

स्टील ऑथॉरिटी ऑफ इंडिया लिमिटेड  
(भारत सरकारका प्रत्यक्षता)  
राँ गटेरियलस विजीन  
मनोहरपुर ओर माईन  
पोस्ट - चिरिया, पन सिंहभूम, झारखण्ड- 833106  
दूरभाष-09308128774,  
E-mail: momchiria@gmail.com



STEEL AUTHORITY OF INDIA LIMITED  
(A Government of India Enterprise)  
RAW MATERIALS DIVISION  
MANOHARPUR ORE MINES  
P.O. - CHIRIA, W. Singhbhum, Jharkhand-833106  
P Ph. No. 09308128774,  
E-mail: momchiria@gmail.com

Ref. No. MCM/PC/6/ 47

Date: 18/11/2017.

To,  
Additional PCCF (IFS)  
Ministry of Environment, Forest and Climate Change  
Regional Office (ECZ)  
Bungalow No. A - 2, Shyamali Colony  
Ranchi - 834 002.

**Sub: Six Monthly Compliance of the Conditions Stipulated in Environmental Clearance of Dhubil Iron Ore Mining project for the period April-2017 to September-2017 of M/s SAIL.**

Sir,

We are hereby submitting status of compliances for the above period up to 30<sup>th</sup> September, 2017 to the conditions stipulated in the Environmental Clearance granted by MoEF vide No:J-11015/251/2009-IA,II(M), Dated:24/01/2012 in respect of Dhubil Iron Ore Mining project of M/s SAIL for production capacity of 0.75MTPA of Iron Ore.

Thanking you.

Yours faithfully,  
For Steel Authority of India Ltd.

18.11.17  
General Manager (Mines)  
Manoharpur Ore Mines  
Raw Material Division, SAIL

Copy to:

1. Director, IA, MoEF&CC, GCI, Indira Paryavaran Bhavan, Allganj, Jor Bagh Road, New Delhi - 110 003.
2. Member Secretary, JSPCB, HFC, Dhanwa, Ranchi - 834 004.
3. In-charge, Eastern Zone, CPCB, Southern Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700 107 (W. B.)

**Status of Compliance to Conditions Stipulated in  
Environmental Clearance granted**

**by**

**MoEFCC**

**Vide Order No: J-11015/251/2009-IA. II (M),**

**Dated: 24th January, 2012 for 0.75 MTPA**

**of**

**Dhobil Iron Ore Mining Project**

**( Period: April'2017 to September'2017 )**



**STEEL AUTHORITY OF INDIA LIMITED**

RAW MATERIALS DIVISION

MANOHARPUR ORE MINES

P.O. – CHIRIA, PIN : 833106

DIST. : SINGHBHUM (WEST)

JHARKHAND STATE

**Environment Clearance letter No:J-11015/251/2009-IA. II(M), Dated: 24<sup>th</sup> January, 2012  
of Dhobil Iron Ore Mining Project for production of 0.75MTPA (ROM) of iron ore.**

**Half yearly compliance report for the period: April'2017 to September'2017**

**A. Specific Conditions**

<b>Sl. No</b>	<b>Condition</b>	<b>Compliance Status as on Sept'2017</b>
i	The project proponent shall obtain Consent to Establish and Consent to Operate from the Jharkhand State Pollution Control Board and effectively implement all the conditions stipulated therein.	Consent to Establishment was obtained from Jharkhand State Pollution Control Board for a capacity of 0.75 MPTA, vide letter no: 1398, dated: 18.05.2012. Consent to Operate has also been obtained from Jharkhand State Pollution Control Board for a capacity of 0.75 MPTA, vide letter Ref No. JSPCB/HO/RNC/CTO-1262735/2017/825, dated: 29.06.2017, with validity up to 30.06.2022. Conditions stipulated in the Consents are being complied with. Status of Conditions Compliance placed as <b>Annexure-1</b> .
ii	Environmental clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No. 460 of 2004, as may be applicable to this project.	Noted.
iii	Environmental clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the competent authority, as may be applicable to the project.	Provision of Wildlife (Protection) ACT 1972 is not attracted to the Project as there are no Wildlife sanctuaries, National Parks or similar places specified in the Act within 10 KM radius of the project.
iv	Environmental clearance is subject to obtaining clearance under Forest (Conservation) Act, 1980 for diversion of forest land. Mine working shall be restricted to the area for which forestry clearance has been obtained. <b>However, As per guidelines of MOEF&amp; CC circular No:F.No.11-599/2014-FC, Dated 01.04.2015. Net Present Value (NPV) to be paid for Total forest area covered in the mining lease.</b>	Forest Clearance was obtained vide letter No: 8-20/98-FC, dated: 21.10.98 for mine working over 29.411 Ha. Mine working restricted within 29.411 Ha for which forestry clearance was obtained.  NPV for total forest area in mining lease area of 513.036 Ha has been deposited in ad-hoc CAMPA Account No: CA 1587 of Corporation Bank, Block –II, CGO Complex, Phase –I, Lodhi Road, New Delhi-110510.
v	Necessary wildlife clearance, as applicable, shall also be obtained.	There is no wild life sanctuary, National Part, wildlife habitat with in 10 KM of project site. Hence Not Applicable.

Sl. No	Condition	Compliance Status as on Sept'2017
vi	The Mining operations shall be restricted to above the groundwater table and it should not intersect the groundwater table. In case of working below the groundwater table, prior approval of the Ministry of Environment and Forests and the Central Ground Water Authority shall be obtained, for which a detailed hydro-geological study shall be carried out.	Water table level at mining lease area is about 400 m AMSL and present working depth of the mine is 638 m AMSL and ultimate working depth of the mine is 486. Hence there is no intersecting of Mine workings with the ground water table. Due to any reason it is required to work below the groundwater table, we will obtain prior approval of the Ministry of Environment, Forest & Climate Change and the Central Ground Water Authority shall be obtained, for which a detailed hydro-geological study will be carried out.
vii	The project proponent shall ensure that no natural watercourse and/or water resources shall be obstructed due to any mining operations. The first order streams and the seasonal nallahs originating from the mining lease area shall be protected.	Due precautions are being taken to avoid obstructions to natural water resources by providing drains and bounds etc. at required places.
viii	The top soil, if any shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long. The topsoil shall be used for land reclamation and plantation.	At present, the mining operations are being carried out within the existing broken area and hence no top soil is generated during this period. If any top soil encountered it will be stored separately and used for reclamation & plantation purpose.
ix	The over burden (OB) generated during the mining operations shall be stacked at earmarked dump site(s) only and it should not be kept active for a long period of time and their phase-wise stabilization shall be carried out. There shall be two external over burden dumps. The stabilized dump in area of 5.23 ha shall not be used for dumping in future. The new dump created in an area of 7.9 ha shall have maximum projected height of 15 m. Proper terracing of the OB dumps shall be carried out so that the overall slope of the dump shall be maintained to 28°. The OB dump should be scientifically vegetated with suitable native species to prevent erosion and surface runoff. In critical areas, use of geo textiles shall be undertaken for stabilization of the dump. Monitoring and management of rehabilitated areas shall continue until the	The over burden (OB) generated during the mining operations is being stored at earmarked site. Dumping of over burden & inter burden waste on stabilized dump was stopped. Terracing of the OB dump and Plantation over terracing and slope of the dump with native species was started from August'2016.  Retaining wall of 804m length (325 mts concrete retaining wall & 479 mts length boulder retaining wall) was constructed around the Sub Grade dump and Fines dump. Dimensions of existing and proposed Retaining wall are 1.2 m height and 1.2 m width. Six monthly Compliance Status is being submitted to the Ministry of Environment & Forests and Climate Change its Regional Office located at Ranchi.

Sl. No	Condition	Compliance Status as on Sept'2017
	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.	
x	<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 Hamsadagaar Nallah, the koina River, the seasonal nallahs 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 de-silted particularly after the monsoon and maintained properly.</p> <p>Garland drains, setting tanks and check dams of appropriate size, gradient and length shall be constructed around the mine pit, soil, mineral and over burden dumps to prevent run off of water and flow of sediments directly into the Hamsadagaar Nalla, the Koina River, the seasonal nallahs and other water bodies and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits shall be constructed at the corners of the garland drains and de-silted at regular intervals.</p>	<p>Retaining wall of about 804 m length was constructed around the mineral dump. Check bunds, Garland drains and siltation pond has been constructed to control surface runoff.</p> <p>Garland drains and sedimentation pits are being de-silted before onset of monsoon every year.</p> <p>Photographs showing the garland drain, Check Dam are placed as <b>Annexure-2</b>.</p> <p><b>Sump capacity:</b> At present mining operations are being carried out much above the water table. During the rainy season no working will be planned from the bottom most bench of the mines. The rain water from working area will be channelized towards bottom most working bench of the Mine. Due pervious nature of the strata the water will be percolated in to the ground within few days. Necessary of pumping was not raised since opening of the mines. Hence the size of the bottom most bench is size of the sump.</p>
xi	Dimension of the retaining wall at the toe of the over burden dumps and the OB benches within the mine to check run-off and siltation shall be based on the rain fall data.	Considering the rainfall data of the area, 1.2 m height and 1.2 m width of Retaining wall of 804 m length (325 mts concrete retaining wall & 479 mts length boulder retaining wall was provided at the bottom of dumps.
xii	The void left unfilled in an area of 6 ha shall be converted into water body. The higher benches of excavated void/mining pit shall be terraced and plantation done to stabilize the slopes. The slope of higher benches shall be made gentler for easy accessibility	<p>After exploitation of the ore or during Mine closure, the following activities will be taken for the use of public,</p> <ol style="list-style-type: none"> <li>1. The slope of higher benches shall be made gentler and void area 6 ha will be converted into water body.</li> </ol>

Sl. No	Condition	Compliance Status as on Sept'2017												
	by local people to use the water body. Peripheral fencing shall be carried out all along the excavated area.	2. Plantation will be done to stabilize the slopes. 3. Peripheral fencing will be carried out all along the excavated area.												
xiii	Plantation shall be raised in an area of 126.645 ha including a 7.5 m wide green belt in the safety zone around the mining lease, over burden dumps, mine benches, around water body, along the roads etc. 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. Greenbelt shall be developed all along the mine lease area in a phased manner and shall be completed within first five years.	Total Safety Zone area is 5.5 ha and most of the Safety Zone area covered by virgin forest. Plantation is being carried out every year, so far 5050 saplings have been planted from 2012 at low density of areas, road sides etc. Details of year wise afforestation activities over last five years are as follows: <table><tr><th>Year</th><th>No of saplings</th></tr><tr><td>2016-17</td><td>600</td></tr><tr><td>2015-16</td><td>450</td></tr><tr><td>2014-15</td><td>500</td></tr><tr><td>2013-14</td><td>500</td></tr><tr><td>2012-13</td><td>1000</td></tr></table>	Year	No of saplings	2016-17	600	2015-16	450	2014-15	500	2013-14	500	2012-13	1000
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xiv	Effective safeguard measures, such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around loading and unloading point and all transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.	Regular water sprinkling is being done on haul roads, loading and unloading point by using 3 no's mobile water sprinklers. About 100 mts length fixed water sprinklers were installed on main haul road at weight bridge area. The transportation road is being maintained regularly with proper grading and repair of potholes. The transport roads are also being cleaned regularly including removal of spillages if any to keep clean & tidy. Ambient air quality monitoring is being done at regular intervals and monitoring results are ensuring as per the National Ambient Air Quality Standards.												
xv	The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.	As the mine pits are located at the hill top, all the surface runoff from the mining areas have been diverted to mine pits, from where it seeps in to the ground. Work Order for conducting Technical Feasibility Study for rainwater harvesting has been placed on M/s KRG rainwater Foundation, Chennai . Draft Technical Feasibility Study report for rainwater harvesting prepared by M/s KRG rainwater Foundation, Chennai was submitted . Final report will be submitted to Central Ground Water Board for their view and recommendations after finalization with recommending consultant.												

Sl. No	Condition	Compliance Status as on Sept'2017																					
xvi	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 on 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 Forest 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.	<p>Network of 6 nos. of existing Dug Wells located around the mines have been selected for ground water level monitoring.</p> <p>Ground water table levels at the selected wells are being monitored at regular intervals i.e. 4 times in a year.</p> <p>The Range of water levels during pre-monsoon (April-May), monsoon (August), 2017 is as follows,</p> <table border="1"> <thead> <tr> <th>ID</th><th>Location</th><th>Water level below the Ground Surface (in meters)</th></tr> </thead> <tbody> <tr> <td>G1</td><td>Adjacent to community centre at Anqua</td><td>4.40- 7.55</td></tr> <tr> <td>G2</td><td>Opposite to community centre at Anqua</td><td>4.87-7.70</td></tr> <tr> <td>G3</td><td>Near Anqua Model Steel Village Gate</td><td>2.22-2.80</td></tr> <tr> <td>G4</td><td>Siva Mandir</td><td>3.80-3.90</td></tr> <tr> <td>G5</td><td>Near CNI Church</td><td>5.90-8.10</td></tr> <tr> <td>G6</td><td>Near Bishra Chowk</td><td>1.95-5.60</td></tr> </tbody> </table> <p>In addition to above Two piezometers one at Chiria (150 feet) and another at Dhobil Village 200 feet provided in February'17 and are being monitored at regular intervals i.e. 4 times in a year. Ground water levels and quality during pre-monsoon (April-May), monsoon (August), 2017 and piezometer photograph is placed in <b>Annexure – 3</b>.</p>	ID	Location	Water level below the Ground Surface (in meters)	G1	Adjacent to community centre at Anqua	4.40- 7.55	G2	Opposite to community centre at Anqua	4.87-7.70	G3	Near Anqua Model Steel Village Gate	2.22-2.80	G4	Siva Mandir	3.80-3.90	G5	Near CNI Church	5.90-8.10	G6	Near Bishra Chowk	1.95-5.60
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xvii	Regular monitoring of the flow rate of the springs and perennial nallahs flowing in and around the mine lease shall be carried out and records maintained.	Regular monitoring of flow rate of water at perennial nalla i.e. Hamsadagaar Nalla, is being done and records are being maintained.																					
xviii	Regular monitoring of water quality upstream and downstream of the Hamsadagaar Nalla shall be carried out and record of monitored date should be maintained and submitted to the Ministry	Water quality monitoring at both upstream and downstream of Hamsadagaar Nalla is being done on quarterly basis and results are being submitting to Ministry of Environment, Forest & Climate Change, it's Regional Office, Ranchi,																					

Sl. No	Condition	Compliance Status as on Sept'2017																																				
	of Environment and Forests, its Regional Office, Bhubaneswar, the Central Groundwater Authority, the State Pollution Control Board and the Central Pollution Control Board.	<p>Jharkhand State Pollution Control Board and other statutory authorities.</p> <p>The Range of upstream and downstream Parameters during April'17 to September'17 is as follows,</p> <table><tr><th>Parameter</th><th>Unit</th><th>Up-stream</th><th>Down-stream</th></tr><tr><td>pH</td><td>-</td><td>7.14 to 7.89</td><td>7.18 to 7.83</td></tr><tr><td>Temperature</td><td>°C</td><td>29.4 to 32.6</td><td>29.1 to 32.2</td></tr><tr><td>Turbidity</td><td>NTU</td><td>6.20 to 7.92</td><td>6.1 to 6.6</td></tr><tr><td>Conductivity</td><td>uS/cm</td><td>146.70 to 152.00</td><td>146.0 to 150.5</td></tr><tr><td>Dissolved Oxygen</td><td>mg/l</td><td>4.94 to 6.57</td><td>6.31 to 7.04</td></tr><tr><td>Total Dissolved Solids</td><td>mg/l</td><td>59.9 to 76.0</td><td>61.9 to 73.0</td></tr><tr><td>Total Suspended Solids</td><td>mg/l</td><td>19.0 to 26.8</td><td>4.0 to 23.3</td></tr><tr><td>Total Solids</td><td>mg/l</td><td>86.7 to 95.0</td><td>77.0 to 85.2</td></tr></table> <p>Water quality data is attached in <b>Annexure – 4</b></p>	Parameter	Unit	Up-stream	Down-stream	pH	-	7.14 to 7.89	7.18 to 7.83	Temperature	°C	29.4 to 32.6	29.1 to 32.2	Turbidity	NTU	6.20 to 7.92	6.1 to 6.6	Conductivity	uS/cm	146.70 to 152.00	146.0 to 150.5	Dissolved Oxygen	mg/l	4.94 to 6.57	6.31 to 7.04	Total Dissolved Solids	mg/l	59.9 to 76.0	61.9 to 73.0	Total Suspended Solids	mg/l	19.0 to 26.8	4.0 to 23.3	Total Solids	mg/l	86.7 to 95.0	77.0 to 85.2
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xix	The Project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of water (surface water and ground water) required for the project.	Permission obtained from Water Resource Department, Govt. Of Jharkhand and agreement has been made with Water Ways Division, Chaibasa on 03.08.2017, for drawl of water from Hamsadagara Nalla to the tune of 0.62 MCM per annum for Manoharpur Ore Mines, Chiria.																																				
xx	Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with the Regional Director, Central Ground Water Board.	Draft Technical Feasibility Study report for rainwater harvesting prepared by M/s KRG rainwater Foundation, Chennai was submitted recently. Final report will be submitted to Central Ground Water Board for their view and recommendations. Prioritizing the approved rainwater harvesting schemes for implementation in phased manner with time schedules.																																				
xxi	Appropriate mitigative measures shall be taken to prevent pollution of the Koina River in consultation with the State Pollution Control Board.	Retaining wall, check dams, garland drains have been constructed to prevent pollution of water bodies.																																				



Sl. No	Condition	Compliance Status as on Sept'2017																
xxii	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 be covered with a tarpaulin and shall not be overloaded.	<p>Pollution Under Control (PUC) certificate is made compulsory for deployment of vehicles in Mines.</p> <p>Scheduled/Preventive maintenance of HEEM and light vehicles are under taken in Workshops/Garages to keep emissions level under control.</p> <p>The vehicles used for transportation of ore are covered with tarpaulins and ensured that there is no overloading.</p>																
xxiii	No blasting shall be carried out after the Sunset. Blasting operation shall be carried out only during the daytime. Controlled blasting shall be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.	<p>1. Blasting is being done only in day time in specified time i.e. 4 – 4.30 PM.</p> <p>2. Controlled blasting with slurry explosives and NONEL detonators is being done to minimize ground vibrations and to arrest fly rocks &amp; boulders.</p>																
xxiv	Digital processing of the entire lease area using remote sensing technique should be done regularly once in three years for monitoring land use pattern and report submitted to the Ministry of Environment and Forests and its Regional Office located at Bhubaneswar.	<p>The entire mine lease is in Ankua RF of Saranda Reserve Forest. The mining and associated activities in Dhobil Iron Ore Mining Project are confined in already broken area of 29.411 ha out of total lease area of 513.036 ha.</p> <p>Digital processing of the entire lease area by using remote sensing technique was done by IIT, Kharagpur. 2014 Land use pattern of the lease area is as follows,</p> <table><tr><th>LU/LC classes</th><th>Dhobil Ore mining lease Area (ha)</th></tr><tr><td>Built-up Land</td><td>28.185</td></tr><tr><td>Scrub land or grass</td><td>34.008</td></tr><tr><td>Dense forest</td><td>167.248</td></tr><tr><td>Open Forest</td><td>261.927</td></tr><tr><td>Water body</td><td>5.149</td></tr><tr><td>Wasted land</td><td>16.498</td></tr><tr><td>Total Area (ha)</td><td>513.036</td></tr></table> <p>Report given by IIT, Kharagpur is given in the <b>Annexure – 5</b>.</p>	LU/LC classes	Dhobil Ore mining lease Area (ha)	Built-up Land	28.185	Scrub land or grass	34.008	Dense forest	167.248	Open Forest	261.927	Water body	5.149	Wasted land	16.498	Total Area (ha)	513.036
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xxv	Drills shall either be operated with dust extractors or equipped with water injection system.	All the Drills are equipped with water injection system.																
xxvi	Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust	Water spraying is being done at Loading & unloading areas and at all the transfer points to control dust emissions.																

Sl. No	Condition	Compliance Status as on Sept'2017
	control arrangements. These should be properly maintained and operated.	
xxvii	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for the workshop and wastewater generated during the mining operation.	Septic Tanks with soaking pits have been provided for the various accommodations. Septic Tank & Soaking Pits are being cleaned regularly and maintained. Proposal for installation ETP at work shop is under process.
xxviii	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.	Pre-placement medical examination and periodical medical examination of all the workers engaged in the Mine are being carried out and records are being maintained.
xxix	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna namely elephant, sloth bear, Indian wolf, python etc. spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and wildlife Department. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. All the safeguard measures brought out in the wildlife Conservation Plan so prepared specific to the project site shall be effectively implemented. A copy of action plan shall be submitted to the Ministry of Environment and Forests and its Regional Office, Bhubaneswar.	All precautions are under taken not to disturb the flora and fauna in the mining lease area. Necessary facilities are being extended to local forest department for their inspection and monitoring of forest area.  Comprehensive Integrated Wildlife Management Plan (IWMP) for the West Singhbhum District has been prepared under aegis of SAIL and was submitted to Govt. of Jharkhand. Measures suggested by Jharkhand Govt. for the leasehold shall be suitably implemented and demand raised by the State Govt. shall be paid for implementation of the Wild Life Management Plan by the Govt. of Jharkhand.
xxx	The entire mining lease area shall be fenced by erecting solar powered electric fencing all round it. The fencing so erected shall be maintained properly and the cost towards erection and maintenance of solar powered electric fencing shall be borne by the project proponent out of the project cost.	In this compliance, the matter has been discussed but within the RF, Solar fencing is not possible due to some un-reachable condition & presuming the obstacle of movement of wild life animals. Accordingly, the matter is being discussed with the State Forest Department. Based on the opinion of the State Forest Department, action will be taken for exemption of solar powered electric fencing as this project falls in reserve forest area.

Sl. No	Condition	Compliance Status as on Sept'2017
xxxi	No transportation of ore outside the mine lease area shall be carried out after the sunset.	Transportation of ore outside the mine lease area is being done only during day time i.e. 6 AM to 6 PM.
xxxii	The critical parameters such as RSPM (Particulate matter with size less than 10 um i.e. PM10) and NOx in the ambient air within the impact zone, peak particle velocity at 300 m distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further, quality of discharged water shall also be monitored (TDS, DO, pH and Total Suspended Solids (TSS)). The monitored data shall be uploaded on the website of the company as well as displayed on a display board at the project site at a suitable location near the main gate of the Company in public domain. The Circular No. J-20012/1/2006-IA (M) dated 27.05.2009 issued by Ministry of Environment and Forests, which is available on the website of the Ministry <a href="http://www.envfor.nic.in">www.envfor.nic.in</a> shall also be referred in this regard for its compliance.	Regular air & water quality monitoring is being done on quarterly basis and results are being submitted to State Pollution Control Board and other statutory authorities. Results of air & water quality data is being displayed at in public domain i.e the main gate of General Office of Mines.
xxxiii	A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	Not Applicable at present. Final Mine closure plan along with the fund details will be submitted to the ministry 05 years in advance.

## B. General Conditions

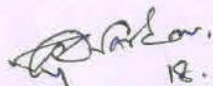
Sl. No	Condition	Compliance Status as on Sept'2017
i	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	Mining is done as per the approved Mining Plan. No change in mining technology and scope of working has been made.
ii	No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.	ROM production and total excavation are kept within permitted/approved Mining Plan. The quantity of Production during 2016 – 17 is as follows: Lump: 317278.64 Tons Fines: 237887.43 Tons ROM: 555166.07 Tons (i.e. 0.55 Million Tons).
iii	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 10um 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.	Four nos. of ambient air quality monitoring stations have been established considering the topographical features and meteorological data. Regular air & water quality monitoring is being done on quarterly basis and results are being submitted to State Pollution Control Board and other statutory authorities.
iv	Data on ambient air quality RSPM (Particulate matter with size less than 10um i.e., PM10 ) & NOx should be regularly submitted to the Ministry of Environment and Forests including its Regional office located at Bhubaneswar and the State Pollution Control Board/Central Pollution Control Board once in six months.	Ambient air quality monitoring data is being submitted to MoEF&CC, New Delhi and Regional Office, Ranchi along with the compliance reports. Air Quality report for the period April, 2017 to September, 2017 is placed as <b>Annexure – 6</b> . Air quality data is also being submitted to Jharkhand State Pollution Control Board and Central Pollution Control Board.
v	Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points should be provided and properly maintained.	To minimize fugitive dust emissions Water spraying on haul roads, loading and unloading and at transfer points are being done regularly. Fixed water sprayers on main haul road have also been provided. Photograph showing the water sprinkling arrangements and Trucks Covered with Tarpaulin Sheet during transportation are placed in <b>Annexure- 7</b> .

Sl. No	Condition	Compliance Status as on Sept'2017																								
vi	Measures should be taken for control of noise levels below 85 dB(A) in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs/muffs.	<p>Workers engaged in operations of HEMM are provided with ear plugs. The Range of noise level during April'17 to September'17 is as follows</p> <table border="1"> <thead> <tr> <th>S. No.</th><th>Location</th><th>Observed Noise level in dB(A)</th></tr> </thead> <tbody> <tr> <td>1</td><td>Near GM Office</td><td>55.6 to 56.8</td></tr> <tr> <td>2</td><td>Near Chiria Hospital</td><td>47.2 to 48.2</td></tr> <tr> <td>3</td><td>Near Mines canteen</td><td>65.3 to 71.6</td></tr> <tr> <td>4</td><td>Near Mining weigh bridge</td><td>62.8 to 74.1</td></tr> <tr> <td>5</td><td>Near Sub-grade dump</td><td>61.3 to 69.5</td></tr> <tr> <td>6</td><td>Near Ankuwa Chawk</td><td>51.9 to 52.3</td></tr> <tr> <td>7</td><td>Near Railway Siding</td><td>69.8 to 72.5</td></tr> </tbody> </table> <p>Measured noise levels in and around the mines is placed in <b>Annexure – 8</b>.</p>	S. No.	Location	Observed Noise level in dB(A)	1	Near GM Office	55.6 to 56.8	2	Near Chiria Hospital	47.2 to 48.2	3	Near Mines canteen	65.3 to 71.6	4	Near Mining weigh bridge	62.8 to 74.1	5	Near Sub-grade dump	61.3 to 69.5	6	Near Ankuwa Chawk	51.9 to 52.3	7	Near Railway Siding	69.8 to 72.5
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vii	Industrial waste water (Workshop and waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422(E) dated 19 <sup>th</sup> May, 1993 and 31 <sup>st</sup> December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	<p>Since 1998, the mine is operated through Composite Mining contractor and all the HEMM and equipment were deployed by the contractor. Most of maintenance jobs are done at their work shop at Rourkela/Manoharpur. However, proposal for construction of vehicle washing &amp; Oil grease traps at Chiria for light vehicles was approved. Construction will be completed before 31.12.2017.</p>																								
viii	Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.	<p>Dust masks are provided to all employees engaged in dust prone areas. 48 employees have undergone training on safety &amp; health aspects during during 1<sup>st</sup> half of 17-18. 440 employees have undergone occupational health surveillance program during 1<sup>st</sup> half of 17-18.</p>																								

Sl. No	Condition	Compliance Status as on Sept'2017												
ix	A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive who will report directly to the Head of the Organization.	<p>A full-fledged Environment Management Cell (EMC) has been established to look after environment aspects headed by an experienced engineer with more than 10 years experience in the field of environment in the rank of Sr. Manager who directly reports Head of Mines. He is further assisted by one more experienced officer with a qualified M-Tech in Environmental Engineering for environment management at Mines.</p> <p>Name, designation &amp; qualification of members of Environment management cell.</p> <table><tr><th>Sl. No</th><th>Name</th><th>Designation</th><th>Qualification</th></tr><tr><td>1</td><td>Sri S S Rao</td><td>Sr. Manager (Mining)</td><td>AMIE (Mining)</td></tr><tr><td>2</td><td>Sri AnupamNaik</td><td>Dy. Manager (Environment)</td><td>M.Tech (Environment)</td></tr></table> <p>In addition to the EMC at Mines level an Environment &amp; lease department at our head quarter i.e. Raw Materials Division, Kolkata headed by a qualified person (M Tech in Environmental Engineering) and experience environmental engineers who facilitate all the RMD mines including MOM, Chiria mines in implementation and maintained of pollution control measures.</p> <p>Further two senior and experienced persons in the fields of Forest &amp; Environment have been engaged by SAIL as advisors for guiding SAIL mines in management of Environment &amp; Forest.</p>	Sl. No	Name	Designation	Qualification	1	Sri S S Rao	Sr. Manager (Mining)	AMIE (Mining)	2	Sri AnupamNaik	Dy. Manager (Environment)	M.Tech (Environment)
Sl. No	Name	Designation	Qualification											
1	Sri S S Rao	Sr. Manager (Mining)	AMIE (Mining)											
2	Sri AnupamNaik	Dy. Manager (Environment)	M.Tech (Environment)											
x	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 of Environment and Forests and its Regional Office located at Bhubaneswar.	<p>There will be separate budget for Environment &amp; Lease department. The allocated budget will be exclusively used for Environment &amp; Lease expenses only. Year wise expenditure from 2013 on Environmental protection measures is as furnished below,</p> <table><tr><th>Year</th><th>Approximate Expenditure</th></tr><tr><td>2013-14</td><td>42.00 Lakhs</td></tr><tr><td>2014-15</td><td>25.70 Lakhs</td></tr><tr><td>2015-16</td><td>44.60 Lakhs</td></tr><tr><td>2016-17</td><td>53.02 Lakhs</td></tr></table>	Year	Approximate Expenditure	2013-14	42.00 Lakhs	2014-15	25.70 Lakhs	2015-16	44.60 Lakhs	2016-17	53.02 Lakhs		
Year	Approximate Expenditure													
2013-14	42.00 Lakhs													
2014-15	25.70 Lakhs													
2015-16	44.60 Lakhs													
2016-17	53.02 Lakhs													
xi	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	<p>This old mine started operation in the year 1991. Hence start of land development not Applicable. However, the copy of the Environmental Clearance has been sent to the Regional Office, MoEF, Ranchi for kind information.</p>												

Sl. No	Condition	Compliance Status as on Sept'2017
	concerned authorities and the date of start of land development work.	
xii	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.	Full co-operation is extended to the officers of the Regional Office, MoEF & CC, Ranchi, by furnishing the requisite data / information / monitoring reports.
xiii	The project proponent shall submit six monthly reports on the status of compliance of the stipulated EC 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 the State Pollution Control Board. The proponent shall upload the status of compliance of the EC 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 & Forests, Bhubaneswar, the respective Zonal Office of Central Pollution Control Board and State Pollution Control Board.	<p>Six monthly compliance reports on the status of implementation of environmental safeguards are being submitted to MoEF&amp;CC, New Delhi, Regional Office – MoEF&amp;CC, Ranchi, Central Pollution Control Board and State Pollution Control Board.</p> <p>Copy of the compliance report including environmental quality data is being uploaded to the SAIL web site i.e. <b>www.sail.co.on</b>.</p>
xiv	A copy of the clearance letter shall be sent by the proponent to concerned panchayat, Zila Parisad/Municipal Corporation, 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.	The copy of Clearance letter was notified in the public places. The clearance letter has been put on the Company website i.e. <b>www.sail.co.on</b> .

Sl. No	Condition	Compliance Status as on Sept'2017
xv	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.	-
xvi	The environmental statement for each financial year ending 31 <sup>st</sup> 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 Regional office of the Ministry of Environment and Forests, Bhubaneswar by e-mail.	Environmental Statement for the financial year 2016-17 ending 31 <sup>st</sup> March, 2017 has been submitted to the Jharkhand State Pollution Control Board vide reference No: MOM/PC/ 6/37, dated: 02-05-2017.
xvii	The project authorities should advertise at least in two local newspapers of the District or State in 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 <a href="http://envfor.nic.in">http://envfor.nic.in</a> and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar.	Advertisement was given in two local newspapers Hindustan Times (English) and Dainik Jagaran (Local Language Hindi) within 7 days of the issue of the environmental clearance for the project.

  
 12.11.17  
 General Manager (Mines)  
 Manoharpur Ore Mines



## Annexure-1

# Compliance Status of CTO for Dhobil Mining lease

## Annexure-1

### Compliance Status of CTO for Dhobil Mining lease

S. No.	A. General Conditions:					Compliance Status
1.	That the occupier shall comply with all conditions of EC, Ref No. J-11015/251/2009-IA.II(M) Dated 24/01/2012, CTE, Ref No. 1396, and dated 18/05/2012, previous CTO, Ref No. 2016/179 dated 07/05/2015 and shall submit report to this effect with supporting documents.					Complied. The conditions laid down in EC accorded vide ref. no. J-11015/251/209-IA.II(M) dated 24.01.2012 issued by MoEF, Govt. of India, CTE and CTO are being complied and status reports are being submitted at MOEF &CC and JSPCB at specified intervals.
2.	That, the occupier shall maintain the National ambient air quality standard given below:					Complied. The ambient air quality is being regularly monitoring and quality maintained within the prescribed standard.
	Sl.No	Pollutant	Time Weighted Average	Industrial Residential, Rural and Other Area	Connection in Ambient Air Ecologically sensitive Area (notified by Central Govt.)	
	(1)	(2)	(3)	(4)	(5)	
	1	Sulphur Dioxide (so <sub>2</sub> ), ug/m <sup>3</sup>	Annual 24 hour	50 80	20 80	
	2	Nitrogen Dioxide (NO <sub>2</sub> ), ug/m <sup>3</sup>	Annual 24 hour	40 80	30 80	
	3	Particulate Matter(size less than 10 um) or PM <sub>2.5</sub> , ug/m <sup>3</sup>	Annual 24 hour	60 100	60 100	
	4	Particulate Matter(size less than 2.5	Annual 24 hour	40 60	40 60	

		um) or PM2.5, ug/m <sup>3</sup>				
	5	Ozone)O3), ug/m <sup>3</sup>	8 hours 1 hour	100 180	100 180	
	6	Lead (Pb) ug/m <sup>3</sup>	Annual 24 hour	0.50 1.0	0.50 1.0	
	7	Carbon Monoxide (CO) mg/m <sup>3</sup>	8 hours 1 hours	02 04	02 04	
	8	Ammonia (NH3) ug/m <sup>3</sup>	Annual 24 hours	100 400	100 400	
	9	Benzene (C6H6) ug/m <sup>3</sup>	Annual	05	05	
	10	Benzo(a) Pyrene(BaP) Particulate Phase only ug/m <sup>3</sup>	Annual	01	01	
	11	Aresenic (As)	Annual	06	06	
	12	Nikel (Ni) ug/m <sup>3</sup>	Annual	20	20	
	Note: Serial No. 1 to 4 – Mandatory Serial no. 5 to 12 As applicable for specific type of industry.					
3	That the occupiershall maintain the emission Quality within the standard and the quantity, as follows.					Complied.
	S N	Parameter		Standard		
	1	Particulate Matter		150 mg/ Nm <sup>3</sup>		
4	That, the occupier shall keep process effluent in close-circuit and the quality of effluent from other sources in conformity with the standard(s) and the discharge quantity as below:					The effluent discharge quality is being maintained within the prescribed standard.
	S N	Parameter		Standard		
	1	Total Suspended Solids		100 mg/L		
	2	BOD		30 mg/L		
	3	COD		250 mg/L		
	4	Oil & Grease		10 mg/L		

5	That the occupier shall dispose of solid wastes as follows:			<p>The main solid waste generated from mining operations is OB &amp; Waste which is dumped in the yard demarcated in the approved mining plan and leveled properly. Terracing, drains around the dump control surface runoff.</p> <p>The quantity of used oil and batteries is very negligible. However used oil stored temporarily stored in sealed drums for auction to registered recycler.</p>
	Sl.No	Waste Type	Mode of Disposal	
	1	Hazardous Carbonaceous Wastes	On Co-processing in high temperature furnaces or kilns	
	2	Hazardous Non-Carbonaceous Wastes	In TSDF	
	3	Non—Carbonaceous Non-Hazardous solid wastes/Mine Over Burden	As a substitute of Soil or Mineral	
6	That the occupier shall keep D.G Sets (s) within acoustic enclosure (s) and shall keep the height (s) of exhaust pipes (s) as per Central Pollution Control Board norm.			Complied.
7	That the occupier shall create and maintain Central Ground Water Board/State Ground Water Directorate approved system of rain water harvesting-cum-ground water recharge and submit the photographic view of the structures within a month.			Report of Rain Water harvesting prepared by M/s KRG Rainwater Foundation, Chennai for mining leases and township of Manoharpur Ore Mines. Prioritizing the approved rainwater harvesting schemes for implementation in phased manner with time schedules. As per the recommendations Rain water harvesting-cum-ground water recharge is under process of construction.
8.	That the occupier shall grow and maintain greenery of the project in the periphery and other available spaces and shall continue enhancing its plant density and biodiversity.			Complied. In addition to maintain earlier plantation, avenue plantation is being carried out every year.
9.	That, the occupier shall submit environmental; statement with supporting stoichiometric calculations analyses reports, every year latest by 30 <sup>th</sup> September of the next financial year.			Environmental Statement for the financial year 2016-17 ending 31 <sup>st</sup> March, 2017 has been submitted to the Jharkhand State Pollution Control Board vide reference No: MOM/PC/ 6/37, dated: 02-05-2017.

10.	That the occupier shall submit report(s) duly monitored and issued by an NABL accredited/ISO 9001:2008 and OHSAS 18001:2007 certified laboratory in ;compliance sub-para (2), (3), (4) and (5) of paragraph 3 of this CTO yearly at required periodicity.	Complied. Regular monitoring of the desired parameters by JSPCB on quarterly basis
11.	That, this CTO is valid subjected to the validity of mining Lease/Mining Plan/ecofriendly/Environmental Clearance, if applicable. In case of no renewal of Mining Lease/Mining Plan, this consent shall be treated as revoked automatically.	Noted.
12	That, this CTO is issued from the environmental angle only and does not absolve the occupier from other statutory obligations prescribed under another law or any other instrument in force. The sole and complete responsibility to comply with these conditions laid down in all other laws for the time- being in force, rests with the industry/unit/ Occupier	Noted.
13	That, this CTO shall not in any way, adversely affect or jeopardize the legal proceeding, if any, instituted in the past or that could be, instituted against you by the State Board for violation or the provisions of the Act or the Rules made there under.	Noted
14	That, the occupier shall comply with all applicable provisions of the water (Prevention & Control of Pollution Act, 1974 ; the water (Prevention & Control of Pollution ) CessAct1977; the Air (prevention and Control of Pollution) Act, 1981; and the Environment (Protection) Act, 1986 and Rules made there under.	Noted

S. No.	Specific Conditions:	Compliance Status
i.	That, the occupier shall install comprehensive cover(s) over stock yard(s) material loading & unloading points, etc. and install systems of dust containment cum cleaning as per CPCB text(s).	Ore Transport vehicles are covered with a tarpaulin sheets to avoid fugitive dust emission. Action is being taken for the installation of closed conveyor system for evacuation of material from mine to processing plant.
ii.	That, the occupier shall do mining in broken up area 29.411 hectares only and due approval from competent authority shall be obtained, if required.	Mining operation were carried out within the broken area of 29.411 Ha as per the IBM Approved Mining Scheme.

iii.	That, the over burden dump shall be made in accordance with conditions imposed in Environmental Clearance.	Complied. The Over burden generated from mining operations is dumped in the yard demarcated in the approved mining plan and leveled properly. Terracing, drains around the dump control surface runoff.
iv.	That, the occupier shall submit a copy of six monthly report regarding compliance of conditions imposed in Environmental Clearance to Regional Office, MOEF, Govt. of India, Ranchi under intimation to the Board Head Quarter.	Complied. Six monthly Compliance Status is being submitted to the Ministry of Environment & Forests and ClimateChange its Regional Office located at Ranchi.
v.	That, the mining operation shall be restricted to above the ground water table and it should be not intersect the ground water table.	Complied. Water table level at mining lease area is about 400 m AMSL and present working depth of the mine is 638 m AMSL and ultimate working depth of the mine is 486. Hence there is no intersecting of Mine workings with the ground water table.
vi.	That, the top soil, if any shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long. The top soil shall be used for land reclamation and plantation.	Complied. At present, the mining operations are being carried out within the existing broken area and hence no top soil is generated during this period. If any top soil encountered it will be stored separately and used for reclamation & plantation purpose.
vii.	That, the occupier shall do blasting operation only during the day time.	1. Blasting is being done only in day time in specified time i.e. 4 – 4.30 PM. 2 Controlled blasting with slurry explosives and NONEL detonators is being done to minimize ground vibrations and to arrest fly rocks & boulders.
viii.	That, the occupier shall do sprinkling of water on haul road and dusty areas.	To minimize fugitive dust emissions Water spraying on haul roads, loading and unloading and at transfer points are being done regularly. Fixed water sprayers on main haul road have also been provided.

ix.	That, the occupier shall reclaim the mined out areas after mining activities and plantation shall be done at the reclaimed site.	At present, the mining operations are being carried out within the existing broken area and hence no reclamation activity is carried out. After the excavation of material, the plantations will be established to reclaim the site.
x.	That the transportation shall be done through covered vehicle to avoid fugitive dust emission.	All vehicles are covered with Tarpaulin cover to arrest the fugitive dust emission.
xi.	That, the occupier shall construct garland drain, setting tanks and check dams at appropriate places to prevent runoff water and flow of sediments into the HamsadagaarNalla the Koina river and other water bodies and submit photographs to the Board Head Quarter.	Retaining wall, garland drain and check dams are provided to prevent runoff water and flow of sediments into the HamsadagaraNalla the Koina river and other water bodies. Photographs showing Retaining wall ,Garland drain and check Dam is placed at Annexure-3.
xii.	That, the occupier shall construct ETP for workshop.	Oil & Grease traps have been provided to treat effluent from the workshop. As presently there is no ore washing plant, no effluent generation from processing ore at the mine.
xiii.	That, the CTO will be affected to the extent due to the final order in WP(c) No-5642 of 2014.	Noted.
xiv.	That, the test reports in compliance of conditions (2) to (5) shall be of NABL accredited/ISO 9001:2008 and OHSAS 18001:2007 certified laboratory which is not owned or controlled by the PP.	Noted.
xv	That the occupier shall submit applications for renewal of consent under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and under section 21 of the Air (Prevention & Control of Pollution) Act, 1981 again 120 days prior to the date of expiry of this consent i.e. 01.07.2017 to 30.06.2022, with requisite fee and documents showing compliance of all of the above conditions.	Noted.

## Annexure-2

### Photographs showing the Check Dam and Retaining Wall



### Annexure - 3

#### GROUND WATER LEVEL MEASUREMENTS & QUALITY

#### A. Ground Water levels in and around the Mines

Location ID	Location of Open Wells	Water level below the Ground Surface (in meters)	
		Pre-monsoon (May, 2017)	Monsoon (August, 2017)
G1	Adjacent to community centre at Anqua	7.55	4.40
G2	Opposite to community centre at Anqua	7.70	4.87
G3	Near Anqua Model Steel Village Gate	2.80	2.22
G4	Siva Mandir	3.90	3.80
G5	Near CNI Church	8.10	5.90
G6	Near Bishra Chowk	5.60	1.95

Sl. No.	Location of Piezometer	Water level below the Ground Surface (in meters)	
		Pre-monsoon (May, 2017)	Monsoon (August, 2017)
1	Chiria Village	4.40	3.70
2	Dhobil village	3.70	3.00

#### B. Ground Water Quality in and around the Mines

Date of sampling:		19.05.2017 (Pre-monsoon)						
S. No.	Parameters	Unit	G 1	G 2	G 3	G 4	G 5	G 6
1	pH	-	7.07	7.02	6.98	6.89	6.88	7.09
2	Temperature	°C	32.90	32.50	32.80	32.30	32.30	32.20
3	Turbidity	NTU	3.66	2.62	1.03	1.37	6.40	5.58
4	Conductivity	uS/cm	340.00	329.00	192.00	304.00	351.00	254.00
5	DO	mg/l	5.02	6.35	6.25	6.02	5.90	7.18
6	TDS	mg/l	140.00	148.00	86.20	126.00	158.00	105.10
7	TSS	mg/l	18.20	15.60	11.30	21.50	45.80	25.30

Date of sampling:		28.08.2017 (Monsoon)						
S. No.	Parameters	Unit	G 1	G 2	G 3	G 4	G 5	G 6
1	pH	-	6.98	7.05	7.03	6.95	6.84	7.15
2	Temperature	°C	28.7	28.6	28.7	28.5	28.6	28.4
3	Turbidity	NTU	4.03	3.65	2.50	1.85	6.70	5.10
4	Conductivity	uS/cm	346.60	366.70	266.30	302.22	382.22	346.50
5	DO	mg/l	6.05	6.40	6.50	6.60	6.20	7.10
6	TDS	mg/l	156.00	165.00	120.00	136.00	172.00	115.00
7	TSS	mg/l	22.50	18.60	13.30	25.60	60.80	28.90





1. Piezometer at Dhobil Village



2. Piezometer at Dhobil Village

**Annexure-4****WATER QUALITY OF HAMSADAGARA NALLA  
(Period: April' 2017 to September'2017)**

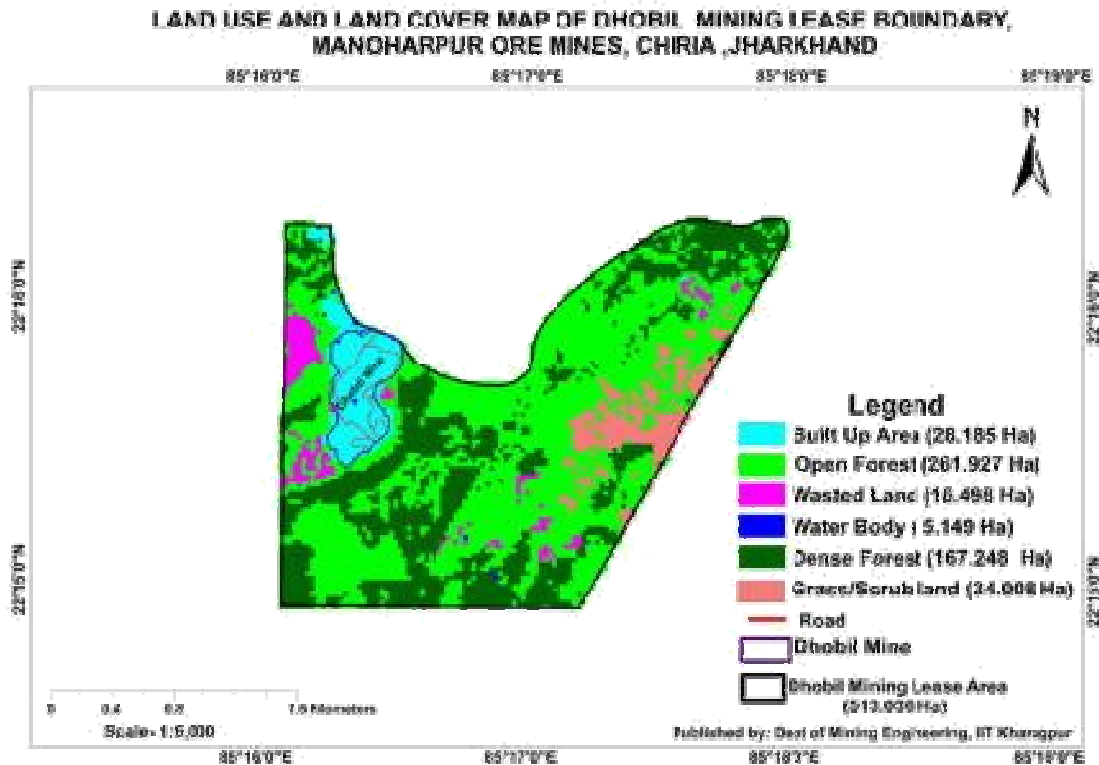
Date of Sampling		18.05.2017 (Pre-monsoon)		
S. No	Parameter	Unit	Hamsadagara Nalla	
			Upstream of Mines	Downstream of Mines
1	pH	-	7.14	7.18
2	Temperature	°C	32.60	32.20
3	Turbidity	NTU	7.92	6.60
4	Conductivity	uS/cm	146.70	150.50
5	Dissolved Oxygen	mg/l	4.94	6.31
6	Total Dissolved Solids	mg/l	59.90	61.90
7	Total Suspended Solids	mg/l	26.80	23.30
8	Total Solids	mg/l	86.70	85.20

Date of Sampling		24.08.2017 (Monsoon)		
S. No	Parameter	Unit	Hamsadagara Nalla	
			Upstream of Mines	Downstream of Mines
1	pH	-	7.89	7.83
2	Temperature	°C	29.40	29.10
3	Turbidity	NTU	6.20	6.10
4	Conductivity	uS/cm	152.00	146.00
5	Dissolved Oxygen	mg/l	6.57	7.04
6	Total Dissolved Solids	mg/l	76.00	73.00
7	Total Suspended Solids	mg/l	19.00	4.00
8	Total Solids	mg/l	95.00	77.00

## Annexure- 5

### Dhobil ore mining lease area land use and land cover:

Dhobil ore mining lease area (513.036 ha) is also classified into the six classes. The distribution of areas are dense forest (167.248 ha), open forest (261.927 ha), water bodies (5.149 ha), scrub land or grass (34.008 ha), barren land/waste land (16.498 ha) and built-up (28.185 ha) shown in **Figure-1**



**Figure: 1.** Land use Land cover map of Dhobil ore mining lease area

Accuracy assessment was carried out using 150 points, 100 point from field data and 50 points existing topographic maps dated, 2005 and land cover map dated 2005 and 2010 (Bhuvan ISRO). Then location of the 150 points was chosen using random stratified method to represent different land cover classes of the area. The land cover mapping of the images, ancillary data and the result of visual interpretation was integrated with the classification result using GIS in order to improve the classification accuracy of the classified image. The summary of the land use land cover classifications are shown in the **Table 2**.

**Table 2: Land use land cover classifications (2014) of Dhobil Mining Lease of Manoharpur Ore Mines**

<b>LU/LC classes</b>	<b>Dhobil Ore mining lease Area (ha)</b>
Built-up Land	28.185
Scrub land or grass	34.008
Dense forest	167.248
Open Forest	261.927
Water body	5.149
Wasted land	16.498
<b>Total Area (ha)</b>	<b>513.036</b>



## Annexure- 6

**AMBIENT AIR QUALITY**  
**(Period: April' 2017 to September'2017)**

Sampling Period		Quarter – 1, 2017-18		
S. No.	Location	RSPM PM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )
1	Near Dhobil Mines Canteen	94.76	6.3	13.1
2	Near GM Office	82.30	4.5	10.3
3	Near Chiria Hospital	65.85	5.3	10.9
4	Near Ankuwa Chowk	68.72	4.4	10.4
5	Near Railway Siding	96.75	5.8	12.8
Norm as per NAAQS		100	80	80

Sampling Period		Quarter – 2, 2017-18		
S. No.	Location	RSPM PM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )
1	Near Dhobil Mines Canteen	38	9	13
2	Near GM Office	32	6	8
3	Near Chiria Hospital	30	BDL	9
4	Near Railway Siding	34	8	11
Norm as per NAAQS		100	80	80





**Fixed water sprayers have been provided on main haul road**



**Water spraying on haul roads**



**Trucks Covered with Tarpalin Sheet during transportation**

**Annexure- 8**

**NOISE QUALITY REPORT**  
**(Period: April' 2017 to September'2017)**

Period of Sampling		Quarter – 1, 2017-18	
S. No.	Location	Observed Noise level in dB(A)	Prescribed Limit (in day time)
1	Near GM Office	55.6	75
2	Near Chiria Hospital	48.2	50
3	Near Mines canteen	71.6	75
4	Near Mining weigh bridge	74.1	75
5	Near Sub-grade dump	69.5	75
6	Near Ankuwa Chowk	52.3	55
7	Near Railway Siding	69.8	75

Date of Sampling		Quarter – 2, 2017-18	
S. No.	Location	Observed Noise level in dB(A)	Prescribed Limit (in day time)
1	Near GM Office	56.8	75
2	Near Chiria Hospital	47.2	50
3	Near Mines canteen	65.3	75
4	Near Mining weigh bridge	62.8	75
5	Near Sub-grade dump	61.3	75
6	Near Ankuwa Chowk	51.9	55
7	Near Railway Siding	72.5	75