



Regd Post with A/D

Ref.No.: MGM/P&E/406 /19

Date: 30/05/2019

To,

**The Additional Director,  
Ministry of Environment and Forest & Climate Change  
Eastern Region Office,  
A/3, Chandrasekharpur,  
Bhubaneswar-751023**

Sub: Submission of Six-monthly EC compliance report on implementation of safeguards in respect of Joda West Iron and Manganese Mine, M/s TATA Steel Ltd. for the period October 2018 to March 2019.

Dear Sir,

We are submitting herewith six-monthly EC compliance report on implementation of safeguards in respect of Joda West Iron and Manganese Mine, M/s TATA Steel Ltd. for the period October 2018 to March 2019 as per EIA notification 2006. The same is also attached in Soft copy to your good office on e-mail to [roez.bsr-mef@nic.in](mailto:roez.bsr-mef@nic.in) for your ready reference.

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

This is for your kind perusal.

Thanking you,  
Yours faithfully,  
F: TATA STEEL LTD.

Agent, Joda West Iron and Manganese Mine &  
Head, Manganese Gr. of Mines  
Ferro Alloys & Minerals Division, Joda.

Encl: as above.

Copy to:

1. Zonal Office Kolkata, Central Pollution Control Board, Southernd Conclave, Block 502, 5th and 6th Floors, 1582 Rajdanga Main Road, Kolkata, West Bengal 700107.
2. The Member Secretary, State Pollution Control Board, A/118, Nilakantha Nagar, Bhubaneswar, Odisha-751012.
3. The Regional Officer, State Pollution Control Board, Baniapat, DD College Road, Keonjhar, Odisha-758001.

**TATA STEEL LTD.**

Ferro Alloys & Minerals Division, Manganese Group of Mines, At/P.O.: Bichhakundi, Via: Joda,  
Dist: Keonjhar Odisha – 758 034 Tel.: 9238101370, e-mail : [mnminesadmin@tatasteel.com](mailto:mnminesadmin@tatasteel.com)  
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Corporate Identity Number L27100MH1907PLC000260 website : [www.tatasteel.com](http://www.tatasteel.com)

**COMPLIANCE REPORT PERIOD: Oct' 18 to March' 19**

**ENVIRONMENTAL CLEARANCE TO  
JODA WEST IRON AND MANGANESE MINE OF TATA STEEL LIMITED  
VIDE MoEF's LETTER NO. J-11015/86/2004-1A. II (M) DATED  
13.09.2005  
COMMENTS SUBMITTED TO THE  
MINISTRY OF ENVIRONMENT & FORESTS,  
GOVERNMENT OF INDIA**

**Present Status of the Project: -**

The Scheme of Mining & Progressive Mine Closure Plan from 2013-14 to 2017-18 over an area of 1437.719 ha. has been approved by Indian Bureau of Mines, Bhubaneswar vide letter no. MS/OTFM/47-ORI/BHU/2012-13, Dt.21.05.2013. The review of Mining plan under Rule no. 17(2) of MCR 2016 and submitted under Rule no. 23 of MCDR 2017 with proposal for the period of 2018-2023 is approved vide letter No. MS/OTFM/18-ORI/BHU/2017-18/2016, Dt. 09/11/2017.

<b>Sl. no</b>	<b>A: Specific conditions</b>	<b>Compliance status</b>
1	Mining shall not be undertaken in areas of forestland within the lease without the necessary approvals / forestry clearance.	<p>We have obtained the Forest Clearance vide MoEF's letter no. F.No.8-89/2004-FC, dt.10.08.2007 over an area of 436.678 ha of forest land within Joda West Iron and Mn. Mine.</p> <p>We have applied for forest diversion over an area of 730.635 ha on 25.11.2015, which is under process.</p> <p>Further, as per MoEF &amp; CC Circular dated F.No.8-78/1996-FC, dated 10.03.2015, an area of 79.239 ha. of non-forest land was recorded as forest in Govt. records as on 25.10.1980. Hence, fresh forest diversion proposal over an area of 79.239 ha has been applied on 20.06.2016 and the same is under process.</p> <p>The mining operation and allied activities are confined within the approved diverted area only.</p>
2	Topsoil should be stacked properly with proper slope at earmarked site(s) with adequate measures and should be used for reclamation and rehabilitation of mined out area.	Agreed. Topsoil stacked properly at earmarked site whenever generated and in need used for plantation in mines.
3	OB and other wastes should be stacked at earmarked sites only and should not be kept active for long periods of time.	OB and other wastes are being dumped as per approved Scheme of Mine of Joda West Iron and Manganese Mine.

	<p>Plantation should be taken up for soil stabilization along the slopes of the dump and terraced after every 5-6 m of height and overall slope angle shall be maintained not exceeding 28°. Sedimentation pits shall be constructed at the corners of the garland drains. Retention/toe walls shall be provided at the base of the dumps.</p>	<p>The dump is terraced at every 10m and overall slope is maintained well within 28° as per approved Scheme of Mining. The inactive portion of OB dumps area being stabilized by plantation of local species.</p> <p>During the year 2018-19, 24345 nos. of saplings were planted. Beside this we also planted around 42536 nos. of vetiver slips.</p> <p>The retaining wall and garland drain with sedimentation pit at corners near toe at low lying area and uplift portion of OB dump has been constructed. Their dimensions are matching the requirements to arrest the run off effectively.</p>
4	<p>Minerals rejects shall be stacked separately at earmarked site/dump only.</p>	<p>The mineral rejects generated during manual processing of manganese ore (i.e. sorting, dressing and sizing) has been stacked separately at earmarked site.</p>
5	<p>Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The drains should be regularly desilted and maintained properly.</p> <p>Garland drains (size, gradient &amp; length) and sump capacity should be designed keeping 50% safety margin over and above the peak sudden rainfall 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.</p> <p>Storm water return system should be provided. Storm water should not be allowed to go to the effluent treatment plant during high rainfall/super cyclone period. A separate storm water sump for this purpose should be created.</p>	<p>Existing catch drains and garland drains are covering the entire dump slope at bottom part. The run off from garland drains are collected in settling/sedimentation pits. The catch drains and sedimentation pits are periodically de-silted and maintained properly.</p> <p>Size, gradient and length of the drains are adequate to take care of the peak flow.</p> <p>A series of check dams and settling pits have been provided for proper settlement of suspended solid in surface runoff.</p>
6	<p>Dimension of retaining wall at the toe of OB dumps and benches within the mine to check run-off and siltation should be based on the rainfall data.</p>	<p>To prevent the siltation and check the run-off, retaining wall and garland drain are provided with the dimension as;</p> <p><u>Dimension of the Retaining Wall:</u> Height – 1 to 1.2 mtr. Width – 1 mtr.</p> <p><u>Dimension of the Garland Drain:</u> Depth – 1.20 to 1.5 mtr. Width – 1 to 1.2 mtr.</p> <p>A multi-stage sedimentation basin with check dam had been provided at H' Quarry to prevent direct flow of surface run off to</p>

		Kundra Nallah, a perennial source of water flowing along the western lease boundary.
7	Trace Metals such as Ni, Co, As and Hg should be analyzed 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 this specific monitoring could be discontinued.	<p>Samples have been analyzed in dust fall &amp; soil during summer season and monsoon season.</p> <p>The detail analysis result is enclosed as <b>Annexure-IX (Dust Fall) &amp; Annexure -X (Soil)</b>.</p>
8	<p>Mine Mineral and OB transportation shall be in trucks/dumpers covered with tarpaulins.</p> <p>Vehicular emissions should be kept under control and regularly monitored.</p> <p>Suitable measures should be taken to check fugitive emissions from haulage roads &amp; transfer points, etc.</p>	<p>The trucks are being covered with tarpaulin during dispatch of manganese ore from mine to Ferro Alloys Plant and Railway Siding located at Joda. OB is being transported by shovel – dumper combination from mine face to dumps located near the quarry itself within 1.5 Km. So, it is not in practice to cover the OB transportation trucks with tarpaulin.</p> <p>All the trucks meant for transportation of mineral from mine to our captive plant &amp; railway siding at Joda is bearing the ‘Pollution under Control’ certificate. The emissions are under control.</p> <p>There is provision of water sprinkling by mobile water sprinklers to suppress fugitive emission from haul roads and other area having potential of producing air borne dust. We have also installed fixed-type water sprinklers along haul road in D-Quarry. The processed manganese ore is being transferred manually; hence there less fugitive emission during transfer of ore.</p> <p>The results of Ambient Air Quality done during the period Oct’18 to March’19 is enclosed as <b>Annexure-IV and V</b>.</p>
9	A green belt of adequate width should be raised by planting the native species around ML area. Plantation should also be carried out along roads, OB dump sites etc. in consultation with the local DFO / Agriculture Department. The density of the trees should be not less than 2500 plants per ha.	<p>Reclamation and plantation program have been drawn. We have planted around 11.54 lakh nos. of trees over an area around 225.9 ha till 2018-19 at safety zone, OB dump and as avenue plantation. The tree density is maintained at the rate of more than 2500 saplings per ha.</p> <ul style="list-style-type: none"> <li>• During the year 2018-19, 24345 nos. of saplings were planted. Beside this we also planted around 42,536 nos. of vetiver slips &amp; 239 fruit bearing plants planted at nearby villages.</li> </ul>

10	Groundwater shall not be used for mine operations. Prior approval of CGWA shall be obtained for using groundwater.	We have obtained NOC from CGWA vide NOC No. CGWA/NOC/MIN/ORIG/2018/3888, Dated 09.08.2018 for a quantity of 146 cum/day.
11	Mining will not intersect groundwater. Prior permission of the MOEF and CGWA shall be taken to mine below water table.	Mining is not intersecting the ground water as the Ground water being at lower level in comparison to existing maximum quarry depth.
12	Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers. The monitoring should be done for quantity four times a year in pre-monsoon (April / May), monsoon (August). Post-monsoon (November) and winter (January) seasons and for quality in May. Data thus collected should be submitted to the MoEF & CGWA quarterly.	Ground water table is much below the existing mine workings because of mining operations are confined at hilly topography only. However, ground water level & quality at existing well at separate location is being monitored.  The ground water quality monitoring results and level are enclosed as <b>Annexure VII &amp; VIII</b> respectively.
13	Trace metals such as Fe, Cr <sup>+6</sup> , Cu, Se, As, Cd, Hg, Pb, Zn and Mn at specific locations for both surface water downstream and in ground water at lower elevations from mine area, shall be periodically monitored in consultation with the OSPCB and State Ground Water Board. Suitable treatment measures shall be undertaken in case levels are found to be higher than permissible limits.	Trace metals such as Fe, Cr <sup>+6</sup> , Cu, Se, As, Cd, Hg, Pb, Zn and Mn at specific locations for both surface water (downstream & upstream) and ground water at lower elevation is being periodically monitored by referring to the standards as per BIS: 10500.  The details of analysis result for ground water and surface water with standards are enclosed as <b>Annexure -VI &amp; VII</b> respectively.
14	"Consent to Operate" should be obtained from SPCB before expanding mining activities.	"Consent to operate" has been obtained from State Pollution Control Board, Orissa vide letter no. 3012/IND-I-CON-186 dated 18.02.16 and Consent order no. 67 valid 31.03.2021.
15	Conservation Plan for conservation of endangered fauna including the Indian Elephant found in and around the mine area shall be prepared and implemented in consultation with identified agencies/institutions and with the State Forest Department. The Plan should be dovetailed with that prepared/under implementation/proposed for the endangered fauna found in the Reserve Forest in the buffer zone of the project site. The costs for the specific activities/tasks should be earmarked in the Conservation Plan and shall not be diverted for any other purpose. Year-wise status of the implementation of the	We have deposited Rs.56,30,000/- on 05.07.2006 through Canara Bank D.D. No.481301 to 481307 being the contribution towards implementation of Wild Life Management Plan prepared for Bonai & Keonjhar division.  Further, as per subsequent demand of forest department, additional amount of Rs. 2,31,24,380 and Rs 3,30,67,537 has been deposited through RTGS towards differential payment for implementation of Regional Wildlife Management Plan prepared for Bonai & Keonjhar division and the DFO, Keonjhar, Orissa was intimated accordingly.

	Plan and the expenditure thereon should be reported to the Ministry of Environment & forests, RO, Bhubaneswar.	Site Specific Wildlife Management Plan has been approved vide memo no. 7726/1WL-SSP-93/2015 dated 31 <sup>st</sup> Aug 2015.  Further, we have deposited an amount of Rs. 9,79,48,000/- towards SSWLCP in respect of Joda West Iron & Mn. Mine through NEFT mode in Odisha CAMPA vide Ref. No.N346170430504053.												
16	A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	A progressive mine closure plan for the period 2013-14 to 2017-18 has been approved by IBM along with the Scheme of Mining.  Further, Progressive mine closure plan for the period of 2018-19 to 2022-23 has been submitted under the Rule No. 23, MCDR 2017.  The final mine closure plan along with details of Corpus fund will be submitted to the Ministry of Environment & Forests in advance of final mine closure for approval.												
<b>Sl. no</b>	<b>B: General Conditions</b>	<b>Compliance Status</b>												
1	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	No change in mining technology and scope of working has been made at the mine. If any changes proposed in technology and scope of workings, prior approval shall be sought from Ministry of Environment & Forests.												
2	No change in the calendar plan including excavation, quantum of manganese ore and waste should be made.	Excavation plan for total excavation, Manganese ore and waste has been prepared and is being strictly adhered. The actual figure for total excavation, manganese ore and waste for the year 2018-19 is given in table below. Table: Plan vs. Actual for year 2018-19 <table border="1" data-bbox="842 1451 1453 1787"> <thead> <tr> <th>Year- 2018-19</th> <th>Plan</th> <th>Actual</th> </tr> </thead> <tbody> <tr> <td>Total Excavation (cum)</td> <td>1286587</td> <td>778880</td> </tr> <tr> <td>Production (MT)/cum</td> <td>100013</td> <td>64866</td> </tr> <tr> <td>OB Removal (cum)</td> <td>1245720</td> <td>752934</td> </tr> </tbody> </table>	Year- 2018-19	Plan	Actual	Total Excavation (cum)	1286587	778880	Production (MT)/cum	100013	64866	OB Removal (cum)	1245720	752934
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3	Four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RPM. SPM, SO <sub>2</sub> , NO <sub>x</sub> . Monitoring. Location of the stations should be decided based on the meteorological data, topographical features, and environmentally and ecologically	Five ambient air quality monitoring stations have been established out of which 2 nos. in core zone (Near Office close proximity to residential and mining area near to H-Quarry) and 3 nos. in buffer zone (at Khandbondh, Bonaikela, Banspani ) Samples are drawn twice in a week in core zone and once in a quarter in buffer zone to												

	<p>sensitive targets in consultation with the State Pollution Control Board.</p> <p>Data on ambient air quality (RPM, SPM, SO<sub>2</sub> &amp; NO<sub>x</sub>.) should be regularly submitted to the Ministry including its Regional office at Bhubaneshwar and the State Pollution Control Board / Central Pollution Control Board once in six months.</p>	<p>ascertain the 24 hour monitoring average for PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, Mn NH<sub>3</sub>, BaP, benzene, As, Ni and Pb .and reports are being submitted to OSPCB every month.</p> <p>It was observed that the environmental parameters are within the prescribed limit.</p> <p>Abstract of the monthly monitoring data on ambient air quality and Water quality are enclosed as <b>Annexure – IV &amp; V.</b></p>
4	Drills should be wet operated or with dust extractors and controlled blasting should be practiced.	Wet drilling concept is already in place. Controlled blasting technique with NONEL is in practice.
5	Fugitive dust emissions from all the sources should be controlled regularly monitored and data recorded properly. Water spraying arrangements on haul roads, wagon loading, dumpers/ trucks, loading & unloading points should be provided and properly maintained.	Effective water sprinkling by mobile water tanker is being done on haul roads and other area having potential of producing air borne dust. Additionally, we have also installed fixed-type water sprinklers along haul road at D-Quarry. The results of Ambient Air Quality done during the period Oct'18 to March'19 is enclosed as <b>Annexure-IV.</b>
6	Adequate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operations of HEMM, etc should be provided with ear plugs/ muffs.	<p>Ear plugs &amp; Ear muffs are provided to the workers working in mining operation &amp; DG operations. Rests of operations are below the noise levels of 80 dBA.</p> <p>The details of noise monitoring for the period Oct'18 to March' 19 are enclosed as <b>Annexure-XI.</b></p>
7	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 191b May, 1993 and 31 <sup>st</sup> December 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	The oil separation system has been provided at workshop and working effectively. This is being centrally used for maintenance of all the Equipment running at Joda West Iron & Mn Mine.
8	Environmental laboratory should be established with adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board.	<p>It is being done by M/s Visiontek Consultancy Service Pvt. Ltd (Recognized as "A" category consultant as by State Pollution Control Board, Odisha).</p> <p>The type of pollution monitoring and analysis equipment used by by M/s Visiontek Consultancy Service Pvt. Ltd is enclosed as <b>Annexure – XII.</b></p>
9.	Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.	Suitable dust masks are being provided to employees (departmental & contractual) engaged in dusty operations. It is also ensured that they use the same. Employees are undergoing Periodical Medical Examination

	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>which is inclusive of lungs function test and audiometry. All the personnel are trained on safety in work place and continuous awareness program are being conducted for all employees to avert manganese poisoning.</p> <p>Periodical Medical Examination of employees (departmental &amp; contractual) are conducted as per prescribed norms of Mines Rule, 1955. The initial and periodical examination includes blood hematology, blood pressure, detailed cardiovascular assessment, neurological examination etc. All chest radiographs are being classified for detection of pneumoconiosis, diagnosis and documentation made in accordance to ILO classifications.</p> <p>Total 384 contractual employees and 35 departmental employees have undergone PME during FY 2018-19.</p> <p>There are no findings of pneumoconiosis and manganese poisoning which is classified as occupational disease.</p>
10	A separate environmental management cell with suitable qualified personnel should be set up under the control of a Senior Executive, who will report directly to the Head of the Organization.	<p>The department is in place and the Head of the department is reporting to General Manager of the division.</p> <p>The organizational structure in place is enclosed as <b>Annexure-XIII</b>.</p>
11	The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar.	<p>Funds allocated for environmental management are spent only for environment related purposes and not diverted to any other purpose.</p> <p>During the year 2018-19, Rs.560407 was allocated for construction of Toe wall &amp; garland drain against which we have spent Rs 832352. For plantation activity Rs. 562500 was allocated against which we have spent Rs. 440645. Similarly, for environment monitoring Rs10,00,000 was allocated against which we have spent Rs.9,79,615.</p>
12	The Regional Office of this Ministry located at Bhubaneshwar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports	We are providing full co-operation to the officers of the Regional Office by furnishing the requisite data / information / monitoring reports.



13	A copy of clearance letter will be marked to the concerned Panchayat/local NGO, if any, from whom suggestion/representation has been received while processing the proposal.	Copy of the clearance letter marked to Chairman, Municipal Council, Joda on 12.01.2006.
14	The State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's Office/Tehsildar's Office for 30 days.	This is applicable to State Pollution Control Board, Orissa.
15	The project authorities should advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular of the locality concerned within seven 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 may also be seen at Web Site of the Ministry of Environment & Forests at <a href="http://envfor.nic.in">http://envfor.nic.in</a> . and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar.	A detail of Environmental Clearance with regard to Joda West Manganese Mine was published in Oriya News Papers Dharitri & Sambad 17.10.2005.
16	The Ministry or any other competent authority may stipulate any further condition for environmental protection.	Noted
17	Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance.	Noted
18	The above conditions will be enforced, inter alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1991 along with their amendments and rules.	Noted

**Additional Conditions as per MoEFCC Letter No. 106-9/11/EPE dt. 02.12.2014 issued to all Non-Coal Mining Projects.**

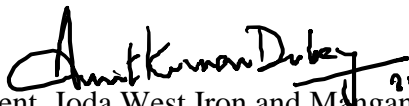
S.No.	Stipulated Condition	Compliance Status
1.	The project authority shall adopt best mining practices for given conditions in the mining area, adequate number of check dam, retaining wall/ structure, garland drains and settling ponds should be provided to arrest the wash off with rain water in catchment area.	The best scientific method of mining is in practice at Joda West Iron and Manganese Mine. Garland grain and Retaining wall are provided at the toe of the overburden dumps. Settling ponds are done at intervals along the garland drain. A five-stage check dam has been provided at H Quarry of the mine to arrest the surface run off with rain water.
2.	The natural water bodies and or stream which are flowing in and around the	The natural water bodies which are flowing around the nearby villages are not disturbed

	village should not be disturbed. The water table should be nurtured so as not 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.	by mining activity. The ground water table is being monitored regularly from the open well and tube well of nearby villages. Drinking water is provided to the villagers through pipe line and overhead tanks.
3.	The illumination and sound at night at project sites disturb the village in respect of both human and animal population. Consequent sleeping disorder and stress may affect the health in the village located close to mining operation. Habitations have a right to darkness and minimal noise level at night. The Project Proponents must ensure that the biological clock of the village is not disturbed by orienting the floodlights mask way from the village and keeping the noise levels well within prescribed limits for day/ night hours.	The operation of the mine is restricted to the day light hours only. Hence, there is no disturbance to the habitats located close to the mining operation. The biological clock of the village is not disturbed.
4.	The project Authority shall make necessary alternative arrangement, where required, in consultation with state Government to provide alternative areas for livestock grazing. In this case context, the Project Authority should implement the direction of Hon'ble Supreme Court with regard to acquiring grazing land. The sparse tress on such grazing ground, which provides mid-day shelter from the scorching sun, should be scrupulously guarded felling lest the cattle abandon the grazing ground or return home by noon.	Not Applicable. There is no grazing land within the M.L. area.
5.	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 building to evaluate the zone of influence and impact of blasting on neighbourhood. Within 500 meters of such sites vulnerable to blasting vibration, avoidance of use of explosives and adoption of alternative means of mineral extraction such as ripper/dozer combination/ rock breakers/ surface mineral etc should be seriously considered and practiced wherever practicable. A provision for monitoring of each blast should be made so that	Deep hole drilling and controlled blasting technique has been adopted in the mine. Vibration study has been done with the help of CIMFR and vibration limit (ppv) found within the limit. Provision for monitoring each blast has been established to ascertain the blast induced vibration (ppv) limit at different distances from the center of blasting.

	<p>impact of blasting on nearby habitation and dwelling unit could be ascertained. The covenant of lease deed under rule 31 of MCR 1960 provided that no mining operation shall be carried out within 50 meters of public works such as public roads and building or inhabited sites except with prior permission from the competent Authority.</p>	
6.	<p>Main haulage road in the mines should be provided with permanent water sprinkler and other road should be regularly wetted water tanker fitted with sprinkler. Crusher and material transfer points should be invariably be provided with bag filter and or dry fogging system. Belt conveyor fully covered to avoid air borne dust.</p>	<p>The main haulage road, mineral stacking area overburden dumping areas are regularly sprinkled with water by using water tankers. There is a plan to cover part of the main haulage road with automatic water sprinkling arrangements in future.</p>
7.	<p>The project Authority shall ensure that productivity of agriculture crops is not affected due to the mining operation. Crop Liability Insurance Policy has to be taken by PP as a precaution to compensate for the crop loss. The impact zone shall be 5 Km from the boundary of mine lease area for insurance policy. In case, several mines are located in cluster mines, formed inter - alia, to sub serve such and objective shall be responsibility for securing such Crop Liability Policy.</p>	<p>Not Applicable. There is no crop land nearby the M.L. area.</p>
8.	<p>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 also accordingly revised and required stipulation under the MMDR Act 1957 and MCR 1969 met.</p>	<p>Not Applicable</p>
9.	<p>Transportation of 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 m) for the purpose of transportation of 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 same is proposed to be used for the project. No</p>	<p>There is no transportation road passing through any village.</p>

	road movement should be allowed on existing village road network without appropriately increasing carrying capacity of such road	
10.	Likewise, alteration or re-routing of foot paths, pagdandies, cart road and village infrastructure/ public utilities or roads (for purpose of land acquisition for mining) shall be avoided to extent possible and in such case acquisition is inevitable, alternative arrangements shall be made first and the only the area can be acquired. In these types of cases Inspection reports by site visit by expert may be insisted upon which should be done through reputed Institutes.	Not Applicable
11.	The CSR activates by companies including mining establishment has become mandatory up to 2% their financial turn over, socio Economic Development of neighborhood. Habitats could also be planned and executed by the PPs more systemically based on need based door to door survey by established Social Institute/ Workers on the lines as required under TOR. " R&R Plan// compensation details for 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 SCs and STs and weaker section of society in study, a need bashed sample survey, family-wise, should be undertaken to assess their requirement, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line department of State Government. It may be clearly brought out whether the village including their R&R and socio-economics aspect should be discussed in EIA report.	Tata Steel has taken up many social initiatives for the upliftment of the education, health and other socio-economic development of the neighboring villages. TSRDS (Tata Steel Rural Development Society) has been pioneering the initiatives through CSR activities.  R&R policy has not been applicable for the PP till now.

Yours Faithfully  
F: Tata Steel Limited

  
Agent, Joda West Iron and Manganese Mines  
& Head (Manganese Group of Mines) , Joda



## ANNEXURE-II : JODA WEST DOMESTIC EFFLUENT WATER QUALITY ANALYSIS REPORT OCTOBER-2018 to MARCH-2019

Sampling Location:STPW-1:STP (Inlet)  
STPW-2: STP (Outlet)

Sl. No	Parameter	Unit	Standards (In land Surface water)	October 2018		November 2018		December 2018		Jan-19		Feb-19		Mar-19	
				STPW-1	STPW-2	STPW-1	STPW-2	STPW-1	STPW-2	STPW-1	STPW-2	STPW-1	STPW-2	STPW-1	STPW-2
1	Colour & Odour	Hazen	Colourless/Odourless as far as practicable	05 & pungent smell	CL & U/O	06 & pungent smell	CL & U/O	03 & pungent smell	CL & U/O	03 & pungent smell	CL & U/O	02 & pungent smell	CL & U/O	03 & pungent smell	CL & U/O
2	Suspended Solids	mg/l	100	276	15	290	24	92	27	95	26	96	30	94	28
3	Particulate size of SS		Shall pass 850 micron IS Sieve	< 850	< 850	< 850	< 850	< 850	< 850	< 850	< 850	< 850	< 850	< 850	< 850
4	pH Value	--	5.5-9.0	7.24	7.6	6.94	7.42	6.35	7.21	6.38	7.12	6.41	7.18	6.48	7.26
5	Temperature	°C	Shall not exceed 50C above the receiving water	23	23	23	23	21	21	21	21	25	25	36	36
6	Oil & Grease(max)	mg/l	10	ND	ND	ND	ND	2.3	ND	2.5	ND	2.8	ND	2.4	ND
7	Total Residual Chlorine	mg/l	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8	Ammonical Nitrogen (as N)	mg/l	50	2.5	ND	2.3	ND	4.7	0.458	5.9	0.46	6.2	0.39	5.1	0.56
9	Total Kjeldahl nitrogen (as NH3)	mg/l	100	8.6	2.1	8.1	2.6	15.6	1.2	6.8	1.8	10.8	2.1	16.2	1.8
10	Free ammonia (as NH3)	mg/l	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
11	BOD(3 days at 270C (max)	mg/l	30	6.3	7.2	38.2	8.2	52.6	5	26	4	36.2	3.2	32.8	3.8
12	Chemical Oxygen Demand as COD	mg/l	250	240	3.1	242	36	188	21	182	20	176	18	184	18
13	Arsenic as As	mg/l	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
14	Mercury (Hg)	mg/l	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
15	Lead as Pb(max)	mg/l	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	Cadmium as Cd (max)	mg/l	2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
17	Hexavalent Chromium as Cr+6	mg/l	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Total Chromium (Cr)	mg/l	2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
19	Copper as Cu (max)	mg/l	3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Zinc as Zn(max)	mg/l	5	0.36	<0.05	0.65	<0.05	0.32	<0.05	0.41	<0.05	0.46	<0.05	0.44	<0.05
21	Selenium (Se) (max)	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Nickel (Ni)	mg/l	3	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Cyanide as CN (max)	mg/l	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
24	Fluoride as F (max)	mg/l	2	0.13	0.08	0.61	0.013	0.11	0.023	0.23	0.023	0.29	0.019	0.18	0.018
25	Dissolved Phosphates (P)	mg/l	5	0.21	<0.05	0.56	<0.05	0.25	<0.05	0.25	<0.05	0.22	<0.05	0.31	<0.05
26	Sulphide (S)	mg/l	2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
27	Phenolic Compounds as C6H5OH (max)	mg/l	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Bio-assay test		90% survival of fish after 96 hours in 100% effluent	90% survival of fishes	100% survival of fishes	82% survival of fishes	99% survival of fishes	79% survival of fishes	98% survival of fishes	79% survival of fishes	98% survival of fishes	90% survival of fishes	99% survival of fishes	85% survival of fishes	100% survival of fishes
29	Manganese (Mn)	mg/l	2	0.03	<0.005	0.07	<0.005	0.026	<0.005	0.024	<0.005	0.018	<0.005	0.041	<0.005
30	Iron as Fe (max)	mg/l	3	1.2	0.08	1.7	0.09	1.23	0.1	1.23	0.1	1.23	0.16	1.54	0.16
31	Vanadium (V)	mg/l	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32	Nitrate Nitrogen	mg/l	10	1.8	0.32	1.9	0.45	2.34	0.65	2.28	0.64	2.6	0.68	2.48	0.74







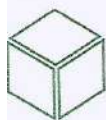
**ANNEXURE-IV: Ambient Air Quality(Core Zone)  
Joda West Iron and Manganese Mine Mines (Oct'18 to March'19)**

Location	Month	Concentration of Pollutants												
		PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	Benzene (µg/m <sup>3</sup> )	Benzo(a) pyrene (ng/m <sup>3</sup> )	Mn (µg/m <sup>3</sup> )
JW-Time Office	Oct'18	44.00	18.89	4.15	9.34	< 4.0	0.28	22.52	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.005
JW-H Quarry		41.80	22.51	4.22	10.71	< 4.0	0.31	20.55	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.003
JW-Time Office	Nov'18	48.75	24.89	4.20	9.34	< 4.0	0.36	22.52	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.005
JW-H Quarry		44.45	23.69	4.27	10.74	< 4.0	0.34	20.75	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.003
JW-Time Office	Dec'18	55.54	26.19	4.18	9.34	< 4.0	0.48	18.16	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.005
JW-H Quarry		52.33	24.94	4.27	10.99	4.17	0.44	21.75	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.003
JW-Time Office	Jan'19	62.53	30.52	4.40	9.74	< 4.0	0.57	23.32	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.005
JW-H Quarry		54.33	28.34	4.50	11.60	< 4.0	0.56	23.40	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.003
JW-Time Office	Feb'19	58.68	29.55	4.44	9.44	< 4.0	0.55	22.30	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.009
JW-H Quarry		53.89	27.53	4.57	11.51	4.5	0.51	22.07	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.009
JW-Time Office	March'19	82.28	36.11	9.11	10.97	4.255556	0.61	22.30	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.010
JW-H Quarry		68.80	29.73	4.52	11.19	4.366667	0.42	21.66	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001

**ANNEXURE- V: AMBIENT AIR QUALITY MONITORING REPORT (BUFFER ZONE)**

Month	Location	Parameters					
		PM10	PM2.5	SO2	NOx	CO	HC
Dec-18	Khondbandh	49.80	20.50	<4	<9	0.35	<0.001
	Bounspani	45.60	23.50	<4	<9	0.18	<0.001
	Baneikela	49.80	21.50	<4.0	<9.0	0.50	<0.001
Mar-19	Khondbandh	49.60	29.20	4.6	9.1	0.61	<0.001
	Bounspani	50.80	30.80	4.9	9.4	0.68	<0.001
	Baneikela	56.60	30.80	5.1	9.6	0.62	<0.001





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

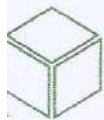
Ref: EnvLab/19/R-224 **GROUND WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF DEC-2018** Date: 02/01/19

1.	Name of Industry	Joda West Manganese Mines ( M/s TATA Steel Limited)
2.	Sampling Location	GW-1:Parama Basti BW GW-2: Kamar Joda OW
3.	Date of sampling	21.12.2018
4.	Date of analysis	22.12.2018 To 28.12.2018
5.	Sample collected by	VCSPIL Representative in presence of TATA Representative

Sl. No	Parameter	Unit	Standards as per IS: 10500, 2012	Analysis Results	
				21.12.2018	
				GW-1	GW-2
<b>Essential Characteristics</b>					
1	Colour	Hazen	5	CL	CL
2	Odour	--	Agreeable	Agreeable	Agreeable
3	Taste	--	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	1	<	<1
5	pH Value	--	6.5-8.5	7.51	7.54
6	Total Hardness (as CaCO <sub>3</sub> )	mg/l	200	158.0	146.0
7	Iron (as Fe)	mg/l	0.3	0.35	0.26
8	Chloride (as Cl)	mg/l	250	28.0	36.0
9	Residual, free Chlorine	mg/l	0.2	ND	ND
<b>Desirable Characteristics</b>					
10	Dissolved Solids	mg/l	500	206.0	264.0
11	Calcium (as Ca)	mg/l	75	38.0	42.0
12	Magnesium (as Mg)	mg/l	30	10.8	11.6
13	Copper (as Cu)	mg/l	0.05	<0.05	<0.05
14	Manganese (as Mn)	mg/l	0.1	0.024	0.026
15	Sulphate (as SO <sub>4</sub> )	mg/l	200	4.6	5.2
16	Nitrate (as NO <sub>3</sub> )	mg/l	45	2.4	2.9
17	Fluoride (as F)	mg/l	1	0.045	0.056
18	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	0.001	<0.001	<0.001
19	Mercury (as Hg)	mg/l	0.001	<0.001	<0.001
20	Cadmium (as Cd)	mg/l	0.003	<0.001	<0.001
21	Selenium (as Se)	mg/l	0.01	<0.001	<0.001
22	Arsenic (as As)	mg/l	0.01	ND	ND
23	Cyanide (as CN)	mg/l	0.05	<0.001	<0.001
24	Lead (as Pb)	mg/l	0.01	<0.001	<0.001
25	Zinc (as Zn)	mg/l	5	<0.05	<0.05
26	Anionic Detergents (as MBAS)	mg/l	0.2	<0.2	<0.2
27	Chromium (as Cr <sup>+6</sup> )	mg/l	-	<0.05	<0.05
28	Chromium (as Cr <sup>+6</sup> )	mg/l	0.5	<0.01	<0.01
29	Mineral Oil	mg/l	200	128.0	136.0
30	Alkalinity	mg/l	0.03	<0.001	<0.001
31	Aluminium as( Al)	mg/l	0.05	<0.01	<0.01
32	Boron (as B)	mg/l	0.05	<0.01	<0.01
33	Poly Aromatic Hydrocarbon as PAH	µg/l	-	<0.001	<0.001
33	Pesticide	mg/l	Absent	Absent	Absent

For Visiontek Consultancy Services Pvt. Ltd.





Ref: Emfab/19/R-1804 (II)

Date: 03/04/19

### GROUND WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF MARCH-2019

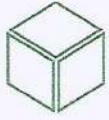
1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : GW-1: Premabasti BW  
GW-2: Kamr Joda OW
3. Date of sampling : 16.03.2019
4. Date of analysis : 18.03.2019 to 23.03.2019
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl. No	Parameter	Testing Methods	Unit	Standard as Per IS 10500:2012	Analysis Results	
					GW-1	GW-2
1	Color	APHA 2120 B, C	Hazen	5	CL	CL
2	Odour	APHA 2150 B	--	Agreeable	Agreeable	Agreeable
3	Taste	APHA 2160 C	--	Agreeable	Agreeable	Agreeable
4	Turbidity	APHA 2130 B	NTU	1	1.8	1.4
5	pH Value	APHA 4500H+ B	--	6.5-8.5	7.42	7.38
6	Total Hardness (as CaCO <sub>3</sub> )	APHA 2540 C	mg/l	300	112.0	121.0
7	Iron (as Fe)	APHA 3500Al B	mg/l	0.3	0.32	0.19
8	Chloride (as Cl)	APHA 5540 C	mg/l	250	34.0	30.8
9	Residual, free Chlorine	APHA 4500B, B	mg/l	0.2	ND	ND
10	Dissolved Solids	APHA 3500Ca B	mg/l	500	188.0	212.0
11	Calcium (as Ca)	APHA 4500Cl- B	mg/l	75	40.2	42.2
12	Magnesium (as Mg)	APHA 3111 B,C	mg/l	30	18.8	22.4
13	Copper (as Cu)	APHA 4500F- C	mg/l	0.05	<0.05	<0.05
14	Manganese (as Mn)	APHA 4500Cl, B	mg/l	0.1	0.018	0.021
15	Sulphate (as SO <sub>4</sub> )	APHA 3500Fe, B	mg/l	200	5.2	4.8
16	Nitrate (as NO <sub>3</sub> )	APHA 3500Mg B	mg/l	45	3.1	3.4
17	Fluoride (as F)	APHA 3500Mn B	mg/l	1	0.042	0.051
18	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	APHA 5220 B	mg/l	0.001	<0.001	<0.001
19	Mercury (as Hg)	APHA 4500 NO <sub>3</sub> E	mg/l	0.001	<0.001	<0.001
20	Cadmium (as Cd)	APHA 5530 B,D	mg/l	0.003	<0.001	<0.001
21	Selenium (as Se)	APHA 3114 B	mg/l	0.01	<0.01	<0.001
22	Arsenic (as As)	APHA 4500 SO <sub>4</sub> <sup>2-</sup> E	mg/l	0.01	<0.01	<0.001
23	Cyanide (as CN)	APHA 2320 B	mg/l	0.05	ND	ND
24	Lead (as Pb)	APHA 2340 C	mg/l	0.01	<0.01	<0.001
25	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	2.4	3.1
26	Anionic Detergents (as MBAS)	APHA 4500 CN- C,D	mg/l	0.2	<0.2	<0.2
27	Chromium (as Cr <sup>6+</sup> )	APHA 3111 B,C	mg/l		<0.05	<0.05
28	Mineral Oil	APHA 3500 Hg	mg/l	0.01	<0.01	<0.01
29	Alkalinity	APHA 3114 B	mg/l	200	72.0	78.0
30	Aluminium as( Al)	APHA 3111 B,C	mg/l	0.03	<0.01	<0.01
31	Boron (as B)	APHA 3500Cr B	mg/l	0.5	<0.5	<0.5
32	Poly Aromatic Hydrocarbon (as PAH)	APHA 6440 B	µg/l	<0.0001	<0.0001	<0.0001
33	Pesticide	APHA 6630 B,C	mg/l	Absent	Absent	Absent

Note: CL: Colourless, ND: Not Detected.

For Visiontek Consultancy Services Pvt. Ltd.





Ref.: Env Lab / 19 / R - 223

Date: 02/01/19

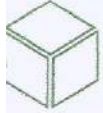
**GROUND WATER LEVEL MONITORING REPORT FOR DEC-2018**

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Date of Recording : 21.12.2018
3. Monitored by : VCSPL Representative in presence of TATA Representative

SL.NO	Monitoring Date	Analysis Result (MT/BGL)
1	Kamar Joda OW	6.8 m
2	Banaikala OW	3.1 m

For Visiontek Consultancy Services Pvt. Ltd.





Ref.: Env/lab/19/R-1805(F)

Date: 03/04/19

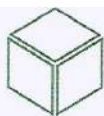
## GROUND WATER LEVEL ANALYSIS REPORT FOR THE MONTH OF MARCH-2019

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : **GWL-1 : Kamar Joda OW**  
**GWL-2: Baneikala OW**
3. Date of sampling : 16.03.2019
4. Sample collected by : VCSPL Representative in presence of TATA Representative

SL.NO	Sample Location	Analysis Result (m/bgl)
1	GWL1:Kamar Joda OW	6.2
2	GWL2: Baneikala OW	3.0

For Visiontek Consultancy Services Pvt. Ltd.





Ref.: Envrlab/19/R-225

Date: 02/01/19

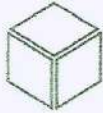
## TRACE METAL DUST FALL ANALYSIS REPORT FOR THE MONTH OF DEC-2018

1. Name of Industry	:	Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling Location	:	F-1: Mines Area
3. Date of sampling	:	18.12.2018
4. Sample collected by	:	VCSPL Representative in presence of TATA Representative

	Parameters	18.12.2018	
		UNIT	RESULT
F-1	Ni	(%)	<0.001
	Co	(%)	<0.001
	Hg	(%)	<0.001
	As	(%)	<0.001

For Visiontek Consultancy Services Pvt. Ltd.





Ref: Env/lab/19/R - 1581

Date: 03.04.19

## DUST FALL MONITORING REPORT FOR THE MONTH OF MARCH-2019

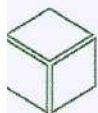
Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)  
Sample collected by : VCSPL representative in presence of TATA representative.

SL.No.	Sample Type	Parameters	MARCH-2019	
			Unit	Analysis Result
1	F-1	Ni	(%)	<0.001
2		Co	(%)	<0.001
3		Hg	(%)	<0.001
4		As	(%)	<0.001



For Visiontek Consultancy Services Pvt. Ltd.





Ref.: Env/10/19/R-226

Date: 02/01/19

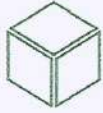
## NOISE MONITORING REPORT FOR DEC-2018

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Date of Recording : 18.12.2018
3. Monitored by : VCSPL Representative in presence of TATA Representative

AAQ				Day time Equivalent	Night time Equivalent
Sl. No	Date	Name of Location	Unit	Result	
1	18.12.2018	Town ship	db	65.6	45.8
2		Hospital		64.2	42.2
3		Mines Area		67.2	46.1
		Railway Sliding		57.3	47.8
<b>CPCB Standard</b>				<b>75</b>	<b>70</b>

For Visiontek Consultancy Services Pvt. Ltd.





Ref.: Em/106/19/R - 1578

Date: 03.04.19

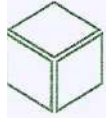
## NOISE MONITORING REPORT FOR MARCH-2019

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Date of Recording : 18.12.2018
3. Monitored by : VCSPL Representative in presence of TATA Representative

Sl. No	Date	Name of Location	Unit	Day time Equivalent	Standard As per CPCB	Night time Equivalent	Standard As per CPCB
				Result		Result	
1	18.03.2019	Town ship	dB	69.0	75	52.0	70
2		Hospital		41.2	50	30.8	40
3		Mines Area		68.8	75	50.2	70
		Railway Sliding		59.6	75	41.2	70



For Visiontek Consultancy Services Pvt. Ltd.



Ref.: Env/106/19/R-227

Date: 02/01/19

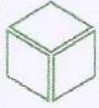
## NOISE EQUIPMENT MONITORING REPORT FOR DEC-2018

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Date of Recording : 18.12.2018
3. Monitored by : VCSPL Representative in presence of TATA Representative

EQUIPMENT				
Sl. No	Date	Name of Location	Unit	Result
1	15.12.2018	Near STP	dB	53.6
2		DG Set		79.5
3		WTP(H -Quarry)		55.6
4		OR-09P-8134(Truck)		64.2
5		OD-O9N-9454(Truck)		79.1
6		Volvo-EC460BLC(Sovel-1)		89.7
7		Volvo-EC460BLC(Sovel-2)		79+4
8		D-Quarry Pump House		59.8
9		Volvo EC360DL(Sovel-3)		88.7
10		Work Shop		69.8
11		OD-O9A-5665(Volvo Truck)		84.6
12		OD-O9A-4693(Volvo Truck)		87.2
<b>CPCB Standard</b>				<b>75</b>



For Visiontek Consultancy Services Pvt. Ltd.



Ref: *Emulab/19/R-2018*

Date: *03/04/19*

## EQUIPMENT NOISE MONITORING REPORT –MARCH 19

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)  
2. Recorded By : VCSPL Representative in presence of TATA Representative

EQUIPMENT				
Sl. No	Date	Name of Location	Unit	Day Time
				Result
1	29.03.2019	Near STP	dB	54.2
2		DG Set		71.2
3		WTP(H -Quarry)		56.8
4		OR-09P-8134(Truck)		70.8
5		OD-O9N-9454(Truck)		72.8
6		Volvo-EC460BLC(Sovel-1)		74.4
7		Volvo-EC460BLC(Sovel-2)		74.1
8		D-Quarry Pump House		72.8
9		Volvo EC360DL(Sovel-3)		74.8
10		Work Shop		70.2
11		OD-O9A-5665( Volvo Truck)		72.8
12		OD-O9A-4693( Volvo Truck)		71.9

For Visiontek Consultancy Services Pvt. Ltd.



ANNEXURE-XII  
LIST OF ENVIRONMENTAL MONITORING EQUIPMENT  
Joda West Iron and Manganese Mine, M/S TATA STEEL LIMITED

<b>LIST OF ENVIRONMENTAL MONITORING EQUIPMENT</b>		
<b>Ambient Air Quality</b>		
<b>Sl.No.</b>	<b>Name of the Instrument</b>	<b>Parameter</b>
1	Respirable Dust sampler	PM <sub>10</sub>
2	Fine Particulate Sampler	PM <sub>2.5</sub>
3	Spectrophotometer UV-Visible range	SO <sub>2</sub> , NO <sub>x</sub>
4	NDIR	CO
5	AAS	Manganese
Other Paraphernalia for analysis of air quality are also available in the laboratory.		
<b>Water Quality</b>		
<b>Sl.No.</b>	<b>Name of the Instrument</b>	<b>Parameter</b>
1	Analytical weighing Balance	Used for weighing the chemicals
2	Micro Balance	Used for weighing CRMs
3	AAS with VGA and Hallow cathode lamps	All Heavy metals (Arsenic, Mercury, Selenium, Cadmium, Chromium, Cobalt, Iron, Lead, Manganese, Zinc, Aluminium, etc..)
4	Spectrophotometer UV-Visible range	Nitrate, Nitrite, Sulphate, Chromium(VI), Fluoride, Cyanide, Phenolic compounds
5	Flame Photometer	Sodium, Potassium
6	Ion Analyzer	Fluoride
7	BOD Incubator	BOD
8	COD Digester	COD
9	Furnace	Total volatile solids, Fixed solids

10	Hot Air Oven	Total Suspended Solids, Total Dissolved Solids
11	pH meter	pH
12	Conductivity meter	Conductivity
13	Turbidity Meter	Turbidity
14	Bacteriological Incubator	Total coli form and fecal coli form
15	Autoclave	sterilization
16	Microscope	Bacteriological colony count
17	Magnetic stirrer	Stirring purpose
18	Vacuum filtration unit	Rapid filtration
19	Water Bath	Boiling and evaporation purpose
20	Cadmium reduction column	Nitrate
21	Fluoride distillation unit	Fluoride
22	Kjeldal flask	Ammonia and Organic Nitrogen
23	Hot Plate	Digestion
24	Pizometer	Water level monitoring
25	Aquarium	Bio assay test

ANNEXURE-XIII  
 ORGANIZATION STRUCTURE  
 Joda West Iron and Manganese Mine, M/S TATA STEEL LIMITED

