The project proponent shall carry out conditioning of the ore with water to mitigate fugitive dust emission, without effecting flow of ore in the ore processing and handling areas.	This shall be taken care when wet processing of ore will start. However, to minimise fugitive dust emission at existing dry crushing and screening plant, dry fog is used and water sprinkling by mobile sprinklers are done at material handling points. Photographs of Air Quality Management are attached as Annexure-II.
10	The effluent from the ore beneficiation plant shall be treated in the tailing thickener and the tailings slurry shall be transported through a closed pipeline to the tailing ponds.	At present, wet processing plant is under construction and hence has not started functioning. When the wet processing plant shall be operational, tailing management shall be made as per the condition given.

Sl. No.	Condition	Compliance
11	The tailing ponds shall be lined HDPE lining.	Currently we don't have any tailing pond because of no wet process. When tailing ponds shall be constructed, that will be provided with HDPE lining.
12	The decanted water from the tailing dam shall be re- circulated and there should be zero discharge from the tailing dam.	Currently we don't have any tailing pond because of no wet process. This will be ensured when both the wet processing plant and tailing ponds are operational.
13	Appropriate technology shall be used for maximum recovery of ore in order to reduce slurry discharge and to increase the life of the tailing ponds.	Currently we don't have any tailing pond because of no wet process. This will be ensured when both the wet processing plant and tailing ponds are operational.
14	The project proponent shall constitute on emergency management team under the control of project incharge to deal with the emergency situation pertaining to the tailing pond for the timely & effective control of emergency situation, it shall be ensured that training programme and mock drill shall be organised for the employees.	The mine is certified under ISO 9001, ISO 14001, OHSAS 18001 & SA8000. Emergency preparedness procedure is already in place to meet the emergency situations. However, after the tailing ponds are constructed and operational, the expected emergency situations arising because of tailing pond management shall be included and mock drills shall be organised for the employees.
15	The Over burden (OB) generated during the mining operations shall be stacked at earmarked dump site (s) only and it should not be kept active for a long period of time and its phase-wise stabilisation shall be carried out. Backfilling shall commence from the fifth year onwards. There shall be six over burden (four for iron and two for manganese ore). Proper terracing of the OB dumps shall be carried out so that the overall slope of the dumps shall be maintained to 28°. The overburden dumps shall 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. Out of the total excavated area of 763.665ha, an area of 758.665ha shall be reclaimed and afforested. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self- sustaining. Compliance status shall be submitted to the Ministry of Environment & Forest and its regional office located at Bhubaneswar on six monthly basis.	OB is being dumped as per plan and within the earmarked area. Inactive portions of the OB dump are gradually stabilised and reclaimed by plantation. The slope of the dump is terraced and the overall slope angle is maintained less than 28 degree. Retaining walls of adequate dimensions have been constructed around the dumps to arrest the suspended solids of the surface run-off effectively. As regard to reclamation of 758.665 ha of excavated land, this will be done as per progressive mine closure plan and shall be achieved at the end of mine life. Compliance status is being submitted regularly to the Ministry of Environment & Forest and its regional office located at Bhubaneswar once in every six months.
16	Catch drains and siltation ponds of appropriate size should be constructed around the tailing ponds, mine working, soil, OB and mineral	Garland drains of adequate length with settling pits, have been made all along the OB dumps to prevent run off of water and flow of sediments

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	<p>dump(s) to prevent run off of water and flow of sediments directly into the Suna Nadi (Kundra Nalla), the Jalpa Nadi, the Baitarni River, the Karo Nadi, the kakrapani nalla, the kundru nalla, the Dalko nalla, the kashi nalla, the Tapodihi nalla, the Teherei nalla, the Achanda nalla and other water bodies. 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 the monsoon and maintained properly. Garland drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed around the tailing ponds, mine pit, soil, OB and mineral dump(s) to prevent run off of water and flow of sediments directly into the Suna Nadi (Kundra Nalla), the Jalpa Nadi, the Baitarni River, the Karo Nadi, the kakrapani nalla, the kundru nalla, the Dalko nalla, the kashi nalla, the Tapodihi nalla, the Teherei nalla, the Achanda nalla and other water bodies and sump capacity should be designed keeping 50% safety margin over and above the 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 shall be constructed at the corners of the garland drains and desilted at regular intervals.</p>	<p>directly into the natural stream. Sedimentation pits have been constructed at the corners of the garland drains to take care of run off of water even during peak rain fall and they are desilted regularly during and after the monsoon. All the Garland drains, Settling tanks and Check dams of appropriate size, gradient and length been constructed both around the mine pit and over burden dump(s) to prevent run off of water and flow of sediments directly into water bodies. Sump capacity has been designed keeping 50% safety margin over and above peak sudden rainfall (based on previous years data). Waste Dump Management measures are shown in Annexure-III.</p>
17	<p>Dimension of retaining wall at the toe of the OB dumps and benches within the mine to check run-off and siltation should be based on the rainfall data.</p>	<p>Retaining wall and Garland drains have been constructed around the OB dumps to check mine run-off. To restrict the run-off, garland drains of adequate dimensions have been constructed beyond the retaining walls as per catchment area of OB dumps and rainfall data which are adequate to take care of the water during peak rain fall. Photographs are attached as Annexure-III.</p>
18	<p>The void left unfilled in an area of 5ha shall be converted into water body. The higher benches of excavated void/ mining pit shall be terraced and plantation done to stabilize the slopes. The slopes of higher benches shall be made gentler for easy accessibility by local people to use the water body. Peripheral fencing shall be carried out all along the excavated area.</p>	<p>This being the activity at the end of mine life shall be done in due course of time.</p>

Sl. No.	Condition	Compliance
19	Plantation shall be raised in an area of 965.018 ha including a 7.5 wide green belt in the safety zone around the mining lease by planting the native species around reclaimed area, mine benches, water body, tailing ponds, along the roads etc. In consultation with the local DFO/Agriculture Department. The density of the tree should be around 2500 plants per hectare. Greenbelt shall be developed all along the mine lease area in a phased manner and shall be completed within first five years.	Till end of Mar'2016, we have planted 308428 nos of saplings over an area of 64.99 ha. Plantation over an area of 965.018 ha shall be achieved at the end of mine life. Plantation over 7.5m greenbelt is in progress Further, plantation is being carried out by native species on the dump slopes and along the side of the roads. Photogaphs of Plantation are shown in Annexure-III.
20	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 point. 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.	Regular water sprinkling is being carried out by use of mobile water sprinklers three nos. of capacity 10 KL each and two of 50 KL capacity around the crushing and screening plant, loading & unloading area and haul roads. Regular monitoring of ambient air quality is being done and the results are within the permissible limits as prescribed by the Central Pollution Control Board. Photographs of safeguards are shown in Annexure-II.
21	Regular monitoring of the flow rate of the springs and perennial nallahs flowing in and around the mine lease shall be carried out and records maintained.	Monitoring of flow rate of Kundra nallah flowing at the side of the mining lease is being out and records maintained.
22	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.	As a step towards conservation of ground water, it is not used for mining operation purpose. Further, the rain water collected in the mines 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. Moreover, the Q-ore body is being augmented for rain water harvesting at Khondbond. Photographs of Rain Water Harvesting are attached as Annexure-IV.

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23	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.	Ground water quality is monitored regularly by engagement of the expertise of IIT, Kharagpur during four times a year. The results are sent to Regional office, MoEF and SPCB, Odisha once in every six months. Since, our mining operations are carried out above the ground water table; there will be no depletion of ground water table because of our mining activity. The monitoring results of Ground water quality & Ground water level are annexed as Annexure-V & VI respectively.
24	The ground water quality around the tailing pond shall be monitored regularly and time series data generated. It shall be ensured that the groundwater quality is not affected adversely due to the project.	Tailing pond has not yet been constructed. However, after it is made and becomes operational, ground water quality around the tailing pond shall be monitored regularly.
25	The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water required for the project.	We have obtained surface water permission from water resource division vide letter no 3300. dated: 11.02.2016. An agreement in Form-K was made on 08.04.2016 with Executive Engineer, Baitarani Division, Salpada under Department of Water Resources
26	Appropriate mitigative measures should be taken to prevent pollution of the Baitarni River, the Suna Nadi & the Karo Nadi in consultation with State Pollution Control Board.	The Baitarani & Karo rivers are not in the vicinity of our project and we do not envisage any pollution due to our mining activities. Moreover our operations and process don't have wet process and effluent discharge. However to prevent pollution of Sona river during rains, all the mitigative measures are taken such as toe wall, garland drains, check dams, settling pits etc. Photographs of the same are shown in Annexure-III.
27	The Project proponent shall practise suitable rainwater harvesting measures on long term basis and work out a detailed scheme for rain water harvesting in consultation with the Central Groundwater Authority and submit a copy of the same to the MoEF & its Regional Office, Bhubaneswar.	Detailed study has been conducted by engagement of the expertise of M/s. KRG Foundation, Chennai to construct rain water harvesting system at the mine site. The rainwater harvesting plan has also been approved by CGWB, South Eastern Region, Bhubaneswar. Copy of the same plan shall be submitted to the MoEF & its Regional Office, Bhubaneswar.

Sl. No.	Condition	Compliance
28	Vehicular emission shall be kept under control and regular monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. The mineral transportation shall be carried out through the covered trucks only and the vehicles carrying the mineral shall not be overloaded	Emission checks for all the vehicles are carried out once in every six months. Effective water sprinkling is done on haul roads to control fugitive dust. Moreover, outside transportation of mineral is carried out through covered trucks. Further, overloading of trucks is restricted to prevent spillage of material.
29	No transportation of ore outside the mine lease area shall be carried out after sunset.	Because of restrictions made by the District Collector, Keonjhar, not to transport ore during day time, the same is transported during night. Letter of the DC is attached as Annexure-VII.
30	No blasting shall be carried out after sunset. Blasting operation shall be carried only during the daytime. Controlled blasting shall be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.	Blasting is being carried out during day time only. Controlled Blasting is being carried out for control of ground vibrations and to arrest fly rocks, as per the recommendations of CIMFR, Dhanbad.
31	Drills shall either be operated with Dust extractors or equipped with water injection system.	Wet drilling is in practice. All drills have been provided with dust suppression system. Photographs of Wet Drilling are shown in Annexure-II.
32	Mineral handling plant 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.	Effective 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. Further, the dust extraction and suppression system are maintained properly for effective dust control. Photographs of the same are shown in Annexure-II.
33	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for workshop and wastewater generated during mining operation.	There is a common residential colony at Joda both for the employees of Khondbond Iron & Mn Mine & Joda East Iron Mine. Because of hilly topography of the residential area, installation of a single Sewage Treatment Plant has not been feasible. Presently, at two locations STP has been installed and it shall be extended for all sewage water generated from the colony. For waste water from workshop, oil and grease separation pits are provided. Further, no waste water generated from Khondbond Iron & Mn Mine is discharged outside of the lease and hence requires no treatment. Photographs of the same are attached as Annexure-VIII.
34	During operation of the project, special emphasis shall be given to minimise risks and hazards due to manganese poisoning.	Management of risks and hazards is being done as per established procedure made under OHSAS 18001. At the time of PME for the employees manganese poisoning is monitored

Sl. No.	Condition	Compliance
		and necessary care is taken for prevention and control.
35	Pre-placement of medical examination and periodical examination of the workers engaged in the project shall be carried out and record maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.	Pre-placement medical examination and periodical examination of the workers engaged are being conducted & record maintained. 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. The concentration of respirable dust at different locations is being monitored. The employees are also given regular awareness training on safety and health aspects as part of implementation process of OHSAS – 18001 systems.
36	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	There has been no requirement for construction of temporary housing for the project labours, since the mine has permanent infrastructural facilities at Joda.
37	Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar.	Digital processing of the lease area based on high resolution satellite imagery was carried out during 2012 by engagement of the expertise of M/s. Ecomen Laboratories Pvt. Ltd. Lucknow. The analysis of the imagery data is attached as Annexure-IX.
38	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna namely sloth bear, elephant, godhi etc. spotted in the study area. The critical habitats if any within the impact zone shall be individually identified and the conservation plan prepared specific to this project in consultation with the state forest and wild life deptt. Should effectively address the same. All the safeguard measures brought out in the wild life conservation plan prepared specific to this project site shall be effectively implemented in consultation with the state forest and wild life deptt. A copy of approved wild life conservation plan shall be submitted to the Ministry & its Regional office , Bhubaneswar within three months.	Tata Steel is taking all the precautionary measures towards conservation and protection of endangered flora and fauna. The endangered species such as, wolf, sloth bear etc. are never or very rarely seen in the area. Site specific Wild Life Conservation Plan with required fund allocation for the mine was prepared and approved from state forest and wild life department vide letter no. 843/1 WL-SSP-100/2016; dated: 28.01.2016. The copy of approved wild life conservation plan has been submitted to the Ministry & its Regional office, bhubaneswar vide letter no: KIM/325/38-A ; dated: 20.05.2016

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39	The entire mining lease area shall be fenced by erecting solar power electric fencing all around it. The fencing so erected shall be maintained properly and the cost towards erection and maintenance of the solar power electric fencing shall be borne by the project proponent out of the project cost.	We have sought guidance and clarification of ACF, Champua forest Range for erection of solar power electric fencing in mine lease area, vide our letter dated: 17.05.2012. Further ACF, Champua forest range has asked guidance from DFO, Keonjhar and the clarification is awaited. . On receipt of approval/suggestion from the state forest department, the solar power electric fencing will be installed.
40	The critical parameters such as RSPM (Particulate matter with size less than 10 micron i.e., PM10) and NOx 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 displayed 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 Forests, which is available on the website of the Ministry www.envfor.nic.in shall also be referred in this regard for its compliance.	The critical parameters like RSPM & NOx in ambient air are being monitored regularly and all the results are within the limits. Peak particle velocity at the time of blasting is also monitored regularly at 300m distance. Ambient Air Quality monitoring Report is attached as Annexure-X. Our unit is Zero Discharge unit. All the monitoring data is being uploaded on the Company's website as part of this report and also displayed on a display board at the main entrance gate of the mine
41	A final Mine closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	A progressive mine closure plan approved by IBM is in place. The final mine closure plan along with details of Corpus fund will be submitted to the Ministry of Environment & Forests 5 years in advance.

General Condition:

Sl. No.	Condition	Compliance
1	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	We are operating as per the approved mining technology and scope of working mentioned in Environmental Clearance granted to us and no change in mining technology and scope of working shall be made and adhered to the condition of MoEF.
2	No further expansion or modification in the plant shall be carried out without prior approval of th MoEF.	For any expansion or modification in future prior approval shall be sought from MoEF.

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3	No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.	<p>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. The production achieved (in MT) during FY: 2015-16</p> <p>For Iron ore(in MTPA) :</p> <table border="1" data-bbox="847 555 1439 748"> <thead> <tr> <th></th> <th>Plan</th> <th>Actual</th> </tr> </thead> <tbody> <tr> <td>ROM</td> <td>3.429</td> <td>0.936</td> </tr> <tr> <td>OB,Waste</td> <td>2.931</td> <td>0.791</td> </tr> <tr> <td>Sub-Grade</td> <td>2.849</td> <td>0.826</td> </tr> <tr> <td>Total Excavation</td> <td>9.209</td> <td>2.553</td> </tr> </tbody> </table> <p>For Mn ore(in TPA) :</p> <table border="1" data-bbox="847 831 1439 1021"> <thead> <tr> <th></th> <th>Plan</th> <th>Actual</th> </tr> </thead> <tbody> <tr> <td>ROM</td> <td>52000</td> <td>4876.891</td> </tr> <tr> <td>OB,Waste</td> <td>380886</td> <td>38492.240</td> </tr> <tr> <td>Sub-Grade</td> <td>5200</td> <td>487.689</td> </tr> <tr> <td>Total Excavation</td> <td>438086</td> <td>13856.820</td> </tr> </tbody> </table>		Plan	Actual	ROM	3.429	0.936	OB,Waste	2.931	0.791	Sub-Grade	2.849	0.826	Total Excavation	9.209	2.553		Plan	Actual	ROM	52000	4876.891	OB,Waste	380886	38492.240	Sub-Grade	5200	487.689	Total Excavation	438086	13856.820
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4	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.	Ambient air quality monitoring is regularly 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. The ambient air quality reports are submitted to Regional office, MoEF, Bhubaneswar and SPCB, Orissa, once in every six months. All the parameters are within the prescribed limit. Ambient Air Quality Report is attached as Annexure-X.																														
5	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.	RSPM (Particulate matter with size less than 10micron i.e., PM10) and , NOx in ambient air are being monitored as per standard guidelines and the reports are submitted to Regional office, MoEF, Bhubaneswar and SPCB, Odisha half yearly. Respirable Dust monitoring report is attached as Annexure-XI.																														
6	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.	Fugitive dust emissions from all the sources are controlled regularly. Effective water sprinkling is being done on haul roads, loading and unloading and at transfer points. Dry fog system is being used in plant areas to avoid generation of fugitive dust. Dust suppression systems in the drills have been provided for effective functioning. Photographs of the same are shown in Annexure-II.																														

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7	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.	Regular noise monitoring is done at different work areas. High noise areas are earmarked and people working there are provided with ear protection equipment and the system is ensured by certification to OHSAS 18001 and regular field audits. Noise monitoring data is attached as Annexure-XII.
8	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.	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. There is no waste water generation from the mines. Photographs of Oil & Grease Separation pit and result of the workshop effluent is enclosed as Annexure-XIII & XIV respectively.
9	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.	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. The employees are also given regular awareness training on safety and health aspects as part of implementation process of OHSAS-18001 systems. Further, employees undergo Lung Function Tests during the Periodical Medical Examination. Periodical Medical Examination of employees and contractor workers are organised regularly to observe any contractions due to exposure to dust and other occupational hazards.
10	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.	A separate environmental management cell is in place with the people having relevant qualification on environmental science. The Head of the environment department reports to General Manager i.e. the head of the organization.
11	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.	Funds allocated for environmental management are spent only for environment related purposes and not diverted to any other purpose. During the year 2015-16 an amount Rs. 150.02 lakhs (approx) was spent towards environmental protection measures at Khondbond Mine. Details of Environmental Expenditure are attached as Annexure-XV.
12	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	This is a running mine. No specific date of start of land development work can be assigned. However, the copy of the Environmental Clearance has been sent to the Regional Office,

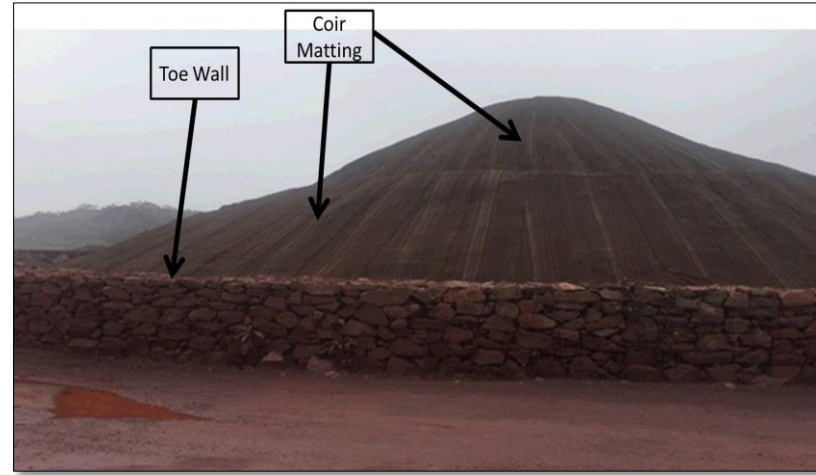
Sl. No.	Condition	Compliance
	authorities and the date of start of land development work.	MoEF, Bhubaneswar for kind information.
13	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation 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.
14	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.	Six monthly reports are submitted regularly on the status of implementation of the stipulated environmental safeguards to the Regional Office, MoEF, Bhubaneswar, Central Pollution Control Board and State Pollution Control Board. Further, the six monthly compliance report along with the monitoring results are uploaded in Tata Steel's website and updated periodically.
15	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.	A copy each of Environment Clearance has been sent to the Sarpanch, Balada Gram Panchayat, Sarpanch, Jalahari Gram Panchayat, Sarpanch, Malada Gram Panchayat and President, Zila Parisad, Keonjhar on 27th December, 2011.
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 statement in Form-V is submitted annually to the State Pollution Control Board, Odisha as prescribed under the Environment (Protection) Rules, 1986. The environmental statement for the year 2014-15 was submitted on 23.09.2015. The environmental statement the year 2015-16 shall be submitted by Sep' 2016. Further, the environmental statement along with status of Environmental Clearance conditions is also put in our Company's website www.tatasteel.com. The same reports are also

Sl. No.	Condition	Compliance
	Environment and Forests, Bhubneswar by e-mail.	sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail.
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 Environment Clearance with regard to Khondbond Iron & Mn Mine were published both in Oriya and English local newspapers named “Pragativadi” and “New India Express” respectively vide our letter no. MD/ENV/616/106/2011, dated: 27.12.2011, the copy of the environmental clearance was communicated to the Member Secretary, OSPCCB, Bhubaneswar.

Annexure-I: Top Soil Collection at the site & at earmarked place



Annexure-II: Air Quality Management



Coir Matting of Dumps



Fixed Water Sprinkler



Mobile Water Sprinkler

Annexure-II: Air Quality Management.....Cont.



Dry Fog at Mobile Crushing & Screening Plant



Dry Fog at Stationary Crushing & Screening Plant

Annexure-II: Air Quality Management.....Cont.



Wet Drilling

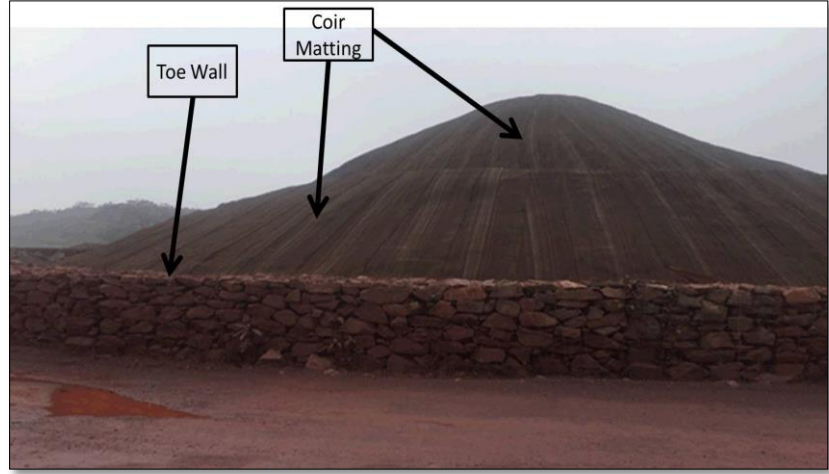


Water Mist Canon



Plantation on Dumps

Annexure-III: Dump Management



Coir Matting of Dumps



Garland Drains

Annexure-III: Dump ManagementCont.



Toe Walls at Dumps



Dump Plantation

Annexure-III: Dump ManagementCont.



Check Dam for Surface Runoff Management



Settling Pit for Surface Runoff Management

Annexure-IV: Rain Water Harvesting Structure



Annexure-V: Ground Water Quality Report (Oct'15-March'16)

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

Date of Sampling: 20th November 2015

No.	Parameter	Permissible Limits	OW* Sebasram Gonua Vill (KH3)	OW* Patrasai Gonua Vill (KH4)
1	pH	6.5-8.5	7.44	7.76
2	Chloride, ppm	250	4.26	6.39
3	Iron, ppm	0.3	0.24	0.15
4	Fluoride, ppm	0.6-1.2	0.71	0.84
5	TDS, g/l	500	44.58	11.41
6	EC, ms/m	600	108.11	182.94
7	Sulphate	400	6.32	6.86
8	Nitrate	45	6.55	4.27
9	Calcium, ppm	200	15.22	25.34
10	Magnesium, ppm	30	11.34	11.62
11	Arsenic, ppm	0.05	0.002	0.001
12	Manganese, ppm	0.30	0.186	0.012
13	Zinc, ppm	5	0.025	0.031
14	Chromium, ppm	0.05	0.004	0.016
15	Lead, ppm	0.05	0.004	0.009
16	Microbial count (CFU/ml) after 24 h	10	Nil	Nil

***OW: Open Well**



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Indian Institute of Technology
Karagpur-721302, India

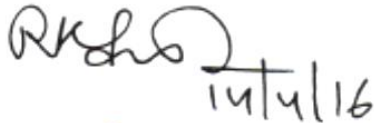
Annexure-V: Ground Water Quality Report (Oct'15-March'16).....Cont.

Ground Water Quality Report at various locations around
KHONDBOND IRON MINE
TATA STEEL
(As per BIS 10500: 1991)

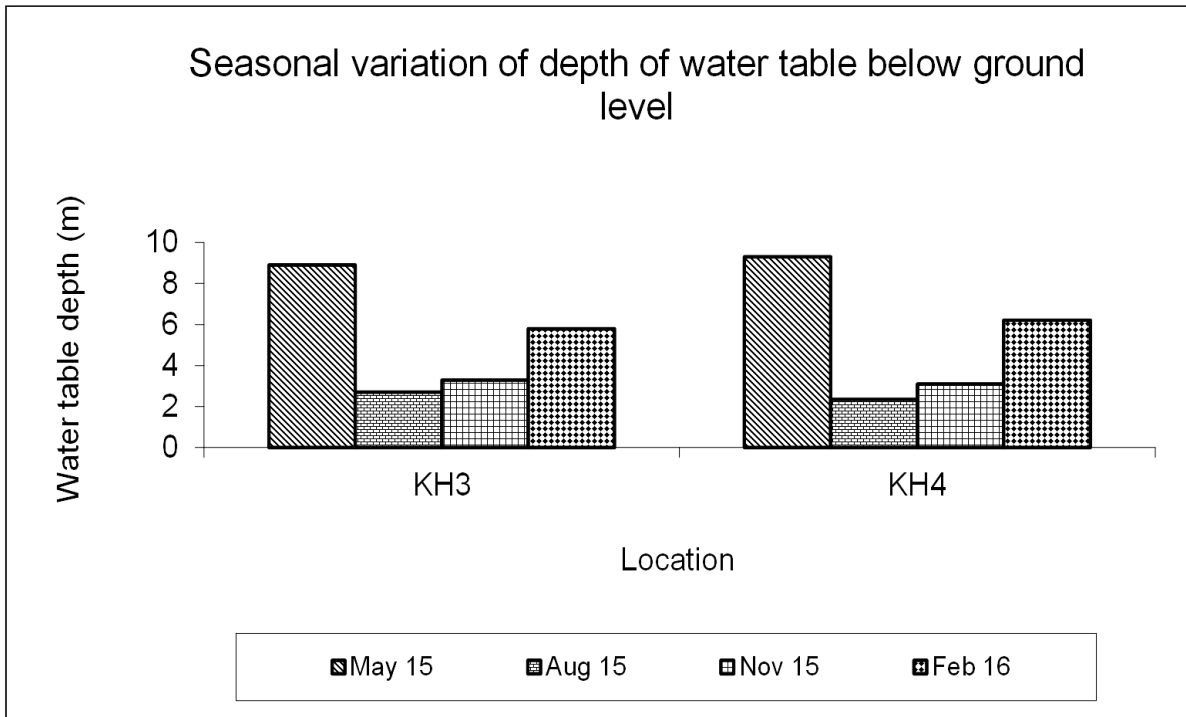
Date of Sampling: 27th February 2016

No.	Parameter	Permissible Limits	OW* Sebasram Gonua Vill (KH3)	OW* Patrasai Gonua Vill (KH4)
1	pH	6.5-8.5	7.32	6.35
2	Chloride, ppm	250	5.63	6.52
3	Iron, ppm	0.3	0.18	0.15
4	Fluoride, ppm	0.6-1.2	0.64	0.77
5	TDS, g/l	500	44.72	13.85
6	EC, ms/m	600	116.79	190.42
7	Sulphate	400	7.42	7.81
8	Nitrate	45	5.31	4.26
9	Calcium, ppm	200	17.47	27.44
10	Magnesium, ppm	30	11.52	12.43
11	Arsenic, ppm	0.05	0.001	0.004
12	Manganese, ppm	0.30	0.19	0.11
13	Zinc, ppm	5	0.042	0.031
14	Chromium, ppm	0.05	0.014	0.011
15	Lead, ppm	0.05	0.014	0.006
16	Microbial count (CFU/ml) after 24 h	10	Nil	Nil

***OW: Open Well**


14/2/16
Dr. R. K. Panda
Professor of Land & Water Resources Engg.,
Deptt. of Agricultural & Food Engg.,
Indian Institute of Technology
Karagpur-721302, India

Annexure-VI: Ground Water Level (Oct'15-March'16)



KH3 – Well at Sebasram Gonua

KH4 – Well Ganua village

Annexure-VII: Imposition of restriction on movement of minerals during day time

DPM's Correspondence

OFFICE OF THE DEPUTY DIRECTOR MINES, JODA, DIST: KEONJHAR.

No. 19626 Mines, dt. 20/5/10

From,
The Deputy Director Mines,
Joda, Keonjhar.

To,
All Mine Owners
Under Joda Circle.

Sub: Imposition of restriction on movement of mineral from the lease hold areas.

Sir,

It is to inform that it was decided in the District level Task Force meeting under the Chairmanship of the Collector & District Magistrate, Keonjhar to restrict movement of vehicle loaded with Iron ore / Mn. Ore from the different mines and Crusher plants / Sponge Iron Plants.

- i. No loading of mineral from the mines / plants and weighing of mineral loaded Trucks shall be allowed from 12.00 midnight to 10.00 a.m. in the morning.
- ii. The Mine owner / plant owners will ensure that no mineral loaded vehicles will stand on the NH-215 during the restricted period from 8.00 a.m. to 8.00 p.m.
- iii. To engage registered transporters and a list of such Regd. owner/transporting Agency along with the terms of the Agreement may be submitted to this office.
- iv. For loading at the Rly. sidings, only registered loading agencies shall be allowed to be engaged by the lessee / licensees and a declaration to this effect shall be submitted at the time of taking permits.

It is therefore requested to submit your compliance report by 25.05.10 positively. Any deviation will viewed seriously.

Yours faithfully,

[Signature]
Deputy Director Mines, Joda
Keonjhar.

Memo No. 19627 Mines, dt. 20/5/10

Copy to All M.O. / S.I.M. / all field staffs for information and necessary action.

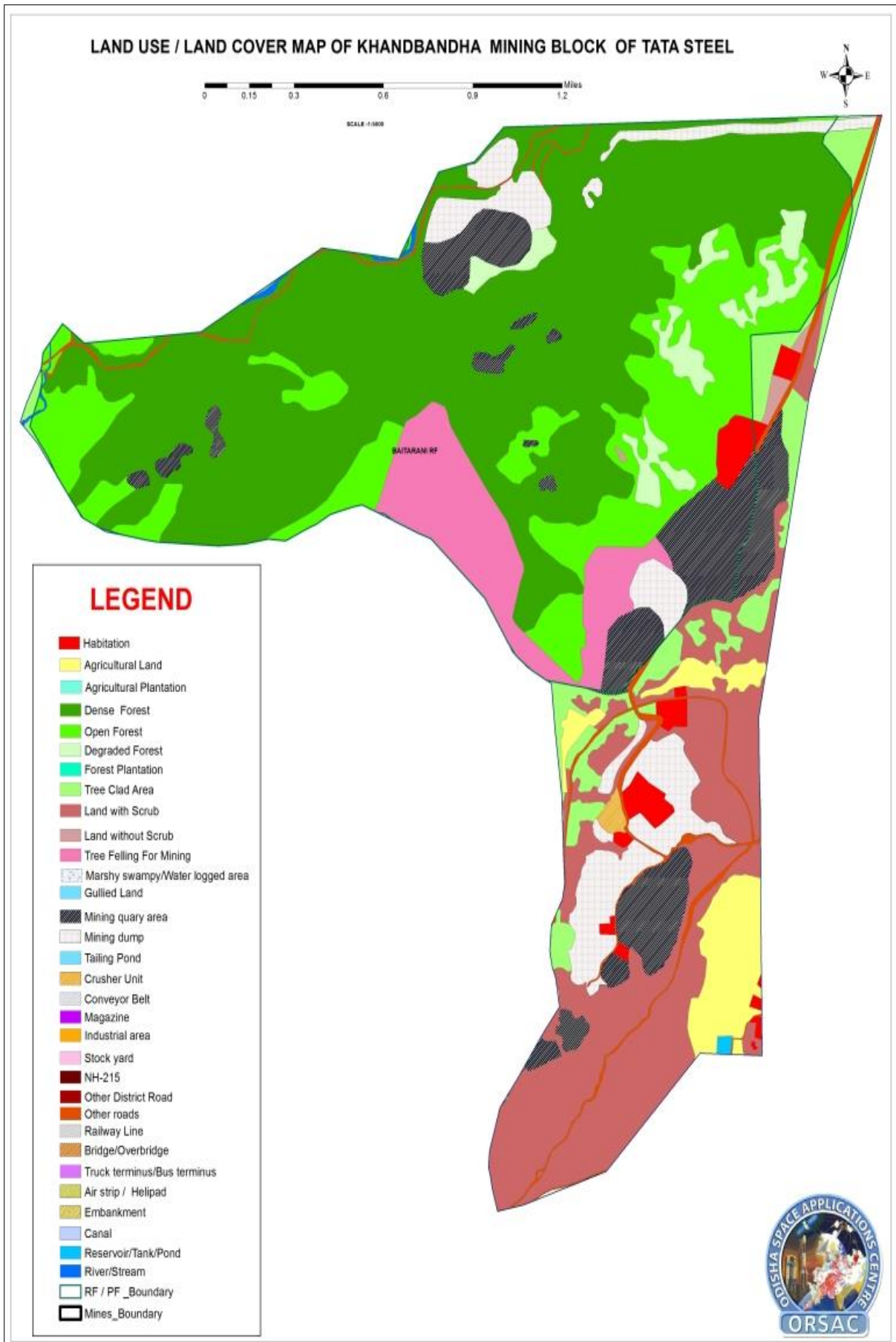
[Signature]
Deputy Director Mines, Joda
Keonjhar.

Received from DPM's office
[Signature]
21/5/2010

Annexure-VIII: STP at Joda



Annexure-IX: Land Use of KIMM



Annexure-X: Ambient Air Quality Report (Oct'15-Mar'16)

Core Zone

Month	Manganese Quarry					Garden near Old Q-Ore body					Labour Colony rest shed					Near IM Section				
	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO
Oct-15	38.44	22.51	BDL	10.11	0.12	43.22	25.29	BDL	10.52	0.13	52.33	30.06	BDL	11.62	0.18	47.44	27.64	BDL	11.03	0.15
Nov-15	47.63	27.64	4.08	10.93	0.13	52.38	29.89	4.21	11.48	0.16	60.38	33.89	4.71	12.36	0.22	56.00	31.91	4.43	11.89	0.19
Dec-15	44.56	27.60	4.02	10.64	0.13	48.78	28.30	4.11	11.19	0.14	57.67	32.63	4.54	12.13	0.20	53.56	30.77	4.27	11.63	0.17
Jan-16	42.89	25.13	BDL	10.43	0.12	47.00	27.3	4.07	11.00	0.14	55.44	31.54	4.36	11.88	0.19	50.56	28.90	4.17	11.43	0.16
Feb-16	42.00	24.48	BDL	10.53	0.12	45.13	26.21	BDL	10.90	0.14	54.63	31.45	BDL	11.61	0.18	49.38	28.41	BDL	11.24	0.16
Mar-16	45.67	26.57	4.10	10.89	0.13	49.89	29.09	4.20	11.31	0.15	59.00	32.60	4.70	12.22	0.21	53.78	30.69	4.40	11.73	0.17

Buffer Zone

Month	Khondbond Village					Chormalda					Guruda				
	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO
Oct-15	51.00	29.80	4.20	11.05	0.17	39.00	23.05	BDL	9.95	0.12	45.00	27.05	BDL	10.40	0.14
Nov-15	60.00	34.65	6.20	11.85	0.19	45.50	26.55	BDL	10.60	0.14	52.50	29.60	BDL	10.65	0.16
Dec-15	67.00	37.60	5.25	12.95	0.28	52.00	29.60	BDL	11.40	0.17	60.50	34.20	4.70	12.40	0.21
Jan-16	59.00	32.85	4.55	12.10	0.19	37.50	21.75	BDL	9.90	0.11	45.50	27.10	BDL	10.90	0.14
Feb-16	51.00	29.80	4.20	11.05	0.17	39.00	23.05	BDL	9.95	0.12	45.00	27.05	BDL	10.40	0.14
Mar-16	60.00	34.65	6.20	11.85	0.19	45.50	26.55	BDL	10.60	0.14	52.50	29.60	BDL	10.65	0.16

Unit of measurement for all parameters except CO is $\mu\text{g}/\text{m}^3$. Co is in mg/m^3

Dikran
Lab-in-charge

Annexure-XI: Respirable Dust Survey (Oct'15-March'16)

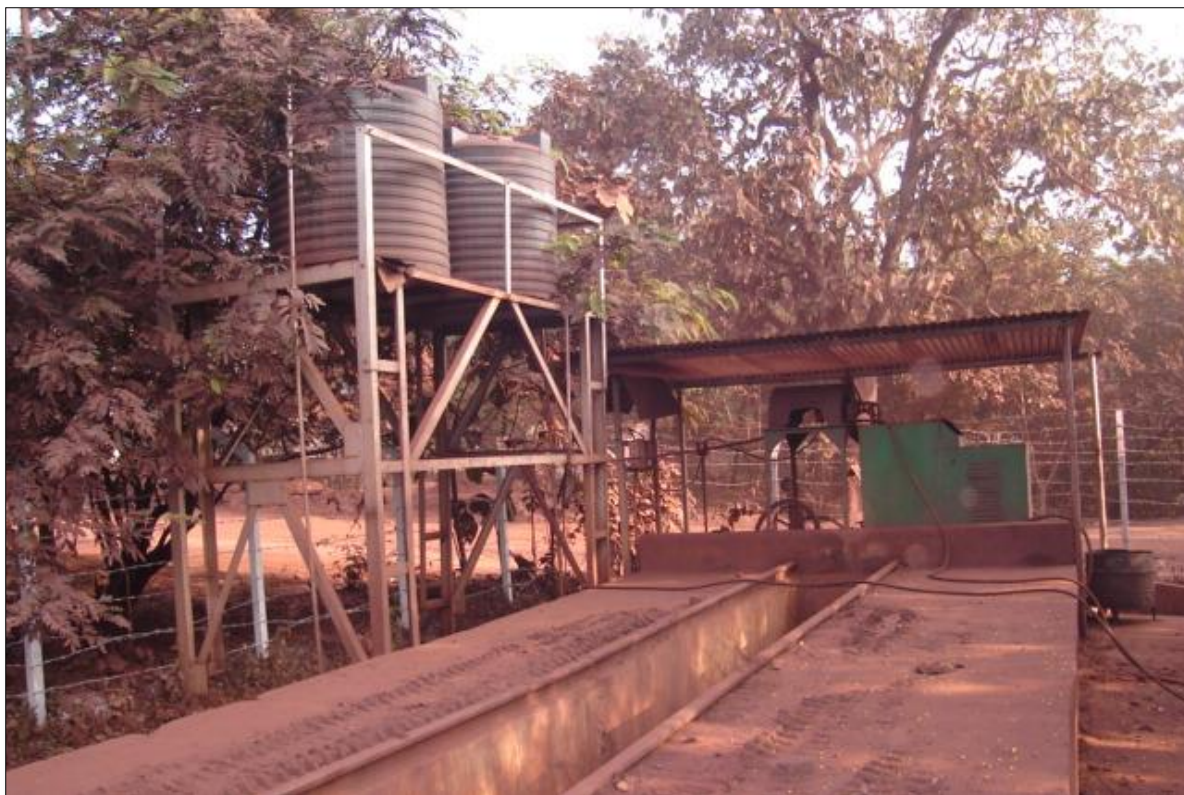
(Respirable Dust assessed with Gravimetric Dust Sampler)
(100% cut off at 7 microns unit density spheres)

Date	Location	Level mg/cu.m	Standard as prescribed by DGMS	Remarks
10.12.15	Near Dumping Hopper	2.19	3.00 mg/cu.m	Within limit
23.12.15	Secondary crusher	2.39	3.00 mg/cu.m	Within limit
08.01.16	Drill 1m away	1.74	3.00 mg/cu.m	Within limit
20.01.16	Shovel 1m away	1.78	3.00 mg/cu.m	Within limit
15.02.16	Dumper (cabin)	0.49	3.00 mg/cu.m	Within limit
24.02.15	Loading point	0.67	3.00 mg/cu.m	Within limit

Annexure-XII: Ambient Noise Quality Report (Oct'15-March'16)

	Location	Limit in dB(A) Leq	Day Time 8.00 am to 10.00 pm	Limit in dB(A) Leq	Night Time 8.00 am to 10.00 pm
Residential area	Hospital Premises	55.00	52.42	45.00	41.27
	Training Centre		50.78		40.23
	Township		53.27		41.82
Industrial area	Manager's Office	75.00	51.27	70.00	40.15
	Mining area		72.63		63.55
	Plant area		74.30		68.13

Annexure-XIII: Oil & Grease Separation Pit



Annexure-XIV: Workshop Effluent Quality (Oct'15-March'16)

Parameter	Unit	Limit	Khondbond Oil & Grease Trap
pH	-	5.5 – 9.0	5.91
Suspended Solids	mg/l	100.00	55.53
Oil & Grease	mg/l	10.00	6.88

Annexure-XV: Annual Expenditure on Environment Safeguards 2015-16

Sl. No.	Activity	Amount (Lakhs)	Type of Expenditure
1	Sewage Treatment Plant	24.50	Capital
2	Acoustic enclosure for DG sets	4.00	Capital
3	Installation of acoustic enclosure	0.80	Recurring
4	Expenses in Dry Fog system operation and maintenance in plant (AMC)	3.00	Recurring
5	Spares for maintaining DFS	5.00	Recurring
6	Power consumption-cost (running of compressor, DFS pump, sprinkler pump etc)	15.00	Recurring
7	Operation and maintenance of mobile water sprinkler	3.17	Recurring
8	Operation & Maintenance of wet Drill	1.50	Recurring
9	Construction of toe wall & garland drain with sasuage net	9.15	Recurring
10	Maintenance of toe wall & garland drain	5.00	Recurring
11	Construction of check dams	5.00	Recurring
12	Maintenance of check dams	1.08	Recurring
13	Maintenance of oil separation pit	0.25	Recurring
14	Concrete work on footpath at equipment area	7.70	Recurring
15	Water Flow meters	0.50	Recurring
16	Replacement of SV lights with LED lights	9.50	Recurring
17	Coir matting of fine stocks	8.00	Recurring
18	Awareness Programme (MEMC Week, World Environment Day)	3.00	Recurring
19	Maintenance of Electronic display board	0.97	Recurring
20	Ground vibration study	4.00	Recurring
21	CTO & CTE Fees	20.36	Recurring
22	Environmental Monitoring	9.94	Recurring
23	Display Board AMC	0.97	Recurring
24	Plantation	7.63	Recurring
	Total =	150.02	0.00