



The Addnl. PCCF (C)
Eastern Regional Office
Ministry of Environment, Forests & Climate Change,
Govt. of India
A/3, Chandrasekharpur
Bhubaneswar-751 013 (Odisha)
Email: roez.bsr-mef@nic.in

MD/ENV/ 221 /110/19
Date: 28.05.2019

Ref: Environmental Clearance letter no. J-11015/63/2008.IA.II(M) dated: 26.11.2010

Sub: Half-yearly compliance status report of Environmental Clearance conditions for the period October'18 - March'19 in respect of Katamati Iron Mine, TATA Steel Ltd.

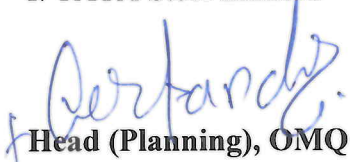
Dear Sir,

Kindly find attached herewith submitting the six monthly compliance report as on date in respect of the stipulated Environmental Clearance conditions of Katamati Iron Mine, TATA Steel Ltd. for the period from **October'18 - March'19** as per EIA Notification, 2006. Also for the same period vide office memorandum no. Z-11013/57/2014-IA.II (M), dated 29.10.2014, is also attached herewith as Annexure -1. The same is also attached in soft copy of the report to your good office on email: roez.bsr-mef@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, Southern Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700107 (W. B.)
: The Member Secretary, State Pollution Control Board, Parivesh Bhawan, A/118, Nilakantha Nagar, Unit – VIII, Bhubaneswar – 751012 (Odisha)
: The Regional Officer, State Pollution Control Board, College Road, At/PO- Baniapata, Keonjhar – 758001 (Odisha)

TATA STEEL LIMITED

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Compliance

to

Environmental Clearance Conditions

of

Katamati Iron Mine
M/s. Tata Steel Limited


For the period: October 2018 – March -2019



**(EC Letter No. J-11015/63/2008-IA.II (M) 26/11/2010 &
EC Letter No. J-11015/63/2008-IA.II (M) 18/01/2019)**

**ENVIRONMENTAL CLEARANCE
OF
KATAMATI IRON MINE OF TATA STEEL LIMITED**
(Oct 2018 to Mar. 2019)

**(MoEF & CC Letter No. J-11015/63/2008.IA.II(M) DATED: 26/11/2010)
FOR PRODUCTION OF 08 MTPA (ROM)**



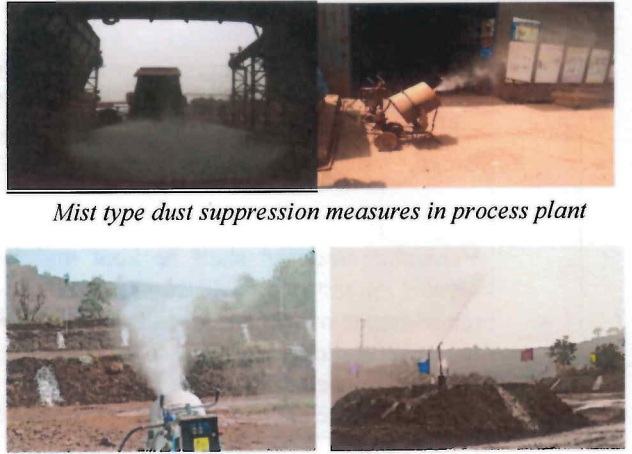
Sl. No.	EC Conditions	Compliance
Specific Conditions		
1.	The project proponent shall obtain Consent to Establish and Consent to Operate from the State Pollution Control Board, Odisha and effectively implement all the conditions stipulated therein.	Being complied with. Consent to Establish has been obtained from the Odisha State Pollution Control Board vide letter no. 12850, dated: 04.08.2010 & no. 11818, dated 18.7.2011 for mobile crushing & screening plant. Consent to Operate has also been obtained from State Pollution Control Board, Odisha vide letter No. 4811/IND/I-CON-185, dated: 18.03.2016, which is valid till 31.03.2021. All the conditions are being effectively implemented.
2.	Environment clearance is subject to grant of Forestry clearance. Necessary Forestry clearance under the Forest (Conservation) Act, 1980 for an area of 199.172 ha forestland involved in the project shall be obtained before starting mining operation in that area. No mining shall be undertaken in the forest area without obtaining requisite prior forestry clearance.	Being complied with. Katamati Iron Mine of TATA Steel has 403.3238 ha lease area, out of which 199.172 ha is a forest land & rest is non-forest. Currently the mining operation is restricted within the non-forest land. The forest diversion proposal has been submitted on 17.04.2007 over an area of 196.9719 ha (165.7928 ha fresh diversion and 31.1791 ha forest land broken prior to 1980) leaving a safety zone of 2.2001 ha which is well in advance stage. Katamati Iron Mine has already received the Stage -1 approval for 360.01 ha (including Sabik, RF & PF) vide F No. 8-01/2018-FC, dated 28 th August, 2018.
3.	Environmental Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No. 460 of 2004, as may be applicable to this project.	Noted down. However, there is no National Park, Sanctuaries, Elephant corridor and tiger reserves within 10 Km radius of lease in the core zone & buffer zone.
4.	Environmental clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the Competent authority, as may be applicable to this project.	Site specific wildlife plan has been approved by Office of Principal Chief Conservator of Forest (Wildlife) and Chief Wildlife warden: Orissa, Bhubaneswar vide letter no. 5842/1WL (C) SSP-306/2011, dated 29 th August 2011. On compliance of this, various found Rs. 1.,22 Cr for Implementation of the Item of Work prescribed for Project Impact Area in the Site Specific Wild life Conservation Plan and Rs. 80.66 lakhs for Implementation of Regional Wild life Management Plan., Rs. 20 lakhs to Forest Department towards construction of Anti-Depression camp building/ barracks was also made. of Rs 10 lakhs in CORPUS


Sl. No.	EC Conditions	Compliance
<i>Specific Conditions</i>		
		fund, Rs. 2 lakhs in SSWLCP have also been deposited Apart from above an employment of 10 local youth of nearby villages have also been provided for patrolling the jungle – forest area and fire protection incidents.
5.	The mining operations shall be restricted to above ground water table and it should not intersect the ground water 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.	Currently, the mining operation is restricted above the ground water table. However, due to hilly terrain for domestic and other purposes an application for 500m ³ /day for ground water withdrawal has been submitted to Central Ground Water Authority along with detailed hydro-geological report.
6.	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.	Being complied with. 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.
7.	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.	Generation of top soil is very minimal because of vertical movement of mining and whatever top soil is generated, is being kept at the earmarked site(s) only inside the Mining Lease area and is being subsequently used for plantation.
8.	The sub grade material, if any shall be stacked at the earmarked sites.	Sub grade material is being stacked at the earmarked sites as per the approved mining plan.
9.	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. Partial backfilling proposed after cessation of mining. The maximum height of the OB dump (s) shall not exceed 30m having three terraces of 10m each and the overall slope of the dumps shall not exceed 27°. It shall be ensured that the OB dump(s) 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 dumps. Monitoring and Management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests and its Regional Office located at Bhubaneswar on six monthly basis.	Over burden is stacked at the earmarked places only. The slopes of the OB dumps are terraced, and the overall slope angle is maintained and not exceeding 27°. The inactive dump slopes are vegetated with native species and grass and vetiver grass for better slope stabilization. The compliance status is being regularly sent to the Regional office, MoEF&CC, Bhubaneswar and SPCB, Odisha half yearly.  <i>OB Dump Plantation</i>
10.	Catch drains and siltation ponds of appropriate size	Garland drains with settling pits, have been made all

Sl. No.	EC Conditions	Compliance
Specific Conditions		
	<p>shall be constructed around the mine working, sub-grade, overburden and mineral dump(s) to prevent run off of water and flow of sediments directly into the Mahadev Nallah, Betlata Nallah, Baitarani River and other water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon maintained properly. Garland drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed around the mine pit, overburden dumps and sub-grade and mineral dump(s) to prevent run off of water and flow of sediments into the Mahadev Nallah, Betlata Nallah, Baitarani River and other water bodies and slump 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 shall be constructed at the corners of the garland drains and desilted at regular intervals</p>	<p>along the OB dumps. Three settling ponds of adequate sizes have been constructed at the end of the garland drains to take care of run-off water even during peak rain fall and they are being de-silted regularly before, during and after the monsoon. There is no outside discharge of any industrial effluent. All the garland drains, settling pits 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. Photographs of toe wall, garland drain and settling pits are attached as.</p>  <p style="text-align: center;"><i>Toe wall, Check dam, garland drain siltation pond</i></p>
11.	<p>Dimension of retaining wall at the toe of the OB dump(s) and the OB benches within the mine to check run-off and siltation should be based on the rainfall data.</p>	<p>Complied with Toe wall and Garland drains have been constructed around the OB dumps to check mine run-off.</p>
12.	<p>Trace Metals such as Ni, Co, As and Hg should be analysed in dust fall and soil samples for at least one year during summer, monsoon and winter seasons. If concentrations of these metals are found below the standards then with prior approval of MoEF&CC this specific monitoring could be discontinued.</p>	<p>We are monitoring trace metals in dust fall and soil samples. All the results of soil and dust fall monitoring are attached herewith as annexure- I.</p>
13.	<p>Plantation shall be raised in an area of 370.155 ha including a 7.5m wide green belt in the safety zone around the mining lease, overburden dump(s), backfilled and reclaimed area, mine benches, around water body, 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</p>	<p>Plantation over an area of 370.155 ha shall be attained at the end of mine life through progressive mine closure plan. However, both fencing and plantation over 7.5m wide area around the mining lease is in progress. Besides the above, concurrent reclamation and rehabilitation program have been established in the mining plan. In this year about 2727 no of saplings are planted in Katamati area. In addition to that a plot of 150 sq feet local & lemon grass is also planted</p>  <p style="text-align: center;"><i>Plantation in the Katamati area</i></p>


Sl. No.	EC Conditions	Compliance
<i>Specific Conditions</i>		
		<p>In this year the slime has been collected and stored in designated place with coir matting for plantation purpose.</p> <div data-bbox="853 517 1485 734" data-label="Image"> </div> <p style="text-align: center;"><i>Plantation in the Katamati area</i></p>
14.	<p>The void left unfilled in an area of 11.2 ha shall be converted into water body. The higher benches of excavated void/mining pit shall be terraced and plantation done to stabilized the slopes. The slope 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>Being complied with.</p> <p>This being the activity at the end of mine life shall be achieved only after complete excavation of Iron ore as per mine plan.</p>
15.	<p>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.</p>	<p>Regular water sprinkling is being done on the haul roads, loading & unloading points for effective dust suppression by mobile and fixed water sprinklers. Dry fog system has also been provided at all transfer point of crushing and screening unit. Photographs of Water Sprinkling and dry fog system are attached. Ambient Air Quality is being monitored regularly as per the norms stipulated in EC granted to us and the results are well within the prescribed limits. Apart from above four continuous ambient air quality monitoring stations are also installed and working smoothly.</p> <div data-bbox="858 1424 1481 1626" data-label="Image"> </div> <p style="text-align: center;"><i>Dust suppression system at Katamati</i></p> <div data-bbox="858 1686 1481 1888" data-label="Image"> </div> <p style="text-align: center;"><i>CAAQMS station of Katamati</i></p>
16.	<p>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.</p>	<p>Regular monitoring of the flow rate of Balijhor Nallah which is flowing outside of the mining lease area is carried out and record maintained regularly.</p>
17.	<p>The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional</p>	<p>Complied with.</p> <p>Suitable ground water augmentation measure in & around Katamati iron Mine has been implemented by</p>

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	Director, Central Ground Water Board.	<p>check dams, toe wall, contours bunds etc.</p> <p>On 15th Nov., 2018 a NOC for ground water withdrawal for 460 m³/day & 1,23,250 m³/yr was accorded to mine from CGWA vide no. CGWA /NOC/MIN /ORIG/2018/4244. Based on hydro-geology study at suitable locations new piezometers are also been installed in mines.</p> <p>In this year 2018, seven (07) number of new ponds constructed in and around mine lease in surrounding village to augment the ground water.</p>
18.	Regular monitoring of ground water level and quality should be carried out in and around the mine lease 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 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 water table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.	Ground water quality and Ground water level are being monitored periodically in and around the lease areas. All the monitoring results are being submitted to regulatory agencies. The monitoring details are attached as annexure-II.
19.	Appropriate mitigative measures should be taken to prevent pollution of the Baitarani River in consultation with State Pollution Control Board.	Being complied with
20.	The Project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water required for the project. The ground water shall not be used for mining operations. Prior approval of Central Ground Water Authority shall be obtained for using ground water.	<p>Complied with</p> <p>Surface water permission has been obtained from competent authority. However, in case of non-availability of surface water ground water shall be used for domestic purpose only. An application to Central Ground Water Authority has already made with detailed hydrogeology report.</p>
21.	Suitable rain water harvesting measures on long term basis shall be planned and implemented in consultation with the Regional Director, Central Ground Water Board.	<p>Being complied with</p> <p>Due to hilly topography and land constraints rain water harvesting structure are made combinely for Noamundi & Katamati Iron Mine in Noamundi colony area as per hydrogeology study.</p>
22.	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	<p>Complied with</p> <p>Mineral is being transported to Noamundi Processing Plant, which is adjacent to Katamati by mining dumpers. Over loading of trucks is restricted to prevent spillage of material. Emission checks for all the vehicles are carried out half yearly. Effective water sprinkling is done on</p>



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	overloaded.	<p>haul roads to control fugitive dust.</p> <p>In this year a wheel washing facility is also installed at exit gate of mine to arrest and control the fugitive emission from mineral transportation.</p>  <p><i>Wheel washing facility at Katamati Mines</i></p>
23.	Blasting operation shall be carried out 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.	<p>Complied with</p> <p>Blasting is carried out during day time only. Controlled Blasting is carried out for control of ground vibrations and to arrest fly rocks, as per the recommendations of CIMFR, Dhanbad.</p>
24.	Drills shall either be operated with Dust extractors or equipped with water injection system.	<p>Drills have been provided with dust suppression system.</p>  <p><i>Wet drilling at Katamati Mines</i></p>
25.	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.	<p>The mineral handling plants at Noamundi area is equipped with high efficiency dust suppression systems..</p>  <p><i>Mist type dust suppression measures in process plant</i></p> <p><i>Water jet with mist water spray in Katamati</i></p> <p>Moreover, loading and unloading areas including transfer points have been provided with dust suppression</p>

Sl. No.	EC Conditions	Compliance
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		<p>facilities. However in mobile screening & crushing adequate dust control measure are made</p>  <p style="text-align: center;"><i>Dust suppression system at Katamati</i></p>
26.	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for workshop and wastewater generated during mining operation.	<p>Being complied with. Two Sewage Treatment Plant (STP) of 50 KLD & 10 KLD and an Effluent Treatment Plant (ETP) of 10 KLD are already installed in common colony area at Noamundi which are working smoothly. One more STP of 50KLD is being installed at new colony area.</p> <p>For the common workshops and all other areas and oil trap is installed with collection system. No wastewater is being generated from mining operations.</p>
27.	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.
28.	Effective safeguard measure shall be taken to ensure that the RSPM levels in the area are well below the prescribed standards.	Effective safeguard measure like Mobile & Stationary water sprinkling, dust suppression systems at loading & unloading point etc. have been provided to minimize fugitive dust emission.
29.	The height of stack shall be as per the prescribed standards/ guidelines.	Not applicable. As no stationary source applicable apart from DG sets used in mine lightening purposes of small capacity.
30.	Trace metals such as Fe, Cr+6, Cu, Se, As, Cd, Hg, Pb, Zn and Mn shall be periodically monitored at specific locations in both surface water downstream and in ground water at lower elevations from mine area, in consultation with the SPCB, Odisha and State Ground Water Board. Suitable treatment measures shall be undertaken in case levels are found to be higher than permissible limits.	Trace metals are being monitored periodically both of surface water and ground water and the monitoring reports are being sent to pollution control board regularly. The monitoring details are attached as annexure-III.
31.	Occupational health programme encompassing identification of hazardous, ranking of the risks, plan to handle such risk should be prepared and implemented effectively.	The mine is certified to both ISO 14001 & OHSAS 18001. Under OHSAS 18001 & DGMS guidelines, hazard identification, risk assessment and measures to minimise risk have been established and are implemented for all activities.
32.	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered flora and fauna namely elephant, sloth bear etc.	Site specific wildlife plan has been approved by Office of Principal Chief Conservator of Forest (Wildlife) and Chief Wildlife warden: Orissa, Bhubaneswar vide letter no. 5842/1WL (C) SSP-306/2011, dated 29 th August

Sl. No.	EC Conditions	Compliance
Specific Conditions		
	<p>Found in the study area. Action plan for conservation of flora and fauna prepared shall be implemented in consultation with the state forest and Wildlife Department. All the safeguard measures brought out in the Wildlife Conservation plan prepared specific to this project site shall be effectively implemented. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. A copy of action plan shall be submitted to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar.</p>	<p>2011.</p> <p>On compliance of this, various found Rs. 1.,22 Cr for Implementation of the Item of Work prescribed for Project Impact Area in the Site Specific Wild life Conservation Plan and Rs. 80.66 lakhs for Implementation of Regional Wild life Management Plan., Rs. 20 lakhs to Forest Department towards construction of Anti-Depression camp building/ barracks was also made. of Rs 10 lakhs in CORPUS fund, Rs. 2 lakhs in SSWLCP have also been deposited</p> <p>Apart from above an employment of 10 local youth of nearby villages have also been provided for patrolling the jungle – forest area and fire protection incidents.</p>
33.	<p>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.</p>	<p>Currently it's been not applicable.</p>
34.	<p>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.</p>	<p>The digital processing of entire lease area is being carried out regularly. The current land use pattern is made by M/s Digital Cartography & Services Pvt. Ltd. the authorized agency by ORSAC, Bhubaneswar. The Resource SAT-II with multispectral bands LISS IV & Carto SAT –I with monochromatic band of year 2016 & 2017 respectively used based on clear vision. The land use land cover change map as on date is attached as annexure-IV.</p>
35.	<p>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.</p>	<p>All the critical parameters mentioned are being monitored internally and from third party. All the monitoring data is being uploaded on the Company's website as part of this report and also as per the circular No. J-20012/1/2006-IA.II(M) dated 27.05.2009 issued by Ministry of Environment and Forests, all the monitoring data is being displayed on the display board at the main entrance gate of the mine.</p> <p>Apart from above four continuous ambient air quality monitoring stations are also installed and working smoothly. Various parameters such as PM₁₀, PM_{2.5}, SOx, NOx is being monitored for every 15 minutes and the date of same is continuously uploaded in Pollution Control Board server. The data is same is also been displayed using electronic display board in public domain</p> <div data-bbox="865 1944 1487 2145" data-label="Image"> </div> <p style="text-align: center;"><i>CAAQMS station of Katamati</i></p>

Sl. No.	EC Conditions	Compliance
Specific Conditions		
36.	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 Conditions		
1.	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	Being complied with. 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&CC.
2.	No change in the calendar plan including excavation, quantum of iron ore and waste produced should be made.	Being complied with. No change in Calendar plan (IBM Approved Mining Plan) shall be made.
3.	At least four ambient air quality- monitoring stations should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10micron i.e., PM ₁₀) and , NO _x 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. .	<p>Ambient Air Quality monitoring is regularly being carried out at four different stations within the core zone, which were located in consultation with the visiting officers of State Pollution control Board, Bhubaneswar. The ambient air quality reports are being submitted to Regional office, MoEF&CC, Bhubaneswar half yearly and to SPCB, Bhubaneswar monthly. Various parameters such as PM₁₀, PM_{2.5}, SO_x, NO_x is being monitored for every 15 minutes and the date of same is continuously uploaded in Pollution Control Board server. The data is same is also been displayed using electronic display board in public domain</p>  <p style="text-align: center;"><i>CAAQMS station of Katamati</i></p>
4.	Data on ambient air quality [RSPM (Particulate matter with size less than 10micron i.e., PM ₁₀) and, NO _x] should be regularly submitted to the Ministry including its Regional Office at Bhubaneswar and to the State Pollution Control Board/ Central Pollution Control Board once in six months.	RSPM (Particulate matter with size less than 10 micron i.e., PM ₁₀) and, NO _x in ambient air are being monitored as per standard guidelines and the reports are submitted to Regional office, MoEF&CC, Bhubaneswar half yearly and SPCB, Odisha monthly. Ambient Air Quality Report is attached as Annexure-V.
5.	Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangements on haul roads, loading and unloading and at transfer points should be provided and properly maintained.	Effective water sprinkling is being done on haul roads and at loading and unloading points. Dust suppression systems in the drills have been provided for functioning effectively.

General Conditions

		 <p style="text-align: center;"><i>Water jet with mist water spray in Katamati</i></p> <p style="text-align: center;"><i>Dust suppression arrangements at Katamati</i></p>
6.	<p>Measures should be taken for control of noise levels below 85dBA in the work environment. Workers engaged in operations of HEMM etc. should be provided with ear plugs/ muffs.</p>	<p>High noise areas are earmarked and people working there are provided with ear protection equipment. All the HEMM's cabin is air conditioned so that there won't be any noise pollution. Regular noise monitoring is being done.</p>
7.	<p>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.</p> <p>Oil and grease trap and retention ponds should be installed before discharge of workshop effluents.</p>	<p>Oil & Grease separation pits have been provided to take care of effluents from the workshop. Its water quality is being monitored regularly and the parameters meet the prescribed standard. There is no waste water discharge from the mine.</p>  <p style="text-align: center;"><i>Oil trap Workshop</i></p>
8.	<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>	<p>Adequate dust masks are provided to employees engaged in dusty areas. PME of company and contractor employees are organized regularly to observe any contractions due to exposure to dust and other occupational hazards. Employees also undergo Lung Function Tests during the Periodical Medical Examination. The employees are also given regular awareness training on safety and health aspects as part of implementation process of OHSAS-18001 systems.</p>
9.	<p>A separate Environment 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 Organisation</p>	<p>Complied with. 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.</p>

General Conditions		
10.	The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar.	Funds allocated for environmental management are spent only for environment related purposes and not diverted to any other purpose. Expenditure details of environmental protection measures during 2018-19 at Katamati Iron Mine are attached as annexure-VI.
11.	The Project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.	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, MoEF&CC, Bhubaneswar for necessary information.
12.	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The Project authorities should extend full co-operation to the officer (s) of the Regional Office by furnishing the requisite data/information/ monitoring reports	We extend full co-operation to the officers of the Regional Office during their visit and furnish the required data, Information and monitoring reports.
13.	The Project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office, Bhubaneswar, 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 environmental 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, Bhubaneswar, the respective zonal officer of Central Pollution Control Board and the State Pollution Control Board.	Six monthly compliance reports are being submitted regularly on the status of implementation of the stipulated environmental safeguards to the MoEF&CC, its Regional Office Bhubaneswar, Central Pollution Control Board Kolkata and State Pollution Control Board, Bhubaneswar. Further, the six monthly compliance reports along with the monitoring results is being uploaded on Tata Steel's website www.tatasteelindia.com and updated periodically.
14.	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.	Complied with
15.	The State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and the Collector's office/ Tehsildar's Office for 30 days.	Complied with
16.	The environmental statement for each financial year ending 31 st 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	The environmental statement for financial year 2015-16 has been submitted to the State Pollution Control Board on vide letter no. MD/ENV/394/120/16 dated: 29.09.2016 and the same had been hosted on Company's website www.tatasteelindia.com . Further, compliance status on environmental clearance conditions was also sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail on 30.05.2015. Further,

General Conditions

	of Environment and Forests, Bhubaneswar by email	compliance status on environmental clearance conditions was also sent to the Regional Office of the Ministry of Environment and Forests, Ranchi by e-mail on 29.05.2017.
17.	The project authorities should advertise at least in two local newspapers of 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 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 Katamati Iron Mine were published both in English and Hindi in local newspapers. The copy of the newspaper advertisement was sent to the Regional Office, MoEF&CC, Bhubaneswar..

**ENVIRONMENTAL CLEARANCE
OF
KATAMATI IRON MINE OF TATA STEEL LIMITED**
(Oct 2018 to Mar. 2019)

**(MoEF & CC Letter No. J-11015/63/2008.IA.II(M) DATED: 18/01/2019)
FOR PRODUCTION OF 08 MTPA (ROM)**

Sl. No.	EC Conditions	Compliance
<i>Specific Conditions</i>		
1.	This Environmental Clearance will not be operation till such time the project proponent complies with all the statutory requirements and judgements of Hon. Supreme Court dated the 2 nd August 2017 in writ petition (civil) no. 114 of 2014 in the matter of common cause vs union of India and Ors.	Being complied with. In compliance with the order of Hon. Supreme Court on dated 02.08.2017 in WPC (Civil) no. 114 /2014 the project proponent has paid the compensation amount of Rs. 82,70,48,782/- (Rupees eighty-two crores seventy lakhs forty eight thousand seven hundred and eighty two only) on date 22.12.2017 being the price there of has compensation under section 21(5) of MMDR Act, 1957 for alleged production without / in excess of the environmental clearance as rationalised by the CEC as per the demand notice no. 4140/mines dated 02.09.2017 issued by the Dy. Director of mines, Joda circle, district – Keonjhar.
2.	Department of Mining & Geology, State Government shall ensure that mining operation shall not commence till the entire compensation levied, for illegal mining paid by the Project Proponent through their respective Department of Mining & Geology in strict compliance of judgment of Hon'ble Supreme Court dated the 2 nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors.	Being complied with. Demand was raised by the Deputy Director Mines, Joda Circle, Dist. - Keonjhar. vide letter 4140/ Mines dated 02.09.2017 amounting of 82,70,48,782/- (Rupees Eighty-two crores seventy lakhs forty eight thousand seven hundred eighty two only) on or before 31.12.2017 pursuant to the para 225 of the Order dated 02.08.2017 of Hon'ble Supreme Court in WPC 114/2014 and the same was paid as per law.
3.	Monitoring of Ambient Air Quality to be carried out based on the 2009 Notification, as amended from time to time by the Central Pollution Control Board.	Complied. Ambient Air Quality monitoring is regularly being carried out at core & buffer zone, which were located in consultation with the visiting officers of State Pollution control Board, Bhubaneswar. The monthly monitoring report of same is been submitted regularly. Apart from above three continuous ambient air quality monitoring stations are also installed and are under operation. The data of PM ₁₀ , PM _{2.5} , SO _x , NO _x , CO etc is been submitted online. The data of monitoring by using electronic board displayed in public domain.
4.	The pollution due to transportation load on the environment will be effectively controlled & water sprinkling will also be done regularly. Vehicles with PUC only will be allowed to ply. The mineral transportation shall be carried out through covered trucks only and the vehicles carrying the mineral shall	Complied. Effective water sprinkling is being done on haul roads and at loading and unloading points. Dust suppression systems in the drills have been provided for functioning effectively.

Sl. No.	EC Conditions	Compliance
Specific Conditions		
	<p>not be overloaded. Project should obtain 'PUC certificate for all the vehicles from authorized pollution testing centre. Washing of all transport vehicle should be done inside the mining lease.</p>	<div data-bbox="858 398 1497 600" data-label="Image"> </div> <p data-bbox="948 600 1394 629"><i>Water jet with mist water spray in Katamati</i></p> <p data-bbox="858 658 1497 719">This year high pressure mobile water sprinkler of 50kL procured & used for water sprinkling in haul roads.</p> <div data-bbox="858 719 1497 1084" data-label="Image"> </div> <p data-bbox="922 1084 1426 1113"><i>Water jet with mist water spray in Katamati mine</i></p> <p data-bbox="858 1173 1497 1272">In this year a wheel washing facility is also installed at exit gate of mine to arrest and control the fugitive emission from mineral transportation.</p> <div data-bbox="858 1285 1497 1442" data-label="Image"> </div> <p data-bbox="963 1442 1385 1471"><i>Wheel washing facility at Katamati Mines</i></p>
5.	<p>The activities and budget earmarked for Corporate Environmental Responsibility (CER) shall be as per Ministry's O.M No 22-65/2017-IA. II (M) dated 01.05.2018 and the action plan on the activities proposed under CER shall be submitted to the Regional Office of the Ministry and State Pollution Control Board.</p>	<p>Being complied.</p>

Soil Quality. Monitoring Report (October'18 – March'19) Katamati Iron Mine



Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)
(ISO 9001:2015, ISO 14001:2015 & OHSAS 18001:2007 Certified)



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Certificate No.: TC-7944

Format No.: 7.8.2/FMT/TR/06

TEST REPORT

Customer Name & Address	M/S. KATAMATI IRON MINES (M/s TATA Steel Limited)		
Test Report No	ENV/AT/18/R-9832	Report Release Date	01/12/18
Sample Code	S-1	Sampled by	VC SPL representative
Sample Name	Soil	Sampled on	29.11.2018
Sample Condition	Scaled	Sampling Location	S-1: Mines Area
Test Started On	30.11.2018	Sample Received On	30.11.2018
		Test Completed On	04.12.2018

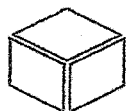
SL.No.	Parameters	Analysis Result
		29.11.2018
1	*Colour	Light Brown
2	*of Soil	Acidic
3	*pH	7.2
4	*Soil Texture	Sandy Loam
5	*Bulk Density (gm/cc)	1.76
6	*Electrical. Conductivity	147.1
7	*Moisture Content	13.5
8	*Chloride (mg/kg)	7845.0
9	*Sulphate (mg/kg)	2014.0
10	*Potassium (mg/kg)	659.0
11	*Phosphorus (mg/kg)	421.0
12	*Nitrogen as N (mg/kg)	526.0
13	*Organic Matter (%)	2.4
14	*Organic Carbon (%)	1.39
15	*Iron (%)	3.1
16	*Nickel (%)	< 0.001
17	*Mercury (%)	< 0.001
18	* Cobalt (%)	< 0.001
19	*Arsenic (%)	< 0.001

Note Above (*) parameters are not in our scope.

- The test values are reported based on the samples received.
- Samples will be destroyed after 7 days from date of issues of the test report subject to nature of preservation. Sample will be preserved as per standard method.
- The test report shall not be reproduced, without written approval of laboratory



Soil Quality. Monitoring Report
(October'18 – March'19)
Katamati Iron Mine



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Certificate No.: TC-7944
Format No.: 7.8.2/FMT/TR/06

TEST REPORT

Customer Name & Address	M/S. KATAMATI IRON MINES (M/s TATA Steel Limited)		
Test Report No	ENV/AB/19/R-1204	Report Release Date	5.2.19
Sample Code	S-1	Sampled by	VCSPL representative
Sample Name	Soil	Sampled on	22.02.2019
Sample Condition	Sealed	Sampling Location	S-1: Mines Area
Test Started On	23.02.2019	Sample Received On	23.02.2019
		Test Completed On	28.02.2019

Sl.No.	Parameters	Analysis Result
		22.02.2019
1	*Colour	Light Brown
2	*of Soil	Acidic
3	*pH	7.41
4	*Soil Texture	Sandy Loam
5	*Bulk Density (gm/cc)	1.81
6	*Electrical. Conductivity	156.2
7	*Moisture Content	14.2
8	*Chloride (mg/kg)	7246
9	*Sulphate (mg/kg)	2018
10	*Potassium (mg/kg)	664
11	*Phosphorus (mg/kg)	420
12	*Nitrogen as N (mg/kg)	518
13	*Organic Matter (%)	2.1
14	*Organic Carbon (%)	1.22
15	*Iron (%)	2.9
16	*Nickel (%)	< 0.001
17	*Mercury(%)	< 0.001
18	* Cobalt (%)	< 0.001
19	*Arsenic (%)	< 0.001

Note Above (*) parameters are not in our scope.

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Dust Fall Monitoring Report (October'18 – March'19) Katamati Iron Mine



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TEST REPORT

Customer Name & Address	M/S. KATAMATI IRON MINES (M/s TATA Steel Limited)		
Test Report No	ENV/2018/IR-9883	Report Release Date	04/12/18
Sample Code	F-1	Sampled By	VCSPL representative
Sample Name	Dust Fall	Sampled On	29.11.2018
Sample Condition	Sealed	Sampling Location	F-1: Mines Area
Test Started On	30.11.2018	Sample Received On	30.11.2018
		Test Completed On	03.12.2018

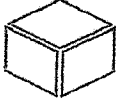
Parameters	Monitoring Date	DF (t/km ² /month)	Ni(%)	Co (%)	*Hg(%)	*As (%)	Fe (%)
DF & M	29.11.2018	2.3	0.08	0.05	<0.001	<0.001	1.25

Note Above (*) parameters are not in our scope.

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2. Samples will be destroyed after 7 days from date of issues of the test report subject to nature of preservation. Sample will be preserved as per standard method.
3. The test report shall not be reproduced, without written approval of laboratory



Dust Fall Monitoring Report (October'18 – March'19) Katamati Iron Mine



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Certificate No.: TC-7944
Format No.: 7.8.2/FMT/TR/06

TEST REPORT

Customer Name & Address	M/S. KATAMATI IRON MINES (M/s TATA Steel Limited)		
Test Report No	Env/ab/19/R-1202	Report Release Date	5.2.19
Sample Code	F-1	Sampled By	VC SPL representative
Sample Name	Dust Fall	Sampled On	07.02.2019
Sample Condition	Sealed	Sampling Location	F-1: Mines Area
Test Started On	08.02.2019	Sample Received On	08.02.2019
		Test Completed On	09.02.2019

Parameters	Monitoring Date	DF (t/km ² /month)	Ni(%)	Co (%)	*Hg(%)	*As (%)	Fe (%)
DF & M	07.02.2019	2.1	0.074	0.052	<0.001	<0.001	1.21

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Ground water Level
Katamati Iron Mine
(October 2018 – March 2019)

Sr. No.	LOCATION	MONTH	
		November, 2018	January, 2019
Existing Dug Well Locations:			
1.	DALAGIRI-1, Near Road	6 m 32 cm	6 m 38 cm
New Piezometer Locations			
2.	Murga Village, Near Security Gate	9m 5cm	10m
3.	Near pit office, Katamati Iron Mine	42m	41m 5cm
4.	Near METSO office, Katamati Mine	47m	47m 2cm
5.	Katamati Mine entrance gate	36m	36m 5cm
Water samples with attached quality report			
1.	Galuri sahi (GW1)	4.5m	4.1m
2.	Murga Mahadev (GW2)	6.2m	6.1m
3.	Dalfiri -2(GW3)	6.4m	6.2m
4.	Mahadevnasa (GW4)	4.9m	4.6m

Newly constructed Piezometer Locations
at
Katamati Iron Mine, TATA Steel Ltd.

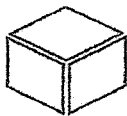


Piezometric borewell installed at Mine Office site, Katamati Mine



Piezometric borewell installed at METSO Office site, Katamati Mine

Ground Water Quality



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Format No.: 7.8.2/FMT/TR/06

TEST REPORT

Customer Name & Address	M/S. KATAMATI IRON MINES (M/s TATA Steel Limited)		
Test Report No	Enl/ab/19/R-1203	Report Release Date	5.02.19
Sample Code	GW-1- GW-4	Sampled by	VCSPL Representative
Sample Name	Ground Water	Sampled on	21.02.2019
Sample Condition	Sealed & Ice Preservative	Sampling Location	GW1: Galuri Sahi , GW2: Murga Mahadev GW3: Dalaffri - 2, GW4: Mahadevnasa
Test Started On	22.02.2019	Sample Received On	22.02.2019
		Test Completed On	28.02.2019

Sl. No	Parameter	Testing Methods	Unit	Standards as per IS: 10500, 2012	Analysis Results			
					GW-1	GW-2	GW-3	GW-4
Essential Characteristics								
1	*Colour	APHA 2120 B, C	Hazen	5	CL	CL	CL	CL
2	*Odour	APHA 2150 B	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	*Taste	APHA 2160 C	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	APHA 2130 B	NTU	1	<0.2	<0.2	<0.2	<0.2
5	pH Value	APHA 4500H' B	--	6.5-8.5	7.48	7.56	7.61	7.52
6	Total Hardness (as CaCO ₃)	APHA 2340 C	mg/l	200	180.0	152.0	142.0	152.0
7	Iron (as Fe)	APHA 3111 B	mg/l	0.3	0.26	0.21	0.22	0.23
8	Chloride (as Cl ⁻)	APHA 4500CB	mg/l	250	26.8	32.8	34.0	41.8
9	*Residual, free Chlorine	APHA 4500CI, B	mg/l	0.2	ND	ND	ND	ND
Desirable Characteristics								
10	Dissolved Solids	APHA 2540 C	mg/l	500	152.0	252.0	321.0	264.0
11	Calcium (as Ca)	APHA 3500Ca B	mg/l	75	32.8	40.6	36.0	40.8
12	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	12.1	13.2	12.8	13.4
13	Copper (as Cu)	APHA 3111 Cu B	mg/l	0.05	<0.05	<0.05	<0.05	<0.05
14	Manganese (as Mn)	APHA 3111 B	mg/l	0.1	0.024	0.038	0.032	0.018
15	*Sulphate (as SO ₄)	APHA 4500 SO ₄ ²⁻ E	mg/l	200	4.6	5.1	6.2	5.6
16	*Nitrate (as NO ₃)	APHA 4500 NO ₃ ⁻ E	mg/l	45	3.1	3	3.2	6.1
17	*Fluoride (as F)	APHA 4500F' C	mg/l	1	0.032	0.062	0.039	0.022
18	*Phenolic Compounds (as C ₆ H ₅ OH)	APHA 5530 B,D	mg/l	0.001	<0.001	<0.001	<0.001	<0.001
19	Mercury (as Hg)	APHA 3112 B	mg/l	0.001	<0.001	<0.001	<0.001	<0.001
20	Cadmium (as Cd)	APHA 3111 B	mg/l	0.003	<0.001	<0.001	<0.001	<0.001
21	*Selenium (as Se)	APHA 3114 B	mg/l	0.01	<0.001	<0.001	<0.001	<0.001
22	*Arsenic (as As)	APHA 3114 B	mg/l	0.01	<0.001	<0.001	<0.001	<0.001
23	*Cyanide (as CN)	APHA 4500 CN' C,D	mg/l	0.05	ND	ND	ND	ND
24	Lead (as Pb)	APHA 3111 B	mg/l	0.01	<0.001	<0.001	<0.001	<0.001
25	Zinc (as Zn)	APHA 3111 B	mg/l	5	<0.05	<0.05	<0.05	<0.05
26	*Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	0.2	<0.2	<0.2	<0.2	<0.2
27	*Chromium (as Cr ⁶⁺)	APHA 3500Cr B	mg/l	--	<0.05	<0.05	<0.05	<0.05
28	*Mineral Oil	APHA 5220 B	mg/l	0.5	<0.01	<0.01	<0.01	<0.01
29	Alkalinity	APHA 2320 B	mg/l	200	132.0	138.0	156.0	152.0
30	*Aluminium as(Al)	APHA 3500Al B	mg/l	0.03	<0.001	<0.001	<0.001	<0.001
31	*Boron (as B)	APHA 4500B, B	mg/l	0.05	<0.01	<0.01	<0.01	<0.01
32	*Poly Aromatic Hydrocarbon as PAH	APHA 6440 B	µg/l	--	<0.001	<0.001	<0.001	<0.001
33	*Pesticide	APHA 6630 B,C	mg/l	Absent	Absent	Absent	Absent	Absent

Note Above (*) parameters are not in our scope.

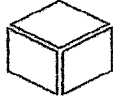
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Surface water analysis report

(October'18 – March'19)

Katamati Iron Mine



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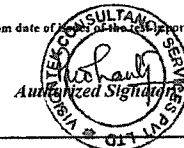
TEST REPORT

Customer Name & Address		M/S. KATAMATI IRON MINES (M/s TATA Steel Limited)	
Test Report No	En/108/19/R-9829	Report Release Date	14/12/18
Sample Code	SW1-SW2	Sampled By	VC SPL Representative
Sample Name	Surface Water	Sampled On	19.11.2018
Sample Condition	Scaled, Ice preservative	Sampling Location	SW-1: JOJO Spring U/S SW-2: JOJO Pump house Down
Test Started On	20.11.2018	Sample Received On	20.11.2018
		Test Completed On	27.11.2018

Sl. No.	Parameter	Testing Method	Unit	Standards as per IS 2296:1991 Class C	Analysis Results	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 4500 C	mg/l	4	5.2	6.1
2	Total Suspended Solids as TSS	APHA 2540 D	mg/l	--	46.0	38.0
3	BOD (3) days at 20°C (max)	IS 3025(P-44) 1993	mg/l	5	2.6	2.2
4	Chemical Oxygen Demand as COD	APHA 9220 B	mg/l	--	28.0	26.0
5	*Total Coli form	APHA 9221 B	MPN/100ML	5000	320.0	280.0
6	pH Value	APHA 4500H+B	--	6.0-9.0	7.46	7.33
7	*Colour (max)	APHA 2120 B,C	Hazen	300	1.0	1.0
8	Total Dissolved Solids	APHA 2540 C	mg/l	1500	128.0	144.0
9	Copper as Cu (max)	APHA 3111 Cu B	mg/l	1.5	<0.05	<0.05
10	Iron as Fe (max)	APHA 3111 B	mg/l	0.5	0.39	0.48
11	Chloride (max)	APHA 4500 Cl-B	mg/l	600	26.0	28.0
12	*Sulphates (SO ₄) (max)	APHA 4500 SO ₄ ²⁻ E	mg/l	400	3.2	4.6
13	*Nitrate as NO ₃ (max)	APHA 4500 NO ₃ ⁻ E	mg/l	50	1.52	1.64
14	*Fluoride as F (max)	APHA 4500F C	mg/l	1.5	0.022	0.018
15	*Phenolic Compounds as C ₁₂ H ₁₀ O (max)	APHA 5530 B,D	mg/l	0.005	<0.001	<0.001
16	*Cadmium as Cd (max)	APHA 3111 B	mg/l	0.01	<0.001	<0.001
17	*Selenium as Se (max)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
18	*Arsenic as As	APHA 3114 B	mg/l	0.2	<0.001	<0.001
19	*Cyanide as CN (max)	APHA 4500 CN ⁻ C,D	mg/l	0.05	ND	ND
20	Lead as Pb (max)	APHA 3111 B	mg/l	0.1	<0.01	<0.01
21	Zinc as Zn (max)	APHA 3111 B	mg/l	15	<0.05	<0.05
22	*Hexa Chromium as Cr +6	APHA 3500Cr B	mg/l	0.05	<0.05	<0.05
23	*Anionic Detergents (max)	APHA 5540 C	mg/l	1	<0.2	<0.2
24	Mercury as Hg	APHA 3112 B	mg/l	--	<0.001	<0.001
25	Manganese as Mn	APHA 3111 B	mg/l	--	<0.005	<0.005

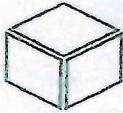
Note Above (*) parameters are not in our scope. Note: CL: Colorless, ND: Not Detected.

1. The test values are reported based on the samples received. 2. Samples will be destroyed after 7 days from date of report subject to nature of preservation. Sample will be preserved as per standard method.
3. The test report shall not be reproduced, without written approval of laboratory



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Surface water analysis. Monitoring Report
(October'18 – March'19)
Katamati Iron Mine



Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)

(ISO 9001:2015, ISO 14001:2015 & OHSAS 18001:2007 Certified)



NABI ACCREDITED

Certificate No.: TC-7944

Format No.: 7.8.2/FMT/TR/06

TEST REPORT

Customer Name & Address	M/S. KATAMATI IRON MINES (M/s TATA Steel Limited)		
Test Report No	Env146/19-R-1199	Report Release Date	5.2.19
Sample Code	SW1- SW2	Sampled By	VCSPL Representative
Sample Name	Surface Water	Sampled On	22.02.2019
Sample Condition	Sealed , Ice preservative	Sampling Location	SW-1: JOJO Spring U/S SW-2: JOJO Pump house Down
Test Started On	23.02.2019	Sample Received On	23.02.2019
		Test Completed On	02.03.2019

Sl. No.	Parameter	Testing Method	Unit	Standards as per IS 2296:1991 Class C	Analysis Results	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 4500O-C	mg/l	4	6.4	6.9
2	Total Suspended Solids as TSS	APHA 2540 D	mg/l	-	32	38
3	BOD (3) days at 270C (max)	IS 3025(I st -44) 1993	mg/l	3	2.8	3.1
4	Chemical Oxygen Demand as COD	APHA 2320 B	mg/l	-	20	21
5	*Total Coli form	APHA 9221 B	MPN/100ML	5000	220	280
6	pH Value	APHA 4500H+B	-	6.5-9.0	7.48	7.42
7	*Colour (max)	APHA 2120 B,C	Hazen	300	Colorless	2
8	Total Dissolved Solids	APHA 2540 C	mg/l	1500	146.0	152.0
9	Copper as Cu (max)	APHA 3111 Cu B	mg/l	1.5	<0.05	<0.05
10	Iron as Fe (max)	APHA 3111 B	mg/l	0.5	0.42	0.46
11	Chloride (max)	APHA 4500 Cl-B	mg/l	600	28.2	31.4
12	*Sulphates (SO ₄) (max)	APHA 4500 SO ₄ ²⁻ E	mg/l	400	4.6	5.4
13	*Nitrate as NO ₃ (max)	APHA 4500 NO ₃ ⁻ E	mg/l	50	1.78	1.81
14	*Fluoride as F (max)	APHA 4500F C	mg/l	1.5	0.026	0.032
15	*Phenolic Compounds as C ₆ H ₅ OH (max)	APHA 5530 B,D	mg/l	0.005	<0.001	<0.001
16	Cadmium as Cd (max)	APHA 3111 B	mg/l	0.01	<0.001	<0.001
17	*Selenium as Se (max)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
18	*Arsenic as As	APHA 3114 B	mg/l	0.2	<0.001	<0.001
19	*Cyanide as CN (max)	APHA 4500 CN ⁻ C,D	mg/l	0.05	ND	ND
20	Lead as Pb(max)	APHA 3111 B	mg/l	0.1	<0.01	<0.01
21	Zinc as Zn(max)	APHA 3111 B	mg/l	15	<0.05	<0.05
22	*Hexa Chromium as Cr+6	APHA 3500Cr B	mg/l	0.05	<0.05	<0.05
23	*Anionic Detergents (max)	APHA 5540 C	mg/l	1	<0.2	<0.2
24	Mercury as Hg	APHA 3112 B	mg/l	-	<0.001	<0.001
25	Manganese as Mn	APHA 3111 B	mg/l	-	<0.005	<0.005

Note Above (*) parameters are not in our scope. Note: CL: Colorless, ND: Not Detected.

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Ground Water Analysis Report



Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)
(ISO 9001:2015, ISO 14001:2015 & OHSAS 18001:2007 Certified)



NABL ACCREDITED

Certificate No.: TC-7944

Format No.: 7.8.2/FMT/TR/06

TEST REPORT

Customer Name & Address	M/S. KATAMATI IRON MINES (M/s TATA Steel Limited)		
Test Report No	ENVLAB/197R-1203	Report Release Date	5.02.19
Sample Code	GW-1- GW-4	Sampled by	VCSPL Representative
Sample Name	Ground Water	Sampled on	21.02.2019
Sample Condition	Sealed & Ice Preservative	Sampling Location	GW1: Galuri Sahi, GW2: Murga Mahadev GW3: Dalafiri - 2, GW4: Mahadevnasa
Test Started On	22.02.2019	Sample Received On	22.02.2019
		Test Completed On	28.02.2019

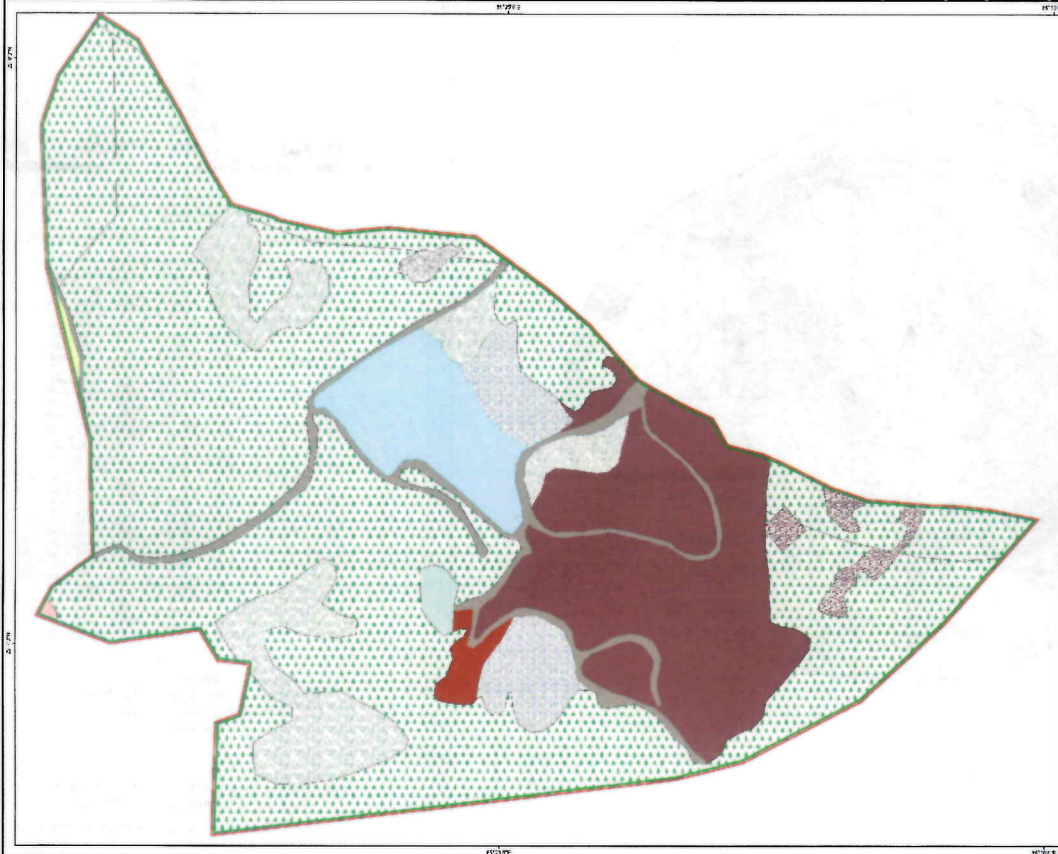
Sl No	Parameter	Testing Methods	Unit	Standards as per IS: 10500, 2012	Analysis Results			
					GW-1	GW-2	GW-3	GW-4
Essential Characteristics								
1	*Colour	APHA 2120 B, C	Hazen	5	CL	CL	CL	CL
2	*Odour	APHA 2150 B	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	*Taste	APHA 2160 C	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	APHA 2130 B	NTU	1	<0.2	<0.2	<0.2	<0.2
5	pH Value	APHA 4500H B	--	6.5-8.5	7.48	7.56	7.61	7.52
6	Total Hardness (as CaCO ₃)	APHA 2340 C	mg/l	200	180.0	152.0	142.0	152.0
7	Iron (as Fe)	APHA 3111 B	mg/l	0.3	0.26	0.21	0.22	0.23
8	Chloride (as Cl ⁻)	APHA 4500Cl B	mg/l	250	26.8	32.8	34.0	41.8
9	*Residual, free Chlorine	APHA 4500Cl, B	mg/l	0.2	ND	ND	ND	ND
Desirable Characteristic								
10	Dissolved Solids	APHA 2540 C	mg/l	500	152.0	252.0	321.0	264.0
11	Calcium (as Ca)	APHA 3500Ca B	mg/l	75	32.8	40.6	36.0	40.8
12	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	12.1	13.2	12.8	13.4
13	Copper (as Cu)	APHA 3111 Cu B	mg/l	0.05	<0.05	<0.05	<0.05	<0.05
14	Manganese (as Mn)	APHA 3111 B	mg/l	0.1	0.024	0.038	0.032	0.018
15	*Sulphate (as SO ₄)	APHA 4500 SO ₄ ²⁻ E	mg/l	200	4.6	5.1	6.2	5.6
16	*Nitrate (as NO ₃)	APHA 4500 NO ₃ ⁻ E	mg/l	45	3.1	3	3.2	6.1
17	*Fluoride (as F)	APHA 4500F C	mg/l	1	0.032	0.062	0.039	0.022
18	*Phenolic Compounds (as C ₆ H ₅ OH)	APHA 5530 B,D	mg/l	0.001	<0.001	<0.001	<0.001	<0.001
19	Mercury (as Hg)	APHA 3112 B	mg/l	0.001	<0.001	<0.001	<0.001	<0.001
20	Cadmium (as Cd)	APHA 3111 B	mg/l	0.003	<0.001	<0.001	<0.001	<0.001
21	*Selenium (as Se)	APHA 3114 B	mg/l	0.01	<0.001	<0.001	<0.001	<0.001
22	*Arsenic (as As)	APHA 3114 B	mg/l	0.01	<0.001	<0.001	<0.001	<0.001
23	*Cyanide (as CN)	APHA 4500 CN ⁻ C,D	mg/l	0.05	ND	ND	ND	ND
24	Lead (as Pb)	APHA 3111 B	mg/l	0.01	<0.001	<0.001	<0.001	<0.001
25	Zinc (as Zn)	APHA 3111 B	mg/l	5	<0.05	<0.05	<0.05	<0.05
26	*Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	0.2	<0.2	<0.2	<0.2	<0.2
27	*Chromium (as Cr ⁶⁺)	APHA 3500Cr B	mg/l	--	<0.05	<0.05	<0.05	<0.05
28	*Mineral Oil	APHA 5220 B	mg/l	0.5	<0.01	<0.01	<0.01	<0.01
29	Alkalinity	APHA 2320 B	mg/l	200	132.0	138.0	156.0	152.0
30	*Aluminium as(Al)	APHA 3500Al B	mg/l	0.03	<0.001	<0.001	<0.001	<0.001
31	*Boron (as B)	APHA 4500B, B	mg/l	0.05	<0.01	<0.01	<0.01	<0.01
32	*Poly Aromatic Hydrocarbon as PAH	APHA 6440 B	µg/l	--	<0.001	<0.001	<0.001	<0.001
33	*Pesticide	APHA 6630 B,C	mg/l	Absent	Absent	Absent	Absent	Absent

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Annexure – IV : Land use/ Land Cover (Core Zone)- Katamati Iron Mine



LAND USE /LAND COVER MAP OF KATAMATI IRON ORE MINES TATA STEEL LTD.



LEGEND
 ■ MINE BOUNDARY ■ SAFETY ZONE

LAND USE/ LAND COVER					
LEVEL	LEVEL-1	LEVEL-2	LEVEL-3	AREA (HA)	AREA (%)
NON-URBAN	TRAP LAND	CROP LAND		2.04	0.02
	WATER BODY	SETTLEMENT		2.22	0.01
BUILT UP LAND	SETTLEMENT	RURAL SETTLEMENT		1.82	0.01
	BARREN LAND	ROAD		15.70	0.07
MED. RURAL	BARREN	ROAD		2.35	0.01
	ROAD	SLAB ROAD		22.34	0.10
WATER BODIES	ROAD	TRAP		14.02	0.06
	QUARRY	QUARRY		4.48	0.02
	QUARRY	QUARRY		68.82	0.31
WATER BODIES	WATER BODIES	WATER BODIES		24.34	0.11
WATER BODIES	WATER BODIES	WATER BODIES		22.25	0.10
TOTAL				408.28	100.00

Prepared for :
 M/S TATA STEEL LTD. OMQ Division
 Noamundi, West Singhbhum
 Jharkhand

Prepared by :
 M/S- Digital Cartography and Services Pvt. Ltd.
 (Authorized Organization of ORSAC)
 1012, Bag 20, Sector 11, G.P. Ganga Road, Bhubaneswar, 751023

**KATAMATI IRON MINE
MONTHLY AIR QUALITY REPORT (CORE ZONE)**

Month	Near Office					Near Plant Site					Near Mining Site					Near Slime Dam				
	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 18	31.56	16.32	<4.0	<9.0	<0.1	50.70	32.91	4.70	15.2	0.30	55.56	54.02	4.92	15.3	0.32	64.16	42.87	6.20	16.28	0.41
Nov 18	42.59	21.53	<4.0	<9.0	<0.1	51.40	29.78	4.68	15.1	0.34	56.92	32.53	4.92	16.1	0.39	64.78	43.72	6.30	16.14	0.39
Dec 18	36.65	23.14	<4.0	<9.0	<0.1	53.79	32.56	4.71	14.9	0.44	61.36	32.98	4.74	16.3	0.42	65.99	45.50	6.46	17.26	0.46
Jan 19	42.71	22.86	4.00	9.00	0.10	55.11	33.68	5.26	15.6	0.51	60.18	34.93	4.59	16.2	0.41	63.74	36.69	6.56	15.38	0.45
Feb 19	42.55	21.23	4.10	9.10	0.10	51.15	30.01	4.68	15.1	0.34	57.76	31.76	4.89	16.1	0.39	65.35	43.61	6.30	16.24	0.39
Mar 19	79.48	33.25	6.24	10.58	0.08	80.98	41.41	5.66	15.6	0.58	49.40	31.79	5.84	16.4	0.42	70.53	42.35	8.63	19.46	0.63

MONTHLY AIR QUALITY REPORT (BUFFER ZONE)


Month	Kankura					Kitabeda					Mirelbera					Balita				
	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 18	30.72	16.53	<4.0	<9.0	0.15	32.01	17.20	<4.0	<9.0	0.11	35.20	18.45	<4.0	<9.0	0.22	32.03	17.15	<4.0	<9.0	0.22
Nov 18	32.40	17.50	<4.0	<9.0	0.15	33.65	15.30	<4.0	<9.0	0.14	35.25	18.80	<4.0	<9.0	0.25	33.05	17.20	<4.0	<9.0	0.22
Dec 18	35.85	17.50	<4.0	<9.0	0.17	38.15	16.05	<4.0	<9.0	0.15	37.70	19.70	<4.0	<9.0	0.23	37.80	18.50	<4.0	<9.0	0.28
Jan 19	44.05	21.20	<4.0	<9.0	0.52	44.35	17.15	<4.0	<9.0	0.27	32.70	23.30	<4.0	<9.0	0.51	40.75	18.90	<4.0	<9.0	0.51
Feb 19	32.00	17.00	<4.0	<9.0	0.15	32.00	16.00	<4.0	<9.0	0.13	31.80	17.25	<4.0	<9.0	0.23	33.05	17.20	<4.0	<9.0	0.22
Mar 19	41.00	25.40	4.45	9.50	0.23	45.80	30.20	4.50	9.80	0.19	46.70	23.30	5.95	10.5	0.39	44.30	21.10	4.45	10.9	0.32

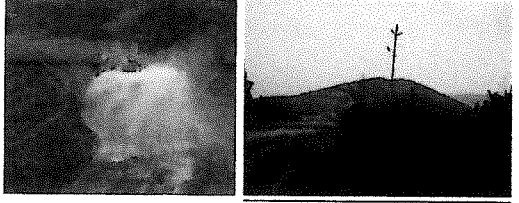
Unit of measurement for all parameters except CO is $\mu\text{g}/\text{m}^3$. Co is in mg/m^3
All figures are in average.

Compliance status
on
Impact of Mining on Habitations-Issue ..related

Katamati Iron Mine, TATA Steel Ltd.
(Oct 2018 to Mar. 2019)

Conditions based on OM dated 29th Oct., 2014 vide no. Z-11013/57/2014-IA.II(M)

S. No.	Condition	Compliance Status
A	The Project Authority shall adopt Best Mining Practice for the given mining conditions. In the mining area, adequate number of check dams, retaining walls/structures, garland drains and settling ponds should be provided to arrest the wash – off with rain water in catchment area.	<p>Being complied.</p> <p>Adequate no. of check dams, retaining walls / structures, garland drains and settling ponds are made in mine to arrest the rain water. In addition to that various rain water harvesting structures are also made in and around mine.</p>  <p style="text-align: center;"><i>Check dams constructed for run off management</i></p>
B	The natural water bodies and or streams which are flowing in and around the village should not be disturbed. The Water Table should be nurtured so as not to go down below the pre-mining period. In case of any water scarcity in the area, the Project Authorities have to provide water to the villagers for their use. A provision for regular monitoring of water table in open dug well located in village should be incorporated to ascertain the impact of mining over ground water table.	<p>Complied with.</p> <p>The water level in open dug well are regularly been monitored at desired frequency of various villages in & around mine of Katamati. Various rain water harvesting structures are also made in and around mine.</p>
C	The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right to darkness and minimal noise levels at night. The Project Proponents (PPs) must ensure that the biological clock of the villagers is not disturbed by orienting the floodlights/ masks away from the noise levels well within the prescribed limit's for day/night hours.	<p>Being complied.</p> <p>The mine is being operated in hill top of iron ore deposit & the habitation is far away from mining operations. However, various technologies are used to reduce the noise level from mining & processing operations. Thick green vegetation cover is also being maintained to absorb noise from the area apart from various other measures.</p>
D	The Project Authority shall make necessary alternative arrangements, where required, in consultation with the State Government to provide alternate areas for livestock grazing. In this context, Project Authority should implement the directions of the Hon'ble Supreme Court with regard to acquiring grazing land. The sparse trees on such grazing ground, which provide mid- which provide mid – day shelter from the scorching sun should be scrupulously guarded	<p>Complied with.</p>

S. No.	Condition	Compliance Status
	against felling lest the cattle abandon the grazing ground or return home by noon.	
E	Where ever blasting is undertaken as part of mining activity, the Project Authority shall carry out vibration studies well before approaching any such habitats or other buildings to evaluate the Zone of influence and impact of blasting on the neighbourhood. Within 500 meters of such sites vulnerable to blasting vibrations, avoidance of use of explosives and adoption of alternative means of mineral extraction, such as ripper/dozer combination/rock breakers/ surface miners etc. should be seriously considered and practiced wherever practicable.	Vibration study for scientific blasting is regularly been done from CSIR recognized agency. And as per recommendations the blasting is been done only in day time with electronic delay detonators for adequate blast and fragmentation. The data for each blast is been maintained and no mining is being done within 50m of public works.
F	Main haulage road in the mine should be provided with permanent water sprinklers and other roads should be regularly wetted with water tankers fitted with sprinklers. Crusher and material transfer points should invariably be provided with Bag filters and or dry logging system. Belt- conveyors should be fully covered to avoid air borne dust.	<p>The main haulage road in the mine is provided with permanent water sprinklers. Apart from above, mobile and spray mist type sprinklers are also used in mine.</p>  <p><i>Mobile & Fixed water sprinklers in Katamati mines</i></p>
G	The Project Authority shall ensure that the productivity of agricultural crops is not affected due to mining operations. Crop Liability Insurance Policy has to be taken by the PP as a precaution to compensate for any crop loss. The impact zone shall be 5km from the boundary of mine lease-area for such insurance policy. In case, several mines are located in a cluster, the Associations of owners of the cluster mines, formed inter-alia, to sub-serve such an objective, shall take responsibility for securing such Crop Liability Policy.	<p>Not applicable</p> <p>Katamati Iron mine is an operational mine since last several decades, and scientific & sustainable mining practices are been adopted.</p>
H	In case any village is located within the mining leasehold which is not likely to be affected due to mining activities during the life of mine, the Expert. Appraisal Committee (EAC) should consider the proposal of Environmental Clearance (EC) for reduced mining area. The Mining lease may be executed for the area for which EC is accorded. The mining plan may also be accordingly revised and required stipulations under the MMDR Act, 1957 and MCR, 1960 met.	<p>Noted.</p> <p>However, no village is located within mine lease area and all mining lease area are mineralized.</p>
I	Transportation of the minerals by road passing through the village shall not be allowed. A 'bypass' road should be constructed (say, leaving a gap of at least 200 meters) for the purpose of transportation of the minerals so that the impact of sound, dust and accidents could be mitigated. The PP shall bear the cost towards the widening and strengthening of existing public road network in case the same is proposed to be used for the Project. No road movement should be allowed on existing village road network without appropriately increasing the	<p>The minerals are being transported by railways by using public and private sidings only. However, at small portion; road transportation is being used till public sidings.</p> <p>The road is adequately maintained by mine as per requirement and only PUC complied vehicle are allowed for transportation. All the vehicle are optimally loaded and covered with tarpaulin sheet. At exit gate of mine to arrest the dust wheel washing facility is also installed.</p>

S. No.	Condition	Compliance Status
	carrying capacity of such roads.	
J	Likewise, alteration or re-routing of foot paths, pagdandies, cart roads, and village infrastructure/public utilities or roads (for purposes of land acquisition for mining) shall be avoided to the extent possible and in case such acquisition is inevitable, alternative arrangements shall be made first and then only the area acquired. In these types of cases, Inspection Reports by site visit by experts may be insisted upon which should be done through reputed Institutes.	Not applicable
K	As CSR activities by Companies including the Mining Establishments has become mandatory up to 2% of their financial turn-over, Socio Economic Development of the neighborhood Habitats could also be planned and executed by the PPs more systematically based on the 'Need based door to door survey' by established Social Institutes/Workers on the lines as required under TOR. "R&R Plan/compensation details for the Project affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SC's /ST's and other weaker sections of the society in the study area, a need based sample survey, family wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village located in the mine lease area will be shifted or not. The issues related to shifting of village including their R&R and socio-economic aspects should be discussed in the EIA Report."	Complied. As Katamati Iron Mine is an operational mine from several decades the PAP is not applicable. However, various surveys are been done as per requirement for social beneficiation.

Environmental Expenditure (2018-19)

Katamati Iron Mine, TATA Steel Ltd

Sl. No.	Heads / Item	Expenditure (Lakhs)	
		Capital	Recurring
1.	Development & maintenance of Gardens at Mines	00	06.42
2.	Tree Plantation & maintenance	00	06.96
3.	Special studies at Katamati Mines (carbons Sequestration, Energy audit, Water budgeting, Occupational health study etc)	00	18.50
4.	Environmental monitoring	00	02.84
5.	CAAQMS maintenance & operation	00	03.54
6.	Installation of new piezometers	20.00	00.00
7.	Wheel Washing facility	30.00	00
8.	Operation of Mobile Water Sprinkling system	00	45.00
9.	Operation Permanent Water Sprinkling	00	14.39
10.	Cleaning of Garland Drain & Settling pits	00	06.30
11.	Annual Maintenance of Dry fog system	00	09.60
12.	Coir matting at slime dump area	55.00	00
13.	Katamati Toe Wall extension	00	02.00
14.	New solar lights installations	00	09.00
15.	Construction of new ponds in villages	00	15.00
Total		105.00	139.55
Environmental Expenditure for the year 2018-19 at Katamati Iron Mine = ~2.44 Cr			