BHARAT COKING COAL LIMITED
(A Mini Ratna Company)
(A Subsidiary of Coal India Limited – A Maharatna Company)
Regd.Off: KoylaBhawan, Koyla Nagar, Dhanbad-826005
CIN: U10101JH1972GOI000918
OFFICE OF THE GENERAL MANAGER
SIJUA AREA

Ref. No. - GM:SA:V:ENV:293

Date- 20/5/16

To,
The Director(s),
Ministry of Environment, Forest & Climate Change
Govt. of India
Eastern-Central Regional Office (ECZ)
Bungalow No. A-2, Shyamali Colony
Ranchi-834002

Subject- Six Monthly Compliance Report of EC Conditions for the period from 1st Oct. 2015 to 31st March, 2016 in respect of cluster V group of Mines of Bharat Coking Coal Limited

Dear Sir,

Please find enclosed the half yearly compliance report of EC Conditions for the period from 1st Oct. 2015 to 31st March, 2016 in respect of cluster V group of Mines of Bharat Coking Coal Limited.

Hope you will find the same in order.

20/05/16
General Manager
Sijua Area, BCCL

Rajesh Ranjan

Cc.

1. Director,1a Monitoring Cell,Paryavaran Bhawan, CGO complex,New Delhi-110003
2. Scientist and Incharge, Zonal Office, Central Pollution Control Board, Kolkata
3. Member Secretary, Jharkhand Pollution Control Board, Ranchi
4. Regional Officer, Jharkhand Pollution Control Board, Dhanbad
5. Dy. General Manager (Env), BCCL HQs, Koyla Bhawan, Dhanbad
6. Addl. General Manager, Sijua Area
7. All project Officers, Sijua Area
8. Area Nodal Officer(Env), Sijua Area
9. Office Copy

ENVIRONMENTAL CLEARANCE COMPLIANCE REPORT OF CLUSTER-V

(GRANTED VIDE EC Order No. J-11015/01/2011-IA.II (M) Dated11.02.2013)

(From OCT'15 to MAR'16)

S. No.	Specific Condition	Compliance Status
1	The maximum production shall not exceed beyond that for which environmental clearance has been granted for the mine of cluster V.	The production from the cluster is within the limit for which environmental clearance has been granted.
2	The road transportation of coal during phase–I should be by mechanically covered trucks. The road used for coal transportation should be developed with avenue plantation on both sides.	Presently, transportation is being done by covering vehicle with tarpaulin. It has been included in the Transportation agreement. 1320 Nos. of Gabion plantation has been done alongside road from Shakti Chowk to Mohlidih. More avenue plantation will be done in a progressive manner.
3	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.	It is being complied. Training and awareness regarding ecological restoration and sustainable development are being imparted within the company and in the nearby population. Training programs are being conducted at VTC and HRD, BCCL regularly.
4	The 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 form.	Complied. **Annexure-1(Action Plan Booklet).**
5	A study should be initiated to analyze extent of reduction in pollution load every year by reducing road transport.	Compliance in progress. CMPDIL has taken up the work for BCCL. Basic Data has been submitted to CMPDI. CMPDI will soon submit the final report of the study
6	The expertise available internationally should be utilized for control of fire in Jharia Coalfields and for their reclamation and to further minimize time for fire and subsidence control.	It is being complied. Presently Master Plan approved by Govt. of India is under implementation for this purpose. A Global EOI was floated foe award of work to international experts for control of fire. However, no eligible bidder qualified for the stage. CIMFR

		has been requested to initiate a study to identify the extent of fire and suggest effective mitigation measures. The proposal is under approval of competent authority.
7	The abandoned pits and voids should be backfilled with OB and reclaimed with plantation and or may be used for pisciculture.	It is being complied. The abandoned pits and voids are going to be backfilled.
8	BCCL may consider setting up a separate management structure for implementing environment policy and socio-economic issues and the capacity building required in this regard.	Complied. BCCL has its own Environment department with Multidisciplinary team along with officers at area level with sufficient manpower. **Annexure-2 (Organization Chart)**
9	The locations of monitoring stations in the Jharia Coalfields should be finalized in consultation with the Jharkhand State Pollution Control Board.	Complied. Plan and letter ratified by RO, JSPCB is available. **Annexure-3(Letter)**
10	The smoke/dust emissions vary from source to source (fuel wood, coal, fly ash from TPPs, silica from natural dust, etc) and a Source Apportionment Study should be carried out for the entire Jharia Coalfield.	Compliance in Progress. To carry out such a study, MoU has been signed with NEERI/ICFRE and has been requested to initiate the study at an earliest.
11	Mineralogical composition study should be undertaken on the composition of the suspended particulate matter (PM10 and PM 2.5) 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.	The ambient environment monitoring work is currently being carried out by CMPDIL which is having CSIR laboratory recognized under the EP Rules.
12	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.	Complied. NRSC Report. **Annexure-4**
13	Measures to prevent ingress of air (Ventilation) in such areas, to prevent restart fresh/spread fires in other areas including in mines of cluster V shall be undertaken.	Action is being taken as specified in EC and as per Jharia Master Plan. Further fire patches are under operation to dig out the fiery coal and combustible materials to save the coal from burning and to stop further spread of the fire. Once the fiery coal

		is dug-out/excavated there will be no more chance of restarting of fresh/spreading of fire into other areas
14	Permanent /regular ambient air monitoring is required for CO, CO2, Methane and its homologues. Monitoring station, mobile monitoring should be established at suitable location as the temp in the mine is high, in the presence of CH4, the coal may catch fire. Presence of Aromatic compounds should be investigated as most of the aromatic compounds are carcinogenic.	The ambient environment monitoring work is currently being carried out by CMPDIL which is having CSIR laboratory recognized under the EP Rules
15	Local institution/university should be contacted for such type of study. Exact measurement for the presence of above gases and their potential danger/harmful effect on human should be assessed. ISM Dhanbad and any local university could be contacted for monitoring.	Local institutions such as ISM and CIMFR are engaged as & when required in the mines.
16	The road transportation should be of bigger/high capacity trucks. The road should be strengthened to carry the load of high capacity trucks. Railway siding with silo loading will be completed by December, 2015 as informed by the proponents.	It is being implemented.
17	Master Plan for dealing with fire for next 12 year which is under implementation, Details of same from August2011 till date year-wise should be provided. An Action Plan which is in progress should be submitted to the Ministry.	Govt. of India approved Master Plan and status of action taken is uploaded on the official website of BCCL www.bccl.gov.in.
18	Underground mining should be taken up after completion of reclamation of Opencast mine area after 15 years.	It shall be complied.
19	No mining shall be undertaken where underground fires continue. Measure shall be taken to prevent/ check such fire including in old OB dump areas where the fire could start due to presence of coal /shale with sufficient carbon content.	It is being complied. Action is being taken to control, mine fires including old OB dump areas as specified in Jharia Master Plan and the mining is being done as per the guidelines and permissions of Directorate General of Mines Safety (DGMS).
20	The rejects of washeries in Cluster –V should be send to FBC based plant.	Coal washery does not exist in this cluster at present.
21	There shall be no external OB dumps. 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.	Action is being taken as specified in EMP. At the end of the mining, there shall not be voids and area will be re-vegetated and reclaimed with the proper eco-restoration techniques suggested by the experts available in BCCL and in external agencies i.e.

		FRI Dehradoon, CEMDE Delhi, etc. Backfilling is being 100% 5 carried out. Eco restoration on old dump sites is being done
22	There shall be no water body left at the end of mining.	It shall be complied.
23	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-V shall be drawn up and implemented.	Being Complied. Calendar plan is prepared and excavation, OB dumping is being done as per the aforesaid calendar plan. Progressive Mine closure plan as per the guidelines of Ministry of Coal have been prepared by Central Mine Planning and Design Institute (CMPDI) for five collieries and it is being implemented
24	The void shall be converted into a water reservoir of a maximum depth of 15-20 m and shall be gently sloped and the upper benches of the reservoir shall be stabilized 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	Compliance to be done at end phase of Mine. Mine in the cluster are active and concurrent backfilling is being done. Thus, the condition shall be complied.
25	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.	It is being followed.. No mining operation was being carried out around the periphery of such nalas and safe distance was maintained. Other than this, Plantation has been done by Forest Department on the stabilized dumps near the nalas, BCCL is also carrying out, first in coal industry, the ecological restoration on dumps thus ensuring that no silt flows down to any of such nalas
26	Active OB dumps near water bodies and rivers should be rehandled for backfilling abandoned mine voids. However, those which have been biologically reclaimed need not be disturbed.	Backfilling is being done. Ecological restoration is in progress as per the roadmap prepared by FRI, Dehradoon.
27	Thick green belt shall be developed along undisturbed areas, mine boundary and in mine reclamation. During post mining stage, a total of 1957.08 ha area would be reclaimed. The total additional area under plantation would be 939.17 ha (green belt of 76 ha, Ext. OB dump 73.07 ha, backfilled area, 300.35 ha, other undisturbed area 489.77 ha) by planting 1878380 plants in 939.19 ha at a total cost Rs 7202.46 lakhs.	Compliance is in progress. Post-Mining stage has still not reached. Mines are active. Plantation is being done at old/dead OB Dumps.
28	The road should be provided with avenue plantation on both side as trees act as sink of carbon and other	It is being developed in a progressive manner. 1320 Gabion plantation has

	pollutant.	been done alongside road on both sides from Shakti Chowk to Mohlidih.
29	Specific mitigative measures identified for the Jharia Coalfields in the Environmental Action Plan prepared for Dhanbad as a critically polluted area and relevant for Cluster V shall be implemented.	Being Complied. Cluster V is implementing the protocol points of Dhanbad Action Plan prepared by JSPCB and BCCL. Dhanbad has come out of the Critically Polluted Areas. Covered trucks are plying on roads. Water sprinkling is being done. Eco-restoration is being carried effectively.
30	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.	Compliance in Progress. A MoU has been entered with NEERI/ICFRE for carrying out such type of studies. The work will start soon by NEERI/ICFRE
31	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 due to dewatering of mine.	Complied. Groundwater is not being used for mining activities. Mine water is being used for industrial purposes (sprinkling on road, firefighting etc.) Mine water
32	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 premonsoon (May), monsoon (August), postmonsoon (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.	Being Complied. Groundwater level and quality is being monitored t by CMPDIL. For installation of Piezometer a tender will soon be floated for award of the work.
33	Mine discharge water shall be treated to meet	The monitoring is being done by

	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.	CMPDIL which is having CSIR laboratory recognized under the EP Rules
34	ETP shall also be provided for workshop and CHP, if any. Effluents shall be treated to confirm to prescribed standards in case discharge into the natural water course	Oil & Grease Trap has been Constructed at Nichitpur Workshop to treat workshop effluents. Another Oil & Grease trap along with settling pond is going to be installed at Tetulmari Workshop.
35	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.	At present only development districts are operational at UG mines in Cluster V and no depillaring district is taken up. However regular monitoring of subsidence will be undertaken on commencement of depillaring districts.
36	Sufficient coal pillars shall be left unextracted 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.
37	High root density tree species shall be selected and planted over areas likely to be affected by subsidence.	Identification of high root density Plant and its plantation in subsidence prone area will be taken-up at the time of depillaring operations.
38	Depression due to subsidence resulting in water accumulating within the low lying areas shall be filled up or drained out by cutting drains.	It shall be complied.
39	Solid barriers shall be left below the roads falling within the blocks to avoid any damage to the roads.	Sufficient barriers are left for saving the surface installation and infra structures as per the statute and DGMS guidelines.
40	No depillaring operation shall be carried out below the township/colony.	It is being complied.
41	The Transportation Plan for conveyor cum–rail for Cluster-V 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 ClusterV should be dovetailed with Jharia Action Plan. The road transpiration of coal during phase–I should be by mechanically covered trucks.	Compliance in progress. Master Plan has been dovetailed with Environment Clearance Conditions. The system is to be installed in 2 nd phase of i.e. after completion of Master Plan (10 years).By that time transportation is being done by covering vehicle with tarpaulin cover. Work for preparation of Transportation plan for conveyor-

		cum-rail has been awarded to CMPDIL.
42	A study should be initiated to analyze extent of reduction in pollution load every year by reducing road transport.	Compliance in progress. CMPDIL has taken up the work for BCCL. Basic Data has been submitted to CMPDI. CMPDI will soon submit the final report of the study
43	R&R of 5835 nos of PAF's involved. They should be rehabilitated at cost of shifting to safe areas at the cost of Rs 104024.9 Lakhs as per the approved Jharia Action Plan.	Compliance in progress. Master Plan for rehabilitation is under implementation.
44	A detailed CSR Action Plan shall be prepared for Cluster V group of mines. Specific activities shall be identified for CSR the budget of Rs. 242.7 Lakhs per year@ Rs 5/T of coal as recurring expenditure. The 265.25 ha of area within Cluster V 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. In addition to afforesting 250.57 ha of are at the postmining stage, the waste land /barren land within Cluster V ML shall be rehabilitated/reclaimed as forest/agricultural land under CSR Plan in consultation with 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 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 A detailed CSR Action Plan shall be prepared for Cluster V group of mines. Specific activities shall be identified for CSR the budget of Rs. 242.7 Lakhs per year@ Rs 5/T of coal as recurring expenditure. The 265.25 ha of area within Cluster V 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. In addition to afforesting 250.57 ha of are at the postmining stage, the waste land /barren land within Cluster V ML shall be rehabilitated/reclaimed as forest/agricultural land under CSR Plan in consultation with local	Being Complied

	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 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	
45	Mine Closure Plan of Cluster –V is in draft stage, the same should be submitted to ministry	It is being complied
46	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: 50000) 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.	Being Complied. CMPDI Ranchi is carrying out the work. The report is also uploaded on company's website.
47	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.	Compliance in Progress. Progressive Mine Closure plan for the collieries is being implemented. Habitat Restoration plan is being prepared by FRI. **Annexure-5(Habitat Restoration Plan)**
48	A separate environmental management cell with suitable qualified personnel shall be setup 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 has been established at the Headquarters. At the area level, one Executive in each area has been nominated as Nodal Officer (Environment). ManagementTrainees/Asst.Manager (Environment) have also been deputed at area level The activities are monitored on regular basis at Area and at Headquarters levels. DGM (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.
49	Implementation of final mine closure plan for Cluster V, subject to obtaining prior approval of the DGMS in regard to mine safety issues	Will be Complied. Final Mine Closure has not yet been reached as the life of mine is still left a Progressive Mine closure plan is being implemented.
50	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 noncompliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.	Complied. Corporate Environment Policy is well formulated and also uploaded on the website. Annexure-9 (CER Report)
B	**General Conditions by MOEF:**	
1	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 complied
2	No change in the calendar plan of production for quantum of mineral coal shall be made.	It is being complied
3	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM10, PM2.5, SO2 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.	Complied. The Environment Monitoring has been done by CIMFR at locations ratified by JSPCB.
4	Data on ambient air quality (PM10, PM 2.5, SO2 and NOx) and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly submitted	Complied. Monitoring is being done by CMPDIL for Ambient air quality (PM10, PM 2.5, SO2 and NOx) and

	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.	heavy metals such as Hg, As, Ni, Cd, Cr. **Annexure-6(Ambient Monitoring Report)**
5	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.	Complied. Personnel operating near HEMMs, drilling machine comply with safety regulation and are equipped with Personal Protective Equipment.
6	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.	Complied. Mine water is being reused in mine for industrial purposes (sprinkling, cooling, fire control etc.) Wastewater is collected and discharged after proper settling / treatment.
7	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.	It is being Complied
8	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	It is being Complied
9	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.	Complied
10	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.	Complied
11	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 has been established at the

		Headquarters. At the area level, one Executive in each area has been nominated as Nodal Officer (Environment). ManagementTrainees/Asst.Manager (Environment) have also been deputed at area level The activities are monitored on regular basis at Area and at Headquarters levels. DGM (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.
12	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.	Complied.
13	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.	Complied.
14	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.	Complied.
15	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,	Complied.

	District Industry Sector and Collector's Office/Tehsildar's Office for 30 days.	
16	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 NOx (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.	Complied.
17	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.	Compliance Report is being submitted regularly on time both in hard copy and in soft copy.
18	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.	Complied
19	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	Complied regularly on time
C	**Other Conditions by MOEF:**	
1	The Ministry or any other Competent Authority may stipulate any further condition(s) for environmental protection.	Complied. Following additional measures as informed by MoEF and JSPCB from time to time
2	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 by PA
3	The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention &	Agreed by PA

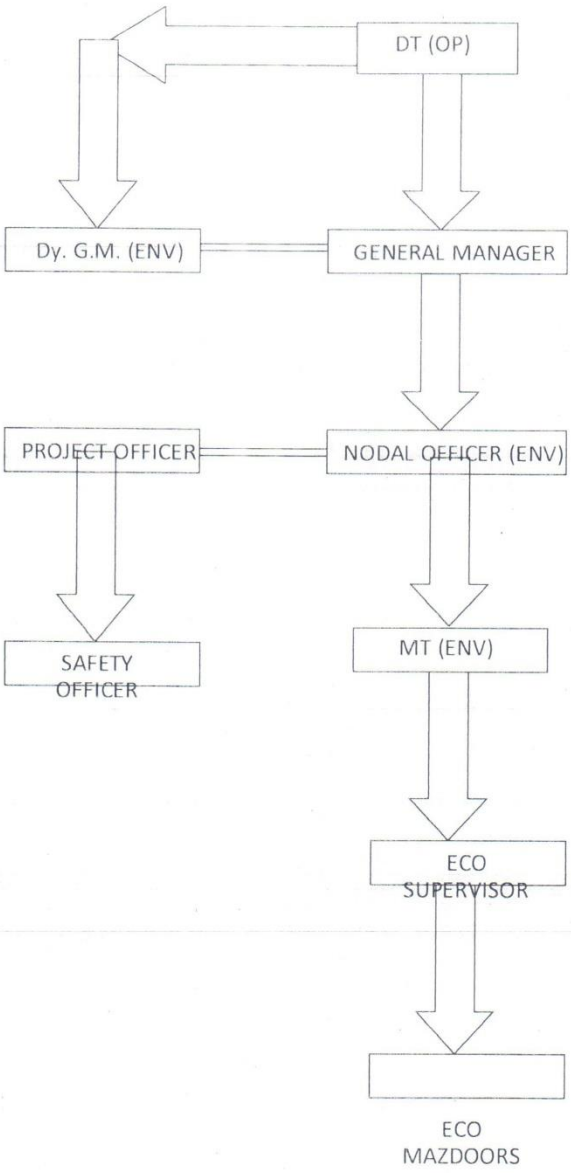
	Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and Rules. The proponent shall ensure to undertake and provide for the costs incurred for taking up remedial measures in case of soil contamination, contamination of groundwater and surface water, and occupational and other diseases due to the mining operations.	
4	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.	Agreed by PA

ANNEXURE-1


Empowering India
Nurturing Nature
Enabling Life
Coal India
Maharatna Company
REHABILITATION & RESETTLEMENT POLICY
OF
COAL INDIA LIMITED 2012

ANNEXURE2

ENVIRONMENTAL MANAGEMENT STRUCTURE OF SIJUA AREA



Rajesh Ranjan

Annexure-3

(7)

BHARAT COKING COAL LIMITED
(A Subsidiary of Coal India Limited)
Office of the HOD (Env.)
Koyla Bhawan : Koyla Nagar
Dhanbad

Ref.No.GM (Env.)/F-JSPCB/2013/ 783 Dated: 06/07/2013

To,
The Regional Officer
Regional Office, JSPCB,
HIG-1, Dhanbad

Sub.: **Fixing up Plans showing monitoring stations/ sampling locations of Air & Noise and Water.**

Dear Sir,

Please find enclosed the plans showing monitoring stations/ sampling locations for compliance of conditions of environmental clearance by the Office of MoEF.

The Plan has been prepared after joint field visits, discussion on the subject matter and further deliberation with Regional Office, Pollution Control Board, Dhanbad.

Submitted for your kind approval.

Received 8/7/13

HOD (Envt.)
BCCL, Dhanbad

Encl:
1. Six copies of Plan showing Sampling Locations of Air & Noise.
2. Six copies of Plan showing Sampling Locations of Water.

Cc:
Member Secretary, JSPCB

(7)

Ph: 0326-2204933

झारखण्ड राज्य प्रदूषण नियंत्रण पर्षद्
Jharkhand State Pollution Control Board
HIG-1, Housing Colony, Dhanbad-826001

Letter No....2650 Dated .....6/7/13.....

From,

Regional Officer,
Dhanbad

To,

HOD (Envt.),
M/s. B.C.C.L.,
Koyla Bhawan, Koyla Nagar,
Dhanbad.

Sub: **Fixing up monitoring station/Sampling location of Air, Water & Noise.**

Sir,

With reference to you letter no. GM(Env.)/F-JSPCB/2013/783, dt. 06.07.2013 We have approved Air, Water & Noise monitoring Station/Sampling location after verification and return a copy of the map.

Encl-A/a.

Your's faithfully,

6/7/13

(Dinesh Prasad Singh)
Regional Officer.

Memo..... Dhanbad, dated.....

Copy to: The Member Secretary, Jharkhand State Pollution Control Board for information & enclose a copy of the map for necessary action.

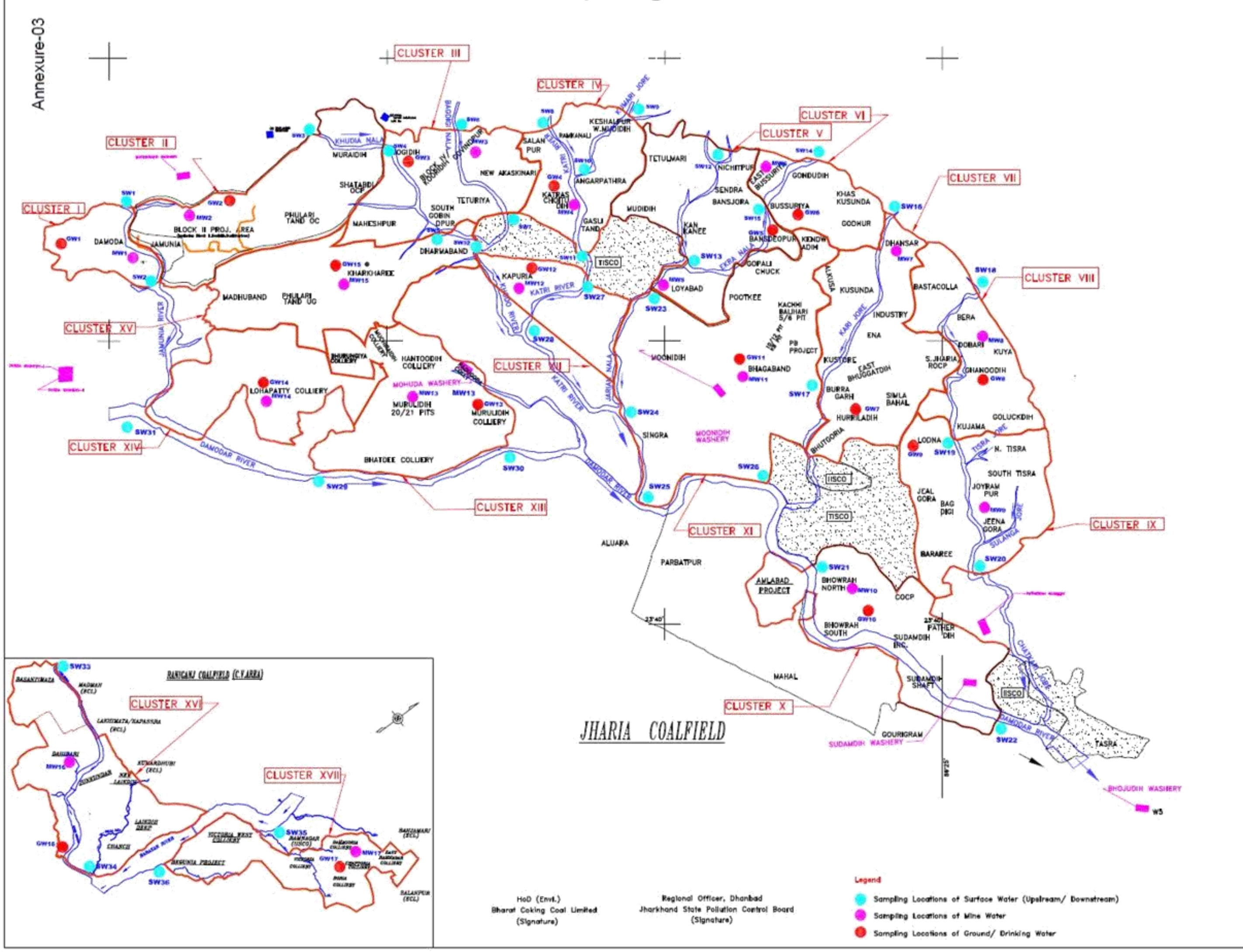
Encl-A/a.

(Dinesh Pd. Singh)
Regional Officer.

Printed by Sandip

Annexure-03

Water Sampling Locations in BCCL



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

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

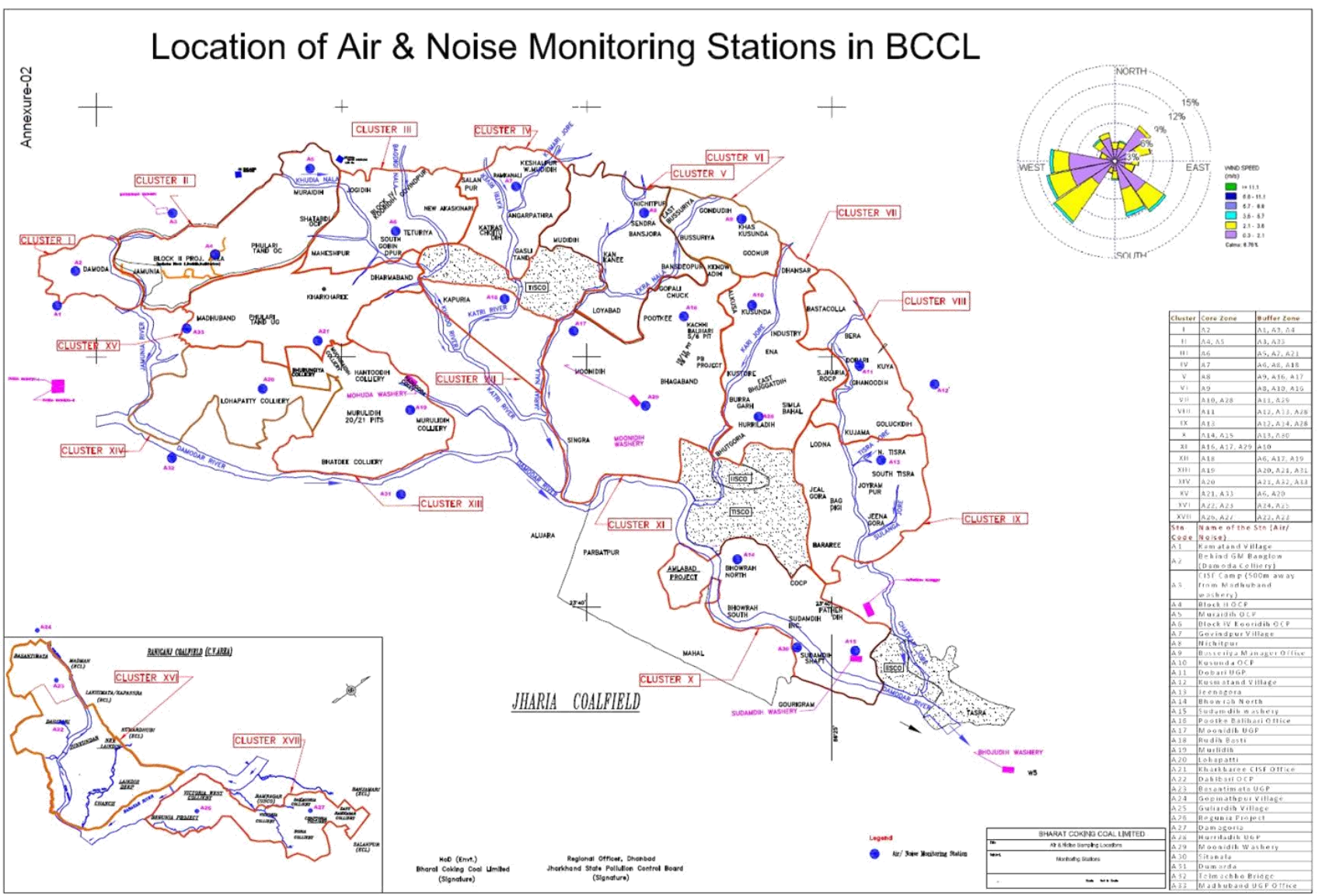
INDEX

Cluster	Surface 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	Bhagabandh UGP	GW11	Bhagabandh
XII	SW27, SW28	Katri River	MW12	Kapuria	GW12	Kapuria
XIII	SW29, SW30	Damodar River	MW13	Muruldih (20/21)	GW13	Murlidih
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	Patlabari Village
XVII	SW35, SW36	Barakar River	MW17	Damagoria Colliery	GW17	Chaptoria

BHARAT COKING COAL LIMITED
WATER SAMPLING LOCATIONS
MONITORING STATIONS

Location of Air & Noise Monitoring Stations in BCCL

Annexure-02



Cluster	Core Zone	Buffer Zone
I	A2	A1, A3, A4
II	A4, A5	A3, A33
III	A6	A5, A7, A21
IV	A7	A6, A8, A18
V	A8	A9, A16, A17
VI	A9	A8, A10, A16
VII	A10, A28	A11, A29
VIII	A11	A12, A13, A28
IX	A13	A12, A14, A28
X	A14, A15	A13, A30
XI	A16, A17, A29	A10
XII	A18	A6, A17, A19
XIII	A19	A20, A24, A31
XIV	A20	A21, A32, A33
XV	A21, A33	A6, A20
XVI	A22, A25	A24, A25
XVII	A26, A27	A22, A27

Stn Code	Name of the Stn (Air/ Noise)
A1	Kamatand Village
A2	Behind GM Banglow (Damoda Colliery)
A3	CISF Camp (500m away from Madhuband washery)
A4	Block II OCP
A5	Muraidih OCP
A6	Block IV Kooridih OCP
A7	Govindpur Village
A8	Nichitpur
A9	Bussuriya Manager Office
A10	Kusunda OCP
A11	Dobari UGP
A12	Kusmatand Village
A13	Jeenagora
A14	Bhowrah North
A15	Sudamdih washery
A16	Pootke Balihari Office
A17	Moonidih UGP
A18	Rudih Basti
A19	Murlidih
A20	Lohapatti
A21	Kharkharee CISF Office
A22	Dahibari OCP
A23	Basantimata UGP
A24	Gopimathpur Village
A25	Guliardih Village
A26	Begunia Project
A27	Damagoria
A28	Hurriladih UGP
A29	Moonidih Washery
A30	Sitanala
A31	Damodia
A32	Telmachho Bridge
A33	Madhuband UGP Office

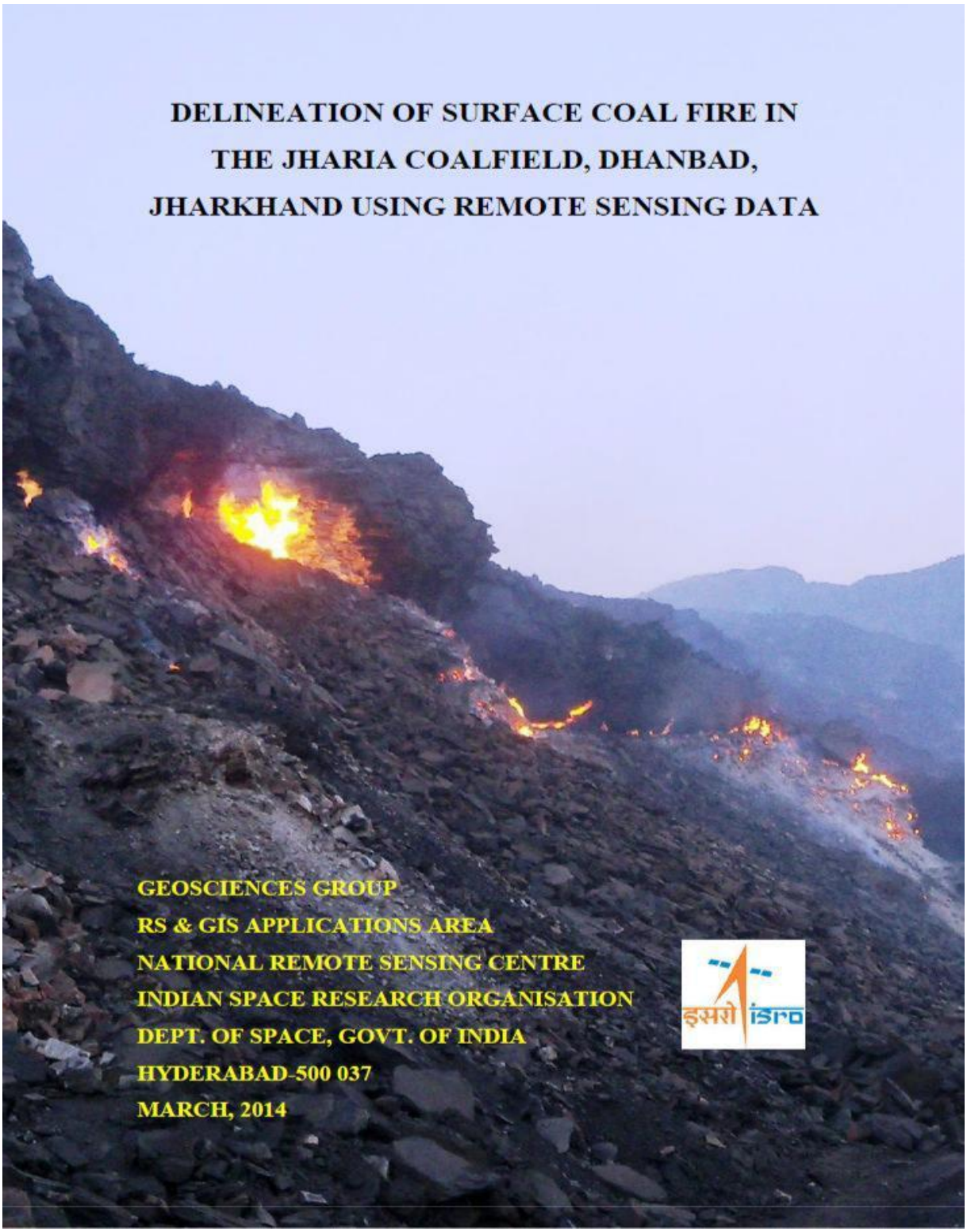
BHARAT COKING COAL LIMITED	
Title	Air & Noise Sampling Locations
Subject	Monitoring Stations
Scale	Not to Scale

Legend: Air/ Noise Monitoring Station

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

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

ANNEXURE-4


DELINEATION OF SURFACE COAL FIRE IN
THE JHARIA COALFIELD, DHANBAD,
JHARKHAND USING REMOTE SENSING DATA
GEOSCIENCES GROUP
RS & GIS APPLICATIONS AREA
NATIONAL REMOTE SENSING CENTRE
INDIAN SPACE RESEARCH ORGANISATION
DEPT. OF SPACE, GOVT. OF INDIA
HYDERABAD-500 037
MARCH, 2014
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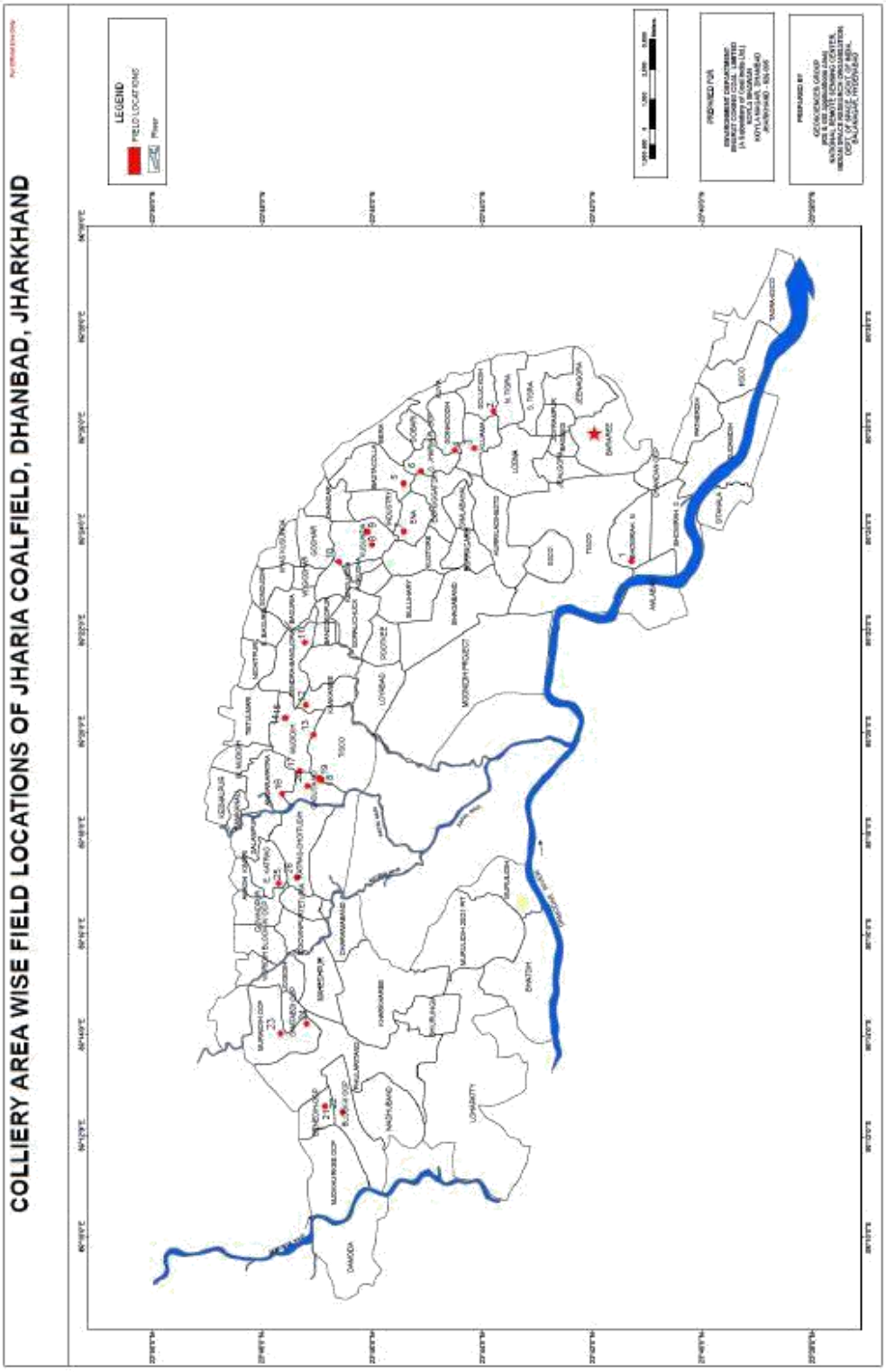

Figure 7: Field locations of coal mine fire shown over colliery area boundary in Jharia coal field, Dhanbad, Jharkhand.

5. There is a decrease in areal extent of the fire (Figure 10) from 2006 to 2012.

Note: *Estimations of fire extent (in terms of sq.km.) both in 2006 and in the present 2012 study are pixel based. They do not represent the actual ground area under fire. These estimations are made for comparative purpose only, to indicate the increase or decrease of areal disposition of fire. Hence, they should not be quoted as fire area on the ground.*

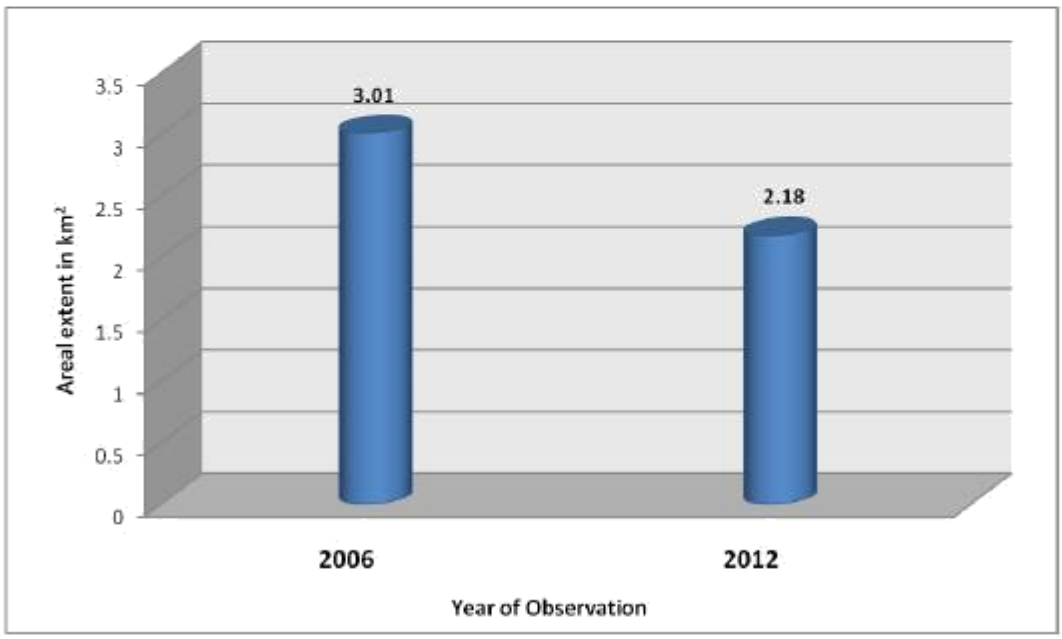

Figure 10: Total fire area statistics

Annexure-5

Road Map for Ecorestoration of BCCL Mine Areas of Dhanbad, Jharkhand

Forest Ecology & Environment Division
Forest Research Institute
Indian Council of Forestry Research & Education
(Ministry of Environment & Forests, Govt. of India)
P.O. New Forest, Dehradun- 248006

Table17. Species Suggested for Plantation in Recreation Park

Sl.No.	Species	Family	Vernacular Name
1.	*Acacia farnesiana*	Mimosaceae	Fragrant acacia
2.	*Bamboosa striata*	Poaceae	Strip Bamboo
3.	*Bauhinia purpurea*	Caesalpiniaceae	Kachnar (purple)
4.	*Bauhinia variegata*	Caesalpiniaceae	Kachnar (white)
5.	*Butea monosperma*	Fabaceae	Plash
6.	*Callistemon viminalis*	Myrtaceae	Bottle brush
7.	*Cassia fistula*	Caesalpiniaceae	Amaltash
8.	*Cynodon dactylon*	Poaceae	Doob Grass
9.	*Delonix regia*	Caesalpiniaceae	Gulmohar
10.	*Dodonaea viscosa*	Sapindaceae	Vilayati Menhadi
11.	*Duranta goldiana*	Verbenaceae	Duranta
12.	*Ficus benghalensis*	Moraceae	Bargad
13.	*Grevilea robusta*	Proteaceae	Bulbul
14.	*Hibiscus rosa - sinensis*	Malvaceae	Gudhal
15	*Mussaenda erythrophylla*	Rubiaceae	Dhoby Bush
16.	*Nerium indicum*	Apocynaceae	Red Kaner
17.	*Nyctanthes arbortris - tis*	Oleaceae	Harsingar
18.	*Plumeria rubra*	Magnoliaceae	Temple tree
19.	*Putranjiva roxburghii*	Putranjivaceae	Putranjiva
20.	*Thespesia populnea*	Malvaceae	Bhendi Pipal
21.	*Thevetia peruviana*	Apocynaceae	Pili kaner

Enrichment Planting in the Fringe Forest Areas.

A large chunk of land on the fringe areas is degraded either due to the various operations in the mining areas or because of biotic interference by local villagers. These areas need to be planted to enrich the density and diversity of the forests.

Discussion with local people and looking into the site conditions,particularly soil and moisture,a number of species have been selected that will not only improve the forest density but will also provide locals with different fruit,fodder and other benefits(Table18).

Degraded Forests /village Areas

Table 18. Species for Degraded Forests /Village Areas

Species	Vernacular Name	Family	Requirement of Seeds gm./ha.
Trees			
Artocarpus heterophyllus Lam. Syn.	Kathal	Moraceae	250
Bauhinia retusa Roxb.	Semla	Caesalpiniaceae	100
Bauhinia variegata Linn.	Kachanr	Caesalpiniaceae	100
Cassia fistula Linn.	Sonari gach, Amaltas	Caesalpiniaceae	200.
Madhuca indica J.F Gmel.	Mahua	Sapotaceae	200
Mangifera indica Linn.	Aam	Anacardiaceae	500
Pithecellobium dulce Benth.	Jangle-jalebi, Vilayati imli	Mimosaceae	100
Pongamia pinnata Linn.	Karanja	Fabaceae	100
Schleichera oleosa (Lour.) Oken. Syn.	Kusum	Sapindaceae	100
Spondias pinnata Linn.	Amra	Anacardiaceae	200
Shrubs			
Alangium salvifolium (Linn. F.) Wang. Syn	Ankul	Alangiaceae	500
Dodonaea viscosa (Linn.) Jacq.	Sinatha, Mehndi.	Sapindaceae	1000
Murraya koenigii Linn.	Mitha Sur	Rutaceae	500

Table 22. Financial Outlay of Mine Spoil Stabilization

S. No.	Mine spoil stabilization Measures	(Cost in Rs. /ha)*
1	Contour Trenching	8,000
2	Steep mined out slopes	15,000
3	**Geotextiles covered area (80 degree slope)	15,000
4	Gully plugging	10,000
5	Flat area (Waste land nearby village area)	8,000
6	Average Cost/ha	11,200

*Includes Cost of labour, Cost of seed, Seed dispersal ,
**Excuding Cost of geotextiles Rupees 50,000/ha

Restoration/afforestation has to be taken in two phase starting from 2011 planting season. In the first phase 100 hectare area is recommended for greening ,during Phase II 126 hectare area may be worked with.Details of area that would be available for restoration in different mines under BCCL is detailed in Table 23.

Table 23 area Available for Restoration During Next Five Years.

Sl.No.	Area of BCCL	Area available for Restoration (in ha)	Remarks
1.	Barora Area	25 ha	
2.	Bastacolla Area	38 ha	
3.	Block-II Area	32 ha	
4.	Chanch Victoria Area	8 ha	
5.	Eastern Jharia Area	22 ha	
6.	Govindpur Area	15 ha	
7.	Katras Area	22 ha	Fit for Bamboo plantation
8.	Kuslore Area	15 ha	
9.	Kusunda Area	20 ha	
10.	Lodna Area	15 ha	
11.	Sijua Area	10 ha	
12.	Western Jharia Area	2 ha	
13.	Western Washery Zone	2 ha	
	Total	226 ha	

Phase I	Average cost of ecorestoration/ afforestation /ha	Rs. 11,200 -
	Total cost of ecorestoration /afforestation/100 ha	Rs.11.20 lakhs
Phase II	Total cost of ecorestoration /afforestation/126 ha	Rs.14,11,200
	Say	Rs.14.12 lakhs

Funding Mechanism

Substantial investment has to be provided by BCCL in terms of manpower and money for successful implementation of the project.

Execution Schedule

The total project needs to be implemented in two phases over a period of ten years.

Phase I 2011-16 Development of a model restoration plantation at one of the BCCL site by FRI, Dehradun on ten hectares of overburden dumps. Ninety hectares of the area to be restored by BCCL in their three mining sites based on this road map.

Phase II 2016-2021 Replication/expansion of proposed restoration models in the 126 hectares area spread over 13 mines of BCCL.

Annexure-6

Environment Monitoring Report

Table 3: Ambient Air Quality in Cluster V Mine Area

(Monitoring Period : January 2014 to March 2014)

Location	Longitude & Latitude	Period/Date of Sampling	Parameters (ug m^3)			
			$PM_{2.5}$	PM_{10}	SO_2	NO_x
Core Zone						
Mine Office, Nichitpur (A-8)	23°48'20" N 86°21'12"E	10/01/2014	142.7	215.9	31.3	57.7
		24/01/2014	89.5	165.0	24.6	47.2
		07/02/2014	114.6	186.8	36.1	73.6
		19/02/2014	96.9	196.9	28.4	62.7
		11/03/2014	103.1	154.0	21.1	22.7
		24/03/2014	98.5	193.6	28.0	43.5
Buffer Zone						
Manager's Office, Bassuriya (A-9)	23°47'17" N 86°22'12" E	15/01/2014	103.5	161.5	22.2	64.6
		27/01/2014	118.1	175.4	24.3	36.2
		13/02/2014	114.1	165.8	27.1	43.9
		24/02/2014	101.2	158.0	24.3	57.1
		12/03/2014	103.6	139.0	21.3	23.4
		26/03/2014	50.0	114.6	24.9	39.8
GM Office, PB Area, Putkee (A-16)	23°45'18" N 86°21'46" E	07/01/2014	64.9	107.7	25.0	26.3
		21/01/2014	75.2	137.0	23.0	31.1
		05/02/2014	86.0	127.0	25.2	32.4
		20/02/2014	68.7	131.7	22.8	43.5
Mine Office, Moonidih U/G (A-17)	23°44'34" N 86°20'59" E	21/01/2014	85.7	170.9	18.0	24.0
		14/02/2014	74.3	108.2	24.8	22.7
		25/02/2014	97.0	146.0	24.0	37.3

The air quality data has been monitored at three sites - (i) Bassuriya (A-9), (ii) PB Project (A-16) and (iii) Moonidih (A-17) in the buffer zone.

Table 5: Physico-chemical Characteristics of Surface Water in Cluster-V Mining Area

S.N.	Parameter and Units	SW-12 (Jarian Nala)	SW-13 (Ekra Nala)	SW-15 (Ekra Nala)	Inland Surface water IS:2296
1.	Odour	Agreeable	Agreeable	Agreeable	Agreeable
2.	DO (mg/L)	5.32	4.33	4.42	4
3.	pH	7.81	6.97	7.58	6.5-8.5
4.	Iron (as Fe), mg/l, Max	0.002	1.012	1.355	50
5.	Chloride (as Cl), mg/l, Max	38.5	26.3	28.1	600
6.	BOD (3days at 27°C), mg/l, Max	2.1	2.7	2.8	3
7.	Total Dissolved Solid, mg/l, Max	335	712	588	1500
8.	Copper (as Cu), mg/l, Max	0.003	0.005	0.002	1.5
9.	Sulphates (as SO_4^{--}), mg/l, Max	119.1	415.2	316.0	400
10.	Nitrate (as NO_3), mg/l, Max	3.58	17.11	1.64	50
11.	Fluorides (as F), mg/l, Max	0.82	0.77	1.27	1.5
12.	Selenium (as Se), mg/l, Max	<0.001	<0.001	<0.001	0.05
13.	Arsenic (as AS), mg/l, Max	<0.001	<0.001	<0.001	0.2
14.	Lead (as Pb), mg/l, Max	<0.001	<0.001	<0.001	0.1
15.	Zinc (as Zn), mg/l, Max	0.001	0.009	0.006	15
16.	Hexavalent Chromium (as Cr^{6+}), mg/l, Max	<0.001	<0.001	<0.001	0.05
17.	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.001	<0.001	<0.001	0.005
Date of Sampling		13.01.2014	16.01.2014	15.01.2014	

Table 6: Physico-chemical Characteristics of Groundwater in Cluster-V Mining Area

S.N.	Parameters	Station Code	Drinking water IS: 10500 (2012)	
		GW-5 (Hand Pump), Nichitpur New Colony)	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source
1.	Colour, Hazen units	<1	5	15
2.	Odour	Agreeable	Agreeable	Agreeable
3.	Taste	Agreeable	Agreeable	Agreeable
4.	Turbidity, NTU Max	1.68	1	5
5.	pH	7.75	6.5-8.5	No relaxation
6.	Alkalinity as $CaCO_3$, mg/l, Max	190	200	600
7.	Total Hardness as $CaCO_3$ (mg/l)	245	200	600
8.	Iron (as Fe) mg/l, Max	1.267	0.3	No relaxation
9.	Chlorides (as Cl) mg/l, Max	13.0	250	1000
10	Free Residual Chlorine, mg/l, Min	0.08	0.2	1.0
11	Total Dissolved Solids mg/l, Max	590	500	2000
12	Calcium (as Ca), mg/l, Max	37.3	75	200
13	Copper (as Cu), mg/l, Max	<0.001	0.05	1.5
14	Manganese (as Mn), mg/l, Max	<0.001	0.1	0.3
15	Sulphate (as SO_4) mg/l, Max	215.6	200	400
16	Nitrate (as NO_3), mg/l, Max	1.74	45	No relaxation
17.	Fluoride (as F), mg/l, Max	0.83	1.0	1.5
18.	Selenium(as Se), mg/l, Max	<0.001	0.01	No relaxation
19	Arsenic (as As), mg/l, Max	<0.001	0.05	No relaxation
20	Lead (As Pb), mg/l, Max	<0.001	0.01	No relaxation
21	Zinc (as Zn) mg/l, Max	0.015	5	15
22	Chromium as Cr^{+6} (mg/l)	<0.001	0.05	No relaxation
23	MPN of Coliform in 100 ml	Nil	Nil	No relaxation
24	Boron (as B), mg/l, Max	<0.001	0.5	1.0
25.	Phenolic Compounds (as C_6H_5OH) mg/l, Max	<0.001	0.001	0.002
	Date of Sampling	16.01.2014		

Table 7: Physico-chemical Characteristics of Mine Effluent Water in Cluster-V Mining Area

S.N.	Parameter	MW-5 (Mudidih U/G Mine Water	Effluent water IS:2490
1.	Colour, Hazen units	1.0	
2.	Odour	Unobjectionable	Unobjectionable
3.	Total Suspended Solids mg/l, max.	48.8	100
4.	pH value	7.95	5.5 to 9.0
5.	Temperature ^{0}C	26.2	Shall not exceed 5°C above the receiving water temperature
6.	Oil and grease, mg/l max.	5.25	10
7.	Total residual chlorine, mg/l max.	0.61	1.0
8.	Ammonical nitrogen (as N), mg/l max.	5.58	50
9.	Kjeldahl nitrogen (as N), mg/l max.	10.4	100
10.	Free ammonia (as NH_3), mg/l max.	2.68	5.0
11.	Biochemical oxygen demand, BOD (3 days at 27°C), mg/l max.	3.54	30
12.	Chemical Oxygen Demand (COD), mg/l max.	72.4	250
13.	Arsenic (as As), mg/l max.	0.001	0.2
14.	Lead (as Pb), mg/l max.	0.001	0.1
15.	Hexavalent chromium (as Cr^{+6}), mg/l max.	0.001	0.1
16.	Total chromium (as Cr), mg/l max.	0.001	2.0
17.	Copper (as Cu), mg/l max.	0.001	3.0
18.	Zinc (as Zn), mg/l max.	0.156	5.0
19.	Selenium (as Se), mg/l max.	0.001	0.05
20.	Nickel (as Ni), mg/l max.	0.002	3.0
21.	Fluoride (as F), mg/l max.	0.55	2.0
22.	Total Dissolved Solids mg/l max.	768	2100
23.	Sulphide (as S), mg/l max.	0.95	2.0
24.	Phenolic compounds (as C_6H_5OH), mg/l max.	0.001	1.0
25.	Manganese (as Mn), mg/l max.	0.001	2
26.	Iron (as Fe), mg/l max.	0.430	3
27.	Nitrate Nitrogen, mg/l max.	6.86	10
	Date of Sampling	27.02.2014	

Table 8.1: Mine Effluent Water of Mudidih U/G, Cluster-V Mining Area

Area: Core Zone		Area	Date of Sampling
MW-5: Mine Effluent Water, Mudidih UGP		Cluster: V	19.01.2014
S.N.	Parameter	MW-5	Effluent water IS:2490
1	pH value	7.33	5.5 to 9.0
2	COD, mg/l max.	60.2	250
3	Total Suspended Solids, mg/l, max.	43.9	100
4	Oil and grease, mg/l max.	5.78	10

Table 8.2: Mine Effluent Water of Mudidih UGP, Cluster-V Mining Area

Area: Core Zone		Area	Date of Sampling
MW-5: Mine Effluent Water, Mudidih UGP		Cluster: V	27.01.2014
S.N.	Parameter	MW-5	Effluent water IS:2490
1.	pH value	7.65	5.5 to 9.0
2.	COD, mg/l max.	65.4	250
3.	Total Suspended Solids, mg/l, max.	36.22	100
4.	Oil and grease, mg/l max.	6.75	10

Table 8.3: Mine Effluent Water of Mudidih UGP, Cluster-V Mining Area

Area: Core Zone		Area	Date of Sampling
MW-5: Mine Effluent Water, Mudidih UGP		Cluster: V	07.02.2014
S.N.	Parameter	MW-5	Effluent water IS:2490
1.	pH value	7.43	5.5 to 9.0
2.	COD, mg/l max.	68.2	250
3.	Total Suspended Solids, mg/l, max.	42.3	100
4.	Oil and grease, mg/l max.	6.2	10

Table 11: Noise Level in the Study Area

Stn. Code	Monitoring Location	Latitude	Longitude	Date of Sampling	Noise level dB(A) average	
					Day Time	Night Time
Core Zone						
N_5	Mine Office, Nichitpur	23°48'20" N	86°21'30" E	10/01/2014	59.8	45.5
				24/01/2014	56.4	46.5
				07/02/2014	62.3	46.6
				19/02/2014	61.5	46.9
				11/03/2014	61.6	49.8
				24/03/2014	58.7	48.1
Standards as per CPCB					75	70
Buffer Zone						
N_6	Manager's Office, Bassuriya	23°47'17" N	86°22'12" E	15/01/2014	60.6	45.8
				27/01/2014	61.4	45.3
				13/02/2014	61.2	46.3
				24/02/2014	58.9	47.8
				12/03/2014	59.7	48.3
				26/03/2014	62.5	46.8
N_{15}	GM Office, PB Area	23°45'18" N	86°21'46" E	07/01/2014	53.4	41.5
				22/01/2014	51.8	43.8
				05/02/2014	52.6	44.1
				20/02/2014	54.1	45.2
N_{17}	Mine Office, Moonidih U/G Mine	23°44'34" N	86°20'59" E	22/01/2014	54.6	44.8
				14/02/2014	58.4	44.8
				25/02/2014	58.7	46.2
Standards as per CPCB					75	70

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

(FOR THE Q.E. MARCH, 2016)

E. C. no. J-11015/01/2011-IA.II (M) dated 11.02.2013.

June, 2016

CMPDI
ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

CLUSTER - V

(FOR THE Q.E. March, 2016)

CONTENTS

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ENVIRONMENTAL MONITORING REPORT OF BHARAT COKING COAL LIMITED CLUSTER – V

(FOR THE Q.E. MARCH, 2016)

E. C. no. J-11015/01/2011-IA.II (M) dated 11.02.2013.

June, 2016

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 Jharia Coalfield (JCF) is a part of Gondwana Coalfields located in Dhanbad district of Jharkhand, the JCF is bounded by $23^0$37' N to $23^0$52' N latitudes and $86^0$09' E to $86^0$30' E longitude occupying an area of 450 Sq.km. BCCL has awarded Environmental monitoring work of Jharia Coalfield (JCF) to Central Mine Planning & Design Institute Limited (CMPDIL). The environmental monitoring has been carried out as per the conditions laid down by the MoEFCC 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 MoEFCC, 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 mitigating measures. The noise levels were recorded in mining area, washray 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 analysed 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 analysed for four parameters on fortnightly basis. Effluent samples were also analysed for all parameters on half-yearly basis. The drinking and Surface water samples were collected and analysed for all parameters on quarterly basis. Thereafter the samples were preserved and analysed 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 MoEFCC 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 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 MoEFCC 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 MoEFCC 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 (MoEFCC) ,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 Jharia Coalfield (JCF). The Jharia Coalfield (JCF) having an area of 450 Sq.KM.

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-V is in the Northern part of the Jharia coalfield. It includes a group of 7 Mines (viz. Nichitpur, OCP, Mudidih colliery (Mixed), Tetulmari colliery (Mixed), Sendra Bansjora colliery (Mixed), Kankanee colliery (Mixed), Bansdeopur colliery (Mixed) and Loyabad colliery. The Cluster – V is situated about 25 - 30 kms from Dhanbad Railway Station. The mines of this Cluster – V 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 Jarian Nala and Ekra Nala.

1.2 The Cluster-V is designed to produce 4.854 MTPA (normative) and 6.311 MTPA (peak) capacity of coal. The average grade of coal W – III & W- IV.

The Project has Environmental Clearance from Ministry of Environment, Forest and Climate Change (MoEFCC) for a rated capacity 4.854 MTPA (normative) and 6.311 MTPA (peak) capacity of coal production vide letter no. J-11015/01/2010-IA.II (M) dated 11th 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 MoEFCC & 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) Nichitpur (A8): Industrial Area

The location of the sampling station is 23^0 48'20" N 86^0 21'30" E. The sampler was placed at roof top at Safety office of Nichitpur. The station was selected to represent the impact of mining activities of Sijua area, poor roads condition, heavy public traffic, burning of coal by the surrounding habitants.

II. BUFFER ZONE Monitoring Location

i) Basseriya Managers Office (A9) : industrial area

The location of the sampling station is 23^0 47'17" N & 86^0 22'12" E. The sampler was placed at Ground level of Safety Office.

ii) Pootki Balihari Office (A16): **Industrial Area**

The location of the sampling station is 23^o40.977' N 086^{o}23.963'E. The sampler was placed at Ground level of Project Office.

iii) Moonidih UGP (A17): Industrial Area

The location of the sampling station is 23^0 39'32" N & 86^0 26'13" E. The sampler was placed at ground level of project office.

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 analysed 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 72 to 94 µ/m^3
In **buffer zone** in **Industrial area** varies from 66 to 98 µ/m^3

Particulate Matter $PM_{2.5}$

In **core zone** under **Industrial area** varies from 31 to 46 µ/m^3
In **buffer zone** in **Industrial area** varies from 32 to 48 µ/m^3

Sulphur Dioxide:

In **core zone** under **Industrial area** varies from 10 to 13 µ/m^3
In **buffer zone** in **Industrial area** varies from 10 to 12 µ/m^3

Oxides of Nitrogen:

In **core zone** under **Industrial area** varies from 20 to 27 µ/m^3
In **buffer zone** in **Industrial area** varies from 18 to 28 µ/m^3

AMBIENT AIR QUALITY DATA

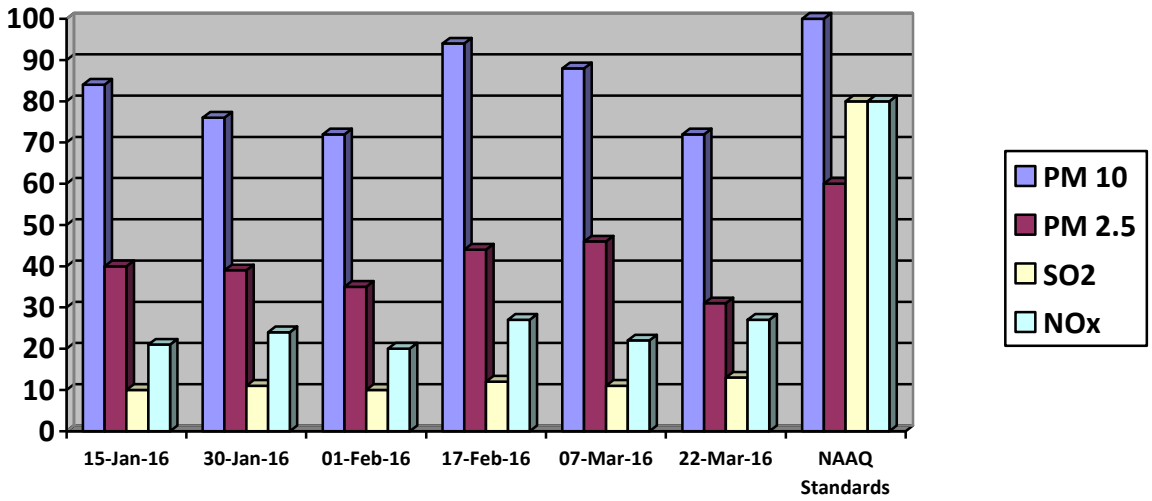
Name of the Company: **Bharat Coking Coal limited** Year : **2015-16.**
Name of the Cluster : **Cluster – V** Q.E.: **March 2016**

Station Code/Name: (a) A8 Nichitpur **Category: Industrial.**

ZONE: Core

- **(b). Station Code/Name: A8 – Nichitpur, Category: Industrial[1].**

Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_X
1	15 - Jan -16	84	40	<10.0	21
2	30 - Jan - 16	76	39	11	24
3	01 - Feb -16	72	35	<10.0	20
4	17 - Feb - 16	94	44	12	27
5	07 - Mar - 16	88	46	11	22
6	22 - Mar - 16	72	31	13	27
	NAAQ Standards	100	60	80	80



Trace Metal analysis report of Ambient Air Quality

Parameters	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Mercury (Hg)	Nickel (Ni)	Lead (Pb)
Concentration($\mu g/m^3$)	<0.005	<0.001	<0.01	<0.001	<0.01	<0.005

Note:

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

[1] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed……  …….Dated 28.05.2016. Job No. 110310

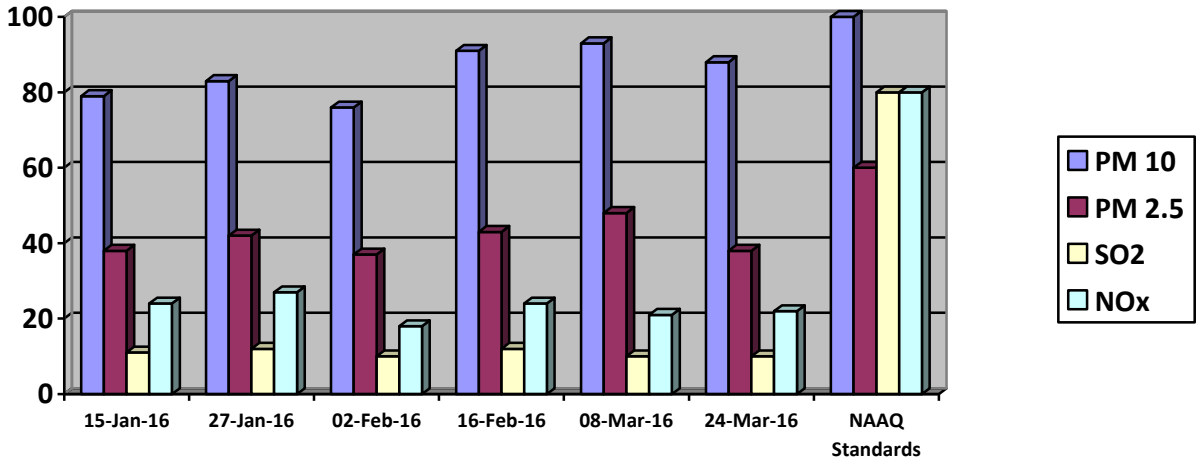
AMBIENT AIR QUALITY DATA

Name of the Company: **Bharat Coking Coal limited** Year : **2015-16.**
Name of the Cluster : **Cluster – V** Q.E.: **March 2016**

Station Code/Name: (a) A9 Baseriya Managers Office **Category:**
(b) A16 Pootki Balihari Office **Industrial.**
(c) A17 Moonidih UGP
ZONE: BUFFER

(a). Station Code/Name: A9 – Baseriya Managers Office, Category: Industrial[2].

Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_x
1	15 - Jan -16	79	38	11	24
2	27 - Jan - 16	83	42	12	27
3	02 - Feb -16	76	37	<10.0	18
4	16 - Feb - 16	91	43	12	24
5	08 - Mar - 16	93	48	<10.0	21
6	24 - Mar - 16	88	38	<10.0	22
	NAAQ Standards	100	60	80	80



Trace Metal analysis report of Ambient Air Quality

Parameters	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Mercury (Hg)	Nickel (Ni)	Lead (Pb)
Concentration($\mu g/m^3$)	<0.005	<0.001	<0.01	<0.001	<0.01	<0.005

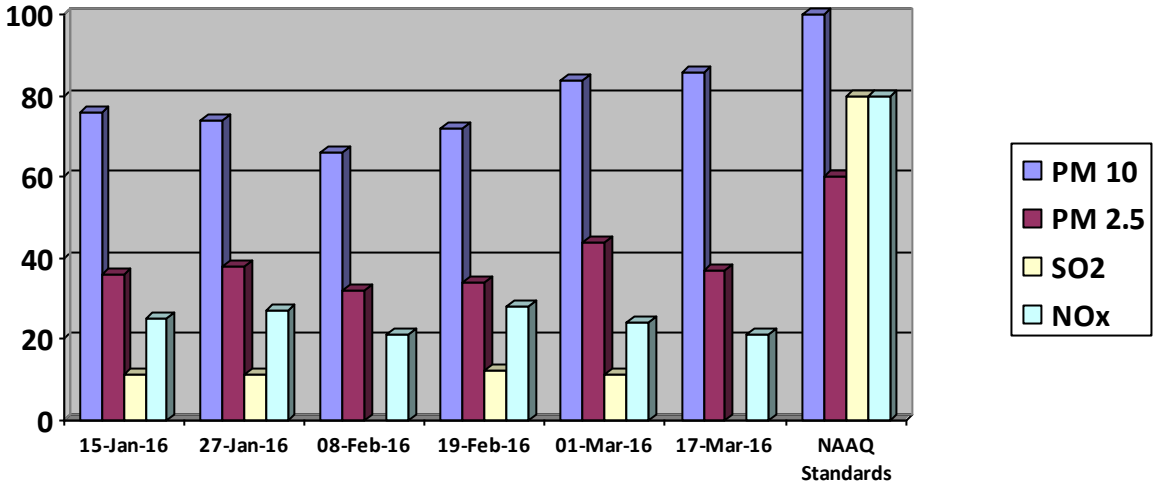
Note:

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

[2] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed……  …….Dated 28.05.2016. Job No. 110310

(b). Station Code/Name: A16 – Pootki Balihari Office, Category: Industrial[3].

Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_X
1	15 - Jan -16	76	36	11	25
2	27 - Jan - 16	74	38	11	27
3	08 - Feb -16	66	32	<10.0	21
4	19 - Feb - 16	72	34	12	28
5	01 - Mar - 16	84	44	11	24
6	17 - Mar - 16	86	37	<10.0	21
	NAAQ Standards	100	60	80	80



Trace Metal analysis report of Ambient Air Quality

Parameters	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Mercury (Hg)	Nickel (Ni)	Lead (Pb)
Concentration($\mu g/m^3$)	<0.005	<0.001	<0.01	<0.001	<0.01	<0.005

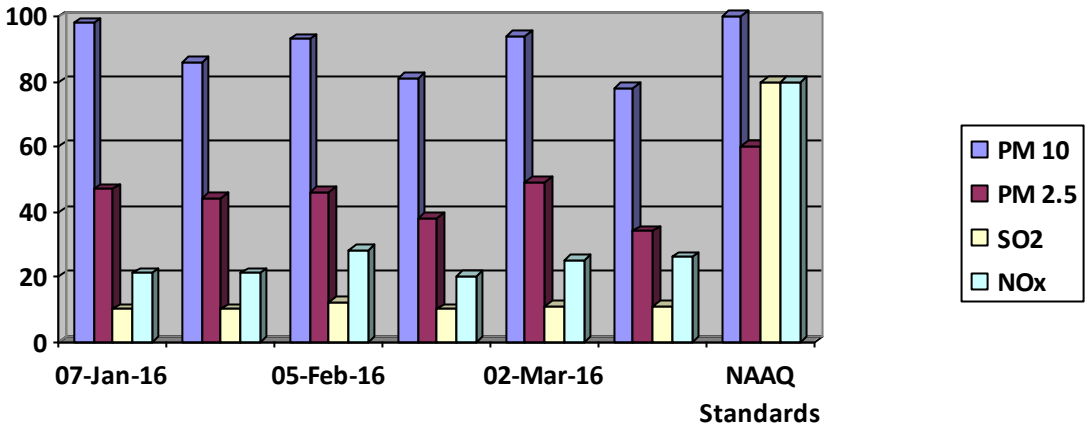
Note:

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

[3] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed……  …….Dated 28.05.2016. Job No. 110310

(c). Station Code/Name: A17 – Moonidih UGP, Category: Industrial[4].

Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_X
1	07 - Jan -16	98	47	<10.0	21
2	22 - Jan - 16	86	44	<10.0	21
3	05 - Feb -16	93	46	12	28
4	26 - Feb - 16	81	38	<10.0	20
5	02 - Mar - 16	94	49	11	25
6	18 - Mar - 16	78	34	11	26
	NAAQ Standards	100	60	80	80



Trace Metal analysis report of Ambient Air Quality

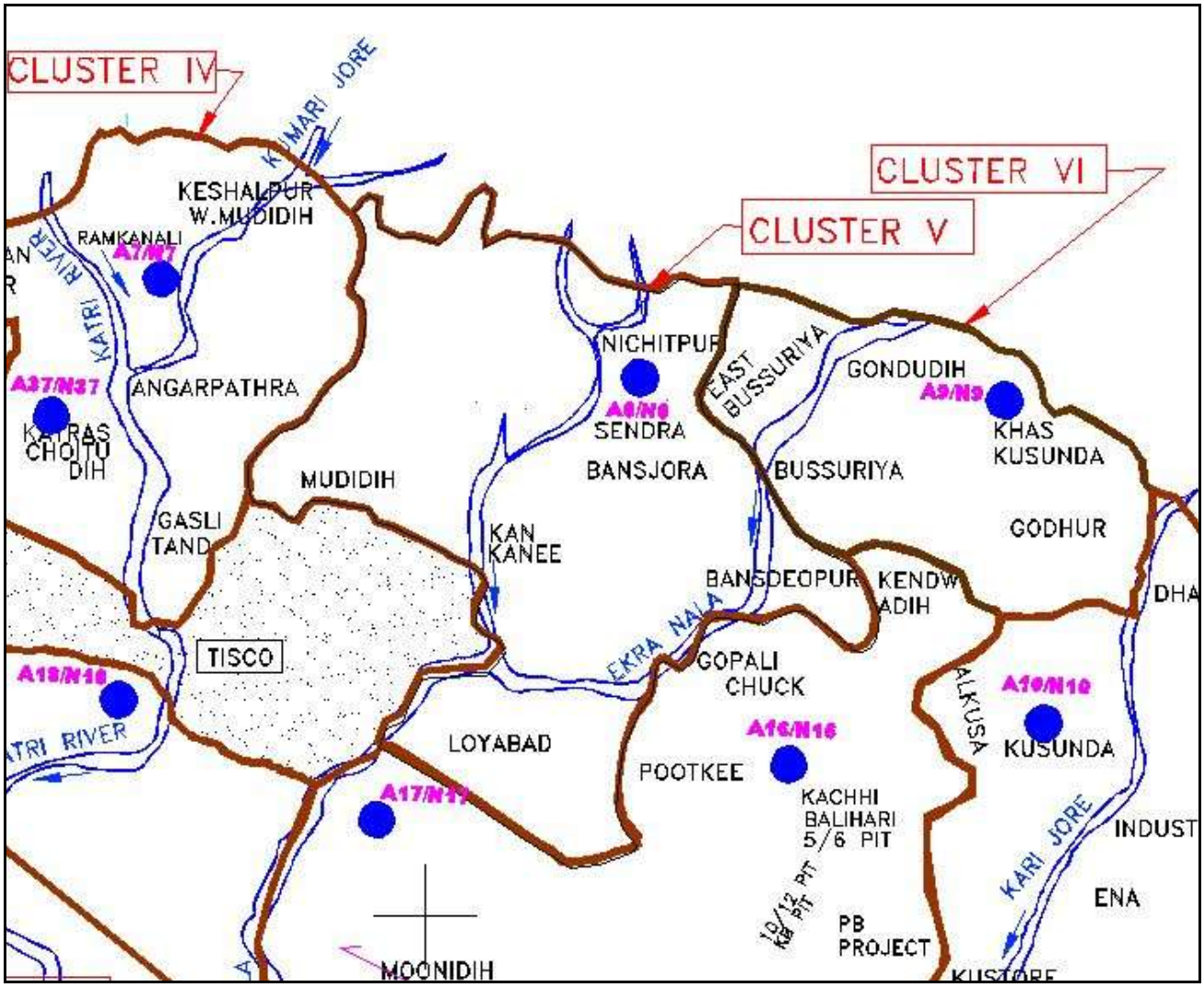
Parameters	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Mercury (Hg)	Nickel (Ni)	Lead (Pb)
Concentration($\mu g/m^3$)	<0.005	<0.001	<0.01	<0.001	<0.01	<0.005

Note:

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

[4] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed……  …….Dated 28.05.2016. Job No. 110310

Fig I: Ambient Air Monitoring Stations in Cluster-V in Core & Buffer Zones



Ambient Air Quality Standards for Jharia 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/m^3	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogendioxide (NO_2), µg/m^3	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/m^3	Annual * 24 Hours **	60 100	60 100	-Gravimetric -TEOM -Beta attenuation
Particulate Matter (Size less than 2.5µm) or $PM_{2.5}$, µg/m^3	Annual * 24 Hours **	40 60	40 60	-Gravimetric -TEOM -Beta attenuation
Ozone (O_3) , µg/m^3	8 Hours * 1 Hour **	100 180	100 180	-UV Photometric -Chemiluminescence -Chemical Method
Lead (Pb) , µg/m^3	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/m^3	8 Hours ** 1 Hour **	02 04	02 04	-Non dispersive Infrared (NDIR) Spectroscopy
Ammonia (NH_3), µg/m^3	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C_6H_6), µg/m^3	Annual *	05	05	-Gas Chromatography (GC) based continuous analyzer -Adsorption and desorption followed by GC analysis
Benzo(a)Pyrene (BaP) Particulate phase only, ng/m^3	Annual *	01	01	-Solvent extraction followed byHPLC/GC analysis
Arsenic (As), ng/m^3	Annual *	06	06	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel (Ni), ng/m^3	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 Mudidih (MW5)**

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

ii) **Nichitpur (DW5)**

iii) **U/S of Jarian Nala (SW12)**

iv) **U/S of Ekra Nala (SW15)**

v) **D/S of Ekra Nala & Jarian Nala (SW13)**

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. Effluent samples were also analysed for 27 parameters on half-yearly 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 : **2015-16.**

Name of the Cluster: **Cluster - V**

Month: **January, 2016.**

Name of the Stations & Code :

1. MW5- Mine Discharge of Mudidih

First Fortnight

Sl. No.	Parameters	MW5 (Mine Discharge) 01.01.2016	As per MOEF General Standards for schedule VI
1	Total Suspended Solids	42	*100 (Max)*
2	pH	7.36	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	28	*250 (Max)*

Second Fortnight

Sl. No.	Parameters	MW5 (Mine Discharge) 25.01.2016	As per MOEF General Standards for schedule VI
1	Total Suspended Solids	72	*100 (Max)*
2	pH	7.52	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	44	*250 (Max)*

All values are expressed in mg/lit unless specified.

Analysed By

18/5/16

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 : **2015-16.**

Name of the Cluster: **Cluster - V**

Month: **February, 2016.**

Name of the Stations & Code : **1. MW5- Mine Discharge of Mudidih**

First Fortnight

Sl. No.	Parameters	MW5 (Mine Discharge) 10.02.2016	As per MOEF General Standards for schedule VI
1	Total Suspended Solids	76	*100 (Max)*
2	pH	7.47	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	44	*250 (Max)*

Second Fortnight

Sl. No.	Parameters	MW5 (Mine Discharge) 27.02.2016	As per MOEF General Standards for schedule VI
1	Total Suspended Solids	62	*100 (Max)*
2	pH	7.59	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	36	*250 (Max)*

All values are expressed in mg/lit unless specified.

Analysed By

18/5/16

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 : **2015-16.**

Name of the Cluster: **Cluster - V**

Month: **March, 2016.**

Name of the Stations & Code :

1. MW5- Mine Discharge of Mudidih

First Fortnight

Sl. No.	Parameters	MW5 (Mine Discharge) 08.03.2016	As per MOEF General Standards for schedule VI
1	Total Suspended Solids	32	*100 (Max)*
2	pH	7.06	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	20	*250 (Max)*

Second Fortnight

Sl. No.	Parameters	MW5 (Mine Discharge) 16.03.2016	As per MOEF General Standards for schedule VI
1	Total Suspended Solids	34	*100 (Max)*
2	pH	8.38	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	28	*250 (Max)*

All values are expressed in mg/lit unless specified

Analysed By

18/5/16

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

WATER QUALITY

(EFFLUENT WATER- ALL PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2015-16.**

Name of the Project : **Cluster - V** Period: **H. E. March, 2016.**

Area : Mudidih **Project: Mudidih Cluster V**

Stations: **Date of Sampling:**

1. Mine Water Discharge Mudidih MW-5 16/03/2016

Sl.No.	Parameter	Sampling Stations			Detection Limit	MOEF -SCH-VI STANDARDS Class 'A'	BIS Standard & Method
		MW-5	2	3			
1	Ammonical Nitrogen, mg/l, Max	0.44			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	<2.00			2.00	30.0	IS 3025 /44:1993,R:2003 3 day incubation at 27°C
4	COD, mg/l, Max	28			4.00	250.0	APHA, 22nd Edition, Closed Reflux, Titrimetric
5	Colour	colourless			Qualitative	Qualitative	Physical/Qualitative
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	2.1			0.30	5.0	APHA, 22nd Edition Molybdovanadate
8	Fluoride (as F) mg/l, *Max*	0.53			0.02	2.0	APHA, 22nd Edition, SPADNS
9	Free Ammonia, mg/l, Max	<0.01			0.01	5.0	IS:3025/34:1988, Nesseler's
10	Hexavalent Chromium, mg/l, Max	<0.01			0.01	0.1	APHA, 22nd Edition, Diphenylcarbohydrazide
11	Iron (as Fe), mg/l, *Max*	<0.06			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, 22nd 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*	<0.10			0.10	3.0	IS-3025/54:2003, AAS-Flame
15	Nitrate Nitrogen, mg/l, *Max*	<0.5			0.50	10.0	APHA, 22nd Edition, UV-Spectrphotometric
16	Oil & Grease, mg/l, Max	<2.00			2.00	10.0	IS 3025/39:1991, R : 2003, Partition Gravimetric
17	Odour	Agreeable			Agreeable	Qualitative	Is-3015/5:1983/R:2012/Qualitative
18	pH value	8.38			2.5	5.5 to 9.0	IS-3025/11:1983, R-1996, Electrometric
19	Phenolic compounds (as C_6H_5OH),mg/l, *Max*	<0.002			0.002	1.0	APHA, 22nd Edition 4-Amino Antipyrine
20	Selenium (as Se), mg/l, *Max*	<0.002			0.002	0.05	APHA, 22nd Edition, AAS-GTA
21	Sulphide (as SO_3), mg/l, Max	<0.005			0.005	2.0	APHA, 22nd Edition Methylene Blue
22	Temperature (^oC)	36.2			Shall not exceed 5^0 C above the receiving temp.		IS-3025/09:1984, Thermometeric
23	Total Chromium (as Cr), mg/l, *Max*	<0.04			0.04	2.0	IS-3025/52:2003, AAS-Flame
24	Total Kjeldahl Nitrogen, mg/l, Max	1.4			1.00	100.0	IS:3025/34:1988, Nesseler's
25	Total Residual Chlorine, mg/l, Max	0.02			0.02	1.0	APHA, 22nd Edition, DPD
26	Total Suspended Solids, mg/l, Max	34			10.00	100.0	IS 3025/17:1984, R :1996, Gravimetric
27	Zinc (as Zn), mg/l, *Max*	<0.01			0.01	5.0	IS 3025 /49 : 1994, R : 2009, AAS-Flame

Analysed By

18/5/16

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

WATER QUALITY

(SURFACE WATER- ALL PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2015-16.**

Name of the Project : **Cluster - V** Period: **Q. E. March, 2016.**

Area : **Mudidih** **Project: Mudidih** **Cluster V**

Stations: **Date of Sampling:**

1. Upstream in Jaria Nala SW-12 14/03/2016
2. Downstream in Jaria Nala SW-13 14/03/2016

Sl. No	Parameter	Sampling Stations				Detection Limit	BIS Standard & Method
		SW-12	SW-13	3	4		
1	Arsenic (as As), mg/l, Max	<0.002	<0.002			0.002	IS 3025/37:1988 R : 2003, AAS-VGA
2	BOD (3 days 27°C), mg/l, Max	2.4	2.6			2.00	IS 3025 /44: 1993, R : 2003 3 day incubation at 27°C
3	Colour (Hazen Unit)	colourless	colourless			Qualitative	Physical/Qualitative
4	Chlorides (as Cl), mg/l, Max	88	110			2.00	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	<0.03	<0.03			0.03	IS 3025 /42 : 1992 R : 2009, AAS-Flame
6	Disolved Oxygen, min.	5.1	4.3			0.10	IS 3025/381989, R : 2003, Winkler Azide
7	Fluoride (as F) mg/l, Max	1.27	1.34			0.02	APHA, 22nd Edition SPADNS
8	Hexavalent Chromium, mg/l, Max	<0.01	<0.01			0.01	APHA, 22nd Edition, 1,5 - Diphenylcarbohydrazide
9	Iron (as Fe), mg/l, Max	<0.06	<0.06			0.06	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
10	Lead (as Pb), mg/l, Max	<0.005	<0.005			0.005	APHA, 22nd Edition AAS-GTA
11	Nitrate (as NO_3), mg/l, Max	12.85	13.73			0.50	APHA, 22nd Edition, UV-Spectrphotometric
12	pH value	7.83	7.91			2.5	IS-3025/11:1983, R-1996, Electrometric
13	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.002	<0.002			0.002	APHA, 22nd Edition 4-Amino Antipyrine
14	Selenium (as Se), mg/l, Max	<0.002	<0.002			0.002	APHA, 22nd Edition AAS-GTA
15	Sulphate (as SO_4) mg/l, Max	70	90			2.00	APHA, 22nd Edition Turbidity
16	Total Dissolved Solids, mg/l, Max	262	304			25.00	IS 3025 /16:1984 R : 2006, Gravimetric
17	Zinc (as Zn), mg/l, Max	0.012	0.018			0.01	IS 3025 /49 : 1994, R : 2009, AAS-Flame

Analysed By

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

WATER QUALITY

(DRINKING WATER- ALL PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2015-16.**

Name of the Project : **Cluster - V** Period: **Q. E. March, 2016.**

Area : **Mudidih** **Project: Mudidih** **Cluster V**

Stations: **Date of Sampling:**

1. Drinking Water from Nichitpur DW-5 08/03/2016

Sl.No	Parameter	Sampling Stations			Detection Limit	IS:10500 Drinking Water Standards	Standard / Test Method
		DW-5	2	3			
1	Boron (as B), mg/l, Max	<0.20			0.20	0.5	APHA, 22nd Edition ,Carmine
2	Colour,in Hazen Units	1			1	5	APHA, 22nd Edition ,Pt.-Co. Method
3	Calcium (as Ca), mg/l, Max	67			1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	58			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	0.36			0.02	1.0	APHA, 22nd Edition , SPADNS
7	Free Residual Chlorine, mg/l, Min	0.02			0.02	0.2	APHA, 22nd 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, 22nd 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	2			0.5	45	APHA, 22nd Edition, UV-Spectrphotometric
12	Odour	Agreeable			Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
13	pH value	8.22			2.5	6.5 to 8.5	IS-3025/11:1983, R-1996, Electrometric
14	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.001			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	30			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	188			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	368			25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (c_aco_3), mg/l, Max	260			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	0.012			0.01	5.0	IS 3025/ 49 : 1994, R : 2009, AAS-Flame

Analysed By

18/5/16

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

WATER QUALITY

(GROUND WATER- ALL PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2015-16.**

Name of the Project : **Cluster - V** Period: **Q. E. March, 2016.**

Area : **Mudidih** **Project: Mudidih Cluster V**

Stations: **Date of Sampling:**

1. Ground Water from Borkiboa Village GW-5 28/02/2016

Sl.No	Parameter	Sampling Stations			Detection Limit	IS:10500 Drinking Water Standards	Standard / Test Method
		GW-5	2	3			
1	Boron (as B), mg/l, Max	<0.20			0.20	0.5	APHA, 22nd Edition ,Carmine
2	Colour,in Hazen Units	3			1	5	APHA, 22nd Edition ,Pt.-Co. Method
3	Calcium (as Ca), mg/l, Max	122			1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	96			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	0.70			0.02	1.0	APHA, 22nd Edition , SPADNS
7	Free Residual Chlorine, mg/l, Min	0.05			0.02	0.2	APHA, 22nd 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, 22nd 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			0.5	45	APHA, 22nd Edition, UV-Spectrphotometric
12	Odour	Agreeable			Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
13	pH value	7.98			0.20	6.5 to 8.5	IS-3025/11:1983, R-1996, Electrometric
14	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.001			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	148			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	176			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	900			25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (c_aco_3), mg/l, Max	616			4.00	200	IS-3025/21:1983, R-2002, EDTA
23	Turbidity, NTU, Max	3			1.0	1	IS-3025/10:1984 R-1996, Nephelometric
24	Zinc (as Zn), mg/l, Max	0.020			0.01	5.0	IS 3025/ 49 : 1994, R : 2009, AAS-Flame

Analysed By

18/5/16

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

CHAPTER - IV

NOISE LEVEL QUALITY MONITORING

4.1 Location of sampling sites and their rationale

i) **Nichitpur (N8)**

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) **baseriya Manegers Office (N9)**

To assess the noise generated in the mines activity. Noise levels were recorded in the mines area

iii) **Pootki Balihari Office (N16)**

To assess the noise level in the industrial area,

iv) **Moonidih UGP (N17)**

To assess the noise level in the industrial area, noise levels were recorded during day time in the Mines area.

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 and night time and the observed values were compared with standards prescribed by MoEFCC.

The results of Noise levels recorded during day and night 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 : **2015-16.**

Name of the Cluster: **Cluster -V** Month: **January, 2016.**

Name of the Stations & Code :

1. **Nichitpur (N8)**
2. **Baseriya Managers Office (N9)**
3. **Pootki Balihari Office (N16)**
4. **Moonidih UGP(N17)**[1]

(a) First Fortnight

Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	**Permissible Limit of Noise level in dB(A)*
1	Nichitpur (N8)	Industrial area	15.01.2016	62.5	*75*
2	Baseriya Manegers Office (N9)	Industrial area	15.01.2016	61.4	*75*
3	Pootki Balihari office (N16)	Industrial area	15.01.2016	61.8	*75*
4	Moonidih UGP (N17)	Industrial area	07.01.2016	67.6	*75*

(b) Second Fortnight

Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	**Permissible Limit of Noise level in dB(A)*
1	Nichitpur (N8)	Industrial area	30.01.2016	61.3	*75*
2	Baseriya Manegers Office (N9)	Industrial area	27.01.2016	57.3	*75*
3	Pootki Balihari office (N16)	Industrial area	27.01.2016	53.4	*75*
4	Moonidih UGP (N17)	Industrial area	22.01.2016	61.5	*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 28.05.2016. Job No. 110310

NOISE LEVEL DATA

Name of the Company: **Bharat Coking Coal Limited** Year : **2015-16.**

Name of the Cluster: **Cluster -V** Month: **February, 2016.**

Name of the Stations & Code :

1. **Nichitpur (N8)**
2. **Baseriya Managers Office (N9)**
3. **Pootki Balihari Office (N16)**
4. **Moonidih UGP(N17)**[2]

a. First Fortnight

Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	**Permissible Limit of Noise level in dB(A)*
1	Nichitpur (N8)	Industrial area	01.02.2016	64.6	*75*
2	Baseriya Manegers Office (N9)	Industrial area	02.02.2016	63.8	*75*
3	Pootki Balihari office (N16)	Industrial area	08.02.2016	63.2	*75*
4	Moonidih UGP (N17)	Industrial area	05.02.2016	59.8	*75*

b. Second Fortnight

Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	**Permissible Limit of Noise level in dB(A)*
1	Nichitpur (N8)	Industrial area	17.02.2016	61.3	*75*
2	Baseriya Manegers Office (N9)	Industrial area	16.02.2016	57.6	*75*
3	Pootki Balihari office (N16)	Industrial area	19.02.2016	66.8	*75*
4	Moonidih UGP (N17)	Industrial area	26.02.2016	61.3	*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 28.05.2016. Job No. 110310

NOISE LEVEL DATA

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

Year : **2015-16.**

Name of the Cluster: **Cluster -V**

Month: **March, 2016.**

Name of the Stations & Code :

1. **Nichitpur (N8)**
2. **Baseriya Managers Office (N9)**
3. **Pootki Balihari Office (N16)**
4. **Moonidih UGP(N17)**[3]

a. First Fortnight data

Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	**Permissible Limit of Noise level in dB(A)*
1	Nichitpur (N8)	Industrial area	07.03.2016	58.7	*75*
2	Baseriya Manegers Office (N9)	Industrial area	08.03.2016	60.3	*75*
3	Pootki Balihari office (N16)	Industrial area	01.03.2016	53.5	*75*
4	Moonidih UGP (N17)	Industrial area	02.03.2016	58.6	*75*

b. Second Fortnight data

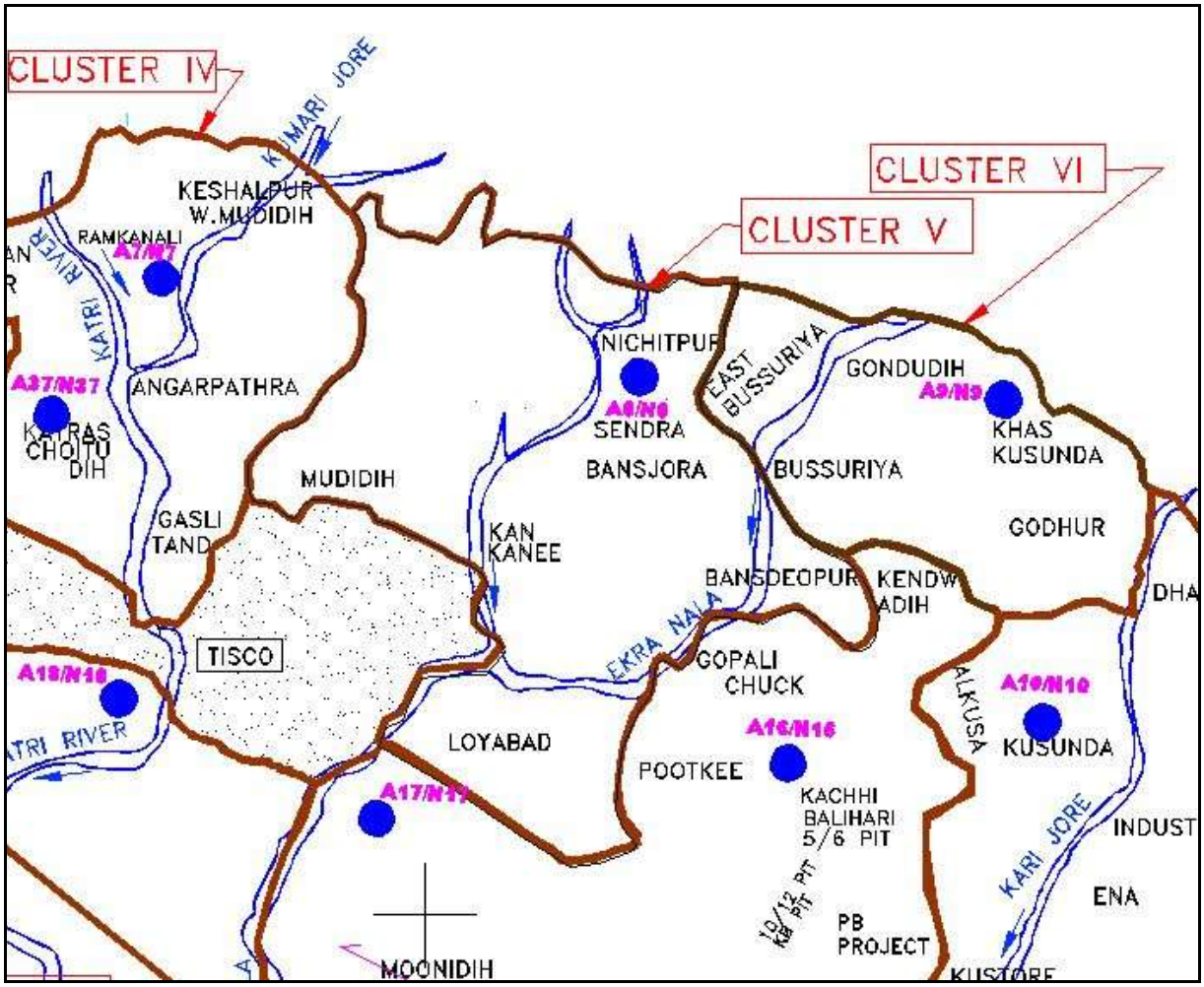
Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	**Permissible Limit of Noise level in dB(A)*
1	Nichitpur (N8)	Industrial area	22.03.2016	61.6	*75*
2	Baseriya Manegers Office (N9)	Industrial area	24.03.2016	62.7	*75*
3	Pootki Balihari office (N16)	Industrial area	17.03.2016	61.7	*75*
4	Moonidih UGP (N17)	Industrial area	18.03.2016	62.3	*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.***

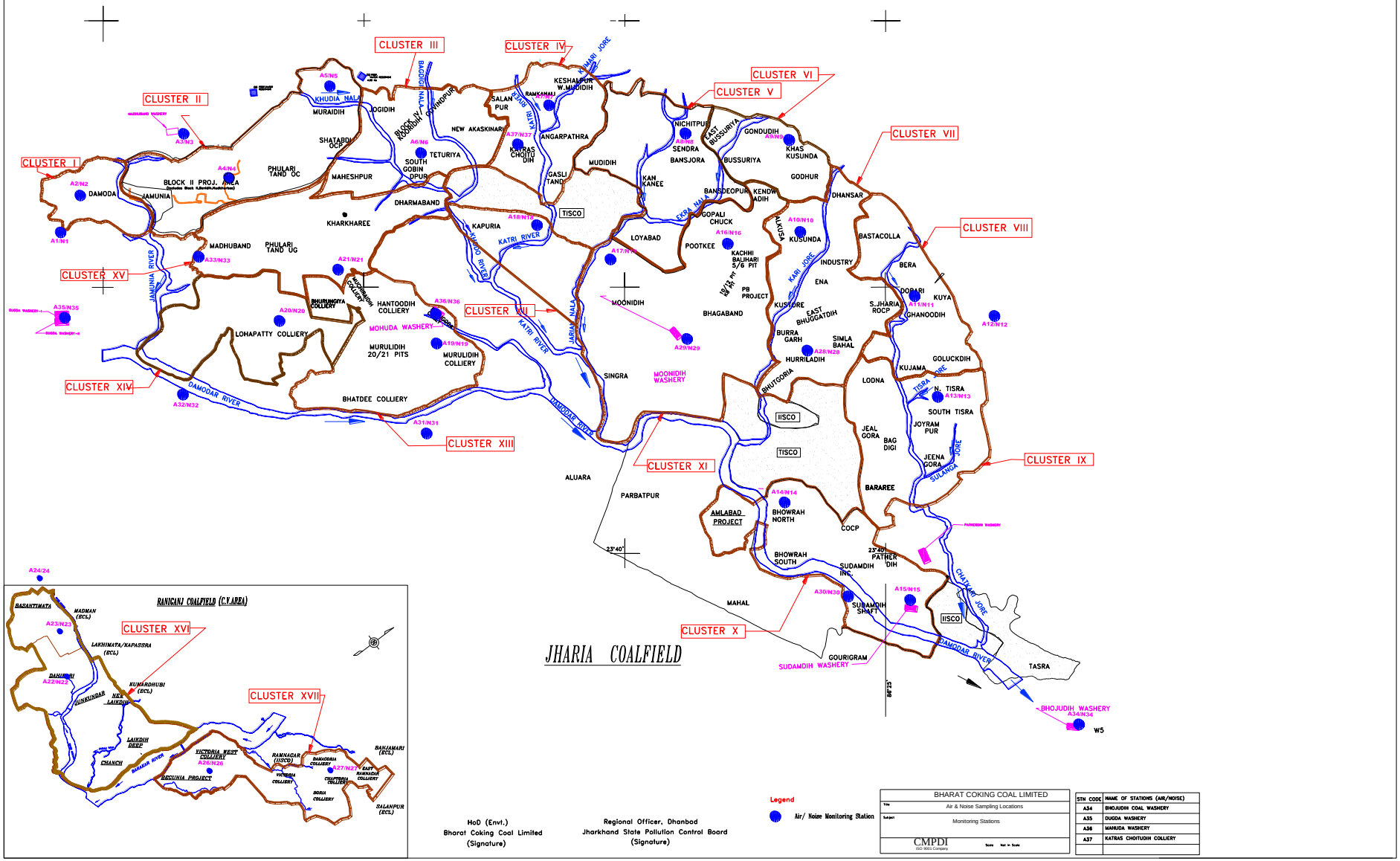
*** Day Time: 6.00 AM to 10.00 PM, +Night Time: 10.00 PM to 6.00 AM.**

[3] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed……  …….Dated 28.05.2016. Job No. 110310

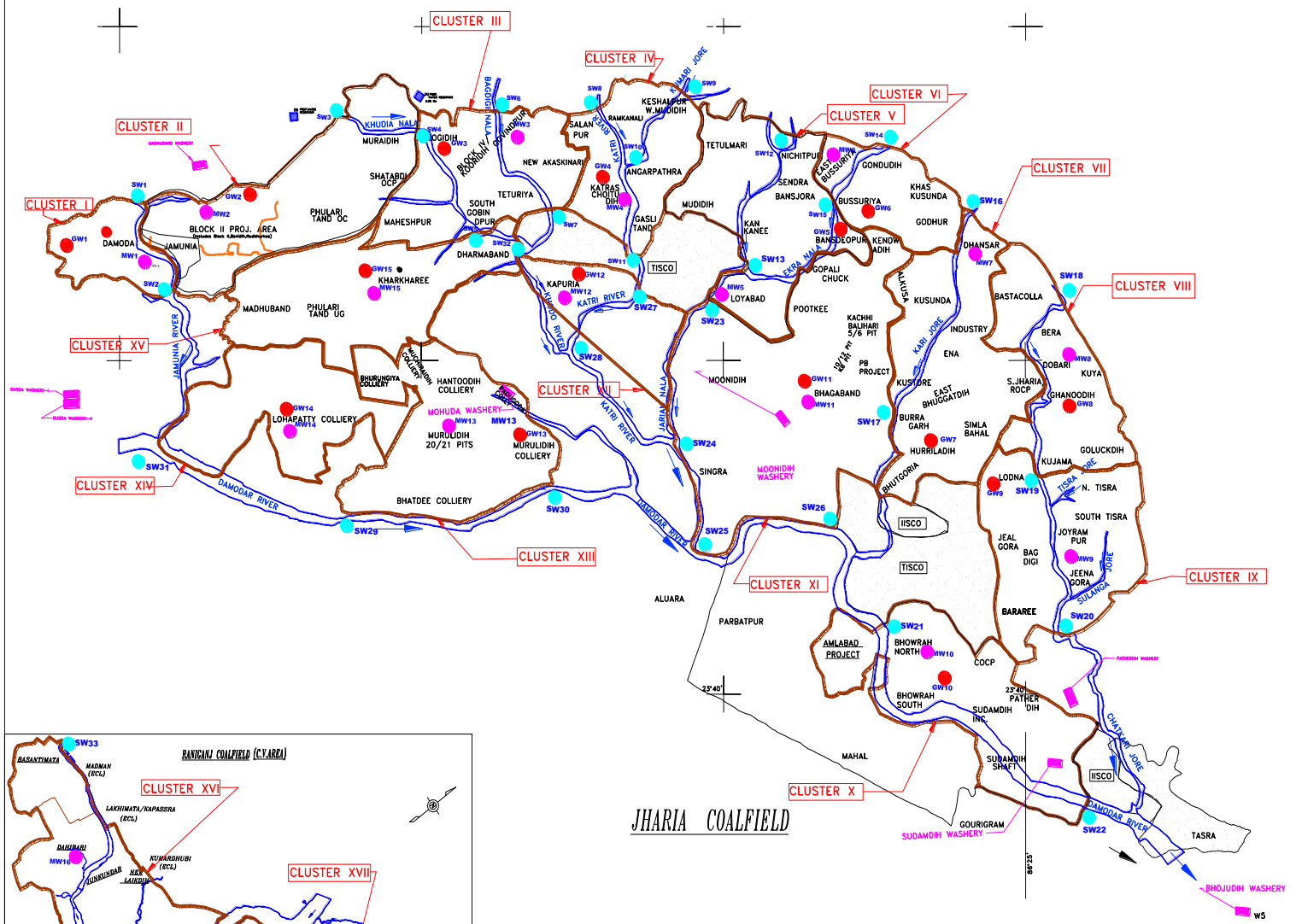
Fig: Noise Level Monitoring Location of Cluster V



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	Patlabari Village
XVII	SW35, SW36	Barakar River	MW17	Damagoria Colliery	GW17	Chaptoria