

एनएमडीसी लिमिटेड

(भारत सरकार का उद्यम)

NMDC Limited

(A GOVT. OF INDIA ENTERPRISE)



पंजीकृत कार्यालय : 'खनिज भवन', 10-3-311/ए,
कैसल हिल्स, मासाब टैंक, हैदराबाद - 500 173.

Regd. Office : 'Khanij Bhavan' 10-3-311/A,
Castle Hills, Masab Tank, Hyderabad-500 173.

ENV/KDL/DEP-14/11C/SMPR/2015/3417

Dated: 10.12.2015

Additional Director (Scientific)
Govt. of India
Ministry of Environment and Forest
Regional Office, Western Region,
Kendriya Paryavaran Bhavan,
Link Road No.3, Ravi Shankar Nagar,
Bhopal - 462 016.

Sub: Six Monthly Progress Report (April' 2015 to September' 2015) on Environmental Compliance in respect of Bailadila Iron Ore Project, Deposit - 14/11C Kirandul of NMDC Ltd, South Bastar, Dantewada, Chhattisgarh.


Ref: Environmental Clearance letter no.J-11015/483/2007-IA.II (M) dated 11/09/2007 received from MoEF, New Delhi.

Sir,

With reference to the above, please find enclosed herewith Six Monthly Progress Report for the period April' 2015 to September' 2015 on Environmental Compliance in respect of Bailadila Iron Ore Project, Deposit - 14/11C Kirandul of NMDC Ltd, South Bastar, Dantewada, Chhattisgarh.

Thanking you,

Yours faithfully,


(M. Jayapal Reddy) 10/12/15
JGM (Env)

Encl: As above.

**TERMS & CONDITIONS
OF
ENVIRONMENTAL CLEARANCE OF DEPOSIT 14/11C
GRANTED BY MoEF, NEW DELHI**

Letter No. J-11015/483/2007-IA.II (M)

New Delhi, Dated 11.09.2007

PERIOD: APRIL'2015 to SEPTEMBER'2015

A.SPECIFIC CONDITIONS

Sl.No.	COMPLIANCE CONDITIONS	STATUS				
i	Appropriate management of slime shall be undertaken to prevent pollution of surface water bodies. As per action plan submitted to the Ministry of Environment & Forests for utilization of slime including additional slime to be generated due to proposed expansion, the slime shall be utilized for pellets manufacturing after beneficiation.	<i>The mitigative measures are being taken to prevent the pollution of surface water bodies. Currently dry screening is being adopted.</i>				
ii	Detailed report on desilting of tailing dams and management of silt shall be submitted to the Ministry Environment & Forests at regular interval.	<i>A quantity of 35,337cu.m. of desilting has been carried out from tailing dam during the period from April 2015 to September 2015. Details are given in Annexure-I.</i>				
iii	Assessment of erosion potential and sedimentation control plan shall be carried out and submitted to the Ministry.	<p>1. <i>Soil and water conservation works amounting to Rs. 141.01 lakhs were carried out through State Forest Department in RF Compartment Nos.1845, 1850, 1852, 1853, 1858, 1862, 1863, 1865, 1867, 1872, 1873, 1874, 1875, 1888, 1889, 1890.</i></p> <p>2. <i>In addition to the above, Forest department has carried out assessment of erosion potential, sedimentation control plan and conservation of water & soil in an area of 4325.762 ha. in three phases as given below –</i></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td style="text-align: center;">Phase-1</td> <td><i>Survey/ Demarcation/ Upchar map/ preparation of project report</i></td> </tr> <tr> <td style="text-align: center;">Phase-2</td> <td><i>Soil Conservation work -</i> <ol style="list-style-type: none"> 1. <i>Contour trench construction (size-3 m x0.3 m x0.3m)</i> 2. <i>Contour trench construction (size – 3 m x0.45 m x0.45 m)</i> </td> </tr> </tbody> </table>	Phase-1	<i>Survey/ Demarcation/ Upchar map/ preparation of project report</i>	Phase-2	<i>Soil Conservation work -</i> <ol style="list-style-type: none"> 1. <i>Contour trench construction (size-3 m x0.3 m x0.3m)</i> 2. <i>Contour trench construction (size – 3 m x0.45 m x0.45 m)</i>
Phase-1	<i>Survey/ Demarcation/ Upchar map/ preparation of project report</i>					
Phase-2	<i>Soil Conservation work -</i> <ol style="list-style-type: none"> 1. <i>Contour trench construction (size-3 m x0.3 m x0.3m)</i> 2. <i>Contour trench construction (size – 3 m x0.45 m x0.45 m)</i> 					

Sl.No.	COMPLIANCE CONDITIONS	STATUS	
		Phase-3	<p>3. Check dam construction with soil/ boulders</p> <p>1. Repairing of Contour trench and check dam constructed during 1st phase</p> <p>2. Contour trench (Seeding work including seed purchase after half filling and in check dam)</p>
<p><i>The above works will be carried out in 10 RF compartments in Kodonar, Gumiyapal and Purangal of Bachel Forest Range, at a cost of Rs.100.35 lakhs.</i></p> <p>3. <i>Also a work order has been given to State Forest Department for carrying out soil conservation works in Paika Nallah and other areas downstream of mine lease areas. The details of scope of the work are as follows:</i></p> <ul style="list-style-type: none"> • <i>Paika nalla bed cleaning work over a length of 492m in RF Compartment no. 1852</i> • <i>Construction of buttress wall of length 500m over R.F. Compartment no. 1850, 1852</i> • <i>Construction of Retaining wall on left bank of the Paika nalla over a length of 240m</i> • <i>Construction of Retaining wall on right bank of Paika nalla over a length of 240m</i> • <i>Construction of Check Dam over Paika nalla in RF Compartment no. 1850, 1852</i> <p><i>Soil and Water Conservation works –</i></p> <ul style="list-style-type: none"> • <i>Soil – water conservation works over protected forest compartment no.s – 1712, 1699,1651,1650,1697,1695,1694,1687 covering a total area of 1918.137 Hectares</i> 			

Sl.No.	COMPLIANCE CONDITIONS	STATUS
		<ul style="list-style-type: none"> • Construction of Check Bunds (20 no.s) over Malangir Nallah (Length - 10 mtr) • Construction of Check Bunds (15 no.s) over Malangir Sahayak (Length - 5 mtr) • Construction of Check Bunds (20 no.s) over Madadi Nalla (Length - 10 mtr) • Construction of Check Bunds (13 no.s) over Madadi Sahayak Nallah (Length -5 mtr) • Construction of Check Bunds (20 no.s) over Perpa Nallah (Length - 10mtr) • Construction of Check Bunds (17 no.s) over Perpa Sahayak Nalla (Length - 5mtr)
iv	<p>Conceptual mining plan for every five year for the life of the mine shall be submitted to the Ministry for record. Water bodies shall be developed and utilized to develop pisci-culture by organizing fishermen cooperative society with the land users and the poorer section (especially tribals) of area opted as members of such society. Financial assistance in the form of share money and managerial assistance shall be made available so that the members themselves can run the affairs of the society in due course. The project proponent shall arrange marketing tie up so that the society gets fair price of their produce and the profits are equitably shared by the members of the society as regular source of income.</p>	<p><i>Scheme of mining along with the progressive mine closure plan of Deposit No. 14 Mining Lease & Deposit 14 NMZ have been approved vide IBM, Nagpur letter no. 314(3)/2010-MCCM(CZ)/S-21 Nagpur, dated 18.01.2011 and 314(3)/2010-MCCM(CZ)/S-22 Nagpur, dated 18.01.2011 respectively. Scheme of mining along with the progressive mine closure plan of Bailadila Iron project deposit 11 ML over an area of 847.924 Ha. was approved vide IBM, Nagpur letter no. 314(3)/2012-MCCM (CZ)/MS-18 Nagpur, dated 11.03.2013.</i></p> <p><i>Draft modified mining plan for 14 ML and 14 NMZ for the period from 01.04.2015 to 31.03.2020 had been submitted IBM, Nagpur on 19.08.2015. Also</i></p>
v	<p>Top soil/solid waste shall be stacked properly with proper slope with adequate safeguards and shall be backfilled (wherever applicable) for reclamation and rehabilitation of mined out areas.</p>	<p><i>There is no top soil in our mine excavation area and the management of solid wastes, overburden etc. is carried out as per the guidelines of I.B.M.</i></p>
vi	<p>Overburden should be stacked at earmarked dump site (s) only and shall not be kept active for long period. The</p>	<p><i>Waste dump management is carried out as per approved progressive mining scheme by IBM, Regional office, Nagpur</i></p>

Sl.No.	COMPLIANCE CONDITIONS	STATUS
	<p>•maximum height of the dumps shall not exceed 30 m, each stage shall be preferably be of 10 m and the overall slope of the dump shall not exceed 28°. The OB dumps shall be backfilled. In critical areas, use of geo textiles shall be undertaken for stabilization of the dump. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forests on six monthly basis.</p>	
vii	<p>Garland drains shall be constructed to arrest silt and sediment flows from soil, and mineral dumps. The water so collected shall be utilized for watering the mine area, roads, green belt development etc. The drains shall be regularly de-silted particularly after monsoon and maintained properly. Garland drain of appropriate size, gradient and length shall be constructed for both mine pit and for waste dumps 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 setting of silt material. Sedimentation pits should be constructed at the corners of the garland drains and desilted at regular intervals.</p>	<p><i>Buttress walls have been constructed at toe of waste dumps and the same are being maintained to arrest the erosion of soil. Garland drains have been constructed and maintained. A buttress wall of length 150 meters (Bottom Width 4meters, Top width 2meters and Height 3meters) has been constructed during the period from April 2015 to September 2015. In addition to the above existing buttress walls are also regularly maintained.</i></p>
viii	<p>Slope of the mining bench and ultimate pit limit shall be as per the mining scheme approved by Indian Bureau of Mines.</p>	<p><i>Slope of the mining bench and ultimate pit limit are in accordance with the mining scheme approved by Indian Bureau of Mines. The details of the same are –</i></p> <ul style="list-style-type: none"> ▪ <i>Bench height (other than blue dust)- 12m</i> ▪ <i>Bench height (blue dust) – 10 m</i> ▪ <i>Minimum bench width during operation</i>

Sl.No.	COMPLIANCE CONDITIONS	STATUS
		<p>phase – 30m</p> <ul style="list-style-type: none"> ▪ Average pit slope - 45⁰ ▪ Berm width- 12m in hard strata & 20 m in blue dust.
ix	Drilling and blasting (if any) shall be conducted by using dust extractors / wet drilling	<i>Controlled blasting has been ensured to minimize dust generation. Wet drilling is ensured so that dust is suppressed at the point of generation.</i>
x	Greenbelt development shall be carried out considering CPCB guidelines including selection of plant species in consultation with the local DFO/ Agriculture department. Herbs and shrubs shall also form a part of afforestation programme besides tree plantation. Plantation shall be raised in 308.73 ha in the ML area, haul roads OB dump sites, etc. The density of the trees should be around 2500 plants per ha. The company shall involve local people with the help of self help group for plantation programme.	<i>An area of 1214.96 ha. (Within and outside the lease areas) has been developed under greenbelt development. An amount of Rs. Rs. 710.3 lakhs has been spent for plantation of 13, 95, 502 no. of saplings in the above area. Also an amount of Rs. 5.49 crores has been released to Chhattisgarh Rajya Van Vikas Nigam Limited, Raipur for carrying out road side plantation over a length of 50 km under Harihar Chhattisgarh program for the FY 2015-16.</i>
xi	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.	<i>Rainwater harvesting is being carried out into the ponds (4Nos.) for recharging of ground water. In addition to the above, 11nos. of ponds have been constructed in different villages such as Madadi, Cholnar, Perpa, Pirnar, Penta and Lendra.</i>
xii	Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring should be carried out four times in a year – pre monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected may be sent regularly to MoEF, Central Ground Water Authority and Regional Director, Central Ground Water Board.	<p><i>Ground water level and quality is regularly (once in a season throughout the year) monitored through MoEF, approved laboratory (M/s Space Geo Tech, Bangalore.) at 30 different locations around BIOM Kirandul Complex. Regularly ground water report is being submitted to Regional Office, MOEF, Bhopal through head office of NMDC Limited, Hyderabad.</i></p> <p><i>The ground water level & quality monitoring has been carried out for Monsoon Season 2015 at BIOM Kirandul Complex.</i></p> <ul style="list-style-type: none"> • <i>The ground water levels varied from 1.60 to 12.95 meters.</i> • <i>pH varied between 6.0 to 7.1.</i> • <i>Total Dissolved Solids levels varied between 3 to 215 mg/l.</i>

Sl.No.	COMPLIANCE CONDITIONS	STATUS																							
		<ul style="list-style-type: none"> • Total Hardness levels varied between 0.5 to 136 mg/l. • Alkalinity levels varied between 0.5 to 124.00 mg/l. • Fluoride (F) levels varied between 0.05 to 0.53 mg/l. • Fe levels varied between 0.02 to 0.54 mg/l. <p>The higher levels of Fe were observed at two (10) no.s of hand pumps.</p> <p>The higher levels Fe is due to the natural lateritic formation in the area. However the project is taking steps towards the installation of iron removal plants for hand pumps located in villages around the project.</p>																							
xiii	<p>The wastewater from the mine shall be treated to conform to the prescribe standards before discharging into natural stream. The discharged water from the tailing dam shall be regularly monitored and report submitted to the Ministry of Environment & Forests, Central Pollution Control Board and the Chhattisgarh Environment Conservation Board.</p>	<p>Complied with. The discharged water from the tailing dam is monitored in four seasons and the report is submitted to MOEF, CPCB & CECB. The water quality data of the monitoring carried out in summer season 2015 is given below:</p> <table border="1" data-bbox="868 1099 1489 1435"> <thead> <tr> <th colspan="2" data-bbox="868 1099 1187 1211">Treated effluent discharge from Tailing dam</th> <th colspan="2" data-bbox="1187 1099 1489 1211">Down Stream discharge at toe of waste dumps after treatment</th> </tr> </thead> <tbody> <tr> <td data-bbox="868 1211 1034 1279">Suspended solids</td> <td data-bbox="1034 1211 1187 1279">18</td> <td data-bbox="1187 1211 1326 1279">pH</td> <td data-bbox="1326 1211 1489 1279">7.34</td> </tr> <tr> <td data-bbox="868 1279 1034 1346">BOD- 3 Day 27°C</td> <td data-bbox="1034 1279 1187 1346">8</td> <td data-bbox="1187 1279 1326 1346">BOD- 5 Day 25°C</td> <td data-bbox="1326 1279 1489 1346">Nil</td> </tr> <tr> <td data-bbox="868 1346 1034 1379">Oil & grease</td> <td data-bbox="1034 1346 1187 1379">Nil</td> <td data-bbox="1187 1346 1326 1379">-</td> <td data-bbox="1326 1346 1489 1379">-</td> </tr> <tr> <td data-bbox="868 1379 1034 1435">Iron (as Fe⁺²)</td> <td data-bbox="1034 1379 1187 1435">0.41</td> <td data-bbox="1187 1379 1326 1435">Iron as (Fe⁺²)</td> <td data-bbox="1326 1379 1489 1435">0.57</td> </tr> </tbody> </table>				Treated effluent discharge from Tailing dam		Down Stream discharge at toe of waste dumps after treatment		Suspended solids	18	pH	7.34	BOD- 3 Day 27°C	8	BOD- 5 Day 25°C	Nil	Oil & grease	Nil	-	-	Iron (as Fe ⁺²)	0.41	Iron as (Fe ⁺²)	0.57
Treated effluent discharge from Tailing dam		Down Stream discharge at toe of waste dumps after treatment																							
Suspended solids	18	pH	7.34																						
BOD- 3 Day 27°C	8	BOD- 5 Day 25°C	Nil																						
Oil & grease	Nil	-	-																						
Iron (as Fe ⁺²)	0.41	Iron as (Fe ⁺²)	0.57																						
xiv	<p>Prior permission from the competent authority shall be obtained for extraction of ground water if any.</p>	<p>Not Applicable.</p>																							
xv	<p>Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transportation of ores and others shall have valid permissions as prescribed under Central Motor Vehicle Rules, 1989 and its amendments. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. The vehicles transporting ores shall be covered with a tarpaulin or other suitable enclosures so that no dust particles/ fine matters escape</p>	<p>Pollution checking of 138 no.s of light & heavy vehicles of the project has been carried out. Transportation of mineral is being carried out through railway rakes.</p>																							

Sl.No.	COMPLIANCE CONDITIONS	STATUS
	during the course of transportation. No overloading of ores for transportation shall be committed.	
xvi	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.	<i>Noted.</i>

B. GENERAL CONDITIONS:

Sl.No.	COMPLIANCE CONDITIONS	STATUS
i	No change in the mining technology and scope of working shall be made without prior approval of the Ministry of Environment & Forests.	<i>There is no change in the mining technology and scope of mining. It is the same as approved by the Ministry of Environment & Forests (MoEF).</i>
ii	No change in the calendar plan including excavation, quantum of mineral iron ore and waste shall be made.	<i>There is no change in the calendar plan.</i>
iii	Conservation measures for protection of flora and fauna in the core zone & buffer zone shall be drawn up in consultation with the local forest and wildlife department.	<i>A wild life conservation plan has been prepared for Dantewada division and the same has been approved by PCCF (wild life) Raipur with a financial out lay of Rs.15.50 crores (Rupees Fifteen Crores Fifty Lakhs only). The amount has been transferred to CAMPA account on 30.04.2014.</i>
iv	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for RPM, SPM, SO ₂ , NO _x monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	<p><i>Ambient air quality monitoring have been carried out at 15 different locations (fortnightly in 3 seasons other than monsoon) and fugitive dust emissions monitoring (monthly in 3 seasons other than monsoon) is being carried out at 20 different locations by MoEF approved laboratories.</i></p> <p><i>Fugitive Emissions Monitoring is carried out as per MoEF, New Delhi, Notification GSR.809 (E) dated 4.10.2010.</i></p> <p><i>The following are the details of Ambient Air Quality Stations:</i></p> <p>Core Zone:</p> <ol style="list-style-type: none"> 1. Deposit 14-Mine Office 2. Deposit 11C-Mine Office 3. Loading Plant, near CSD, Kirandul

Sl.No.	COMPLIANCE CONDITIONS	STATUS
		<p>4. Between Screening Plant I&II 5. Proposed site for CP-14 (P-plot) . 6. Motor room 203 (Near tunnel mouth) 7. Proposed site for CP-11B</p> <p>Buffer Zone:</p> <p>1. Kodonar Village 2. Perpa Village 3. Kadampal Village 4. Near Malinger Pump House 5. Proposed Site for SP-III 6. DLM Colony 7. Residential Quarters near Millenium Park 8. Ambedkar Bhawan</p>
v	<p>Data on ambient air quality (RPM, SPM, SO₂, NO_x) should be regularly submitted to the Ministry including its Regional Office located at Bhopal and the State Pollution Control Board/ Central Pollution Control Board once in six months.</p>	<p>Data on ambient air quality is regularly submitted to Ministry and Regional Office located at Bhopal, SPCB and CPCB through head office of NMDC Limited, Hyderabad.</p> <p>The air quality data of monitoring carried out in summer season 2015 is given below:</p> <p>Fugitive Dust Emissions:-</p> <ul style="list-style-type: none"> • Total Particulate Matter levels varied between 298 and 428.2 µg/m³. • Sulphur-dioxide levels varied between 10.2 and 14.1 µg/m³. • Nitrogen oxides levels varied between 14.3 and 20.4 µg/m³. <p>Ambient Air Quality:</p> <ul style="list-style-type: none"> • Particulate Matter under 10 microns (PM₁₀) varied between 43.2 and 78.6 µg/m³. • Sulphur-dioxide levels varied between 9.5 and 15.4 µg/m³. • Nitrogen oxides levels varied between 13.6 and 21.4 µg/m³. • Carbon monoxide levels are below detectable limits. • PM2.5 varied between from 19.7-34.2 µg/m³.

Sl.No.	COMPLIANCE CONDITIONS	STATUS
vi	Fugitive dust emissions from all the sources shall be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points should be provided and properly maintained.	<p><i>Various preventive/ mitigative measures have been taken to control fugitive dust generation from all the sources. Following control measures are implemented to control the fugitive dust emissions:</i></p> <ul style="list-style-type: none"> • <i>Dust suppression system at loading plant / stock piles.</i> • <i>The fugitive dust is suppressed by regular water sprinkling on mines haul roads.</i> • <i>Plantation is done around the mining areas, along mine roads and conveyors for arresting fugitive dust.</i>
vii	Measures shall 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><i>Adequate measures have been taken to control the noise levels in working environment and use of PPEs is ensured.</i></p> <p><i>Following control measures are implemented to control the noise levels:</i></p> <ul style="list-style-type: none"> • <i>Deep- hole blasting is restricted to day time.</i> • <i>Proper stemming to prevent blown out of holes.</i> • <i>Regular Maintenance of machinery.</i> • <i>Provision of ear muffs / ear plugs to workers in noise prone zones.</i> • <i>Operator's cabin is safely guarded from noise.</i> • <i>Use of rubber coated screens in screening plants.</i> • <i>Rubber lining at transfer points of conveyors.</i> • <i>Developing greenbelt on the sides of conveyors and crushing plant screening plant and loading plant.</i> • <i>Reducing the exposure time of workers to the higher noise levels.</i> • <i>Ensuring periodical monitoring of noise levels.</i>
viii	Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the	<p><i>One ETP (Capacity 10 KL) has been installed at the hilltop for treatment of effluent coming from auto garage and</i></p>

Sl.No.	COMPLIANCE CONDITIONS	STATUS
	standards prescribed under GSR 422 (IE) dated 19 th May, 1993 and 31 st December, 1993 or as amended from time to time.	<i>analysis of water samples are being carried out in the all four seasons.</i>
ix	Personnel working in dusty area shall be provided with protective respiratory devices and they shall also be imparted with adequate training and information on safety and health aspects.	<i>All Persons working in mines and plants have been provided with PPEs and regular trainings related to Environment, Safety and on Health aspect are being given by Training & Safety Department.</i>
x	Occupational health surveillance program of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed. Records of the health of the workers shall be maintained.	<i>Periodic Medical Examination is ensured for all workers. For the period April 2015 to September 2015, no. of workers of BIOM Kirandul Complex, tested under Periodic Medical Examination is 382.</i>
xi	A Separate Environmental Management Cell with suitable qualified personnel should be set-up under the control of Senior Executive, who will report directly to the Head of the Organization.	<i>A separate Environmental Management Dept. has been established with well qualified and experienced personnel under the control of Jt.GM (Production through DGM (Training Safety & Environment)). The organizational chart of environment department is enclosed as Annexure – II.</i>
xii	The project authorities shall inform to the Regional Office of the Ministry located at Bhopal regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.	<i>Noted.</i>
xiii	The funds earmarked for environment protection measures shall be kept in separate account and shall not be diverted for another purpose. Year wise expenditure shall be reported to the Ministry and its Regional Office located at Bhopal.	<i>For the year 2014-15, an expenditure of Rs.987.74 Lakhs has been incurred for Environmental Protection / Improvement works at BIOM Kirandul Complex. Copy of Environment Statement for the FY 2014-15 is enclosed as Annexure-III.</i>
xiv	The project authorities shall inform to the Regional Office located at Bhopal regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development	<i>Noted.</i>

Sl.No.	COMPLIANCE CONDITIONS	STATUS
	work.	
xv	The Regional Office of this Ministry located at Bhopal shall monitor compliance of the stipulated conditions. The project authorities shall extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data /information/ monitoring reports.	<i>The Project extends its full cooperation to Regional Office by furnishing the requisite data /information/ monitoring reports and also during inspection of Mines, monitoring locations etc.</i>
xvi	A copy of clearance letter will be marked to the concerned Panchayat/ local NGO, if any from whom suggestion/ representation has been received while processing the proposal.	<i>Submitted.</i>
xvii	State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's office/ Tehsildar's Office for 30 days.	<i>Displayed.</i>
xviii	The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of clearance letter informing that the project has been accorded environmental clearance and a copy of 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 Bhopal.	<i>BIOM, Kirandul Complex had published it in two local newspaper Viz-Dainik Bhaskar, Raipur Edition (in Hindi) and Hitavada, Raipur Edition (in English) both on 07.10.2007.</i>

LIST OF ANNEXURES

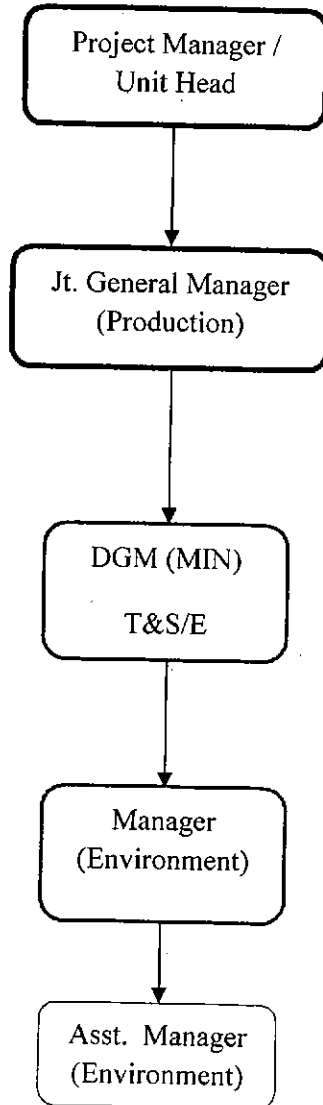
- I. Desilting Details
- II. Organizational Chart of Environment Department at BIOM, Kirandul Complex.
- III. Copy of Environment Statement for FY 2014-15

Annexure-I

A quantity of 35,337 cu.m. of slime has been desilted between April 2015 and September 2015.

Sl. No.	Check Dam/ Tailing Dam/ Nallah	Quantity Desilted (In cu.m)
1.	Downstream Check Dam No. 2,3,4 &5	2240
2.	Ponds at Intake Well	8717
3.	Check Dam No. 3,4 &5	2582
4.	Check Dam No. 7	6935
5.	Check Dam No.8	3628
6.	Check Dam No.9	2766
7.	Check Dam No.6	455
8.	Check Dam No. 2	2081
9.	Kadampal Tailing Dam	3778
10.	PWD Bridge over Kirandul Nallah	2155
Total Desilted		35337

**Organizational Chart
of
Environment Department at BIOM, Kirandul Complex**





एन एम डी सी लिमिटेड

NMDC LIMITED

(भारत सरकार का उद्यम) (A Government of India Enterprises)

बैलाडीला आयरन ओर माइन, किरन्दुल कॉम्प्लेक्स

Bailadila Iron Ore Mine, Kirandul Complex

(आई.एस.ओ. 9001:2000 एवं आई.एस.ओ. - 14001 प्रमाणित एकक) (An ISO - 9001:2000 & ISO - 14001 Certified Unit)

किरन्दुल - 494556, जिला - दक्षिण बस्तर दन्तेवाड़ा (छत्तीसगढ़) भारत, KIRANDUL - Distt. - SOUTH BASTAR DANTEWADA (C.G.) INDIA



0/c
Yr

No. BIOM KDL/Env./808/655/2015

Date: 22.08.2015

To,
The Member Secretary,
Chhattisgarh Environment Conservation Board
Commercial Complex,
Chhattisgarh Housing Board Colony,
Kabir Nagar, Raipur (C.G.) -492099

Sub: Submission of Environment Statement (Form-V)

Sir,

As per the requirement under Environment Protection Act 1986, we are submitting Environment Statement of Deposit- 14/11C i.e. Form-V for the year 2014-15.

Thanking you,

Yours faithfully,

General Manager

CC:

1. Regional Officer,
Chhattisgarh Environment Conservation Board
HIG-5 & 6, Aghanpur Housing Board Colony,
Chitrakot Road, Jagdalpur,
Dist: Bastar
Chhattisgarh.-494005
2. ED (RP)
NMDC Limited
Khanij Bhawan, Masab Tank,
Hyderabad- 500028

हम हिन्दी में पत्राचार का स्वागत करते हैं ।

किरन्दुल फैक्स Kirandul Fax : वित्त Finance: 07857-256335, सामग्री Materials : 07857-256544, कार्मिक Personnel : 07857-255226

पंजीकृत कार्यालय: 10-3-311/, कैसल हिल्स, खनिज भवन, मसाब टैंक, हैदराबाद - 500028
Regd. Office: 10-3-311/A, Castle Hills, Khanij Bhavan, Masab Tank, Hyderabad - 500 028

FORM : V
(SEE RULES -14)

ENVIRONMENT (PROTECTION) SECOND AMENDMENT RULES
1992 ENVIRONMENTAL STATEMENT FOR THE FINANCIAL
YEAR 2014-15 (ENDING WITH 31ST MARCH 2015)

PART - A

i)	Name and address of the owner / Occupier of the Industry Operation or process	General Manager Deposit 14/11C Bailadila Iron Ore Mine, Kirandul Complex, NMDC Limited, Kirandul, Dist.- South Bastar Dantewada (CG) 494556
ii)	Date of Last Environmental Audit Report Submitted.	17.08.2014

PART - B

i)	Water Consumption Cu.m/ day	
	Process	Nil (Water consumption in process is nil as the plant is being operated in dry process)
	Cooling/ Spraying,	1933 Cu.m / day
	Domestic	6479 Cu.m / day

NAME OF PRODUCT	WATER CONSUMPTION PER UNIT OF PRODUCT	
	During the previous Financial Year (2013-2014)	During the Current Financial Year (2014-2015)
Iron Ore (Lump Ore + Fine Ore)	0.078 Cu.m. / Tonne of Product	0.062 Cu.m. / Tonne of Product.

ii)	Raw Material Consumption
-----	--------------------------

NAME OF RAW MATERIAL	NAME OF PRODUCTS	CONSUMPTION OF RAW MATERIAL
No raw material is being used for production of Lump and Fine Ore.		

PART-C

POLLUTION GENERATED (Parameters as specified in the consent issued)

i) Pollutants	Quantity of Pollution Generated	Percent of Variation from Standard with reasons.
a) Water	Monitoring Data of Kadampal Tailing Dam discharge for Summer Season 2015 is enclosed as Annexure-I.	Monitored parameters are well within the GSR-422E Norms.
b) Air	Monitoring Data of Summer Season 2015 is enclosed as Annexure –II.	Well within the prescribed Limit as per CPCB notification Dt: 11/04/1194. Also monitoring was carried out as per MoEF, New Delhi, Notification GSR.809 (E) dated 4.10.2010.

PART – D

HAZARDOUS WASTE

(As Specified Under Hazardous Wastes Management and Handling Rules, 1989 as amended in 2008)

HAZARDOUS WASTE	TOTAL QUANTITY (KL)	
	During the Previous Financial Year (2013-2014)	During the Current Financial Year (2014-2015)
a) From Process	<i>The total used oil/spent oil generated at BIOM Kirandul Complex: 89.16KL</i>	<i>The total used oil/spent oil generated at BIOM Kirandul Complex: 58.76 KL</i>
b) From Pollution Control Facilities	<i>No hazardous materials are being produced.</i>	

PART-E

SOLID WASTE - TOTAL QUANTITY

	DURING THE PREVIOUS FINANCIAL YEAR 2013-14	DURING THE CURRENT FINANCIAL YEAR 2014-15
a) From Process	<i>Deposit-14/11C Slime = Nil</i>	<i>Deposit-14/11C Slime = Nil</i>
b) From Pollution Control Facilities	<i>Tailing dam is the pollution control facility where slimes settled and clear water discharges into the down stream. Hence, there is no generation of pollution and solid waste from Tailing Dam.</i>	
c) Quantity recycled	<i>No Recycling</i>	

PART- F

Please specify the characteristics (In terms of concentration and quantity) of Hazardous as well as Solid and indicate disposal practice adopted for both the categories of waste.

Hazardous Waste	<i>Used / Spent Oil = 58.76 KL</i>
Solid Waste	<i>Deposit-14/11C Excavated Waste Rocks = 24.39 Lakh Tonnes Stocked in Waste Dumps, which is 20.39 % of the Total Excavation.</i>

PART- G

Impact of the Pollution Control Measures on Conservation of Natural Resources and consequently on the cost of production.

To control generation of dust at source dust suppression system has been installed at Deposit-11C crushing plant, Deposit-14 Crushing plant, Down Hill & Loading plant. Dust suppression measures taken in mining areas, and haul roads have also helped in reducing the generation of dust. With this the ambient air quality around the mine and plants, is controlled.

During the year 2014-2015, the Total Expenditure on Environment Pollution Control work at BIOM Kirandul Complex is Rs. 987.74 Lakhs. It works out that for Environment Pollution Control work we spent Rs. 10.37 Per Tonne of Ore produced.

PART - H

Additional Investment Proposal for Environmental Protection including abatement of pollution.

Tentative Budget proposed for BIOM Kirandul Complex 2015-16 is Rs.750 Lakhs.

570

FORM - I

Any other particulars in respect of Environment protection and abatement of pollution

The following expenditure has been incurred towards Environment protection and pollution of abatement at BIOM Kirandul Complex for the year 2014-2015.

S.No.	PARTICULARS	Expenditure Incurred (in Rs. Lakhs)
1.	Desilting of slimes	236.57
2.	Construction/ maintenance of buttress wall / check bunds	49.05
3.	Repairs & maintenance of dam	43.31
4.	Plantation works	546.03
5.	Horticulture works	57.99
6.	Environmental monitoring studies/ consultancy	44.00
7.	ISO audit/ studies	5.59
8.	Others	5.19
TOTAL		987.74


General Manager
BIOM, KIRANDUL COMPLEX

Table No-18
Water Quality Data

Project : NMDC Ltd., BIOM, Deposit 14/11C
Season : Summer 2015
Sampling Date : 22.05.2015

No	Parameter	Unit	WQB14-1	WQB14-2	WQB14-3	WQB14-4	GSR-422E Norms
1	Colour & Odour	Pt-Co	21&OU	24&OU	19&OU	26&OU	-
2	Suspended Solids	mg/l	18	21	14	17	100
3	Particulate size of Suspended Solids	100% are passing	100% are passing	100% are passing	100% are passing	100% are passing	Shall pass 850 µm sieve
4	Dissolved Solids (Inorganic)	mgO ₂ /l	45	52	34	85	-
5	pH	-	6.72	6.83	7.15	7.27	5.5-9.0
6	Temperature	°C	32	32	32	32	5°C above
7	Oil & Grease	mg/l	Nil	Nil	Nil	Nil	10
8	Total residual chloride	mg/l	Nil	Nil	Nil	Nil	1.0
9	Ammonical nitrogen as N	mg/l	0.14	0.31	0.17	0.21	50
10	Total Kjeldahl nitrogen	mg/l	0.5	0.7	0.4	0.6	100
11	Free ammonia as NH ₃	mg/l	Nil	Nil	Nil	Nil	5.0
12	BOD (3 days at 27 °C)	mgO ₂ /l	08	20	10	13	30
13	Chemical Oxygen Demand	mgO ₂ /l	37	45	32	56	250
14	Arsenic as As	mg/l	<0.001	<0.001	<0.001	<0.001	0.2
15	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.01
16	Lead as Pb	mg/l	<0.001	<0.001	<0.001	<0.001	0.01
17	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	2
18	Hexavalent chromium as Cr ⁺⁶	mg/l	<0.001	<0.001	<0.001	<0.001	0.10
19	Total chromium	mg/l	<0.001	<0.001	<0.001	<0.001	2.0
20	Copper as Cu	mg/l	<0.001	<0.001	<0.001	<0.001	3
21	Zinc as Zn	mg/l	0.11	0.16	0.15	0.12	5
22	Selenium as Se	mg/l	<0.001	<0.001	<0.001	<0.001	0.05
23	Nickel as Ni	mg/l	<0.001	<0.001	<0.001	<0.001	3
24	Boron as B	mg/l	<0.001	<0.001	<0.001	<0.001	-
25	Percent Sodium	mg/l	14.3	17.5	15.3	14.7	-
26	Residual Sodium carbonate	mg/l	Nil	Nil	Nil	Nil	-
27	Cyanide as CN	mg/l	Nil	Nil	Nil	Nil	0.2
28	Chloride as Cl	mg/l	19	15	22	17	-
29	Fluoride as F	mg/l	0.6	0.7	0.5	0.4	2
30	Dissolved Phosphates	mg/l	0.20	0.28	0.24	0.19	5.0
31	Sulphates as SO ₄	mg/l	8	11	9	7	-
32	Sulphides as S	mg/l	Nil	Nil	Nil	Nil	2
33	Phenolic Comp.s as C ₆ H ₅ OH	mg/l	Nil	Nil	Nil	Nil	1.0
34	Manganese	mg/l	Nil	Nil	Nil	Nil	2.0
35	Iron as Fe	Mg/l	0.41	0.84	0.56	0.35	3.0
36	Vanadium as V	mg/l	Nil	Nil	Nil	Nil	0.2
37	Nitrate Nitrogen	mg/l	0.28	0.38	0.34	0.30	10

WQB14-1 : Discharge of Spillway water from Kadampal Tailing Dam

WQB14-2 : Influent to Oxidation Pond

WQB14-3 : Effluent from Oxidation pond

WQB14-4 : Influent to Service Center's Effluent Treatment Plant (ETP)

Table No. 1**AMBIENT AIR QUALITY DATA**

Project: NMDC Ltd., Deposit 14/11C, BIOM, Kirandul.

Season: Summer Season 2015

Location : Deposit – 14 Mine Office (AB14-1)Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	12.03.2015	78.6	33.4	15.4	20.5
	21.03.2015	76.4	30.6	14.7	21.4
April 2015	12.04.2015	71.6	30.2	14.8	19.2
	25.04.2015	73.5	31.2	14.1	18.6
May 2015	14.05.2015	75.6	34.2	12.3	16.4
	24.05.2015	72.3	32.5	13.4	17.8
Min.		71.6	30.2	12.3	16.4
Max.		78.6	34.2	15.4	21.4
Mean.		74.7	32.0	14.1	19.0

Note: CO values found to be $< 5 \mu\text{g}/\text{m}^3$ **Table No. 2****Location : Deposit – 11C Mine Office (AB14-2)**Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	13.03.2015	70.5	29.3	14.7	19.1
	26.03.2015	73.5	30.8	14.5	18.7
April 2015	13.04.2015	71.6	31.4	13.8	18.4
	26.04.2015	67.5	28.6	14.1	19.4
May 2015	15.05.2015	72.4	31.7	13.2	17.6
	24.05.2015	74.8	33.5	12.1	16.3
Min.		67.5	28.6	12.1	16.3
Max.		74.8	33.5	14.7	19.4
Mean.		71.7	30.9	13.7	18.3

Note: CO values found to be $< 5 \mu\text{g}/\text{m}^3$

Table No. 3**AMBIENT AIR QUALITY DATA**

Project: NMDC Ltd., Deposit 14/11C, BIOM, Kirandul. Season: Summer Season 2015

Location : Loading Plant near CSD Kirandul (AB14-3)

Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	02.03.2015	68.4	28.5	13.4	17.6
	16.03.2015	63.2	25.4	12.7	16.8
April 2015	02.04.2015	71.2	31.8	12.8	15.5
	16.04.2015	67.5	29.6	13.7	16.2
May 2015	02.05.2015	69.8	30.3	13.2	17.1
	14.05.2015	72.5	31.8	12.6	15.4
Min.		63.2	25.4	12.6	15.4
Max.		72.5	31.8	13.7	17.6
Mean.		68.8	29.6	13.1	16.4

Note: CO values found to be $< 5 \mu\text{g}/\text{m}^3$ **Table No. 4**

Location : Between Screening Plant I & II (AB14-4)

Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	03.03.2015	72.5	31.8	14.7	20.6
	17.03.2015	68.4	30.5	14.2	19.5
April 2015	03.04.2015	69.7	29.4	13.8	18.5
	17.04.2015	71.2	30.8	14.6	19.2
May 2015	04.05.2015	74.5	33.6	12.7	16.3
	15.05.2015	70.8	30.7	13.4	17.8
Min.		68.4	29.4	12.7	16.3
Max.		74.5	33.6	14.7	20.6
Mean.		71.2	31.1	13.9	18.7

Note: CO values found to be $< 5 \mu\text{g}/\text{m}^3$

Table No. 5

AMBIENT AIR QUALITY DATA

Project: NMDC Ltd., Deposit 14/11C, BIOM, Kirandul. Season: Summer Season 2015

Location : Kodenar Village (AB14-5)

Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	04.03.2015	56.3	24.7	13.5	17.6
	18.03.2015	52.4	25.7	12.4	17.1
April 2015	04.04.2015	58.9	26.3	12.7	16.8
	18.04.2015	55.4	23.8	11.5	16.1
May 2015	05.05.2015	57.4	24.1	11.3	15.6
	16.05.2015	60.7	25.4	10.7	15.2
Min.		52.4	23.8	10.7	15.2
Max.		60.7	26.3	13.5	17.6
Mean.		56.9	25.0	12.0	16.4

Note: CO values found to be $< 5 \mu\text{g}/\text{m}^3$

Table No. 6

Location : Perpa Village (AB14-6)

Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	05.03.2015	47.5	20.8	12.3	15.8
	18.03.2015	43.2	19.7	11.8	15.3
April 2015	05.04.2015	49.6	21.7	11.4	14.6
	18.04.2015	51.4	22.6	10.5	14.2
May 2015	07.05.2015	50.7	21.3	10.2	15.4
	17.05.2015	51.8	23.4	9.6	13.6
Min.		43.2	19.7	9.6	13.6
Max.		51.8	23.4	12.3	15.8
Mean.		49.0	21.6	11.0	14.8

Note: CO values found to be $< 5 \mu\text{g}/\text{m}^3$

Table No. 7**AMBIENT AIR QUALITY DATA**

Project: NMDC Ltd., Deposit 14/11C, BIOM, Kirandul. Season: Summer Season 2015

Location : Kadampal Village (AB14-7)

Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	05.03.2015	50.4	22.7	11.2	16.7
	19.03.2015	47.5	20.5	12.4	16.3
April 2015	05.04.2015	51.7	23.4	10.5	15.6
	19.04.2015	49.7	21.4	11.6	16.4
May 2015	08.05.2015	50.8	21.8	11.1	15.3
	18.05.2015	53.7	24.6	10.1	14.7
Min.		47.5	20.5	10.1	14.7
Max.		53.7	24.6	12.4	16.7
Mean.		50.6	22.4	11.2	15.8

Note: CO values found to be $< 5 \mu\text{g}/\text{m}^3$ **Table No. 8**

Location : Near Malangir Pump House (AB14-8)

Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	06.03.2015	48.2	23.4	12.1	15.7
	20.03.2015	45.6	21.1	11.4	15.2
April 2015	06.04.2015	49.7	22.7	10.7	14.8
	20.04.2015	51.4	24.2	10.3	14.4
May 2015	09.05.2015	52.7	24.7	9.5	13.4
	19.05.2015	50.3	22.1	10.6	13.8
Min.		45.6	21.1	9.5	13.4
Max.		52.7	24.7	12.1	15.7
Mean.		49.7	23.0	10.8	14.6

values found to be $< 5 \mu\text{g}/\text{m}^3$

Note: CO

Table No. 9**AMBIENT AIR QUALITY DATA**

Project: NMDC Ltd., Deposit 14/11C, BIOM, Kirandul. Season: Summer Season 2015

Location : Proposed Augmentation of SP-III (AB14-9)

Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	07.03.2015	62.4	28.5	13.4	18.1
	21.03.2015	59.6	26.4	12.5	17.8
April 2015	07.04.2015	64.7	29.8	12.2	16.7
	21.04.2015	61.7	27.6	11.7	16.3
May 2015	10.05.2015	67.5	30.2	11.2	15.8
	19.05.2015	63.5	27.8	11.5	16.4
Min.		59.6	26.4	11.2	15.8
Max.		67.5	30.2	13.4	18.1
Mean.		63.2	28.4	12.1	16.9

Note: CO values found to be $< 5 \mu\text{g}/\text{m}^3$ **Table No. 10**

Location : Proposed site for Crushing Plant – 14 (AB14-10)

Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	14.03.2015	69.7	31.4	14.2	18.7
	27.03.2015	66.8	30.6	13.7	18.1
April 2015	14.04.2015	68.7	29.4	13.3	17.5
	27.04.2015	70.2	32.7	12.8	18.2
May 2015	16.05.2015	74.5	33.7	12.2	17.1
	25.05.2015	67.6	30.2	12.8	17.7
Min.		66.8	29.4	12.2	17.1
Max.		74.5	33.7	14.2	18.7
Mean.		69.6	31.3	13.2	17.9

Note: CO values found to be $< 5 \mu\text{g}/\text{m}^3$

Table No. 11**AMBIENT AIR QUALITY DATA**

Project: NMDC Ltd., Deposit 14/11C, BIOM, Kirandul. Season: Summer Season 2015

Location : Motor Room 203 (near Tunnel Mouth) (CZ) (AB14-11)

Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	16.03.2015	64.2	28.5	14.3	19.7
	28.03.2015	60.7	27.1	13.8	19.2
April 2015	16.04.2015	69.6	31.4	13.3	17.5
	28.04.2015	65.4	30.2	13.6	18.4
May 2015	17.05.2015	71.5	32.7	12.5	17.2
	26.05.2015	68.4	31.9	12.3	16.8
Min.		60.7	27.1	12.3	16.8
Max.		71.5	32.7	14.3	19.7
Mean.		66.6	30.3	13.3	18.1

Note: CO values found to be $< 5 \mu\text{g}/\text{m}^3$ **Table No. 12**

Location : Proposed Crushing Plant – 11B (AB14-12)

Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	18.03.2015	61.5	28.4	13.1	17.5
	28.03.2015	57.4	26.5	12.8	16.8
April 2015	18.04.2015	58.7	27.2	13.8	17.3
	28.04.2015	56.2	25.8	12.4	16.4
May 2015	18.05.2015	64.8	29.7	11.6	15.7
	28.05.2015	59.6	27.2	12.6	16.4
Min.		56.2	25.8	11.6	15.7
Max.		64.8	29.7	13.8	17.5
Mean.		59.7	27.5	12.7	16.7

Note: CO values found to be $< 5 \mu\text{g}/\text{m}^3$

Table No. 13

AMBIENT AIR QUALITY DATA

Project: NMDC Ltd., Deposit 14/11C, BIOM, Kirandul. Season: Summer Season 2015

Location : DLM Colony (AB14-13)

Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	09.03.2015	54.7	25.9	11.9	15.4
	25.03.2015	50.3	23.4	11.1	14.7
April 2015	09.04.2015	57.6	26.3	11.4	14.6
	21.04.2015	52.4	24.7	10.9	15.1
May 2015	11.05.2015	55.6	22.8	11.7	16.4
	21.05.2015	51.7	23.6	10.4	14.5
Min.		50.3	22.8	10.4	14.5
Max.		57.6	26.3	11.9	16.4
Mean.		53.7	24.5	11.2	15.1

Note: CO values found to be $< 5 \mu\text{g}/\text{m}^3$

Table No. 14

Location : Residential Quarters near Millennium Park (AB14-14)

Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	10.03.2015	54.5	25.6	12.5	16.4
	23.03.2015	49.7	23.7	11.6	15.8
April 2015	10.04.2015	51.7	21.8	11.3	15.4
	23.04.2015	55.8	24.7	12.4	16.4
May 2015	12.05.2015	53.8	23.6	11.3	15.7
	22.05.2015	50.8	22.4	10.9	14.8
Min.		49.7	21.8	10.9	14.8
Max.		55.8	25.6	12.5	16.4
Mean.		52.7	23.6	11.7	15.8

Note: CO values found to be $< 5 \mu\text{g}/\text{m}^3$

Table No. 15

AMBIENT AIR QUALITY DATA

Project: NMDC Ltd., Deposit 14/11C, BIOM, Kirandul. Season: Summer Season 2015

Location : Ambedkar Bhawan (Near Loading plant) (AB14-15)

Unit: $\mu\text{g}/\text{m}^3$

Month	Sampling Date	Parameters (24 Hrly)			
		PM 10	PM 2.5	SO ₂	NO _x
March 2015	11.03.2015	68.2	28.3	13.2	17.4
	24.03.2015	63.7	26.4	12.7	16.7
April 2015	11.04.2015	69.7	27.5	13.6	17.7
	24.04.2015	65.8	29.7	12.2	16.3
May 2015	14.05.2015	67.4	25.4	12.7	16.8
	23.05.2015	70.8	29.5	11.7	15.4
Min.		63.7	25.4	11.7	15.4
Max.		70.8	29.7	13.6	17.7
Mean.		67.6	27.8	12.7	16.7

Note: CO values found to be $< 5 \mu\text{g}/\text{m}^3$