



भारत सरकार  
GOVERNMENT OF INDIA  
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय  
MINISTRY OF ENVIRONMENT, FORESTS  
& CLIMATE CHANGE

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F. No. 3-42/2007-(ENV) | 2959.

Dated: 29<sup>th</sup> November, 2017

To

✓ The Scientist 'F'  
IA Division (Non-Coal Mining),  
Ministry of Environment, Forest & Climate Change  
Vayu Wing, 3rd Floor, Indira Paryavaran Bhawan,  
Aliganj, Jorbagh Road,  
New Delhi-110003

(Kind Attention: Shri Surender Kumar)

**Sub:** Status of compliance of conditions stipulated in the environment clearance dated 11.09.2007 accorded by the Ministry of Environment Forest and Climate Change, New Delhi to Deposit 14/11 C Iron Ore Mine of M/s National Mineral Development Corporation in Bailadilla Hill Range in Kirandul, Dantewada, Chhattisgarh – regarding.

**Ref:** IA Division of the MoEF&CC, New Delhi's letter no. J-11015/483/2007-IA.II(M) dated 11.09.2007.

Sir,

I am directed to refer to the IA Division of the MoEF&CC's letter number mentioned in the subject above wherein the mining project of the Project Proponent mentioned in the subject above was accorded environment clearance. The PP vide their letter no. NMDC/BLD/DEP-14/11C/EC/2017/509 dated 1.06.2017 requested the Regional Office to furnish the updated compliance status of the EC conditions stipulated in the environment clearance dated 11.09.2007. In this connection, it is to inform that a visit of the area was undertaken by the Regional Office on 11.10.2017 to monitor the updated status of compliance. Observations of the Regional Office on the issues, as revealed during the inspection, are given as under:

**1. Condition complied with partially by the PP**

- i. **Condition no.(i) & (ii) of specific condition** – Efforts being made by the User Agency for the slime management appeared to be inadequate. The PP needs to explore the options for effective and speedy utilization of slime accumulated in the tailing dam.
- ii. **Condition no. (iv) of the specific condition** - No conceptual mining plan for every five years for the life of mine has been prepared and submitted to the MoEF&CC. Further, no efforts appears to have been made by the PP to develop pisci-culture by organizing fishermen cooperative society with the land users and the poorer section (especially tribals) of area, financial assistance, marketing tie up for the cooperative societies as no supporting detail in this regard could be furnished by the PP.
- iii. **Condition no. (vii) –** The PP needs to strengthen measures to check flowing of OB into the surrounding forest land by constructing garland drains of consideration size copupled with strong buttress walls.
- iv. **Condition no. (x) of specific conditions** - PP has undertaken plantation in the blank area through Chhattisgarh State Forest Development Corporation. However, exact area planted under the extant mining lease could not be worked out as the mine wise detail of plantation was not available with the User Agency.
- v. **Condition no. (xiii) of specific conditions** - No scientific and effective measures for the water treatment in the mining pits have been undertaken by the PP. Provisions of garland drains,

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catch drains and siltation ponds, etc has been observed to be very poor resulting into the flowing of silt into the surrounding water resources especially during raining seasons.

- vi. **Condition no. (iii) of general conditions** - PP has not complied with the provision of this condition in accordance with the provisions stipulated in the extant condition. Compliance of Wildlife Management Plan has been done by the PP after lapse of a period of almost 7 years. Further, no detail pertaining to the updated status of implementation of the Wildlife Management Plan has been made available by the PP.
- 2. Conditions not complied with by the PP**
- i. **Conditions no. (iii) of specific conditions** - No study related to the assessment of erosion potential and sedimentation control done by the User Agency after receipt of the environment. However, it was informed by the PP that recently, a study has been awarded to the ICFRE, Dehradun which inter-alia include comprehensive assessment of erosion potential and mitigative measures in the form of soil conservation measures in the mining leases of the PP.
- ii. **Condition no. (vi) of specific condition** - Observations made during the inspection are enclosed at Annexure-II.
3. The PP has also informed that a court case pertaining to the issues related to the evacuation of tailing dam is pending in the District Court, Dantewada.

A detailed report on the monitoring of the conditions stipulated in the environment clearance is enclosed herewith.

This issues with the approval of the Addl. PCCF (Central), Regional Office (West Central Zone) MoEF&CC, Nagpur.

Encl: as above

Yours faithfully,



Charan Jeet Singh  
Scientist 'C'

**Copy to:**

1. Director RO HQ, Ministry of Environment, Forest & Climate Change, Government of India, 1st Floor Agni Wing, Indra Paryavaran Bhawan, Jorbagh Road, New Delhi- 110 003.
2. Member Secretary, State Level Environment Impact Assessment Authority & Secretary, Housing and Environment Department, Government of Chhattisgarh, Mantralay Mahanadi Bhawan, New Raipur, Chhattisgarh
3. Director (Monitoring Cell), Ministry of Environment, Forest & Climate Change, Indra Paryavaran Bhawan, Aliganj, Jorbagh Road, New Delhi-110003
4. Project Proponent (M/s National Mineral Development Corporation, Kirandul Mining Project, Dantewada, Chhattisgarh)
5. Guard File.



Charan Jeet Singh  
Scientist 'C'

**STATUS OF COMPLIANCE OF CONDITIONS STIPULATED IN THE ENVIRONMENT CLEARANCE DATED 11.09.2007 ACCORDED BY THE MINISTRY OF ENVIRONMENT FOREST AND CLIMATE CHANGE, NEW DELHI TO DEPOSIT 14/11 C IRON IRE MINE OF M/S NATIONAL MINERAL DEVELOPMENT CORPORATION IN BAILADILA HILL RANGE IN KIRANDUL, DANTEWADA, CHHATTISGARH**

1. The IA Division of the MoEF&CC's vide its letter no. J-11015/483/2007-IA.II(M) dated 11.09.2007 had accorded environment clearance to the 14/11C Deposit Iron Ore Mine of M/s NMDC subject to fulfilment of certain conditions prescribed therein.
2. The environment clearance accorded by the MoEF&CC, New Delhi pertains to the area of 935.522 ha, comprised of 3 mining lease of the Project Proponent 11C Part and 14 NMZ. Currently, the NMDC has 9 mining leases granted in their favour and out of total 9 mining leases, 6 mining leases 3 in Kirandul and 3 in Bachel are currently operational All these mining leases have approved production capacity of 36 MTPA and so far the NMDC could attain a maximum production level of approximately 23 MTPA (Annexure-I).
3. The project proponent has now proposed to enhance the production from 12.0 MTPA to 20.0 MTPA from the Bailadila Deposit 14/11C, Kirandul. A visit of the area was undertaken by the Regional Office on 11.10.2017 to monitor the updated status of compliance of conditions stipulated in the environment clearance dated 11.09.2007. Observations of the Regional Office, as revealed during the inspection, are given as under:

S. No.	Conditions stipulated in the environment clearance	Status of compliance
A.	<b>Specific conditions</b>	
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.	<p><b>Partially complied with</b></p> <p>It was observed that slime generated is being stored into the tailing dam which is spread over an area of approximately 296.77 acres. The tailing dam was observed to be fully saturated with the with the slime i.e. tailing dam as attained its full capacity. It was informed that total capacity of the tailing dam is approximately 45 lakh cum. The PP has informed that nearly a quantity of 3.51 lakh cum has been de-silted from the tailing dam during the period of last current financial year from October 2016 to March, 2017, a quantity of 66,301 cum has been de-silted from the tailing dam. The PP has also informed that to accommodate the additional slime being generated from the mining activities, de-silting of the tailing dam is being done by them regularly. Against the total slime of 6.5 lakh cum accumulated into the tailing dam, only 3.51 lakh cum have been de-silted so far by the PP.</p> <p>However, it was also observed during the inspection, that area receives incessant rain during the Monsoon and slime generated from the mining activities of the PP again settles into the tailing pond. Given the saturation level of the tailing dam, it can be ascertained that whatever is de-silted by the PP annually, almost equivalent additional slime is accumulated during rainy season and hence the efforts made by the PP for the de-silting of the slime appears to be inadequate. It was also observed that given the incessant rains and saturation of the</p>

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		<p>tailing pond with slime, there are likely chances that slime is flowing beyond the tailing dam into the natural water drainage system.</p> <p>It was further observed that de-silted slime is being piled up in the same area as the user agency has no option to utilize the slime at present.</p> <p>Currently, no measures have been observed to be installed by the PP for the utilization of slime. However, the PP has informed that they are in a process of setting up of slime beneficiation plant at Bachel. Approval of the same has been obtained under the Forest (Conservation Act, 1980 over an area of approximately 33 ha. The PP has also informed that slime accumulated in the tailing dam will be used in the slime beneficiation plant which will be further transported to the Nagamar Steel Plant, Jagdalpur through a slurry pipe line. Proposal for the slurry pipeline has already been submitted by the PP for seeking approval under the Forest (Conservation) Act, 1980 to the Regional Office, Nagpur. However, the proposed mechanism to utilize the slime accumulated in the tailing dam is likely to take more time in years.</p> <p>Therefore, the PP needs to explore the options for effective and speedy utilization of slime accumulated in the tailing dam.</p>
ii	Detailed report on desilting of tailing dams and management of silt shall be submitted to the Ministry Environment & Forests at regular interval.	<p><b>Partially complied with</b></p> <p>It was informed that during the period of October 2016 to March, 2017, a quantity of 66,301 cum has been de-silted from the tailing dams. Given the annual influx of slime into the tailing dams from the mining activities, the quantity of slime de-silted appears to be meager.</p> <p>No effective measures for the management of silt were observed to be being taken by the PP in their lease area. No detail pertaining to the submission of the plan for the management of slime has been made available by the PP.</p>
iii	Assessment of erosion potential and sedimentation control plan shall be carried out and submitted to the Ministry.	<p><b>Not complied with</b></p> <p>No study related to the assessment of erosion potential and sedimentation control done by the User Agency after receipt of the environment. However, it was informed by the PP that recently, a study has been awarded to the ICFRE, Dehradun which inter-alia include compressive assessment of erosion potential and mitigative measures in the form of soil conservation measures in the mining leases of the PP. So far, the PP has undertaken soil conservation measures through State Forest Department only.</p>
iv	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	<p><b>Partially complied with</b></p> <p>No conceptual mining plan for every five years for the life of mine has been prepared and submitted to the MoEF&amp;CC. However, it was observed that as</p>

	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.	per the provision of the Mineral Concession Rules, the PP has prepared Mining plan for a period of 5 years and got the same approved by the IBM Nagpur. Currently, the mining plan of the PP is valid for the period of 01.04.2015 to 31.03.2020 Further, no efforts appears to have been made by the PP to develop pisci-culture by organizing fishermen cooperative society with the land users and the poorer section (especially tribals) of area, financial assistance, marketing tie up for the cooperative societies as no supporting detail in this regard could be furnished by the PP.
v	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.	No stacking/dumping of top soil and its management were seen in the lease area during the inspection. The PP has informed that area falls in Bailadilla Mountain Range having rocky substratum and almost there is no top soil in the area due to exposed rocks and accordingly, management of top soil, for want of top soil, could not be undertaken.
vi	Overburden should be stacked at earmarked dump site (s) only and shall not be kept active for long period. The 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.	<b>Not complied with</b> Observations made during the inspection are enclosed at Annexure-II.
vii	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 de-silted at regular intervals.	<b>Partially complied with</b> A buttress wall is observed being constructed by the PP to arrest the silt and mineral from the dumps. Given the steep slope of the area coupled with incessant rains and poor OB management practices, the Buttress wall is washed away during the rainy season causing the silt/slime to flow into the surrounding forest areas. It was observed that the PP has constructed small catch drains to create sump for the settling of the silt/slime. However, given the catchment area of the mine, the capacity of the catch drains appears to be nominal. The PP has been advised to design and construct such structures in based on the rainfall data, catchment area and silt/slime flow to effectively control and arrest the silt and slime within the lease area.

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viii	Slope of the mining bench and ultimate pit limit shall be as per the mining scheme approved by Indian Bureau of Mines.	The PP has consented to comply with the provision stipulated in this condition.
ix	Drilling and blasting (if any) shall be conducted by using dust extractors / wet drilling	Being complied with It was informed that controlled blasting and wet drilling is being ensured to minimize dust generation.
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.	<b>Partially complied with</b> During the site visit it is observed that the PP has undertaken plantation in the blank area through Chhattisgarh State Forest Development Corporation. However, exact area planted under the extant mining lease could not be worked out as the mine wise detail of plantation was not available with the User Agency. As per the relevant documents made available by User Agency has made consolidated detail of afforestation over an area of 1213.76 ha. Mine wise detail of afforestation undertaken by the User Agency was not readily available with the User Agency.
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.	<b>Being complied with</b> The PP has informed that rainwater harvesting is being carried out into the 4 ponds for recharging of ground water. It was also informed that additional 11 of ponds have also been constructed in different villages such as Madadi, Cholnar, Perpa, Pinar, Penta and Lendra. However, no detail regarding consultation made with the Central Ground Water Board to augment ground water resources by undertaking construction of ponds has been made available by the PP
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.	<b>Being complied with</b> It was informed that ground water level and quality is regularly monitored at 30 locations through M/s Space Geo Tech, Bangalore which is an accredited laboratory around BIOM Kirandul Complex. Detail is enclosed at Annexure-III. The PP has also informed that higher levels of Fe were observed at two locations 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.
xiii	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.	<b>Partially complied with</b> It was informed that PP is carrying put monitoring of water discharged from the tailing dam. However, no scientific and effective measures for the water treatment in the mining pits have been undertaken by the PP. Provisions of garland drains, catch drains and siltation ponds, etc has been observed to be very poor resulting into the flowing of silt into the surrounding water resources especially during raining seasons. The PP has been

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		advised to strengthen such measures to arrest silt and to ensure water flowing the lease is laden with minimum silt.
xiv	Prior permission from the competent authority shall be obtained for extraction of ground water if any.	The PP has informed that no groundwater is being used by them in their mining operations. Requirement of water is met through the existing water sources i.e. local perennial nallah.
xv	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 during the course of transportation. No overloading of ores for transportation shall be committed.	<b>Being complied with</b> It was informed that regular pollution checking of 138 vehicles, both light and heavy is being carried out. Majority of transportation of mineral is being carried out through railway rake only small proportion if mineral is transported by road.
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.	The PP has consented to this condition. An undertaking in compliance to this condition has been submitted by the PP.
<b>B.</b>	<b>GENERAL CONDITIONS</b>	
i	No change in the mining technology and scope of working shall be made without prior approval of the Ministry of Environment & Forests.	<b>Being complied with</b> The PP has informed that there is no change in the mining technology and scope of mining.
ii	No change in the calendar plan including excavation, quantum of mineral iron ore and waste shall be made.	<b>Being complied with</b> The PP has informed that there is no change in the calendar plan.
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.	<b>Partially complied with</b> The PP has informed that 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. It appears that the PP has not complied with the provision of this condition in accordance with the provisions stipulated in the extant condition. Compliance of Wildlife Management Plan has been done by the PP after lapse of a period of almost 7 years. Further, no detail pertaining to the updated status if implementation of the Wildlife Management Plan has been made available by the PP.
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 <sub>2</sub> , NO <sub>x</sub> monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring	<b>Being complied with</b> The PP has informed that Ambient air quality monitoring is being 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. Detail of reports

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	should be undertaken in consultation with the State Pollution Control Board.	pertaining to the AAQM is enclosed as <b>Annexure-IV</b> .
v	Data on ambient air quality (RPM, SPM, SO <sub>2</sub> , NO <sub>x</sub> ) 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.	<b>Being complied with</b> The PP has consented to this condition
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.	<b>Being complied with</b> It was observed that preventive/ mitigative measures have been taken to control fugitive dust generation from all the sources as per detail given below: i. Dust suppression system have been installed at loading plant / stock piles. ii. The fugitive dust is suppressed by regular water sprinkling on mines haul roads. iii. Plantation is done around the mining areas, along mine roads and conveyors for arresting fugitive dust.
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.	<b>Being complied with</b> The PP has informed that appropriate measures have been taken to control the noise levels in working environment and use of PPEs is ensured.
viii	Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (IE) dated 19 <sup>th</sup> May, 1993 and 31 <sup>st</sup> December, 1993 or as amended from time to time.	<b>Being complied with</b> It is observed that one ETP of 10 KL capacity has been installed at the hilltop for treatment of effluent coming from workshop/garage and analysis of water samples are being carried out in the all four seasons.
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.	<b>Being complied with</b> It was informed that 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.
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.	<b>Being complied with</b> It was informed that 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.
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.	<b>Complied with</b> 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 <b>Annexure - V</b> .
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	The PP has consented to this condition.



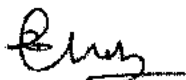


	development work.	
xiii	The funds earmarked for environment protection measures shall be kept in separate account and shall not be diverted for another purpose. Year wise expenditure shall be reported to the Ministry and its Regional Office located at Bhopal.	<b>Being complied with</b> It was informed that 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-VI.
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 work.	The PP has consented to this condition
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.	The PP has consented to this condition
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.	Complied with The PP has informed that a copy of the EC was submitted to the concerned panchayat.
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.	Complied with The PP has informed that compliance of this condition was ensured by the concerned State Government's Department
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 <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 Bhopal.	Complied with It was informed that BIOM, Kirandul Complex had published environment clearance in two local newspaper Viz- Dainik Bhaskar, Raipur Edition (in Hindi) and Hitavada, Raipur Edition (in English) both on 07.10.2007.

From the examination of the above following is revealed

**4. Condition complied with partially by the PP**

- i. **Condition no.(i) & (ii) of specific condition** – Efforts being made by the User Agency for the slime management appeared to be inadequate. The PP needs to explore the options for effective and speedy utilization of slime accumulated in the tailing dam.
- ii. **Condition no. (iv) of the specific condition** - No conceptual mining plan for every five years for the life of mine has been prepared and submitted to the MoEF&&CC. Further, no efforts appears to have been made by the PP to develop pisci-culture by organizing fishermen cooperative society with the land users and the poorer section (especially tribals) of area, financial assistance, marketing tie up for the cooperative societies as no supporting detail in this regard could be furnished by the PP.



- iii. **Condition no. (vii) –** The PP needs to strengthen measures to check flowing of OB into the surrounding forest land by constructing garland drains of consideration size coupled with strong buttress walls.
  - iv. **Condition no. (x) of specific conditions -** PP has undertaken plantation in the blank area through Chhattisgarh State Forest Development Corporation. However, exact area planted under the extant mining lease could not be worked out as the mine wise detail of plantation was not available with the User Agency.
  - v. **Condition no. (xiii) of specific conditions -** No scientific and effective measures for the water treatment in the mining pits have been undertaken by the PP. Provisions of garland drains, catch drains and siltation ponds, etc has been observed to be very poor resulting into the flowing of silt into the surrounding water resources especially during raining seasons.
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- 5. Conditions not complied with by the PP**
- i. **Conditions no. (iii) of specific conditions -** No study related to the assessment of erosion potential and sedimentation control done by the User Agency after receipt of the environment. However, it was informed by the PP that recently, a study has been awarded to the ICFRE, Dehradun which inter-alia include compressive assessment of erosion potential and mitigative measures in the form of soil conservation measures in the mining leases of the PP.
  - ii. **Condition no. (vi) of specific condition -** Observations made during the inspection are enclosed at Annexure-II.
6. The PP has also informed that a court case pertaining to the issues related to the evacuation of tailing dam is pending in the District Court, Dantewada.

  
Charan Jeet Singh  
Scientist 'C'

Annexure-I

Details of Existing NMDC Mining Leases, in Chhattisgarh State (Dantewada District) (All Areas in Hectares)

S. No.	M.L. Area	Original M.L. Area	Date of Grant of M.L.	Govt. Revenue Land	Area of Forest Land Involved	Area of Forest Land Surrendered	Forest Area Diverted for Non-Forest Purposes	Date of Issue of Final Forest Clearance from MOEF, New Delhi	Date of Issue of Forest Clearance from State Govt.	Date of Issue of lease Renewal Order from MRD, Bhopal
1.	Bailadila Deposit-14 Kirandul	407.55	12/09/65	-	407.550	85.162	322.388	18/06/99	18/06/99	May, 2001
2.	Bailadila Deposit-14 Kirandul	546.882	7/12/65	-	546.882	40.140	506.742	18/06/99	18/06/99	Pending with MRD office Chhattisgarh.
3.	Bailadila Deposit-5 Bacojhi	672.250	12/09/65	-	672.250	132.200	540.050	18/06/99	18/06/99	19/10/2005
4.	Bailadila Deposit-10 Bacheli	308.340	11/09/65	-	308.340	17.00	309.34	29/07/98	24/08/98	02/01/2007
5.	Bailadila Deposit-10 Float Ore Bacheli	308.139	12/09/67	-	308.130	165.330	142.800	29/07/98	24/08/98	Pending with MRD office Chhattisgarh
6.	Bailadila Deposit-11 Bacheli	1809.230	13/09/67	42.08	1767.140	892.216	874.924	22/12/99	31/12/99	19/10/2005
7.	Deposit-3 Bacheli	3308.34	03/08/77	-	3308.34	0	3308.34	-	-	Detailed prospecting proposed during 2001. After obtaining permission from Chhattisgarh Forest Deptt.
8.	Deposit-13 Kirandul	413.745	8/10/2008	-	315.433	0	315.433	-	-	-
9.	Deposit-4 Bacheli	646.595	13/01/2012 (In Principle)	-	665.230	0	-	-	-	-
	Total	8499.063			8317.295	1332.063				

**Details of approved capacities, in terms of annual production, of various mining leases of the NMDC in Kirandul and Bachel**

S. No.	Name of the mining lease	Name of Mining Project	Details of approved capacity in Million Tonnes Per Annum (MTPA)	
			Date of grant of Environment clearance	Total capacity approved (MTPA)
1.	Deposit 11 C Part	Kirandul	-	
2.	Deposit 14NMZ	Kirandul		12
3.	Deposit 14 ML	Kirandul		
4.	Deposit 11 B Part	Kirandul		7
5.	Deposit-13	Kirandul		10
	<b>Sub -Total</b>	<b>Kirandul</b>		<b>29</b>
6.	Deposit -5	Bachel	-	10
7.	Deposit-10	Bachel	-	4.2
8.	Deposit -- 11A	Bachel	-	2.8
9.	Deposit-4	Bachel	-	-
10.	<b>Sub -Total</b>	<b>Bachel</b>		<b>17</b>
	<b>Total</b>			<b>46</b>
				<b>36</b> <b>(excluding Dep-13)</b>

**OVER BURDEN MANAGEMENT****i. OB Management on 14 ML**

Deposit 14 comprised of two mining leases 14 ML and 14 NMZ. The Addl. PCCF (Central), Regional Office, Bhopal in his inspection report submitted to the MoEF&CC, New Delhi vide letter dated 24.06.2014 had reported flowing of over burden into the forest areas from the mining leases of 14 ML and 11 C. During the current inspection, the representative of the user agency have informed that two sites have been earmarked for OB dump in 14 ML. Out of the two sites dumping is being carried out in one site only while the other site has been stabilized and no further dumping is being done there. However, examination of the stabilization measures by the User Agency revealed that stabilization measures have not been taken appropriately. Top of the OB was observed devoid of any plantation, except grass which might have grown up at its own during the natural course. The soil conservation measures have not been implemented appropriately as the formation of gullies/nails were seen bifurcating the OB in the dump stated to be stabilized by the user agency. Plantation of trees species on the side of OB facing the forest area was observed while no other measures could be seen indicating the efforts of the UA towards the stabilization of the OB.

Similarly, the active dump site of 14 ML revealed that dumping is being done by the user agency without complying with the prescriptions as contained on the environment clearance dated 11.09.2007 regarding maintaining a height of 20 meters and slope of 28 degree. The PP has informed that in case of OB dumping in hilly areas, the same does not hold good and is not possible scientifically also. The UA have also informed that this fact has been reported to the MoEF&CC also. However, they could not produce any evidence supporting their claim.

The efforts being made by the PP for the construction of a Buttress wall, using the available stone and boulders from the OB, is seen in the active site. It was informed that buttress wall is being constructed to arrest the flow of OB into the forest area. No other measure for stabilization of OB and arresting the flow into the forest area was seen in this. *In view of the fact that OB dump has already attained adequate height and slope, the user agency should resort to appropriate scientific methods of bench formation to check flow of OB into the forest area.*

**ii. OB Management of 11 ML**

The effort of UA to arrest the flowing of OB into the forest areas were seen in the form of Buttress wall only. It is informed that for want of any effective measures of implemented by the User Agency for OB stabilization, in the year 2006, incessant rains during monsoon coupled with inadequate measures for stabilization of OB, caused the sliding of large mass of OB into the forest area destroying the plantation and regeneration in the forest area of approximately 21.86 ha. Subsequently, the State Forest Department attempted to rejuvenate the area by planting trees species at the cost of PP.

It was also observed that area earmarked for OB dump of 11 ML mining lease is also being used for OB dumping of 14 NMZ lease which appears to not permissible. OB Dump of 11 ML has attained a height of more than 30 meters with slope of approximately of between 50 to 60 degree. Though the PP has now started bench formation yet there are likely chances, in case of incessant rains occurs, the same may again flows into the forest as the buttress wall is insufficient arrest the large mass which may detach/slide from the OB dump.

Scientific management of OB is an important activity which the UA should implement in consultation with the institute of repute and in accordance with the relevant conditions invariably stipulated in the environment and forest clearances accorded by the Ministry. The PP have informed that recently they have awarded a study to the ICFRE, Dehradun which inter-alia includes suggestive measures for the OB stabilization.

**iii. Lease wise details of area earmarked for OB Dump and Status of approval under Forest (Conservation) Act, 1980**

The details of areas earmarked for dumping of over burden and status of grant of forest clearance is given below in the Table:

S. No.	Name of the lease	Particulars of Waste Dump	Area (Ha)	Capacity (Lakh Tonne)	Availability of approval under FC Act	Remark
1.	Deposit 14 Mining Lease	14 (1)	35.0	170	Yes	OB is being dumped in 14 (1) area
		14 (2)	8.00	20	Yes	-
		14 (3)	5.00	15	Yes	-
		<b>Sub Total</b>	<b>46.0</b>	<b>205</b>	-	-
2.	Deposit 14 NMZ	Nil	-	-	-	Dumping of OB is being done in the area of 11 ML Mining lease.
		Proposed	12.387	70	Proposal to be submitted	-
3.	Deposit 11 ML (11A)	11 A (Southern Waste Dump)	10.56	34.0	Yes	
		11 A (Northern Waste Dump)	8.93	24.0	Yes	
		11 A (in the excavated portion of Southern ore body)	-	21.2	-	
		<b>Sub Total</b>	<b>19.49</b>	<b>79.2</b>	-	-
	Deposit 11 ML (11B)	11 B (Waste Dump 1)	11.248	37	No	Under active use and has quantity of 8.5 LT
		11 B (Waste Dump 2)	4.678	11	No	-
		<b>Sub - total</b>	<b>15.926</b>	<b>48</b>	-	-
	Deposit 11 ML (11C)	11 C	18.202	135	No	Under active use and has quantity of 100 LT
		<b>Sub - total</b>	<b>18.202</b>	<b>135</b>	-	-
			<b>Grand Total</b>	<b>99.436</b>	<b>467.2</b>	-

From the above, it can be ascertained that the user agency has been using area for dumping in unauthorizedly in mining lease of 11 ML. Further, the user agency has not earmarked any area for OB dumping in 14 NMZ lease and the OB generated from the lease are being dumped into the mining lease of 11 ML. The representative of the user agency, leases where approval for dumping is not available under the Forest (Conservation) Act, 1980, the same will be obtained and a proposal in this regard will be submitted to the State Government.

Table No. 45: Water Quality Data

S.N	Parameter	Unit	WQ-1	WQ-2	WQ-3	WQ-4	GSR: 422E Norms
	Sampling Date		12.05.17	12.05.17	12.05.17	12.05.17	
1	Color	Pt-Co	12	11	10	15	
2	Suspended Solids	mg/l	29	31	28	30	
3	Particulate size of Suspended Solids	100% are passing	100% are passing	100% are passing	100% are passing	100% are passing	100
4	Dissolved Solids (Inorganic)	mg/l	30	46	20	44	Shall pass 850-micron IS1 sieve
5	pH	-	6.25	7.14	6.37	6.69	
6	Temperature	°C	28	29	28	29	5.5-9.0
7	Oil & Grease	mg/l	Nil	Nil	Nil	Nil	5°C above
8	Total residual chloride	mg/l	Nil	Nil	Nil	Nil	10
9	Ammonical nitrogen as N	mg/l	0.45	0.52	0.47	0.42	1.0
10	Total Kjeldahl nitrogen	mg/l	1.6	1.4	0.9	0.9	50
11	Free ammonia as NH <sub>3</sub>	mg/l	Nil	Nil	Nil	Nil	100
12	BOD (3 days at 27°C)	mg/l	18	20	16	12	5.0
13	Chemical Oxygen Demand	mg/l	66	68	36	48	30
14	Arsenic as	mg/l	<0.001	<0.001	<0.001	<0.001	250
15	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.2
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	0.01
18	Hexavalent chromium as Cr <sup>6+</sup>	mg/l	<0.001	<0.001	<0.001	<0.001	2
19	Total chromium	mg/l	<0.001	<0.001	<0.001	<0.001	0.10
20	Copper as Cu	mg/l	<0.001	<0.001	<0.001	<0.001	2.0
21	Zinc as Zn	mg/l	<0.001	<0.001	<0.001	<0.001	3
22	Selenium as Se	mg/l	0.12	0.17	0.11	0.10	5
23	Nickel as Ni	mg/l	<0.001	<0.001	<0.001	<0.001	0.05
24	Boron as B	mg/l	<0.001	<0.001	<0.001	<0.001	3
25	Percent Sodium	%	10.2	11.7	12.6	11.8	
26	Residual Sodium carbonate	mg/l	Nil	Nil	Nil	Nil	
27	Cyanide as CN	mg/l	Nil	Nil	Nil	Nil	
28	Chloride as Cl	mg/l	30	41	18	22	0.2
29	Fluoride as F	mg/l	0.51	0.57	0.52	0.63	
30	Dissolved Phosphates	mg/l	0.33	0.42	0.40	0.37	2
31	Sulphates as SO <sub>4</sub>	mg/l	12	18	10	11	5.0
32	Sulphides as S	mg/l	Nil	Nil	Nil	Nil	
33	Phenolic Comp. as C <sub>6</sub> H <sub>5</sub> OH	mg/l	Nil	Nil	Nil	Nil	2
34	Manganese	mg/l	Nil	Nil	Nil	Nil	1.0
35	Iron as Fe	mg/l	0.18	0.22	0.43	0.25	2.0
36	Vanadium as V	mg/l	Nil	Nil	Nil	Nil	3.0
37	Nitrate Nitrogen	mg/l	0.35	0.26	0.27	0.29	0.2

WQB 14-1: Discharge of spillway water from Kadampal tailing dam  
 WQB 14-3: Effluent from Oxidation Pond

WQB 14-2: Influent to Oxidation Pond  
 WQB 14-4: Influent to Service Center's Effluent Treatment Plant (ETP)

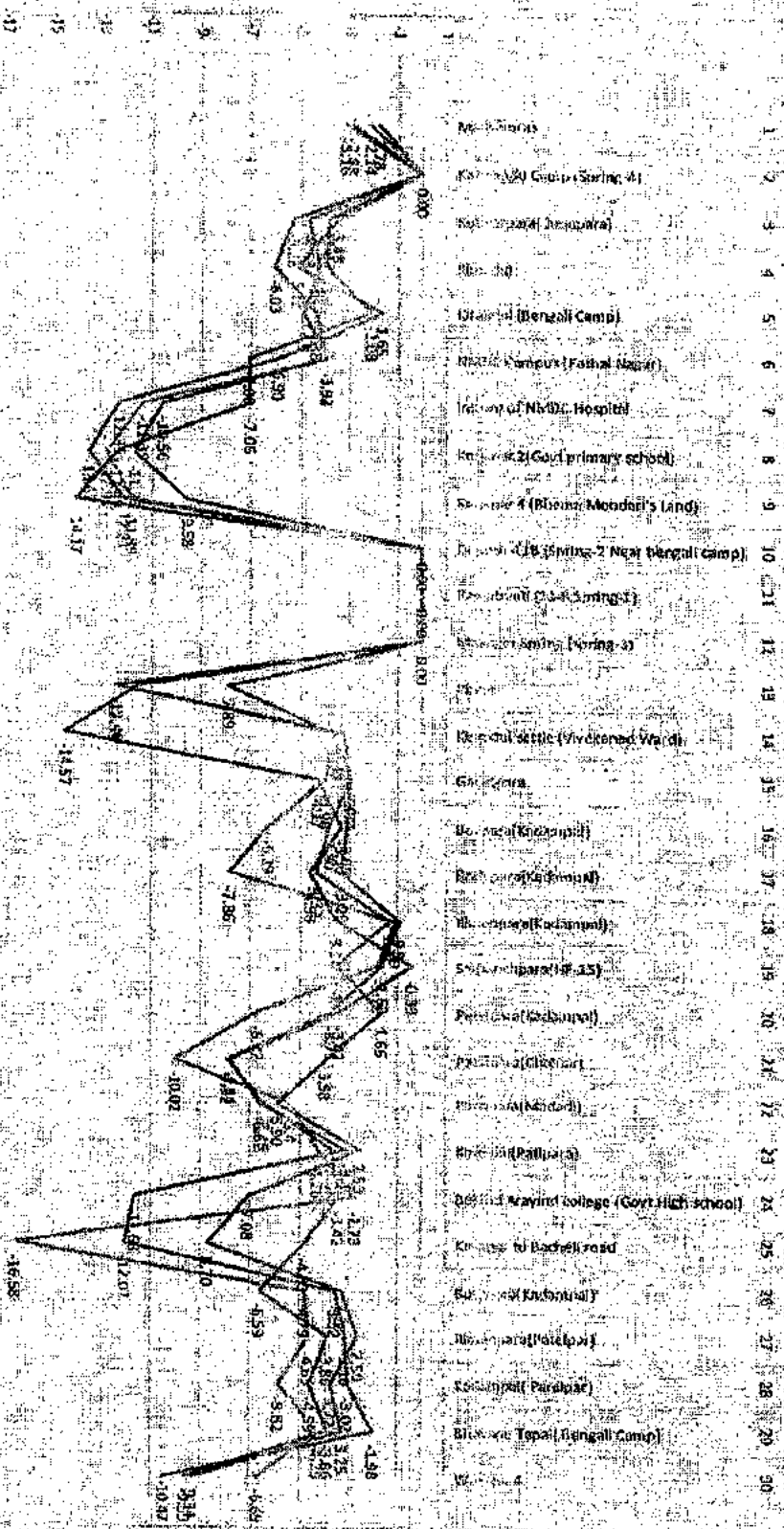
Table No.47: Water Quality Data

S. No.	Parameter	Unit	WQB14-8	GSR-422E Norms
Sampling Date			12.05.17	
1	Colour	Hazen	2	
2	Odour	-	Unobjectionable	
3	Taste	-	Agreeable	
4	Turbidity	NTU	5.8	
5	pH	-	7.65	5.5-9.0
6	Total Hardness as CaCO <sub>3</sub>	mg/l	20	
7	Calcium as Ca	mg/l	4.9	
8	Magnesium as Mg	mg/l	0.88	
9	Copper as Cu	mg/l	<0.001	3
10	Iron as Fe	mg/l	<0.01	3.0
11	Manganese as Mn	mg/l	<0.001	2.0
12	Chlorides as Cl	mg/l	16	1000
13	Sulphates as SO <sub>4</sub>	mg/l	6.7	1000
14	Nitrate as NO <sub>3</sub>	mg/l	Nil	10
15	Fluoride as F	mg/l	0.37	2
16	Phenols as C <sub>6</sub> H <sub>5</sub> OH	mg/l	<0.001	-
17	Mercury as Hg	mg/l	<0.001	0.01
18	Cadmium as Cd	mg/l	<0.001	2
19	Selenium as Se	mg/l	<0.001	0.05
20	Arsenic as	mg/l	<0.001	0.2
21	Cyanide as CN	mg/l	<0.001	0.2
22	Lead as Pb	mg/l	<0.001	0.1
23	Zinc as Zn	mg/l	<0.01	5
24	Chromium as Cr+6	mg/l	<0.001	0.1
25	Mineral Oil	mg/l	Nil	-
26	Residual Free-chlorine	mg/l	0.12	-
27	Total coliforms	MPN/100ml	Absent	-
28	E-coli	MPN/100ml	Absent	-
29	Total Dissolved solids	mg/l	80	2100

WQB14 - 8 : Treated water at the water treatment Plant immediately after Disinfection at Kirandul

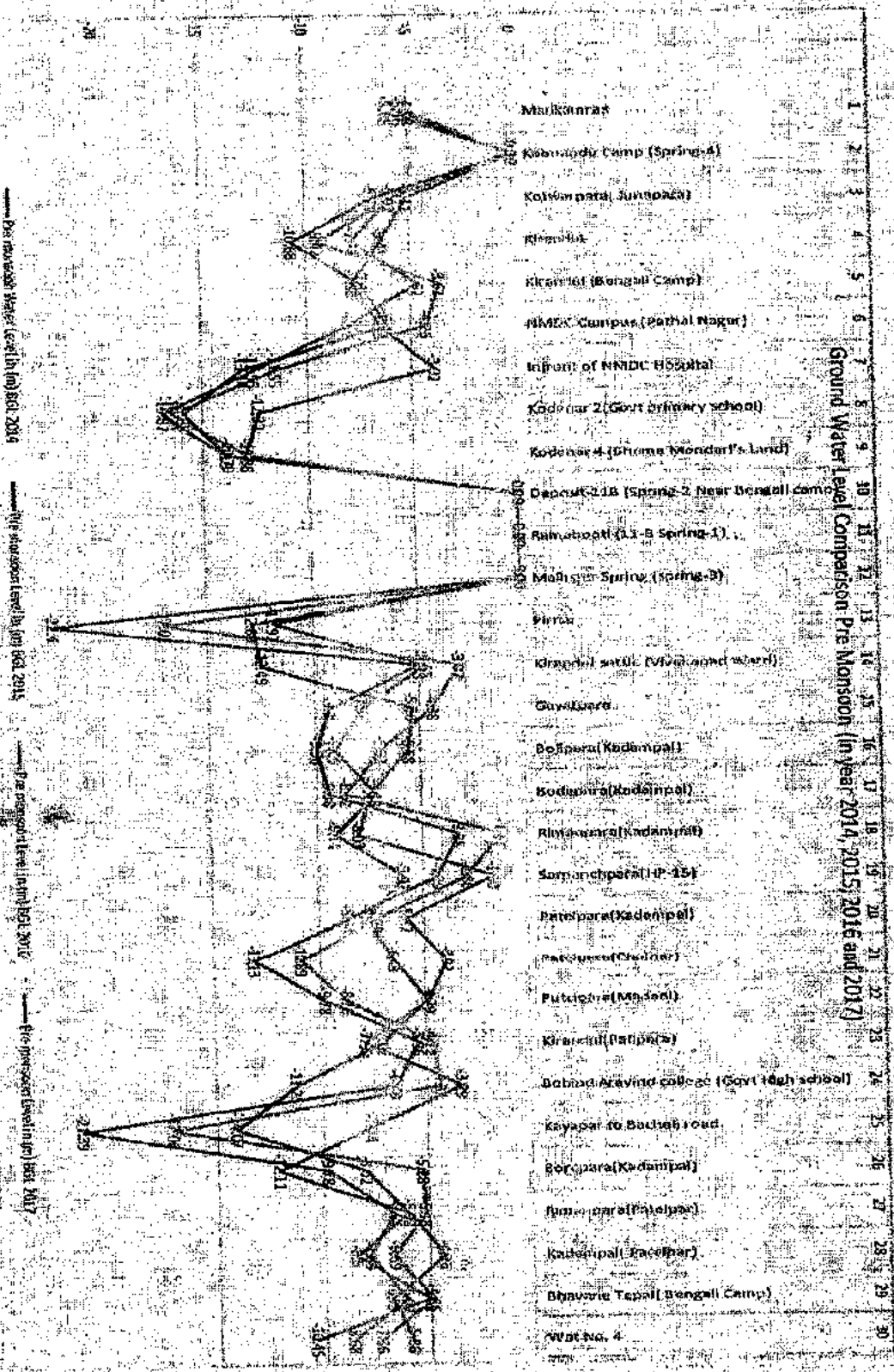


Ground Water Level Comparison Post-Monsoon (in year 2014, 2015, 2016 and 2017)



16.58

25



Pre monsoon level in Jun 2014

Pre monsoon level in Jun 2015

Pre monsoon level in Jun 2016

Pre monsoon level in Jun 2017

0

Table No. 16

Location: DLM Colony (AAQ-13)

Month	Sampling Date	Parameters ( $\mu\text{g}/\text{m}^3$ )				
		PM 10	PM 2.5	SO <sub>2</sub>	NO <sub>x</sub>	CO
March 2017	03/04-03-17	48	18	8.8	10.8	BDL
	17/18-03-17	40	19	19.8	11.7	BDL
April 2017	04/05-04-17	51	19	9.5	11.4	BDL
	28/29-04-17	42	21	11.2	12.7	BDL
May 2017	05/06-05-17	52	21	11.5	12.1	BDL
	15/16-05-17	43	21	12.5	13.8	BDL
Min.		40	18	8.8	10.8	BDL
Max.		52	21	12.5	13.8	BDL
Mean.		46	19.8	11.5	12.1	BDL

Note: CO found to be Below Detectable Limit ( $0.0145 \text{ g}/\text{m}^3$ )

Table No. 17

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

Month	Sampling Date	Parameters ( $\mu\text{g}/\text{m}^3$ )				
		PM 10	PM 2.5	SO <sub>2</sub>	NO <sub>x</sub>	CO
March 2017	04/05-03-17	45	16	8.7	10.6	BDL
	18/19-03-17	37	15	8.5	11.3	BDL
April 2017	05/06-04-17	48	18	9.2	11.2	BDL
	13/14-04-17	39	18	9.3	12.4	BDL
May 2017	06/07-05-17	49	19	10.8	12.8	BDL
	16/17-05-17	40	19	11.5	13.6	BDL
Min.		37	15	8.5	10.6	BDL
Max.		49	19	10.8	13.6	BDL
Mean.		43	17.7	9.5	12	BDL

Note: CO found to be Below Detectable Limit ( $0.0145 \text{ g}/\text{m}^3$ )

## Ambient Air Quality Data

Table No. 4

Location: Deposit - 14 Mine Office (AAQ-1)

Season: Summer 2017

Month	Sampling Date	Parameters ( $\mu\text{g}/\text{m}^3$ )				
		PM 10	PM 2.5	SO <sub>2</sub>	NO <sub>x</sub>	CO
March 2017	02/03-03-17	60	28	11.5	13.5	BDL
	14/15-03-17	56	23	11.2	14.1	BDL
April 2017	01/02-04-17	64	30	11.8	14.2	BDL
	13/14-04-17	58	25	12.3	15.5	BDL
May 2017	01/02-05-17	66	32	12.7	15.6	BDL
	13/14-05-17	58	27	13.5	16.8	BDL
Min.		56	23	11.2	13.5	BDL
Max.		66	32	13.5	16.8	BDL
Mean.		60.3	27.5	12.2	15.0	BDL

Note: CO found to be Below Detectable Limit (CO < 114.5  $\mu\text{g}/\text{m}^3$ )

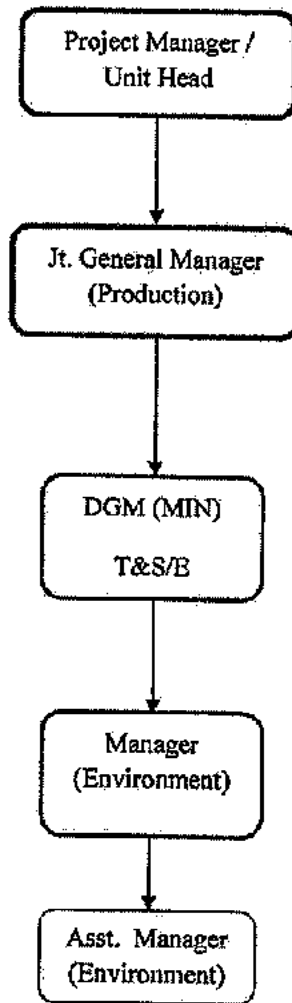
Table No. 5

Location: Deposit - 11C Mine Office (AAQ-2)

Month	Sampling Date	Parameters ( $\mu\text{g}/\text{m}^3$ )				
		PM 10	PM 2.5	SO <sub>2</sub>	NO <sub>x</sub>	CO
March 2017	03/04-03-17	54	21	10.2	14.6	BDL
	16/17-03-17	53	21	10.3	14.7	BDL
April 2017	02/03-04-17	57	23	11.4	15.7	BDL
	15/16-04-17	55	23	11.4	15.7	BDL
May 2017	02/03-05-17	59	25	12.1	16.8	BDL
	14/15-05-17	57	25	12.4	16.4	BDL
Min.		53	21	10.2	14.6	BDL
Max.		59	25	12.4	16.8	BDL
Mean.		55.8	23	11.3	15.7	BDL

Note: CO found to be Below Detectable Limit (CO < 114.5  $\mu\text{g}/\text{m}^3$ )

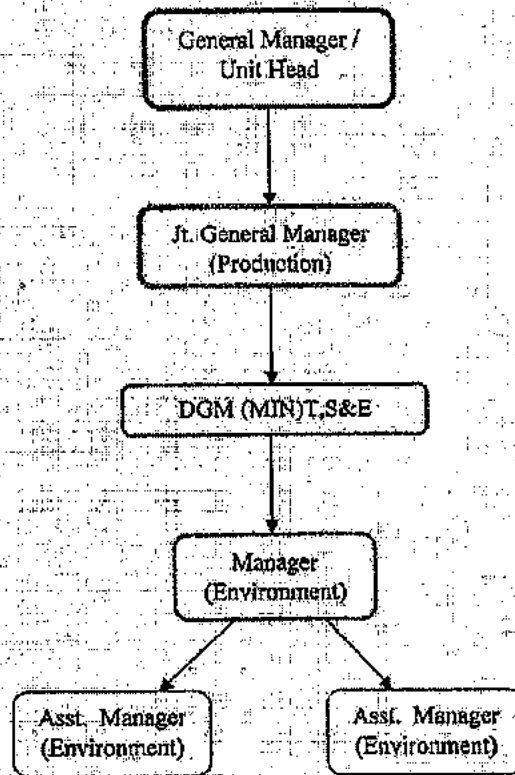
**Organizational Chart of  
Environment Department at BIOM, Kirandul Complex**



• **Quantity desilted between October 2016 and March 2017.**

Sl. No.	Check Dam/ Tailing Dam/ Nallah	Quantity Desilted (in cum)
1.	Check Dam No.8	5377
2.	Check Dam No.9	6825
3.	Check Dam No.6	6613
4.	Check Dam No. 2	12582
5.	Kadampal Tailing Dam	34904
<b>Total Desilted</b>		<b>66301</b>

**ORGANIZATIONAL CHART OF ENVIRONMENT DEPARTMENT**



**GROUND WATER REPORT**

Graphical representation of the water level below the ground for thirty locations in and around Kirandul complex for winter, pre-monsoon and post-monsoon for the year 2014, 2015, 2016 and 2017 is given in Annexure 1.

### MONITORING DATA

The reports of the seasonal monitoring carried out by M/S Pragati Labs, M/S ISM Dhanbad, M/S Space Geo Tech and M/S NIMH is attached as Annexure 2.

### DETAILS OF PPE ISSUED

The detail of PPEs issued to NMDC employees are as follows:

Sl. No.	Item Description (Size)	Item Code as per IAS	Unit	2014-15	2015-16	2016-17
1	2	3	4	5	6	7
<b>Rain Suit</b>						
1	Extra Large	86A018918	Pair	257	291	288
2	Large	86A019016	Pair	626	549	535
3	Medium	86A019111	Pair	456	388	374
<b>Total</b>				<b>1339</b>	<b>1228</b>	<b>1197</b>
<b>Gum Boot/Knee Boot</b>						
1	Size-5	86A050518	Pair	41	19	22
2	Size-6	86A050613	Pair	97	53	51
3	Size-7	86A050718	Pair	134	68	75
4	Size-8	86A050813	Pair	73	56	24
5	Size-9	86A050918	Pair	32	20	8
6	Size-10	86A051016	Pair	5	10	3
7	Size-11	86A051111	Pair	2	3	0
<b>Total</b>				<b>384</b>	<b>229</b>	<b>183</b>
<b>Ankle Shoes</b>						
1	5	86A040517	Pair	68	55	32
2	6	86A040612	Pair	134	149	168
3	7	86A040717	Pair	179	272	211
4	8	86A040812	Pair	154	152	134
5	9	86A040917	Pair	35	51	42
6	10	86A041015	Pair	12	17	15
<b>Total</b>				<b>582</b>	<b>696</b>	<b>602</b>
<b>Leather Shoe</b>						
1	5	86A010514	Pair	55	70	52
2	6	86A010619	Pair	241	305	229
3	7	86A010714	Pair	491	565	577

4	8	86A010819	Pair	487	565	559
5	9	86A010914	Pair	199	236	211
6	10	86A011012	Pair	84	97	118
7	11	86A011117	Pair	17	26	14
<b>Total</b>				<b>1574</b>	<b>1864</b>	<b>1760</b>
<b>Canvas Shoes</b>						
1	5	86A020515	Pair	11	17	0
2	6	86A020610	Pair	20	40	6
3	7	86A020715	Pair	43	23	0
4	8	86A020810	Pair	36	55	0
5	9	86A020915	Pair	17	31	0
6	10	86A021013	Pair	4	4	0
7	11	86A021118	Pair	0	0	0
<b>TOTAL</b>				<b>131</b>	<b>170</b>	<b>6</b>
<b>Helmet</b>						
1	Helmet Logo	86A140219		315	489	216
2	Helmet Plain for C.I.S.F	86A140314	No.	188	193	208
3	Helmet (Green) for V.I.Ps	86A130113	No.	10	10	0
4	Helmet (Red) for Blasting Section	86A180118	No.	21	0	8
<b>TOTAL</b>				<b>534</b>	<b>692</b>	<b>432</b>
<b>Water Bottle</b>						
1	Insulated Water Bottle (2 Litre Capacity), Make - Milton, Cello	86A300219	No.	0	0	229
<b>Gumcha</b>						
1	Gumcha	39A106017	No.	2603	2551	2773
<b>Respirator</b>						
1	Respirator	86A400216	No.	1446	2459	2725
<b>Ear Plug</b>						
1	Ear Plug	86A400616	No.	500	1387	1705



Fluorescent Jacket						
1	Extra Large	86A411810	No.	46	86	0
2	Large	86A411915	No.	250	121	139
3	Medium	86A412019	No.	132	44	39
Total				428	251	178
Safety Goggle						
1	Safety Goggle	86A401714	No.	563	485	307
Rubber Hand Gloves						
1	Rubber Hand Gloves 14 inch Length	35B025212	Pair	17	48	95
2	Rubber Hand Gloves 16 inch Length	35B025517	Pair	50	69	50
Total				67	117	145

**EXPENDITURE DETAILS OF ENVIRONMENT DEPARTMENT**

Environment Expenditure (for FY)		2016-17	2015-16	2014-15	2013-14	2012-13
Sl. No.	Particulars					
1	Desilting of slimes	95.11	128.59	286.57	172.95	372.05
2	Soil and water conservation works				219.55	
3	Construction/maintenance of buttress wall/check bunds	13.45	12.41	49.05	6.57	1.76
4	Repair & maintenance of dam	22.77	13.80	43.31	45.51	43.56
5	Plantation	2972.31	550.15	546.03	56.26	6.41
6	Horticulture works		43.45	57.99	64.46	71.18
7	Environmental monitoring studies/consultancy	23.95	10.11	44.00	37.70	36.43
8	ISO audit/studies		0.28	5.59	0.22	0.56
9	Others	18.91	64.18	5.19	59.53	38.29
TOTAL		3156.50	822.97	987.74	662.75	570.24

**DETAILS OF KADAMPAL TAILING DAM**

Sl. No.	Description	Details
1.	Length of dam	540 m
2.	Width	110 m at base, 4 m at top

3.	Height	17 m (max), 10 m (avg.)
4.	Top of the earthen dam	571 MRL
5.	Spill over level	566 MRL
6.	Area submerged	173 acres upto 567 m R.L.
7.	Land acquired	296.77 acres upto 571 m R.L.
8.	Capacity	40,00,000 m <sup>3</sup>
9.	Estimated life of dam	10 years
10.	Date of completion of dam construction	31.05.1989

PRODUCTION DETAILS OF BIOM KIRANDUL COMPLEX (ROM DETAILS)

Month of the FY	FY 2017-18	FY 2016-17	FY 2015-16	FY 2014-15
April	8.23	7.57	4.45	8.26
May	8.28	8.07	3.88	7.57
June	7.38	7.60	4.76	10.57
July	6.07	3.45	5.91	6.25
Aug	6.40	5.98	4.14	6.85
Sept.	7.22	6.77	3.57	7.88
Oct.	7.79	9.06	6.58	4.87
Nov.		11.77	6.06	5.91
Dec.		11.25	6.37	10.50
Jan.		11.44	6.34	9.09
Feb.		10.42	9.09	7.85
March		10.68	11.15	9.70
Total in FY	43.43*	104.07	72.28	95.30

\*Till Oct 2017