



Director (S)
Ministry of Environment and Forests
Eastern Regional Office,
A/3, Chandrasekharpur
Bhubaneswar- 751023

Ref No: SCM/ ENV/ 012/ 051 / 15

Date: 30th May 2015

Sub: Submission of Six monthly compliance report on implementation of Environmental safeguards of Sukinda Chromite Mine, for the period from Oct'14 to Mar'15.

Ref: Ministry of Environment and Forests Letter No: J-11015/96/2011-IA.II(M) dated 06.09.2013

Dear Sir,

We are herewith submitting the six monthly compliance report in respect of the stipulated environmental clearance conditions of Sukinda Chromite Mine for the period from Oct'14 to Mar'15 as per EIA Notification, 2006.

We are also sending you the soft copy of the report to your good office on email: mef.or@nic.in for your ready reference.

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

Thanking you,

Yours faithfully,

Manager cum Agent
Sukinda Chromite Mine
M/s Tata Steel Limited

Encl: As above

CC: MoEF, New Delhi
CPCB, Zonal office Kolkata
OSPCB, Bhubaneswar
OSPCB, Regional office Kalinganagar

TATA STEEL LIMITED

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Compliance
to
Environmental Clearance Conditions
of
Sukinda Chromite Mine
M/s. Tata Steel Limited
For the period: Oct' 14 - Mar' 15

(MoEF Letter Ref No: J-11015/96/2011-IA.II (M), dated 06.09.2013)

Compliance to the Environment Clearance Letter No: J-11015/96/2011-IA.II (M), dated 06.09.2013 in respect of Sukinda Chromite Mine for Mining Lease renewal, increase in production for Chrome Ore (ROM): 2.40 MTPA, Pyroxenite Ore (ROM): 0.50 MTPA, Chrome Concentrate: 0.65 MTPA, Change in mining technology to opencast & underground mining, change in beneficiation technology and increase in project area.

A. Specific Condition:

Sl	Condition	Compliance
I	No mining activities will be allowed in forest area for which the Forest Clearance is not available	No mining is being carried out beyond any forest area other than the forest area over 73.697 ha for which the Forest Clearance/ TWP is available. Stage-I FC along with one year working permission was obtained from MoEF & CC vide letter no. 8-78/1996-FC (pt-I), dated 03.11.2014.
II	The project proponent will seek and obtain approval under the FC Act, 1980 for diversion of the entire forest land located within the mining lease within a period of two years from 01.02.2013 i.e. the date of issue of guidelines by FC vide their letter F. No. 11-362/ 2012-FC, failing which the mining lease area will be reduced to the non-forest area plus the forest area for which the project proponent has been able to obtain the FC at the end of this time period. In the case of reduction in mine lease area, the project proponent will need to get a revised mining plan approved from the competent authority for reduced area and enter into a new mining lease as per reduced lease area. The EC will be construed to be available for the mining lease area as per the revised mining lease deed.	Renewal Forest Diversion Proposal for entire forest land of 73.697 ha within the Mining Lease area has been applied in time. The FDP has been duly recommended by the F&E department, Govt. of Odisha to the Ministry of Environment & Forests, Govt. of India for onward consideration for grant of Forest Clearance. MoEF, Govt. Of India has granted Stage-I Forest Clearance with one year working permission vide its letter no. 8-78/1996-FC (pt-I), dated 03.11.2014. Copy of the letter enclosed as Annexure-I .
III	Till all the clearances are obtained for the proposed tailing pond/dam the project would only use existing tailing dam.	The Forest Diversion proposal for 8.370 ha of forest land involved in the proposed area for dry tailing disposal is under active consideration of State Forest Dept. For the non-forest part i.e. 65.315 ha land lease proposal is in preview of Odisha State Land Settlement and it is now under process. Till the time the above clearances are not obtained, the tailing is being disposed within the existing tailing dam.
IV	Environmental clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the Standing Committee of National Board for Wildlife, as may be applicable to this project.	There is no Wild Life sanctuary, National Park, Biosphere reserves or other Eco sensitive zone located within 10 km from the mining lease boundary. Hence, clearance under the Wildlife (Protection) Act, 1972 from the Standing Committee of National Board for Wildlife is not applicable.
V	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.	The Consent to Establish has been already obtained from Odisha State Pollution Control Board vide letter no. 17750/IND-II-NOC-5664 dated 30.09.2013. Consent to Operate would be applied and obtained before the proposed expansion activity for increase in production starts. The condition stipulated in the Consent to Establish and Consent to Operate is being effectively implemented.
VI	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.	As per Ministry of Environment Notification and local forest notification, there are no wildlife sanctuaries, national park/ biosphere reserve or any other sensitive zones located within 10 Km radius from the mining lease boundary.
VII	As part of ambient air quality monitoring during operational phase of the project, the air	The ambient air quality is being monitored at six locations within the Core Zone twice a week. Personal dust sampling is also being

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	samples shall also be analysed for their mineralogical composition as may be so prescribed or notified by this Ministry and records maintained.	carried out. The mineralogical composition has been done and result thereof has been enclosed as Annexure-II . The analysis report for personal dust sampling the taken in month of Feb'15 and Mar'15 is enclosed as Annexure-III .																														
VIII	The ores and minerals shall be covered by tarpaulin or by such other means when transported out of the mine by road. The vehicles shall not be overloaded.	Mineral and ores which is transported out of the mine lease boundary to the various destinations using the outside trucks is being completely covered by tarpaulin and is secured in position by plastic straps. All the vehicles are weighed with help four Weigh Bridge located within the mining lease boundary to ensure that vehicle is not overloaded. Photograph showing the same is enclosed as Annexure-IV .																														
IX	Effective safeguard measures such as conditioning of ore with water, regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around crushing and screening plant, loading and unloading point and transfer points. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.	<p>To limit the fugitive emissions, various control measures like water sprinkling on haul road, transfer points, Ore stack yard, etc is being done. Four graders have been deployed for grading all the haul roads to remove the accumulated muck. Nine water sprinklers (two of 28 KL, four of 20 KL, one 12 KL, one 10 KL and one 8 KL) have been deployed in the mine area for dust suppression on haul road and at mineral storage yards. The main haul roads and areas in maintenance, stack yard and chrome ore beneficiation plant have been concreted and for controlling dust stationary water sprinkler have also been installed in these permanent haulage roads. Plantation of 5-20 m width has also been raised in between colony and mines to minimize any air borne problems to the inhabitants.</p> <p>Stationary water sprinklers have been installed in roads within COB Plant and Workshop also. Water spraying is done through pressure water jets at feed hopper, transfer points, discharge chute to prevent dust generation. The process at COB Plant is totally wet and eliminates the chance of any dust generation. The concentrate stacks are now being covered using tarpaulin sheets to prevent finer concrete particle from getting air borne. Successful trials have also been conducted by using Dustex chemical (a lignosulphonate product derived from the wood pulping process and developed specially for road stabilization and dust control) during water sprinkling for effective dust suppression and less consumption of water. It is nontoxic, easy to handle and satisfies all environmental requirements. Photographs showing measures taken to control dust are attached in Annexure-V.</p> <p>The details of concrete road including provision of fixed water sprinkler are as follows:</p> <p style="text-align: center;">Table I: Concrete and Fixed Water Sprinkler Details</p> <table border="1" data-bbox="753 1547 1517 1843"> <thead> <tr> <th>Particulars</th> <th>Location</th> <th>Length(m)</th> <th>Width(m)</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Concrete road</td> <td>Main Haulage road</td> <td>1000</td> <td>13</td> </tr> <tr> <td>COB Plant</td> <td>100</td> <td>10</td> </tr> <tr> <td>LOP Plant</td> <td>200</td> <td>06</td> </tr> <tr> <td>Workshop</td> <td>200</td> <td>06</td> </tr> <tr> <td rowspan="4">Fixed water sprinkling system</td> <td>Main Haulage road</td> <td>1000</td> <td>-</td> </tr> <tr> <td>COB Plant</td> <td>100</td> <td>-</td> </tr> <tr> <td>LOP Plant</td> <td>200</td> <td>-</td> </tr> <tr> <td>Workshop</td> <td>100</td> <td>-</td> </tr> </tbody> </table> <p>All these majors are being successfully implemented to maintain Ambient Air Quality. The ambient air quality monitoring report is for period of Oct 14' to Mar'15 is attached in Annexure VI.</p>	Particulars	Location	Length(m)	Width(m)	Concrete road	Main Haulage road	1000	13	COB Plant	100	10	LOP Plant	200	06	Workshop	200	06	Fixed water sprinkling system	Main Haulage road	1000	-	COB Plant	100	-	LOP Plant	200	-	Workshop	100	-
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X	The project authority shall implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.	Rain water harvesting proposal has already been submitted to the Regional Ground Water Board, Bhubaneswar. The final approval is awaited. However, we now have a fully functional roof top rain water harvesting project operating at the Administrative office inaugurated in Oct 2014. Photograph showing the same is enclosed as Annexure-VII. Further, feasibility study was conducted through KRG Foundation to explore the possibility of water harvesting in the nearby villages located in the mine periphery. Recommendations thereof shall be implemented in phased manner.
XI	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and installing new piezometers during the 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 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 groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.	Presently there are 10 nos. of piezometers installed in the periphery of the quarry. We have plans to install further 6 nos. of piezometers during 2014-15. Till that time, we are conducting regular monitoring of ground water of the open wells/ dug wells located around the nearby villages on monthly basis and all the data are being submitted to OSPCB on monthly basis along with the Form-1 of Water Cess Return. The data so collected is 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. The ground water quality and level recorded in nearby villages is enclosed as Annexure-VIII .
XII	The maximum height of the overburden dumps from its toe to the top of the dump on sloping ground shall not be more than 110 m. The dump slope shall be suitably terraced by leaving berms of adequate width in between lifts such that the overall slope angle (i.e. angle between the line joining the crest to the toe of the dump and across all such lifts with the horizontal) does not exceed 28 degrees.	<p>The maximum height of the overburden dumps from its toe to the top of the dump on sloping ground is being maintained within 110 m.</p> <p>Dump Stability Study was taken up in 2010-11 with IIT, Kharagpur as per advice of the Regional Office of the MoEF, Bhubaneswar, for assessing long term dump stability requirements. As per the Report of May'2011, dumps upto 110m height are stable. The topography of the present dumping area is undulated and hilly ranging from 140 mRL to 200 mRL. There is another hillock in front of the present dumping area which is an advantage to keep the slope more stable and safe. Benched have been provided and overall slope of these benched dumps are less than 28°.</p> <p>To gain further confidence, another study was conducted in association with CIMFR, Nagpur to assess the in-situ stress of foundation and dump slope and to get a clue of various geotechnical techniques for stabilisation of dump. As per the Final report the dump is found to be stable at a height of 110m. Further, recommendations as per final report shall be implemented.</p> <p>Presently, backfilling of OB-II quarry is going on since April' 2014. Photograph showing the same is enclosed as Annexure-XXI.</p>
XIII	The individual slopes and berms of each lift or bench of the overburden dump when	Each level of dump is provided with garland drain and water from upper level flow to next level via concrete patch path (channel)

Sl	Condition	Compliance
	<p>completed shall be provided with adequate drainage arrangements or shall be suitably stabilized by such other means to prevent erosion due to surface run-offs.</p>	<p>provided for same purpose at areas were feasible. The concrete patch path ensures less soil erosion and flow of water from designated path. Further, coir matting has been done on the dump slopes to prevent wash off during the monsoon. Garland drains with 10 nos. of settling pits for silt collection of 1.5 m-2m width and 1m-1.5m deep have been constructed on the toe of all the OB dumps to collect the surface run-off during rainy season. The collected run-off was being treated in the Geological Camp ETP and Temple ETP and then discharged beyond the lease boundary. The garland drains and settling pits are being cleaned before the onset of rainy season for efficient and better management of surface run off in the lease area. Presently, new ETP is under construction and is scheduled to be commissioned in July' 2015. Once commissioned, all the surface runoff would be channelized to the New ETP and would treated adequately before discharging it to outside the leasehold area.</p>
XIV	<p>Adequate precautionary measures shall be taken for strengthening the dump foundation. Particularly while dumping over soft ground, the toe region all along the extremities of such dumps shall be suitably buttressed with hard rocky boulders after excavating the topsoil and soft ground. Dumping operations shall commence only after such preparatory work for the dump foundation is completed in order to prevent its failure, which may trigger a slide of the entire dump.</p>	<p>Dump Stability Study was taken up in 2010-11 with IIT, Kharagpur as per advice of the Regional Office of the MoEF, Bhubaneswar, for assessing long term dump stability requirements. As per the Report of May'2011, dumps upto 110m height are stable. The topography of the present dumping area is undulated and hilly ranging from 140 mRL to 200 mRL. There is another hillock in front of the present dumping area which is an advantage to keep the slope more stable and safe. Benched have been provided and overall slope of these benched dumps are less than 28°.</p> <p>To gain further confidence, as per the advice of EAC members another study was conducted in association with CIMFR, Nagpur to assess the in-situ stress of foundation and dump slope and to suggest various geotechnical techniques including buttressing etc for stabilisation of dump. As per the Final report of March'2013 the dump is found to be stable.</p> <p>However as a precautionary measure, present dump have been made with bench height of 10-15m with adequate berm width to maintain overall slope angle less than 28 degree. Each level of bench is provided with garland drain and water from each level flow to next level via concrete patch path provided for same purpose. The concrete patch path (channel) ensures less soil erosion and flow of water from designated path. Garland drains with 10 nos. of settling pits for silt collection of 1.5 m-2m width and 1m-1.5m deep have been constructed so that water do not get stagnant at one place which may increase chances of failure. Similarly toe wall along with garland drain is constructed all around dump photograph attached in Annexure-IX. Practice like coir mating and Vetiver Plantation along with dump plantation is also followed to stabiles dump. Photograph attached in Annexure-X.</p>
XV	<p>All external over burden dumps at the end of the mine life shall be reclaimed and rehabilitated by afforestation. 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.</p>	<p>As per the approved Mining Plan & Progressive Mine Closure Plan, all the external overburden dumps at the end of life shall be reclaimed and rehabilitated through plantation in time bound phased manner. The compliance report of the same shall also be submitted to the Ministry of Environment & Forests and its Regional Office located at Bhubaneswar. The year wise target of plantation as per Mining Plan/ Scheme of Mining and actual achieved is enclosed as Annexure-XXII</p>

Sl	Condition	Compliance
XVI	<p>Catch drains and siltation ponds of appropriate size shall be constructed around the mine working, soil, mineral and OB dump(s) to prevent run off of water and flow of sediments directly into the Damsala Nallah and other water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly. Garland drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed both around the mine pit and over burden dump(s) to prevent run off of water and flow of sediments directly into the Damsala Nallah and other water bodies and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 20 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits shall be constructed at the corners of the garland drains and desilted at regular intervals.</p>	<p>Garland drains with 10 nos. of settling pits for silt collection of 1.5 m-2m width and 1m-1.5m deep have been constructed on the toe of all the OB dumps to collect the surface run-off during rainy season. The collected run-off is being treated in the Geological camp ETP and Temple ETP and then discharged beyond the lease boundary. The garland drains and settling pits are being cleaned before the onset of rainy season for efficient and better management of surface run off in the lease area.</p> <p>Besides, we are now constructing one new ETP with sophisticated treatment facility like automated dosing system, clari-focculator, and flash mixture, dry sludge collection system etc to ensure more effective treatment of surface runoff and mine discharge water before it is let out of the lease boundary.</p> <p>The garland drains have also been designed considering the waterfall data of the region. In order to assess the adequacy of the surface runoff management, discussion has been made with NIT, Rourkela to conduct the study. Upon completion of the study the recommendation shall be suitably implemented.</p>
XVII	<p>Retaining wall having adequate dimensions shall be constructed at the toe of the over burden dumps to check run-off and siltation.</p>	<p>Toe wall along with garland drain is constructed all around dump photograph of same is attached in Annexure-IX. During the Oct 14' to Mar'15 garland drain around length of 65 m kutchra drain was concreted..</p>
XVII I	<p>Plantation shall be raised in an area of 384.44 ha including a 7.5m wide green belt in the safety zone around the mining lease, backfilled and reclaimed area, around the higher benches of excavated void etc. after the completion of opencast mining activity by planting the native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.</p>	<p>The plantation programme is being carried out as per the approved Mining Plan & Progressive Mine Closure Plan same as that was envisaged in the EIA report. During 2014-15 total 50100 no. of saplings were planted over 5.1 ha of area within the Mining lease and in the Additional area of 100 ha allotted for overburden dumping. The density of tree more than 2500 trees per ha is being maintained. Further to above, company had taken up plantation programme in the nearby villages through TSRDS (Tata Steel rural Development Society). During Oct 14' to Mar'15 total 1660 Nos. of sapling were planted in the nearby villages.</p>
XIX	<p>Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of SPM and RPM such as haul road, loading and unloading point and transfer points. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard</p>	<p>To limit the fugitive emissions, various control measures like water sprinkling on haul road, transfer points, Ore stack yard, etc is being done. Four graders have been procured for grading all the haul roads to remove the accumulated muck. Nine water sprinklers (two of 28 KL, four of 20 KL, one 12 KL, one 10 KL and one 8 KL) have been deployed in the mine area for dust suppression on haul road and at mineral storage yards. The main haul road and areas in maintenance stack yard and chrome ore beneficiation plant has been concreted. Stationary water sprinkler has also been installed in these permanent haulage roads. Photograph showing the already installed stationary water sprinkling system is enclosed as Annexure-V. Stationary water sprinklers have been installed in roads within COB Plant and Workshop also. Water spraying is done through pressure water jets at feed hopper, transfer points, discharge chute to prevent dust generation. The process at COB Plant is totally wet and</p>

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		<p>eliminates the chance of any dust generation. The concentrate stacks are now being covered using tarpaulin sheets to prevent finer concrete particle being getting air borne. Plantation of 5-20 m width has also been raised in between colony and mines to minimize any air borne problems to the inhabitants. Successful trials have also been conducted by using Dustex chemical (a lignosulphonate product derived from the wood pulping process and developed specially for road stabilization and dust control) during water sprinkling for effective dust suppression and less consumption of water. It is nontoxic, easy to handle and satisfies all environmental requirements. All parameter w.r.t ambient air quality is complying with the prescribed limit Annexure-VI.</p>
XX	<p>Mine water discharge and/or any waste water shall be properly treated in an ETP/s for the removal of hexavalent chromium and to meet the prescribed standards before reuse/discharge. The run off from OB dumps and other surface run off shall be analyzed for hexavalent chrome and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.</p>	<p>During the compliance period, the mine had operated 3 ETPs to treat the mine discharge water and surface runoff. The mine discharge water was treated in the ETP-1 having ferrous sulphate dosing facility, mixing chamber, channels, roughing filters and de-sludging facility. Similarly, surface runoff was treated in the ETP-2 & ETP-3 having baffles and ferrous sulphate dosing facility and is located near Old Geological camp & near Jagannath temple respectively. Network of concrete drain. Garland drains have been made to channelize the surface runoff from stack-yard, OB dumps for its treatment in the ETP.</p> <p>Water samples are tested on hourly basis for qualitative analysis using DPC and H₂SO₄ for immediate detection of Cr+6. Water samples are tested at our own laboratory on daily basis to monitor the presence of Cr+6. Further, water samples are drawn and tested at OPCB accredited 3rd party on weekly & monthly basis and records are maintained.</p> <p>Further, Company is now installing one more sophisticated ETP automated dosing system, Clariflocculator, and flash mixture, dry sludge collection system, multi-bed filtration system etc to ensure more effective treatment of surface runoff and mine discharge water before it is let out of the lease boundary. Photographs showing the status of installation of new ETP are enclosed as Annexure-XI.</p> <p>Further, company has also commissioned one Herbal Treatment Plant in the COB Plant since 2007-08 for the online hexa-chrome treatment of the chrome concentrate. Some of its related processes have been patented and Company has also won DSIR National Award for the same. Photographs showing herbal treatment plant are attached as Annexure-XII.</p>
XXI	<p>The decanted water from the beneficiation plant shall be re-circulated within the plant and there shall be zero discharge.</p>	<p>Tailings produced from the plant are fed to thickener. Thickener increases the settling rate of particles thus producing clarified water which is re-circulated to the plant. Thickener's discharge is fed to Tailings Dewatering Plant and Tailing pond. Clarified water from the tailing pond & clear water produced from the dewatering plant is re-circulated back to the COB plant ensuring zero discharge from the plant. Recently, company has installed one Tailing dewatering unit at the COB Plant to recover the water from the tailing and dispose in the form of dry cake for safe and environment friendly disposal. Photograph showing the same is enclosed as Annexure-XIII.</p>
XXII	<p>Regular monitoring of water quality upstream and downstream of Damsala Nallah shall be carried out and record of monitoring data</p>	<p>The water quality upstream and downstream of Damsala Nallah is being carried out once in a month and record of monitoring data is maintained and submitted to State Pollution Control Board on</p>

Sl	Condition	Compliance
	should be maintained and submitted to Ministry of Environment and Forests, its Regional Office, Bhubneswar, Central Groundwater Authority, Regional Director, Central Ground Water Board, State Pollution Control Board and Central Pollution Control Board.	monthly basis. Analysis report for the period Oct 14' to Mar'15 is enclosed as Annexure-XIV
XXII I	Appropriate mitigative measures shall be taken to prevent pollution of Damsala Nallah, if any, in consultation with the State Pollution Control Board.	During the compliance period, the mine discharge water and surface run off water was treated in the ETPs before discharging it out of our lease. Further, we are constructing new ETP of higher capacity with facilities like, settling pit, flash mixture, clarri-focculator, automatic dosing system, dry sludge collection system, multi sand filters etc as per the Direction of State Pollution Control Board. The water so treated in the above ETPs shall continue to be analysed at regular interval to confirm the CPCB standards before releasing the same to outside.
XXI V	The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water for the project.	We have made necessary application for drawl of Surface water from Damsala nalla for domestic uses vide our letter no. FAMD/L&L/56-4/2012, dated 28.07.2012. Necessary Water Management Plan has also been submitted. The Proposal is now active consideration of the Water Resources dept. However, we continued to pay the water rent to Tahsildar, Sukinda as demanded as the area falls under Rural Category.
XXV	Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with Regional Director, Central Ground Water Board.	Rainwater harvesting study was done and submitted to Eastern Regional Office, CGWB, Bhubaneswar and final approval is awaited. As per the report, one roof top rain water harvesting structure has already started at GM office building which is fully functional. Photograph showing the same is enclosed as Annexure-VII . Further, feasibility study has been carried out for possible water harvesting in the periphery through KRG Foundation which shall be implemented in future in phased manner.
XXV I	Vehicular emissions shall be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral from mine face to the beneficiation plant. The vehicles shall not be overloaded.	Vehicular emission is done on six monthly basis through a third party for the HEMMs used for Mining. The K factor for all the vehicle is found to be <0.33. Regular conditioning monitoring of the HEMMs is also being carried out to keep the vehicle in good condition. Transport vehicles are also allowed after they get necessary PUC from RTO office. It is ensured that the vehicles are not being overloaded.
XXV II	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.	The blasting operation takes place only in day time. The timing of blasting is 8:30 AM to 9:30 AM. Practices like pre-wetting of blast area is used to control dust generation. Controlled blasting method like pre-splitting is being practiced here to reduce back break. Both, SME and NONEL blasting are being practiced to reduce huge inventory in the magazine house and control ground vibration, respectively. Further, Blast Vibration study is conducted through CIMFR, Dhanbad on quarterly basis and recommendation thereof is being strictly followed.
XXV III	Drills shall either be operated with dust extractors or equipped with water injection system.	In-built wet drilling facility exists in all the drilling machines to reduce dust generation. Most of the drill cabins have been made air conditioned. Apart from this, the drill operators as well as workmen working in the dust prone area of the mining area have also been provided with nose mask. Pre-wetting of blasting area is also a regular practice to control fly rocks and from the dust getting airborne. Both, SME and NONEL blasting are being practiced to control ground vibration and dust generation.
XXI X	Mineral handling plant shall be provided with either adequate number of high efficiency dust	Roads in COB plant has been concreted and stationary water sprinklers have been installed in roads within COB Plant.

Sl	Condition	Compliance
	extraction system or water injection system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.	Spraying by pressure water jets are done at feed hopper, transfer points, discharge chute to prevent dust generation. The process at COB Plant is totally wet and eliminates the chance of any dust generation.
XXX	Consent to operate shall be obtained from State Pollution Control Board prior to start of enhanced production from the mine.	Consent to operate shall be obtained from State Pollution Control Board prior to start of enhanced production from the mine as advised.
XXX I	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for workshop and wastewater generated during mining operation.	<p>Domestic effluent of the township is treated at Sewage Treatment Plant constructed as per BIS standard and the treated water is being reused for garden development. An oil and grease trap system has been provided in the workshop to remove oil and grease from the workshop effluents. Similar type oil and grease separation pit has also been provided at contractor workshop also. Photograph showing the STP & Oil and Grease trap is enclosed as Annexure-XV.</p> <p>The effluents free of oil and grease is again reused for washing of HEMMs and is an effort is being made towards recycling of process water to 100%. Centralized used oil collection system is place in workshop to arrest spillage of oil on shop floor.</p> <p>Similarly, mine water is also being treated in the ETP and is let out beyond the lease area which finds way into a small drain. This let out water is being used by the villagers for agriculture purpose only. From the inference of the recent data for the period Oct 14' to Mar'15 (Annexure-XVI), it is evident that the let out water quality confirms to the quality of effluents discharged to the mainland. The garland drains are now so connected that now surface runoff during the monsoon was being coursed to the Geological Camp ETP and Temple ETP where it is fully treated before discharge out from our leasehold. Garland drains have been provided to collect the surface runoff from the ore stock yards within the lease.</p> <p>Company is now installing one more sophisticated ETP automated dosing system, clari-focculator, and flash mixture, dry sludge collection system, multi-bed filtration system etc to ensure more effective treatment of surface runoff and mine discharge water before it is let out of the lease boundary.</p> <p>An Herbal Treatment Plant is also there in COB Plant since 2007-08 for the online hexa-chrome treatment of the chrome concentrate. Photographs showing herbal treatment plant are attached as Annexure-XII. After settlement in the tailing pond, the clear water is recycled and used in the beneficiation plant.</p>
XXX II	Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar.	Digital processing of the entire lease area using remote sensing technique was carried out for baseline information of land use pattern and was report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar in the Chapter-3 of the EIA report in year 2013. Next map along with the findings shall be submitted to the Ministry in due course of time.
XXX III	Regular monitoring of ambient air quality including free silica shall be carried out and records maintained.	Regular monitoring of ambient air quality including free silica shall be carried out and records maintained. The ambient air quality report is attached as Annexure-VI . The analysis report of free silica for the month of Feb'15 and Mar'15 is enclosed as Annexure-III . Report of mineralogical composition of particulate matter is attached as is Annexure-II

Sl	Condition	Compliance
XXX IV	Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.	All the employees do undergo periodical medical examination (PME) in hospital every five years. However as per the recent notification, PME of all the employees shall be carried out once in three years for those employees who have reached 45 years of age or more. As of now, no occupational diseases have been reported till date. Approx. 216 nos. of contract workers and 270 departmental persons were covered under PME respectively during year 2014-2015. To improve the occupational health and removing the safety hazards at industrial workplace, 3 ACT (Advice, Connect & Transform) teams have been made under Wellness@ Workplace programme. We have carried out the health surveillance program for both permanent and contractual employees for the period 2000 to 2011, in which 994 permanent and 744 contractual employees have been undergone. The chromium level in the blood samples of all the employees is found to be normal.
XXX V	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna such as elephant etc. spotted in the buffer zone of the mine and contribute towards the cost of implementation of the plan and/or Regional Wildlife Management Plan for conservation of flora and fauna so prepared by the State Forest and Wildlife Department. The amount so contributed shall be included in the project cost. A copy of action plan shall be submitted to the Ministry and its Regional Office, Bhubaneswar within 3 months	We have deposited Rs 81,20,000/- and Rs 24,36,000/- through DD No. DD no. 111682, dated 21.07.2009 and through RTGS mode on 07.03.2014 respectively in the State Specific CAMPA account towards the cost of Wildlife Management Plan @ Rs 26,000/- per ha of ML area for implementation of Regional Wildlife Management Plan. Further, Project specific Wild Life Conservation Plan has already been submitted to DFO, Cuttack vide our letter no. SCM/ ENV/091/13, dated 18.12.2013. Same was recommended by RCCF, Angul vide his letter no. 1197, dated 19.03.2015 and presentation before PCCF (WL), Odisha was made on 10.04.2015. The final approval of the Site Specific Wild Life Conservation Plan is awaited. All the precautionary measures stipulated by State Forest Department and laid down during the approval of Site Specific Wild Life Conservation Plan shall be adhered to. Once, the Site Specific Wild Life Conservation Plan is approved, copy of the same shall be submitted to Ministry and its Regional Office, Bhubaneswar.
XXX VI	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.	At present Final Closure of the mine is not envisaged. However, as per Rule 23C of MCDR, 1988, Final Mine Closure Plan shall be submitted to IBM one year prior to such proposal for final closure of the mine and copy of the approved plan shall be provided to the . Ministry of Environment & Forests.

B. General Conditions:

I	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	There is no change in mining technology and scope of working proposed be made beyond the scope of the present EC obtained. Prior approval from the Ministry would be sought in case of change in scope of working in future.	
II	The calendar plan including excavation, quantum of chrome ore, beneficiated chrome concentrates, pyroxenite ore and waste shall not be exceeded.	During the year 2014-15 total excavation, quantum of chrome ore, beneficiated chrome ore and waste (OB) has not exceeded the approved quantity granted in approved mining plan. Details are given in table below. There was no production from pyroxenite quarry. Table IV: Excavation Approved Quantity Vs. Actual	
Compliance for the year 2014-15			
Particulars		Plan	Actual
Total Excavation (Lakh cum)		67.9	15.13
Chrome Ore ROM (MT)		1766406	275590
Waste Generation (Lakh cum)		62.5	13.44

Sl	Condition	Compliance															
		<table border="1" data-bbox="751 210 1511 439"> <tr> <td data-bbox="751 210 1193 271">Beneficiated chrome concentrate (MT)</td> <td data-bbox="1193 210 1339 271">510370</td> <td data-bbox="1339 210 1511 271">71045</td> </tr> <tr> <td colspan="3" data-bbox="751 271 1511 315" style="text-align: center;">Underground Mining</td> </tr> <tr> <td data-bbox="751 315 1193 353">Total Excavation (Lakh Cum)</td> <td data-bbox="1193 315 1339 353">0.98</td> <td data-bbox="1339 315 1511 353">0</td> </tr> <tr> <td data-bbox="751 353 1193 392">Chrome ore ROM (MT)</td> <td data-bbox="1193 353 1339 392">18704</td> <td data-bbox="1339 353 1511 392">0</td> </tr> <tr> <td data-bbox="751 392 1193 439">Waste Generation (Lakh Cum)</td> <td data-bbox="1193 392 1339 439">0.93</td> <td data-bbox="1339 392 1511 439">0</td> </tr> </table> <p data-bbox="751 439 1511 622">* Target as per approved Mining Plan. The underground mining is yet to start and the production and excavation levels were less than the target as mining operations were suspended since 17.05.2014 to 22.01.2015 after pronouncement of Supreme Court Judgement in WP (C) 114 of 2014.</p>	Beneficiated chrome concentrate (MT)	510370	71045	Underground Mining			Total Excavation (Lakh Cum)	0.98	0	Chrome ore ROM (MT)	18704	0	Waste Generation (Lakh Cum)	0.93	0
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III	At least four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10 micron i.e., PM10) and NOX monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board. The data so recorded should be regularly submitted to the Ministry including its Regional office located at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months.	Six air quality monitoring stations (four in the work zone, one in residential area and one in hospital i.e. sensitive area) had been set up within the mine lease area. Monitoring of the air quality is being conducted twice in a week as per CPCB guide lines. Likewise quarterly monitoring is done in 10 buffer zone locations. PM10, PM2.5, SO2,NOx, CO, O3, Pb, NH3, Benzene, benzo(a) Pyrene, Arsenic & Nickel parameters in the air quality were being monitored. We have started ambient air quality monitoring as per recent Gazette Notification 826(E), dated 16.11.2009. The data on ambient air quality of core zone as well as buffer zone for the period Oct 14' to Mar'15 reveal that all the parameters are within the stipulated standards (Annexure-VI).															
IV	Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs / muffs.	<p data-bbox="740 1122 1522 1464">Noise monitoring is being done once in a three months both in work zone and in ambient. The data on noise level for the period Oct 14' to Mar'15 indicate that the values of noise levels are within the prescribed limits. To limit exposure of noise level of 85 dBA, due precautions at source and at the receiver end are being taken adequately. Wherever possible the noise is controlled at the source by replacement of metallic screens by rubber screens & polyurethane panels etc at Chrome Ore Beneficiation and Lumpy Ore Processing plant. DG sets have also been provided with acoustic enclosures to prevent noise propagation.</p> <p data-bbox="740 1464 1522 1845">The operator's cabin of all the HEMM's including drills and dozers has been made air conditioned which serves as acoustic barriers. Controlled blasting technique like presplit blasting, use of Nonel and SME (Site Mixed Emulsion) is being followed as per CIMFR, Dhanbad's recommendation minimize noise pollution and fly rock generation. However, the people working in the noisy areas are provided with personal protective appliances to reduce exposure of high noise. Regular test of all the vehicles is being carried out to check whether the vehicles are meeting pollution under control (PUC) norms. The K factor for all the vehicles is <0.33. Noise monitoring for the period Oct 14' to Mar'15 is attached as Annexure-XVII.</p>															
V	There will be zero waste water discharge from the plant	Tailings produced from the plant are fed to thickener. Thickener increases the settling rate of particles thus producing clarified water which is re-circulated to the plant. Thickener's discharge is fed to Tailings Dewatering Plant and Tailing pond. Clarified water from the tailing pond & Clear Water produced from the dewatering plant is re-circulated to the COB plant. Photographs															

Sl	Condition	Compliance																																																																								
		are attached in Annexure-XIII .																																																																								
VI	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.	Persons working in comparatively dusty and noisy areas have been provided with dust mask and ear muffs approved by the DGMS. Regular training programme is conducted among the employees to bring awareness in respect to safety and health. Company has now tied up with M/s Dupont to drive its safety excellence journey.																																																																								
VII	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>All the employees do undergo periodical medical examination (PME) in hospital every five years. However as per the recent notification, PME of all the employees shall be carried out once in three years for those employees who have reached 45 years of age or more. As of now, no occupational diseases have been reported till date. Approx. 216 nos. of contract workers and 270 persons were covered under PME during year 2014-2015. To improve the occupational health and removing the safety hazards at industrial workplace, 3 ACT (Advice, Connect & Transform) teams have been made under Wellness@ Workplace programme.</p> <p>We have carried out the health surveillance program for both permanent and contractual employees for the period 2000 to 2011, in which 994 permanent and 744 contractual employees have been undergone. The chromium level in the blood samples of all the employees is found to be normal.</p>																																																																								
VIII	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.	The Environmental Management Cell is being headed by the Head (Mine and Production Planning) and is supported by Senior Manager(Mine Planning & Environment), Manager (Environment), Environmental Supervisor and Chemists. The Head (MPP) is directly reporting to the GM, Operations of the Division. Roles, responsibility and authorities of all members of environmental cell's employees have been defined in integrated management system and proper communication has been made.																																																																								
IX	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>Separate budgetary provisions are made for environmental protection measures every year. Funds earmarked for this purpose for the year 2014-15 and actual expenditure against plan for year 2014-15 is as follows:</p> <table border="1"> <thead> <tr> <th>Sl no.</th> <th>Item/ Particulars</th> <th>Plan 2014-15</th> <th>Actual 2014-15</th> </tr> </thead> <tbody> <tr><td>1</td><td>Afforestation</td><td>80</td><td>98.5</td></tr> <tr><td>2</td><td>Dust suppression</td><td>60</td><td>55</td></tr> <tr><td>3</td><td>Treatment of mine discharge & recycling</td><td>60</td><td>45</td></tr> <tr><td>4</td><td>Environment & weather , exhaust monitoring</td><td>30</td><td>39.8</td></tr> <tr><td>5</td><td>Horticulture development</td><td>54</td><td>56.05</td></tr> <tr><td>6</td><td>Drinking water supply</td><td>40</td><td>35.5</td></tr> <tr><td>7</td><td>STP Operation & Maintenance</td><td>5</td><td>7.25</td></tr> <tr><td>8</td><td>Sanitation</td><td>60</td><td>43.2</td></tr> <tr><td>9</td><td>Malaria eradication</td><td>5</td><td>5.46</td></tr> <tr><td>10</td><td>Garland drain& storm water drain and Toe</td><td>25</td><td>54.82</td></tr> <tr><td>11</td><td>Family planning</td><td>2</td><td>1.3</td></tr> <tr><td>12</td><td>Slime dam management</td><td>80</td><td>86.12</td></tr> <tr><td>13</td><td>Environment awareness (EMS)</td><td>6</td><td>6</td></tr> <tr><td>14</td><td>Community Development through TSRDS</td><td>140</td><td>249</td></tr> <tr><td>15</td><td>Hazardous waste management</td><td>6</td><td>2.6</td></tr> <tr><td>16</td><td>Bio medical waste management</td><td>4</td><td>2</td></tr> <tr><td></td><td>Total (Rs Lakh)</td><td>657</td><td>787.6</td></tr> </tbody> </table>	Sl no.	Item/ Particulars	Plan 2014-15	Actual 2014-15	1	Afforestation	80	98.5	2	Dust suppression	60	55	3	Treatment of mine discharge & recycling	60	45	4	Environment & weather , exhaust monitoring	30	39.8	5	Horticulture development	54	56.05	6	Drinking water supply	40	35.5	7	STP Operation & Maintenance	5	7.25	8	Sanitation	60	43.2	9	Malaria eradication	5	5.46	10	Garland drain& storm water drain and Toe	25	54.82	11	Family planning	2	1.3	12	Slime dam management	80	86.12	13	Environment awareness (EMS)	6	6	14	Community Development through TSRDS	140	249	15	Hazardous waste management	6	2.6	16	Bio medical waste management	4	2		Total (Rs Lakh)	657	787.6
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X	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.	The Financial closure of the mine is not envisaged in near future. Necessary intimation to the Regional Office would be provided before commencement of land development activity.
XI	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data/ information/ monitoring reports.	The mine management will always extend full cooperation to officer(s) of Regional office by furnishing the requisite data/ information/ monitoring report as and when required.
XII	The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office Bhubaneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board. The proponent shall upload the status of compliance of the environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar, the respective Zonal Officer of Central Pollution Control Board and the State Pollution Control Board.	Six monthly reports on the status of compliance report of the stipulated environmental clearance conditions including results of monitored data is submitted to the Ministry of Environment and Forests, its Regional Office Bhubaneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board is submitted in both hard copy as well as soft copy. Last EC compliance was submitted vide letter no. SCM/ENV/012/88/14 dated 27.11.2014. We are also uploading the same in our website on our website www.tatasteelindia.com. The snapshot of the site is attached as Annexure-XVIII
XIII	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.	Environment Clearance letters were sent to concerned Panchayat, Zila Parisad / Municipal Corporation, Urban Local Body and is attached in Annexure XIX . No suggestion was received. We have also uploaded the same in our website on our website www.tatasteelindia.com. The snapshot of the site is attached as Annexure-XVIII .
XIV	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 by the State Pollution Control Board
XV	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	The Environment Statement in Form-V is being submitted before 30th Sept of every year and the same is also uploaded in the company website as shown in screenshot in Annexure-XVIII . Environment Statement for the year 2013-14 was submitted vide letter no. SCM/ENV/002/064/14 to the State Pollution Control Board and to the Regional Office of MoEF by e-mail

Sl	Condition	Compliance
	Environment and Forests, Bhubaneswar by e-mail.	
XVI	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.	The grant of Environmental Clearance was advertised in the Oriya daily " The Samaja " (date: 11.09.2013, page-5) and in English daily " The New Indian Express " (date: 11.09.2013, page-5). Copy of the above advertisement was also forwarded to the Eastern Regional Office of the MoEF vide letter no. SCM/ ENV/ 012/066/13, dated 18.06.2013. Copy of the letter is enclosed as Annexure-XX .

Date: 30th May' 2015



Manager Cum Agent

Sukinda Chromite Mine

F. No. 8-78/1996-FC (pt.-I)
Government of India
Ministry of Environment, Forests and Climate Change
(Forest Conservation Division)

Indira Paryavaran Bhawan
Aliganj, Jorbagh Road
New Delhi -110 003
Dated: 3rd November, 2014

To,
The Principal Secretary (Forests),
Government of Odisha,
Bhubaneswar.

Sub: Diversion of 73.697 hectares of forest land in Sukinda Chromite Mines of M/s. TATA Steel Ltd. In Jajpur district during 3rd Renewal of mining lease (RML) period.

Sir,

I am directed to refer to the Government of Odisha's letter No 10F (Cons) 73/ 2014-8679/ F &E dated 9th May 2014 on the above mentioned subject, seeking prior approval of the Central Government under Section 2 of the Forest (Conservation) Act, 1980, and to say that the said proposal has been examined by the Forest Advisory Committee constituted by the Central Government under section-3 of the aforesaid Act.

2. After careful consideration of the proposal of the State Government of Odisha and on the basis of the recommendations of the Forest Advisory Committee, the Central Government hereby agrees to accord **stage-I approval** for the diversion of 73.697 hectares of forest land in Sukinda Chromite Mines of M/s. TATA Steel Ltd. In Jajpur district during 3rd Renewal of mining lease (RML) period, subject to the following conditions:

- (i) Legal status of the diverted forest land shall remain unchanged;
- (ii) Following activities shall be undertaken by the user agency at the project cost:
 - (a) A plan containing appropriate mitigative measures to minimize soil erosion and choking of streams shall be prepared and implemented;
 - (b) Planting of adequate drought hardy plant species and sowing of seeds in the appropriate area within the mining lease to arrest soil erosion;
 - (c) Construction of check dams, retention / toe walls to arrest sliding down of the excavated material along the contour;
 - (d) Stabilize the overburden dumps by appropriate grading/benching so as to ensure that that angles of repose at any given place is less than 28°; and
 - (e) Strict adherence to the prescribed top soil management.
- (iii) State Government shall charge the Net Present Value (NPV) of the forest area diverted under this proposal from the user agency as per the Orders of the Hon'ble

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Supreme Court of India dated 28.03.2008, 24.04.2008 and 09.05.2008 in Writ Petition (Civil) No. 202/1995 and the guidelines issued by this Ministry vide its letter No. 5-3/2007-FC dated 05.02.2009 in this regard;

- (iv) At the time of payment of the Net Present Value (NPV) at the present rate, the user agency shall furnish an undertaking to pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India;
- (v) All the funds received from the User Agency under the project shall be transferred to Ad-hoc CAMPA in the concerned Saving Bank Account in Corporation Bank, Lodhi Road, New Delhi-110003;
- (vi) User agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986;
- (vii) User agency shall maintain 7.50 meters wide strip all along the periphery of the mining lease as safety zone. No mining activity shall be undertaken in the safety zone;
- (viii) State Government shall ascertain the status, as on 25th October 1980, of the area located in the mining lease which has been treated as 'non-forest' as per the Hal (present) record of rights and intimate the same to the Ministry of Environment and Forests, Government of India within a period of one month from the date of grant of stage-I approval;
- (ix) User agency shall prepare a schedule of the surrender of the fully(biologically) reclaimed mined out forest land and submit the same to the Ministry of Environment and Forests before grant to stage-II approval under the FC Act;
- (x) The User Agency shall pay the proportionate cost of implementation of Regional Wildlife Management Plan at revised cost; and
- (xi) The user agency shall pay towards the cost of site specific conservation plan to be approved by the CWLW, Odisha for its implementation in leasehold as well as surrounding area.
- (xii) User agency in consultation with the State Forest Department shall create and maintain alternate habitat/ home for the avifauna, whose nesting trees are to be cleared in this project. Bird nests artificially made out of eco-friendly materials shall be used in the area, including forest area and human settlements, adjoining the forest area being diverted for the project;
- (xiii) User agency either himself or through the State Forest Department shall undertake fencing, protection and afforestation of the safety zone area (7.5 meter strip all along the outer boundary of the area identified to undertake mining), at the project cost;

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- (xiv) User agency either himself or through the State Forest Department shall undertake afforestation on degraded forest land, one and half time in extent to the area used for safety zone;
- (xv) Period of diversion of the said forest land under this approval shall be for a period co-terminus with the period of the mining lease proposed to be granted under the Mines and Minerals (Development and Regulation) Act, 1957, and the Rules framed there-under, subject to a maximum period of 20 years;
- (xvi) User agency either himself or through the State Forest Department shall undertake gap planting and soil & moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.4), if any, located in the area within 100 meters from outer perimeter of the mining lease;
- (xvii) User agency shall undertake de-silting of the village tanks and other water bodies located within five km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies, whenever required;
- (xviii) User agency shall undertake mining in a phased manner and take due care for reclamation of the mined over area. The concurrent reclamation plan shall be executed by the User Agency as per the approved mining plan/scheme and an annual report on implementation thereof shall be submitted to the Nodal Officer, Forest (Conservation) Act, 1980, Government of Odisha and the Addl. Principal Chief Conservator of Forests (Central), Ministry of Environment & Forests, Regional Office (Eastern Zone), Bhubaneswar. If it is found from the annual report that the activities indicated in the concurrent reclamation plan are not being executed by the user agency, the Nodal Officer or the Addl. Principal Chief Conservator of Forests (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities are satisfactorily executed;
- (xix) No labour camp shall be established on the forest land;
- (xx) User agency shall provide firewood preferably alternate fuel to the labourers and the staff working at the site so as to avoid any damage and pressure on the adjacent forest areas;
- (xxi) Boundary of the mining lease and safety zone shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, forward and back bearing and distance from pillar to pillar;
- (xxii) Forest land shall not be used for any purpose other than that specified in the proposal;
- (xxiii) State Government shall complete settlement of rights, in term of the Scheduled Tribes and Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, if

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any, on the forest land to be diverted and submit the documentary evidence as prescribed by this Ministry in its letter No. 11-9/1998-FC (pt.) dated 3rd August 2009, in support thereof;

- (xxiv) Any other condition that the Regional Office (Eastern Zone), Bhubaneswar of this Ministry, Bhubaneswar may stipulate, from time to time, in the interest of conservation, protection and development of forests & wildlife; and
- (xxv) User agency and the State Government shall ensure compliance to provisions of the all Acts, Rules, Regulations and Guidelines, for the time being in force, as applicable to the project.

3. After receipt of the report on compliance to the conditions stipulated in the paragraph-2 above, from the Government of Odisha, final/ stage-II approval for diversion of the said forest under Section-2 of the Forest (Conservation) Act, 1980 will be issued by this Ministry. Transfer of the said forest land to the user agency shall not be affected by the Government of Odisha till final/stage-II approval for its diversion is issued by this Ministry.

4. However, pending receipt of report on compliance to the conditions stipulated in paragraph-2 above and grant of final/stage-II approval under the Forest (Conservation) Act, 1980 for diversion of the said forest land, State Government may allow the user agency to undertake mining, as per the approved mining plan, in the already broken up forest land being diverted for mining purposes (as per the approved land use plan), for a period not exceeding one year from the date of issue of this letter.

5. Stage-I approval and Working Permission for mining over already broken up area is subject to in-principle decision of the authority in the State Government in terms of section 8(3) of the Mines and minerals (Development and Regulation) Act, 1957 that in the interest of mineral development it is necessary to renew the lease.

Yours faithfully,

SIL

(H. C. Chaudhary)
Director

Copy to:

1. The Principal Chief Conservator of Forests, Government of Odisha, Bhubaneswar.
2. The Nodal Officer, the Forest (Conservation) Act, 1980, the Government of Odisha, Bhubaneswar.
3. The Addl. Principal Chief Conservator of Forests (Central), Regional Office (Eastern Zone), Bhubaneswar.
4. User Agency.
5. Monitoring Cell, FC Division, MoEF, New Delhi.
6. Guard File.

(H. C. Chaudhary)
Director

**ANNEXURE II
MINERALOGICAL COMPOSITION OF PARTICULATE MATTER**

Sl. No.	Location	Mineralogical Composition (%)						
		Cr ₂ O ₃	Fe ₂ O ₃	MnO ₂	SiO ₂	Al ₂ O ₃	MgO	CaO
1.	COB Plant	18.9	6.7	1.3	23.8	11.9	13.1	3.1
2.	Stack Yard	21.1	7.0	1.5	21.8	11.1	13.7	2.6
3.	Laboratory Top	18.1	7.0	1.2	24.9	11.1	13.1	2.9
4.	Hospital Top	15.1	6.6	1.0	23.5	11.0	12.3	2.5
5.	Mining Complex	21.5	7.3	1.7	24.9	10.5	11.9	3.2
6.	Tailing Pond	17.0	7.4	1.1	20.9	10.5	12.2	3.4
7.	Residential Colony (Qtr No.L2/R-73)	15.6	6.7	0.8	22.8	12.8	11.3	3.5

**ANNEXURE III
PERSONAL RESPIRABLE DUST**

Date	Sampler Attached to the Person	Personal Respirable Dust in µg/m ³	Respirable Free Silica (%)
09.02.2015	Mr. Pankaj Kumar Mohanta	0.438	4.5
09.02.2015	Mr. Prafulla Kumar Mohanta	0.443	4.2
04.03.2015	Mr. Pankaj Kumar Mohanta	0.465	4.4
04.03.2015	Mr. Prafulla Kumar Mohanta	0.458	4.7

**ANNEXURE IV
COVERING OF LOADED TRUCK BY TARPAULIN**



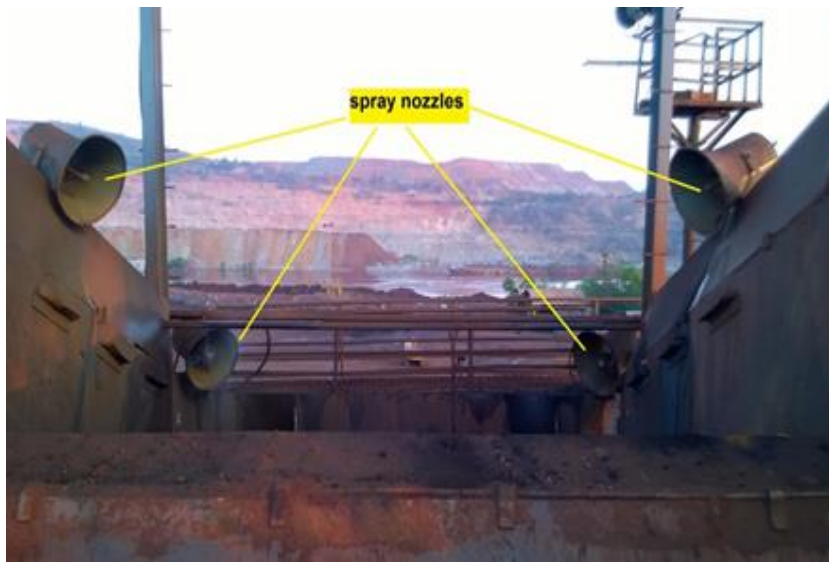
ANNEXURE V
DUST CONTROLLING MAJORS



Concrete Path



Stationary Water Sprinkler



Dust Suppression System at Hopper



Water Sprinkling



Concentrate Stack Covered With Tarpaulin



COVERING OF TRUCK BY TARPAULIN

Truck Covered With Tarpaulin

ANEXURE-VI
TATA STEEL LIMITED, SUKINDA CHROMITE MINE
AMBIENT AIR QUALITY PARAMETERS (Oct'14 to Mar'15)

Monthl y Averag e	PM10 µg/m3						PM2.5µg/m3						SO2 µg/m3						NOX µg/m3						CO						O3					
	C	S	L	H	M	T	C	S	L	H	M	T	C	S	L	H	M	T	C	S	L	H	M	T	C	S	L	H	M	T	C	S	L	H	M	T
Oct-14	55.67	61.56	51.56	43.44	47.56	39.78	31.92	34.69	29.60	25.59	27.52	23.71	4.51	4.89	4.29	4.04	4.11	BDL	12.11	12.31	11.38	10.64	10.98	10.31	0.18	0.22	0.15	0.12	0.13	0.11	6.91	7.41	6.44	5.77	6.09	5.43
Nov-14	66.38	72.13	61.25	53.38	56.88	48.00	37.44	41.08	34.64	30.99	32.44	27.93	5.20	5.71	4.80	4.18	4.39	4.08	11.84	13.41	12.53	11.70	12.09	11.29	0.26	0.30	0.21	0.15	0.18	0.13	7.90	8.46	7.45	6.60	7.05	6.15
Dec-14	64.33	68.89	59.78	51.00	55.22	47.11	35.93	39.21	33.87	28.54	31.59	26.84	4.83	5.29	4.43	4.11	4.26	4.04	11.94	12.53	11.70	10.81	11.29	10.43	0.23	0.28	0.20	0.15	0.17	0.13	7.77	8.21	7.39	6.33	6.89	5.77
Jan-15	61.56	65.67	55.78	47.33	51.44	42.89	34.61	36.79	31.78	27.77	29.98	25.91	4.57	5.04	4.23	<4.0	4.07	<4.0	11.18	11.97	11.04	10.03	10.53	9.64	0.21	0.25	0.17	0.12	0.14	0.11	7.43	7.89	6.94	6.04	6.46	5.57
Feb-15	61.25	66.00	57.38	48.63	53.75	44.13	34.45	37.54	32.35	28.20	30.93	25.81	4.23	4.64	4.04	<4.0	<4.0	<4.0	10.57	12.21	11.18	10.26	10.75	9.90	0.24	0.27	0.18	0.16	0.16	0.14	7.38	7.89	6.98	6.01	6.45	5.56
Mar-15	47.56	51.78	43.78	36.00	39.67	32.00	27.67	29.48	25.68	21.50	23.70	19.01	4.01	4.16	4.00	4.00	4.00	4.00	10.58	11.36	10.51	9.70	10.13	9.40	0.15	0.17	0.13	0.11	0.12	0.10	5.57	5.89	5.24	5.02	5.02	5.00
Monthl y Averag e	Pb µg/m3						NH3 µg/m3						Benzene µg/m3						Benzo(a)Pyrene ng/m3						Arsenic ng/m3						Nickel ng/m3					
	C	S	L	H	M	T	C	S	L	H	M	T	C	S	L	H	M	T	C	S	L	H	M	T	C	S	L	H	M	T	C	S	L	H	M	T
Oct-14	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<20	<20	<20	<20	<20	<20	0.78	0.84	0.73	0.63	0.67	0.59	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nov-14	<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<20	<20	<20	<20	<20	<20	0.85	0.92	0.80	0.71	0.75	0.66	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dec-14	0.00081	0.0010	0.00067	<0.0005	0.00033	<0.0005	<20	<20	<20	<20	<20	<20	0.81	0.86	0.74	0.64	0.69	0.59	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Jan-15	0.00017	0.00028	0.00009	<0.0005	<0.0005	<0.0005	<20	<20	<20	<20	<20	<20	0.76	0.82	0.71	0.58	0.63	0.53	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Feb-15	0.00008	0.00011	0.00006	<0.0005	<0.0005	<0.0005	<20	<20	<20	<20	<20	<20	0.79	0.84	0.74	0.64	0.68	0.58	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Mar-15	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<20	<20	<20	<20	<20	<20	0.68	0.74	0.63	0.53	0.48	0.48	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

C:COB Plant
S:Stackyard
Complex
T: Tailing Dam

Residential Area: L: Laboratory Top
Sensitive Area : H: Hospital

M:Mining

BUFFER ZONE AAQ

Sl.No	Location		PM10 µg/m ³	PM2.5 µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³	O ₃ µg/m ³	Pb µg/m ³	NH ₃ µg/m ³	Benzene µg/m ³	Benzo(a)Pyr ene ng/m ³	Arsenic ng/m ³	Nickel ng/m ³
1	Birasa Birasal	AVERAGE	47.00	27.25	<4.0	10.68	0.14	5.97	<0.0005	< 20	0.66	<0.1	< 0.5	< 0.5
2	Kanehipal	AVERAGE	52.25	30.28	<4.0	11.23	0.18	6.18	<0.0005	< 20	0.73	<0.1	< 0.5	< 0.5
3	Kalarangiatta	AVERAGE	63.50	33.80	4.42	12.25	0.26	7.45	<0.0005	< 20	0.83	<0.1	< 0.5	< 0.5
4	Kaliapani	AVERAGE	46.50	26.98	<4.0	10.70	0.15	6.60	<0.0005	< 20	0.65	<0.1	< 0.5	< 0.5
5	Kakudia	AVERAGE	50.75	29.43	<4.0	10.80	0.16	5.98	<0.0005	< 20	0.68	<0.1	< 0.5	< 0.5
6	Sendashara	AVERAGE	35.75	20.93	<4.0	9.56	0.11	5.05	<0.0005	< 20	0.56	<0.1	< 0.5	< 0.5
7	Laxmidharpur	AVERAGE	55.50	31.55	<4.0	10.66	0.18	6.70	<0.0005	< 20	0.76	<0.1	< 0.5	< 0.5
8	Sukarangi	AVERAGE	62.50	35.73	4.43	12.10	0.22	7.38	<0.0005	< 20	0.83	<0.1	< 0.5	< 0.5
9	Muruabil	AVERAGE	41.75	24.85	<4.0	10.55	0.12	5.67	<0.0005	< 20	0.59	<0.1	< 0.5	< 0.5
10	Kharkhari	AVERAGE	48.00	28.70	<4.0	10.65	0.15	6.18	<0.0005	< 20	0.69	<0.1	< 0.5	< 0.5

Annual Average Ambient Air Quality in Buffer Zone

Sl.No	Location	Month of Monitoring	PM10 µg/m ³	PM2.5 µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³	O ₃ µg/m ³	Pb µg/m ³	NH ₃ µg/m ³	Benzene µg/m ³	Benzo(a)Pyr ene ng/m ³	Arsenic ng/m ³	Nickel ng/m ³
1	Birasal	Dec'14	58	32.5	<4.0	11.4	0.19	6.7	<0.0005	< 20	0.81	<0.1	< 0.5	< 0.5
		Mar'15	46	27.5	<4.0	10.9	0.14	5.4	<0.0005	< 20	0.69	<0.1	< 0.5	< 0.5
2	Kanehipal	Dec'14	64	36.8	4.2	11.9	0.23	7.1	<0.0005	< 20	0.88	<0.1	< 0.5	< 0.5
		Mar'15	51	29.3	<4.0	11.4	0.18	5.8	<0.0005	< 20	0.74	<0.1	< 0.5	< 0.5
3	Kalarangiatta	Dec'14	78	44.1	5.3	13.2	0.35	8.5	<0.0005	< 20	0.93	<0.1	< 0.5	< 0.5
		Mar'15	66	27.5	4.4	12.8	0.24	7.3	<0.0005	< 20	0.89	<0.1	< 0.5	< 0.5
4	Kaliapani	Dec'14	52	29.3	<4.0	11.1	0.17	5.9	<0.0005	< 20	0.66	<0.1	< 0.5	< 0.5
		Mar'15	40	23.8	<4.0	10.2	0.13	< 5	<0.0005	< 20	0.62	<0.1	< 0.5	< 0.5
5	Kakudia	Dec'14	61	35.5	<4.0	11.4	0.2	6.7	<0.0005	< 20	0.74	<0.1	< 0.5	< 0.5
		Mar'15	53	29.5	<4.0	11.7	0.16	6.1	<0.0005	< 20	0.75	<0.1	< 0.5	< 0.5
6	Sendashara	Dec'14	45	27.8	<4.0	10.7	0.13	5.3	<0.0005	< 20	0.71	<0.1	< 0.5	< 0.5
		Mar'15	37	21.2	<4.0	9.8	<0.1	< 5	<0.0005	< 20	0.59	<0.1	< 0.5	< 0.5
7	Laxmidharpur	Dec'14	63	36.1	<4.0	11.6	0.21	7.1	<0.0005	< 20	0.89	<0.1	< 0.5	< 0.5
		Mar'15	56	31.8	<4.0	11.9	0.19	6.4	<0.0005	< 20	0.77	<0.1	< 0.5	< 0.5
8	Sukarangi	Dec'14	69	38.4	4.7	12.3	0.26	7.7	<0.0005	< 20	0.96	<0.1	< 0.5	< 0.5
		Mar'15	62	35.5	<4.0	12.6	0.22	6.9	<0.0005	< 20	0.84	<0.1	< 0.5	< 0.5
9	Muruabil	Dec'14	51	29.7	<4.0	11.5	0.15	6	<0.0005	< 20	0.58	<0.1	< 0.5	< 0.5
		Mar'15	44	26.9	<4.0	10.8	0.12	5.1	<0.0005	< 20	0.65	<0.1	< 0.5	< 0.5
10	Kharkhari	Dec'14	57	31.9	<4.0	11.8	0.18	6.5	<0.0005	< 20	0.72	<0.1	< 0.5	< 0.5
		Mar'15	49	31.9	<4.0	11.2	0.15	5.6	<0.0005	< 20	0.69	<0.1	< 0.5	< 0.5

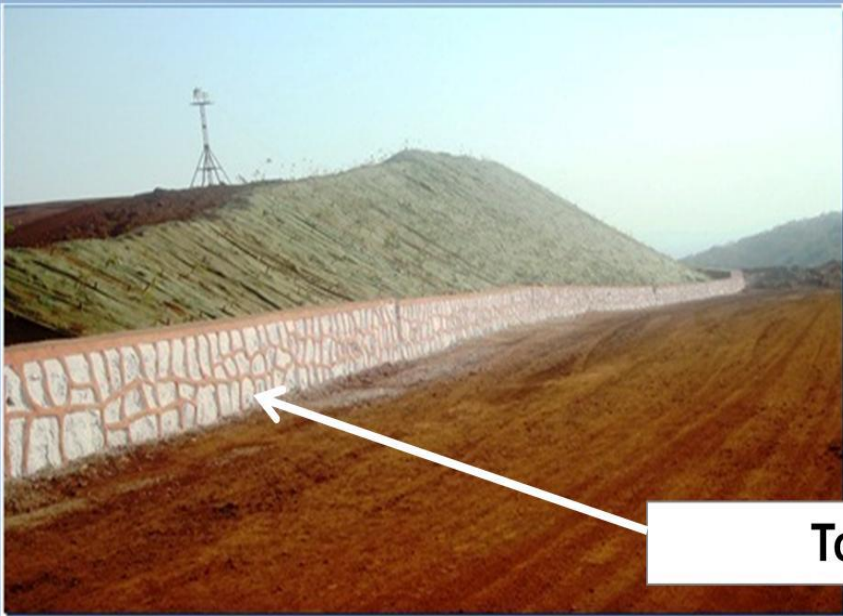
ANNEXURE VII- Roof Top Rain water Harvesting



ANEXURE-VIII
Ground Water Quality in Villages (April' 14 to September' 14)

S.No.	Parameter	Unit	IS-10500	Oct'14 (Odisha Village)	Nov'14 (Maruabili village)	Dec'14 (Sukarangi Village)	Jan'15 (Kanehipal)	Feb'15 (Sendhasara village)	Mar'15 (Laxmidharpur village)
1	Colour	Hazen	5	CL	CL	CL	CL	CL	CL
2	Odour	-	U/O	U/O	U/O	U/O	U/O	U/O	U/O
3	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU max	5	<1	<1	<1	<1	<1	<1
5	pH	-	6.5-8.5	7.2	6.9	7.1	6.9	7	7.2
6	Dissolved Oxygen	Mg/l	-	6.8	6.7	6.8	6.6	6.8	6.4
7	Total Hardness (as CaCO ₃)	Mg/l	300	57	52	49	57	62	59
8	Iron (as Fe)	Mg/l	0.3	0.15	0.12	0.13	0.15	0.14	0.11
9	Chloride (as Cl)	Mg/l	250	10.1	11.4	10.9	11.1	10.4	10.9
10	Rsidual free chlorine	Mg/l	0.2	ND	ND	ND	ND	ND	ND
11	Fluorides (as F)	Mg/l	1	0.036	0.03	0.04	0.07	0.03	0.04
12	Total Dissolved Solids	Mg/l	500	122	114	126	122	106	122
13	Calcium as Ca	Mg/l	75	8.8	9.2	9.3	9.1	9.5	9.8
14	Magnesium (as Mg)	Mg/l	30	6.4	7	7.2	6.6	6.2	6.9
15	Copper (as Cu)	Mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
16	Manganese (as Mn)	Mg/l	0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
17	Sulphates (as SO ₄)	Mg/l	200	18.2	19.4	16.4	17.5	15.1	18.2
18	Nitrate (as NO ₃)	Mg/l	45	0.23	0.27	0.23	0.26	0.22	0.44
19	Mercury (as Hg)	Mg/l	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
20	Cadmium (as Cd)	Mg/l	0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
21	Selenium (as Se)	Mg/l	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Arsenic (as As)	Mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Cyanide (as CN)	Mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
24	Lead (as Pb)	Mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
25	Zinc (as Zn)	Mg/l	5	0.18	0.23	0.19	0.21	0.17	0.21
26	Chromium (as Cr ⁺⁶)	Mg/l	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
27	Mineral Oil	Mg/l	0.01	Nil	Nil	Nil	Nil	Nil	Nil
28	Alkalinity	Mg/l	200	29	26	24	27	21	36
29	Boron	Mg/l	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
30	Ground Water Level	m	-	4.9	6.1	9.9	11.3	11.9	13.1

ANEXURE-IX
Toe wall, Garland Drain and Surface Runoff Channel



Toe Wall



Toe Wall & garland drain



Surface runoff channel

ANEXURE-X
Coir Mating, Vetiver Plantation and Dump Plantation



Vetiver Plantation



ANNEXURE XI : New ETP Progress



Clariflocculator of New ETP



flash Mix Chamber

ANEXURE-XII
Herbal Treatment Plant



ANEXURE-XIII
Recycling of Water At COB Plant



Thickener and Water Recirculation Arrangement



Tailing Dewatering Plant and Water Recirculation Arrangement

ANEXURE-XIV
Water Quality Report At Upstream and Downstream of Damsala Nallah

Month	Parameter	Location		
		MINE WATER OF QUARRY O.B.- X	DAMSALA RIVER UPSTREAM	DAMSALA RIVER DOWNSTREAM
Oct'14	Hexavalent Chromium as Cr+6 (mg/l)	0.72	0.09	0.07
Nov'14		0.64	0.061	0.057
Dec'14		0.74	0.049	0.042
Jan' 15		0.40	0.065	0.053
Feb'15		0.37	0.058	0.044
Mar'15		0.29	0.041	0.035

ANNEXURE XV : Oil Separation Pit



Sewage Treatment Plant



ANEXURE-XVI
Water Quality Report
TATA STEEL LIMITED
SUKINDA CHROMITE MINE
Water Quality Parameters of ETP Inlet (Oct'14 to Mar'15)

Sl. No	Parameter	Unit	Standards (In land Surface water)	Oct'14	Nov'14	Dec'14	Jan'15	Feb'15	Mar'15	AVERAGE
										Inlet
1	Colour & Odour	Hazan/-	5.0 / U/O	8 & U/O	5 & U/O	3 & U/O	4 & U/O	2 & U/O	4 & U/O	26 & U/O
2	Suspended Solids	mg/ltr	100	71	37	28	48	51	47	47
3	Particular Size of Suspended Solids	μ(micron)	<850	<850	<850	<850	<850	<850	<850	<850
4	PH	--	5.5-9.0	6.9	6.7	6.8	6.7	6.8	6.6	6.75
5	Temperature	°c.	Shall not exceed 5°C above the receiving water	25	24	24	23	25	25	24.33
6	Oil & Grease	mg/ltr	10	0.9	0.74	0.62	0.54	0.64	0.71	0.69
7	Total Residual Chlorine	mg/ltr	1	ND	ND	ND	ND	ND	ND	ND
8	Amm. Nitrogen as N	mg/ltr	50	0.44	0.35	0.25	0.33	0.48	0.53	0.39
9	Total Kjeldal Nitrogen as NH ₃	mg/ltr	100	2.58	1.26	1.19	1.26	1.36	1.47	1.52
10	Free Ammonia as NH ₃	mg/ltr	5	0.002	0.001	0.002	0.0008	0.002	0.003	0.0018
11	BOD (3) days at 27°C.	mg/ltr	30	4.9	4.9	4.2	3.7	3.1	2.87	3.945
12	COD	mg/ltr	250	15.7	13.7	12.5	11.3	8.4	7.15	11.45
13	Arsenic as As	mg/ltr	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
14	Mercury as Hg	mg/ltr	0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
15	Lead as Pb	mg/ltr	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
16	Cadmium as Cd	mg/ltr	2	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
17	Hexa Chromium as Cr ⁺⁶	mg/ltr	0.1	0.73	0.63	0.71	0.4	0.37	0.29	0.52
18	Total Chromium as Cr	mg/ltr	2	0.42	0.34	0.29	0.43	0.32	0.37	0.36
19	Copper as Cu	mg/ltr	3	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20	Zinc as Zn	mg/ltr	5	0.19	0.22	0.26	0.31	0.26	0.31	0.26
21	Selenium as Se	mg/ltr	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Nickel as Ni	mg/ltr	3	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Cyanide as CN	mg/ltr	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
24	Fluoride as F	mg/ltr	2	0.074	0.065	0.08	0.06	0.05	0.06	0.06
25	Diss. Phosphate as P	mg/ltr	5	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013
26	Sulphide as S	mg/ltr	2	ND	ND	ND	ND	ND	ND	ND
27	Phenolic Compounds as C ₆ H ₅ OH	mg/ltr	1	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007
28	Bio-assay Test	--	90% survival of fish after 96 hours in 100% effluent	97%	97%	97%	97%	97%	97%	97.00%
29	Manganese as Mn	mg/ltr	2	0.036	0.029	0.033	0.029	0.043	0.036	0.034
30	Iron as Fe	mg/ltr	3	0.68	0.51	0.51	0.63	0.47	0.38	0.53
31	Vanadium as V	mg/ltr	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32	Nitrate Nitrogen	mg/ltr	10	0.36	0.48	0.39	0.48	0.38	0.27	0.39
33	Pesticides (as Benzene hexa chloride), μg/l Max.	μg/l Max	10	Absent	Absent	Absent	Absent	Absent	Absent	Absent

NB
: C.L. Colourless, O.L – Odourless, BDL- Below Detectable Limit. ND- Not Detectable.

Water Quality Parameters of ETP Outlet (Oct'14 to Mar'15)

Sl. No	Parameter	Unit	Standards (In land Surface water)	Oct'14	Nov'14	Dec'14	Jan'15	Feb'15	Mar'15	AVERAGE
				Outlet	Outlet	Outlet	Outlet	Outlet	Outlet	Outlet
1	Colour & Odour	Hazan/-	5.0 / U/O	CL & U/O	CL & U/O	CL & U/O	CL & U/O	CL & U/O	2 & U/O	CL & U/O
2	Suspended Solids	mg/ltr	100	24	19	14	36	33	34	26.67
3	Particular Size of Suspended Solids	μ(micron)	<850	<850	<850	<850	<850	<850	<850	<850
4	PH	--	5.5-9.0	7.2	7.1	7.2	7.2	7.1	6.9	7.12
5	Temperature	°c.	Shall not exceed 5°C above the receiving water	25	24	24	23	25	25	24.33
6	Oil & Grease	mg/ltr	10	ND	ND	ND	ND	ND	ND	ND
7	Total Residual Chlorine	mg/ltr	1.0	ND	ND	ND	ND	ND	ND	ND
8	Amm. Nitrogen as N	mg/ltr	50	0.38	0.28	0.21	0.28	0.39	0.45	0.33
9	Total Kjeldal Nitrogen as NH ₃	mg/ltr	100	1.74	1.17	1.11	1.17	1.24	1.35	1.30
10	Free Ammonia as NH ₃	mg/ltr	5.0	0.003	0.002	0.002	0.0022	0.002	0.003	0.002
11	BOD (3) days at 27°C.	mg/ltr	30	1.22	1.22	1.34	1.42	1.84	1.65	1.45
12	COD	mg/ltr	250	3.72	1.63	3.87	3.64	5.2	4.96	3.84
13	Arsenic as As	mg/ltr	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
14	Mercury as Hg	mg/ltr	0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
15	Lead as Pb	mg/ltr	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
16	Cadmium as Cd	mg/ltr	2.0	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
17	Hexa Chromium as Cr ⁺⁶	mg/ltr	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
18	Total Chromium as Cr	mg/ltr	2.0	0.48	0.39	0.33	0.46	0.38	0.28	0.39
19	Copper as Cu	mg/ltr	3.0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20	Zinc as Zn	mg/ltr	5.0	0.17	0.18	0.2	0.28	0.22	0.24	0.22
21	Selenium as Se	mg/ltr	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Nickel as Ni	mg/ltr	3.0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Cyanide as CN	mg/ltr	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
24	Fluoride as F	mg/ltr	2.0	0.066	0.053	0.04	0.05	0.04	0.05	0.05
25	Diss. Phosphate as P	mg/ltr	5.0	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013
26	Sulphide as S	mg/ltr	2.0	ND	ND	ND	ND	ND	ND	BDL
27	Phenolic Compounds as C ₆ H ₅ OH	mg/ltr	1.0	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007
28	Bio-assay Test	--	90% survival of fish after 96 hours in 100% effluent	98%	98%	98%	97%	98%	98%	98.00%
29	Manganese as Mn	mg/ltr	2.0	0.031	0.022	0.026	0.023	0.031	0.029	0.03
30	Iron as Fe	mg/ltr	3.0	0.59	0.47	0.4	0.45	0.35	0.33	0.43
31	Vanadium as V	mg/ltr	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32	Nitrate Nitrogen	mg/ltr	10	0.31	0.36	0.32	0.36	0.32	0.21	0.31
33	Pesticides (as Benzene hexa chloride), μg/l Max.	μg/l Max	10	Absent	Absent	Absent	Absent	Absent	Absent	Absent

NB

: C.L. Colourless, O.L – Odourless, BDL- Below Detectable Limit. ND- Not Detectable.

TATA STEEL LIMITED
SUKINDA CHROMITE MINE
Water Quality Parameters at Oil separation System - INLET (Oct' 14 to Mar' 15)

Sl. No	Parameter	Unit	Standard s	Oct'14	Nov'14	Dec'14	Jan'15	Feb'15	Mar'15	AVERAGE
				Inlet	Inlet	Inlet	Inlet	Inlet	Inlet	Inlet
1	Colour & Odour	--	5 & U/O	5 & U/O	7 & U/O	5 & U/O	2 & U/O	CL & U/O	2 & U/O	9.81 U/O
2	Suspended Solids	mg/l	100	88	96	74	49	56	47	68.33
3	Particular Size of S.S.	μ(micron)	<850	<850	<850	<850	<850	<850	<850	<850
4	pH	--	5.5-9.0	7.4	7.5	7.4	7.5	7.4	7.3	7.41
5	Temperature	°C	Shall not exceed 5°C above the receiving water	25	24	24	23	25	25	24.33
6	Oil & Grease	mg/l	10	1.3	1.4	1.8	2.2	1.9	1.6	1.7
7	Total Residual Chlorine	mg/l	1	ND	ND	ND	ND	ND	ND	ND
8	Amm. Nitrogen as N	mg/l	50	0.41	0.37	0.28	0.34	0.42	0.38	0.37
9	Total Kjeldal Nitrogen as NH ₃	mg/l	100	1.22	1.17	1.26	1.41	1.37	1.25	1.28
10	Free Ammonia as NH ₃	mg/l	5	0.006	0.006	0.004	0.005	0.004	0.004	0.0048
11	BOD(3) days at 27°C	mg/l	30	3.4	2.9	2.4	1.9	1.4	1.26	2.21
12	COD	mg/l	250	9.7	8.7	7.8	6.5	4.8	3.78	6.88
13	Arsenic as As	mg/l	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
14	Mercury as Hg	mg/l	0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
15	Lead as Pb	mg/l	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
16	Cadmium as Cd	mg/l	2	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
17	Hexa Chromium as Cr ⁺⁶	mg/l	0.1	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
18	Total Chromium as Cr	mg/l	2	0.38	0.29	0.36	0.27	0.22	0.23	0.29
19	Copper as Cu	mg/l	3	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20	Zinc as Zn	mg/l	5	0.18	0.22	0.18	0.26	0.21	0.28	0.22
21	Selenium as Se	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Nickel as Ni	mg/l	3	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Cyanide	mg/l	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
24	Fluoride as F	mg/l	2	0.044	0.036	0.05	0.03	0.04	0.05	0.04
25	Diss. Phosphate as P	mg/l	5	< 0.0013	< 0.0013	< 0.0013	< 0.0013	< 0.0013	< 0.0013	< 0.0013
26	Sulphide as S	mg/l	2	ND	ND	ND	ND	ND	ND	BDL
27	Phenolic Compounds as C ₆ H ₅ OH	mg/l	1	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007
28	Bio-assay Test,	%	90% survival of fish after 96 hours in 100% effluent	97%	97%	97%	98%	98%	98%	97.50%
29	Manganese as Mn, mg/l	mg/l	2	0.026	0.021	0.018	0.016	0.022	0.017	0.021
30	Iron as Fe, mg/l	mg/l	3	0.37	0.44	0.32	0.41	0.32	0.36	0.37
31	Vanadium as V, mg/l	mg/l	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32	Nitrate Nitrogen , mg/l	mg/l	10	0.28	0.33	0.25	0.37	0.27	0.24	0.29
33	Pesticides (as Benzene hexa chloride)	μg/l	10	Absent	Absent	Absent	Absent	Absent	Absent	Absent

NB

: C.L. Colourless, O.L - Odourless, BDL- Below Detectable Limit., ND- Not Detectable.

**Water Quality Parameters at Oil separation System
OUTLET (Oct' 14 to Mar' 15)**

Sl. No	Parameter	Unit	Standards	Oct'14	Nov'14	Dec'14	Jan'15	Feb'15	Mar'15	AVERAG E
				Outlet	Outlet	Outlet	Outlet	Outlet	Outlet	Outlet
1	Colour & Odour	--	5 & U/O	CL & U/O	CL & U/O	CL & U/O	CL & U/O	CL & U/O	CL & U/O	CL & U/O
2	Suspended Solids	mg/l	100	29	18	14	16	21	19	19.5
3	Particular Size of S.S.	μ(micron)	<850	<850	<850	<850	<850	<850	<850	<850
4	pH	--	5.5-9.0	7.2	7.2	7.1	7.2	7.1	7.1	7.15
5	Temperature	°C	Shall not exceed 5°C above the receiving water	25	24	24	23	25	25	24.33
6	Oil & Grease	mg/l	10	ND	ND	ND	ND	ND	ND	ND
7	Total Residual Chlorine	mg/l	1	ND	ND	ND	ND	ND	ND	ND
8	Amm. Nitrogen as N	mg/l	50	0.35	0.31	0.21	0.28	0.36	0.31	0.303
9	Total Kjeldal Nitrogen as NH ₃	mg/l	100	1.15	1.04	1.1	1.28	1.22	1.16	1.15
10	Free Ammonia as NH ₃	mg/l	5	0.003	0.0028	0.002	0.0022	0.005	0.004	0.003
11	BOD(3) days at 27°C	mg/l	30	1.6	1.3	1.3	1.2	1.1	1.14	1.27
12	COD	mg/l	250	4.8	2.1	3.7	3.9	3.6	3.42	3.58
13	Arsenic as As	mg/l	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
14	Mercury as Hg	mg/l	0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
15	Lead as Pb	mg/l	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
16	Cadmium as Cd	mg/l	2	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
17	Hexa Chromium as Cr ⁺⁶	mg/l	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
18	Total Chromium as Cr	mg/l	2	0.31	0.24	0.21	0.25	0.19	0.19	0.23
19	Copper as Cu	mg/l	3	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20	Zinc as Zn	mg/l	5	0.16	0.19	0.14	0.22	0.18	0.23	0.18
21	Selenium as Se	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Nickel as Ni	mg/l	3	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Cyanide	mg/l	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
24	Fluoride as F	mg/l	2	0.037	0.031	0.04	0.02	0.03	0.04	0.033
25	Diss. Phosphate as P	mg/l	5	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013
26	Sulphide as S	mg/l	2	ND	ND	ND	ND	ND	ND	ND
27	Phenolic Compounds as C ₆ H ₅ OH	mg/l	1	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007
28	Bio-assay Test,	%	90% survival of fish after 96 hours in 100% effluent	98%	98%	98%	98%	98%	98%	98%
29	Manganese as Mn, mg/l	mg/l	2	0.022	0.016	0.014	0.01	0.019	0.011	0.01533
30	Iron as Fe, mg/l	mg/l	3	0.32	0.38	0.27	0.35	0.27	0.31	0.31677
31	Vanadium as V, mg/l	mg/l	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32	Nitrate Nitrogen , mg/l	mg/l	10	0.24	0.28	0.21	0.29	0.22	0.19	0.238
33	Pesticides (as Benzene hexa chloride)	μg/l	10	Absent	Absent	Absent	Absent	Absent	Absent	Absent

NB

: C.L. Colourless, O.L – Odourless, BDL- Below Detectable Limit., ND- Not Detectable.

Annexure XVII: Noise Survey Report
Noise Survey Report at COB Plant, LOP Plant of SCM, TATA STEEL LTD.

SL.No.	LOCATION	Dec'14	Mar'15	AVERAGE
		Noise level in dB(A)	Noise level in dB(A)	
1	COB Plant Gate	53.8	54.6	54.2
2	Canteen	61.9	55.4	58.7
3	Work Shop	68.5	61.2	64.9
4	Office	61.3	58.4	59.9
5	D.G.Shed	69.9	56.3	63.1
6	MCC Room	67.3	58.1	62.7
7	Vibrating Screen	72.5	61	66.8
8	Scrubber	67.7	53.4	60.6
9	Control Room	62.5	51.6	57.1
10	Secondary Apron	66.3	60	63.2
11	Cone Crusher	67.1	56.2	61.7
12	DTJ Crusher	68.9	57.3	63.1
13	Concentrated Ore Loading	66.4	55.2	60.8
14	Wobbler area	68.2	58.9	63.6
15	Primary Apron feeder	71.5	59.6	65.6
16	C -1A	65.0	53.4	59.2
17	Shaking Table	70.4	61.2	65.8
18	Multiple Bin	73.9	64.4	69.2
19	H.T Room	60.7	51.4	56.1
20	Hydro Cyclone	64.5	53.6	59.1
21	Spirals	61.3	49.7	55.5
22	VS Ball Mill	71.9	62.7	67.3
23	C.6A	69.7	58.2	64.0
24	H.F Screen	70.5	61.2	65.9
25	Sieve band area	71.7	59.8	65.8
26	C3	68.4	58.1	63.3
27	C4	71.6	56.7	64.2
28	LOPP Sayaji Crusher	74.5	54.9	64.7
29	LOPP Screen	71.8	57.6	64.7
30	LOPP Control Room	70.4	53.8	62.1
31	LOPP Hopper	67.0	56.1	61.6

Ambient Noise Level Survey in Residential Areas of SCM, TSL from 6AM to 6AM (Next Day)

Sl.No	Time in Hrs.	Locations	Dec'14	Mar'15	AVERAGE
			Noise level in dB(A)	Noise level in dB(A)	
1	6.00	Main Gate	62.5	63.6	63.05
2	6.30	Market Complex	60.5	59.6	60.05
3	7.00	Hospital	48.1	48.6	48.35
4	7.30	Post Office	44.9	44.2	44.55
5	8.00	Study Center	42.8	43.6	43.2
6	8.30	Water treatment Plant (D.G was not in operation)	48.5	49	48.75
7	9.00	STP	49.1	48.4	48.75
8	9.30	Shishu Mandir	43.6	44.4	44
9	10.00	Children's Park	51.3	52.4	51.85
10	10.30	3RSF Qtrs	50.9	50	50.45
11	11.00	L2R Qtrs	48.6	49.1	48.85
12	11.30	Recreation Club	52.8	53.6	53.2
13	12.00	B4-B6 Block Qtrs	50.2	51.3	50.75
14	12.30	B3-B4 Block Qtrs	49.1	48.2	48.65
15	13.00	Geological Camp	47.9	48.4	48.15
16	13.30	Babu Line	46.4	45.7	46.05
17	14.00	Guest House	44.5	45.3	44.9
18	14.30	3R Qtrs	52.6	53.7	53.15
19	15.00	VT Centre	51.9	51	51.45
20	15.30	SS High school	53.5	54	53.75
21	16.00	2RF Qtrs	48.1	47.4	47.75
22	16.30	CT Qtrs	45.4	46.2	45.8
23	17.00	STP	41.3	41.8	41.55
24	17.30	Police Out Post	48.6	47.9	48.25
25	18.00	Jagarnnath Temple	41.9	42.7	42.3
26	18.30	GM Banglow	48.9	50	49.45
27	19.00	Market Complex	60.4	59.5	59.95
28	19.30	Laboratory	48.9	49.4	49.15
29	20.00	Chrome Vally Club	49.6	50.4	50
30	20.30	Atwal's Camp	47.2	48.3	47.75
31	21.00	Duplex Qtrs	44.9	44	44.45
32	21.30	FootBall Ground	43.1	43.6	43.35
33	22.00	B4-B6 Block Qtrs	48.1	49.2	48.65
34	22.30	Sisu Mandir	46.9	46	46.45
35	23.00	5 Star Qtrs	44.2	44.7	44.45
36	23.30	Stewart School	49.4	48.7	49.05
37	0.00	A9-A13 Qtrs	50.6	51.4	51
38	0.30	A14-A19 Qtrs	48.5	49	48.75
39	1.00	A-17 - A23 Qtrs	42.7	42	42.35
40	1.30	B1-B3 Block	44.9	45.7	45.3

41	2.00	Hospital	42.7	43.8	43.25
42	2.30	SBI	51.5	50.6	51.05
43	3.00	Jagarnnath Temple	48.4	48.9	48.65
44	3.30	TSRDS	44.3	45.1	44.7
45	4.00	Babu Line	40.9	42	41.45
46	4.30	Guest House Annexe	43.8	42.9	43.35
47	5.00	Banabharati Dance School	44.5	45	44.75
48	5.30	Main Gate	56.9	56.2	56.55

Ambient Noise Level Survey in Industrial Areas of SCM, TSL from 6AM to 6AM(Next Day)

Sl.No	Time in Hrs.	Location	Dec'14	Mar'15	AVERAGE
			Noise level in d B(A)	Noise level in d B(A)	
1	6.00	Canteen Gate	56.5	57.6	57.05
2	6.30	Quarry Pump House	62.1	61.2	61.65
3	7.00	Stack Yard	66	66.5	66.25
4	7.30	Lumpy Plot	63.8	63.1	63.45
5	8.00	40 t. Weigh Bridge	70.5	71.3	70.9
6	8.30	Concentrated Ore Stack Yard	67.9	68.4	68.15
7	9.00	OB Dump	73.4	72.7	73.05
8	9.30	OB IX Quarry	67.2	68	67.6
9	10.00	Atwal's Pyroxinate Crusher	70.5	71.6	71.05
10	10.30	Magazine	69.4	68.5	68.95
11	11.00	Pyroxinate Quarry	66.2	66.7	66.45
12	11.30	OB-II Quarry	70.5	71.3	70.9
13	12.00	OB Dump	67.2	68.3	67.75
14	12.30	Naresh Kumar Crusher	68.5	67.6	68.05
15	13.00	OB-X Quarry	71.1	71.6	71.35
16	13.30	Old ETP	65.6	64.9	65.25
17	14.00	Mining Complex	70.8	71.6	71.2
18	14.30	Slime Dam	71.5	72.6	72.05
19	15.00	OB-IX Quarry	64.8	63.9	64.35
20	15.30	Pyroxinate Plot	65.9	66.4	66.15
21	16.00	OB Dump	63.6	62.9	63.25
22	16.30	Temple Gate	72.8	73.6	73.2
23	17.00	Air Strip	69.5	70	69.75
24	17.30	Hauling Gate	68.7	68	68.35
25	18.00	Work Shop	71.5	72.3	71.9
26	18.30	New ETP	62.8	63.9	63.35
27	19.00	20T Weigh Bridge	70.4	69.5	69.95
28	19.30	Engg. Complex	72.2	72.7	72.45
29	20.00	Atwal's Chrome Crusher	68.6	69.4	69

30	20.30	New ETP	69.4	70.5	69.95
31	21.00	Canteen Gate	67.2	66.3	66.75
32	21.30	Hauling Gate	71.9	72.4	72.15
33	22.00	Work Shop	60.4	61.5	60.95
34	22.30	Old ETP	54.9	54	54.45
35	23.00	Petrol Pump	56.3	56.8	56.55
36	23.30	Quarry Pump House	72.8	72.1	72.45
37	0.00	Hospital Gate	49.4	50.2	49.8
38	0.30	OB X Quarry	57	57.5	57.25
39	1.00	Alwal's chrome crusher	66.2	65.5	65.85
40	1.30	Atwal's Garage	57.9	58.7	58.3
41	2.00	Old OK Line	43.8	44.9	44.35
42	2.30	Air Strip	41.5	40.6	41.05
43	3.00	Stack Yard	61.9	62.4	62.15
44	3.30	40Ton Weigh Bridge	64.5	65.3	64.9
45	4.00	Naresh Kumar Crusher	66.2	67.3	66.75
46	4.30	OB IX Quarry	64.5	63.6	64.05
47	5.00	Work shop	65.2	65.7	65.45
48	5.30	Canteen Gate	52.4	51.7	52.05

NOISE LEVEL SURVEY AT GEOLOGICAL LABORATORY IN COB PLANT SCM TSL

Sl.No	Location	Dec'14		Mar'15		AVERAGES	
		Noise Level in dB(A)		Noise Level in dB(A)		Noise Level in dB(A)	
		Max	Min	Max	Min	Max	Min
1	Exhaust Fan	65.1	61.8	63.5	57.2	64.3	59.5
2	Dry Sieve Shaker Machine	56.4	50.9	55.1	51.5	55.8	51.2
3	Wet Sieve Shaker Machine	72	64.5	68.6	62.3	70.3	63.4
4	Manual sample preparation table	65.1	61.8	63.5	57.2	64.3	59.5

ANEXURE-XVIII

Uploaded EC, EC Status Condition and Annual Environment Statement

Tata Steel - Compliance Reports##### - Microsoft Internet Explorer provided by ITS, TATA STEEL

http://www.tatasteelindia.com/compliance-report.asp#

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Values stronger than steel

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TATA

You are in: Home > Compliance Reports

Compliance Reports

▶ [Half Yearly Environment Compliance Reports](#)

- EC for Jamadoba Coal Washery
- EC for 6&7 Pits Colliery
- CRZ Clearance Gopalpur project
- [EC Compliance Sukinda Chromite Mines April 13 - September 13](#)
- Environment Statement of Sukinda Chromite Mines for 2012-13
- Environment Statement of Tiringpahar Manganese Mines for 2012-13
- [Environmental clearance to Sukinda chromite mine of Tata Steel limited](#)
- Environmental Clearance for Kotre Basantpur & Pachmo Opencast Coal mine, West Bokaro, Tata Steel Ltd.
- Six Monthly Compliance Report for Rebar Mill and Ferro Chrome Plant, Tata Steel Ltd.
- Six Monthly Compliance Report for Kalinganagar Project, Tata Steel Ltd.
- Environmental Statement for the year 2011-12, Kalinganagar Project, Tata Steel Ltd.
- Environmental Clearance to Bamebari Manganese Mine, Tata Steel Ltd.
- Environmental Clearance to Joda West Manganese Mine, Tata Steel Ltd.
- Environmental Clearance to Malda Manganese Mine, Tata Steel Ltd.
- Environmental Clearance to Manmora Manganese Mine, Tata Steel Ltd.
- Environmental Clearance to Tiringpahar Manganese Mine, Tata Steel Ltd.
- Environmental Clearance conditions of Noamundi Iron Mine, Tata Steel Ltd.
- Environmental Clearance conditions of Khondbond Iron & Manganese Mine, Tata Steel Ltd.
- Environmental Clearance conditions of Kalamati Iron Mine, Tata Steel Ltd.
- Environmental Clearance conditions of Joda East Iron Mine, Tata Steel Ltd.
- Environmental Clearance of West Bokaro Opencast Coal Mine, Tata Steel Ltd.

Uploaded EC, EC Status Condition

www.tatasteelindia.com/si x tata steel india cpmplianc x Tata Steel Corporate Soci x about:blank x Corporate Citizen | Enviro x

www.tatasteelindia.com/corporate-citizen/environment-compliance-reports.asp

- Monitoimg and Analysis Report April 2014 to March 2015
- EC Compliance Report of Tata Steel - Hooghly Met Coke Division, Haldia (Oct '14 to Mar '15)
- Washery - III Production Data (Monthly Average)
- EC Compliance Report of 5 MTPA (Apr'14 to Sep'14)
- EC Compliance Report of 6-8 MTPA (Apr'14 to Sep'14)
- EC Compliance Report of 9-7 MTPA (Apr'14 to Sep'14)
- Monitoimg and Analysis Report (Apr'14 to Sep'14)
- Environmental Statement of Gomardih Dolomite Quarry (2013-2014)
- Half Yearly EC Compliance Report of Hooghly Met Coke Division, Haldia (Apr'14 to Sep'14)
- Half Yearly EC Compliance Report of Ferro Alloys Plant, Bamnipal (Apr'14 to Sep'14)
- Half Yearly EC Compliance Report of Gomardih Dolomite Quarry (Apr'14 to Sep'14)
- Half Yearly EC Compliance Report of Sukinda Chromite Mine (Apr'14 to Sep'14)
- Half Yearly EC Compliance Report of Bamebari Manganese Mine (Apr'14 to Sep'14)
- Half Yearly EC Compliance Report of Joda West Manganese Mine (Apr'14 to Sep'14)
- Half Yearly EC Compliance Report of Malda Manganese Mine (Apr'14 to Sep'14)

www.tatasteelindia.com/corporate-citizen/pdf/env-statement-sukinda-apr14-sep14.pdf

11:00
25-05-2015

EC Compliance of Apr-14 to Sept-14

Tata Steel Careers - Creati x Corporate Citizen | Enviroi x

www.tatasteelindia.com/corporate-citizen/environment-compliance-reports.asp

Environment Compliance Reports

- Environment
- Infrastructure Development
- Case Studies
- Environment Compliance Reports

- Environmental Statement of Kalimela Open Cast Project for the financial year ending 31st March 2014
- Environmental Statement of Jamadoba Coal Washery for the financial year ending 31st March 2014
- Environmental Statement of Bhelatand A. Colliery for the financial year ending 31st March 2014
- Environmental Statement of Jamadoba Colliery for the financial year ending 31st March 2014
- Environmental Statement of 6&7 Pits Colliery for the financial year ending 31st March 2014
- Environmental Statement of Bhelatand Coal Washery for the financial year ending 31st March 2014
- Environmental Statement of Jamadoba Power House No. 3 for the financial year ending 31st March 2014
- Environmental Statement of Digwadih Colliery for the financial year ending 31st March 2014
- Environmental Statement of Sijua Colliery for the financial year ending 31st March 2014
- Environmental Statement of Sukinda Chromite Mines for the financial year 2013-14**
- Environmental Statement of Ferro Alloys Plant, Bamnipal, Keonjhar for the financial year 2013-14
- Environmental Statement of Ferro Manganese Plant, Joda for the financial year ending 31st March 2014
- Environmental Statement of Tiringpahar Manganese Mine for the financial year ending 31st March 2014
- Environmental Statement of Bamebari Manganese Mine for the financial year ending 31st March 2014

www.tatasteelindia.com/corporate-citizen/pdf/env-statement-sukinda-13-14.pdf

17:49
11-11-2014

Uploaded Environment Statement 2013-14

ANEXURE-XIX
Environment Clearance Intimation letters Panchayat, Zila Parisad



Ref: SCM/ENV/ 61 / 13
Date: 25/09/13

Mrs. Bhagabati Mohanta,
Chairman,
Panchayat Samiti, Sukinda Block,
Sukinda

Sub: Intimation of obtaining Environmental Clearance under EIA Notification, 2006 in respect of Sukinda Chromite Mine having Mining Lease area over 406 ha in Jajpur District,

Dear Madam,

We would like to inform you that Ministry of Environment & Forests (MoEF), Govt. of India has accorded Environmental Clearance in respect of Sukinda Chromite Mine, M/s Tata Steel Limited for renewal of mine lease, expansion of Chrome Ore Beneficiation plant and Pyrocorinix ore capacities and change of mining & beneficiation technologies vide its letter no. F-11015/96/2011-G.O.(M), Dated 06.09.2013.

We, therefore request your good self to kindly acknowledge the receipt of the above letter.

Yours Faithfully
Tata Steel Limited

Chief (Mining)
&
Manager Cum Agent
Sukinda Chromite Mine

Encl: As above

*Bhagabati Mohanta
Chairman
Sukinda*

TATA STEEL LIMITED

Tata Steel Limited, Plot No. 1, Sector-10, Gurgaon, Haryana-122002
Phone: +91 122 60 20000 Fax: +91 122 60 20000
Registered Office: Bhatinda House, 24, Connaught Place, New Delhi-110028
www.tatasteel.com



Ref: SCM/EMV/ 66 / 13

Date: 25/9/13

Mr. Bidhyadhar Patra
Member,
Zila Parishad, Jaipur

Sub: Intimation of obtaining Environmental Clearance under EIA Notification, 2006 in respect of Sukinda Chromite Mine having Mining Lease area over 406 ha in Jaipur District.

Dear Sir,

We would like to inform you that Ministry of Environment & Forests (MoEF), Govt. of India has accorded Environmental Clearance in respect of Sukinda Chromite Mine, M/v Tata Steel Limited for renewal of mine lease, expansion of Chromite Ore Beneficiation plant and Pyroconite ore capacities and change of mining & beneficiation technologies vide its letter no. J-11015/96/2013-IA.II(M), Dated 06/09/2013.

We, therefore request your good self to kindly acknowledge the receipt of the above letter.

Yours Faithfully
T: Tata Steel Limited

Chief (Mining)
&
Manager Cum Agent
Sukinda Chromite Mine

End: As above

Bidhyadhar Patra
Bidhyadhar Patra 25/9/13
Zilaparisad Member
IT Zone, Sukinda, Jaipur

TATA STEEL LIMITED

Head Office: TATA STEEL LIMITED, Jamshedpur-831001, Jharkhand, India
Bhilai Office: TATA STEEL LIMITED, Bhilai-492015, Chhattisgarh, India
Corporate Office: TATA STEEL LIMITED, 100, Park Road, Kolkata-700016, India
www.tatasteel.com



Ref: SCM/ENV/EN/13

Date: 25/09/13

Mrs. Jinita Manda,
Sarpanch,
Kaliapani Gram Panchayat
Kaliapani

Sub: Intimation of obtaining Environmental Clearance under EIA Notification, 2006 in respect of Sukinda Chromite Mine having Mining Lease area over 406 ha in Jajpur District.

Dear Madam,

We would like to inform you that Ministry of Environment & Forests (MoEF), Govt. of India has accorded Environmental Clearance in respect of Sukinda Chromite Mine, M/s Tata Steel Limited for renewal of mine lease, expansion of Dryness Ore, Beneficiation plant and Pyrozone ore capacities and change of mining & beneficiation technologies vide its letter no. J-11015/96/2013-I.A.II(M), Dated 06.09.2013.

We, therefore request your good self to kindly acknowledge the receipt of the above letter.

Yours Faithfully,
T. Tata Steel Limited


Chief (Mining)
&
Manager Care Agent
Sukinda Chromite Mine

Jinita Manda
Sarpanch
KALIAPANI G.P.

Encl: As above

TATA STEEL LIMITED

Sukinda Chromite Mine, Kalijapani, Jajpur District, Orissa-751005
Phone No. 76 3736, 369121, 369122, 369123
Registered Office: Kalijapani, P.O. Kalijapani, District: Jajpur, Orissa-751005
www.tatasteel.com



Ref: SCM/ENV/ 70 / 13
Date: 26/04/13

Mrs. Sashama Nayak
Sarpanch,
Ransol Grama Panchayat,
Ransol

Sub: Intimation of obtaining Environmental Clearance under EIA Notification, 2006 in respect of Sakinda Chromite Mine having Mining Lease area over 406 ha in Jajpur District.

Dear Madam,

We would like to inform you that Ministry of Environment & Forests (MoEF), Govt. of India has accorded Environmental Clearance in respect of Sakinda Chromite Mine, M/s Tata Steel Limited for renewal of mine lease, expansion of Chrome Ore, Beneficiation plant and Pyrometallurgic capacity and change of mining & beneficiation technologies vide its letter no. J-11015/96/2013-LA.II(M), Dated 06.09.2013.

We, therefore, request your good self to kindly acknowledge the receipt of the above letter.

Yours Faithfully
F: Tata Steel Limited

Chief (Mining)
&
Manager Core Agent
Sakinda Chromite Mine

Encl: As above

S. Nayak
Sarpanch
Ransol Grama Panchayat

TATA STEEL LIMITED

Corporate Office: Plot No. 1, Sector-1, Gurgaon, Haryana
Registered Office: Plot No. 1, Sector-1, Gurgaon, Haryana
www.tatasteel.com



Ref: SCM/ENV/71 / 13

Date: 25/09/13

Mrs. Renuka Dehari
Sarpanch,
Chingadipal Grama Panchayat,
Chingadipal

Sub: Intimation of obtaining Environmental Clearance under EIA Notification, 2006 in respect of Sakinda Chromite Mine having Mining Lease area over 400 ha in Jajpur District.

Dear Madam,

We would like to inform you that Ministry of Environment & Forests (MoEF), Govt. of India has accorded Environmental Clearance in respect of Sakinda Chromite Mine, M/s Tata Steel Limited for renewal of mine lease, expansion of Chrome Ore, Beneficiation plant and Pyrocentric ore capacities and change of mining & beneficiation technologies vide its letter no. J-11015/96/2011-IA(E/M), Dated 06.09.2013.

We, therefore request your good self to kindly acknowledge the receipt of the above letter.

Yours Faithfully
F: Tata Steel Limited

Chief (Mining)
&
Manager Cum Agent
Sakinda Chromite Mine

Encl. As above

Renuka Dehari
Sarpanch
Chingadipal G.P.

TATA STEEL LIMITED

Corporate Office: Tata Steel Limited, Sakinda, Jajpur District, Orissa
Telephone: 06742 20241/2/3 Fax: 06742 20244

Regional Office: Sakinda, Sakinda, Jajpur District, Orissa
Telephone: 06742 20241/2/3 Fax: 06742 20244

www.tatasteel.com



Ref: SCM/ENV/ 72 /13

Date: 25/04/13

Mr. Gobinda Chandra Dethari,
Sarpanch,
Kankadpal Grama Panchayat,
Kankadpal

Sub: Intimation of obtaining Environmental Clearance under EIA Notification, 2006 in respect of Sukinda Chromite Mine having Mining Lease area over 406 ha in Jajpur District.

Dear Sir,

We would like to inform you that Ministry of Environment & Forests (MoEF), Govt. of India has accorded Environmental Clearance in respect of Sukinda Chromite Mine, M/s Tata Steel Limited for renewal of mine lease, expansion of Chrome Ore, Beneficiation plant and Pyrocentric ore capacities and change of mining & beneficiation technologies vide its letter no. J-11015/96/2011-(AJEM), Dated 06.09.2013.

We, therefore request your good self to kindly acknowledge the receipt of the above letter.

Yours faithfully
Tata Steel Limited


Chief (Mining)
&
Manager-Cum Agent
Sukinda Chromite Mine

Encl: As above


25-09-2013
SARPANCH
KANKADAPAL G.P.

TATA STEEL LIMITED

Corporate Office: 100, Park Road, Jamshedpur - 831001, Jharkhand, India
Registered Office: 100, Park Road, Jamshedpur - 831001, Jharkhand, India
www.tatasteel.com

ANEXURE-XX

Environmental Clearance Advertisement and Intimation to Eastern Regional Office of the MoEF



Addl. Director(S)
Ministry of Environment & Forests
Eastern Regional Office
A/3, Chandrasekharapur,
Bhubaneswar- 751023

Ref: SCM/ ENV/ 012/066 /13
Date: 18th June' 2013

Sub: Advertisement for grant of Environmental Clearance in respect of Sukinda Chromite Mine in Jajpur District of Odisha (Mining Lease area: 406 ha).

Ref: Ministry of Environment & Forests, Govt. of India letter no. J-11015/96/2011-1A.II(M), Dated 06.09.2013.

Dear Sir,

As per the General Condition no. xvi of the Environmental Clearance granted by Ministry of Environment & Forests, Govt. of India in respect of Sukinda Chromite Mine vide letter no. J-11015/96/2011-1A.II(M), Dated 06.09.2013, the matter was advertised in the Oriya daily " **The Samaja**" (date: 11.09.2013, page-5) and in English daily " **The New Indian Express**" (date: 11.09.2013, page-5). Copy of the above advertisement is enclosed as annexure for your ready reference.

Thanking you,

Yours sincerely,
f: Tata Steel Ltd.

Manager cum Agent
Sukinda Chromite Mine

Encl: as above

TATA STEEL LIMITED

Sukinda Chromite Mine (S) - Kalarangata Dist. Jajpur, Orissa 751023
Phone no. 01 6726 26731 Fax : 01 6726 26734
Registered Office: 9th Floor, Tower 3A, One One One, Mumbai - 400 001

ANEXURE-XXI
Photographs of Backfilling



ANEXURE-XXII
Year wise Plantation target and Actual Plantation Achieved

Year	Plan (Within ML)		Actual (within ML)		Plan (Outside ML)		Actual (Outside ML)	
	Nos. of Sapling	Area in Ha	Nos. of Sapling	Area in Ha	Nos. of Sapling	Area in Ha	Nos. of Sapling	Area in Ha
1998-99	4000	1.62	4000	1.7				
1999-00	4000	1.62	18000	4				
2000-01	5000	2.02	28342	2				
2001-02	5000	2.02	15000	0.5				
2002-03	5000	2.02	22000	1.5				
2003-04	10000	4	45500	1.5				
2004-05	2500	1	48000	1				
2005-06	6250	2.5	75000	2.5				
2006-07	14375	5.75	129500	5.75				
2007-08	13550	5.42	94000	4.42	Additional Area (100ha)obtained#			
2008-09	3000	1.2	85250	2.94	8750	3.5	36750	1.76
2009-10	4000	1.6	28000	3.9	17750	7.1	56000	5.6
2010-11	0	0	25000	2	20000	8	60000	6.5
2011-12	11250	4.5	45000	4.5	8750	3.5	35000	3.5
2012-13	4625	1.9	5700	1.83	21375	8.55	40000	6.5
2013-14	6250	2.5	3700	1.32	20000	8	54326	5.6
2014-15	4000	1.6	4050	1.2	19875	7.95	50100	5.1
TOTAL	102800	41.27	676042	42.56	116500	46.6	332176	34.56

Note: #Actual less than plan due to delay in phased allotment of land in additional area of 100 ha