

ENVIRONMENTAL CLEARANCE COMPLIANCE OF
CLUSTER-XIII (GRANTED VIDE LETTER NO.J-
11015/11/2010-IA.II (M) DATED 06.06.2013

(APRIL'18 – SEPT'18)

Sl. No.	A. Specific Conditions by MOEF:	Compliance
i.	No mining shall be undertaken in/under the forestland until prior forestry clearance has been obtained under the provisions of FC Act 1980.	Stage-I forest clearance of 6.41 ha of forest land of proposed Murulidih O/C mine has been issued by MOEF vide letter no.5-JHC188/2010-BHU dated 05.03.13. All the conditions of the above letters are compiled including the total online payment of Rs 8155592.17/- was done to MoEF through RTGS/NEFT. Awaited for Stage-II forest clearance for the same.
ii	The EC is granted to Murulidih 20/21 Pits U/G of 0.18 MTPA and a peak production of 2.34 MTPA in an ML area of 571. 32 ha.	Coal production from Murulidih 20/21 Pits U/G is temporary suspended from December 2015.
iii.	The maximum production in the cluster shall not exceed beyond that for which environmental clearance has been granted for the cluster XIII as per given below:	. Being Complied. (Presently there is not any producing mine under cluster XIII) Annexure I
iv.	The measure identified in the environmental plan for cluster – XIII group of mine and the condition given in this environmental clearance letter shall be dovetailed to the implementation of Jharia Action Plan.	Being Complied.
v.	As there is no fire in cluster XIII but the measure should be adopted proponent to control spread of neighboring fire to this cluster XIII. The proponent shall prepare time series maps of Jharia Coal field through NRSA to monitor & prevent fire problems in this Jharia Coalfield by Isothermal mapping / imaging and monitoring temperatures of the coal seam (whether they are closed 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 fire in other areas including in mines of cluster – XIV shall be undertaken.	Work Order Issued to National Remote Sensing Center, ISRO for “Delineation of Surface Coal Fire and associated Land Subsidence in Jharia Coalfield, Jharkhand using satellite based remote – sensing techniques”. Annexure - II
Vi.	Underground mining should be taken up after completion of reclamation of O/C mine area after two years.	Agreed. Presently there is no running O/C mine in cluster XIII.

vii.	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.
Viii	There shall be no external OB dumps. 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.	Being complied.
ix.	A detailed calendar plan of production with plan for OB dumping and back filling (for open cast mines) and reclamation and final mine closure plan for each mine of cluster XIII shall be drawn up & implemented.	Being implemented. Mine closure plan is approved.
x.	The void in 5 ha. Area shall be converted in to a water reservoir of maximum depth of 15-20 mtr in post mining stage and shall be gently sloped and upper benches of the reservoir shall be stabilized with plantation and periphery of the reservoir fenced . The abandoned pits and voids should be backfilled with OB & biologically reclaimed with plantation and or may used for pisciculture.	Will be Complied.
xi.	Mining shall be carried out as per statute 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 extend feasible and the embankment proposed along water body shall be strengthened with stone pitching.	Complied and will be complied as per statute.
xii.	Active OB dumps near water body and rivers should be rehandled for back filling abandoned mine voids. However, those which have been biologically reclaimed need not be disturbed.	There is no opencast project running in cluster XIII at present.

xiii.	Thick green belt shall be developed along undisturbed areas, mine boundary and in mine reclamation. During post mining stage, a total of 91.75 ha would be reclaimed and afforested by planting native species in consultation with local DFO/Agriculture deptt. /Institutions with the relevant discipline. The density of the trees should be around 2500 plants per ha.	It is being complied. Four Eco-restoration Sites of total area 8.4 Ha. (Site-A= 4.2 Ha. Site-B =1.5 Ha, Site-C =1.8 Ha and Site-D= 0.9 Ha) reclaimed area are developed and maintained at Murulidih (about 2500 plants per ha).
Ha	The roads should be provided with avenue plantation on both sides as trees act as sink of carbon and other pollutant.	Agreed. Being complied.
xv.	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 XIII shall be implemented.	Being Implemented.
xvi.	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, fly ash 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 (PM10 and PM2.5) in Jharia Coalfields and also quantified. These studies would help ascertain source and extent of the air pollution, based on which appropriate mitigative measures could be taken.	Location of monitoring stations was already finalized. Source Apportionment 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.
xvii.	No ground water shall be used for mining activities. Additional water required, if any, shall be met from mine water or by recycling/ reused of the water from the existing activities and from rain water harvesting measures. The project authority shall meet water requirement of nearby village (s) in case the village wells go dry to dewatering of mine.	Agreed. Being implemented.
xviii.	Regular monitoring of groundwater level and quality of the study area shall be carried out by establishing a network of existing wells and	It is being complied. CMPDI RI-II has prepared a report for Location and design of Piezometers. Ground water monitoring has been done.

	<p>construction of new piezometers. The monitoring for quantity shall be done 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.</p>	
xix.	<p>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.</p>	<p>Agreed. Being implemented. CMPDIL, Dhanbad is monitoring the same. Annexure- III</p>
xx.	<p>ETP shall also be provided for workshop, and CHP, if any. Effluents shall be treated to conform to prescribe standards in case discharge into the natural water course.</p>	<p>There is no effluent discharge into natural water course. However there is arrangement for treatment of effluent discharge to prescribed standards. There is neither Open Cast mine running nor CHP nor such workshop from where effluent discharge is found.</p>
xxi.	<p>Regular monitoring of subsidence movement on the surface over and around the working area and impact natural drainage pattern, water bodies, vegetation, structure, roads and surroundings shall be continued till movement ceases completely. In case observation of any high rate of subsidence movement, appropriate effective corrective measure shall be taken to avoid loss of life and material. Cracks shall be effectively plugged with ballast and clayey soil /suitable material.</p>	<p>Being implemented. Subsidence study is being conducted by ISM Dhanbad before the start of panel. Extraction done in Non-Effective Width Method so that there is no subsidence on the surface.</p>
xxii.	<p>Sufficient coal pillars shall be left un extracted around the air shaft (within subsidence influence area) to protect from any damage from subsidence, if any.</p>	<p>Already complied. Subsidence monitoring is being done.</p>
xxiii.	<p>High root density tree species shall be selected and planted over areas likely to be affected by subsidence.</p>	<p>Plantation in BCCL is being done on 3-tier basis, in which both, Monocotyledonae (Monocots) such as grasses, bamboo etc and Dicotyledonae (Dicots) such as sheesham, mango etc are being planted for developing an extensive root system. The Monocots having fibrous root system helps in developing the root density at the topsoil level while, Dicots having the tap root system have a distributed root density in</p>

		topsoil, subsoil and regolith layer of soil. These two root system together forms the high root density system.
Xxiv.	Depression due to subsidence resulting in water accumulating within low lying areas shall be filled up or drained out by cutting drains.	Complied.
Xxv.	Solid barriers shall be left below the roads falling within the blocks to avoid any damage to the road.	Already complied as per statute.
xxvi.	No depillaring operation shall be carried out below the township/colony.	Depillaring operation are being carried out after getting written permission from DGMS which is statutory binding.
xxvii.	The transportation plan for conveyor – cum – rail for cluster XIII 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 XIV should be dovetailed with Jharia Action Plan. The road transportation of coal during phase I should be by mechanically covered trucks.	Will be Complied. Presently there is no producing mine under cluster- XIII.
xxviii.	A study should be initiated to analyze extent of reduction in pollution load every year by reducing road transport.	Pollution load study report for has been submitted by CMPDI. Annexure- IV
.xxix.	R & R of 2187 nos. of PAF's involved. They should be rehabilitated at cost of Rs. 11199.89 lakhs as per the approved Jharia Action Plan.	PAF's /PAP's involved is being rehabilitated as per cost specified as per Jharia Action Plan.

Xxx.	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.	Being Complied. Will be submitted.
.Xxxi.	A detailed CSR action plan shall be prepared for cluster XIII group 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 area within	

	<p>the cluster XIII ML that would be existing 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 under taken in the project area under CSR. Issue raised in the public hearing should also be integrated with activities being taken up under CSR. The details of CSR undertaken along with budgetary provisions for the village wise various activities and the 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.</p>	<p>Agreed. Being implemented.</p>
xxxii.	<p>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.</p>	<p>Time series map of vegetation cover in the Jharia Coal field has been carried out through CMPDI in the year 2014 and 2017 (which is enclosed as Annexure- V)</p>
xxxiii.	<p>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.</p>	<p>Agreed .Eco-restoration sites (4 no. of total area 8.4 ha) using native species are maintained. Mine closer plan is approved for Murulidih 20/21 Pits Colliery.</p>
xxxiv.	<p>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 Company for implementing environment policy and socio – economic issues and the capacity building required in this regard.</p>	<p>A full-fledged Environment Department, headed by a HOD (Environment) along with a suitable qualified multidisciplinary team of executives which includes Environment, Mining & Excavation, 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</p>

		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 Headquarters 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.
xxxv.	Implementation of final mine closure plan for cluster XIII, subject to obtaining prior approval of the DGMS in regard to Mines Safety issues.	Will be implemented.
Xxxvi.	Corporate Environment Responsibility:	Annexure- VI
a)	The Company shall have a well laid down Environment Policy approved by the Board of Directors.	Agreed.
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.	Already prescribed.
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.	Already complied.
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.	Being followed.
Sl. No	B. General Conditions Conditions by MOEF:	Compliance
i.	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.	Being complied.
ii.	No change in the calendar plan of production for quantum of mineral coal shall be made.	Being Followed.

iii.	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM₁₀, PM_{2.5}, SO₂ and NO_x 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 locations of monitoring stations in the Jharia Coalfields has finalized in consultation with the Jharkhand State Pollution Control Board. The work of monitoring of ambient environment is being done through Central Mine Planning and Design Institute (CMPDI) having laboratory recognized under the EP Rules. Records for the same are maintained. Annexure - III
iv.	Data on ambient air quality (PM₁₀, PM_{2.5}, SO₂ 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.	Being complied. Monitoring done by CMPDIL.
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.	Being Complied.
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.	The work of monitoring of ambient environment done through Central Mine Planning and Design Institute RI-II (CMPDI), Dhanbad which is having laboratory recognized under the EP Rules. There is no effluent discharge from workshop no coal production from any mines of Cluster-XIII. However there is arrangement for treatment of effluent discharge to prescribed standards. There is neither Open Cast mine running nor CHP nor such workshop from where effluent discharge is found. Very small quantity of burnt oil is generated which is used to lubricate the machines.
vii.	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.	Already Complied.
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 analyzed through a laboratory recognized under EPA Rules,	It is being complied. Monitoring is done by CMPDIL.

	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 analyzed through 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.	Being Complied. Vocational training Centers under Separate Human Resource Development Deptt. is Conducting regular training programme on these issues.
x.	Occupational health surveillance program me 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) `s guideline.
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 which includes Environment, Mining, Excavation, have 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 is being initiated to comply the same. Agreed to report the same.

xiii.	<p>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.</p>	It has been complied.
xiv.	<p>A copy of the environmental clearance letter shall be marked to concern Panchayat/Zila Parishad, 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.</p>	Complied.
xv.	<p>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.</p>	Complied.
xvi.	<p>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 in public domain. The monitoring data of environmental quality parameter (air, water, noise and soil) and critical pollutant such as PM10, PM2.5, SO₂ 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.</p>	Complied.

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.	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.	Agreed. Being and shall be complied.
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.	Being complied. Agreed.
7	The Ministry or any other competent authority may stipulate any further condition(s) for environmental protection.	Agreed
8	Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract the provisions of the Environment (Protection) Act, 1986.	Agreed

	<p>The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and Rules. The proponent shall ensure to undertake and provide for the costs incurred for taking up remedial measures in case of soil contamination, contamination of groundwater and surface water, and occupational and other diseases due to the mining operations.</p>	Agreed
10	<p>The Environmental Clearance is subject to the outcome of the Writ Petition filed by M/S Bharat Coking Coal Limited (BCCL) in response to the closure orders issued by the Jharkhand State Pollution Control Board which is pending in the Jharkhand High Court.</p>	Agreed




Project officer,
Lohapatti colliery / 20/21 pits Murulidih colliery

Project Officer
LOHAPATI COLLIERY

ANNEXURE- I

A. Production from April'18 to Sept'18 of Cluster XIII mines

Month		April '18	May'18	June'18	July'18	Aug'18	Sept'18	Total (Million ton)
	Murulidih 20/21 pits	0	0	0	0	0	0	0
Cluster XIII	Bhurungiya colliery	Nil						Nil
	Muchraidih colliery							
	Hantoodih Colliery							
	Padugora colliery							
	Murulidih colliery							
	Bhatdee colliery							
	Total (in Million ton)							0
Remarks: - Murulidih 20/21 pits colliery temporarily closed for production from December-2015.								

<p>भारत कोकिंग कोल लिमिटेड एक मिनीरत्न कंपनी (कोल इंडिया लिमिटेड का एक अंग) पंजीकृत कार्यालय कोयला भवन, कोयला नगर, (धनबाद) झारखंड-826005 CIN:U10101JH1972GOI000918 Tele: 0326 2230174 FAX: 0326 2230176 ईमेल : cgmsafety@bccl.gov.in</p>		<p>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</p>
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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”

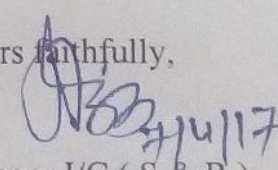
Dear Sir,

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,


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

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**ENVIRONMENTAL QUALITY REPORT
OF
BHARAT COKING COAL LIMITED,
CLUSTER – XIII**

(FOR THE Q.E. JUNE 2018)

E. C. no. J-11015/11/2010-IA.II (M) dated 06.06.2013-



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

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**ENVIRONMENTAL QUALITY REPORT
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CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

4.0 Results and interpretations

4.1 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 within permissible limits.

4.2 Heavy Metal in Ambient Air

The results of Heavy metal in Ambient Air Quality are presented in tabular form for each monitoring station. The concentration of heavy metals in ambient air is well within the permissible limit.

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)

2.2 Ambient Air Quality Sampling Locations

I. CORE ZONE Monitoring Location

i) Murlidih 20/21 (A19): Industrial Area

The location of the sampling station is 23°43' 51.82" N & 86° 16' 21.17" E.

II. BUFFER ZONE Monitoring Location

i) Lohapatti (A20)

The location of the sampling station is 23°44'29.42" N & 86°16'49.96" E.

ii) Kharkharee CISF Office (A21)

The location of the sampling station is 23°46' 29.00" N 86° 14' 37.08"E.

ii) Dumarda (A31)

The location of the sampling station is 23° 42' 50.00" N 86° 15' 4.00"E.

2.3 Results and interpretations

The results of Heavy metal in Ambient Air Quality are presented in tabular form for each monitoring station. The concentration of heavy metals in ambient air is well within the permissible limit.

AMBIENT AIR QUALITY DATA

Name of the Company: **Bharat Coking Coal Limited** Year : **2018-19.**

Name of the Cluster : **Cluster -XIII** PERIOD: **Q. E. JUNE- 2018.**

MONTH: JUNE 2018

Heavy Metal Analysis report of Ambient Air Quality

SAMPLE	Cadmium(Cd) (µg/m3)	Mercury(Hg) (µg/m3)	Arsenic(As) (ng/m3)	Chromium(Cr) (µg/m3)	Nickel (Ni) (ng/m3)	Lead (Pb) (µg/m3)
Murlidih 20/21 (A19)	<0.001	<0.001	<0.005	0.01	<0.01	<0.005
Lohapatti (A20)	<0.001	<0.001	<0.005	0.02	<0.01	<0.005
Kharkharee CISF Office (A21)	<0.001	<0.001	<0.005	0.03	<0.01	<0.005
Dumarda (A31)	<0.001	<0.001	<0.005	0.02	0.01	0.005

सुमन सेन, रुद्र

Analysed By
JSA/SA/SSA

५

Checked By
Lab In Charge
RI-2, CMPDI, Dhanbad

21/6/19

Approved By
HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

CHAPTER – II

WATER QUALITY MONITORING

3.1 Location of sampling sites

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

- i) Drinking Water quality at **Murlidih 20/21 (DW13)**
- iii) Surface Water quality at **U/S of Damodar River (SW29)**
- ii) Surface Water quality at **D/S of Damodar River (SW30)**
- iii) Mine Effluent Quality at **Murlidih 20/21 (MW13)**

3.2 Methodology of sampling and analysis

Water samples were collected as per standard practice. Effluent samples were analyzed for 25 parameters on quarterly basis & for 27 parameters on half yearly basis. The drinking and Surface water samples were collected and analyzed for 25 and 17 parameters respectively, on quarterly basis. Thereafter the samples were preserved and analyzed at the Environmental Laboratory at CMPDI RI-I, Asansol, West Bengal.

3.3 Results & Interpretations

The results are given in tabular form along with the applicable standards. Results show that most of the parameters are within the permissible limits.

WATER QUALITY

(SURFACE WATER- 17 PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2018-19.**

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

Period: **Q. E. JUNE- 2018.**

Area : **Murulidih (20/21)**

Project:
Murulidih (20/21)

Cluster XIII

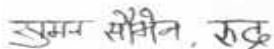
Stations:

1. Upstream of Damodar River SW-29
2. Downstream of Damodar River SW-30 07/06/2018

Date of Sampling:
04/06/2018

Sl.No	Parameter	Sampling Stations				Detection Limit	IS:2296 – 1982 (Inland surface water) Class C	BIS Standard & Method
		SW-29	SW-30					
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	<2.0	<2.0			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	41	48			2.00	600	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	<0.03	<0.03			0.001	1.5	IS 3025 /42 : 1992 R : 2009, AAS-Flame
6	Disolved Oxygen, min.	3.8	3.6			0.10	4	IS 3025/38:1989, R : 2003, Winkler Azide
7	Fluoride (as F) mg/l, Max	0.35	0.39			0.02	1.5	APHA, 22 nd Edition SPADNS
8	Hexavalent Chromium, mg/l, Max	0.018	0.027			0.01	0.05	APHA, 22 nd Edition, 1,5 - Diphenylcarbohydrazide
9	Iron (as Fe), mg/l, Max	<0.06	<0.06			0.06	50	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
10	Lead (as Pb), mg/l, Max	<0.005	<0.005			0.005	0.1	APHA, 22 nd Edition AAS-GTA
11	Nitrate (as NO ₃), mg/l, Max	4.44	6.12			0.50	50	APHA, 22 nd Edition, UV-Spectrophotometric
12	pH value	8.02	7.98			2.5	6.5-8.5	IS-3025/11:1983, R-1996, Electrometric
13	Phenolic compounds (as C ₆ H ₅ OH), mg/l, Max	<0.002	<0.002			0.002	5.0	APHA, 22 nd Edition 4-Amino Antipyrine
14	Selenium (as Se), mg/l, Max	<0.002	<0.002			0.002	0.05	APHA, 22 nd Edition AAS-GTA
15	Sulphate (as SO ₄) mg/l, Max	108	146			2.00	400	APHA, 22 nd Edition Turbidity
16	Total Dissolved Solids, mg/l, Max	680	702			25.00	1500	IS 3025 /16:1984 R : 2006, Gravimetric
17	Zinc (as Zn), mg/l, Max	<0.002	<0.01			0.01	5.0	IS 3025 /49 : 1994, R : 2009, AAS-Flame

All values are expressed in mg/lit unless specified.


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RI-2, CMPDI, Dhanbad


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HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

WATER QUALITY

Name of the Company: **Bharat Coking Coal Limited** Year : **2018-19.**

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

Period: **Q.E. JUNE 2018.**

Area : **Murulidih (20/21)**

Project: Murulidih Cluster XIII
(20/21)

Stations:**Date of Sampling:**

05.06.2018

1. Drinking Water from Murulidih DW-13

Sl. No	Parameter	Sampling Stations			Detection Limit	IS:10500 Drinking Water Standards	Standard / Test Method
		DW-13					
1	Boron (as B), mg/l, Max	<0.2			0.20	0.5	APHA, 22 nd Edition ,Carmine
2	Colour,in Hazen Units	3			1	5	APHA, 22 nd Edition ,Pt.-Co. Method
3	Calcium (as Ca), mg/l, Max	53.4			1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	58			2.00s	250	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	<0.001			0.001	0.05	IS 3025/42 : 1992 R : 2009, AAS-Flame
6	Fluoride (as F) mg/l, Max	0.27			0.02	1.0	APHA, 22 nd Edition , SPADNS
7	Free Residual Chlorine, mg/l, Min	<0.02			0.02	0.2	APHA, 22 nd Edition, DPD
8	Iron (as Fe), mg/l, Max	<0.06			0.06	0.3	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
9	Lead (as Pb), mg/l, Max	<0.005			0.005	0.01	APHA, 22 nd Edition, AAS-GTA
10	Manganese (as Mn), mg/l, Max	<0.02			0.02	0.1	IS-3025/59:2006, AAS-Flame
11	Nitrate (as NO ₃), mg/l, Max	4.9			0.5	45	APHA, 22 nd Edition, UV-Spectrophotometric
12	Odour	Agreeable			Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
13	pH value	7.97			2.5	6.5 to 8.5	IS-3025/11:1983, R-1996, Electrometric
14	Phenolic compounds (as C ₆ H ₅ OH), mg/l, Max	<0.001			0.001	0.001	APHA, 22 nd Edition, 4-Amino Autipyrine
15	Selenium (as Se), mg/l, Max	<0.002			0.002	0.01	APHA, 22 nd Edition, AAS-GTA
16	Sulphate (as SO ₄) mg/l, Max	196			2.00	200	APHA, 22 nd Edition. Turbidity
17	Taste	Acceptable			Qualitative	Acceptable	APHA, 22 nd Edition. Taste
18	Total Alkalinity (c _a co ₃),, mg/l, Max	154			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	<0.04			0.04	0.05	IS-3025/52:2003, AAS-Flame
21	Total Dissolved Solids, mg/l, Max	494			25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (c _a co ₃), mg/l, Max	128			4.00	200	IS-3025/21:1983, R-2002, EDTA
23	Turbidity, NTU, Max	2			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
25	Nickel as Ni, mg/l Max	<0.005			0.005	0.02	IS 3025/ 49 : 1994, R : 2009, AAS-Flame

All values are expressed in mg/lit unless specified.

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21/06/19

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HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

WATER QUALITY

(MINE EFFLUENT- 27 PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2018-19.**

Name of the Project: **Cluster - XIII** Period: **Q.E. JUNE 2018.**

Area : **Murulidih (20/21)**

Project: **Murulidih Cluster XIII (20/21)**

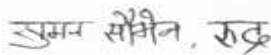
Stations:

Date of Sampling: **23/06/2018**

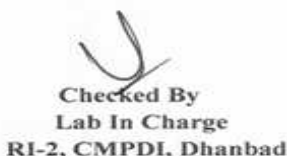
1. Mine Water Discharge Murulidih (20/21) MW-13

Sl.No.	Parameter	Sampling Stations			Detection Limit	MOEF -SCH-VI STANDARDS Class 'A'	BIS Standard & Method
		MW-13					
1	Ammonical Nitrogen, mg/l, Max	0.2			0.02	50.0	IS 3025/34:1988, R : 2009, Nessler's
2	Arsenic (as As), mg/l, Max	<0.002			0.002	0.2	IS 3025/37:1988 R : 2003, AAS-VGA
3	B.O.D (3 days 27°C), mg/l, Max	<2			2.00	30.0	IS 3025 /44:1993,R:2003 3 day incubation at 27°C
4	Colour	colourless			Qualitative	Qualitative	Physical/Qualitative
5	COD, mg/l, Max	28			4.00	250.0	APHA, 22 nd Edition, Closed Reflux, Titrimetric
6	Copper (as Cu), mg/l, Max	0.03			0.03	3.0	IS 3025/42: 1992 R : 2009, AAS-Flame
7	Dissolved Phosphate, mg/l, Max	<0.3			0.30	5.0	APHA, 22 nd Edition Molybdovanadate
8	Fluoride (as F) mg/l, Max	0.55			0.02	2.0	APHA, 22 nd Edition, SPADNS
9	Free Ammonia, mg/l, Max	<0.01			0.01	5.0	IS:3025/34:1988, Nessler's
10	Hexavalent Chromium, mg/l, Max	0.094			0.01	0.1	APHA, 22 nd Edition, Diphenylcarbohydrazide
11	Iron (as Fe), mg/l, Max	0.64			0.06	3.0	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
12	Lead (as Pb), mg/l, Max	<0.005			0.005	0.1	APHA, 22 nd Edition, AAS-GTA
13	Manganese(as Mn), mg/l, Max	<0.02			0.02	2.0	IS-3025/59:2006, AAS-Flame
14	Nickel (as Ni), mg/l, Max	<0.005			0.005	3.0	IS-3025/54:2003, AAS-Flame
15	Nitrate Nitrogen, mg/l, Max	<0.5			0.50	10.0	APHA, 22 nd Edition, UV-Spectrophotometric
16	Oil & Grease, mg/l, Max	<2.0			2.00	10.0	IS 3025/39:1991, R : 2003, Partition Gravimetric
17	pH value	7.93			2.5	5.5 to 9.0	IS-3025/11:1983, R-1996, Electrometric
18	Phenolic compounds (as C ₆ H ₅ OH),mg/l, Max	<0.002			0.002	1.0	APHA, 22 nd Edition 4-Amino Antipyrine
19	Selenium (as Se), mg/l, Max	<0.002			0.002	0.05	APHA, 22 nd Edition, AAS-GTA
20	Sulphide (as SO ₃), mg/l, Max	<0.005			0.005	2.0	APHA, 22 nd Edition Methylene Blue
21	Temperature (°C)	31.6			Shall not exceed 5° C above the receiving temp.		IS-3025/09:1984, Thermometric
22	Total Chromium (as Cr), mg/l, Max	<0.06			0.04	2.0	IS-3025/52:2003, AAS-Flame
23	Total Kjeldahl Nitrogen, mg/l, Max	1.0			1.00	100.0	IS:3025/34:1988, Nessler's
24	Total Residual Chlorine, mg/l, Max	0.05			0.02	1.0	APHA, 22 nd Edition, DPD
25	Total Suspended Solids, mg/l, Max	24			10.00	100.0	IS 3025/17:1984, R :1996, Gravimetric
26	Zinc (as Zn), mg/l, Max	<0.01			0.01	5.0	IS 3025 /49 : 1994, R : 2009, AAS-Flame
27	Odour	Agreeable			Agreeable	Qualitative	Is-3015/5:1983/R:2012/Qualitative

All values are expressed in mg/lit unless specified.



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Lab In Charge
RI-2, CMPDI, Dhanbad



Approved By
HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

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**ENVIRONMENTAL MONITORING REPORT
OF
BHARAT COKING COAL LIMITED,
CLUSTER – XIII**

(FOR THE MONTH JULY, 2018)

E. C. no. J-11015/11/2010-IA.II (M) dated 06.06.2013-

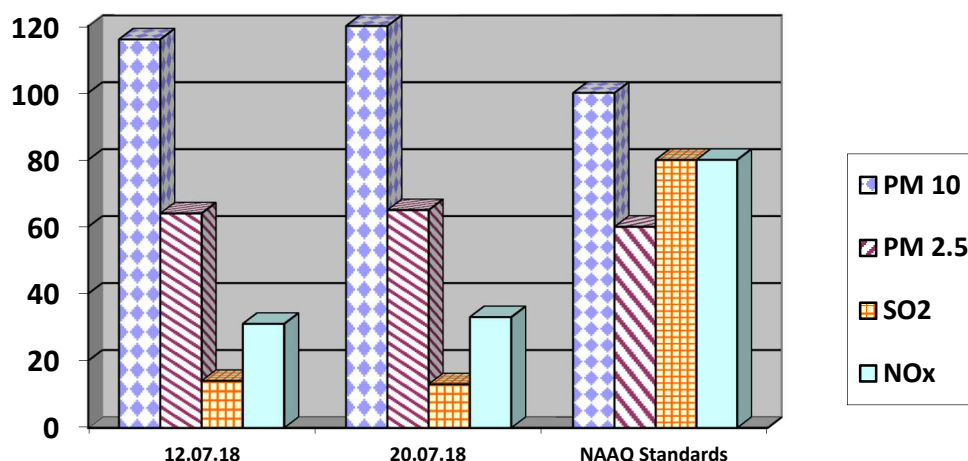


CMPDI

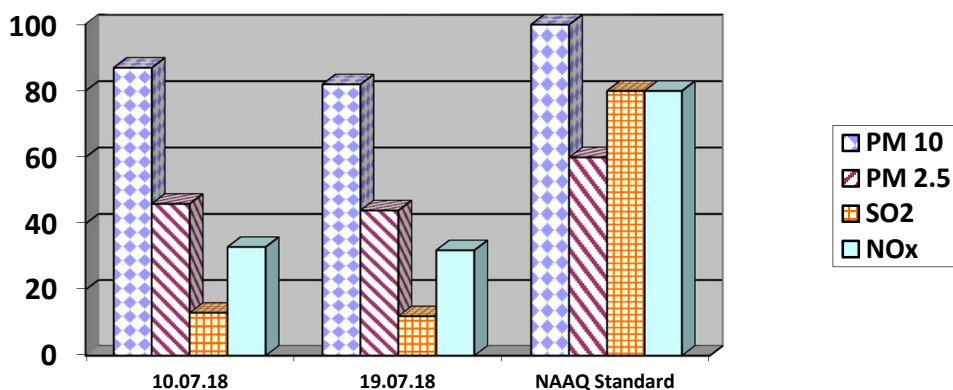
ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

AMBIENT AIR QUALITY DATA**Cluster –XIII,Bharat Coking Coal limited****Month: JULY,2018****Year : 2018-19.**

Station Name: A19 – Murlidih 20/21		Zone: Core		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO ₂	NO _x
1	12.07.18	116	64	14	31
2	20.07.18	120	65	13	33
	NAAQ Standards	100	60	80	80



Station Name: A20, Lohapatti		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO ₂	NO _x
1	10.07.18	87	46	13	33
2	19.07.18	82	44	12	32
	NAAQ Standard	100	60	80	80



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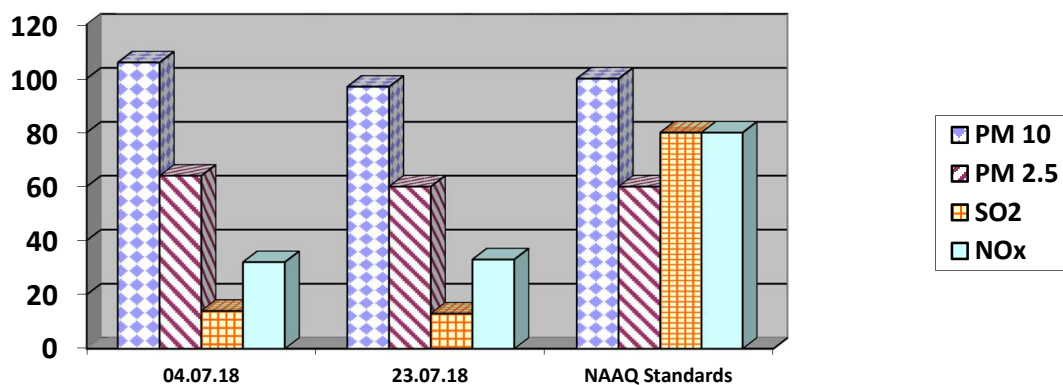
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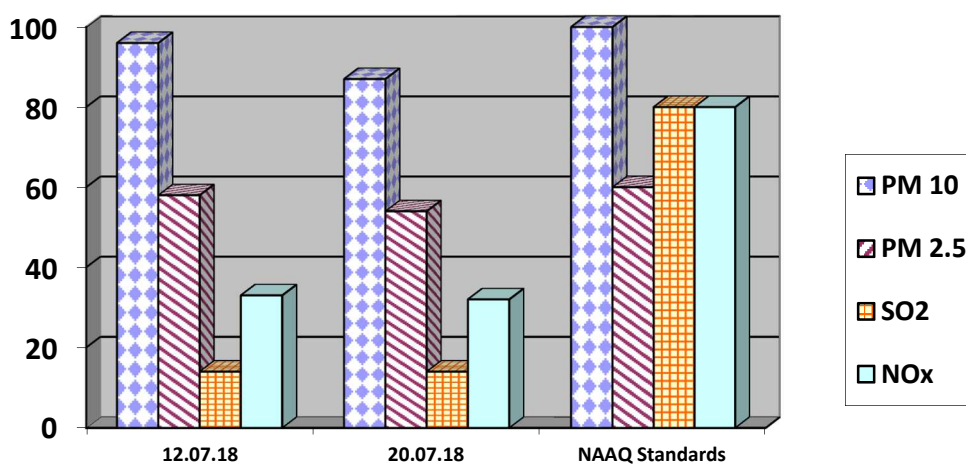
21/7/18

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HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

Station Name: A21Kharkharee		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	04.07.18	106	64	14	32
2	23.07.18	97	60	13	33
	NAAQ Standards	100	60	80	80



Station Name: A31 Dumarda		Zone: Buffer		Category: Residential	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	12.07.18	96	58	14	33
2	20.07.18	87	54	14	32
	NAAQ Standards	100	60	80	80



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

Analysed By
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Lab In Charge
RI-2, CMPDI, Dhanbad

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RI-2, CMPDI, Dhanbad

WATER QUALITY MONITORING

3.1 Location of sampling sites

(Refer **Plate No. – II**)

i) **Mine Discharge of Murlidih 20/21 (MW13)**

A sampling point is fixed to assess the effluent quality of Mine discharge. This location is selected to monitor effluent discharge in to Jamunia.

3.2 Methodology of sampling and analysis

Water samples were collected as per standard practice. The effluent samples were collected and analyzed for four parameters on fortnightly basis at the Environmental Laboratory of CMPDI RI-II, Dhanbad.

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 parameters are within the permissible limits.

WATER QUALITY DATA (EFFLUENT WATER- FOUR PARAMETERS)

Name of the Cluster: Cluster -XIII		Month: JULY, 2018	Name of the Station: Mine Discharge of Murlidih 20/21	
Sl. No.	Parameters	MW13 First Fortnight 13-07-2018	MW13 Second Fortnight 20-07-2018	As per MOEF General Standards for schedule VI
1	Total Suspended Solids	38	44	100 (Max)
2	pH	7.78	7.84	5.5 - 9.0
3	Oil & Grease	<2.0	<2.0	10 (Max)
4	COD	32	28	250 (Max)

All values are expressed in mg/lit unless specified.

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RI-2, CMPDI, Dhanbad

21/07/18

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HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

NOISE LEVEL QUALITY MONITORING

4.1 Location of sampling sites

- i) Murlidih (N19)
- ii) Lohapatti (N20)
- iii) Kharkharee CISF Office (N21)
- iv) Dumarda (N31)

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 in day time. Noise levels were measured in Decibels, 'A' weighted average, i.e. dB (A).

4.3 Results & Interpretations

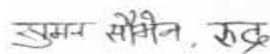
Ambient noise levels were recorded during day time and the observed values were compared with standards prescribed by MoEFCC. The results of Noise levels recorded during day time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values 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

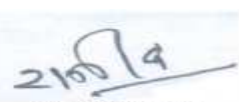
Name of the Project: Cluster -XIII			Month: JULY, 2018		
Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	*Permissible Limit of Noise level in dB(A)
1	Murlidih 20/21 (N19)	Industrial area	12.07.18	64.2	75
2	Murlidih 20/21	Industrial area	20.07.18	62.9	75
3	Lohapatti (N20)	Industrial area	10.07.18	61.7	75
4	Lohapatti	Industrial area	19.07.18	62.8	75
5	Kharkharee (N21)	Industrial area	04.07.18	63.2	75
6	Kharkharee	Industrial area	23.07.18	62.7	75
7	Dumarda (N31)	Residential area	12.07.18	54.3	55
8	Dumarda	Residential area	20.07.18	53.8	55

**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.*

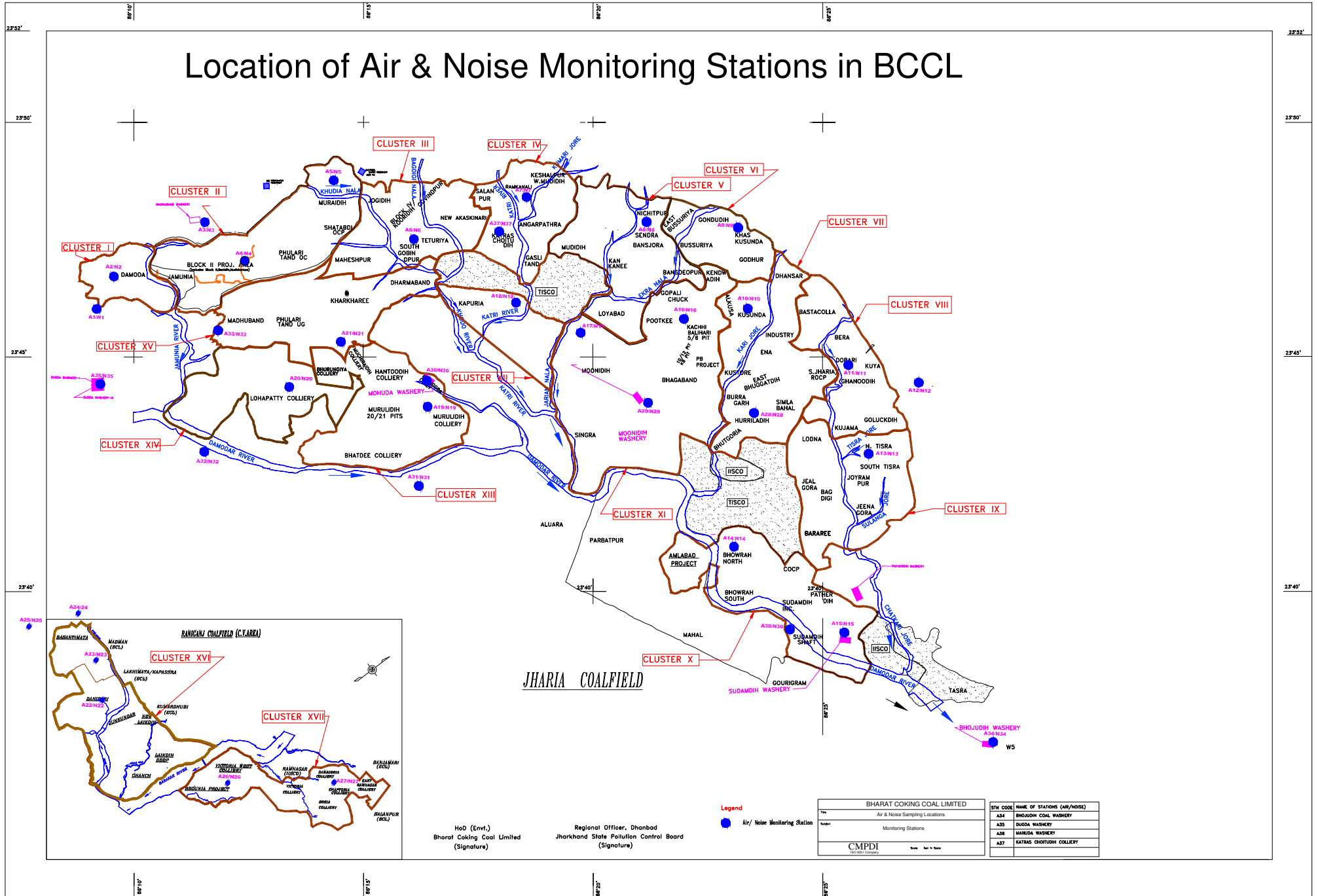
** Day Time: 6.00 AM to 10.00 PM,*


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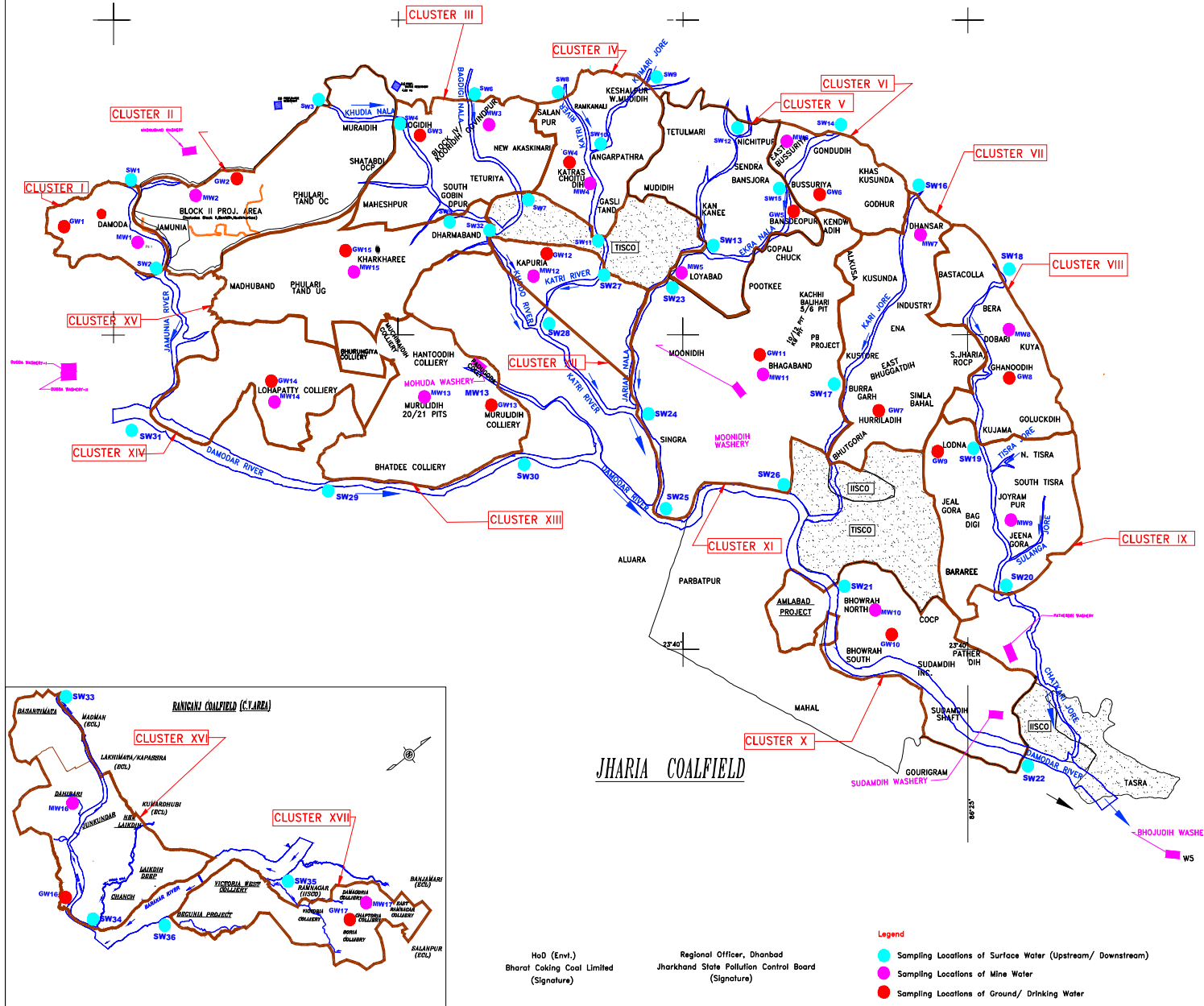

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HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

Location of Air & Noise Monitoring Stations in BCCL



Water Sampling Locations in BCCL



INDEX

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

Legend

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

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

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

Customer: BHARAT COKING COAL LIMITED

Title: WATER SAMPLING LOCATIONS

Subject: MONITORING STATIONS

CMPDI

Date: Not to Date



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

CLUSTER XIII GROUP OF MINES

**(Murulidih 20/21 pits, Bhurungia, Muchraidih, Hantoodih,
Padugora, Murulidih and Bhatdih)**

**Normative Production : 0.18 MTPA
Peak Production : 0.234 MTPA
Lease Hold Area : 1898.62 Ha**

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	7-11

Chapter – I

Introduction

1.1 Genesis:

MOEF provided Environmental Clearance to the various mines of the Cluster J-11015/ 11/ 2010-IA.II(M) dated 6 June 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 XIII mines of BCCL consists of existing mine of Murulidih 20/21 pits and six closed mines (Bhurungia, Muchraidih, Hantoodih, Padugora, Murulidih and Bhatdih). This cluster of mines are located in the southwestern part of the Jharia coalfield in Mohuda basin. These mines are taken over by BCCL from private mine owners after nationalization through Coal Mines Nationalization Act, 1972-73. The Murulidih 20/21 pit mine is operating since pre-nationalisation period.

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-XIII group of mines of BCCL is a group of seven mines consisting of one underground mine and six abandoned/closed mines including one opencast mine of Western Jharia Area in Jharia 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 –XIII

SI No	Name of Mine	Production Capacity (MTY)		Lease Hold Area (Ha)
		Normative	Peak	
1	Murulidih 20/21 pits	0.18	0.234	571.32
2	Bhurungiya colliery	nil	nil	170.44
3	Muchraidih colliery	nil	nil	83.23
4	Hantoodih colliery	nil	nil	193.41
5	Padugora colliery	nil	nil	17.6
6	Murulidih colliery	nil	nil	315.62
7	Bhatdee colliery	nil	nil	547.00
	Total	0.18	0.234	1898.62

1.3.3 Impact of Fire Control on Ambient Air Quality:

Due to unscientific mining prior to nationalization there are unstable sites identified in the BCCL. Out of 595 unstable sites identified in the Master Plan, 15 sites consisting of 2187 no. of houses/families are affected. The affected families will be rehabilitated in adjacent non coal bearing area at a cost of Rs. 11199.89 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 39.3⁰C and the minimum was 6.2⁰C. 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 DISTRIBUTIONPeriod: 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

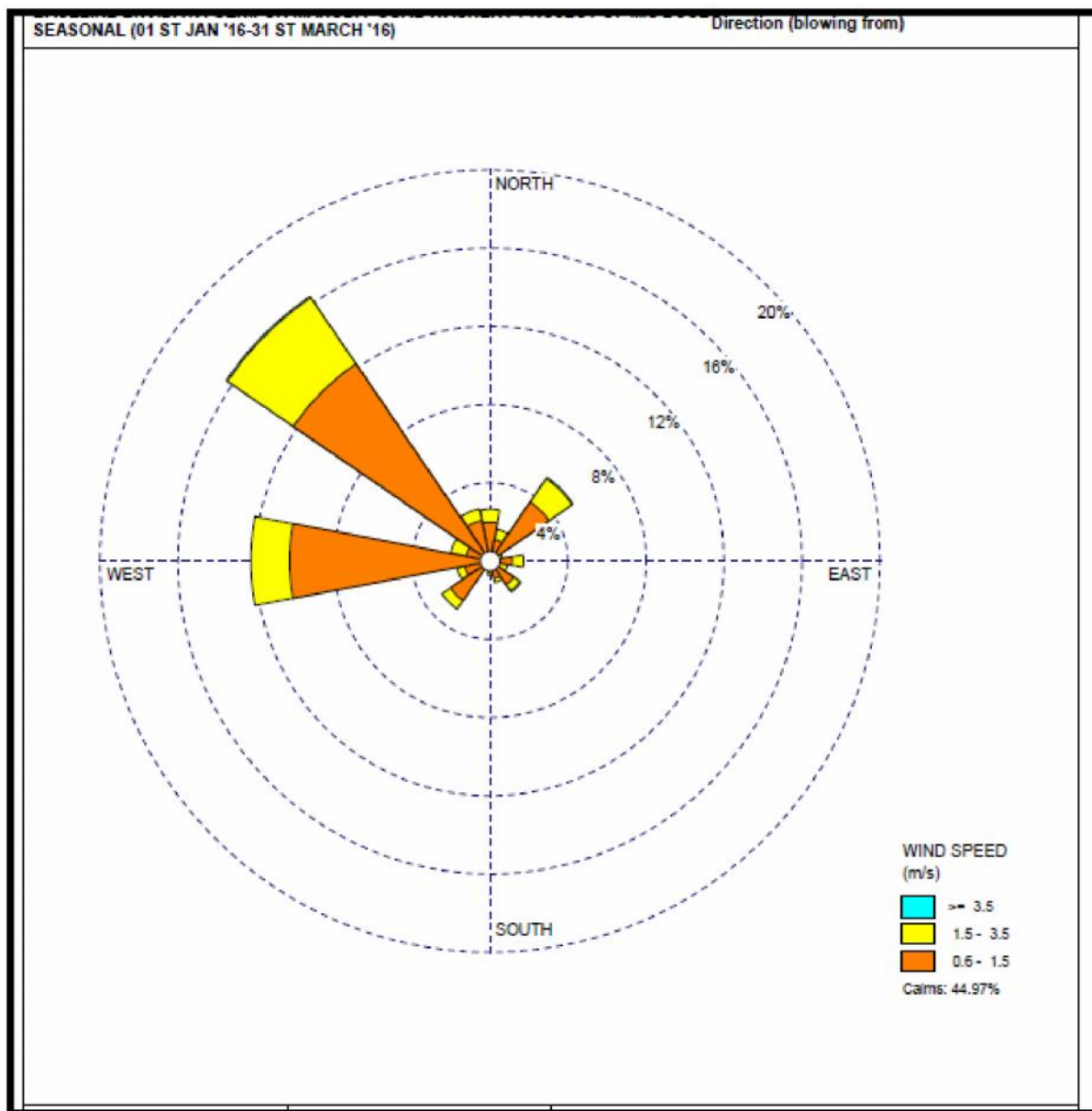


Figure No.-1.1 Wind Rose diagram for the period 1st Jan to 31st March 2016

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 sidings for 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 described and dust load has been worked out for the

year	2013-14,	2014-15	and	2015-16.
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2.2.1 Murulidih 20/21 pits Colliery :

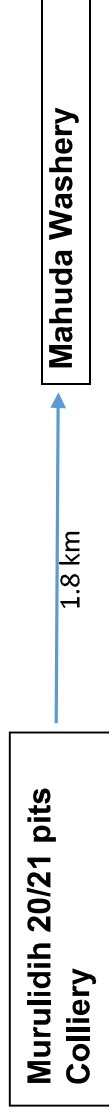


Table: 2.1 Dust Generation (Kg/day)

Dust generated per day (Kg/Day)										
Name of the Mine	Year	Location	Distance from Face to Siding (Km)	Coal Transferred	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
Murulidih 20/21 pits Colliery	13-14	Mahuda washery	1.80	46687.85	141.00	20.00	25.38	0.53	13.451	
		Total for 13-14			141.00				13.451	0.10
	14-15	Mahuda washery	1.80	43670.23	132.00	20.00	23.76	0.53	12.593	
		Total for 14-15			132.00				12.593	0.10
	15-16	Mahuda washery	1.80	10425.59	32.00	20.00	5.76	0.53	3.053	
		Total for 15-16			32.00				3.053	0.10

* 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 PM₁₀ 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 for the 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 10425.59 tones resulting in 1043 kg of daily fugitive dust generation. The dust (PM-10) generation rate at present is 0.10 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 7090 kg/day for daily coal production of 70909 tonnes (0.234 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
XIII	Murulidih 20/21 pits	0.234	Coal transport by Conveyor to Railway Siding
	Total	0.234= 70909 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 10425.59 tones resulting in 1043 kg of daily fugitive dust generation. The dust (PM-10) generation rate at present is 0.10 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):

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

7090 kg/day for daily coal production of 70909 tonnes (0.234 MTY) during Phase –II.

1. 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.
2. **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)	10425	1043
2029-30 (By Road transportation)	70909	7090
2029-30(By Conveyor Transportation)	70909	0

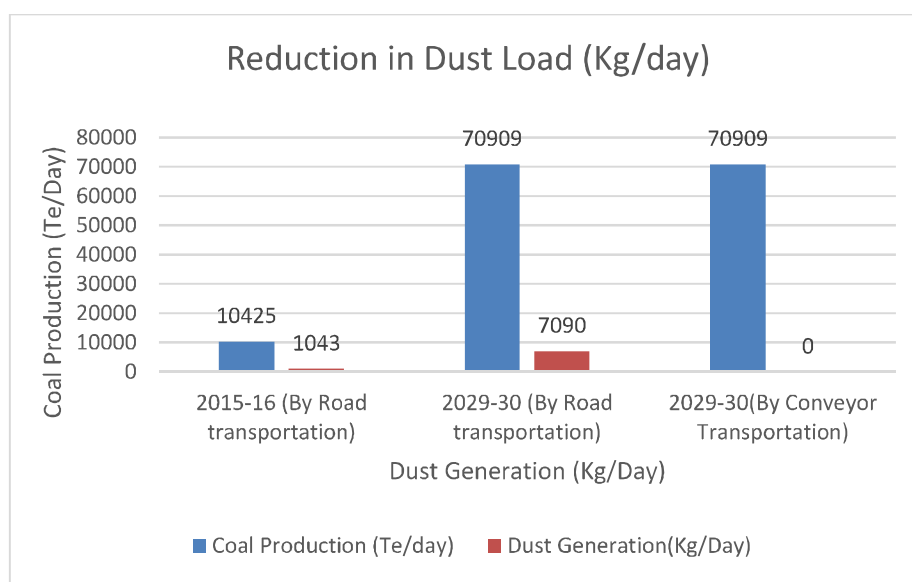
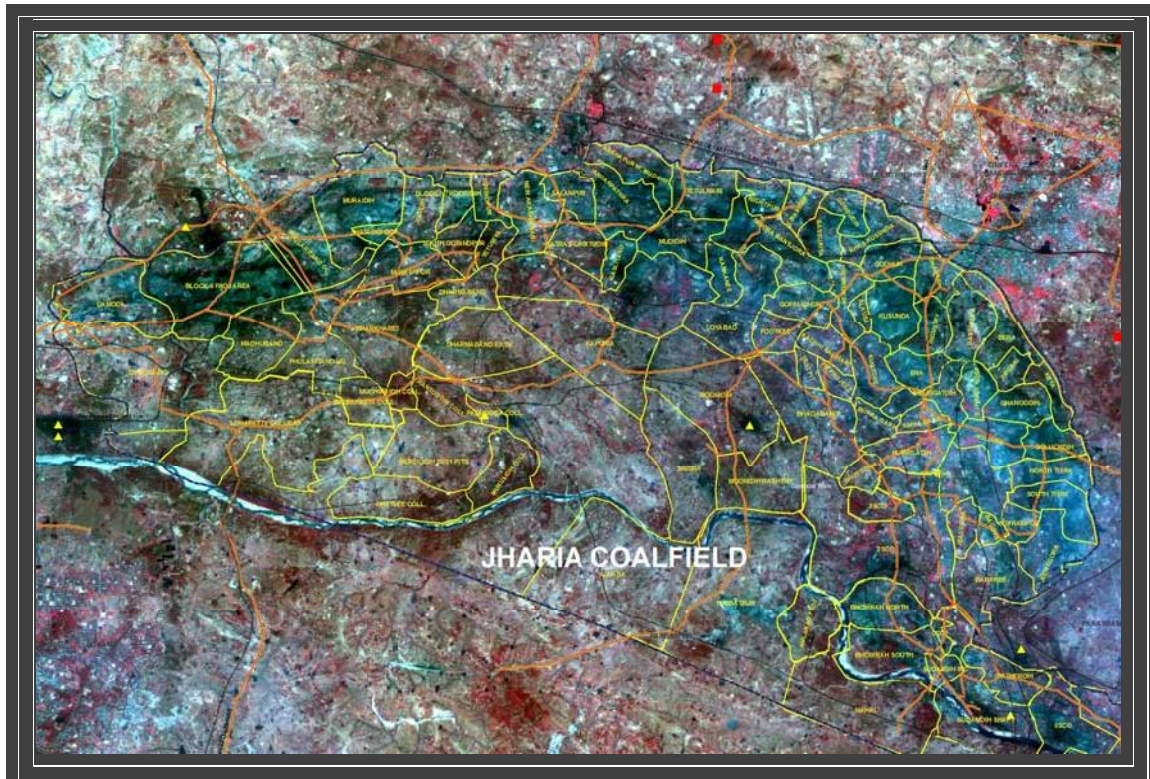


Figure 2.1: Presentation of reduction in dust generation due to replacement of Road transportation by Conveyor system.

Vegetation Cover Mapping of Jharia Coalfield based on Satellite Data of the Year- 2016



Submitted to
Bharat Coking Coal Ltd (BCCL)
Dhanbad

March 2017

Vegetation Cover Mapping of Jharia Coalfield based on Satellite Data of the Year- 2016

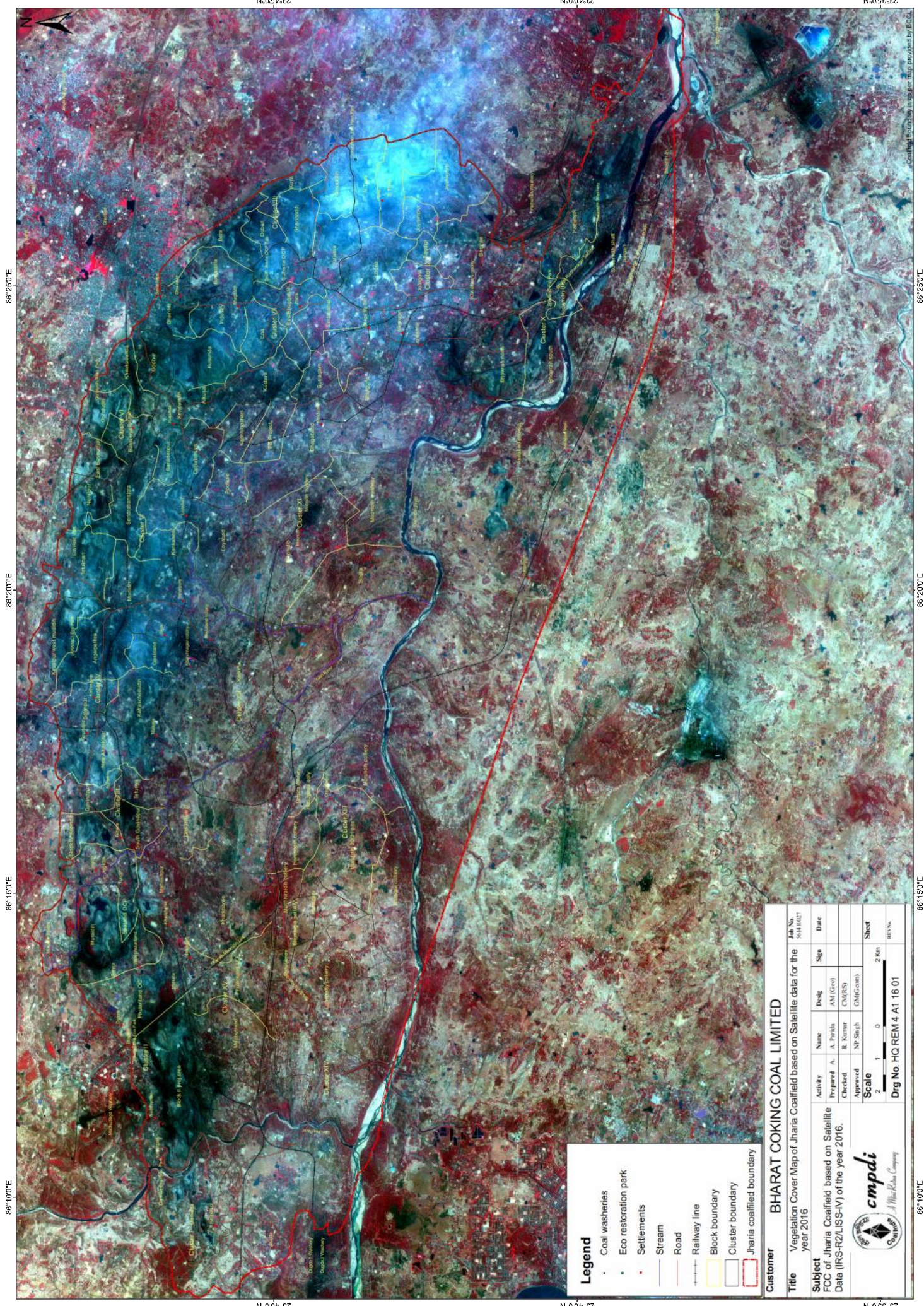
March-2017



**Remote Sensing Cell
Geomatics Division
CMPDI, Ranchi**

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(8) Aim of the Report	To prepare Land use and vegetation cover map of Jharia Coalfield on 1:50000 scale based on satellite data for monitoring the impact of coal mining on land use pattern and vegetation cover & also to prepare cluster wise Land use/ Cover maps falling under Jharia Coalfield.
(9) Executing Unit	Remote Sensing Cell, Geomatics Division Central Mine Planning & Design Institute Limited, Gondwana Place, Kanke Road, Ranchi 834008
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(11) Authors	Ms Ayesha Parida, Assistant Manager (Remote Sensing)
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Legend

- Coal washeries
- Eco restoration park
- Settlements
- Stream
- Road
- Railway line
- Block boundary
- Cluster boundary
- Jharia coalfield boundary

Customer **BHARAT COKING COAL LIMITED**

Title **Vegetation Cover Map of Jharia Coalfield based on Satellite data for the year 2016**

Subject **FCC of Jharia Coalfield based on Satellite Data (IRS-R2/LISS-IV) of the year 2016.**



Scale

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ANNEXURE-VI



BHARAT COKING COAL LIMITED
(A Subsidiary of Coal India Limited – A Maharatna Company)

CORPORATE ENVIRONMENTAL POLICY

Bharat Coking Coal Limited (BCCL), a subsidiary of Coal India Limited, is a Public Sector Undertaking engaged in mining of coal and allied activities. It is the only producer of Prime Coking Coal in India. BCCL was incorporated in 1972 to operate coking coal mines operating in the Jharia and Raniganj Coalfields. Currently, the Company operates 66 coal mines and 8 Coal Washeries.

Our mission is to produce the planned quantity of coal efficiently and economically with due regard to safety, conservation and quality. BCCL affirms its commitment for environment friendly mining with right mitigation of pollution, reclamation of the degraded land, preservation of biodiversity and proper disposal of waste following the best environmental practices including judicious use of the non-renewable energy on the path of continual improvement. Towards this commitment, BCCL shall endeavor to:

- ❖ Conduct mining and associated operations in an environmentally responsible manner to comply with applicable laws and other requirements related to environmental aspects.
- ❖ Design projects with due consideration of Sustainable Development by integrating sound environmental management practices in all our activities.
- ❖ Prevent pollution of surrounding habitation by continuous monitoring and adopting suitable measures for environment protection.
- ❖ Ensure compliance of all applicable Environmental and Forest Clearance conditions and other statutory conditions issued by regulatory agencies.
- ❖ Implement the Environmental Management Plans in all our mines effectively to mitigate pollutions on air, water and noise; proper disposal of wastes and reclamation and ecological restoration of degraded land; and by also dovetailing the Jharia action/ Master Plan for dealing with Fires, Subsidence and Rehabilitation of affected people with the Environmental Management Plans under the Cluster Concept.
- ❖ Strive to conserve Bio-Diversity through Ecological restoration methods.
- ❖ Conserve natural resources through recycling of wastes on the principle of Reduce, Recycle and Reuse. Put special thrusts on efficient energy utilization as a measure to reduce carbon foot-print.
- ❖ Strive for continual improvement in our environmental performances by setting targets, measuring progress and taking corrective action.
- ❖ Create environmental awareness among the employees and the local communities through pro-active communication and training and encourage our business associates to adopt similar approach for environmental protection.

Place: Dhanbad
Date: 25.5.12


Chairman-cum-Managing Director

Chairman-cum-Mg. Director
BHARAT COKING COAL LIMITED
Kalya Bhawan, Dhanbad-826 005

भारत कोकिंग कोल लिमिटेड

(कोल इंडिया का एक उपक्रम)
पंजीकृत कार्यालय : कोयला भवन, कोयला नगर,
धनबाद-826005
सीआइएन : U10101JH1972GOI000918

महाप्रबंधक का कार्यालय**पश्चिमी झरिया क्षेत्र**

पो. मुनीडीह, जिला: धनबाद (झारखण्ड)-828129

फोन नं. 0326 2273483; फेक्स: 0326 2273445, ई-मेल: cgmwj@bcccl.gov.in

**Bharat Coking Coal Limited**

(A Subsidiary of Coal India Limited)
Regd. Off. : Koyla Bhawan, Koyla Nagar
Dhanbad - 826005
CIN : U10101JH1972GOI000918

**OFFICE OF THE GENERAL MANAGER
WESTERN JHARIA AREA**

PO: MOONIDIH, DISTT: DHANBAD (JHARKHAND) - 828129

PHONE NO: 0326 2273483, FAX NO: 0326 2273445, e-mail : cgmwj@bcccl.gov.in

**MOONIDIH HOSPITAL
W.J.Area****ANNEXURE -III****Subject: Details of CSR activities from 26/3/18 to 25/11/18.**

Period	CSR CLINIC	WELLNESS	BANDE MATARAM
26/3/18 TO 25/4/18	716	17	NIL
26/4/18 TO 10/5/18	274	NIL	08
11/5/18 TO 25/5/18	359	NIL	14
26/5/18 TO 10/6/18	313	NIL	15
11/6/18 TO 25/6/18	340	62	NIL
26/6/18 TO 10/7/18	325	5	10
11/7/18 TO 25/7/18	397	70	9
26/7/18 TO 10/8/18	428	46	13
11/8/18 TO 25/8/18	421	53	6
26/8/18 TO 10/9/18	507	61	15
11/9/18 TO 25/9/18	520	56	9
26/9/18 TO 10/10/18	424	55	10
11/10/18 TO 25/10/18	374	15	11
26/10/18 TO 10/11/18	444	27	6
11/11/18 TO 25/11/18	256	35	12

2.

Name of Camp	Date	No. of beneficiaries	Place
Awareness camp (Seasonal Disease)	14/6/18	36	CISF CAMP
Medical Village camp	22/6/18	52	Karitand
Hypertension Awareness camp	16/6/18	34	Mnd Hospital
-----DO-----	6/7/18	42	Mnd Hospital
-----DO-----	23/7/18	46	Mnd Hospital
Woman Health awareness camp	18/7/18	24	CISF CAMP
Hypertension Awareness camp	19/7/18	24	CISF CAMP
Medical Village camp	26/7/18	173	Dhobni Basti
Hypertension Awareness camp	23/8/18	51	Mnd Hospital
Diabetic Awareness camp	31/8/18	32	CISF CAMP
Health Awareness camp	27/9/18	30	CISF CAMP
Hypertension Awareness camp	25/10/18	54	Mnd Hospital

ANNEXURE-VII

A. Training from April'18 to Sept'18

No of employees (Departmental & Contractual) received training in Cluster XIII (April'18 to Sept'18)	
Types of Training	Numbers
Basic Training	0
Refresher Training	11