Bharat Coking Coal Limited
(A Subsidiary of Coal India Limited)
OFFICE OF THE GENERAL MANAGER
CHANCH-VICTORIA AREA-XII
P.O.-BARAKAR – 713324, DIST-BURDWAN (W.B.)
Phone : 0341-2520061/62; FAX 0341-2520063

Ref. No: BCCL/CV/ ENVT/2017/ 84 Date: 29/05/17

To,
The Director,
Ministry of Environment, Forest, Climate Change,
Regional Office (ECZ), Bungalow No. A-2,
Shyamali Colony,
Ranchi, Jharkhand- 834002

Sub:- Six Monthly Report On Implementation Of Environmental Measures For The Period From October 2016 To March 2017 In Respect Of Cluster-XVI Group Of Mines Of BCCL.

Dear Sir,

Enclosed please find herewith the six monthly reports on implementation of environmental protection measure for the period from October 2016 To March 2017 in respect of Cluster-XVI group of mines of BCCL.

Hope you will find the same in order.

Yours Faithfully

General Manager
CV Area

CC to: - (1) Dr. Sunita Aulock, Director IA monitoring cell, Paryavaran Bhawan CGO Complex, New Delhi-110003
(2) The Incharge, Zonal Office, CPCB, Southernd Conclave, Block 502,5th & 6th Floors, 1582 Rajdanga Main Road Kolkata – 700107 (W.B)
(3) The Regional Officer, JSPCB, Hirapur, Dhanbad- 826001, Jharkhand
(4) Dy.GM (Environment), BCCL, Koyla Bhawan, Dhanbad.
(5) AGM, CV Area.
(6) Project Officer, DBOCP
(7) Nodal Officer (Envt), CV Area.
(8) Office Copy

COMPLIANCE OF EC CONDITIONS OF CLUSTER- XVI

EC order no- J-11015/185/2010-IA.II (M) Dated 06.02.2013

Up to March 2017

<table>
<tr><th>Sl. no.</th><th>A. Specific Conditions by MOEF:</th><th>Compliance</th></tr>
<tr><td>i</td><td>The maximum production shall not exceed beyond that for which environmental clearance has been granted for the 5 mines of cluster XVI as below:</td><td>The approved peak production of coal for Cluster XVI is 1.963 MTPA. The total production of coal for the cluster XVI for the FY 2016-17 is 1.299 MT which is well within the limit. Production of the coal in this FY 2016-17 during October'16 to March'17 is 0.688 MT.</td></tr>
<tr><td>ii</td><td>All the void /water bodies should be backfilled up to ground level and no OB dump at the end of mining.</td><td>Dahibari Basantimata OCP (DBOCP) is the only operating OC project in Cluster XVI and backfilling is being done simultaneously. At the end of mining all water bodies and void will be filled up to ground level and there will be no OB dump remains left.</td></tr>
<tr><td>iii</td><td>Extensive plantation should be provided on either side of River;</td><td>A total of 2, 30,000 Nos. saplings are planted till March 2017 in Cluster XVI. Apart from this extensive plantation already exist on both side of Khudia river.</td></tr>
<tr><td>iv</td><td>Impact of mining on ground water of the area (Impact Zone) should be provided;</td><td>Time series data for the FY 2015, 2016 and 2017 is attached as Annexure-1. There is no significant impact.</td></tr>
<tr><td>v</td><td>A Garland drain should be provided</td><td>Garland drain is already present along the periphery of quarry area along with master drain which is named as C-9 drain.</td></tr>
<tr><td>vi</td><td>Excess water from mine after treatment should be supplied to the villagers.</td><td>At present excess water from mine is supplied to the villages through settling pond. Location of pond is at the south of Palasia incline & Palasia village is beneficiary.

Apart from this an action plan for Utilization and treatment of surplus mine water has been prepared. In this regard, 26 mines have been identified for the implementation of the action plan in the Phase –I of the scheme.</td></tr>
<tr><td>vii</td><td>Rejects of washery along with dry carbon slurry should be utilized in power plant and other recognized vendors.</td><td>There is no washery in operation at present.</td></tr>
<tr><td>viii</td><td>A time schedule for filling of existing and abandoned quarries be done.</td><td>Old abandoned Quarry no. 1, 2, 3 & 3/4 of Kalimati Seam at Basantimata Mine has been filled upto ground level. NLOCP, JOCP & KOCP abandoned quarry has been filled up.

Year wise Backfilling till now is as below:-
<table>
<tr><th>Sl No.</th><th>Year</th><th>Quantity (Lakh M^3)</th></tr>
<tr><td>1.</td><td>2012-13</td><td>7.25</td></tr>
<tr><td>2.</td><td>2013-14</td><td>55.00</td></tr>
</table>
</td></tr>
</table>

			3.	2014-15	85.75
			4.	2015-16	5.00
			5.	2016-17	7.00
ix	**The measure identified in the environmental plan for cluster XVI groups of mine and the conditions given in this environmental clearance letter shall be dovetailed to the implementation of the Jharia Action Plan.**	Master Plan activities are dovetailed with compliance of environmental clearance conditions.			
x	**As there is no fire in Cluster XVI but the measure should be adopted by proponent to control spread of neighboring fire to this Cluster XVI. The proponent shall prepare time -series maps of the Jharia Coalfields through NRSA to monitor and prevent fire problems in the Jharia Coalfields by Isothermal mapping /imaging and monitoring temperatures of the coal seams (whether they are close to spontaneous ignition temperatures) and based on which, areas with potential fire problems shall be identified. Measures to prevent ingress of air (Ventilation) in such areas, to prevent restart fresh/spread fires in other areas including in mines of cluster XIV shall be undertaken.**	**Preparation of time series maps is a continuous process and is being complied by BCCL. On three years interval time series maps are being prepared.** A study and first of the time series Map has been prepared through NRSC Hyderabad **and the report was submitted by NRSC on April, 2014. Presently (i.e. in2017) the Work Order for "Delineation of Surface Fire and associated land subsidence in Jharia Coal Field using satellite based remote sensing techniques" has already been awarded to NRSC under the MoU signed with NRSC**. The copy of the work order is enclosed as **Annexure 2.**			
xi	**Underground mining should be taken up after completion of reclamation of Opencast mine area after 2 years.**	It shall be complied. Mining is being done as per the guidance and approval/permission of DGMS.			
xii	**No mining shall be undertaken where underground fires continue. Measure shall be taken to prevent/ check such fire including in old OB dump**	It is being complied. The fire control measures are being taken through opencast excavation method to prevent /check its further spread.			
xiii	**A part of cluster XVI is under Barakar River and Damodar River. It was clarified that although the mine is underground, there is no coal underneath River Damodar, which would be mined. The Committee desired that the data of bore wells near River Damodar require to be monitored for permeability and seepage of waster of River Damodar.**	At present there is no underground mining operation below the River Damodar & Barakar. The data of dugwell near Khudia River is being monitored for ground water level. Working underground mine has not reached near river Damodar & Barakar and it is more than 1000 mtr. away from river bed. When working mine will reach within 15 mtr. of river bed then seepage will be monitored as per requirement of regulation 126 , danger for surface water; of CMR 1957 under Mines act 1952. The bore hole will be maintained & monitored as per regulation 127 (B) of CMR 1957 of Mines act. 1952. So it will be complied on time.			

xiv	**The rejects of washeries in Cluster –XVI should be send to FBC based plant.**	Washery is yet to be started.
xv	**There shall be no external OB dumps. OB produce from the whole cluster will be 29.01 Mm^3. OB from One Patch OCP mine shall be backfilled. At the end of the mining there shall be no void and the entire mined out area shall be re-vegetated. Areas where opencast mining was carried out and completed shall be reclaimed immediately thereafter.**	There are seven OB dump in the cluster. All the OB dumps are within the leasehold area and are on de-coaled area. These dumps are created outside/externally to excavation area for reasons of safety and to facilitate mining. At the end of mining all the dumps will be leveled and backfilled in opencast excavated area. Action is being taken as specified in EMP for Backfilling of OB concurrent with mining. No fresh land is used for OB dumping. Proper vegetation is being developed on the OB dump to avoid erosion of soil and gully formation and also to stabilize sufficiently the OB slope.
xvi	**A detailed calendar plan of production with plan for OB dumping and backfilling (for OC mines) and reclamation and final mine closure plan for each mine of cluster- XVI shall be drawn up and implemented.**	Calendar plan has been prepared. Mine closure plan as per the guidelines of Ministry of Coal has been prepared by CMPDI and it is being followed..
xvii	**The void in 5 ha area shall be converted into a water reservoir of a maximum depth of 15-20 m in post mining stage and shall be gently sloped and the upper benches of the reservoir shall be stabilised with plantation and the periphery of the reservoir fenced. The abandoned pits and voids should be backfilled with OB and biologically reclaimed with plantation and or may be used for pisciculture**	It shall be complied. Continuous process of the backfilling has been adopted. A part of the void will be converted into the water body as specified in EMP.
xviii	**Mining shall be carried out as per statuette from the streams/nalas flowing within the lease and maintaining a safe distance from the Nalas flowing along the lease boundary. A safety barrier of a minimum 60m width shall be maintained along the nalas/water bodies. The small water bodies in OC shall be protected to the extent feasible and the embankment proposed along water body shall be strengthened with stone pitching.**	Mining is being carried out as per Statute from the streams/Nalas following within the lease and maintaining a safe distance from the nalas flowing along the lease boundary.
xix	**Active OB dumps near water bodies and rivers should be rehandled for backfilling abandoned mine voids. However, those which have been**	Presently No OB is being dumped near water bodies. The OB dumps created earlier already stabilized & further action has been taken for their eco-restoration work as per Road Map prepared by FRI, Dehradun and as per the action plan of Prof. CR Babu ,Professor Emirates CEMDE, Delhi University. The OB

<table>
<tr><td></td><td>biologically reclaimed need not be disturbed.</td><td>dumps which are already present at the bank of River will be provided with the Toe-Wall to arrest the silt from going into river.</td></tr>
<tr><td>xx</td><td>Thick green belt shall be developed along undisturbed areas, mine boundary and in mine reclamation. During post mining stage, a total of 242.09ha area would be reclaimed by planting native species in consultation with the local DFO/Agriculture Department/institution with the relevant discipline. The density of the trees shall be around 2500 plants per ha.</td><td>Year wise plantation is being done as per following plan:-
<table>
<tr><th>Year</th><th>Biologically Reclaimed Area</th></tr>
<tr><td>2013-14</td><td>1.0 Ha.</td></tr>
<tr><td>2014-15</td><td>4.6 Ha.</td></tr>
<tr><td>2015-16</td><td>4.0 Ha.</td></tr>
<tr><td>2016-17</td><td>12.5 Ha.</td></tr>
<tr><td>2017-18</td><td>7.0 Ha.</td></tr>
<tr><td>2018-19</td><td>10.0 Ha.</td></tr>
<tr><td>2019-20</td><td>15.0 Ha.</td></tr>
<tr><td>2020-21</td><td>15.0 Ha.</td></tr>
<tr><td>2021-22</td><td>15.0 Ha.</td></tr>
<tr><td>2022-23</td><td>15.0 Ha.</td></tr>
<tr><td>2023-24</td><td>15.0 Ha.</td></tr>
<tr><td>2024-25</td><td>25.0 Ha.</td></tr>
<tr><td>2025-26</td><td>25.0 Ha.</td></tr>
<tr><td>2026-27</td><td>25.0 Ha.</td></tr>
<tr><td>2027-28</td><td>25.0 Ha.</td></tr>
<tr><td>2028-29</td><td>28.0 Ha.</td></tr>
</table></td></tr>
<tr><td>xxi</td><td>The road should be provided with avenue plantation on both side as trees act as sink of carbon and other pollutant.</td><td>1700 gabion trees were planted by DFO along the transportation road and siding in cluster XVI. More roadside plantation has been included in 2017-18 plantation programme.</td></tr>
<tr><td>xxii</td><td>Specific mitigative measures identified for the Jharia Coalfields in the Environmental Action Plan prepared for Dhanbad as a critically polluted are and relevant for Cluster -XVI shall be implemented.</td><td>Dhanbad Action Plan has been prepared in consultation with Jharkhand Pollution Control Board for entire BCCL and not cluster wise. It is being implemented comprehensively for all the mines of BCCL.</td></tr>
<tr><td>xxiii</td><td>The locations of monitoring stations in the Jharia Coalfields should be finalized in consultation with the Jharkhand State Pollution Control Board. The Committee stated that smoke/dust emission vary from source to source (fuel wood, coal, flyash from TPPs, silica from natural dust, etc) and a Source Apportionment Study should be got carried out for the entire Jharia Coalfields. Mineralogical composition study should be undertaken on the composition of the suspended particulate matter (PM_{10} and $PM_{2.5}$) in Jharia Coalfields and also quantified. These studies would help ascertain source and</td><td>The locations in the Jharia coalfield have been finalized in consultation with the Jharkhand State Pollution Control Board. CIL has entered a MoU with NEERI to carry out such study.
Tender for conducting source apportionment study for BCCL was floated twice, however, none of the bidders qualified. Therefore, as per the MoU "Sustainable Coal Mining in Coal India Limited" entered between CIL and NEERI, NEERI Nagpur was approached for conducting Source Apportionment Study BCCL for compliance of EC conditions. The proposal regarding Conducting the Source Apportionment Study has been submitted by NEERI. Presently it has been submitted to CIL for further scrutiny and approval.</td></tr>
</table>

	extent of the air pollution, based on which appropriate mitigative measures could be taken.	
xxiv	**No groundwater shall be used for the mining activities. Additional water required, if any, shall be met from mine water or by recycling/reuse of the water from the existing activities and from rainwater harvesting measures. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry to dewatering of mine.**	No ground water is being utilized for the purpose of industrial use of the water. Mine water has been channelized through pipelines and through discharge in to the ponds for its use for the community and irrigation purposes. During summer season filter water as well as raw water is being supplied through water tanker to local adjacent villages where required. Pressure Filters have been installed for the filtration of mine water being supplied to nearby habitat. Aalready 6 Nos. filters have been installed and in operation.
xxv	**Regular monitoring of groundwater level and quality of the study area shall be carried out by establishing a network of existing wells and construction of new peizometers. The monitoring for quantity shall be dome four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality including Arsenic and Fluoride during the month of May. Data thus collected shall be submitted to the Ministry of Environment & Forest and to the Central Pollution Control Board/SPCB quarterly within one month of monitoring. Rainwater harvesting measures shall be undertaken in case monitoring of water table indicates a declining trend.**	Ground water level and quality are being monitored by CMPDIL Ranchi. As of now water accumulated in quarries during monsoon is being extracted and being used in recharging of nearby ponds. Report for Groundwater monitoring is enclosed as **Annexure 1**.
xxvi	**Mine discharge water shall be treated to meet standards prescribed standards before discharge into natural water courses/agriculture. The quality of the water discharged shall be monitored at the outlet points and proper records maintained thereof and uploaded regularly on the company website.**	Analysis report has been uploaded in the website.
xxvii	**ETP shall also be provided for workshop, and CHP, if any. Effluents shall be treated to confirm to prescribe standards in case discharge into the natural**	Proposal for ETP is under process in association with CMPDI at DBOCP. Action plan of CMPDI is enclosed herewith as **Annexure 3.** We have already processed the installation of Oil & Grease trap

	water course.	for Workshop for which we have received the design from CMPDI (enclosed) as **Annexure 4.** Since only crushing is being done at CHP, hence ETP is not required for CHP.
xxviii	**Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural drainage pattern, water bodies, vegetation, structure, roads, and surroundings shall be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate effective corrective measures shall be taken to avoid loss of life and material. Cracks shall be effectively plugged with ballast and clayey soil/suitable material.**	There is no depillaring is going on in underground mines of Cluster XVI, hence no mining induced subsidence is taking place. There has been no subsidence occurred during Environmental Clearance compliance period till now. Regular monitoring of the area is being done by mine officials in this regard.
xxix	**Sufficient coal pillars shall be left un-extracted around the air shaft (within the subsidence influence area) to protect from any damage from subsidence, if any.**	Sufficient coal pillars have been left around air shafts as per the statutes and DGMS guidelines.
xxx	**High root density tree species shall be selected and planted over areas likely to be affected by subsidence.**	It is being complied. The plantation programme includes such plants.
xxxi	**Depression due to subsidence resulting in water accumulating within the low lying areas shall be filled up or drained out by cutting drains.**	It is being complied.
xxxii	**Solid barriers shall be left below the roads falling within the blocks to avoid any damage to the roads.**	It is being followed. Sufficient barriers are left for saving the surface installation and infra structures as per the statute and DGMS guidelines.
xxxiii	**No depillaring operation shall be carried out below the township/colony.**	No depillaring operation is being carried out below township/colony.
xxxiv	**The Transportation Plan for conveyor-cum–rail for Cluster-XVI should be dovetailed with Jharia Action Plan. Road transportation of coal during Phase–I should be by mechanically covered trucks, which should be introduced at the earliest. The Plan for conveyor-cum–rail for Cluster-**	Presently tarpaulin covered coal transportation is being done as earlier there were no OEM (original equipment manufacturer) which were supplying such trucks for coal transportation. However, Initiatives has been taken at corporate level of coal India Limited for developing the mechanically covered trucks and a vendor meeting for the same has been held with the OEM on dated 07.05.2016. Further, a proposal for inclusion of mechanically covered trucks in the Contract Terms has been initiated to ensure that the

	XIV should be dovetailed with Jharia Action Plan. The road transpiration of coal during phase–I should be by mechanically covered trucks.	Outsourcing company should deploy Mechanically Covered Trucks for coal Transportation. Further, the study regarding installation of conveyer-cum-rail system for transportation of coal has been entrusted to CMPDIL. The conveyor-cum–rail system will be installed during Second Phase of Master Plan. Mechanically covered trucks were deployed of trial basis in Coal India ltd. but due to their unsuccessful run they have been removed. Tarpaulin covered trucks are being used until the introduction of successful mechanically truck in Coal India Ltd. However the matter has been taken to the higher management for introduction of conveyer-cum-rail system for transportation of coal Proposal for queries & inquiries is under progress for conveyer-cum-rail system.
xxxv	**A study should be initiated to analyze extent of reduction in pollution load every year by reducing road transport.**	The study regarding pollution load in aspect of Cluster XVI has been done by CMPDI, Ranchi for year 2015-16. The final report regarding pollution load in aspect of Cluster XVI is attached as **Annexure-5**.
xxxvi	**R&R of 1193 nos of PAF's involved. They should be rehabilitated at cost of Rs 10171.88 lakhs as per the approved Jharia Action Plan.**	The rehabilitation of 1193 PAF is being done by Jharia Rehabilitation & Development Authority (JRDA) under Jharia Action Plan. Presently they are surveying the house in Cluster XVI. Final report on rehabilitation is yet to be submitted by District Collector, Dhanbad.
xxxvii	**Details of transportation, CSR, R&R and implementation of environmental action plan for each of the 17 clusters should be brought out in a booklet for and submitted to Ministry.**	Booklet on CSR, Transportation and R&R activities and implementation of environmental action plan is prepared.
xxxviii	**A detailed CSR Action Plan shall be prepared for Cluster XVI croup of mines. Specific activities shall be identified for CSR of Rs 20.25/annum @ of Rs 5/ton of coal production. as recurring expenditure. The 242.09ha of area within Cluster XVI ML existing as waste land and not being acquired shall be put to productive use under CSR and developed with fruit bearing and other useful species for the local communities. Third party evaluation shall be got carried out regularly for the proper implementation of activities undertaken in the project area under CSR. Issue raised in the Public Hearing shall also be integrated with activities being**	It is being complied. BCCL is implementing CSR activities.

	taken up under CSR. The details of CSR undertaken along with budgetary provisions for the village-wise various activities and expenditure thereon shall be uploaded on the company website every year. The company must give priority to capacity building both within the company and to the local youth, who are motivated to carry out the work in future.	
xxxix	**For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted to MOEF and its Regional office at Bhubaneswar.**	Time series map of vegetation cover in the Jharia Coal field has been carried out through CMPDI in the year 2014 which is enclosed herewith as **Annexure 6**.
xl	**A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests five year before mine closure for approval. Habitat Restoration Plan of the mine area shall be carried out using a mix of native species found in the original ecosystem, which were conserved in-situ and ex-situ in an identified area within the lease for reintroduction in the mine during mine reclamation and at the post mining stage for habitat restoration.**	Mine closure plan as per the guidelines of Ministry of Coal has been prepared by CMPDI and it is being followed.
xli	**A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company for implementing environment policy and socio-economic issues and the capacity building required in this regard.**	A full-fledged Environment Department, headed by a HoD (Environment) along with a suitable qualified multidisciplinary team of executives which includes Environment, Mining, Excavation disciplines executives and technicians has been established in Headquarters. They are also trained in ecological restoration, sustainable development, rainwater harvesting methods etc. At the project level, one Executive in each area has also been nominated as Project Nodal Officer (Environment) and is also entrusted with the responsibility of compliance and observance of the environmental Acts/ Laws including environment protection measures .The activities are monitored on regular basis at Area and at Head quarters levels. GM

		(Environment) at head quarter level, co-ordinates with all the Areas and reports to the Director (Technical) and in turn he reports to the CMD of the company. The team is multidisciplinary and very much motivated under the guidance of company's Director (Technical) and CMD. Further capacity building at both corporate and operating level is being done.
xlii	**Implementation of final mine closure plan for Cluster XVI, subject to obtaining prior approval of the DGMS in regard to mine safety issues.**	Final Mine Closure Plan, as per the guideline will be submitted 5 years before the closure of the Mine. For the purpose of safety issues related to the closure prior approval of DGMS will be taken in this regard.
xliii	**Corporate Environment Responsibility:** **a) The Company shall have a well laid down Environment Policy approved by the Board of Directors.** **b) The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.** **c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished.** **d) To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.**	A well defined Corporate Environment Policy has already been laid down and approved by the Board of Directors. This is also posted on BCCL website. Complied. A hierarchical system of the company to deal with environmental issues from corporate level to mine level already exists. Being complied.
B	**General Conditions by MOEF:**	
i	**No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.**	It is being followed.
ii	**No change in the calendar plan of production for quantum of mineral coal shall be made.**	The approved peak production of coal for Cluster XVI is 1.963 MTPA. The total production of coal for the cluster XVI for the FY 2016-17 is

		1.299 MT which is well within the limit. Production of the coal in this FY 2016-17 during October'16 to March'17 is 0.688 MT.
iii	**Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM_{10}, $PM_{2.5}$, SO_2 and NOx monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.**	The location of monitoring stations has been finalized after the consultation with JSPCB. The work of monitoring of ambient air quality was being done by Central Institute of Mining & Fuel Research (CIMFR), Dhanbad who is having CSIR laboratory recognized under the EP Rules and presently, CMPDIL has taken up the monitoring work. **(Annexure-7)**
iv	**Data on ambient air quality (PM_{10}, $PM_{2.5}$, SO_2 and NO_x) and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly submitted to the Ministry including its Regional Office at Bhubaneswar and to the State Pollution Control Board and the Central Pollution Control Board once in six months. Random verification of samples through analysis from independent laboratories recognized under the EPA rules, 1986 shall be furnished as part of compliance report.**	The location of monitoring stations has been finalized after the consultation with JSPCB. The work of monitoring of ambient air quality was being done by Central Institute of Mining & Fuel Research (CIMFR), Dhanbad who is having CSIR laboratory recognized under the EP Rules and presently, CMPDIL has taken up the monitoring work. **(Annexure-7)**
v	**Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.**	It is being complied. All the workers engaged in noisy operations are provided with the Ear plugs/muffs.
vi	**Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.**	Proposal for ETP is under process in association with CMPDI. Action plan of CMPDI is enclosed herewith as **Annexure 3**. We have already processed the installation of Oil & Grease trap for Workshop for which we have received the design from CMPDI (enclosed) as **Annexure 4**. Since only crushing is being done at CHP, hence ETP is not required for CHP.
vii	**Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for**	It is being complied. Only tarpaulin covered vehicles all allowed carrying minerals and they are optimally loaded.

	transporting the mineral shall be covered with tarpaulins and optimally loaded.	
viii	**Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board and data got analysed through a laboratory recognised under EPA Rules, 1986.**	Monitoring work is being done by CMPDIL HQ which has a laboratory recognized under EPA rules 1986.
ix	**Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.**	Dust masks are provided to persons working in dusty areas. Training on safety & health is imparted at regular intervals at VTCs and at work place.
x	**Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed and records maintained thereof. The quality of environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by the company while outsourcing.**	Initial Medical Examination (IME) and Periodical Medical Examination (PME) of all the personnel are carried out as per the Statutes and Director General of Mines Safety (DGMS) guideline. Records of IME & PME are also being maintained.
xi	**A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company.**	A full-fledged Environment Department, headed by a HoD (Environment) along with a suitable qualified multidisciplinary team of executives (30 nos.) which includes Environment, Mining, Excavation, Civil, Survey ,Electrical & mechanical, Forestry disciplines executives and technicians (4 nos.) has been established in Headquarters. They are also trained in ecological restoration, sustainable development, rainwater harvesting methods etc. At the project level, one Executive in each area has also been nominated as Project Nodal Officer (Environment) and is also entrusted with the responsibility of compliance and observance of the environmental Acts/ Laws including environment protection measures .The activities are monitored on regular basis at Area and at Head quarters levels. GM (Environment) at head quarter level, co-ordinates with all the Areas and reports to the Director (Technical) and in turn he reports to the CMD of the company. The team is multidisciplinary and very much motivated under the guidance of company's Director (Technical) and CMD. Further capacity building at both corporate and operating level is

		being done.
xii	**The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its Regional Office at Bhubaneswar.**	It has been complied. The funds were earmarked as per EMP plan and kept in separate finance head for the expenditure to maintain environmental protection measures.
xiii	**The Project authorities shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution control Board and may also be seen at the website of the ministry of Environment& Forests at http://envfor.nic.in.**	It has been complied.
xiv	**A copy of the environmental clearance letter shall be marked to concern Panchayat/ZilaParishad, Municipal corporation or Urban local body and local NGO, if any, from whom any suggestion /representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on company's website.**	It has been complied.
xv	**A copy of the environmental clearance letter shall be shall also be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the Regional Office, District Industry Sector and Collector's Office/Tehsildar's Office for 30 days.**	It has been complied.
xvi	**The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated environmental clearance conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same**	It has been complied.

	in public domain. The monitoring data of environmental quality parameter (air, water, noise and soil) and critical pollutant such as PM_{10}, $PM_{2.5}$, SO_2 and NO_x (ambient) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mine office and in corporate office and on company's website.	
xvii	**The project proponent shall submit six monthly compliance reports on status of compliance of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office of the Ministry, respective Zonal Office s of CPCB and the SPCB.**	It is being complied.
xviii	**The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/ information/monitoring reports.**	Full cooperation is being provided for the regional office authorities for monitoring of Environmental Clearance conditions compliances.
xix	**The Environmental statement for each financial year ending 31 March in For –V is mandated to be submitted by the project proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986,as amended subsequently, shall also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MoEF by E-mail .**	Environmental Statement for each financial year is submitted to the regional office of Jharkhand State pollution control board by 30th June.

Project Officer
DBOCP

Manager
DBOCP

Nodal Officer(Env)
DBOCP

Addl. General Manager
CV Area

Area Nodal Officer (Env)
CV Area

Asst. Mgr. (Env)
CV Area

General Manager
CV Area

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A Mini Ratna Company

GROUNDWATER LEVEL & QUALITY REPORT FOR CLUSTER OF MINES, BCCL

(Assessment year - 2014)

[CLUSTER – I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XIII, XIV, XV & XVI]

JHARIA COALFIELD AND RANIGANJ COALFIELD (PART)

(BHARAT COKING COAL LIMITED)

MARCH – 2015

Regional Institute – II
Central Mine Planning & Design Institute Ltd.
(An ISO 9001:2000 Company)
(A Subsidiary of Coal India Ltd.)
Koyla Bhawan Complex, Koyla Nagar
DHANBAD – 826005

3.15 Monitoring of Ground Water Levels of Cluster-XVI

Cluster-XVI consists of five mines namely, Dahibari-Basantimata OC, Basantimata UG, New Laikidih OC, Laikdih Deep UG and Chunch UG under the administrative control of Chanch-Victoria Area of BCCL. This cluster of mines is located in the western part of Raniganj Coalfield in Dhanbad district of Jharkhand.

The present leasehold area of Cluster-XVI is 1964.21 Ha. The topography of the area is undulating with slope towards south west. The area is plain with gently undulating with elevation varying from 100 m to 140 m AMSL. The general slope of the area is towards southeast. Barakar River and Khudia River are controlling the drainage of the area. The area comes under the watershed area of Barakar River.

4 hydrograph stations (**DB-22, DB-23, DB-24 and DB-25**) are located in the core zone of the mine area. Water level monitoring in these monitoring stations has been done in the months of January, April, August & November'2014 and the Ground water level data is enclosed in the table below:

Sl No.	Well No.	Location	Water level BGL in meters			
			Jan'14	Apr'14	Aug'14	Nov'14
1	DB-22	Dahibari, Niche Basti	6.40	6.48	2.18	3.03
2	DB-23	Dahibari OC	3.85	3.95	2.32	2.13
3	DB-24	Dahibari	9.05	-	-	8.45
4	DB-25	Palasya	3.10	3.37	1.24	2.73
Average GW Level			***5.60***	***4.60***	***1.92***	***4.09***

Ground Water Level (in BGL) varies from 3.10 to 9.05 m during January, 3.37 to 6.48 m during April, 1.24 to 2.32 m during August and 2.13 to 8.45 m during November'2014 within the Core Zone of Cluster-XVI area.

Annexure – IV

GROUNDWATER SAMPLE LOCATION DETAILS

Sl No	Name of Cluster	Ground Water Sample	Dug well (CMPDI)	Location	Date of sampling
1	CLUSTER-I	GW-1	B-15	BERA VILLAGE	10.03.14
2	CLUSTER-II	GW-2	B-59	KHODOVALY VILLAGE	10.03.14
3	CLUSTER-III	GW-3	A-29	GOVINDPUR,AMBAGAN VILLAGE	10.03.14
4	CLUSTER-IV	GW-4	B-63	KESHALPUR, BATIGHAR	10.03.14
5	CLUSTER-V	GW-5	D-30	BORKIBOA VILLAGE	10.03.14
6	CLUSTER-VI	GW-6	D-25	GODHUR MORE	10.03.14
7	CLUSTER-VII	GW-7	D-80	DHANSAR MINE RESCUE STN.	11.03.14
8	CLUSTER-VIII	GW-8	D-48	NEAR GHANOODIH OC	11.03.14
9	CLUSTER-IX	GW-9	D-5	JEALGORA, NEAR P.O.	11.03.14
10	CLUSTER-X	GW-10	D-35	PATHERDIH RLY. COLONY	11.03.14
11	CLUSTER-XI	GW-11	A-32	MONNIDIH BAZAR	10.03.14
12	CLUSTER-XIII	GW-13	A-23	MACHHAYARA, BESIDE NH-32	10.03.14
13	CLUSTER-XIV	GW-14	B-23	LOHAPATTI VILLAGE	10.03.14
14	CLUSTER-XV	GW-15	B-32A	MADHUBAND VILLAGE	10.03.14
15	CLUSTER-XVI	GW-16	D-22	DAHIBARI,NICHE BASTI	11.03.14

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GROUNDWATER LEVEL & QUALITY REPORT FOR CLUSTER OF MINES, BCCL

(Assessment year - 2015)

[CLUSTER – I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XIII, XIV, XV & XVI]

JHARIA COALFIELD AND RANIGANJ COALFIELD (PART)

(BHARAT COKING COAL LIMITED)

MARCH – 2016

Regional Institute – II
Central Mine Planning & Design Institute Ltd.
(An ISO 9001:2000 Company)
(A Subsidiary of Coal India Ltd.)
Koyla Bhawan Complex, Koyla Nagar
DHANBAD – 826005

3.3 O Monitoring of Ground Water Levels of Cluster-XVI

Cluster-XVI consists of five mines namely, Dahibari-Basantimata OC, Basantimata UG, New Laikidih OC, Laikdih Deep UG and Chunch UG under the administrative control of Chanch-Victoria Area of BCCL. This cluster of mines is located in the western part of Raniganj Coalfield in Dhanbad district of Jharkhand.

The present leasehold area of Cluster-XVI is 1964.21 Ha. The topography of the area is undulating with slope towards south west. The area is plain with gently undulating with elevation varying from 100 m to 140 m AMSL. The general slope of the area is towards southeast. Barakar River and Khudia River are controlling the drainage of the area. The area comes under the watershed area of Barakar River.

4 hydrograph stations (**DB-22, DB-23, DB-24 and DB-25**) are located in the core zone of the mine area. Water level monitoring in these monitoring stations has been done in the months of February, April, August & November'2015 and the Ground water level data is enclosed in the table below:

Sl No.	Well No.	Location	Water level (bgl in meters)			
			Feb'15	Apr'15	Aug'15	Nov'15
1	DB-22	Dahibari, Niche Basti	3.78	4.59	2.50	3.53
2	DB-23	Dahibari OC	4.33	3.38	4.16	6.04
3	DB-24	Dahibari	8.38	9.52	5.30	8.20
4	DB-25	Palasya	3.47	3.83	2.13	2.68
Average GW Level			***4.99***	***5.33***	***3.52***	***5.11***

Ground Water Level (in bgl) varies from 3.47 to 8.38 m during February, 3.38 to 9.52 m during April, 2.13 to 5.30 m during August and 2.68 to 8.20 m during November'2015 within the Core Zone of Cluster-XVI area.

GROUNDWATER LEVEL & QUALITY

REPORT

FOR CLUSTER OF MINES, BCCL

(Assessment year - 2016)

[CLUSTER – I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XIII, XIV, XV & XVI]

JHARIA COALFIELD AND RANIGANJ COALFIELD (PART)

(BHARAT COKING COAL LIMITED)

MARCH – 2017

Regional Institute – II
Central Mine Planning & Design Institute Ltd.
(An ISO 9001:2000 Company)
(A Subsidiary of Coal India Ltd.)
Koyla Bhawan Complex, Koyla Nagar
DHANBAD – 826006

3.3 O Monitoring of Ground Water Levels of Cluster-XVI

Cluster-XVI consists of five mines namely, Dahibari-Basantimata OC, Basantimata UG, New Laikidih OC, Laikdih Deep UG and Chunch UG under the administrative control of Chanch-Victoria Area of BCCL. This cluster of mines is located in the western part of Raniganj Coalfield in Dhanbad district of Jharkhand.

The present leasehold area of Cluster-XVI is 1964.21 Ha. The topography of the area is undulating with slope towards south west. The area is plain with gently undulating with elevation varying from 100 m to 140 m AMSL. The general slope of the area is towards southeast. Barakar River and Khudia River are controlling the drainage of the area. The area comes under the watershed area of Barakar River.

4 hydrograph stations (**DB-22, DB-23, DB-24 and DB-25**) are located in the core zone of the mine area. Water level monitoring in these monitoring stations has been done in the months of February, April, August & November'2016 and the Ground water level data is enclosed in the table below:

Sl No.	Well No.	Location	Water level (bgl in meters)			
			Feb'16	Apr'16	Aug'16	Nov'16
1	DB-22	Dahibari, Niche Basti	3.63	5.38	1.13	3.33
2	DB-23	Dahibari OC	4.26	5.30	0.53	0.90
3	DB-24	Dahibari	8.40	10.65	1.70	6.50
4	DB-25	Palasya	3.33	3.61	1.28	1.98
Average GW Level			***4.91***	***6.24***	***1.16***	***3.18***

Ground Water Level (in bgl) varies from 3.33 to 8.40 m during February, 3.61 to 10.65 m during April, 0.53 to 1.70 m during August and 0.90 to 6.50 m during November'2016 within the Core Zone of Cluster-XVI area.

भारत कोकिंग कोल लिमिटेड
एक मिनीरत्न कंपनी
(कोल इंडिया लिमिटेड का एक अंग)
पंजीक्रत कार्यालय कोयला भवन ,कोयला नगर ,
(धनबाद)झारखंड826005(
CIN:U10101JH1972GOI000918
Tele: 0326 2230174 FAX: 0326 2230176
ईमेल :cgmsafety@bccl.gov.in

Bharat Coking Coal Limited
A Miniratna Company
(A subsidiary of Coal India Ltd)
Office of GM I/C(S&R)
Koyla Bhawan, Koyla Nagar,
Dhanbad, Jharkhand-826005
CIN:U10101JH1972GOI000918
Tele: 0326 2230174 FAX: 0326 2230176 Email: cgmsafety@bccl.gov.in

पत्र संख्या भाकोकोलि/उप महाप्रबंधक(एस&आर)I/C/संचिका-MP/17 323 दिनांक-:07.04.2017

To,
Dr, Vinod Kumar,
Group Head, Geosciences group
National Remote Sensing Center
India Space Research Organization
Dept of Space, Govt of India,
Balanagar, Hyderabad - 500037

Sub:- Work –Order for " Delineation of Surface Coal Fire and associated Land Subsidence in Jharia Coalfield, Jharkhand using satellite based remote – sensing techniques"

Dear Sir,

Consequent upon competent approval of proposal on aforesaid subject and subsequent signing o MOU between BCCL and NRSC, the aforesaid work is awarded to NRSC for Rs.18,10500/- (Eighteen lac ten thousand five hundred) only, against 100% payment in advance subject to terms and conditions listed in MOU. As per agreed payment terms and Demand Note No. 07/2016-17,

You are therefore requested to initiate all necessary activities for commencing the subject work as early as possible.

Thanking you,

Yours faithfully,

7/4/17

General Manager I/C (S & R)

Cc to :
1. Director (T) P&P, BCCL- for kind information.
2. TS to CMD, BCCL – for kind information.
3. Sri Mithilesh Kumar, Sr.Mgr.(M),Safety.Deptt., KoylaBhawan

सेन्ट्रल माईन प्लानिंग एण्ड डिजाइन इन्स्टीच्यूट लिमिटेड
(कोल इण्डिया लिमिटेड की अनुषंगी कम्पनी / भारत सरकार का एक लोक उपक्रम)
गोन्दवाना प्लेस, काँके रोड, राँची - 834 031, झारखंड (भारत)
Central Mine Planning & Design Institute Limited
(A Subsidiary of Coal India Limited / Govt. of India Public Sector Undertaking)
Gondwana Place, Kanke Road, Ranchi - 834 031, Jharkhand (INDIA)
Corporate Identity Number (CIN): U14292JH1975GOI001223

पत्रांकः CMPDI/ENV./2017/ E-52287 दिनांकः 27.04.2017

सेवा में,

उप महाप्रबन्धक (पर्यावरण)
बी .सी .सी .एल.
कोयला भवन
धनबाद-826005

विषयः Regarding offer for preparation of scheme for workshop ETP including removal of oil and grease by mechanical means with cost estimate for 7 workshops of BCCL.

Reference: Letter No. BCCL/Dy. GM(Env.)/F-EMP/17/1310-1311(h) dated- 08.04.2017 of Dy. GM(Env.) BCCL

महोदय,

This has reference to your above referred letter regarding offer for preparation of scheme for workshop ETP including removal of oil and grease by mechanical means with cost estimate for 7 workshops of BCCL. It has been requested vide your above referred letter to provide the following details:

1. The details of activity-wise/element-wise ED required with justification.
2. Time bound action plan for completion of the job.

Following is the detail of activity-wise ED required for each job with time required for completion:

Sl. No.	ACTIVITY	EDs REQUIRED	WORKING DAYS REQUIRED
1	Preliminary visit to BCCL for discussions and thereafter visit to the site for collection of data (includes travelling, boarding and lodging expenses)	3	3
2	Process design of the scheme and preparation of drawings	15	8
3	Preparation of estimate and specification for civil engg. Items	10	5
4	Preparation of estimate and specification for Electrical & Mechanical engg. Items(includes estimate of non-standard items)	10	5
5	Compilation of report	2	2
	TOTAL	40 EDs	23 working days

फोन नम्बर / Phone No. : +91 651 2230483;
फैक्स नम्बर / Fax No.: +91 651 2231447
वेब साईट / Website Address: www.cmpdi.co.in

cmpdi
A Mini-Ratna Company

सेन्ट्रल माईन प्लानिंग एण्ड डिजाइन इन्स्टीच्यूट लिमिटेड
(कोल इण्डिया लिमिटेड की अनुषंगी कम्पनी / भारत सरकार का एक लोक उपक्रम)
गोन्दवाना प्लेस, काँके रोड, राँची - 834 031, झारखंड (भारत)

Central Mine Planning & Design Institute Limited
(A Subsidiary of Coal India Limited / Govt. of India Public Sector Undertaking)
Gondwana Place, Kanke Road, Ranchi - 834 031, Jharkhand (INDIA)
Corporate Identity Number (CIN): U14292JH1975GOI001223

Since preparation of scheme for one workshop ETP shall be taken up at a time and due to the commitment of other jobs undertaken by the department, the completion of preparation of the job (schemes for ETP for all the 7 workshops of BCCL) shall take approximately 6 months time from the zero date.

Further it has been mentioned in your above referred letter that each modular type skimmer costs Rs.6-7 lakhs, whereas the consultancy charges of CMPDI for preparation of scheme for each ETP is 40 EDs amounting to approximately Rs. Eight lakhs(as per current ED rate and taxes) which seems on the higher side. It is to mention here that preparation of scheme for ETP includes a number of activities as mentioned above and the ETP shall have a number of units, including mechanical oil skimmer, based on effluent characteristics, discharge standards and treated effluent reuse requirement. It is to be mentioned here that oil skimmer is one of the options for removal of oil and grease from effluent. The choice of appropriate oil removal mechanism depends on a number of factors which is the prerogative of the designer. Hence cost of one particular unit of ETP doesn't reflect the total cost of ETP, which also includes cost of other units and consultancy charges.

भवदीय

28-4-17

(एच. के. घनवट)

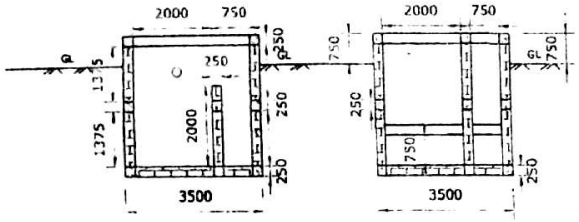
महा-प्रबन्धक(पर्यावरण)

प्रतिलिपि:

1.क्षेत्रीय निदेशक ,आर.आई -II ,कोयला भवन, धनबाद-826005 – for kind information

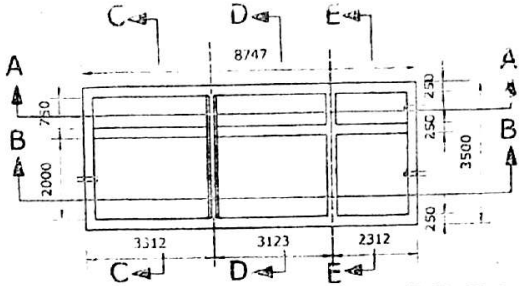
2. महाप्रबन्धक (B.D.), CMPDI HQ – for kind information

फोन नम्बर / Phone No. : +91 651 2230483;
फैक्स नम्बर / Fax No.: +91 651 2231447
वेब साईट / Website Address: www.cmpdi.co.in

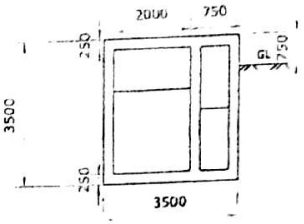


SECTION C-C

SECTION D-D

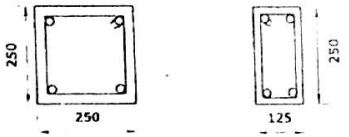


TOP VIEW



SECTION E-E

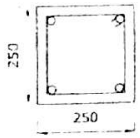
BEAM DETAILS



BEAM B-1 BEAM B-2

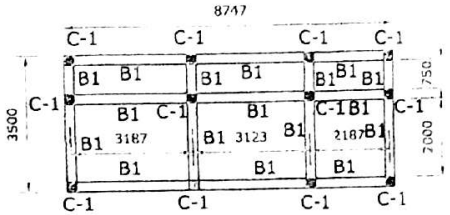
ALL BEAM WILL HAVE 4 No. 12MM MAIN BAR & 6MM STRIPPUS @ 200 C/C

COLUMN DETAILS



COLUMN C-1

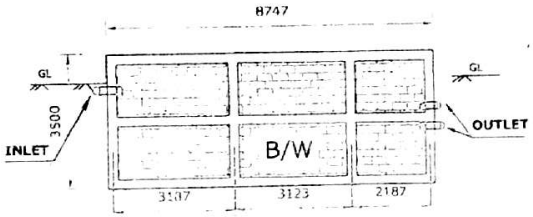
ALL COLUMN WILL HAVE 4 No. 12MM MAIN BAR & 6MM STRIPPUS @ 150 C/C



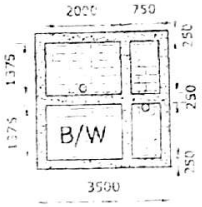
LAY-OUT PLAN

B-1 INDICATE BEAM OF SAME C/S

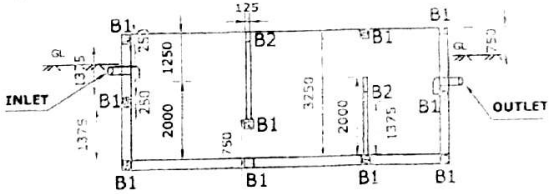
C-1 INDICATE COLUMN OF SAME C/S



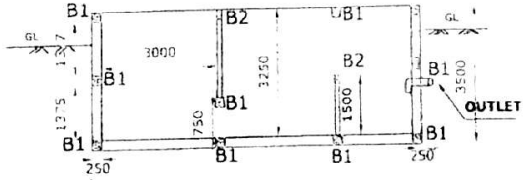
SIDE ELEVATION



SIDE ELEVATION



SECTION B-B



SECTION A-A

NOTES:-

1. ALL DIMENSIONS ARE IN MM
2. ADOPT AS PER WORKSHOP CAPACITY

PLATE NO.-2

Customer: BHARAT COKING COAL LIMITED				
Job Title: GREASE AND OIL TRAP				Job No. 201211900
Subject: MEDIUM SEDIMENTATION TANK	Activity	Name	Designation	Signature / Date
	Design'd	M. S. Nomani	C. Manager(C.E)	07.2011
	Drawn	M. H. Haque	Chief Draftsman	07.2011
	Check'd	M. S. Nomani	C. Manager(C.E)	07.2011
	Approved	D. K. Choudhary	G. M. (CIVIL)	07.2011
	Scale: N.T.S			Sheet: 1 OF 1

CMPDI

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RESTRICTED
The information given in this report is not to be communicated either directly or indirectly to the press or to any person not holding an official position in the CIL/Government.

Study to Analyze the Extent of Reduction of Pollution Load Every Year by reducing Coal Transportation by Road

CLUSTER XVI GROUP OF MINES

(Dahibari Basantimata OCP, Basantimata UG, New Laikdih OCP (Includes prop. Dahibari Washery, Laikdih Deep UG, Chanch UG, Dahibari washery)

Normative Production :1.51 MTPA
Peak Production :1.963 MTPA
Lease Hold Area : 1964.21Ha

Bharat Coking Coal Limited

(March, 2017)

Prepared by

Environment Division

Central Mine Planning & Design Institute Limited

CMPDI (HQ)

Gondwana Place

Kanke Road, Ranchi-834008

CONTENTS

CHAPTER NO.	TITLE	PAGE No.
I	INTRODUCTION	1-6
II	FUGITIVE DUST GENERATION DUE TO MOVEMENT OF COAL	7-12

Chapter – I

Introduction

1.1 Genesis:

MOEF provided Environmental Clearance to the various mines of the Cluster vide letter no. J-11015/185/2010-IA.II(M) dated 6 Feb 13 As per the Environmental Clearance Conditions given by the Ministry of Environment & Forest "A study should be initiated to analyse extent of reduction in pollution load every year by reducing road transport of coal". Therefore the present study has been carried out to quantify the pollution load due to coal transportation.

1.2 Methodology:

In order to find out the pollution load due to coal transportation a Questionnaire was developed by the Environment Division of CMPDI Headquarter and Regional Institute –II, Dhanbad. The Questionnaire was circulated to the various mines of BCCL for collection of the requisite inputs for this study. The quantification of pollution load for PM-10 has been carried out on the basis of the field visit, data provided by BCCL officials and interaction with them.

1.3 General Information about the Cluster:

1.3.1 Brief Description:

Cluster-XVI group of mines of BCCL is a group of five mines consisting of opencast and underground mines and one proposed washery (Dahibari Washery) in the Chanch-Victoria Area in Raniganj Coalfield of the Bharat Coking Coal Limited in the Dhanbad District of Jharkhand state. BCCL is the proponent of the cluster and it is under the administrative control of Coal India Limited. Coal India Limited is a Public Sector Undertaking of Government of India and functioning under the Ministry of Coal, Govt. of India.

BCCL is the proponent of the cluster and it is under the administrative control of Coal India Limited.

1.3.2 Nature and Size of the Cluster:

Cluster-XVI group of mines of BCCL is a group of five mines consisting of opencast and underground mines and one proposed washery (Dahibari Washery) in the Chanch-Victoria Area in Raniganj Coalfield of the Bharat Coking Coal Limited in the Dhanbad District of Jharkhand state.

The details of the mines showing normative/ peak productions, lease hold areas and life are given in Table no. 1.1.

Table 1.1: Details of the Mines of Cluster

Sl No	Name of Mines	Production Capacity (MTY)		Lease Hold Area (Ha)
		Normative	Peak	
1	Dahibari Basantimata OCP	1.30	1.69	385.68
2	Basantimata UG	0.21	0.273	417.00
3	New Laikdih OCP (Includes prop. Dahibari Washery)	0.00	0.00	305.1
4	Laikdih Deep UG	0.00	0.00	281.00
5	Chanch UG	0.00	0.00	575.43
	Total	1.51	1.963	1964.21
	Proposed Washery	Capacity	Lease Hold Area (Ha)	
	Dahibari washery	1.6 MTPA	12 (Within New Laikdih lease hold)	

1.3.3 Impact of Fire Control on Ambient Air Quality:

Mining in Raniganj coalfield was started more than 200 years back and most of the mines were opencast with manual excavations. Gradually underground mines were started at shallow depth and the mining was done by the private mine operators. Due to complex geo-mining conditions, the private mine operators abandoned the mines without taking care of the safety, conservation of the post mining situations. The unscientific mining has created many small surface craters or unsafe goaf in the Raniganj Coalfield area.Out of 595 unstable sites identified in the Master Plan , 13 sites consisting of 1193 no. of houses/families are affected due to instability. The affected families will be rehabilitated in adjacent non coal bearing area at a cost of Rs. 10171 lakhs.

1.3.4 Impact of Resettlement on Ambient Air Quality:

As per Jharia Action Plan (JAP) household will be shifted for implementation of master plan. The reduction in number of households within the leasehold area of Cluster will lead to reduction in generation of air pollutants due to reduction in movement of man & materials apart from decrease in consumption of coal as a domestic fuel. As per Jharia Action Plan (JAP) household will be shifted as per for implementation.

1.4 Meteorological Data

A meteorological data generated during 1st January 16 to 31st March 2016 has been presented in this report .The micro meteorological set up was established at the roof of BCCL Dugda Guest house and parameters like temperature, relative humidity, wind speed and directions, cloud cover and rainfall were recorded. The data were collected on hourly basis during the entire study period.

Generally, moderate winds prevailed throughout the study period. The wind velocity ranged between ≤ 0.5 m/s to 13.2 m/s. The seasonal average wind speed was observed to be 0.69 m/s. Wind-roses were made by using latest WRPLOT View of Lakes Environmental Software.

The analysis of wind pattern during the season showed that the predominant wind directions were from North-West & West followed by North-East having frequencies 15.71%, 11.45% & 4.67% respectively.The receptors located in the Downwind directions i.e. SE and East from the dust generating sources are likely to be affected. The dispersion of air borne dust during calm period (45% of time) will be very poor and buildup of pollutant concentration during this period will occur.

The maximum temperature recorded was 39.3^0C and the minimum was 6.2^0C. The daily average relative humidity values were in the range of 32.2 to 65.0%. The sky was mostly clear during the study period. The average atmospheric pressure value has been found to be around 732.3 mm Hg. Total 94.5mm rainfall was recorded

during the study period. The average rainfall during the season was found to be 1.04 mm.

Table 1.2: SEASONAL WIND DISTRIBUTION

Period: 01st JAN.'2016 – 31stMAR.'2016

Wind Direction	Wind Velocity (m/s) & Duration (%)				
	< 0.5	0.6 -1.5	1.6 -3.5	>3.5	Total
N		1.61	0.78	0.00	2.38
NNE		0.83	0.37	0.00	1.19
NE		3.17	1.47	0.05	4.67
ENE		0.41	0.14	0.00	0.55
E		1.10	0.69	0.00	1.79
ESE		0.50	0.37	0.00	0.87
SE		1.28	0.41	0.05	1.74
SSE		0.64	0.18	0.00	0.82
S		0.41	0.09	0.00	0.50
SSW		0.28	0.05	0.00	0.32
SW		2.29	0.60	0.00	2.88
WSW		1.06	0.41	0.00	1.47
W		8.99	2.48	0.00	11.45
WNW		1.24	1.01	0.00	2.24
NW		11.47	4.22	0.05	15.71
NNW		2.11	0.73	0.00	2.84
CALM	48.40	-	-	-	48.40
Total	48.40	37.32	13.97	0.15	100

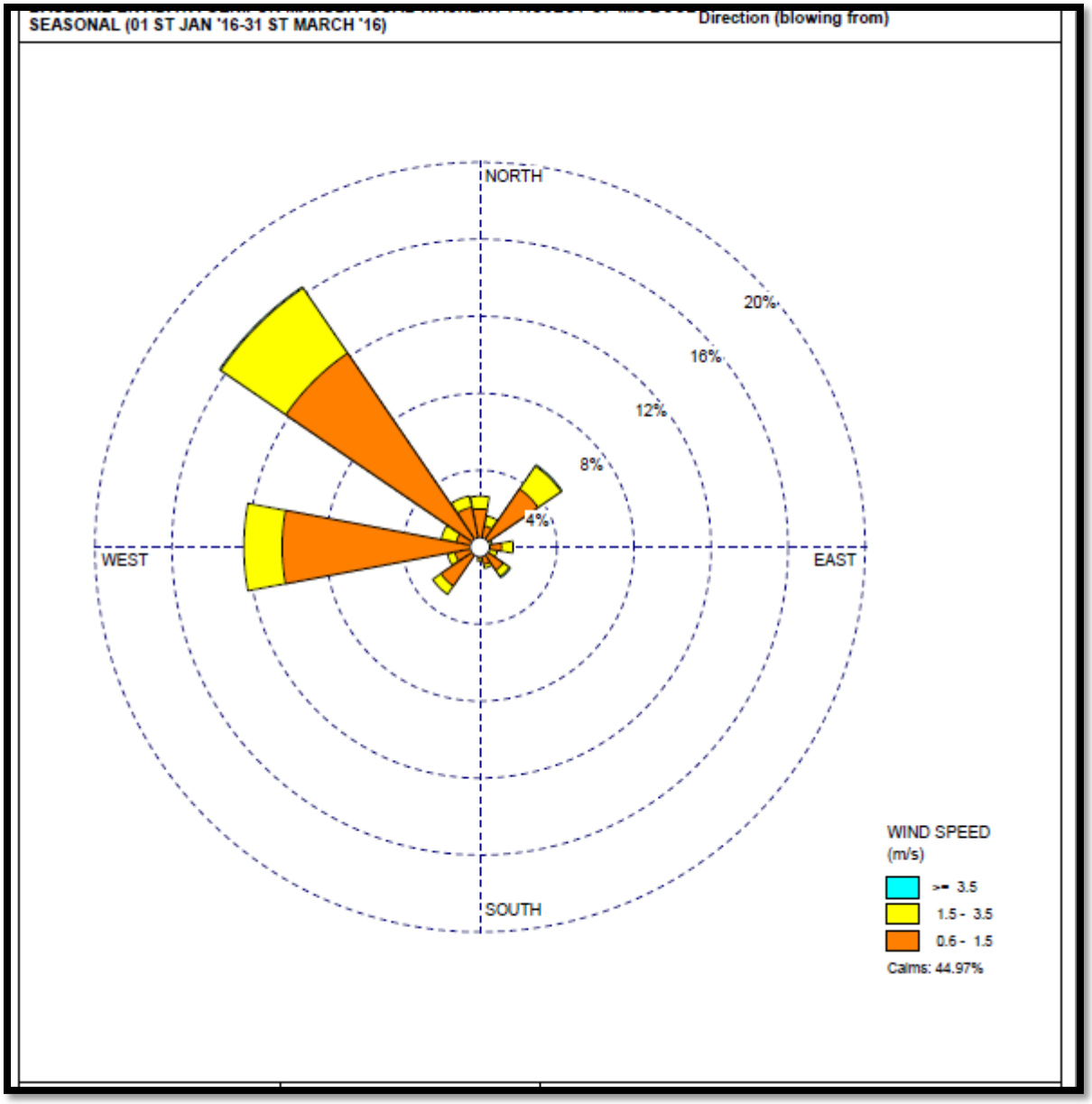


Figure No.-1.1 Wind Rose diagram for the period 1St Jan to 31St March 2016

Chapter – II

Fugitive Dust Generation Due To Movement of Coal

2.1 Introduction

The coal produced moves to the consumers via Road & Rail. Coal from the mine face is brought to the surface dumps and bulk of it goes to the nearby railway sidingsfor further movement to the consumer- end through rail. The journey from the mine face to the railway siding is covered by road. A portion of the coal produced by the mine directly goes to the consumers via road. Transportation of coal by rail is an environmentally better option than the road transportation. Road Transportation results in generation of fugitive dust from road surface apart from other pollutants released due to consumption of Diesel.

The fugitive dust generated due to coal transportation through road depend upon the following factors:

1. Speed and Weight of the moving vehicles.
2. Silt Content of the Road Dust (Particles less than 200 mesh size is considered as silt)
3. Silt loading of the road dust (Kg/m^2).
4. Moisture Content of the dust lying on the road surface.
5. Ambient Temperature, Humidity & wind velocity.

The dust generation will be lower if the quantity of dust (silt loading) lying on the road surface is minimum and the moisture content of the loose material lying on the road surface is high.

2.2 Movement of Coal

Distance travelled by coal and subsequent release of fugitive dust during its journey towards the consumer end has been describedand dust load has been worked out for the year 2013-14, 2014-15 and 2015-16.

2.2.1 Amalgamated Dahibari Basantimata Colliery :

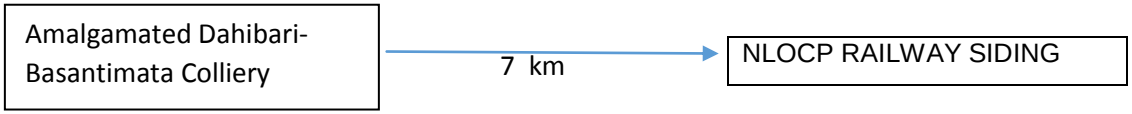


Table: 2.1 Dust Generation (Kg/day)

Name of the Mine	Year	Location	Distance from Face to Siding (Km)	Coal Transferred(Te)	Daily Coal Production (Te/Day)	Capacity of the Dumper	Vehicle Kilometer Travelled	Emission Rate for PM 10 (kg/VKT)	Pollution Load * Dust Generated Per Day (Kg/day)	Dust generated Kg/per tonne
Amalgamated Dahibari-Basantimata Colliery	15-16	NLOCP RAILWAY SIDING	7.00	1084000	3285.00	20.00	2299.50	0.53	1218.735	
		Total for 15-16			**3285.00**				**1218.735**	0.37

* In terms of PM 10 expressed as kg/day, ** Average distance has been considered, *** Capacities of Dumpers used in transportation of coal from face to siding taken as 30Te, to Washery 20Te, and Outside Transport 15 Te. ..## Emission rate for PM_{10} has been taken from the S&T work (funded by MoC) carried out by CMPDI during 2002-2007.

2.3 Optimum Coal Transportation scheme in the Present Scenario:

Phase – I (for 10 + 05 Years)

As suggested by the Environmental Appraisal Committee, it is proposed to continue the existing Road–Rail transport network system in view of the implementation of the Jharia Action Plan(JAP) for 10 years and another 05 years gestation period after the completion of the JAP for consolidation of the backfilled dug out fire areas and unstable areas is required. Thus the period of 15 years, make the Phase – I. All mitigation measures like covered trucks, green belting on either side of the road, enhanced water sprinkling, proper maintenance of roads, removal of spilled materials etc shall be adopted for 15 years with the existing road – rails transport system.

2.4 Conceptual Plan of Proposed Integrated Coal Transportation Network forthe Cluster:

Phase – II (after 15 Years):

As suggested by the EAC Members, BCCL shall implement conveyor –cum-rail transport to avoid movement of trucks within the cluster for coal transportation in Phase –II. Loading of coal by pay–loaders shall be discontinued.

During 2015-16, the combined daily coal production of the Cluster was 1084000 tones resulting in 402164 kg of daily fugitive dust generation. The dust (PM-10) generation rate at present is 0.37 kg/te.

As a result of replacement of existing road transportation of coal by Conveyor to railway siding will result in reduction of fugitive dust generation to the extent of 220689 kg/day for daily coal production of 594848 tonnes (1.963 MTY) during Phase –II.

Table 2.2: Proposed Infrastructure for Coal Transportation (phase – II)

Cluster	Mines in Operation in Phase - II	Production Capacity (MTY)	Proposed Transport Infrastructure in Phase – II
XVI	Amalgamated Dahibari Basantimata **Colliery**	**1.963**	**Coal transport by Conveyor to Railway Siding**
	Total	**1.963 MTY** = **594848** tonnes /Day	

2.5 Conclusion:

On the basis of the study undertaken to assess the impact of coal transportation on pollution load, the followings may be concluded:

Phase – I :(2013-14 to 2028 -29) :

1. During Phase – I, business as usual(BAU) scenario will prevail and the existing road cum rail transport network system will be used for coal dispatch to the consumers. During 2015-16, the combined daily coal production of the Cluster was 1084000 tones resulting in 402164 kg of daily fugitive dust generation. The dust (PM-10) generation rate at present is 0.37 kg/te.
2. The generation of fugitive dust due to transportation of coal by road can be further reduced by enforcing covering of loaded trucks, periodical removal of loose materials lying on the road surface and black topping of coal transportation roads.
3. Avenue plantation, effective wetting of the road surface and proper maintenance of roads will further result in mitigation of the impact of road generated dust on ambient air quality.
4. Better road condition, by the use of Mechanical Sweeper or vacuum cleaner dust generation may be minimized.

Phase – II :(From 2029-30 Onwards):

1. As a result of replacement of existing road transportation of coal by Conveyor to railway siding will result in reduction of fugitive dust generation to the extent of 220689 kg/day for daily coal production of 594848 tonnes (1.963 MTY) during Phase –II.
2. During Phase –II, dust load will further reduce due to quenching of mine fire and domestic coal consumption after resettlement of general population dwelling within the command area of cluster, as a result of implementation of Jharia Action Plan. It will result in significant improvement in ambient air quality.

3. **Coal Production Vs. Dust Generation due to Road Transportation is presented below:**

Table2.3: Coal Production Vs. Dust Generation due to Road Transportation

Year	Coal Production (Te/day)	Dust Generation(Kg/Day)
2015-16 (By Road transportation)	1084000	402164
2029-30 (Considering peak production and all the coal transported through Road)	594848	220689
2029-30(By Conveyor Transportation)	594848	0

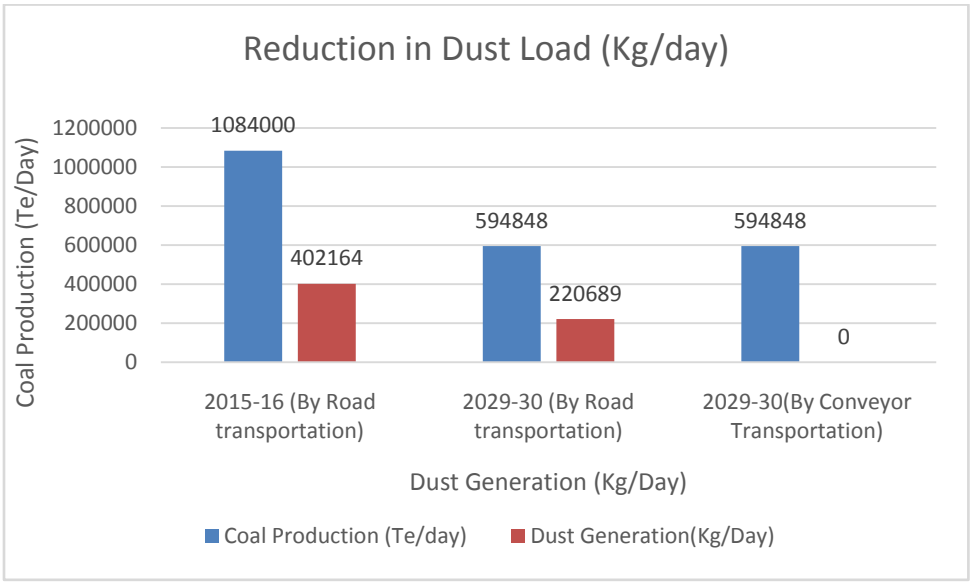
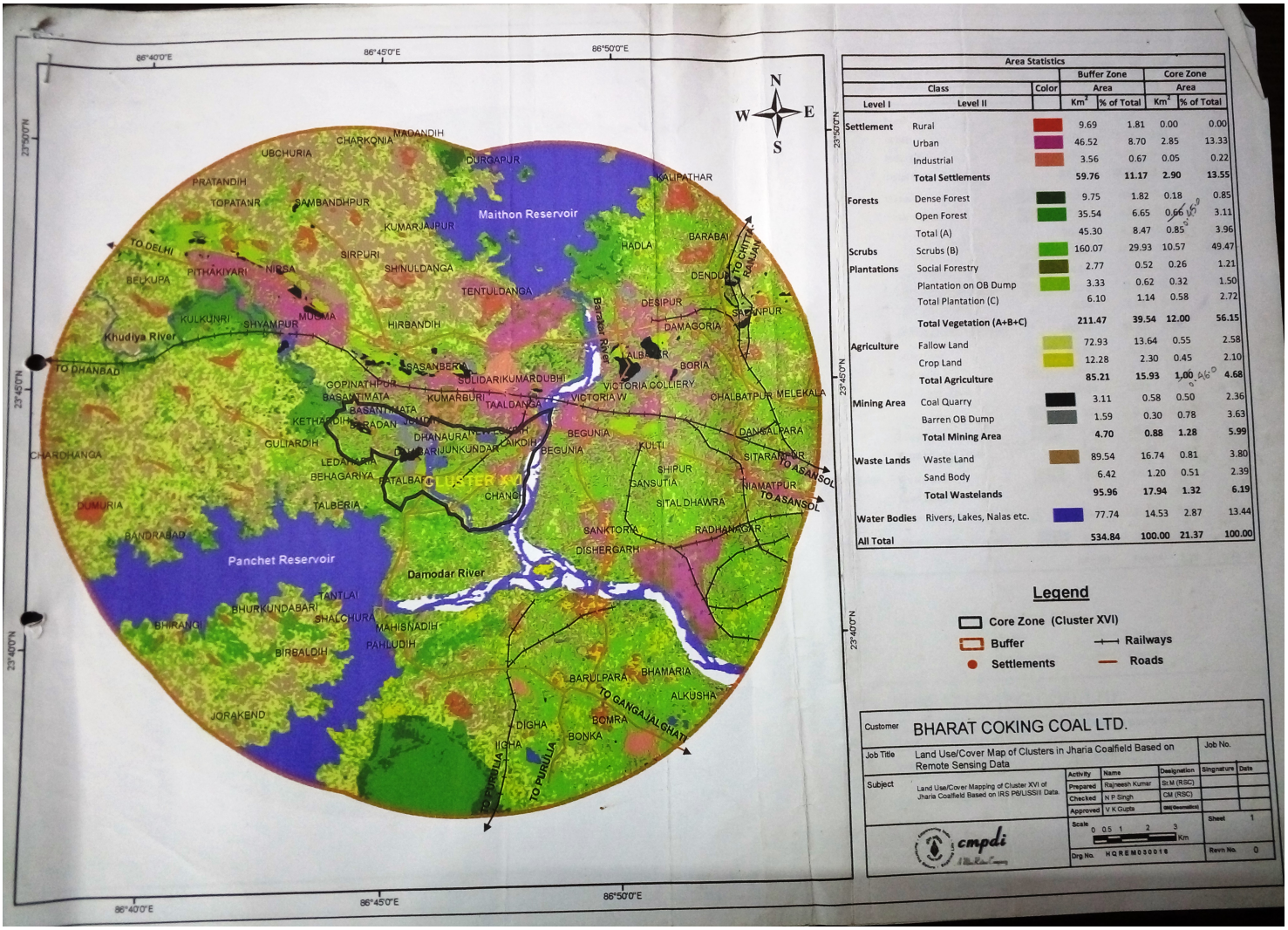


Figure 2.1: Presentation of reduction in dust generation due to replacement of Road transportation by Conveyor system.



Area Statistics

Class		Color	Buffer Zone Area Km²	Buffer Zone Area % of Total	Core Zone Area Km²	Core Zone Area % of Total
Level I	Level II					
Settlement	Rural		9.69	1.81	0.00	0.00
	Urban		46.52	8.70	2.85	13.33
	Industrial		3.56	0.67	0.05	0.22
	Total Settlements		**59.76**	**11.17**	**2.90**	**13.55**
Forests	Dense Forest		9.75	1.82	0.18	0.85
	Open Forest		35.54	6.65	0.66	3.11
	Total (A)		45.30	8.47	0.85	3.96
Scrubs	Scrubs (B)		160.07	29.93	10.57	49.47
Plantations	Social Forestry		2.77	0.52	0.26	1.21
	Plantation on OB Dump		3.33	0.62	0.32	1.50
	Total Plantation (C)		6.10	1.14	0.58	2.72
	Total Vegetation (A+B+C)		**211.47**	**39.54**	**12.00**	**56.15**
Agriculture	Fallow Land		72.93	13.64	0.55	2.58
	Crop Land		12.28	2.30	0.45	2.10
	Total Agriculture		**85.21**	**15.93**	**1.00**	**4.68**
Mining Area	Coal Quarry		3.11	0.58	0.50	2.36
	Barren OB Dump		1.59	0.30	0.78	3.63
	Total Mining Area		**4.70**	**0.88**	**1.28**	**5.99**
Waste Lands	Waste Land		89.54	16.74	0.81	3.80
	Sand Body		6.42	1.20	0.51	2.39
	Total Wastelands		**95.96**	**17.94**	**1.32**	**6.19**
Water Bodies	Rivers, Lakes, Nalas etc.		77.74	14.53	2.87	13.44
All Total			534.84	100.00	21.37	100.00

Legend

- Core Zone (Cluster XVI)
- Buffer
- Settlements
- Railways
- Roads

Customer: BHARAT COKING COAL LTD.

Job Title: Land Use/Cover Map of Clusters in Jharia Coalfield Based on Remote Sensing Data

Job No.

Subject: Land Use/Cover Mapping of Cluster XVI of Jharia Coalfield Based on IRS P6/LISSIII Data.

Activity	Name	Designation	Signature	Date
Prepared	Rajneesh Kumar	Sr.M (RSC)		
Checked	N P Singh	CM (RSC)		
Approved	V K Gupta	GM(Geomatics)		

cmpdi

Scale: 0 0.5 1 2 3 Km

Sheet 1

Drg No. HQREM030018

Revn No. 0

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ENVIRONMENTAL MONITORING REPORT OF BHARAT COKING COAL LIMITED, CLUSTER – XVI

(FOR THE Q.E. DEC, 2016)

E. C. no. J-11015/185/2010-IA.II (M) dated 06.02.2013.

March, 2017

CMPDI

ISO 9001 Company

Regional Institute-II

Dhanbad, Jharkhand

CLUSTER - XVI

(FOR THE Q.E. DEC, 2016)

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ENVIRONMENTAL MONITORING REPORT OF BHARAT COKING COAL LIMITED CLUSTER – XVI

(FOR THE Q.E. DEC, 2016)

E. C. no. J-11015/185/2010-IA.II (M) dated 06.02.2013.

March, 2017

CMPDI
ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

EXECUTIVE SUMMARY

1.0 Introduction

The purpose of environmental monitoring is to assess the quality of various attributes that affects the fauna and flora. In accordance with the quality of these attributes appropriate strategy is to be developed to control the pollution level within the permissible limits. The three major attributes are air, water and noise level.

Bharat Coking Coal Limited (BCCL), a Subsidiary company of Coal India Limited is operating Underground and Opencast Mines in Raniganj Coalfield (RCF) is a part of Gondwana Coalfields located in Burdwan district of West Bengal, the RCF is bounded by $23^0$42' N to $23^0$75' N latitudes and $86^0$43' E to $86^0$85' E longitude occupying an area of 450 Sq.km. BCCL has awarded Environmental monitoring work of Raniganj Coalfield (RCF) to Central Mine Planning & Design Institute Limited (CMPDIL). The environmental monitoring has been carried out as per the conditions laid down by the MoEF&CC while granting environmental clearance of project, consent letter issued by the respective SPCB, and other statutory requirements.

2.0 Sampling location and rationale

2.1 Ambient air sampling locations

The ambient air quality monitoring stations were selected to represent core, buffer zone area. The rationale has been based on the guidelines stipulated by MoEF&CC, consent letter of SPCB, as well as other statutory requirements.

2.2 Water sampling stations

The Water sampling stations were selected for mine sump water, drinking water supply, well/ Hand pump water also surface water samples.

2.3 Noise level monitoring locations

Noise levels vary depending on the various activities in mining areas. The monitoring of noise level in different locations will be helpful to take appropriate mitigative measures. The noise levels were recorded in mining area, washery and in residential area.

3.0 Methodology of sampling and analysis

3.1 Ambient air quality

Parameters chosen for assessment of ambient air quality were Particulate Matter (PM_{10}), Fine Particulate Matter ($PM_{2.5}$), Sulphur Di-oxide (SO_2) and Nitrogen Oxides (NO_X). Respirable Dust Samplers (RDS) and Fine Dust Sampler ($PM_{2.5}$ sampler) were used for sampling of PM_{10}, SO_2, & NO_X and Fine Dust Sampler ($PM_{2.5}$ sampler) were used for sampling of $PM_{2.5}$ at 24 hours interval once in a fortnight and the same for the gaseous pollutants. The samples were analyzed in Environmental Laboratory of CMPDI, RI-I, Asansol.

3.2 Water quality

Water samples were collected as per standard practice. The effluent samples were collected and analyzed for four parameters on fortnightly basis. The ground and Surface water samples were collected and analyzed for 25 and 17 parameters on quarterly basis. Thereafter the samples were preserved and analyzed at the Environmental Laboratory at CMPDI (HQ), Ranchi.

3.3 Noise level monitoring

Noise level measurements in form of 'L_{EQ}' were taken using Integrated Data Logging Sound Level Meter. Noise levels were measured in Decibels, 'A' weighted average, i.e. dB(A).

4.0 Results and interpretations

4.1 Air quality

It has been seen from the analysis results that the 24 hours average concentration parameters like PM_{10}, $PM_{2.5}$, SO_2 and NO_X are mostly within the permissible limits in all sampling locations as per MoEF&CC Gazette Notification No. GSR 742(E) dt 25.09.2000 Standards for Coal Mines and National Ambient Air Quality Standard -2009. Sometimes the concentration of SPM, PM_{10} & $PM_{2.5}$ exceeds the limits due to heavy public traffic, poor road condition, coke oven plants, burning of coal by surrounding habitants, brick making, municipal waste dumps and industries like Steel Plant, thermal Plants including their fly ash etc.

4.2 Water quality

The test results indicate that the major parameters compared with MoEF&CC Gazette Notification No. GSR 742(E) dt 25.09.2000 Standards for Coal Mines, IS.10500/2012 (Drinking water) and IS: 2296 (Surface water), are with in permissible limits.

4.3 Noise Level

During the noise level survey it has been observed that the noise level in the sampling locations is within the permissible limits prescribed as per MoEF&CC Gazette Notification No. GSR 742(E) dt 25.09.2000 Standards for Coal Mines for Industrial Area and Noise pollution (Regulation and Control) Rules, 2000.

CHAPTER - I

INTRODUCTION

1.0 Any industry and development activities including coal mining is bound to affect environmental attributes. There are positive as well as negative impacts of such operations. For controlling the adverse impacts a regular monitoring is essential. The environmental monitoring is being done as per the guide-lines stipulated by Ministry of Environment, Forest and Climate Change (MoEF&CC), Govt. of India.

The very purpose of environmental monitoring is to assess the quality of various attributes which affects the environment. As per quality of these attributes appropriate strategy is to be developed to control the pollution level within the permissible limits. The three major attributes are air, water and noise level.

Bharat Coking Coal Limited (BCCL), a subsidiary company of Coal India Limited (CIL) is operating UG Mines and Opencast Mines in Raniganj Coalfield (RCF).

Bharat Coking Coal has awarded Environmental Monitoring work of all Projects, Cluster wise, to Central Mine Planning & Design Institute Limited (CMPDIL). The environmental monitoring has been carried out as per conditions laid down by MoEFCC while granting environmental clearance to different projects. CMPDI has trained manpower and well equipped laboratory to carry out monitoring, analysis and R&D work in the field of environment.

1.1 The Cluster-XVI is in the Western part of the Raniganj coalfield and situated in the C.V. area of BCCL. It includes a group of 5 Mines (viz. Dahibari Basantimata OCP, Basantimata UG, New Laikdih OCP, Laikdih Deep UG & Chanch UG). The Cluster – XVI is situated about 50 - 55 kms from Dhanbad Railway Station. The mines of this Cluster – XVI are operating since pre nationalization period (prior to 1972-73). It is connected by both Railway and Road. The drainage of the area is governed by Khudia River & Barakar River.

1.2 The Cluster-XVI is designed to produce 1.51 MTPA (normative) and 1.963 MTPA (peak) capacity of coal.

The Project has Environmental Clearance from Ministry of Environment, Forest and Climate Change (MoEF&CC) for a rated capacity 1.51 MTPA (normative) and 1.963 MTPA (peak) capacity of coal production vide letter no. J-11015/185/2010-IA.II (M) dated 06th February, 2013.

Ministry of Environment, Forest and Climate Change while granting environmental clearance has given one of the General conditions that " Four ambient air quality monitoring stations should be established in the core zone as well as in the buffer zone for PM_{10}, $PM_{2.5}$, SO_2, NOx monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board." And other conditions regarding water / effluent and noise level monitoring.

In compliance of these conditions the Environmental Monitoring has been carried out & report prepared for submission to MoEF&CC & SPCB and other statutory authorities.

CHAPTER-II

AMBIENT AIR QUALITY MONITORING

2.1 Location of sampling station and their rationale:

(as per G.S.R. 742 (E) dt. 25th December,2000)

2.1.1 Ambient Air Quality Sampling Locations

I. CORE ZONE Monitoring Location

i) Dahibari OCP (A22): Industrial Area

The location of the sampling station is 23°42'20'' to 23°44'40''N 086°43'35'' to 086°47'06''E. The sampler was placed at a height of 1.5m from above ground level of Substation Office. The station was selected to represent the impact of mining activities and poor roads condition, heavy public traffic, burning of coal by the surrounding habitants.

ii) Basantimata UGP Office (A23): Industrial Area

The location of the sampling station is 23°43'20'' to 23°44'40''N 086°43'35'' to 086°46'E. The sampler was placed at Roof of Project Office. The station was selected to represent the impact of mining activities and the poor roads condition, heavy public traffic, burning of coal by the surrounding habitants.

2.2 Methodology of sampling and analysis

Parameters chosen for assessment of ambient air quality were Particulate Matter (PM_{10}), Particulate Matter ($PM_{2.5}$), Sulphur di-oxide (SO_2) and Nitrogen oxides (NO_X). Respirable Dust Samplers (RDS) & fine particulates for $PM_{2.5}$ sampler were used for sampling PM_{10} & $PM_{2.5}$ respectively at 24 hours interval once in a fortnight and the same for the gaseous pollutants. The samples were analyzed in Environmental Laboratory of CMPDI, RI-I, Asansol.

2.3 Results & Interpretations

The results of Ambient Air Quality are presented in tabular form along with Bar chart for each monitoring station. The interpretations of different parameters are given below:

2.3.1 **Ambient air quality**

Particulate Matter PM_{10}

In **core zone** under **Industrial area** varies from 88 to 124 µ/m^3

Particulate Matter $PM_{2.5}$

In **core zone** under **Industrial area** varies from 41 to 57 µ/m^3

Sulphur Dioxide:

In **core zone** under **Industrial area** varies from 11 to 16 µ/m^3

Oxides of Nitrogen:

In **core zone** under **Industrial area** varies from 26 to 31 µ/m^3

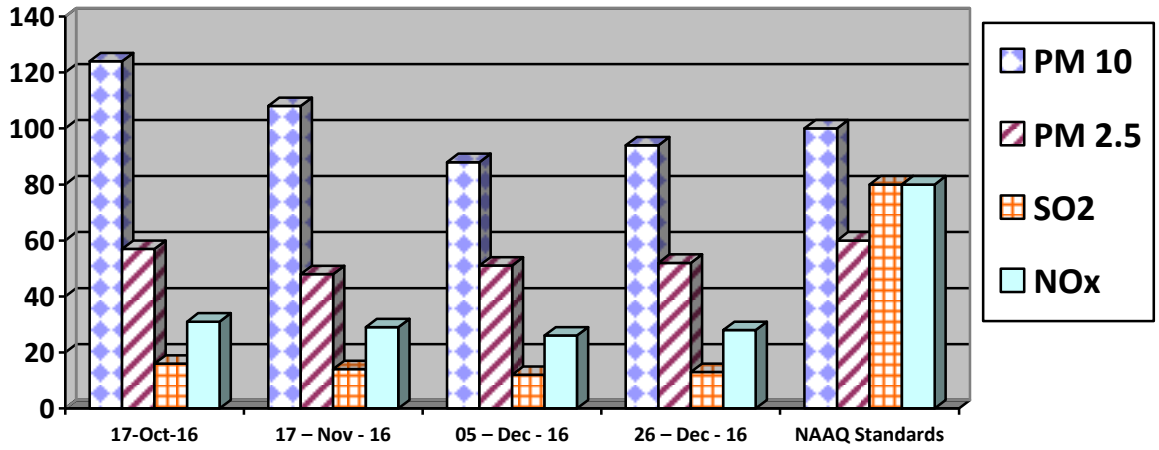
AMBIENT AIR QUALITY DATA

Name of the Company: **Bharat Coking Coal limited** Year : **2016-17.**
Name of the Cluster : **Cluster – XVI** Q.E.: **Dec 2016**

Station Code/Name: (a) A22 Dahibari OCP **Category: Industrial.**
(b) A23 Basantimata UGP
ZONE: Core

(a). Station Code/Name: A22- Dahibari OCP Category: Industrial[1].

Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	17 - Oct -16	124	57	16	31
2	17 – Nov - 16	108	48	14	29
3	05 – Dec - 16	88	51	12	26
4	26 – Dec - 16	94	52	13	28
NAAQ Standards		100	60	80	80



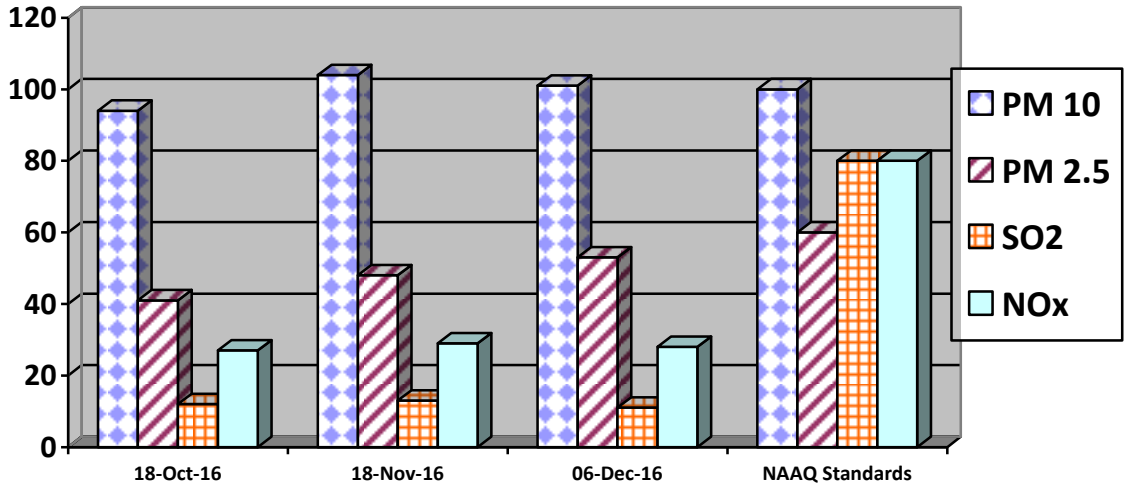
Note:

- *All values are expressed in microgram per cubic meter.*
- *24 hours duration*

[1] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed…… …….Dated 22.02.2017. Job No. 110310

(b). Station Code/Name: A23- Basantimata UGP Category: Industrial[2].

Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	18 -Oct -16	94	41	12	27
2	18 - Nov -16	104	48	13	29
3	06 - Dec -16	101	53	11	28
NAAQ Standards		100	60	80	80

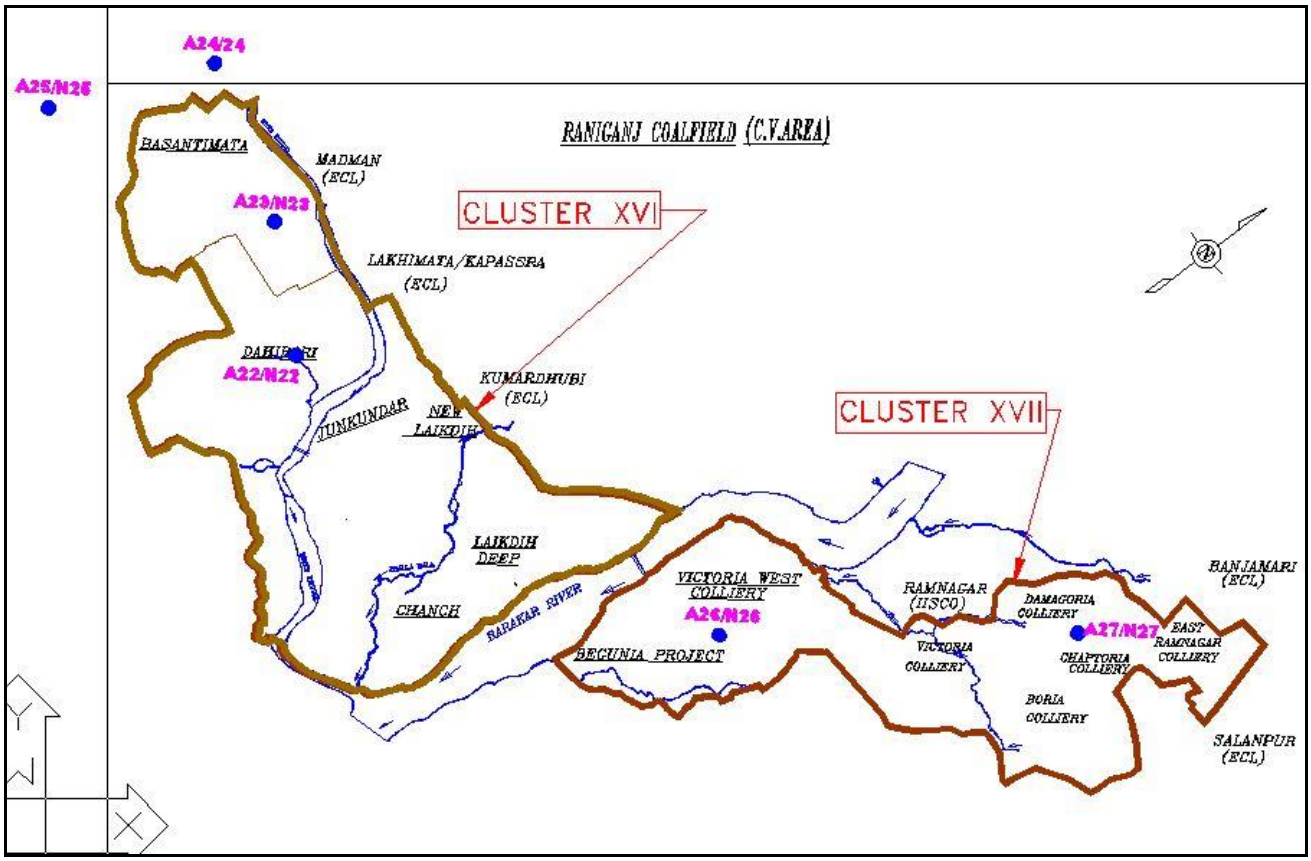


Note:

- *All values are expressed in microgram per cubic meter.*
- *24 hours duration*

[2] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed…… …….Dated 22.02.2017. Job No. 110310

Ambient Air Monitoring Stations in Cluster- XVI in Core & Buffer Zones



Ambient Air Quality Standards for Raniganj Coal Field
As per the Environment (Protection) Amendment Rules, 2000 notified vide notification G.S.R. 742(E), dated 25.9.2000.

Category	Pollutant	Time weighted average	Concentration in Ambient Air	Method of Measurement
1	2	3	4	5
III Coal mines located in the coal fields of • Jharia • Raniganj • Bokaro	Suspended Particulate Matter (SPM)	Annual Average * 24 hours **	500 µg/m^3 700 µg/m^3	- High Volume Sampling (Average flow rate not less than 1.1 m^3/minute)
	Respirable Particulate Matter (size less than 10 µm) (RPM)	Annual Average * 24 hours **	250 µg/m^3 300 µg/m^3	Respirable Particulate Matter sampling and analysis
	Sulphur Dioxide (SO_2)	Annual Average * 24 hours **	80 µg/m^3 120 µg/m^3	1.Improved west and Gaeke method 2.Ultraviolet fluorescene
	Oxide of Nitrogen as NO_2	Annual Average * 24 hours **	80 µg/m^3 120 µg/m^3	1. Jacob & Hochheiser Modified (Na-Arsenic) Method 2. Gas phase Chemilumine-scence

Note:

* Annual Arithmetic mean for the measurements taken in a year, following the guidelines for frequency of sampling laid down in clause 2.

** 24 hourly / 8 hourly values shall be met 92% of the time in a year. However, 8% of the time it may exceed but not on two consecutive days.

NATIONAL AMBIENT AIR QUALITY STANDARDS

New Delhi the 18th November 2009

In exercise of the powers conferred by Sub-section (2) (h) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No. 14 of 1981), and in supersession of the notification No(s).S.O.384(E), dated 11th April 1994 and S.O.935(E), dated 14th October 1998, the Central Pollution Control Board hereby notify the National Ambient Air Quality Standards with immediate effect

Pollutant	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
		Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO_2), µg/m³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogendioxide (NO_2), µg/m³	Annual * 24 Hours **	40 80	30 80	-Jacob &Hochheiser modified ($NaOH$-$NaAsO_2$) Method -Gas Phase Chemiluminescence
Particulate Matter (Size less than 10µm) or PM_{10}, µg/m³	Annual * 24 Hours **	60 100	60 100	-Gravimetric -TEOM -Beta attenuation
Particulate Matter (Size less than 2.5µm) or $PM_{2.5}$, µg/m³	Annual * 24 Hours **	40 60	40 60	-Gravimetric -TEOM -Beta attenuation
Ozone (O_3) , µg/m³	8 Hours * 1 Hour **	100 180	100 180	-UV Photometric -Chemiluminescence -Chemical Method
Lead (Pb) , µg/m³	Annual * 24 Hours **	0.50 1.0	0.50 1.0	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper -ED-XRF using Teflon filter
Carbon Monoxide (CO), mg/m³	8 Hours ** 1 Hour **	02 04	02 04	-Non dispersive Infrared (NDIR) Spectroscopy
Ammonia (NH_3), µg/m³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C_6H_6), µg/m³	Annual *	05	05	-Gas Chromatography (GC) based continuous analyzer -Adsorption and desorption followed by GC analysis
Benzo(a)Pyrene (BaP) Particulate phase only, ng/m³	Annual *	01	01	-Solvent extraction followed byHPLC/GC analysis
Arsenic (As), ng/m³	Annual *	06	06	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel (Ni), ng/m³	Annual *	20	20	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

* Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

NOTE: Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigations.

CHAPTER – III

WATER QUALITY MONITORING

3.1 Location of sampling sites

(Refer **Plate No. - II**)

i) **Mine Discharge of Dahibari (MW16)**
A sampling point is fixed to assess the effluent quality of Mine discharge. This location is selected to monitor effluent discharge in to Khudia Nala.

ii) Ground Water quality at **Patlabari Village (GW16)**

iii) Surface Water quality at **U/S of Khudia River (SW33)**

iv) Surface Water quality at **D/S of Khudia River (SW34)**

3.2 Methodology of sampling and analysis

Water samples were collected as per standard practice. The effluent samples were collected and analysed for four parameters on fortnightly basis. The drinking and Surface water samples were collected and analysed for 25 and 17 parameters respectively, on quarterly basis. Thereafter the samples were preserved and analysed at the Environmental Laboratory at CMPDI (HQ), Ranchi.

3.3 Results & Interpretations

The results are given in tabular form along with the applicable standards. Results are compared with Schedule - VI, effluent prescribed by MoEF&CC. Results show that most of the parmeters are within the permissible limits.

WATER QUALITY DATA

(EFFLUENT WATER FOUR PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited**

Year : **2016-17.**

Name of the Project : **Cluster - XVI**

Month: **Oct, 2016.**

Name of the Stations & Code : **1. MW16- Mine Discharge of Dahibari**

First Fortnight

Sl. No.	Parameters	MW16 (Mine Discharge) 15.10.2016	As per MOEF General Standards for schedule VI
1	Total Suspended Solids	44	*100 (Max)*
2	pH	9.04	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	50	*250 (Max)*

Second Fortnight

Sl. No.	Parameters	MW16 (Mine Discharge) 18.10.2016	As per MOEF General Standards for schedule VI
1	Total Suspended Solids	40	*100 (Max)*
2	pH	8.21	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	50	*250 (Max)*

All values are expressed in mg/lit unless specified.

1 27/10/16
2 27/10/16
Analysed By

Approved By
Dy.Technical Manager
Env. Lab, CMPDI (HQ),
(Authorized Signatory)

WATER QUALITY DATA

(*EFFLUENT WATER FOUR PARAMETERS)*

Name of the Company: **Bharat Coking Coal Limited**

Year : **2016-17.**

Name of the Project : **Cluster - XVI**

Month: **Nov, 2016.**

Name of the Stations & Code : **1. MW16- Mine Discharge of Dahibari**

First Fortnight

Sl. No.	Parameters	MW16 (Mine Discharge) 11.11.2016	As per MOEF General Standards for schedule VI
1	Total Suspended Solids	48	*100 (Max)*
2	pH	8.15	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	52	*250 (Max)*

Second Fortnight

Sl. No.	Parameters	MW16 (Mine Discharge) 19.11.2016	As per MOEF General Standards for schedule VI
1	Total Suspended Solids	32	*100 (Max)*
2	pH	8.16	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	38	*250 (Max)*

All values are expressed in mg/lit unless specified.

Analysed By

Approved By
Dy.Technical Manager
Env. Lab, CMPDI (HQ),
(Authorized Signatory)

WATER QUALITY DATA

(*EFFLUENT WATER FOUR PARAMETERS)*

Name of the Company: **Bharat Coking Coal Limited**

Year : **2016-17.**

Name of the Project : **Cluster - XVI**

Month: **Dec, 2016.**

Name of the Stations & Code :

1. MW16- Mine Discharge of Dahibari

First Fortnight

Sl. No.	Parameters	MW16 (Mine Discharge) 06.12.2016	As per MOEF General Standards for schedule VI
1	Total Suspended Solids	32	*100 (Max)*
2	pH	8.27	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	36	*250 (Max)*

Second Fortnight

Sl. No.	Parameters	MW16 (Mine Discharge) 27.12.2016	As per MOEF General Standards for schedule VI
1	Total Suspended Solids	16	*100 (Max)*
2	pH	8.46	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	32	*250 (Max)*

All values are expressed in mg/lit unless specified.

Analysed By
JSA/SA/SSA

Checked By
Lab Incharge
Env. Lab, RI-2, CMPDI

Approved By
Dy.Technical Manager
Env. Lab, CMPDI (HQ),
(Authorized Signatory)

WATER QUALITY

(SURFACE WATER- ALL PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2016-17.**

Name of the Project : **Cluster - XVI** Period: **Q. E. Dec, 2016**

Area : **Dahibari UGP** **Project: Dahibari UGP** **Cluster XVI**

Stations: **Date of Sampling:**

1. Upstream in Khudia River SW-33 06/12/2016
2. Downstream in Khudia River SW-34 06/12/2016

Sl. No	Parameter	Sampling Stations				Detection Limit	IS:2296 – 1982 (Inland surface water) Class	BIS Standard & Method
		SW-33	SW-34	3	4			
1	Arsenic (as As), mg/l, Max	<0.002	<0.002			0.002	0.2	IS 3025/37:1988 R : 2003, AAS-VGA
2	BOD (3 days 27°C), mg/l, Max	2.4	2.6			2.00	300	IS 3025 /44: 1993, R : 2003 3 day incubation at 27°C
3	Colour (Hazen Unit)	colourless	colourless			Qualitative	300	Physical/Qualitative
4	Chlorides (as Cl), mg/l, Max	36	36			2.00	600	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	<0.03	<0.03			0.03	1.5	IS 3025 /42 : 1992 R : 2009, AAS-Flame
6	Disolved Oxygen, min.	5.2	4.8			0.10	4	IS 3025/381989, R : 2003, Winkler Azide
7	Fluoride (as F) mg/l, Max	0.77	0.75			0.02	1.5	APHA, 22nd Edition SPADNS
8	Hexavalent Chromium, mg/l, Max	0.19	0.15			0.01	0.05	APHA, 22nd Edition, 1,5 - Diphenylcarbohydrazide
9	Iron (as Fe), mg/l, Max	1.649	1.603			0.06	50	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
10	Lead (as Pb), mg/l, Max	0.067	0.032			0.005	0.1	APHA, 22nd Edition AAS-GTA
11	Nitrate (as NO_3), mg/l, Max	7.33	6.81			0.50	50	APHA, 22nd Edition, UV-Spectrphotometric
12	pH value	8.50	8.53			2.5	6.5-8.5	IS-3025/11:1983, R-1996, Electrometric
13	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.002	<0.002			0.002	0.0005	APHA, 22nd Edition 4-Amino Antipyrine
14	Selenium (as Se), mg/l, Max	<0.002	<0.002			0.002	0.05	APHA, 22nd Edition AAS-GTA
15	Sulphate (as SO_4) mg/l, Max	160	140			2.00	400	APHA, 22nd Edition Turbidity
16	Total Dissolved Solids, mg/l, Max	447	455			25.00	1500	IS 3025 /16:1984 R : 2006, Gravimetric
17	Zinc (as Zn), mg/l, Max	<0.01	<0.01			0.01	5.0	IS 3025 /49 : 1994, R : 2009, AAS-Flame

Analysed By
JSA/SA/SSA

Checked By
Lab Incharge
Env. Lab, RI-2, CMPDI

Approved By
Dy.Technical Manager
Env. Lab, CMPDI (HQ),
(Authorized Signatory)

All values are expressed in mg/lit unless specified.

WATER QUALITY

(GROUND WATER- ALL PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2016-17.**

Name of the Project : **Cluster - XVI** Period: **Q. E. Dec, 2016**

Area : **Dahibari UGP** **Project: Dahibari UGP** **Cluster XVI**

Stations: 1. Ground Water from Pattabari village GW-16

Date of Sampling: 07/12/2016

Sl. No	Parameter	Sampling Stations			Detection Limit	IS:10500 Drinking Water Standards	Standard / Test Method
		GW-16	2	3			
1	Boron (as B), mg/l, Max	<0.20			0.20	0.5	APHA, 22nd Edition ,Carmine
2	Colour,in Hazen Units	12			1	5	APHA, 22nd Edition ,Pt.-Co. Method
3	Calcium (as Ca), mg/l, Max	102.4			1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	130			2.00	250	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	<0.03			0.03	0.05	IS 3025/42 : 1992 R : 2009, AAS-Flame
6	Fluoride (as F) mg/l, Max	0.37			0.02	1.0	APHA, 22nd Edition , SPADNS
7	Free Residual Chlorine, mg/l, Min	0.04			0.02	0.2	APHA, 22nd Edition, DPD
8	Iron (as Fe), mg/l, Max	2.100			0.06	0.3	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
9	Lead (as Pb), mg/l, Max	0.230			0.005	0.01	APHA, 22nd Edition, AAS-GTA
10	Manganese (as Mn), mg/l, Max	0.032			0.02	0.1	IS-3025/59:2006, AAS-Flame
11	Nitrate (as NO_3), mg/l, Max	43.1			0.5	45	APHA, 22nd Edition, UV-Spectrphotometric
12	Odour	Agreeable			Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
13	pH value	8.41			2.5	6.5 to 8.5	IS-3025/11:1983, R-1996, Electrometric
14	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.002			0.001	0.001	APHA, 22nd Edition,4-Amino Autipyrine
15	Selenium (as Se), mg/l, Max	<0.002			0.002	0.01	APHA, 22nd Edition, AAS-GTA
16	Sulphate (as SO_4) mg/l, Max	95			2.00	200	APHA, 22nd Edition. Turbidity
17	Taste	Acceptable			Qualitative	Acceptable	APHA, 22nd Edition. Taste
18	Total Alkalinity (c_aco_3),, mg/l, Max	168			4.00	200	IS-3025/23:1986, Titration
19	Total Arsenic (as As), mg/l, Max	<0.002			0.002	0.01	IS 3025/ 37:1988 R : 2003, AAS-VGA
20	Total Chromium (as Cr), mg/l, Max	0.517			0.04	0.05	IS-3025/52:2003, AAS-Flame
21	Total Dissolved Solids, mg/l, Max	782			25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (c_aco_3), mg/l, Max	456			4.00	200	IS-3025/21:1983, R-2002, EDTA
23	Turbidity, NTU, Max	1			1.0	1	IS-3025/10:1984 R-1996, Nephelometric
24	Zinc (as Zn), mg/l, Max	<0.01			0.01	5.0	IS 3025/ 49 : 1994, R : 2009, AAS-Flame

Analysed By
JSA/SA/SSA

Checked By
Lab Incharge
Env. Lab, RI-2, CMPDI

Approved By
Dy.Technical Manager
Env. Lab, CMPDI (HQ),
(Authorized Signatory)

All values are expressed in mg/lit unless specified.

CHAPTER - IV

NOISE LEVEL QUALITY MONITORING

4.1 Location of sampling sites and their rationale

i) **Dahibari OCP (N22)**

To assess the noise level in mine site, the noise levels were recorded in the mine area where all mining activities are in progress.

ii) **Basantimata UGP (N23)**

To assess the noise level in mine site, the noise levels were recorded in the mine area where all mining activities are in progress.

4.2 Methodology of sampling and analysis

Noise level measurements in form of 'L_{EQ}' were taken using Integrated Data Logging Sound Level Meter (NL-52 OF RION CO. Ltd. Make) during day time. Noise levels were measured for about one hour time in day time. Noise levels were measured in Decibels, 'A' weighted average, i.e. dB (A).

4.3 Results & Interpretations

Ambient noise levels were recorded during day time and the observed values were compared with standards prescribed by MoEFCC.

The results of Noise levels recorded during day time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{EQ} are presented**.**

The observed values at all the monitoring locations are found to be within permissible limits.

NOISE LEVEL DATA

Name of the Company: **Bharat Coking Coal Limited** Year : **2016-17.**

Name of the Project : **Cluster -XVI** Month: **Oct, 2016.**

Name of the Stations & Code :

1. **Dahibari OCP(N22)**
2. **Basantimata UGP (N23)**[1]

Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	**Permissible Limit of Noise level in dB(A)*
1	**Dahibari OCP (N22)**	**Industrial area**	17.10.2016	60.8	*75*
2	**Basantimata UGP (N23)**	**Industrial area**	18.10.2016	61.8	*75*

Permissible limits of Noise Level as per MOEF Gazette Notification No. GSR 742(E) dt. 25.09.2000 Standards for Coal Mines and Noise Pollution (Regulation and Control) Rules, 2000.

*** Day Time: 6.00 AM to 10.00 PM, +Night Time: 10.00 PM to 6.00 AM.**

[1] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed……  …….Dated 22.12.2016. Job No. 110310

Noise Level Monitoring Location of Cluster XVI

NOISE LEVEL DATA

Name of the Company: **Bharat Coking Coal Limited** Year : **2016-17.**

Name of the Project : **Cluster -XVI** Month: **Nov, 2016.**

Name of the Stations & Code :

1. **Dahibari OCP(N22)**
2. **Basantimata UGP (N23)**[2]

Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	**Permissible Limit of Noise level in dB(A)*
1	**Dahibari OCP (N22)**	**Industrial area**	17.11.2016	61.4	*75*
2	**Basantimata UGP (N23)**	**Industrial area**	18.11.2016	59.3	*75*

Permissible limits of Noise Level as per MOEF Gazette Notification No. GSR 742(E) dt. 25.09.2000 Standards for Coal Mines and Noise Pollution (Regulation and Control) Rules, 2000.

*** Day Time: 6.00 AM to 10.00 PM, +Night Time: 10.00 PM to 6.00 AM.**

[2] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed……  …….Dated 22.12.2016. Job No. 110310

NOISE LEVEL DATA

Name of the Company: **Bharat Coking Coal Limited** Year : **2016-17.**

Name of the Project : **Cluster -XVI** Month: **Dec, 2016.**

Name of the Stations & Code :

1. **Dahibari OCP(N22)**
2. **Basantimata UGP (N23)**[3]

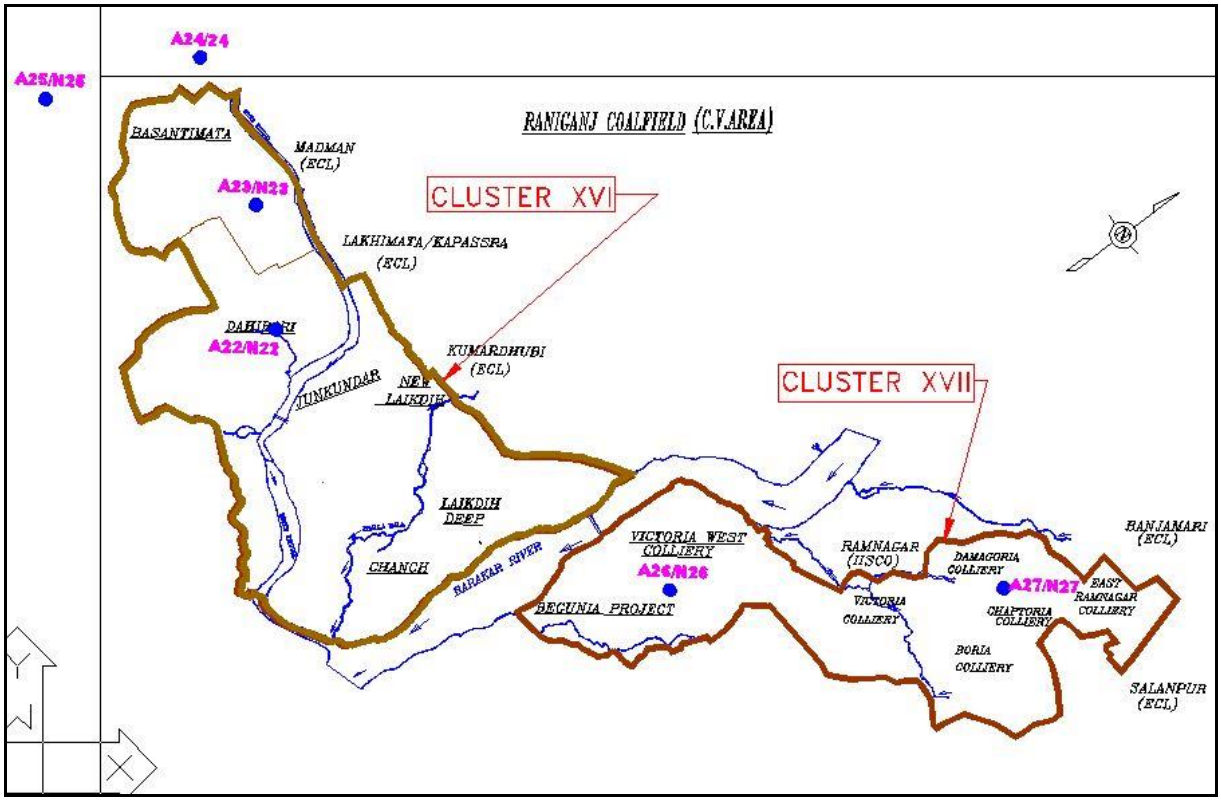
Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	**Permissible Limit of Noise level in dB(A)*
1	**Dahibari OCP (N22)**	**Industrial area**	05.12.2016	62.1	*75*
2	**Basantimata UGP (N23)**	**Industrial area**	06.12.2016	58.4	*75*
3	**Dahibari OCP (N22)**	**Industrial area**	26.12.2016	59.7	*75*

Permissible limits of Noise Level as per MOEF Gazette Notification No. GSR 742(E) dt. 25.09.2000 Standards for Coal Mines and Noise Pollution (Regulation and Control) Rules, 2000.

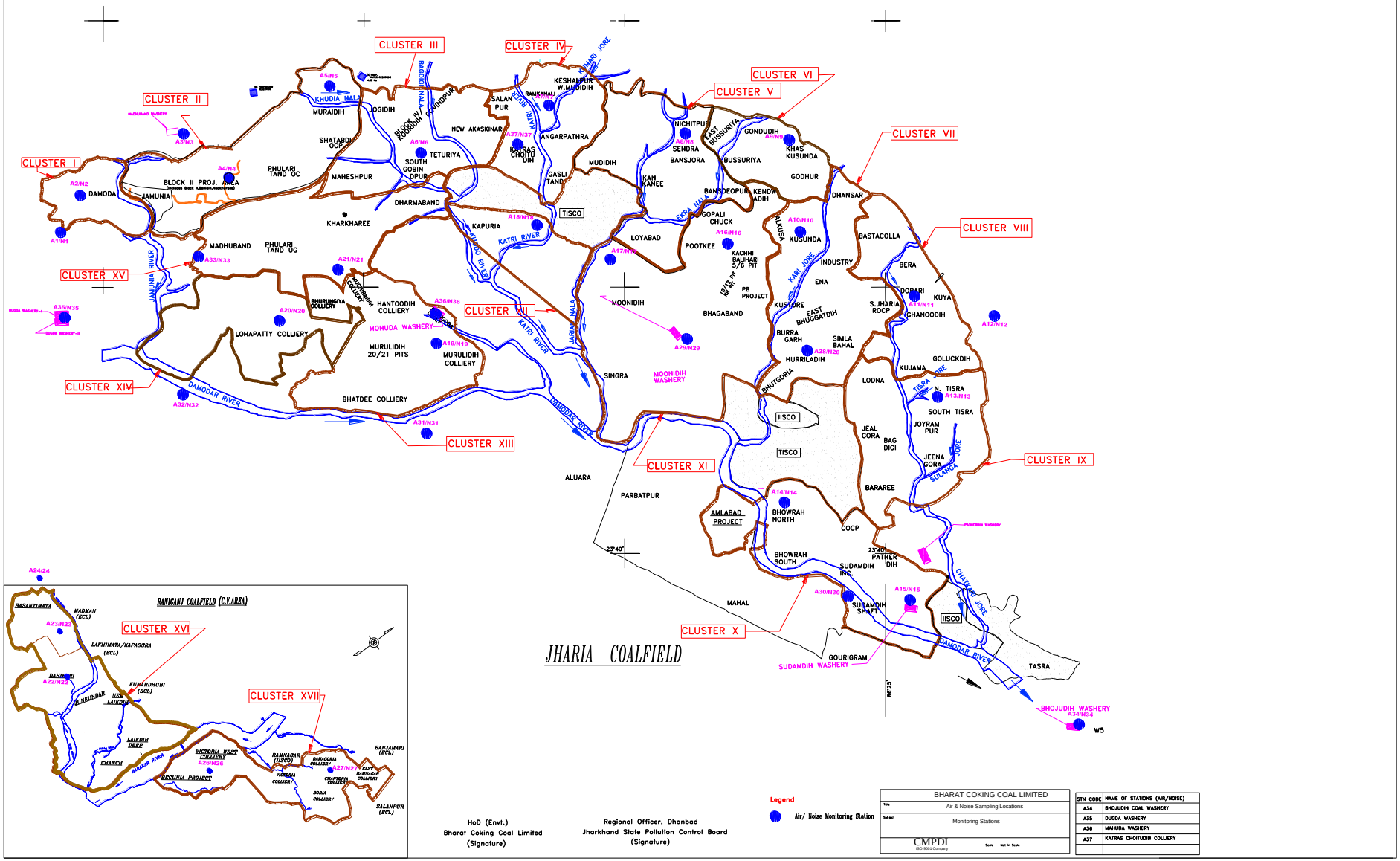
*** Day Time: 6.00 AM to 10.00 PM, +Night Time: 10.00 PM to 6.00 AM.**

[3] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed……  …….Dated 22.12.2016. Job No. 110310

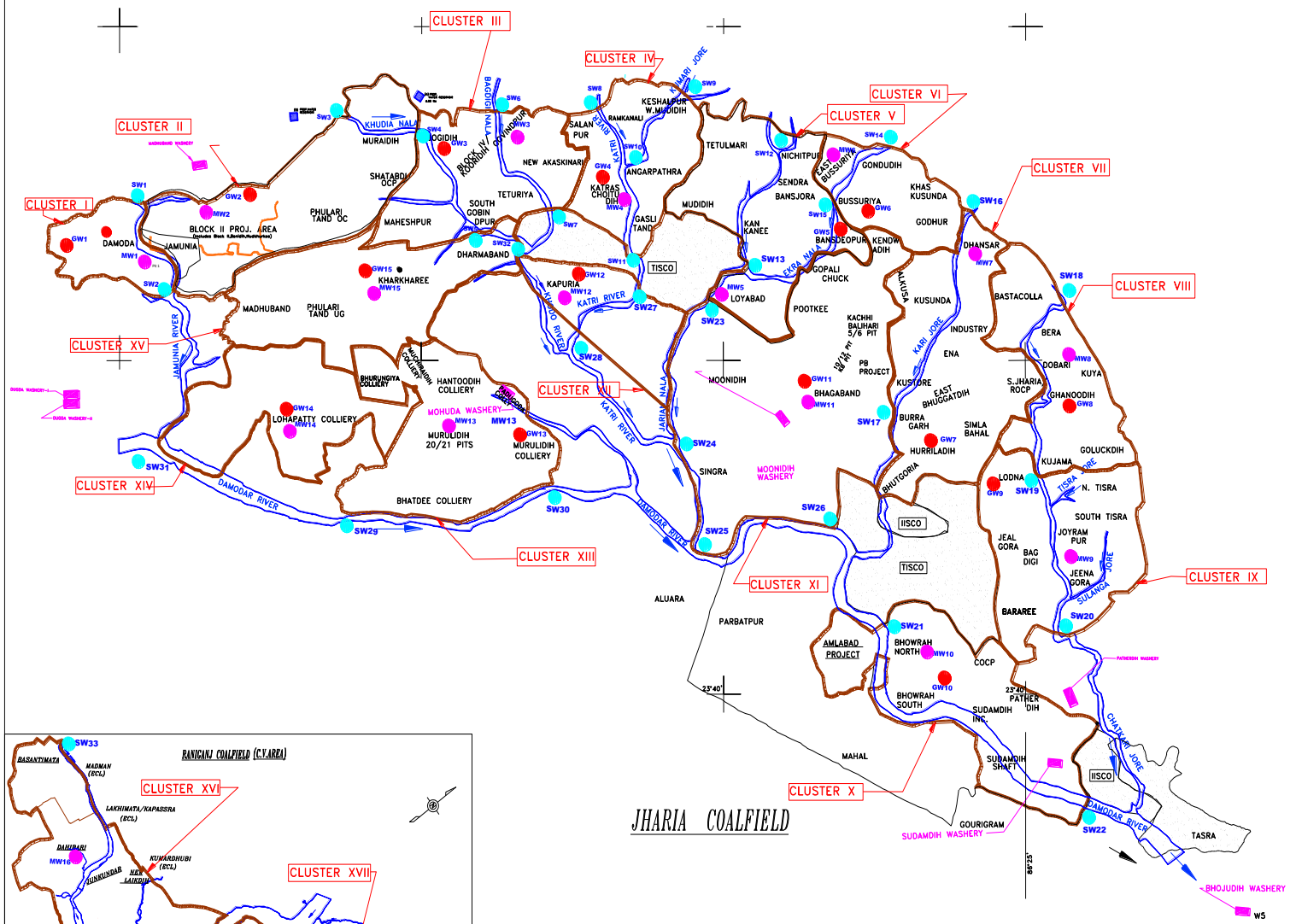
Noise Level Monitoring Location of Cluster XVI



Location of Air & Noise Monitoring Stations in BCCL



Water Sampling Locations in BCCL



INDEX

Cluster	Suface Water (U/S, D/S)	Name of River/ Nala / Jore	Mine/ Effluent Water	Sampling Location	Ground Water	Sampling Location
I	SW1, SW2	Jamunia River	MW1	Damoda Area	GW1	Ghutway Village
II	SW3, SW4	Khudia Nala	MW2	Block II OCP	GW2	Joyrampur Village
III	SW4, SW5, SW6, SW7	Khudia Nala, Bagdigi Nala	MW3	Govindpur Colliery	GW3	Jogidih Village
IV	SW8, SW11, SW9, SW10	Katri River, Kumari Jore	MW4	Chotudih	GW4	Kankanee Village
V	SW12, SW13, SW15	Jarian Nala, Ekra Nala	MW5	Mudidih	GW5	Nichitpur
VI	SW14, SW15	Ekra Nala	MW6	East Bassuria UGP	GW6	Bansjora Borewell
VII	SW16, SW17	Kari Jore	MW7	Dhansar UGP	GW7	Hurriladih
VIII	SW18, SW19	Kashi Jore	MW8	Dobari UGP	GW8	Ghanudih
IX	SW19, SW20	Kashi Jore	MW9	Jeenagora	GW9	Lodna
X	SW21, SW22	Damodar River	MW10	Bhowrah North	GW10	Bhowrah South
XI	SW23, SW24, SW25, SW26	Jarian Nala, Damodar River	MW11	Bhagaband UGP	GW11	Bhagabandh
XII	SW27, SW28	Katri River	MW12	Kapuria	GW12	Kapuria
XIII	SW29, SW30	Damodar River	MW13	Murulidih (20/21)	GW13	Murilidih
XIV	SW31, SW29	Damodar River	MW14	Lohapatti	GW14	Lohapatti
XV	SW5, SW32	Khudia Nala	MW15	Kharkharee UGP	GW15	Kharkharee
XVI	SW33, SW34	Khudia River	MW16	Dahibari OCP	GW16	Patlaban Village
XVII	SW35, SW36	Barakar River	MW17	Damagoria Colliery	GW17	Chaptoria

HoD (Envt.)
Bharat Coking Coal Limited
(Signature)

Regional Officer, Dhanbad
Jharkhand State Pollution Control Board
(Signature)

Legend
- Sampling Locations of Surface Water (Upstream/ Downstream)
- Sampling Locations of Mine Water
- Sampling Locations of Ground/ Drinking Water

Customer: BHARAT COKING COAL LIMITED
Title: WATER SAMPLING LOCATIONS
Subject: MONITORING STATIONS
CMPDI (ISO 9001 Company)
Scale: Not To Scale