



To,
Dr. R.K. DEY, IFS
Addnl. PCCF (C), Regional Office (EZ)
Ministry of Environment, Forests & Climate Change,
Govt. of India, A/3, Chandrasekharpur
Bhubaneswar-751 013 (Odisha)
roez[dot]bsr-mef[at]nic[dot]in

MD/ENV/ 79 /110/18
Date: 29.05.2018

Sub: Submission of Half-yearly compliance status report of Environmental Clearance conditions for the period October'17 – March'18 in respect of Katamati Iron Mine of TATA Steel Ltd.

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

Dear Sir,

We are herewith submitting the six monthly Environmental Clearance compliance report of Katamati Iron Mine, TATA Steel Ltd. for the period from **October'17 – March'18** as per EIA Notification, 2006. The same has also been submitted to your kind office by hard & soft copy along with e-mail to 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 endeavoring further improvements in our Environmental Management practices.

Thanking you,
Yours faithfully,

f: TATA Steel Limited

Head (Planning), OMQ

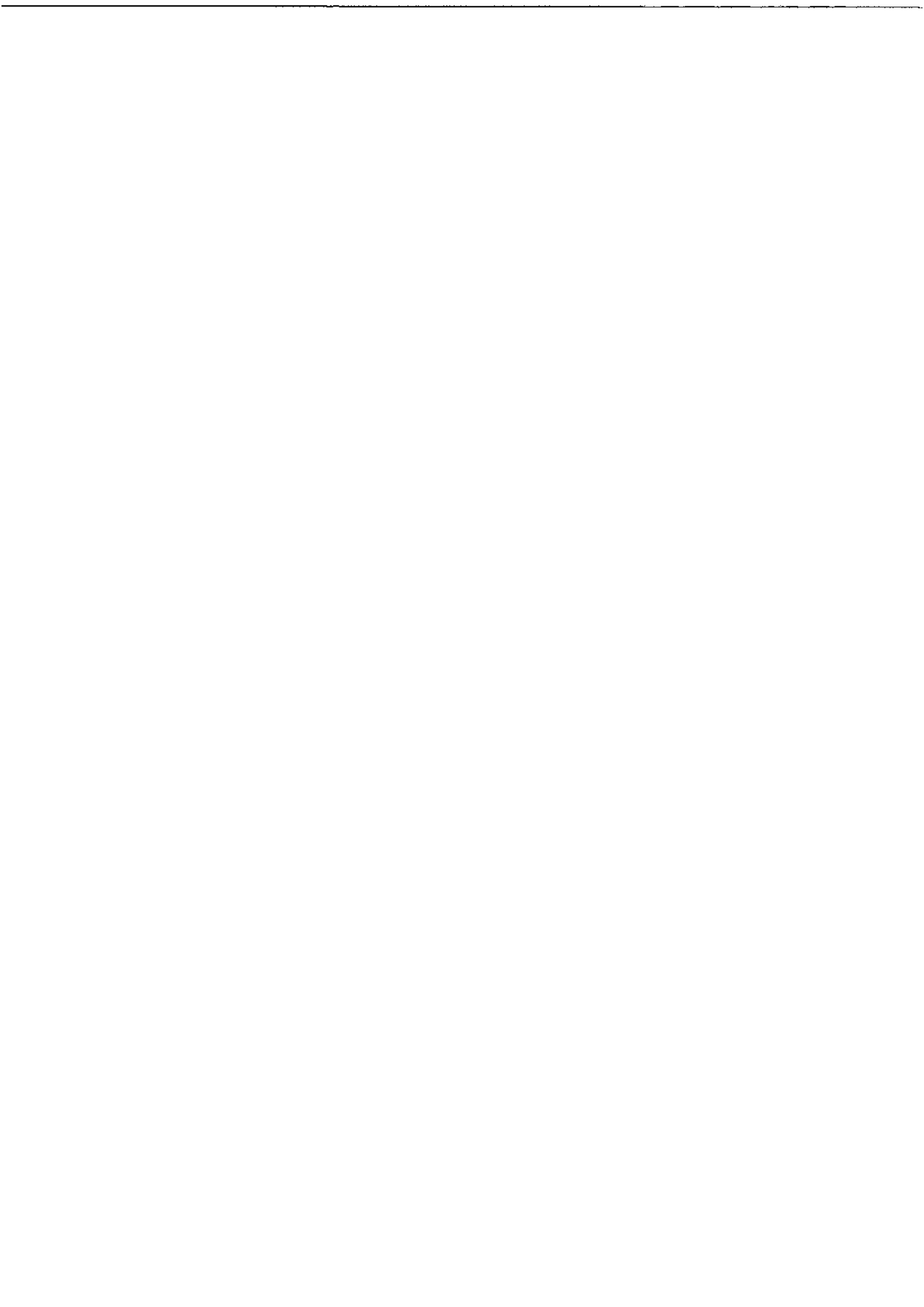
Encl: As above

1. The Chairman, Central Pollution Control Board, Southern Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700107 (W. B.)
2. The Member Secretary, State Pollution Control Board, Paribesh Bhawan, A/118, Nilkanta Nagar, Unit – VIII, Bhubaneswar – 751012 (Odisha).
3. The Regional Officer, State Pollution Control Board, College Road, At/PO- Baniapat, Keonjhar – 758001 (Odisha).

TATA STEEL LIMITED

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Registered Office Bombay House 24 Homi Mody Street Mumbai 400 001





Compliance
to
Environmental Clearance Conditions
of
Katamati Ore Mine
M/s. Tata Steel Limited


For the period: Oct'17 - March'18

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



**ENVIRONMENTAL CLEARANCE
OF
KATAMATI IRON MINE OF TATA STEEL LIMITED**
(Oct 2017 to Mar. 2018)




(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
<i>Specific Conditions</i>		
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.
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 fund, Rs. 2 lakhs in SSWLCP have also been deposited








Sl. No.	EC Conditions	Compliance
Specific Conditions		
		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. 
10.	Catch drains and siltation ponds of appropriate size 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	Garland drains with settling pits, have been made all 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

OB Dump Plantation


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Specific Conditions		
	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>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><i>Toe wall, Check dam, garland drain siltation pond</i></p>
11.	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>Complied with</p> <p>Toe wall and Garland drains have been constructed around the OB dumps to check mine run-off.</p>
12.	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>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.	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>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. We have planted grass tufts along roads, vacant places and inactive dump slopes. Moreover, vetiver plantation is carried out over 0.4 ha. The density of plants is about 3,550 nos. per hectare.</p>  <p><i>Plantation in the Katamati area</i></p>
14.	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	<p>Being complied with. 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>

Sl. No.	EC Conditions	Compliance
Specific Conditions		
	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.	
15.	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>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>  <p style="text-align: center;"><i>Dust station of Katamati</i></p>  <p style="text-align: center;"><i>CAAQMS station of Katamati</i></p>
16.	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.	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.
17.	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.	<p>Complied with.</p> <p>Suitable ground water augmentation measure in & around Katamati iron Mine has been implemented by check dams, toe wall, contours bunds etc. However, a suitable hydro-geology study has been conducted and water withdrawal permission for 500m³/day with ground water recharge plan has been submitted to Director, Central Ground Water Board.</p>  <p style="text-align: center;"><i>RWH measures at Katamati</i></p> <p>Apart from above due hilly terrain and limited area, rain water harvesting arrangements are made in colony area</p>

Sl. No.	EC Conditions	Compliance
Specific Conditions		
		at Noamundi.
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.	Complied with 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.
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.	Being complied with 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.
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 overloaded.	Complied with 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 haul roads to control fugitive dust.
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.	Complied with 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.
24.	Drills shall either be operated with Dust extractors or	Drills have been provided with dust suppression

Sl. No.	EC Conditions	Compliance
<i>Specific Conditions</i>		
	equipped with water injection system.	system. 
25.	<p>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>	<p>The mineral handling plants at Noamundi area is equipped with high efficiency dust suppression systems. Moreover, loading and unloading areas including transfer points have been provided with dust suppression facilities. However in mobile screening & crushing adequate dust control measure are made.</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><i>Dust station of Katamati</i></p>
26.	<p>Sewage treatment plant shall be installed for the colony. ETP shall also be provided for workshop and wastewater generated during mining operation.</p>	<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	Pre-placement medical examination and




Sl. No.	EC Conditions	Compliance
Specific Conditions		
	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.	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.	<p>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.</p> <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>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 29th August 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.	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	Currently it's been not applicable.

Sl. No.	EC Conditions	Compliance
Specific Conditions		
	completion of the project.	
34.	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.	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.
35.	The critical parameters such as RSPM (Particulate matter with size less than 10 microm 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>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}, 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>
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	Ambient Air Quality monitoring is regularly being

General Conditions

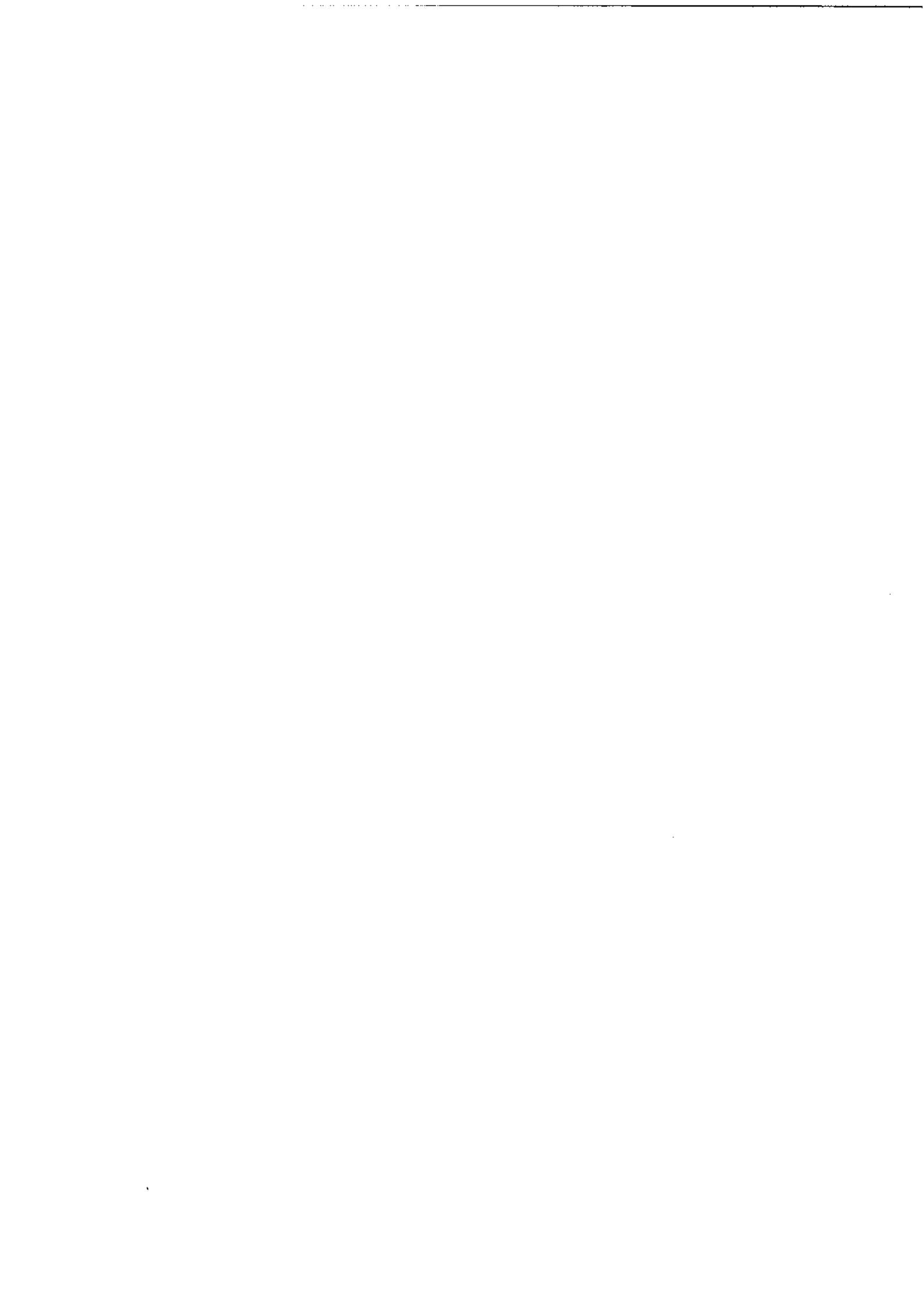
	<p>should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10micron i.e., PM₁₀) and , NOx monitoring. Location of the stations should be decided based on the meteorological data, topographical features, and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board. .</p>	<p>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.	<p>Data on ambient air quality [RSPM (Particulate matter with size less than 10micron i.e., PM₁₀) 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.</p>	<p>RSPM (Particulate matter with size less than 10 micron i.e., PM₁₀) 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.</p>
5.	<p>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.</p>	<p>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.</p>  <p style="text-align: center;"><i>Water jet with mist water spray in Katamati</i></p>  <p style="text-align: center;"><i>Dust station of 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</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</p>

General Conditions

	<p>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>prescribed standard. There is no waste water discharge from the mine.</p>  <p><i>Oil trap Workshop</i></p>
<p>8.</p>	<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>
<p>9.</p>	<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>
<p>10.</p>	<p>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.</p>	<p>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 2016-17 at Noamundi Iron Mine are attached as annexure-VI.</p>
<p>11.</p>	<p>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.</p>	<p>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.</p>
<p>12.</p>	<p>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</p>	<p>We extend full co-operation to the officers of the Regional Office during their visit and furnish the required data, Information and monitoring reports.</p>
<p>13.</p>	<p>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</p>	<p>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</p>

General Conditions

	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.	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 of Environment and Forests, Bhubaneswar by email	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, 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..



Annexure 1 – Dust Fall Monitoring Report – Katamati Iron Mine

October'17 – March'18



Visiontek Consultancy Services Pvt. Ltd.
(An Enviro Engineering Consulting Cell)



ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref: VCSPL/17/R-3592

Date: 04-01-2018

DUST FALL MONITORING REPORT FOR THE MONTH OF DEC -2017

1. Name of Industry : Katamati Iron Mines (M/s TATA Steel Limited)
2. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl No.	Parameters	Unit	Analysis Results
			Df-1
1.	Nickel as Ni	%	0.031
2.	Cobalt as Co	%	0.011
3.	Mercury as Hg	%	<0.001
4.	Arsenic as As	%	<0.001
5.	Iron as Fe	%	1.56

Total Dust fall for the month of Dec-4.28 t/km²/month



For Visiontek Consultancy Services Pvt. Ltd.

Annexure 1 – Dust Fall Monitoring Report – Katamati Iron Mine.....contd..

October'17 – March'18



Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Co.)



Ref: ENV/IAA/18/18-192

Date: 01/04/18

DUST FALL MONITORING REPORT FOR THE MONTH OF MAR-2018

1. Name of industry: **Katamati Iron Mine (M/s TATA Steel Limited)**
 2. Sample collected by: **VCNPT Representative in presence of TATA Representative**

Sl No.	Parameters	Unit	Analysis Results	
			Observed	DE-F
1	Sulphur (S)	%	0.00	0.04
2	Cobalt (Co)	%	0.00	0.0078
3	Manganese (Mn)	%	0.00	0.001
4	Aluminum (Al)	%	0.00	0.0001
5	Iron as Fe	%	0.00	0.0001

Total Dust fall for the month of Mar=3.14 (3.14) gm/m³/month



Visiontek Consultancy Services Pvt. Ltd.

Annexure 1 – Soil Qlty. Analysis Report – Katamati Iron Mine

October'17 – March'18



Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref: VCSPL/1718- 3392

Date: 04-01-2018

SOIL QUALITY ANALYSIS REPORT FOR THE MONTH OF DEC -2017

1. Name of Industry : **Katamati Iron Mines (M/s TATA Steel Limited)**
2. Sampling Location : **S-1: Mines Area**
3. Date of Sampling : **25.12.2017**
4. Date of Analysis : **26.12.2017 to 31.12.2017**
5. Sample collected by : **VCSPL Representative in presence of TATA Representative**

Sl No.	Parameters	Unit	Analysis Results
			S-1
1.	Colour	--	Gray
2.	Type of Soil	--	Acidic
3.	pH	--	6.22
4.	Soil Texture	--	Sandy Clay
5.	Bulk density	Gm/cc	1.25
6.	Electrical Conductivity	µs/cm	128.6
7.	Moisture Content	%	10.6
8.	Chloride as Cl	mg/kg	7050
9.	Sulphate as SO_4^{2-}	mg/kg	1860
10.	Potassium as K	mg/kg	550
11.	Phosphorus as P	mg/kg	310
12.	Available Nitrogen as N	Mg/kg	560
13.	Organic Matter	%	2.8
14.	Organic Carbon	%	1.6
15.	Iron as Fe	%	1.8
16.	Nickel as Ni	%	< 0.001
17.	Mercury as Hg	%	< 0.001
18.	Cobalt as Co	%	< 0.001
19.	Arsenic as As	%	< 0.001



For Visiontek Consultancy Services Pvt. Ltd.

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Annexure 1 - Soil Qlty. Analysis Report - Katamati Iron Mine.....contd...

October'17 - March'18



Visiontek Consultancy Services Pvt. Ltd.

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ISO 9001 : 2008
ISO 14001 : 2004
CERT. NO. 18001 / 2007

Ref: ENV/LAB/15/R-198

Date: 04/04/18

SOIL QUALITY ANALYSIS REPORT FOR THE MONTH OF MAR-2018

1. Name of Industry : Katamati Iron Mines (M/s TATA Steel Limited)
2. Sampling Location : S-1: Mines Area
3. Date of Sampling : 12.03.2018
4. Date of Analysis : 13.03.2018 TO 20.03.2018
5. Sample collected by : VCSP, Representative in presence of TATA Representative

Sl No.	Parameters	Unit	Analysis Results
			S-1
1	Colour	--	GRAY
2	Type of Soil	--	Acide
3	pH	--	6.02
4	Soil Texture	--	Clay Sandy, Loam
5	Bulk density	Gm/cc	1.25
6	Electrical Conductivity	µs/cm	136.5
7	Moisture Content	%	5.6
8	Chloride as Cl	mg/kg	7400
9	Sulphate as SO_4^{2-}	mg/kg	2150
10	Potassium as k	mg/kg	520
11	Phosphorus as P	mg/kg	640
12	Available Nitrogen as N	Mg/kg	680
13	Organic Matter	%	3.4
14	Organic Carbon	%	2.0
15	Iron as Fe	%	2.2
16	Nickel as Ni	%	< 0.001
17	Mercury as Hg	%	< 0.001
18	Cobalt as Co	%	< 0.001
19	Arsenic as As	%	< 0.001

For Visiontek Consultancy Services Pvt. Ltd.



Annexure-II: Ground Water Qlty. Report (Oct'17 - Mar'18)
Katamati Iron Mine



Visiontek Consultancy Services Pvt. Ltd.
(An Enviro Engineering Consulting Cell)



ISO 9001:2008
 ISO 14001:2004
 CERTIFIED

Ref: VC&PL/17HR-3396

Date: 04.01.2018

GROUND WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF DEC .2017

1. Name of Industry : **Katamati Iron Mines (M/s TATA Steel Limited)**
2. Sampling location : **GW-1: Talasa Village ;
GW-2: Kumbha Village .**
3. Date of sampling : **14.12.2017**
4. Date of analysis : **15.12.2017 to 20.12.2017**
5. Sample collected by : **VCSPL Representative in presence of TATA Representative**

Sl. No	Parameter	Testing Methods	Unit	Standard as per IS (2000-2011)	Analysis Results	
					GW-1	GW-2
Essential Characteristics						
1	Colour	APHA 2120 B, C	Haar	5	CL	CL
2	Odour	APHA 2150 B	---	1.00	1.00	1.00
3	Taste	APHA 2160 C	---	Agreeable	AI	AI
4	Turbidity	APHA 2130 B	NTU	5	+2	+2
5	pH Value	APHA 4100B ¹ B	---	6.5-8.5	7.24	7.31
6	Total Hardness (as CaCO ₃)	APHA 2140 C	mg/l	300	146.0	142.0
7	Iron (as Fe)	APHA 3100a, B	mg/l	0.3	0.28	0.28
8	Chloride (as Cl ⁻)	APHA 4100C ² B	mg/l	250	41.0	39.0
9	Sulphate, (as SO ₄)	APHA 4100C ² B	mg/l	0.2	ND	ND
Desirable Characteristics						
10	Dissolved Solids	APHA 2140 C	mg/l	500	133.0	127.0
11	Calcium (as Ca)	APHA 3100a, B	mg/l	75	40.9	40.1
12	Magnesium (as Mg)	APHA 3100a, B	mg/l	30	10.7	10.2
13	Copper (as Cu)	APHA 3111 B,C	mg/l	0.05	<0.01	<0.01
14	Manganese (as Mn)	APHA 3100a, B	mg/l	0.1	0.014	0.013
15	Sulphate (as SO ₄)	APHA 4100 SO ₄ ²⁻ B	mg/l	200	7.8	7.4
16	Nitrate (as NO ₃)	APHA 4100 NO ₃ ⁻ B	mg/l	45	2.0	2.4
17	Fluoride (as F)	APHA 4100 F	mg/l	1.0	0.016	0.015
18	Phenolic Compounds (as C ₆ H ₅ OH)	APHA 5100 B,D	mg/l	0.001	<0.001	<0.001
19	Mercury (as Hg)	APHA 5100 Hg	mg/l	0.001	<0.001	<0.001
20	Cadmium (as Cd)	APHA 5117 B,C	mg/l	0.01	<0.001	<0.001
21	Antimony (as Sb)	APHA 5114 B	mg/l	0.01	<0.001	<0.001
22	Arsenic (as As)	APHA 5114 B	mg/l	0.05	<0.001	<0.001
23	Cyanide (as CN ⁻)	APHA 4100 CN ⁻ C,D	mg/l	0.05	ND	ND
24	Lead (as Pb)	APHA 5111 B,C	mg/l	0.05	<0.01	<0.01
25	Zinc (as Zn)	APHA 5111 B,C	mg/l	5	0.1	0.12
26	Arsenic Dithionite (as MBAS)	APHA 5140 C	mg/l	0.2	<0.2	<0.2
27	Chromium (as Cr ⁶⁺)	APHA 5100 C ² B	mg/l	0.05	<0.05	<0.05
28	Miscel Oil	APHA 5120 B	mg/l	0.01	<0.01	<0.01
29	Alkalinity	APHA 2120 B	mg/l	200	131.0	127.0
30	Aluminium (as Al)	APHA 5100A B	mg/l	0.05	<0.001	<0.001
31	Boron (as B)	APHA 4100 B	mg/l	1	<0.01	<0.01
32	Poly Aromatic Hydrocarbon (as PAH)	APHA 6400 B	ug/l	---	<0.0001	<0.0001
33	Pathogen	APHA 9220 B,C	mg/l	Absent	Absent	Absent
34	Total Coliform	APHA 9221 B	MPN/100	Not more than 10MPN/100ml	<2	<2

Note: CL - Colourless, AI - Agreeable, CO - Coliforms, ND - Not Detected



For Visiontek Consultancy Services Pvt. Ltd.

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**Annexure-II: Ground Water Qlty. Report (Oct'17 - Mar'18)...Cont.
Katamati Iron Mine**



Visiontek Consultancy Services Pvt. Ltd.
(An Enviro Engineering Consulting Cell)



ISO 9001 : 2008
ISO 14001 : 2007

Ref: ENVLAB/18/R-280

Date: 04/04/18

GROUND WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF MAR-2018

1. Name of Industry : **Katamati Iron Mines (M/s TATA Steel Limited)**
2. Sampling location : **GW-1: Talapat Village**
3. Date of sampling : **GW-2: Katsaha Village**
4. Date of analysis : **12.03.2018**
5. Date of analysis : **12.03.2018 TO 29.03.2018**
6. Sample collected by : **WSPS Representative in presence of TATA Representative**

Sl No.	Parameter	Testing Method	Unit	Standard as per IS-10388:1991	Analysis Results	
					GW-1	GW-2
Physical Characteristics						
1	Colour	APHA 2120 B (1)	Plume	5	1.05	1.05
2	Turbidity	APHA 2120 B (1)	NTU	5	0.2	0.2
3	TSS	APHA 2120 B (1)	mg/l	Agreeable	0.2	0.2
4	Total Hardness	APHA 2120 B (1)	mg/l	500	7.42	7.14
5	Ca ⁺⁺ (mg/l)	APHA 2120 B (1)	mg/l	5.0	1.07	1.07
6	Total Hardness (as CaCO ₃)	APHA 2120 B (1)	mg/l	500	4.78	4.78
7	Total TDS	APHA 2120 B (1)	mg/l	500	22.1	22.1
8	Hardness (as Ca ⁺⁺)	APHA 2120 B (1)	mg/l	200	10.0	10.0
9	Hardness (as Mg ⁺⁺)	APHA 2120 B (1)	mg/l	300	1.71	1.71
Chemicals & Inorganics						
10	Ammonia (as N)	APHA 2120 B (1)	mg/l	500	0.03	0.03
11	Nitrate (as N)	APHA 2120 B (1)	mg/l	50	0.1	0.1
12	Nitrate (as NO ₃)	APHA 2120 B (1)	mg/l	50	11.2	11.2
13	Ammonia (as N)	APHA 2120 B (1)	mg/l	5.0	0.03	0.03
14	Nitrate (as N)	APHA 2120 B (1)	mg/l	50	0.1	0.1
15	Nitrate (as NO ₃)	APHA 2120 B (1)	mg/l	50	2.18	2.18
16	Fluoride (as F)	APHA 2120 B (1)	mg/l	1.0	0.019	0.018
17	Fluoride (as F)	APHA 2120 B (1)	mg/l	1.0	0.019	0.018
18	Fluoride (as F)	APHA 2120 B (1)	mg/l	0.500	0.001	0.001
19	Chloride (as Cl)	APHA 2120 B (1)	mg/l	250	0.001	0.001
20	Sulfate (as SO ₄)	APHA 2120 B (1)	mg/l	500	0.001	0.001
21	Sulfate (as SO ₄)	APHA 2120 B (1)	mg/l	500	0.001	0.001
22	Sulfate (as SO ₄)	APHA 2120 B (1)	mg/l	500	0.001	0.001
23	Chloride (as Cl)	APHA 2120 B (1)	mg/l	500	0.001	0.001
24	Lead (as Pb)	APHA 2120 B (1)	mg/l	0.05	0.001	0.001
25	Cadmium (as Cd)	APHA 2120 B (1)	mg/l	0.01	0.001	0.001
26	Asbestos (as As)	APHA 2120 B (1)	mg/l	0.05	0.001	0.001
27	Chromium (as Cr)	APHA 2120 B (1)	mg/l	0.05	0.001	0.001
28	Copper (as Cu)	APHA 2120 B (1)	mg/l	0.05	0.001	0.001
29	Iron (as Fe)	APHA 2120 B (1)	mg/l	5	0.11	0.11
30	Aluminum (as Al)	APHA 2120 B (1)	mg/l	0.2	0.2	0.2
31	Zinc (as Zn)	APHA 2120 B (1)	mg/l	0.05	0.001	0.001
32	Manganese (as Mn)	APHA 2120 B (1)	mg/l	0.05	0.001	0.001
33	Nickel (as Ni)	APHA 2120 B (1)	mg/l	0.05	0.001	0.001
34	Total Chloride	APHA 2120 B (1)	mg/l	Not more than 1000 mg/l	0.4	0.4

Note: (C) - Colorless, (A) - Agreeable, (S) - Suspended Solids, (N) - Not Present

For Visiontek Consultancy Services Pvt. Ltd.

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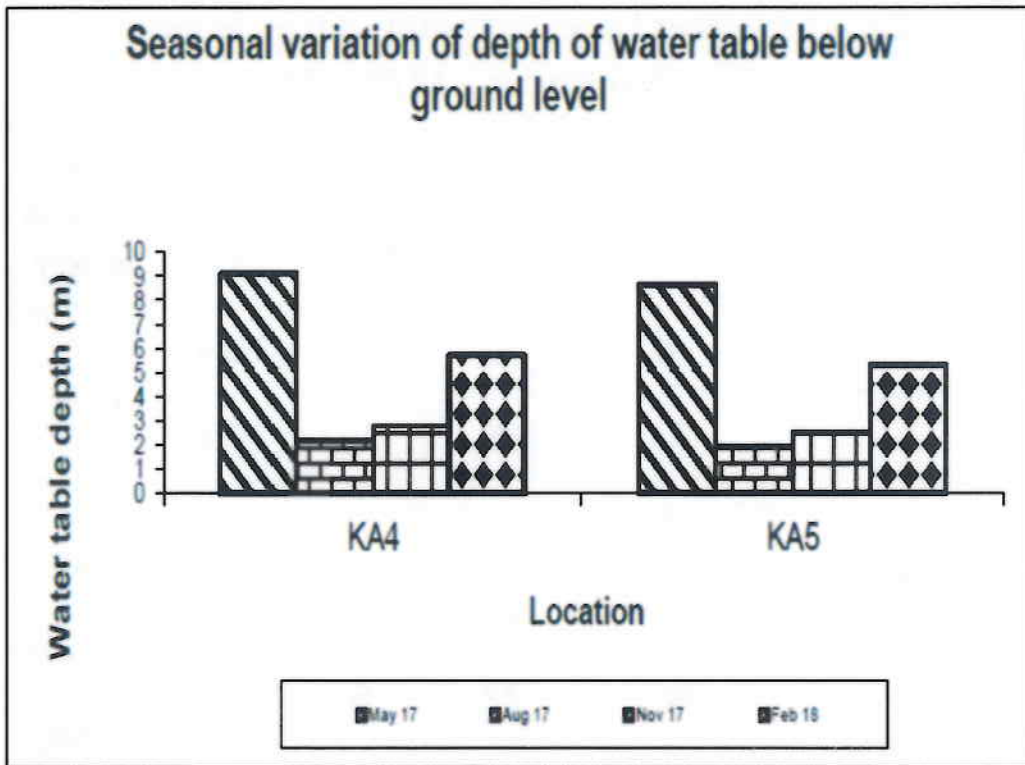
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Annexure II – Ground Water Level – Katamati Iron Mine

October'17 – March'18

KATAMATI IRON MINE
TATA STEEL LIMITED



KA4 – Well at Talasahi, Murga

KA5 – Well at Rabrusai, Mahadevnasa

Tushar

Annexure II - Ground Water Level - Katamati Iron MineContd.

October'17 - March'18

KATAMATI IRON MINE

TATA STEEL LIMITED

Ground Water Level in Katamati Iron Mine					
Date of Monitoring : 12/01/2018					
Location	Coordinates				Water level in meter
	Direction	Degree₀	Min'	Sec''	
Mahadevnasa	N	22	6	20.4	2.99
	E	85	29	10.4	
Daladiki	N	22	6	26.4	2.45
	E	85	28	45.5	
Daladiki	N	22	6	27.8	7.58
	E	85	28	38	

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Annexure II – Ground Water Level – Katamati Iron Mine...Contd.

October'17 – March'18

KATAMATI IRON MINE
TATA STEEL LIMITED

Ground Water Level in Katamati Iron Mine					
Date of Monitoring : 18/11/2017					
Location	Coordinates				Water level in meter
	Direction	Degree °	Min'	Sec"	
Mahadevnasa	N	22	6	20.4	3.32
	E	85	29	10.4	
Daladiki	N	22	6	26.4	2.94
	E	85	28	45.5	
Daladiki	N	22	6	27.8	8.3
	E	85	28	38	

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Annexure-III: Surface Water Qlty. Report (Oct'17 – Mar'18)

Katamati Iron Mine



Visiontek Consultancy Services Pvt.Ltd.
(An Enviro Engineering Consulting Cell)



Ref: VCSPL/HR - 3069

Date: 09.11.17

SURFACE WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF OCT-2017

- | | | |
|------------------------|---|---|
| 1. Name of Industry | : | Katamati Iron Mines (M/s TATA Steel Limited) |
| 2. Sampling location | : | SW-1: Jaga Spring water;
SW-2: Jaga Nallah. |
| 3. Date of sampling | : | 09.10.2017 |
| 4. Date of analysis | : | 10.10.2017 to 10.10.2017 |
| 5. Sample collected by | : | VCSPL Representative in presence of TATA Representative |

Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2296:1992 Class-'C'	Analysis Results	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4	8.1	5.9
2	Total Suspended Solids as TSS	APHA 2540 D	mg/l	—	27.0	28.0
3	BOD (5) days at 27°C (max)	APHA 5210 B	mg/l	3	<1.0	<1.0
4	Chemical Oxygen Demand as COD	APHA 5220 C	mg/l	—	7	8
5	Total Coli Bact	APHA 9221 B	MPS/100 ml	5000	<60	110
6	pH Value	APHA 4500F B	—	6.0-9.0	7.28	7.42
7	Colour (max)	APHA 2120 H, C	Plates	500	0	0
8	Total Dissolved Solids	APHA 2540 C	mg/l	1500	103	101
9	Copper as Cu (max)	APHA 3111 B,C	mg/l	1.5	<0.05	<0.05
10	Iron as Fe (max)	APHA 3500A, B	mg/l	0.5	0.55	0.3
11	Chloride (max)	APHA 4500 B	mg/l	600	20	22
12	Sulphates (SO ₄) (max)	APHA 4500 SO ₄ E	mg/l	400	3.6	3.5
13	Nitrate as NO ₃ (max)	APHA 4500 NO ₃ E	mg/l	50	1.12	1.2
14	Fluoride as F (max)	APHA 4500 C	mg/l	1.5	0.022	0.028
15	Phenolic Compounds as C ₁₂ H ₁₀ O (max)	APHA 2520 H,D	mg/l	0.005	<0.001	<0.001
16	Calcium as Ca (max)	APHA 3111 B,C	mg/l	0.01	<0.001	<0.001
17	Selenium as Se (max)	APHA 3114 D	mg/l	0.05	<0.001	<0.001
18	Arsenic as As	APHA 3114 D	mg/l	0.2	<0.001	<0.001
19	Cyanide as CN (max)	APHA 4200 CN C,D	mg/l	0.05	ND	ND
20	Total as Phosphorus	APHA 3124 B,C	mg/l	0.2	<0.01	<0.01
21	Zinc as Zn (max)	APHA 3111 B,C	mg/l	15	<0.01	<0.01
22	Hexa Chromium as Cr ^{VI}	APHA 2500C B	mg/l	0.05	<0.01	<0.01
23	Antonie Detergent (max)	APHA 2540 C	mg/l	1.0	<0.2	<0.2
24	Mercury as Hg	APHA 2500 Hg	mg/l	—	<0.001	<0.001
25	Manganese as Mn	APHA 2500 Mn B	mg/l	—	<0.005	<0.001

ND: Not Detected, N/D: Not Determined



For Visiontek Consultancy Services Pvt. Ltd.



Ref: VCSPL/17/K-3232

Date: 04/12/2017

SURFACE WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF NOV-2017

1. Name of Industry : Katamati Iron Mines (M/s TATA Steel Limited).
2. Sampling location : SW-1: Jojo Spring water;
SW-2: Jojo Nullah.
3. Date of sampling : 16.11.2017
4. Date of analysis : 17.11.2017 to 23.11.2017
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS:2296-1992 (Class -C)	Analysis Results	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4	7.8	6.1
2	Total Suspended Solids as TSS	APHA 2540 D	mg/l	—	210	280
3	BOD (3 days at 27°C) (max)	APHA 5210 B	mg/l	3	<1.8	<1.8
4	Chemical Oxygen Demand as COD	APHA 5220 C	mg/l	—	6	6
5	Total Colliform	APHA 9221 B	MPC/100 ml	5000	450	470
6	pH Value	APHA 4500H B	—	6.5-9.0	7.30	7.30
7	Calcium (max)	APHA 3120 B, C	Hardness	300	CL	CL
8	Total Dissolved Solids	APHA 2540 C	mg/l	1500	111	116
9	Copper as Cu (max)	APHA 3111 B,C	mg/l	1.5	<0.05	<0.05
10	Iron as Fe (max)	APHA 3500 G, D	mg/l	0.3	0.49	0.40
11	Chloride (max)	APHA 4500C B	mg/l	600	22	20
12	Sulphate (SO ₄) (max)	APHA 4500 SO ₄ E	mg/l	400	3.9	4.2
13	Nitrate as NO ₃ (max)	APHA 4500 NO ₃ E	mg/l	50	1.2	1.24
14	Fluoride as F (max)	APHA 4500 F C	mg/l	1.5	0.02	0.001
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,C	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,C	mg/l	0.1	<0.01	<0.01
21	Zinc as Zn (max)	APHA 3111 B,C	mg/l	15	<0.05	<0.05
22	Hexa Chromium as Cr ^{VI}	APHA 3500 G B	mg/l	0.05	<0.05	<0.05
23	Antibiotic Detergents (max)	APHA 5540 C	mg/l	1.0	<0.2	<0.2
24	Mercury as Hg	APHA 3500 Hg	mg/l	—	<0.001	<0.001
25	Manganese as Mn	APHA 3500 Mn B	mg/l	—	<0.001	<0.001

Note: CL: Coliform, ND: Not Detected

For Visiontek Consultancy Services Pvt. Ltd.



The No.108, District Centre, Chandrasekharpur, Bhubaneswar-76, Tel: 91-674-2742250/250750

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Ref: VC/SPL/17/R-3391

Date: 24-01-2018

SURFACE WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF DEC-2017

1. Name of Industry : Katamati Iron Mines (M/s TATA Steel Limited).
2. Sampling location : SW-1: Jojo Spring water;
SW-2: Jojo Nallah.
3. Date of sampling : 14.12.2017
4. Date of analysis : 15.12.2017 to 20.12.2017
5. Sample collected by : VC/SPL Representative in presence of TATA Representative

Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2296:1992 Class -"C"	Analysis Results	
					SW-1	SW-2
1	Dissolved Oxygen (azimoure)	APHA 2540 C	mg/l	4	3.5	3.4
2	Total Suspended Solids as TSS	APHA 2540 D	mg/l	--	12.0	16.0
3	BOD (3) days at 27°C (max)	APHA 5210 B	mg/l	3	<1.8	<1.4
4	Chemical Oxygen Demand as COD	APHA 5220-C	mg/l	--	8	10
5	Total Coli. form	APHA 9221 B	NPN/100 ml	5000	430	510
6	pH Value	APHA 4500H ⁺ B	--	6.0-9.0	7.42	7.43
7	Colour (max)	APHA 2120 B, C	Platin	300	CL	CL
8	Total Dissolved Solids	APHA 2540 C	mg/l	1500	120.0	128.0
9	Copper as Cu (max)	APHA 3111 B-C	mg/l	1.5	<0.05	<0.05
10	Iron as Fe (max)	APHA 3500Fe, B	mg/l	0.5	0.4	0.42
11	Chloride (max)	APHA 4500Cl B	mg/l	600	26	28
12	Sulphate (SO ₄) (max)	APHA 4500 SO ₄ ²⁻ E	mg/l	400	4.2	4.0
13	Nitrate as NO ₃ (max)	APHA 4500 NO ₃ ⁻ E	mg/l	50	1.3	1.04
14	Fluoride as F (max)	APHA 4500F C	mg/l	1.5	0.028	0.028
15	Phenolic Compounds as C ₆ H ₅ OH (max)	APHA 5530 B,D	mg/l	0.005	<0.01	<0.01
16	Cadmium as Cd (max)	APHA 3111 B,C	mg/l	0.01	<0.01	<0.01
17	Selenium as Se (max)	APHA 3114 B	mg/l	0.05	<0.01	<0.01
18	Arsenic as As	APHA 3114 B	mg/l	0.2	<0.01	<0.01
19	Cyanide as CN (max)	APHA 4200 CN C,D	mg/l	0.05	ND	ND
20	Lead as Pb(max)	APHA 3111 B,C	mg/l	0.1	<0.01	<0.01
21	Zinc as Zn(max)	APHA 3111 B,C	mg/l	15	<0.05	<0.05
22	Hexa Chromium as Cr ^{VI}	APHA 3500Cr B	mg/l	0.05	<0.05	<0.05
23	Anionic Detergents (max)	APHA 5540 C	mg/l	1.0	<0.2	<0.2
24	Mercury as Hg	APHA 3500 Hg	mg/l	--	<0.01	<0.01
25	Manganese as Mn	APHA 3500 Mn B	mg/l	--	<0.01	<0.01

Note: CL: Coloursless, ND: Not Detected



For Visiontek Consultancy Services Pvt. Ltd.



Ref: Env/106/18/R-298

Date: 05.02.2018

SURFACE WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF JAN-2018

1. Name of Industry : Katamati Iron Mines (M/s TATA Steel Limited)
2. Sampling location : SW-1: Jajo Spring water, SW-2: Jajo Nullah.
3. Date of sampling : 14.01.2018
4. Date of analysis : 16.01.2018 to 22.01.2018
5. Sample collected by : VCSPT Representative in presence of TATA Representative

Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2286:1992 Class - 'C'	Analysis Results	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4	4.0	4.5
2	Total Suspended Solids as TSS	APHA 2540 D	mg/l	--	100	140
3	BOD (5 days) at 27°C (max)	APHA 5210 B	mg/l	3	<1.8	<1.8
4	Chemical Oxygen Demand as COD	APHA 5220 C	mg/l	--	12	18
5	Total Coll. Bact	APHA 9221 B	MPN/100 ml	5000	100	110
6	pH Value	APHA 4500 F B	--	6.5-8.5	7.18	7.42
7	Calcium (max)	APHA 2120 B, C	Hardness	300	CL	CL
8	Total Dissolved Solids	APHA 2540 C	mg/l	1500	125.0	120.0
9	Copper as Cu (max)	APHA 3111 B,C	mg/l	1.5	<0.05	<0.05
10	Iron as Fe (max)	APHA 3500 A, B	mg/l	0.5	0.44	0.47
11	Chloride (max)	APHA 4500 G, H	mg/l	600	38	29
12	Sulphate (SO ₄) (max)	APHA 4500 H04 E	mg/l	400	4.1	4.5
13	Nitrate as NO ₃ (max)	APHA 4500 H05, F	mg/l	50	1.50	1.7
14	Fluoride as F (max)	APHA 4500 F C	mg/l	1.5	0.037	0.034
15	Thiosulfate Compounds as C ₂ H ₄ O ₂ (max)	APHA 5530 B,D	mg/l	0.005	<0.001	<0.001
16	Cadmium as Cd (max)	APHA 3111 B,C	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,C	mg/l	0.1	<0.01	<0.01
21	Zinc as Zn (max)	APHA 3111 B,C	mg/l	2.5	<0.05	<0.05
22	Hexa Chromium as Cr ⁶⁺	APHA 3500 C, H	mg/l	0.05	<0.05	<0.05
23	Anionic Detergent (max)	APHA 5340 C	mg/l	1.0	<0.2	<0.2
24	Mercury as Hg	APHA 3500 Hg	mg/l	--	<0.001	<0.001
25	Manganese as Mn	APHA 3500 Mn D	mg/l	--	<0.05	<0.05

Note: CL: Coliforms, ND: Not Detected

For Visiontek Consultancy Services Pvt. Ltd.





Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001:2008
ISO 14001:2004
OHSAS 18001:2007

Ref: ETV lab/18/R-436

Date: 03-03-2018

SURFACE WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF FEB-2018

1. Name of Industry : Katamall Iron Mines (M/s TATA Steel Limited).
2. Sampling location : SW-1: Japa Spring water;
SW-2: Japa Nallah.
3. Date of sampling : 12.02.2018
4. Date of analysis : 13.02.2018 to 19.02.2018
5. Sample collected by : VC/NPL Representative in presence of TATA Representative

Sl No.	Parameter	Testing Methods	Unit	Standards as per IS-2286:1992 Class - 'C'	Analysis Results	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4	2.3	5.2
2	Total Suspended Solids as TSS	APHA 2540 D	mg/l	--	22.0	30.0
3	DOC (Oxidize at 27°C (max)	APHA 5210 H	mg/l	3	-1.8	-1.8
4	Chemical Oxygen Demand as COD	APHA 5210 C	mg/l	--	15	19
5	Total Coli form	APHA 9221 B	MPN/100 ml	5000	211	226
6	pH Value	APHA 4500 F B	--	6.5-8.5	7.35	7.39
7	Colour (max)	APHA 2120 B, C	Ptmc	300	15	15
8	Total Dissolved Solids	APHA 2540 C	mg/l	1500	129.0	136.0
9	Copper as Cu (max)	APHA 3111 B,C	mg/l	1.5	-0.05	-0.05
10	Iron as Fe (max)	APHA 3500 A, B	mg/l	0.5	0.45	0.47
11	Chloride (max)	APHA 4500 C D	mg/l	600	30	32
12	Sulfate (SO ₄) (max)	APHA 4500 B04 E	mg/l	400	4.4	4.7
13	Nitrate as NO ₃ (max)	APHA 4500 N03, E	mg/l	50	1.04	1.02
14	Fluoride as F (max)	APHA 4500 C	mg/l	1.5	0.03	0.03
15	Thiomate Compounds as C ₂ H ₃ OH (max)	APHA 5530 HJ D	mg/l	0.005	-0.001	-0.001
16	Cadmium as Cd (max)	APHA 3111 B,C	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,C	mg/l	0.1	-0.01	-0.01
21	Zinc as Zn (max)	APHA 3111 B,C	mg/l	35	-0.05	-0.05
22	Hexa Chromium as Cr ⁶⁺	APHA 3500 C B	mg/l	0.05	-0.05	-0.05
23	Arsenic Determined (max)	APHA 2540 C	mg/l	1.0	-0.2	-0.2
24	Mercury as Hg	APHA 3500 Hg	mg/l	--	-0.001	-0.001
25	Manganese as Mn	APHA 3500 Mn D	mg/l	--	-0.001	-0.001

Note: C/L - Colorless; ND - Not Detected



For Visiontek Consultancy Services Pvt. Ltd.



Ref: ENV/CR/18/P-199

Date: 04/04/18

SURFACE WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF MAR 2018

- | | |
|------------------------|---|
| 1. Name of Industry | Karamati Iron Mines (M/s TATA Steel Limited). |
| 2. Sampling location | SW-1: Japs Spring water;
SW-2: Japs Nallah. |
| 3. Date of sampling | 12.03.2018 |
| 4. Date of analysis | 13.03.2018 TO 20.03.2018 |
| 5. Sample collected by | VCSPL Representative in presence of TATA Representative |

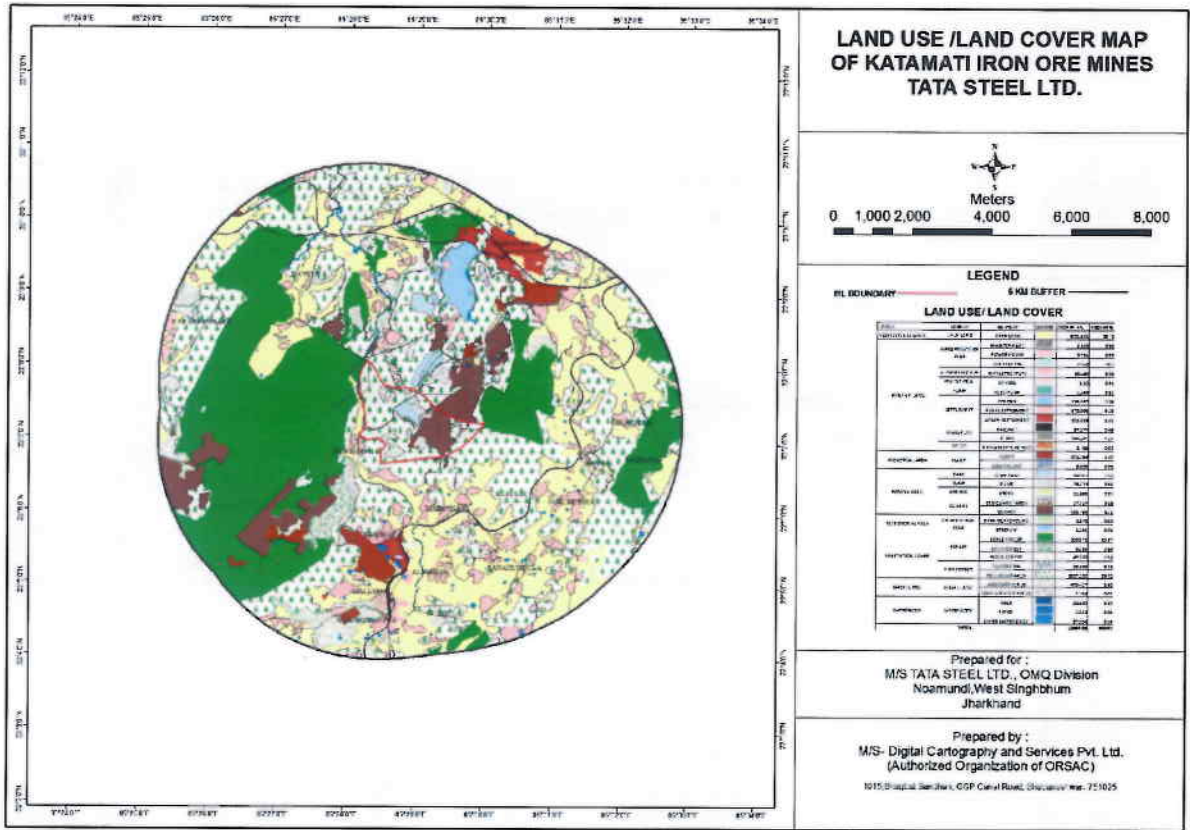
Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2276:1992 Class - C ¹	Analysis Results	
					SW-1	SW-2
1	Dissolved Oxygen (mmoles/l)	APHA 2540 C	mg/l	8	5.5	5.5
2	Total Suspended Solids as TSS	APHA 2540 D	mg/l	—	20.0	24.0
3	BOD (5 days at 20°C) (mass)	APHA 5210 D	mg/l	3	<0.8	<1.8
4	Chemical Oxygen Demand as COD	APHA 5220 C	mg/l	—	20.0	28.0
5	Total Cell Count	APHA 9221 D	SFPU/100 ml	5000	500.0	200.0
6	pH Value	APHA 4500F D	—	6.5-8.5	7.49	7.37
7	Colour (mass)	APHA 2120 D, C	Platin	200	CL	CL
8	Total Dissolved Solids	APHA 2540 C	mg/l	1500	150.0	149.0
9	Copper as Cu (mass)	APHA 3111 D,C	mg/l	1.5	<0.05	<0.05
10	Iron as Fe (mass)	APHA 3800A, B	mg/l	0.5	0.47	0.46
11	Chloride (mass)	APHA 4500C B	mg/l	400	34	33
12	Sulphate (SO ₄) (mass)	APHA 4500 B,C ¹ D	mg/l	400	4.6	5.1
13	Nitrate as NO ₃ (mass)	APHA 4500 B,C ¹ D	mg/l	50	1.86	1.98
14	Fluoride as F (mass)	APHA 4500 C	mg/l	1.5	0.07	0.04
15	Phosphate Compounds as P ₂ O ₅ (mass)	APHA 4500 D,D	mg/l	0.005	<0.001	<0.001
16	Cadmium as Cd (mass)	APHA 3111 D,C	mg/l	0.01	<0.001	<0.001
17	Selenium as Se (mass)	APHA 3114 D	mg/l	0.05	<0.001	<0.001
18	Arsenic as As	APHA 3114 D	mg/l	0.2	<0.001	<0.001
19	Cyanide as CN (mass)	APHA 4500 D,C,D	mg/l	0.05	ND	ND
20	Lead as Pb(mass)	APHA 3111 D,C	mg/l	0.1	<0.01	<0.01
21	Zinc as Zn(mass)	APHA 3111 D,C	mg/l	15	<0.01	<0.01
22	Beta Chromium as Cr ⁶⁺	APHA 3500C, B	mg/l	0.05	<0.01	<0.01
23	Arsenic Disorganics (mass)	APHA 3540 C	mg/l	1.0	<0.1	<0.1
24	Mercury as Hg	APHA 3500 Hg	mg/l	—	<0.001	<0.001
25	Manganese as Mn	APHA 4500 Mn D	mg/l	—	<0.05	<0.05

Note: CL: Colorless, ND: Not Detected

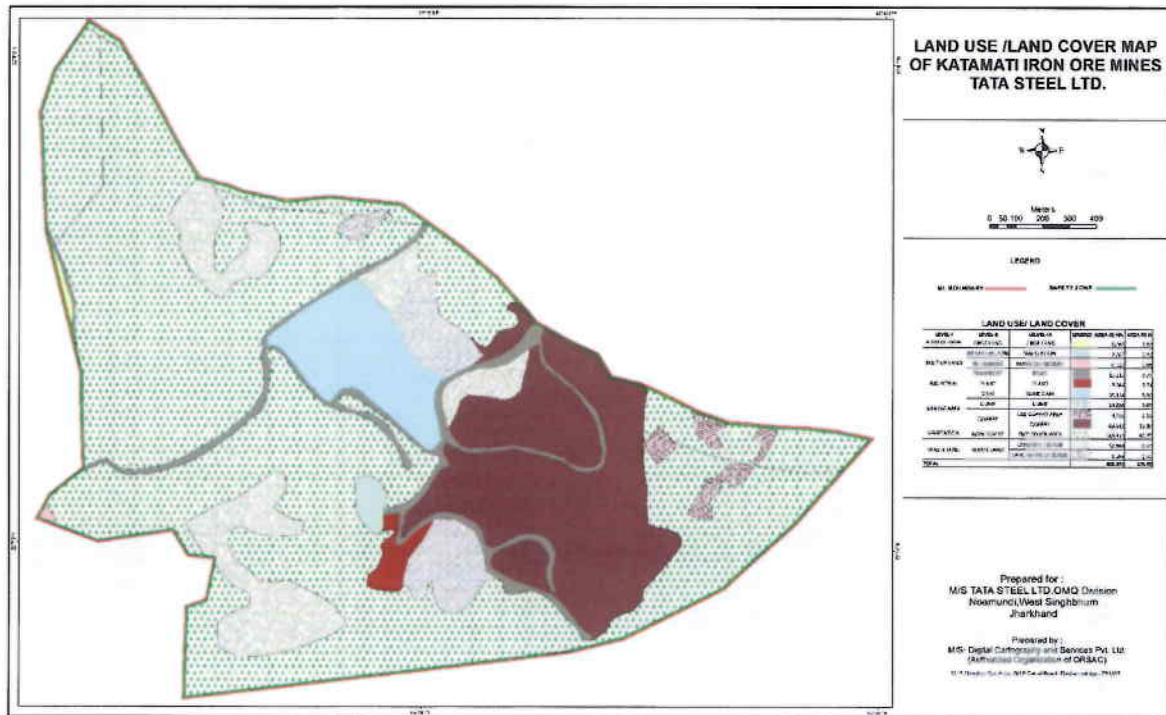


For Visiontek Consultancy Services Pvt. Ltd.

Annexure-IV: Land Use/Land Cover (Buffer Zone)- Katamati Iron Mine



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



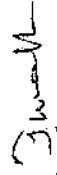
Annexure – V - KATAMATI IRON MINE AVERAGE AIR QUALITY REPORT (CORE ZONE)

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 17	46.19	22.43	3.77	9.90	0.24	56.50	28.33	4.48	11.96	0.32	54.80	27.39	4.32	11.38	0.28	47.76	22.87	4.12	10.44	0.23
Nov 17	66.30	33.50	4.70	13.10	0.37	73.00	37.70	5.10	14.00	0.42	68.50	35.00	5.00	13.60	0.40	59.30	29.50	4.60	12.50	0.34
Dec 17	70.55	35.49	4.96	13.65	0.41	85.45	46.30	5.99	16.39	0.49	81.45	41.76	5.91	16.33	0.49	64.98	32.74	4.55	13.04	0.35
Jan 18	73.24	36.09	5.13	14.62	0.43	83.67	44.61	5.97	16.79	0.51	78.51	39.64	5.61	16.01	0.47	65.53	32.86	4.71	13.44	0.37
Feb 18	72.26	35.89	5.06	15.05	0.45	84.64	44.94	6.01	17.31	0.55	80.44	41.24	5.68	16.25	0.50	63.95	31.74	4.58	13.69	0.39
Mar 18	71.33	35.95	4.93	15.78	0.47	87.54	47.16	5.86	17.93	0.58	79.86	40.74	5.43	17.13	0.54	65.88	32.54	4.51	13.95	0.41

AVERAGE AIR QUALITY REPORT (BUFFER ZONE)

Month	Kankura					Kitabeda					Mireibera					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 17	36.55	16.90	4.00	9.00	0.13	36.70	17.00	4.00	9.00	0.14	37.00	16.90	4.00	9.00	0.13	42.10	19.20	4.00	9.00	0.15
Nov 17	44.50	21.60	<4.0	<9.0	0.17	46.70	22.60	4.0	<9.0	0.19	47.60	23.30	4.0	9.0	0.19	49.50	24.20	4.00	9.00	0.22
Dec 17	54.00	26.35	4.10	10.25	0.25	55.65	27.80	4.20	10.60	0.27	52.35	26.20	4.05	9.90	0.24	56.25	27.65	4.25	10.7	0.28
Jan 18	55.65	26.65	4.15	10.65	0.31	56.50	27.65	4.15	11.10	0.33	56.05	27.40	4.15	10.4	0.30	56.25	27.65	4.25	10.7	0.28
Feb 18	58.40	28.65	4.25	10.95	0.29	54.60	26.50	4.15	10.40	0.28	56.10	27.50	4.15	10.7	0.30	55.70	27.15	4.15	10.6	0.29
Mar 18	57.80	28.00	4.15	10.40	0.28	57.80	27.75	4.30	10.65	0.29	54.65	26.50	4.10	10.3	0.29	55.85	27.05	4.10	10.3	0.29

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


 Lab-in-charge

Annexure VI - ENVIRONMENTAL EXPENDITURE (2017-18) - Katamati Iron Mine

S. no.	Heads	Expenditure (in lakhs)	
		Capital	Recurring
1	Operation of Mobile Water Sprinkling	0	45
2	Permanent Water Sprinkling	0	14.39
3	Cleaning of Garland Drain & Settling Pit	0	6.3
4	Operation & Annual Maintenance of Dry fog system	0	9.6
5	Vibration Studies	0	5.95
6	Environment Monitoring	0	6.81
7	Display Board AMC	0	15.3
8	Plantation	0	18.1
9	Dry Fog System Installation	0	15
10	Garbage Dump at Bottom Bin Canteen	20	0
11	Parking Lot Paver block	0	0.15
12	Lease Line fencing(KTM)	0	1
13	Septic Tank(KTM)	0	5
14	Katamati Toe Wall	0	1
15	Waste Oil Pit at Equipment Maintenance	0	2
16	Shed for storing Oil Drum	0	3.5
17	Waste Oil Pit at Old DB swimming Pool	0	2
18	Equipment Flooring	0	9
19	Maintenance of Solid Waste Management Township	0	15
20	Providing PCC road at Township	0	73
21	Water Supply(25 nos.): Deep Bore Well/Wells/Tube Wells/Pipeline	0	6
22	Livelihood through promotion of agriculture(600 farmers): Irrigation infrastructure/support of farm inputs(seeds, agro equipments, Training on agri practises.)	25.04	0
23	Enhancing Irrigation facility through construction of irrigation infrastructure	13.3	20
24	Solid Waste management	0	25
25	Operation of incineration	0	16.6
26	Operation & maintenance of water treatment plant (including cost of chemicals quality testing by third party & stamping of flow meters)	0	6.81
27	Operation & maintenance of sewage treatment plant	0	35.9
28	Mobile Water Sprinkling Maintenance	0	37.75
29	100% Change over from DG set power to OSEB Power at Katamati	0	10
30	Replacement of 250W HPSV Light with 120W LED Light (100 Nos.)	0	12.1
31	Replacement Of Conventional Light Fittings By Led Lights	0	26.41
32	Undergrounding Of Oh Lines	0	48.65
33	Replacement Of Bare Oh Conductor By Ab Cable	0	3
34	Provision Of Solar Lights (2nos)	0	2
35	Provision Of Timers To Control Outdoor Light Timing	0	0.6
36	Fixing of Energy meter to monitor in houses & Control Energy	0	8.11
37	Installation of Dry Type Transformer in place of Oil Cooled Transformer	0	0.65
38	CAAQMS Maintenance	120	0
Total		178.34	507.68

