भारत कोकिंग कोल लिमिटेड
एक मिनिरत्न कम्पनी
(कोल इंडिया लिमिटेड का एक अंग)
महाप्रबंधक का कार्यालय, पूर्वी झरिया क्षेत्र
पो.ओ.- भौरा, जिला - धनबाद (झारखण्ड)
पिन - ८२८३०२, दूरभाष - ०३२६-२३२००७७,
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CIN: U10101JH1972GOI000918
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Bharat Coking Coal Limited
A MINI RATNA Co.
(A Subsidiary of Coal India Ltd)
Office of the General Manager, Eastern Jharia Area
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Ref. No.: BCCL/EJ/AM (Env.)/2017/ 409 Date: 30/05/2017
31

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

Sub.: Six monthly compliance report of the conditions of Environmental Clearance granted to Cluster X group of mines of BCCL for the period from October 2016 to March 2017.
(Ref.: EC Order No.- J-11015/380/2010-IA.II(M) dated 06.02.2013.)

Dear Sir,

Kindly find the enclosed here with the six monthly compliance report of the conditions of Environmental Clearance for the period from October 2016 to March 2017 in respect of Cluster X group of mines of BCCL.

Thanking You.

Encl.: Six monthly compliance report with annexure

Yours faithfully
31/5/17
General Manager,
Eastern Jharia Area, BCCL
Cluster X

CC to:
1. Director, 1A Monitoring Cell, Paryavaran Bhawan, CGO Complex, New delhi-110003.
2. Dy. GM / HOD (Env.), BCCL, Koyla Bhawan, Dhanbad
3. AGM, E.J. Area, Bhowra, BCCL
4. Area Manager (Env.), E.J. Area
5. Master File

ENVIRONMENTAL CLEAGRANCE COMPLIANCE OF CLUSTER-X

(GRANTED VIDE J-11015/380/2010-IA.II (M) Dated 06.02.2013)
(From October 2016 to March 2017)

Sl. No.	A. Specific Conditions by MOEF:	Compliance
I.	The maximum production from the opencast and underground section in the cluster shall not exceed beyond that for which environmental clearance has been granted for the cluster X as below:	Complied (100%). The production from the cluster is within the limit for which environmental clearance has been granted.
II.	All the void /water bodies should be backfilled up to Ground level and no OB dump at the end of mining.	It shall be complied. Action is being taken as specified in EMP.
III.	Extensive plantation should be provided on either side of Damodar River.	A proposal will be initiated for the plantation purpose along the Damodar river in the area which is under cluster X. In addition to this, Action has been taken for the plantation or eco-restoration work as per the Road Map prepared by Forest Research Institute (FRI), Dehradun. Annexure I – Details of Plantation in EJ Area (Cluster X)
IV.	Details of impact of mining on Damodar River should be assessed and provided;	Detail study on Damodar River will be taken up by CMPDI. However, CMPDI is carrying out the Environment Monitoring which comprises of sampling and analysis of water from Damodar River (SW 21 & SW 22) under surface water analysis. Result of upstream and downstream samples showing no major changes in water quality of Damodar river.
V.	Impact of mining on ground water of the area (Impact Zone) should be provided;	Study will be taken up by CMPDI. Ground water monitoring is being carried out by CMPDI.
VI.	A Garland drain should be provided and the drain water should not be discharged in to Damodar River;	No mine water is being discharged into Damodar river. Garland drain and toe wall will be provided along the stabilized O.B. dump and then it will be biologically stabilized through plantation/ eco-restoration works.
VII.	Excess water from mine after treatment should be supplied to the villagers;	An action plan for the utilization and treatment of surplus mine water has been prepared. In this regard 26 mines have been identified for implementation of the Phase-I of the action Plan.
VIII.	Rejects of washery along with dry carbon slurry should be utilized in power plant and other recognized vendors;	Being complied.
IX.	There should be no discharge from the Washery (Slurry) in to the Damodar River. The entire washery	All the washeries of BCCL are designed on Closed Circuit System to ensure no

	water should be recycled;	discharge from the washery premises.
X.	Damodar River should be protected by plantation on both sides;	A proposal will be initiated for the plantation purpose along the Damodar river in the area which is under cluster X. In addition to this, Action has been taken for the plantation or eco-restoration work as per the Road Map prepared by Forest Research Institute (FRI), Dehradun.
XI.	A herbal garden with medicinal plants be developed;	Kamini Kalyan Herbal Garden with 3.32 Ha. area has been taken up for 2016-17. Medicinal/ herbal plants have been planted as per FRI / BCCL Env. Dept. HQ guidelines.
XII.	A time schedule for filling of existing and abandoned quarries be done.	It is being complied.
XIII.	Of the total water bodies area of 286.54 ha in the post mining land use, consist of 243.97 ha of natural water bodies like Damodar river and no. of water ponds. Only 42.57 ha of mine voids were proposed to be converted to artificial water bodies for catering to domestic use of local villagers. Keeping in view the Damodar river in the vicinity, there should be no additional water bodies are created from mine.	It will be complied.
XIV.	The measure identified in the environmental plan for cluster X groups of mine and the conditions given in this environmental clearance letter shall be dovetailed to the implementation of the Jharia action plan.	Master plan/Jharia Action Plan is dovetailed with environmental clearance conditions.
XV.	As there is no fire in cluster X but the measure should be adopted by proponent to control the spread of neighboring fire to the cluster X. The proponent shall prepare time series maps of the Jharia Coalfields through NRSA to monitor and prevent fire problems in the Jharia Coalfield by isothermal mapping/ imaging and monitoring temperatures of the coal seams (whether they are close to spontaneous ignition temperatures) and based on which, areas with potential fire problems shall be identified. Measures to prevent ingress of air (ventilation) in such areas, to prevent restart fresh/ spread fires in other areas including in mines of cluster XIV shall be undertaken.	Work has been awarded to NRSC (earlier NRSA) to monitor and prevent fire problems in the Jharia Coalfield and NRSC has submitted their final report. Fire affected area has been reduced from 9.00 Km^2 to 2.18 Km^2. For further dealing of fire and subsidence action has been taken and working as per the strategic plan of digging out of fiery coal followed by reclamation. A Global EOI was floated to control fire in Jharia Coalfield. None of the bidder qualified. Presently (i.e. in 2017) the Work Order for "Delineation of Surface Fire and associated land subsidence in Jharia Coal Field using satellite based remote sensing techniques" has already been awarded to NRSC under the MoU signed with NRSC. Measure to prevent ingress of air (ventilation) is being taken as specified in EMP 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 re-starting of fresh/ spreading of fire into other areas. Annexure II – Work Order awarded to NRSA regarding delineation of the surface coal fire.
XVI.	Underground mining should be taken up after completion of reclamation of Opencast mine area after 2 years.	It is being complied. Mining is being done as per the guidelines and approval/permission of Directorate General of Mines Safety (DGMS).
XVII.	No mining shall be undertaken where underground fires continue. Measure shall be taken to prevent/check such fire including in old OB dump.	It is being complied. There is no fire in Cluster X. However 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).
XVIII.	A part of cluster X is under River Damodar. It was clarified that although the mine is underground, there is no coal underneath River Damodar, which would be mined. The Committee desired that the data of bore wells near River Damodar require to be monitored for permeability and seepage of waster of River Damodar.	CMPDI RI-II has been requested to conduct study of permeability and seepage of water of River Damodar.
XIX.	The rejects of washeries in Cluster –X should be send to FBC based plant.	It will be complied.
XX.	There shall be no external OB dumps. OB produce from the whole cluster will be 29.01 Mm3. OB from One Patch OCP mine shall be backfilled. At the end of the mining there shall be no void and the entire mined out area shall be re-vegetated. Areas where opencast mining was carried out and completed shall be reclaimed immediately thereafter.	Action is being taken as specified in EMP. O.B. removed from mine/ collieries are back filled in old/ abandoned quarry/voids. 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 Dehradun, CEMDE Delhi
XXI.	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- X shall be drawn up and implemented.	Calendar plan of production and OB removal has been prepared for year 2015-16 to 2017-18. Mine closure plan as per the guidelines of Ministry of Coal have been prepared by Central Mine Planning and Design Institute (CMPDI) and it is being implemented. Annexure III – Calendar Year plan of cluster X for year 2015-16 to 2017-18.

XXII.	The void in 5 ha area shall be converted into a water reservoir of a maximum depth of 15-20 m in post mining stage and shall be gently sloped and the upper benches of the reservoir shall be recognized with plantation and the periphery of the reservoir fenced. The abandoned pits and voids should be backfilled with OB and biologically reclaimed with plantation and or may be used for pisciculture	It shall be complied. A part of the void will be converted into the water body as specified in EMP. Detailed plan of COCP Bhowra O/C to be prepared for Pisciculture and boat, plantation, sitting arrangement etc. will be provided around the periphery of the reservoir and which will be developed as water recreational park.
XXIII.	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 60 m 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. Action for construction of embankment has been taken as specified in EMP. Every year monsoon preparation programme is carried out by colliery / mines before the onset of monsoon for protection of mines from rain water flow and to maintain a safe distance from nalas flowing or small water bodies protection in the lease boundary.
XXIV.	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.	No OB is being dumped near water bodies. The OB dumps created earlier already stabilized & further action has been taken for their eco-restoration work as per Road Map prepared by FRI, Dehradun.
XXV.	Thick green belt shall be developed along undisturbed areas, mine boundary and in mine reclamation. During post mining stage, a total of 47.63 ha area would be reclaimed by planting native species in consultation with the local DFO/Agriculture Department/institution with the relevant discipline. The density of the trees shall be around 2500 plants per ha.	It is being complied. Yearly plantation is being done for development of green belts as per EMP. Eco-restoration sites of 19.64 Ha. has been already taken up and 3.10 Ha. has been started in 2017-18. In addition to this, 3.32 Ha. of area will be developed as Herbal garden center. All the Ecological restoration work in the BCCL is under the supervision of FRI Dehradun.
XXVI.	The road should be provided with avenue plantation on both side as trees act as sink of carbon and other pollutant.	Due to absence of permanent roads in the coalfield, avenue plantation couldn't be done but trees were planted near permanent structures to minimize the pollution. However, it has been requested from colliery to provide a proposal for plantation along the road approaching to colliery office.
XXVII.	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 –XIV shall be implemented.	Dhanbad Action Plan has been prepared in consultation with Jharkhand Pollution Control Board for entire BCCL. It is being implemented comprehensively for all the mines of BCCL. Some of the salient actions of this cluster are as under: 1. Construction of pucca road.

		2. Construction of water reservoir for mine water utilization 3. Plantation.
XXVIII.	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.	The locations of monitoring stations have been finalized in consultation with JSPCB. The monitoring work of ambient environment quality is being carried out by Central Mine Planning & Design Institute Limited (CMPDIL) which is having CSIR laboratory recognized under the EP Rules. Tender for conducting Source Apportionment Study for BCCL was floated twice, however, none of the bidders qualified. Therefore, as per the MoU "Sustainable Coal Mining in Coal India Limited" entered between CIL and NEERI, NEERI Nagpur was approached for conducting Source Apportionment Study BCCL for compliance of EC conditions. The proposal regarding Conducting the Source Apportionment Study has been submitted by NEERI. Presently it has been submitted to CIL for further scrutiny and approval.
XXIX.	No groundwater shall be used for the mining activities. Additional water required, if any, shall be met from mine water or by recycling/reuse of the water from the existing activities and from rainwater harvesting measures. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry to dewatering of mine.	It is being complied and mine water is being used for the industrial purpose like water sprinkling to suppress dust generation, etc. Further Mine water is also utilized for the community and irrigation purposes. Following action has been taken by the company: • Installation of Pressure filters for utilization of mine water. In cluster X, there is three nos. of Rapid Gravity Pressure Filter plant of total 1.72 MGD capacity, which is used for supply of water in nearby colonies, houses, quarters. Annexure IV – Details of water Filter plants in Cluster X.
XXX.	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 done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality including Arsenic and Fluoride during the month of May. Data	Regular monitoring of Ground water quality is being carried out by CMPDIL. The Ground water Level and Quality report for Clusters of mines (including Cluster X), BCCL have been submitted by CMPDIL & attached as Annexure V. Annexure V – Ground water level and Quality report.

	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.	Establishment of new piezometers is under process. CMPDI has prepared a report for design location and construction of 23 Nos of Piezometer covering all the 17 clusters of BCCL. Tender for establishing and construction of a network of piezometer well system was opened on 05th May 2017, in which only one bidder has participated. The tender is under scrutiny.
XXXI.	Mine discharge water shall be treated to meet standards prescribed standards before discharge into natural water courses/agriculture. The quality of the water discharged shall be monitored at the outlet points and proper records maintained thereof and uploaded regularly on the company website.	Mine discharge water is being allowed to settle down in the mine sumps before disposal into storage reservoirs. The monitoring of water quality parameters is being done by CMPDIL and parameters are well within the prescribed limit provided by CPCB.
XXXII.	ETP shall also be provided for workshop, and CHP, if any. Effluents shall be treated to confirm to prescribe standards in case discharge into the natural water course.	The work of installation of Oil and Grease Trap arrangement has been taken up with CMPDI. The subject assignment will be completed within eight months from the date of issue of work order.
XXXIII.	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 X and no depillaring district is taken up. However regular monitoring of subsidence will be undertaken on operating depillaring districts.
XXXIV.	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.
XXXV.	High root density tree species shall be selected and planted over areas likely to be affected by subsidence.	Identification of high root density Plant species and its plantation in subsidence prone area will be taken-up at the time of depillaring operations.
XXXVI.	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, where ever applicable.
XXXVII.	Solid barriers shall be left below the roads falling within the blocks to avoid any damage to the roads.	It is being followed. Sufficient barriers are left for saving the surface installation and infra structures as per the statute and DGMS guidelines.
XXXVIII.	No depillaring operation shall be carried out below the township/colony.	It is being followed.

XXXIX.	The Transportation Plan for conveyor-cum–rail for Cluster- X should be dovetailed with Jharia Action Plan. Road transportation of coal during Phase–I should be by mechanically covered trucks, which should be introduced at the earliest. The Plan for conveyor-cum–rail for Cluster-XIV should be dovetailed with Jharia Action Plan. The road transpiration of coal during phase–I should be by mechanically covered trucks.	Action has been taken for formulating the adequate transportation plan for conveyor cum rail system of dispatch. CMPDIL, RI-II has been requested to conduct study and prepare the plan in this regarding. By that time transportation is being done by covering vehicle with tarpaulin cover. Initiatives has been taken at corporate level of coal India Limited for developing the mechanically covered trucks and a vendor meeting for the same has been held with the OEM on dated 07.05.2016. Further, a proposal for inclusion of mechanically covered trucks in the Contract Terms has been initiated to ensure that the Outsourcing company should deploy Mechanically Covered Trucks for coal Transportation.
XL.	A study should be initiated to analyze extent of reduction in pollution load every year by reducing road transport.	CMPDI is carrying out the study to analyze extent of reduction in pollution load every year by reducing road transport. The Pollution load study report for cluster X is awaited.
XLI.	R&R of 1670 nos of PAF's involved. They should be rehabilitated at cost of Rs 7087.75 Lakhs as per the approved Jharia Action Plan.	Implementation of master plan has already been started through Jharkhand Rehabilitation and Development Authority (JRDA), Dhanbad and 547 families (Non-BCCL) has been rehabilitated at well-established Jharia Vihar Township located at Belgoria.
XLII.	Details of transportation, CSR, R&R and implementation of environmental action plan for each of the 17 clusters should be brought out in a booklet for and submitted to Ministry.	A separate booklet comprising of CSR activities has been prepared and attached as annexure VI (B). Annexure VI (B) – CSR Booklet of Cluster X
XLIII.	A detailed CSR Action Plan shall be prepared for Cluster X group of mines. Specific activities shall be identified for CSR of Rs 20.25/annum @ of Rs 5/ton of coal production. As recurring expenditure. The 47.63 ha of area within Cluster XIV ML existing as waste land and not being acquired shall be put to productive use under CSR and developed with fruit bearing and other useful species for the local communities. Third party evaluation shall be got carried out regularly for the proper implementation of activities undertaken in the project area under CSR. Issue raised in the Public Hearing shall also be integrated with activities being taken up under CSR.	It being complied. BCCL is implementing CSR Activities. CSR action plan of BCCL for 2016-17 including CSR budget and expenditure during 2016-17 is enclosed as Annexure VI (A). A separate CSR committee has been formed at Area level of Bhowra for cluster-X, who will look after the works being executed under CSR. A booklet comprising of CSR activities conducted by E.J. area has been prepared and attached as annexure VI (B) – CSR Booklet of cluster X.

	The details of CSR undertaken along with budgetary provisions for the village-wise various activities and expenditure thereon shall be uploaded on the company website every year. The company must give priority to capacity building both within the company and to the local youth, who are motivated to carry out the work in future.	
XLIV.	For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted to MOEF and its Regional office at Bhubaneswar.	Presently a time series map of vegetation cover in the Jharia Coal Field is being carried out through CMPDI, Ranchi using satellite imagery for every 3 years. The Vegetation Cover Mapping of Jharia Coalfield based on Satellite Data of the Year- 2016 has been submitted by CMPDIL and attached as annexure VII. Annexure VII – Vegetation Cover Mapping of Jharia Coalfield based on Satellite Data of year 2016.
XLV.	A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests five year before mine closure for approval. Habitat Restoration Plan of the mine area shall be carried out using a mix of native species found in the original ecosystem, which were conserved in-situ and ex-situ in an identified area within the lease for reintroduction in the mine during mine reclamation and at the post mining stage for habitat restoration.	Mine closure plan as per the guidelines of Ministry of Coal has been prepared by CMPDI and it is being complied.
XLVI.	A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company for implementing environment policy and socioeconomic issues and the capacity building required in this regard.	A full-fledged Environment Department, headed by a HoD (Environment) along with a suitable qualified multidisciplinary team of executives which includes Environment, Mining, Excavation, Civil executives and technicians has been established in Headquarters. They are also trained in ecological restoration, sustainable development, rainwater harvesting methods etc. At the project level, one Executive in each area has also been nominated as Project Nodal Officer (Environment) and is also entrusted with the responsibility of compliance and observance of the environmental acts/ laws including environment protection measures. The activities are monitored on regular basis at Area and at Head quarter levels. GM (Environment) at head quarter level,

		co-ordinates with all the Areas and reports to the Director (Technical) and in turn he reports to the CMD of the company. The team is multidisciplinary and very much motivated under the guidance of company's Director (Technical) and CMD. Further capacity building at both corporate and operating level is being done.
XLVII.	Implementation of final mine closure plan for Cluster X, subject to obtaining prior approval of the DGMS in regard to mine safety issues	Final Mine Closure Plan has been prepared for each Mine in this cluster. Before implementation of final mine closure plan, prior permission from DGMS has been taken in regard to mine safety issues.
XLVIII.	Corporate Environment Responsibility: A. The Company shall have a well laid down Environment Policy approved by the Board of Directors. B. The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions. C. The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished. D. To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.	A well-defined Corporate Environment Policy has already been laid down and approved by the Board of Directors. This is also posted on BCCL website. Complied. A hierarchical system of the company to deal with environmental issues from corporate level to mine level already exists. Being complied.
B.	**General Conditions by MOEF:**	
I.	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.	Being complied.
II.	No change in the calendar plan of production for quantum of mineral coal shall be made	Being followed. Production is being done well within production capacity of this cluster as per EC.
III.	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.	The optimum location of monitoring stations in Jharia Coal Field finalized in consultation with the Jharkhand State Pollution Control Board. Ambient air quality is being regularly monitored by CMPDIL. Annexure VIII – Environmental Monitoring

	Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.	Report for cluster X.
IV.	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 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.	Ambient air quality data (PM10, PM2.5, SO2 and NOx) and other monitoring data have been regularly monitored and analyzed by CMPDIL and submitted the report, which is attached as annexure III. Annexure VIII – Environmental Monitoring Report for cluster X.
V.	Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.	It is being complied in mines and also the Noise levels are below the Ambient Noise Standard (Day time 75 dB & Night Time (70 dB for Industrial Area). However, ear muffs / ear plugs are provided to the workers engaged in blasting and drilling operations, HEMM operations etc.
VI.	Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.	The optimum location of monitoring stations in Jharia Coal Field finalized in consultation with the Jharkhand State Pollution Control Board. Mine water & ground water quality is being regularly monitored by CMPDIL. Physico-Chemical characteristics of effluents are well within the prescribed limit. For installation of oil and grease trap, a proposal has been moved to CMPDIL through HQ coordination.
VII.	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.	Vehicular emissions are being under control and the pollution control certificate issued by state pollution control board is also provided to vehicles which are verified by area manager (transport) and area manger (E&M) regularly. All the vehicles used for coal transportation are covered with tarpaulins.
VIII.	Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board and data got analysed through a laboratory recognized under EPA Rules, 1986.	Monitoring of Environmental quality parameters have been regularly done by CMPDIL with proper analysis equipment.
IX.	Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.	It is being complied. All Personnel working in mines are provided with reparatory masks and safety eyeglass to protect the dust inhalation.

		A separate full-fledged Human Resource Development Department is conducting regular training programme on these issues. Apart from this, Vocational Training Center exist in E.J. area (cluster X), which provides periodical training on the safety and occupational health issue to workers working in the mines.
X.	Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed and records maintained thereof. The quality of environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by the company while outsourcing.	Initial Medical Examination (IME) and Periodical Medical Examination (PME) of all the personnel are carried out as per the Statutes and Director General of Mines Safety (DGMS) guideline. Annexure IX – List of IME and PME of cluster X (EJ Area) for 2016-17.
XI.	A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company.	A full-fledged Environment Department, headed by a HoD (Environment) along with a suitable qualified multidisciplinary team of executives which includes Environment, Mining, Excavation, Civil executives and technicians has been established in Headquarters. They are also trained in ecological restoration, sustainable development, rainwater harvesting methods etc. At the project level, one Executive in each area has also been nominated as Project Nodal Officer (Environment) and is also entrusted with the responsibility of compliance and observance of the environmental Acts/Laws including environment protection measures .The activities are monitored on regular basis at Area and at Headquarters levels. GM (Environment) at head quarter level, co-ordinates with all the Areas and reports to the Director (Technical) and in turn he reports to the CMD of the company. The team is multidisciplinary and very much motivated under the guidance of company's Director (Technical) and CMD. Further capacity building at both corporate and operating level is being done.
XII.	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its	It is being complied.

	Regional Office at Bhubaneswar.	
XIII.	The Project authorities shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution control Board and may also be seen at the website of the ministry of Environment & Forests at http://envfor.nic.in.	It has been complied. Advertisement in local newspaper has also been done.
XIV.	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.
XV.	A copy of the environmental clearance letter shall be shall also be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the Regional Office, District Industry Sector and Collector's Office/Tehsildar's Office for 30 days.	Complied.
XVI.	The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated environmental clearance conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same 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. The clearance letter has been uploaded on the BCCL website.
XVII.	The project proponent shall submit six monthly compliance reports on status of compliance of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office of the Ministry, respective Zonal Offices of CPCB and the SPCB.	Being complied.
XVIII.	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/ information/monitoring reports.	Project authority is ready to extend its full cooperation for any kind of visit and inspection conducted by Regional Office in connection with EC Conditions Compliance.

	ending 31 March in Form –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.	been regularly submitted for each financial year to Jharkhand State Pollution Control Board. Annexure X – Environmental statement (Form-V) of projects/collieries of E.J. Area attached.
C.	**Other Conditions by MOEF:**	
i.	The Ministry or any other Competent Authority may stipulate any further condition(s) for environmental protection.	Agreed.
ii.	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.
iii.	The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and Rules. The Proponent shall ensure to undertake and provide for the costs incurred for taking up remedial measures in case of soil contamination, contamination of groundwater and surface water, and occupational and other diseases due to the mining operations.	It is being complied.
iv.	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.

31/5/17
Area Manager (Env.)
EJ Area

Project Officer
Bhowra (North),
EJ Area

Project Officer
Bhowra (South),
EJ Area

31/5/17
Project Officer
ASP,
EJ Area

31/05/17
Project Officer
Amlabad,
EJ Area

31.05.17
Addl. General Manager
EJ Area, BCCL
Cluster X

31/5/17
General Manager
EJ Area, BCCL
Cluster X

ANNEXURE - I

Details of Plantation under Ecological Restoration Sites in E.J. Area

Name of Area	Name of Project	Location of Plantation	No. of Plantation	Area under Ecological Restoration (Ha)
Eastern Jharia (EJ) Area	Bhowra South Colliery (U/G and OCP)	3 Pit OB dump Eco Restoration site	12189	4.78
	Bhowra (North) U/G Mines	Bhowra North / BLA OB Eco Restoration Site	13000	5.20
	Amalgamated Sudamdih-patherdih (ASP) Colliery	Vrindavan / COCP Patherdih Eco Restoration Site	14275	5.71
		Mohalbani Eco Restoration site	10874	3.95
		Kamini Kalyan Kendra Herbal Garden (revival plan proposed for 2016-17)	278	3.32
		Sudmaidh Incline Eco-restoration site (Proposed for 2017-18)	-	New site for 2017-18
	Amalabad Colliery	-	-	-
	Gabion Plantation (through DFO)	Patherdih Colony Ambona BIT Sindri	2500	-

Plantation Data of BCCL (Project wise)

S No	Name of the Area	Name of unit/Colliery	Afforestation/plantation by DFO		Ecological Restoration		Gabion plantation by DFO	Total Plantation area (ha)	Total Plantation (nos)
			Area (Ha)	No of Plants	Area (Ha)	No of Plants			
		Damoda (Mix)			7	31500		7	31500
		Muraidih OCP	183.71	565933	53.65	26645		237.36	592578
1	Barora	Phularitand	60	194730	2.5	7700	1000	62.5	203430
2	Block-II	Amalgamated Block-II OCP (ABOCP)	15	37500	10.8	27000	570	25.8	65070
		Maheshpur Colliery	6	15000			250	6	15250
		South Govindpur Colliery	20	50000				20	50000
		New Akashkineree Mixed	12	30000	13.5	33750		25.5	63750
3	Govinpur	Kharkharee	14	35000				14	35000
		AKWMC	17.08	9075	6.42	16050	1685	23.5	26810
		Katras Choitdih	2	1060				2	1060
		salanpur	1	530				1	530
4	Katras	Gaslitand	1	530				1	530
		Nichitpur OC Mine	5	10000	2.8	7000	1320	7.8	18320
		Tetulmari Colliery	5	10000	10.3	25750		15.3	35750
		Mudidih Colliery	5	10000				5	10000
		Sendra Bansjore Colliery	10	20000				10	20000
		Loyabad UG Mine	40	80000				40	80000
		Bansdeopur Colliery	5	10000				5	10000
5	Sijua	Kankanee Colliery	3	6000				3	6000
		East Bassuriya Colliery	19.5	39000				19.5	39000
6	Kusunda	Gondudih Khas kusunda (GKKC)	10.5	21000	6.79	16975	500	17.29	38475
		Burragarh	5	6035	7	42000	1390	12	49425
		Simlabahal	3	3621				3	3621
		Hurriladih	3	3621				3	3621
		Kustore	3	3624				3	3624
		Kachhi Balihari 10/12 Pit	5	6035				5	6035
7	PB	PB Project	2	2414				2	2414
		South Jharia/ Rajapur OCP			12	30000	500	12	30500
		East Bhuggatdih	29.5	59000				29.5	59000
		Bastacolla	10.8	21600				10.8	21600
		Bera			7.67	19175		7.67	19175
		Debari	10	20000				10	20000
8	Bastacolla	Goluckdih	9.7	19400				9.7	19400

S No	Name of the Area	Name of unit/Colliery	Afforestation/plantation by DFO		Ecological Restoration		Gabion plantation by DFO	Total Plantation area (ha)	Total Plantation (nos)
			Area (Ha)	No of Plants	Area (Ha)	No of Plants			
		Kujama	20	40000			1848	20	41848
		Lodna	8	16000				8	16000
		NT/ST			15	37500		15	37500
		Jealgora	5	10000				5	10000
		Bagdigi	10	20000				10	20000
		Joyrampur	10	20000				10	20000
9	Lodna	Bararee	7	14000				7	14000
		Bhowrah North	10	12000	5.2	13000	2500	15.2	27500
		Bhowrah South			8.73	21825		8.73	21825
		Patherdih Mix	10	12000	5.71	14275		15.71	26275
		Sudamdih	70	84000				70	84000
10	EJ	Amlabad	10	12000				10	12000
		Moonidih	130	215000				130	215000
		Murulidih	20	20000	7.5	18750		27.5	38750
		Murulidih 20/21 Pit	10	10000				10	10000
		Bhurungiya	20	20000				20	20000
		Muchraidih	20	20000				20	20000
		Hantoodih	15	15000				15	15000
		Padugora	15	15000				15	15000
		Bhatdee	20	20000				20	20000
11	WJ	Lohapatti	10	10000				10	10000
		Damagoria	14.5	44515			7300	14.5	51815
		Jhunkundar	46	141235	5.6	15241		51.6	156476
12	CV	NL OCP			16.5	9879		16.5	9879
		Koyla Nagar	10.5	12600			4450	10.5	17050
		Jagjivan Nagar	3.4	4080				3.4	4080
		Washery division	35	110250			125	35	110375
		CCWO Colony	2.6	3120				2.6	3120
13	Others	Bhuli Township	8.9	10680				8.9	10680
	TOTAL		1056.69	2202188	204.67	414015	23438	1261.36	2639641

ANNEXURE - II

भारत कोर्किंग कोल लिमिटेड एक मिनीरत्न कंपनी (कोल इंडिया लिमिटेड का एक अंग) पंजीक्रत कार्यालय कोयला भवन ,कोयला नगर , (धनबाद)झारखंड826005(CIN:U10101JH1972GOI000918 Tele: 0326 2230174 FAX: 0326 2230176 ईमेल :cgmsafety@bccl.gov.in		Bharat Coking Coal Limited A Miniratna Company (A subsidiary of Coal India Ltd) Office of GM I/C(S&R) Koyla Bhawan, Koyla Nagar, Dhanbad, Jharkhand-826005 CIN:U10101JH1972GOI000918 Tele: 0326 2230174 FAX: 0326 2230176 Email: cgmsafety@bccl.gov.in

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

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

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

Dear Sir,

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

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

Thanking you,

Yours faithfully,

7/4/17

General Manager I/C (S & R)

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

ANNEXURE - III

COAL / OB PROGRAMME 2017-18.

YEARLY PRODUCTION PROGRAMME - UNIT-WISE, SEAM WISE, GRADE WISE, MONTH-WISE FOR THE YEAR 2017-2018.

Area- EJ Area — **Coal : 7.00 LTe.** — **OB : 42.00 LM3**

Year 2017-18 — (Coal in tonnes/ OB in cu.m.)

Mine	Seam	Grade	Target 2017-18	Apr	May	Jun	1st Qtr.	Jul	Aug	Sep	2nd Qtr	Oct	Nov	Dec	3rd Qtr	Jan	Feb	Mar	4th Qtr	Total
Underground(Dept.)																				
Bhowra N	V	W-II	25600	2304	2304	2304	6912	1963	1963	1962	5888	2048	2048	2048	6144	2219	2218	2219	6656	25600
Bhowra S	IV (T)	W- IV	24200	2178	2178	2178	6534	1856	1855	1855	5566	1936	1936	1936	5808	2097	2097	2098	6292	24200
A/Total-U/G		Coal Prod.	49800	4482	4482	4482	13446	3819	3818	3817	11454	3984	3984	3984	11952	4316	4315	4317	12948	49800
Opencast (Dept.)																				
COCP	IB	W-III	20000	1800	1800	1800	5400	1534	1533	1533	4600	1600	1600	1600	4800	1733	1732	1734	5200	20000
	IT / IM	W-IV	22500	2025	2025	2025	6075	1725	1725	1725	5175	1800	1800	1800	5400	1950	1950	1950	5850	22500
	II	W-IV	10000	900	900	900	2700	767	767	766	2300	800	800	800	2400	867	866	867	2600	10000
		Coal	52500	4725	4725	4725	14175	4026	4025	4024	12075	4200	4200	4200	12600	4550	4548	4551	13650	52500
		OB	150000	13500	13500	13500	40500	11500	11500	11500	34500	12000	12000	12000	36000	13000	13000	13000	39000	150000
A/Total-O/C		Coal	52500	4725	4725	4725	14175	4026	4025	4024	12075	4200	4200	4200	12600	4550	4548	4551	13650	52500
		OB	150000	13500	13500	13500	40500	11500	11500	11500	34500	12000	12000	12000	36000	13000	13000	13000	39000	150000
A/G. Total Dept. (O/C + U/G)		Coal	102300	9207	9207	9207	27621	7845	7843	7841	23529	8184	8184	8184	24552	8866	8863	8868	26598	102300
		OB	150000	13500	13500	13500	40500	11500	11500	11500	34500	12000	12000	12000	36000	13000	13000	13000	39000	150000
Hired O.C.P.																				
3pit West	IX / X	W-II	175000	15750	15750	15750	47250	13417	13417	13416	40250	14000	14000	14000	42000	15167	15166	15167	45500	175000
	XI / XII	W-II	148700	13383	13383	13383	40149	11401	11400	11400	34201	11896	11896	11896	35688	12887	12887	12888	38662	148700
	XIII	W-II	100000	9000	9000	9000	27000	7667	7667	7666	23000	8000	8000	8000	24000	8667	8666	8667	26000	100000
		Coal	423700	38133	38133	38133	114399	32485	32484	32482	97451	33896	33896	33896	101688	36721	36719	36722	110162	423700
		OB	3120000	280800	280800	280800	842400	239200	239200	239200	717600	249600	249600	249600	748800	270400	270400	270400	811200	3120000
X-patch	IV / IVB	W-IV	160000	14400	14400	14400	43200	12267	12267	12266	36800	12800	12800	12800	38400	13867	13866	13867	41600	160000
	VI	W-IV	14000	1260	1260	1260	3780	1074	1073	1073	3220	1120	1120	1120	3360	1214	1213	1213	3640	14000
		Coal	174000	15660	15660	15660	46980	13341	13340	13339	40020	13920	13920	13920	41760	15081	15079	15080	45240	174000
		OB	930000	83700	83700	83700	251100	71300	71300	71300	213900	74400	74400	74400	223200	80600	80600	80600	241800	930000
A/Total (Hired OCP)		Coal	597700	53793	53793	53793	161379	45826	45824	45821	137471	47816	47816	47816	143448	51802	51798	51802	155402	597700
		OB	4050000	364500	364500	364500	1093500	310500	310500	310500	931500	324000	324000	324000	972000	351000	351000	351000	1053000	4050000
Departmental + Hired OCP																				
Area Total (Dept+O/S)		Coal	700000	63000	63000	63000	189000	53671	53667	53662	161000	56000	56000	56000	168000	60668	60661	60670	182000	700000
		OB	4200000	378000	378000	378000	1134000	322000	322000	322000	966000	336000	336000	336000	1008000	364000	364000	364000	1092000	4200000
QTRLY % (COAL)				27				23				24				26				

COAL /OB PROGRAMME 2016 - 2017

YEARLY PRODUCTION PROGRAMME - UNIT-WISE / MONTH-WISE FOR 2016- 2017

Coal : 6.50 LTe. **OB : 37.50 LM3**

Area- EJ Area																		
Year 2016-17													***(Coal in '000 tonnes/OB in '000 cu.m.)***					
Mine	**Grade**	**Apr**	**May**	**Jun**	**1st Qtr.**	**Jul**	**Aug**	**Sep**	**2nd Qtr**	**Oct**	**Nov**	**Dec**	**3rd Qtr**	**Jan**	**Feb**	**Mar**	**4th Qtr**	**Total**
Underground(Dept.)																		
Bhowra N	W-II	3.24	3.78	3.78	**10.80**	3.07	3.07	3.06	**9.20**	2.88	3.36	3.36	**9.60**	3.64	3.12	3.64	**10.40**	**40.00**
Bhowra S	W- III	2.42	2.84	2.84	**8.10**	2.30	2.30	2.30	**6.90**	2.16	2.52	2.52	**7.20**	2.73	2.34	2.73	**7.80**	**30.00**
ASP	W-IV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
Bhutgoria	W-IV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
A/Total-U/G	**Coal Prod.**	**5.66**	**6.62**	**6.62**	**18.90**	**5.37**	**5.37**	**5.36**	**16.10**	**5.04**	**5.88**	**5.88**	**16.80**	**6.37**	**5.46**	**6.37**	**18.20**	**70.00**
Opencast (Dept.)																		
COCP	W-IV	4.86	5.67	5.67	**16.20**	4.60	4.60	4.60	**13.80**	4.32	5.04	5.04	**14.40**	5.46	4.68	5.46	**15.60**	**60.00**
	OB	20.24	23.63	23.63	**67.50**	19.16	19.17	19.17	**57.50**	18.00	21.00	21.00	**60.00**	22.75	19.50	22.75	**65.00**	**250.00**
A/Total-O/C	**Coal**	**4.86**	**5.67**	**5.67**	**16.20**	**4.60**	**4.60**	**4.60**	**13.80**	**4.32**	**5.04**	**5.04**	**14.40**	**5.46**	**4.68**	**5.46**	**15.60**	**60.00**
	OB	**20.24**	**23.63**	**23.63**	**67.50**	**19.16**	**19.17**	**19.17**	**57.50**	**18.00**	**21.00**	**21.00**	**60.00**	**22.75**	**19.50**	**22.75**	**65.00**	**250.00**
A/G.Total (O/C + U/G)	**Coal**	**10.52**	**12.29**	**12.29**	**35.10**	**9.97**	**9.97**	**9.96**	**29.90**	**9.36**	**10.92**	**10.92**	**31.20**	**11.83**	**10.14**	**11.83**	**33.80**	**130.00**
	OB	**20.24**	**23.63**	**23.63**	**67.50**	**19.16**	**19.17**	**19.17**	**57.50**	**18.00**	**21.00**	**21.00**	**60.00**	**22.75**	**19.50**	**22.75**	**65.00**	**250.00**
Hired O.C.P.																		
C-1 Patch	ST-II	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
	OB	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
3pit West	**W-I**				**0.00**				**0.00**				**0.00**				**0.00**	**0.00**
	W-II	25.92	30.24	30.24	**86.40**	24.54	24.53	24.53	**73.60**	23.04	26.88	26.88	**76.80**	29.12	24.96	29.12	**83.20**	**320.00**
	OB	162.00	189.00	189.00	**540.00**	153.33	153.33	153.34	**460.00**	144.00	168.00	168.00	**480.00**	182.00	156.00	182.00	**520.00**	**2000.00**
X-patch	W-IV	16.20	18.90	18.90	**54.00**	15.34	15.33	15.33	**46.00**	14.40	16.80	16.80	**48.00**	18.20	15.60	18.20	**52.00**	**200.00**
	OB	121.50	141.75	141.75	**405.00**	115.00	115.00	115.00	**345.00**	108.00	126.00	126.00	**360.00**	136.50	117.00	136.50	**390.00**	**1500.00**
A/Total (Hired OCP)	**Coal**	**42.12**	**49.14**	**49.14**	**140.40**	**39.88**	**39.86**	**39.86**	**119.60**	**37.44**	**43.68**	**43.68**	**124.80**	**47.32**	**40.56**	**47.32**	**135.20**	**520.00**
	OB	**283.50**	**330.75**	**330.75**	**945.00**	**268.33**	**268.33**	**268.34**	**805.00**	**252.00**	**294.00**	**294.00**	**840.00**	**318.50**	**273.00**	**318.50**	**910.00**	**3500.00**
Departmental + Hired OCP																		
Area Total (Dept+O/S)	**Coal**	**52.64**	**61.43**	**61.43**	**175.50**	**49.85**	**49.83**	**49.82**	**149.50**	**46.80**	**54.60**	**54.60**	**156.00**	**59.15**	**50.70**	**59.15**	**169.00**	**650.00**
	OB	**303.74**	**354.38**	**354.38**	**1012.50**	**287.49**	**287.50**	**287.51**	**862.50**	**270.00**	**315.00**	**315.00**	**900.00**	**341.25**	**292.50**	**341.25**	**975.00**	**3750.00**
QTRLY % (COAL)		27				23				24				26				

COAL /OB PROGRAMME 2015 - 2016

YEARLY PRODUCTION PROGRAMME - UNIT-WISE / MONTH-WISE FOR 2015 - 2016

Coal : 5.28 LTe. **OB : 33.15 LM3**

Area- EJ Area

Year 2015-16 *(Coal in '000 tonnes/OB in '000 cu.m.)*

Mine	Grade	Apr	May	Jun	1st Qtr.	Jul	Aug	Sep	2nd Qtr	Oct	Nov	Dec	3rd Qtr	Jan	Feb	Mar	4th Qtr	Total
Underground(Dept.)																		
Bhowra N	W-II	3.00	3.00	3.00	9.00	3.50	3.50	3.50	10.50	3.50	3.50	3.50	10.50	3.50	3.00	3.50	10.00	40.00
Bhowra S	W- III	2.50	2.50	2.50	7.50	2.50	2.50	2.50	7.50	2.50	2.50	2.50	7.50	2.50	2.50	2.50	7.50	30.00
ASP	W-IV	3.00	3.00	3.00	9.00	3.00	3.00	3.00	9.00	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	20.00
Bhutgoria	W-IV	5.00	5.00	5.00	15.00	5.00	5.00	5.00	15.00	5.00	5.00	5.00	15.00	5.00	5.00	5.00	15.00	60.00
A/Total-U/G	**Coal Prod.**	**13.50**	**13.50**	**13.50**	40.50	**14.00**	**14.00**	**14.00**	42.00	**13.00**	**11.00**	**11.00**	35.00	**11.00**	**10.50**	**11.00**	32.50	150.00
Opencast (Dept.)																		
COCP	W-IV	5.00	5.00	5.00	15.00	5.00	5.00	5.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00
	OB	15.00	15.00	15.00	45.00	15.00	15.00	15.00	45.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.00
BLA Patch	ST-II	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	OB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A/Total-O/C	**Coal**	**5.00**	**5.00**	**5.00**	15.00	**5.00**	**5.00**	**5.00**	15.00	**0.00**	**0.00**	**0.00**	0.00	**0.00**	**0.00**	**0.00**	0.00	30.00
	OB	**15.00**	**15.00**	**15.00**	45.00	**15.00**	**15.00**	**15.00**	45.00	**0.00**	**0.00**	**0.00**	0.00	**0.00**	**0.00**	**0.00**	0.00	90.00
A/G.Total (O/C + U/G)	**Coal**	**18.50**	**18.50**	**18.50**	55.50	**19.00**	**19.00**	**19.00**	57.00	**13.00**	**11.00**	**11.00**	35.00	**11.00**	**10.50**	**11.00**	32.50	180.00
	OB	**15.00**	**15.00**	**15.00**	45.00	**15.00**	**15.00**	**15.00**	45.00	**0.00**	**0.00**	**0.00**	0.00	**0.00**	**0.00**	**0.00**	0.00	90.00
Hired O.C.P.																		
C-1 Patch	ST-II	9.00	9.00	9.00	27.00	8.00	8.00	8.00	24.00	9.00	9.00	9.00	27.00	10.00	8.00	9.00	27.00	105.00
	OB	60.00	60.00	60.00	180.00	65.00	65.00	65.00	195.00	65.00	65.00	65.00	195.00	60.00	60.00	60.00	180.00	750.00
3pit West	**W-I**	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	2.00	2.00	6.00	2.00	2.00	2.00	6.00	14.00
	W-II	10.00	10.00	10.00	30.00	12.00	12.00	10.00	34.00	12.00	11.00	11.00	34.00	11.00	11.00	11.00	33.00	131.00
	OB	100.00	100.00	100.00	300.00	110.00	110.00	110.00	330.00	110.00	110.00	110.00	330.00	100.00	100.00	100.00	300.00	1260.00
X-patch	W-IV	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	3.00	10.00	15.00	28.00	22.00	22.00	25.00	69.00	98.00
	OB	0.00	0.00	0.00	0.00	0.00	0.80	170.00	170.80	170.00	175.00	175.00	520.00	175.00	175.00	175.00	525.00	1215.80
A/Total (Hired OCP)	**Coal**	**19.00**	**19.00**	**19.00**	57.00	**20.00**	**20.00**	**21.00**	61.00	**26.00**	**32.00**	**37.00**	95.00	**45.00**	**43.00**	**47.00**	135.00	348.00
	OB	**160.00**	**160.00**	**160.00**	480.00	**175.00**	**175.80**	**345.00**	695.80	**345.00**	**350.00**	**350.00**	1045.00	**335.00**	**335.00**	**335.00**	1005.00	3225.80
Departmental + Hired OCP																		
Area Total (Dept+O/S)	**Coal**	**37.50**	**37.50**	**37.50**	112.50	**39.00**	**39.00**	**40.00**	118.00	**39.00**	**43.00**	**48.00**	130.00	**56.00**	**53.50**	**58.00**	167.50	528.00
	OB	**175.00**	**175.00**	**175.00**	525.00	**190.00**	**190.80**	**360.00**	740.80	**345.00**	**350.00**	**350.00**	1045.00	**335.00**	**335.00**	**335.00**	1005.00	3315.80
QTRLY % (COAL)		21				22				25				32				

WATER TREATMENT PLANT/ FILTER PLANT

UNDER CLUSTER X, BHARAT COKING COAL LIMITED, DHANBAD

In cluster X (under Eastern Jharia area), there is three nos. of Rapid Gravity Pressure Filter plant of total 1.72 MGD capacity, which is used for supply of water in nearby colonies, houses, quarters. After treatment and filtration, treated water is supplied to nearby residents both employees and non employees peoples.

Effluent analysis is monitored by CMPDIL quarterly and gives environment monitoring report regularly for cluster X of BCCL. This report includes the effluent analysis report, air quality monitoring report, surface & ground water report and noise monitoring report.

Detail of Water Treatment Plant/ Filter Plant in E.J. Area are given below:

Detail of Water Treatment Plant/ Filter Plant in E.J. Area					
S. No.	Location of source of water	Treatment method	Capacity (MGD)	In use (MGD)	Supply of water
1	Sudamdih	Rapid gravity filter	0.8	0.47	Sudamdih colony, Patherdih colony, Patherdih Basti, Patherdih Basti, Supkar Basti, Hattala basti, etc
2	Bhowra	Rapid gravity filter	0.66	0.39	Gaurkhuti, 12 no. basti, 13 no.basti, 35 no. basti; 6 no. dhowra, Manjhi Basti, Gandhi Nagar, 19 no. Basti upar, 19 no. Basti niche, etc.
3	Amlabad	Rapid gravity filter	0.26	0.02	Amlabad colony and nearby basti

Encl.: i. Effluent analysis/ Env. Monitoring report of Q.E. Dec.2016

ii. Photos of different filter plants under cluster X

WATER QUALITY DATA

(*EFFLUENT WATER-FOUR PARAMETERS)*

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

Year : **2016-17.**

Name of the Cluster: **Cluster - X**

Month: **October, 2016.**

Name of the Stations & Code :

1. MW10- Mine Discharge of Bhowrah North

First Fortnight

Sl. No.	Parameters	MW10 (Mine Discharge) 13.10.2016	As per MOEF&CC General Standards for schedule VI
1	Total Suspended Solids	44	*100 (Max)*
2	pH	8.37	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	54	*250 (Max)*

Second Fortnight

Sl. No.	Parameters	MW10 (Mine Discharge) 19.10.2016	As per MOEF&CC General Standards for schedule VI
1	Total Suspended Solids	40	*100 (Max)*
2	pH	8.53	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	48	*250 (Max)*

All values are expressed in mg/lit unless specified.

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

Analysed By

WATER QUALITY DATA

(EFFLUENT WATER-FOUR PARAMETERS)

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

Name of the Cluster: **Cluster - X** Month: **November, 2016.**

Name of the Stations & Code : **1. MW10- Mine Discharge of Bhowrah North**

First Fortnight

Sl. No.	**Parameters**	**MW10** (Mine Discharge) 15.11.2016	**As per MOEF&CC General Standards for schedule VI**
1	Total Suspended Solids	36	*100 (Max)*
2	pH	8.29	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	46	*250 (Max)*

Second Fortnight

Sl. No.	**Parameters**	**MW10** (Mine Discharge) 23.11.2016	**As per MOEF&CC General Standards for schedule VI**
1	Total Suspended Solids	32	*100 (Max)*
2	pH	8.18	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	42	*250 (Max)*

All values are expressed in mg/lit unless specified.

Analysed By

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

WATER QUALITY DATA

(EFFLUENT WATER-FOUR PARAMETERS)

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

Year : **2016-17.**

Name of the Cluster: **Cluster - X**

Month: **December, 2016.**

Name of the Stations & Code :

1. MW10- Mine Discharge of Bhowrah North

First Fortnight

Sl. No.	Parameters	MW10 (Mine Discharge) 12.12.2016	As per MOEF&CC General Standards for schedule VI
1	Total Suspended Solids	28	*100 (Max)*
2	pH	8.81	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	40	*250 (Max)*

Second Fortnight

Sl. No.	Parameters	MW10 (Mine Discharge) 22.12.2016	As per MOEF&CC General Standards for schedule VI
1	Total Suspended Solids	24	*100 (Max)*
2	pH	8.94	*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
JSA/SA/SSA

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

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

PHOTOGRAPHS SHOWING FILTER PLANTS IN CLUSTER X (EASTERN JHARIA AREA), BCCL, DHANBAD

A. Location of Filter Plant

B. Units of Filter Plant

C. Different units of Filter Plant

Fig.1: Sudamdih Filter Plant of Eastern Jharia Area, BCCL

A. Location of Filter Plant

B. Units of Filter Plant

C. Different units of Filter Plant

Fig.2: Amlabad Filter Plant of Eastern Jharia Area, BCCL

A. Location of Filter Plant

B. Units of Filter Plant

C. Different units of Filter Plant

Fig.3: Bhowra Filter Plant of Eastern Jharia Area, BCCL

ANNEXURE - V

STRICTLY RESTRICTED
FOR COMPANY USE ONLY

RESTRICTED

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

GROUNDWATER LEVEL & QUALITY

REPORT

FOR CLUSTER OF MINES, BCCL

(Assessment year - 2016)

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

JHARIA COALFIELD AND RANIGANJ COALFIELD (PART)

(BHARAT COKING COAL LIMITED)

MARCH – 2017

Regional Institute – II

Central Mine Planning & Design Institute Ltd.

(An ISO 9001:2000 Company)
(A Subsidiary of Coal India Ltd.)
Koyla Bhawan Complex, Koyla Nagar
DHANBAD – 826005

DETAILS OF THE REPORT

Sl No.	ITEMS	INFORMATIONS
1	Geographical Area	Jharia Coalfield (JCF): 453 sq. km. Raniganj Coalfield (RCF part): 19.64 sq. km. (Cluster-XVI area only)
2	Major Physiographic Units	Dissected Pediplain with surface Reduced Level (RL) varies from 160 m to 220 m above mean sea level (AMSL) in JCF and 100 m to 140 m AMSL in RCF.
3	Drainage System	Damodar River is the master drainage flowing along western boundary of the JCF. Jamunia River, Khudia River, Katri River, Jarian Nala, Ekra Jore, Kari Jore, Kashi Jore, Chatkari Jore and their tributaries are flowing through the JCF area. Damodar River, Barakar River is the master drainage of the part of RCF area (CV Area).
4	Annual Rainfall	JCF and part of RCF area – 1509 mm (2016) (Dhansar Mine Rescue Station rainfall data)
5	Geological Formations	Gondwana Formation
6	Aquifer System	Top Unconfined/Phreatic Aquifer – average thickness 25 m Semi-confined to confined Aquifer – average thickness 50–200 m
7	Hydrogeological properties	Unconfined Aquifer (Damoda BJ Section & Block-III): Hydraulic Conductivity – upto 0.50 m/day Transmissivity – 10 - 42 m^2/day Semi-confined to confined Aquifer (Sitanala & Kumari Block): Hydraulic Conductivity – 0.0006-1.44 & 0.05-0.0027 m/day Transmissivity – 0.06 – 0.573 m^2/day
8	Groundwater Level Monitoring Network	Out of total 254 no of monitoring stations 64 nos located within core mining area and rest comes within Buffers zone. 60 Nos. of Groundwater monitoring well (Dug Wells) network is established by CMPDI to record groundwater level data in and around the Core Zone of JCF and 4 Nos. of Groundwater monitoring well (Dug Wells) in RCF (CV Area).
9	Groundwater Levels Below Ground Level (bgl)	JCF area: Pre-monsoon – 0.78 to 16.73 m (Avg. 5.64 m bgl) in ‘2016 Post-monsoon – 0.30 to 12.43 m (Avg. 3.19 m bgl) in ‘2016 RCF area (part): Pre-monsoon – 3.61 to 10.65 m (Avg. 6.24 m bgl) in ‘2016 Post-monsoon – 0.90 to 6.50 m (Avg. 3.18 m bgl) in ‘2016
10	Groundwater Quality	Potable
11	Proposed Piezometers	New piezometers (23 nos.) have been proposed to monitor impact of coal mining on groundwater regime within the coalfield area (JCF & part of RCF) for maximum depth upto 290 m to monitor deeper aquifers.

1.0 INTRODUCTION

1.1 CLIMATE, TEMPERATURE & RAINFALL

The Jharia Coalfield (JCF) and part of Raniganj Coalfield (RCF) area in Dhanbad District belongs to sub-humid tropical climatic region. The maximum temperature during summer shoots upto 45^{o} C and falls between 10^{o} C to 5^{o} C in winter. The maximum rainfall occurs during the period between June and September.

The annual rainfall in the area is 1509 mm (Dhansar Mine Rescue Station, 2016) has been considered in year 2016 given in **Annexure-I**. IMD stations nearby the Coalfield area are Dhanbad, Baghmara and Asansol. The mean non-monsoon rainfall in the area is 15% and the monsoon rainfall is 85% of total annual rainfall. Rainfall is the primary source of groundwater recharge.

1.2 GEOMORPHOLOGY

Northern part of the JCF area is covered with hills and thin forest. In general the altitude varies from 160 m above mean sea level (AMSL) in Sudamdih area to 220 m AMSL in Barora area. Pediplains are developed over sedimentary rocks or Gondwana formation consisting of Sandstone, Shale, coal, etc. Dissected pediplains are developed over Gondwana formations found in Jharia, Baghmara, Katras areas etc. However, in RCF (part) areas the altitude varies from 100 m to 140 m AMSL. The general slope of the topography is towards south, i.e. Damodar River.

3.0 GROUNDWATER LEVEL MONITORING

To collect the representative groundwater levels in the study area, CMPDI has established a monitoring network of total 254 monitoring stations out of which 64 located within core zone and rest comes within Buffer zone. 60 dug wells within JCF and 04 dug wells within RCF (part) area (Details of the Hydrograph stations & water level are given in **Annexure-IIA** & **IIB**) spread over the entire BCCL leasehold area, **Figure No-1**. Water level monitoring in 254 hydrograph stations has been done in pre-monsoon as well as in post monsoon whereas in 64 stations monitoring done in quarterly (February, May, August and November month of each year) basis.

Depth to water level of the water table depict the inequalities in the position of water table with respect to ground surface and is useful in delineating recharge / discharge areas, planning of artificial recharge structure and shows the overall status of the groundwater level in the area. Historical groundwater level (GWL) of entire JCF and part of RCF with fluctuation, GWL of Non-mining / Mining areas and GWL of the Cluster of Mines of BCCL are shown in this report to assess the effect of Coal mining activity in the groundwater regime in and around the Coalfield area.

Mining is a dynamic phenomenon. The mining activity creates dis-equilibrium in environmental scenario of the area and disturbs the groundwater conditions/regime in particular. The impact on shallow water regime due to mining activity can be broadly viewed as under:

- Historical GWL with annual fluctuation over the years
- GWL scenario in Non-mining and Mining area (OC/UG mines)
- GWL scenario of Cluster of mines of BCCL

**Construction of piezometers within Jharia Coalfield and part of Raniganj Coalfield to monitor groundwater level of deeper aquifers is already in progress.*

3.3 J Monitoring of Ground Water Levels of Cluster-X

Cluster-X consists of ten coal mines and one coal Washery namely; Bhowrah North mixed mines (UG & OC), Bhowrah South mixed mines (UG, 3 Pit OCP, Chandan OCP), Patherdih Mixed mines (UG, Chandan OCP), Sudamdih incline UG mine, Sudamdih Shaft UG mine, Amlabad UG (Closed) and Sudamdih Coal Washery under the administrative control of Eastern Jharia Area of BCCL. This cluster of mines is located in the eastern part of Jharia Coalfield in Dhanbad district of Jharkhand.

The present leasehold area of Cluster-X is 2057.47 Ha. The area has an undulating topography with gentle slope towards south and south east. The RL varies from 185 m to 150.0 m AMSL. Gaurkuthi Nala and few seasonal streams are controlling the drainage pattern of the area. The area comes under the watershed of Damodar River.

4 hydrograph stations (**A-19, D-35, D-36 and D-77**) are located in the core zone of the mine area. Water level monitoring in these monitoring stations has been done in the months of February, April, August & November‘2016 and the Ground water level data is enclosed in the table below:

Sl No.	Well No.	Location	Water level (bgl in meters)			
			Feb’16	Apr’16	Aug’16	Nov’16
1	A-19	Bhowrah	4.75	8.10	1.35	4.40
2	D-35	Patherdih	7.22	9.52	2.53	6.45
3	D-36	Sudamdih	0.46	0.78	0.25	0.95
4	D-77	Amlabad	3.75	4.60	2.49	2.90
Average WL (bgl)			***4.05***	***5.75***	***1.66***	***3.68***

Ground Water Level (in bgl) varies from 0.46 to 7.22 m during February, 0.78 to 9.52 m during April, 0.25 to 2.53 m during August and 0.95 to 6.45 m during November‘2016 within the Core Zone of Cluster-X area.

4.0 GROUNDWATER LEVEL SCENARIO

During the month of February'2016 the depth to water level (in bgl) within 15 nos Cluster of mines varies from 0.46 m to 12.80 m with an average varies from of 2.04 m to 7.49 m. During the month of April'2016 the depth to water level varies from 0.78 m to 16.73 m with an average varies from 2.94 m to 10.09 m. During the month of August'2016 the depth to water level varies from 0.20 m to 3.58 m with an average varies from 0.68 m to 2.12 m. During the month of November'2016 the depth to water level varies from 0.30 m to 12.43 m with an average varies from 1.76 m to 6.46 m. The summarized water level data of all clusters are given in **Table No – 4**.

Depth to water level (in bgl) values described that water level goes down to maximum 16.73 m during pre-monsoon'2016 and maximum upto 12.43 m during post-monsoon'2016. Un-confined aquifer is affected around 20 m to 30 m maximum close to active opencast mining areas, showing steep gradient towards mine void. Other than that, there is no mining effect in the water level within JCF area and RCF area (part). Historical water level data and hydrograph of permanent observation stations from CGWB shown in **Annexure–III**.

Monitoring groundwater (quantity & quality) to assess the present condition and resource has been done regularly in the coalfield areas. Well hydrographs (**Annexure–III**) are prepared and studied to identify potentially adverse trends so that appropriate action can be taken to protect groundwater resource. According to the hydrograph trend analysis of CGWB monitoring wells, no significant decline trend of water level is noticed in any particular area for the last 10 years within the coalfield area. Regarding quality monitoring, the water sample location map (**Figure No–2**) with collection points details (dug wells) are given in **Annexure–IV**.

Table No–4: Groundwater level data Cluster-wise

Sl. No.	Cluster of BCCL	No. of Monitoring Wells	Water level fluctuation Below ground level (Feb, Apr, Aug & Nov'16)	Formation
1	I	4 nos.	0.40 to 6.45 m	Barakar
2	II	5 nos.	0.50 to 9.36 m	Barakar
3	III	5 nos.	0.35 to 10.33 m	Barakar
4	IV	5 nos.	0.35 to 8.93 m	Barakar
5	V	4 nos.	0.20 to 5.70 m	Barakar
6	VI	2 nos.	0.25 to 4.45 m	Barakar
7	VII	6 nos.	0.20 to 6.55 m	Barakar
8	VIII	4 nos.	0.28 to 11.15 m	Barakar
9	IX	6 nos.	0.45 to 9.40 m	Barakar
10	X	4 nos.	0.25 to 9.52 m	Barakar
11	XI	5 nos.	0.65 to 7.49 m	Barakar & Barren Measure
12	XIII	5 nos.	0.40 to 11.87 m	Raniganj
13	XIV	3 nos.	1.09 to 10.63 m	Raniganj
14	XV	4 nos.	1.09 to 16.73 m	Barakar & Barren Measure
15	XVI	4 nos.	0.53 to 10.65 m	Barakar

5.0 GROUNDWATER QUALITY

The ground water sample of the study area (15 nos. of Cluster of mines, BCCL) have been collected from dug wells and analysed. Fifteen ground water samples (GW-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15 & 16) were analysed quarterly (February, May, August and November'2016) at CMPDI (HQ), Ranchi. The water sampling details are given in **Annexure–IV** and Water sample locations are shown in **Figure No-2**. The water quality data are enclosed in **Annexure–VA, VB, VC and VD**.

The study of the variations in water quality parameters are described below:

During the month of February, May, August and November'2016:

The pH of the groundwater samples varies between 7.56 to 8.26 in February'16, 7.10 to 8.31 in May'16, 6.16 to 8.27 in August'16 and 7.85 to 8.57 in November'16. The pH is within the ISI standards of drinking water except in Cluster-VIII during November'16.

During the month of February, May, August and November'2016:

The mineral constituents dissolved in water constitute the dissolved solids. The total dissolve solids varies from 388 to 910 mg/l in February'16, from 370 to 1070 in May'16, from 320 to 1060 in August'16 and from 276 to 902 in November'2016. The TDS values are above the IS 10500 standards of drinking water.

During the month of February, May, August and November'2016:

During the month of February'16 the alkalinity of the water samples varies from 84 to 372 mg/l and are slightly above the stipulated standard of (200 mg/l) drinking water. The concentrations of calcium in the water samples vary from 40 to 122 mg/l and are slightly above the permissible limit (75 mg/l) of drinking water standards. The total hardness ranges between 156 to 616 mg/l and the value of total hardness in water samples are above the permissible limit (200 mg/l). The sulphate ranges between 66 to 178 mg/l and the value of sulphate in water sample are within the permissible limit (200 mg/l). The Iron, Copper, Manganese, Lead, Zinc and Chromium concentration in the water samples are found to be below the upper ISI limits for drinking water.

During the month of May'16 the alkalinity of the water samples varies from 80 to 504 mg/l and are above the stipulated standard of (200 mg/l) drinking water. The concentrations of calcium in the water samples vary from 42 to 133 mg/l and are slightly above the permissible limit (75 mg/l) of drinking water standards. The total hardness ranges between 176 to 724 mg/l and the value of total hardness in water samples are above the permissible limit (200 mg/l). The sulphate ranges between 52 to 230 mg/l and the value of sulphate in water sample are slightly above the permissible limit (200 mg/l). The Iron, Copper, Manganese, Lead, Zinc and Chromium concentration in the water samples are found to be below the upper ISI limits for drinking water.

During the month of August'16 the alkalinity of the water samples varies from 80 to 432 mg/l and are above the stipulated standard of (200 mg/l) drinking water. The concentrations of calcium in the water samples vary from 46 to 110 mg/l and are slightly above the permissible limit (75 mg/l) of drinking water standards. The total hardness ranges between 172 to 496 mg/l and the value of total hardness in water samples are above the permissible limit (200 mg/l). The sulphate ranges between 60 to 224 mg/l and the value of sulphate in water sample are slightly above the permissible limit (200 mg/l). The Iron, Copper, Manganese, Lead, Zinc and Chromium concentration in the water samples are found to be below the upper ISI limits for drinking water.

During the month of November'16 the alkalinity of the water samples varies from 32 to 408 mg/l and are slightly above the stipulated standard of (200 mg/l) drinking water. The concentrations of calcium in the water samples vary from 34 to 115 mg/l and are slightly above the permissible limit (75 mg/l) of drinking water standards. The total hardness ranges between 120 to 780 mg/l and the value of total hardness in water samples are above the permissible limit (200 mg/l). The sulphate ranges between 41 to 260 mg/l and the value of sulphate in water sample are within the permissible limit (200 mg/l). The Iron, Copper, Manganese, Lead, Zinc and Chromium concentration in the water samples are found to be below the upper ISI limits for drinking water.

7.0 CONSERVATION MEASURES & FUTURE STRATEGY

- BCCL has installed 25 Pressure Filter Plant of total capacity of 4.16 MGD to meet drinking water requirement nearby the area. At present 63 Water Treatment Plants are operational having capacity of 16.16 MGD within Jharia Coalfield area. Further installation of 28 more Pressure Filter Plants with the capacity of 5.84 MGD are in progress.

- BCCL participated in development of low cost technology for drinking water in a CSIR project along with CIMFR, Dhanbad and a pilot plant of 4000 Liters/hour is functional at PB Project site of BCCL. Similar plant has been proposed at other sites of BCCL.

- A scheme entitled 'Scheme for multi-purpose utilization of surplus mine water of Barora Area, Block II and Govindpur Area of BCCL' was prepared with a view to harness the excess water discharge to take care of the persistence problem of water scarcity in the nearby villages. In the scheme, two water reservoirs of capacity 27 MG and 17 MG have been proposed in the non-coal bearing area for storage of 3250 GPM and 2000 GPM surplus mine water which will be fed through pipe line by mine discharge at mines of Barora, Block-II and Govindpur Area.

- Roof-top rainwater harvesting (RWH) will be taken up in the project area using the administrative buildings. 138 no. of quarters having roof-top area of about 14950 sq. m. is already prepared to harvest rainwater and around 13150 cum/annum of water is going to be recharged the nearby groundwater system through RWH structures. Proposal already made to facilitate this kind of RWH structure at suitable locations i.e. Lodna Area, Kusunda Area (Jawahar Nagar, Matkuria, Coal Board Colony), Sijua Area (Nichitpur and Tetulmari Colony) within Jharia Coalfield to augment groundwater recharge.

- After cessation of mining, with plenty rainfall and abundant ground water recharge, the water levels will recoup and attain normalcy. Thus, the impact of mining on groundwater system may be considered as a temporary

phenomenon. The abandoned mine workings (UG) behave as water pool and improves the resources availability in the coalfield area.

- Utilization of treated mine water discharge by both industry and local people in the mine influence area. The excess mine water can be used to recharge groundwater system through connecting pipeline to abandoned dug wells. Utilization of mine water for irrigation use will also enhance the ground water recharge potential through artificial recharge in the area.

- Increase vegetative cover by plantation in the mine area under land amelioration measures. This will contain the surface run-off and increase the groundwater recharge.

- Creation of awareness among workers and local peoples about Rain water harvesting and artificial recharge will be given priority. This aspect is usually covered during the Environmental Week celebrated every year (5 to 12 June).

- Monitoring of water quality of mine water discharge, local River/nala and domestic water source (dug well/hand pump wells) will be continued under routine monitoring (February, May, August & November).

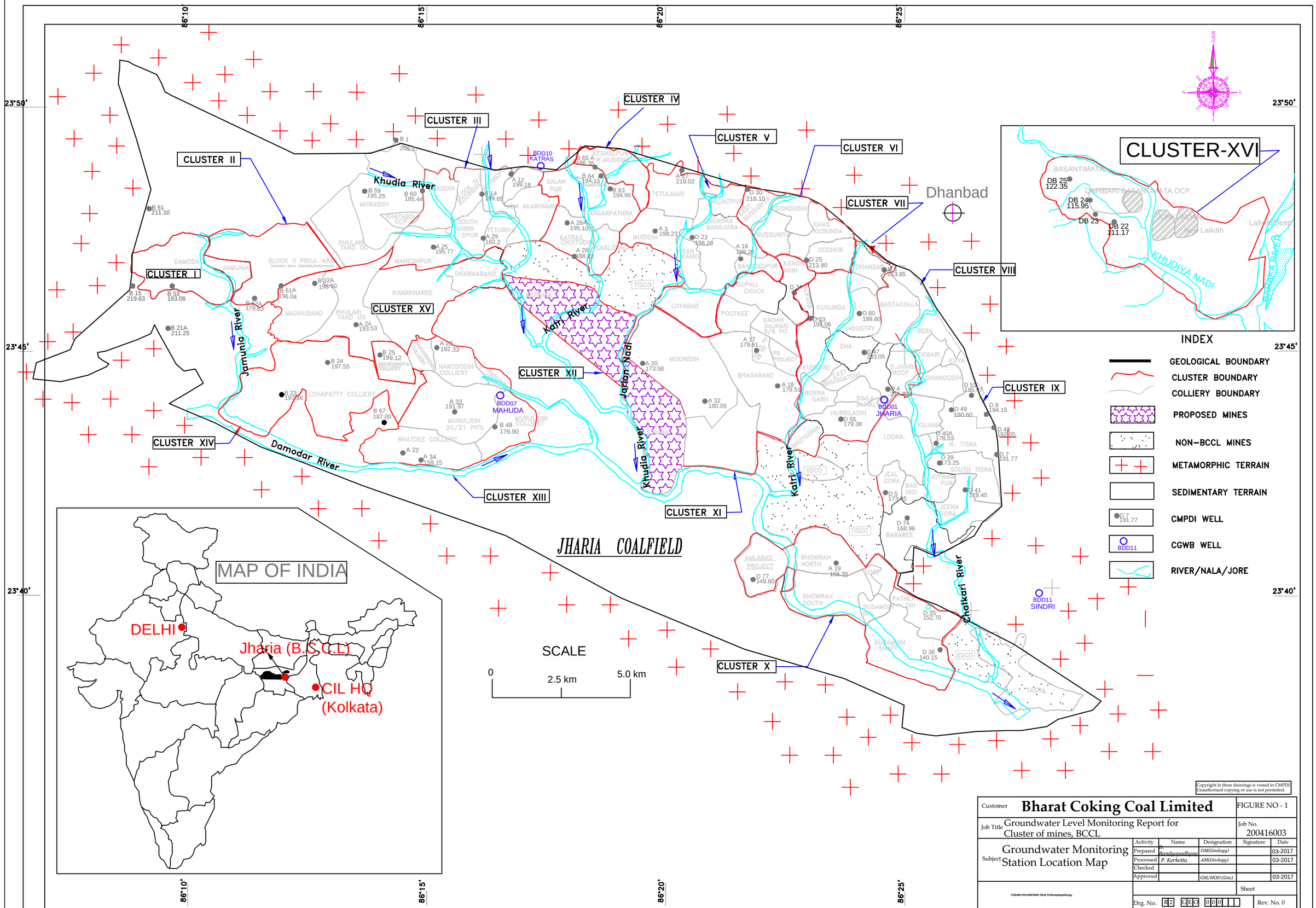
Annexure – IV

GROUNDWATER SAMPLE LOCATION DETAILS

Sampling month: February, May, August & November month of assessment year'2016

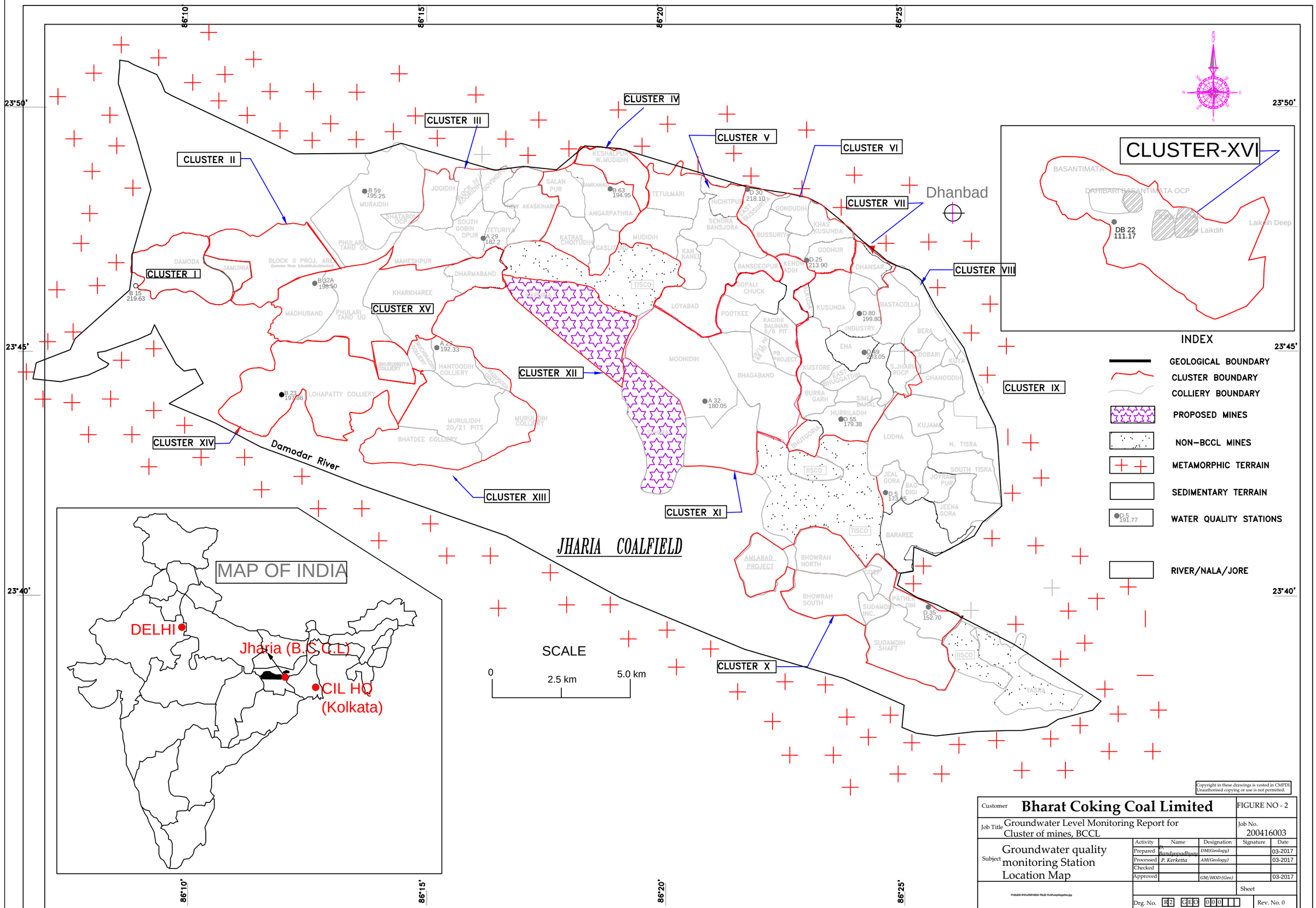
Sl No	Name of Cluster	Ground Water Sample	Dug well (CMPDI)	Location	Sampling Date			
					Feb'16	May'16	Aug'16	Nov'16
1	CLUSTER-I	GW-1	B-15	BERA VILLAGE	28/02	20/05	23/08	23/11
2	CLUSTER-II	GW-2	B-59	KHODOVALY VILLAGE	28/02	20/05	23/08	23/11
3	CLUSTER-III	GW-3	A-29	GOVINDPUR,AMBAGAN VILLAGE	28/02	20/05	23/08	23/11
4	CLUSTER-IV	GW-4	B-63	KESHALPUR, BATIGHAR	28/02	20/05	23/08	28/11
5	CLUSTER-V	GW-5	D-30	BORKIBOA VILLAGE	28/02	20/05	23/08	28/11
6	CLUSTER-VI	GW-6	D-25	GODHUR MORE	28/02	21/05	30/08	28/11
7	CLUSTER-VII	GW-7	D-80	DHANSAR MINE RESCUE STN.	29/02	21/05	30/08	28/11
8	CLUSTER-VIII	GW-8	D-49	NEAR GHANOODIH OC	29/02	21/05	30/08	28/11
9	CLUSTER-IX	GW-9	D-5	JEALGORA, NEAR P.O.	29/02	21/05	30/08	29/11
10	CLUSTER-X	GW-10	D-35	PATHERDIH RLY. COLONY	29/02	21/05	30/08	29/11
11	CLUSTER-XI	GW-11	A-32	MONNIDIH BAZAR	28/02	20/05	24/08	29/11
12	CLUSTER-XIII	GW-13	A-23	MACHHAYARA, BESIDE NH-32	28/02	20/05	24/08	28/11
13	CLUSTER-XIV	GW-14	B-23	LOHAPATTI VILLAGE	28/02	20/05	24/08	28/11
14	CLUSTER-XV	GW-15	B-32A	MADHUBAND VILLAGE	28/02	20/05	24/08	28/11
15	CLUSTER-XVI	GW-16	D-22	DAHIBARI,NICHE BASTI	29/02	21/05	30/08	29/11

GROUNDWATER MONITORING STATION LOCATION MAP



Customer	**Bharat Coking Coal Limited**				FIGURE NO - 1
Job Title	Groundwater Level Monitoring Report for Cluster of mines, BCCL				Job No. 200416003
Subject	Groundwater Monitoring Station Location Map	Activity	Name	Designation	Signature / Date
		Prepared	P. Bandyopadhyay	DM(Geology)	03-2017
		Processed	P. Kerketta	AM(Geology)	03-2017
		Checked			
		Approved		GM/HOD (Geo)	03-2017
					Sheet
		Drg. No.	R2 CES 000		Rev. No. 0

GROUNDWATER QUALITY MONITORING STATION LOCATION MAP



Customer	**Bharat Coking Coal Limited**				FIGURE NO - 2
Job Title	Groundwater Level Monitoring Report for Cluster of mines, BCCL				Job No. 200416003
Subject	Groundwater quality monitoring Station Location Map	Activity	Name	Designation	Signature / Date
		Prepared	P. Bandyopadhyay	DM(Geology)	03-2017
		Processed	P. Kerketta	AM(Geology)	03-2017
		Checked			
		Approved		GM/HOD (Geo)	03-2017
					Sheet
		Drg. No.	R2 CES 000		Rev. No. 0

ANNEXURE – VI (A)

BHARAT COKING COAL LIMITED

CSR BUDGET AND EXPENDITURE for FY 2016-17

Expenditure under CSR for the year 2016-17				
S. No.	CSR Project or Activity identified	Sector in which the project is covered	Amount spent on the projects or programs Sub-heads:(1) Direct Expenditure on projects or programs(2) Overheads: (lakhs)	
			Direct	Overheads
1	Construction of toilets in various school in Paschimi Singhbhum District of Jharkhand.	Eradicating hunger, poverty and malnutrition, promoting health care including preventive health care and sanitation including contribution to Swach Bharat Kosh set-up by the Central Government for the promotion of sanitation and making available safe drinking water	389.32	3.00
2	Construction of toilets in various school in Bokaro District of Jharkhand.	Eradicating hunger, poverty and malnutrition, promoting health care including preventive health care and sanitation including contribution to Swach Bharat Kosh set-up by the Central Government for the promotion of sanitation and making available safe drinking water	8.15	
3	Construction of toilet in various school in Dumka District of Jharkhand.	Eradicating hunger, poverty and malnutrition, promoting health care including preventive health care and sanitation including contribution to Swach Bharat Kosh set-up by the Central Government for the promotion of sanitation and making available safe drinking water	341.96	
4	Construction of toilet in various school in Gumla District of Jharkhand.	Eradicating hunger, poverty and malnutrition, promoting health care including preventive health care and sanitation including contribution to Swach Bharat Kosh set-up by the Central Government for the promotion of sanitation and making available safe drinking water	68.77	
5	Construction of toilet in various schools in Dhanbad District	Eradicating hunger, poverty and malnutrition, promoting health care including preventive health care and sanitation including contribution to Swach Bharat Kosh set-up by the Central Government for the	1.17	

		promotion of sanitation and making available safe drinking water		
6	Construction of toilet in various schools in Simdega District of Jharkhand.	Eradicating hunger, poverty and malnutrition, promoting health care including preventive health care and sanitation including contribution to Swach Bharat Kosh set-up by the Central Government for the promotion of sanitation and making available safe drinking water	132.02	
7	Construction of toilets in various schools in Purbi Singhbhum district of Jharkhand.	Eradicating hunger, poverty and malnutrition, promoting health care including preventive health care and sanitation including contribution to Swach Bharat Kosh set-up by the Central Government for the promotion of sanitation and making available safe drinking water	2.00	
8	Constn. of Toilets in various School in Koderma District of Jharkhand.	Eradicating hunger, poverty and malnutrition, promoting health care including preventive health care and sanitation including contribution to Swach Bharat Kosh set-up by the Central Government for the promotion of sanitation and making available safe drinking water	16.91	
9	SVA LIABILITY	Eradicating hunger, poverty and malnutrition, promoting health care including preventive health care and sanitation including contribution to Swach Bharat Kosh set-up by the Central Government for the promotion of sanitation and making available safe drinking water	737.86	
10	SVA LIABILITY reversed	Eradicating hunger, poverty and malnutrition, promoting health care including preventive health care and sanitation including contribution to Swach Bharat Kosh set-up by the Central Government for the promotion of sanitation and making available safe drinking water	(1,022.52)	
Total			675.63	3.00
Grand Total			**678.63**	

BHARAT COKING COAL LIMITED			
CSR BUDGET AND EXPENDITURE			
Year	**CSR Budget (Rs in lakh)**	**Projects/ Activities**	**Expenditure incurred (In Rs. Lakhs)**
2013-14	3050	Drinking Water/ Water Supply	278
		Education	20
		Infrastructure Development	351.15
		Skill Development	82
		Medical/Healthcare	49
		Others (Uttrakhand Chief Minister Relief fund)	2000
		Total of 2013-14	**2780.15**
2014-15	3080	Drinking Water/ Water Supply & Sanitation	4.69
		Education	2.87
		Infrastructure Development	244.9
		Skill Development	55.73
		Medical/Healthcare	32.55
		Forestry & Environment	73.43
		Others	18.29
		PMNRF	1000
		Total of 2014-15	**1432.46**
2015-16	3300	Drinking Water/ Water Supply & Sanitation	3.33
		Swachh Vidyalaya Abhiyan	5868.51
		Education	17.01
		Infrastructure Development	161.75
		Skill Development	0.12
		Medical/Healthcare	33.06
		Forestry & Environment	2.94
		Conservation of Natural resources	63.76
		Others	13.23
		Transfer of CSR Expenditure spent by BCCL CSR Budget allotted by CIL (CIL the Holding Company has also incurred CSR expenditure to the tune of Rs.10.97 crore through BCCL, which has been borne and accounted for the books of CIL)	-1096.58
		Total of 2015-16	**5067.13**

CSR ACTIVITY PLAN

OF

CLUSTER – X

AS PER

EC CONDITION (SPECIFIC CONDITION-XLII): Details of transportation, CSR, R&R and implementation of environmental action plan for each of the 17 clusters should be brought out in a booklet for and submitted to Ministry.

MAY, 2017

INTRODUCTION

Coal India has adopted CSR as a strategic tool for sustainable growth. For Coal India in the present context, CSR means not only investment of funds for Social Activity but also Integration of Business processes with Social processes. Even much before the issue of CSR became global concern; Coal India was aware of its Corporate Social Responsibility and was fulfilling the aspiration of the Society through well-defined "Community Development Policy" within the periphery of 8 Kms. of the Project sites. This has resulted into a harmonious relationship between Coal India and the peripheral Communities.

Coal India has identified land oustees, PAP and those staying within the radius of 25 Kms of the Project as primary beneficiaries. Poor and needy section of the society living in different parts of India are second beneficiaries. For carrying out CSR activities, 80% of the budgeted amount are be spent within the radius of 25 Km of the Project Site/Mines/Area HQ/Company HQ and 20% of the budget to be spent within the States in which operating.

SCOPE

As per Schedule VII Section 135 of New Companies Act 2013 the following should be the Scope of Activities under Corporate Social Activities:

i. Eradicating hunger, poverty and malnutrition, promoting healthcare including preventive health care and sanitation and making available safe drinking water.
ii. Promoting education, including special education and employment enhancing vocation skills especially among children, women, elderly, and differently able and livelihood enhancement projects;
iii. Promoting gender equality, empowering women, setting up homes and hostels for women and orphans, setting up old age homes, day care centers and such other facilities for senior citizens and measures for reducing inequalities faced by socially and economically backward groups;
iv. Ensuring environmental sustainability, ecological balance, protection of Flora and Fauna, animal welfare, agro-forestry, conservation of natural resources and maintaining quality of soil, air and water;
v. Protection of national heritage, art and culture including restoration of buildings and sites of historical importance and works of art; setting up public libraries, promotion and development of traditional arts and handicrafts;
vi. Measures for the benefit of armed forces veterans, war widows and their dependents
vii. Training to promote rural sports, nationally recognized sports, Paralympics sports and Olympic sports;
viii. Contribution to the Prime Minister's National Relief Fund or any other fund set up by the Central Government for socio-economic development and relief and welfare of the Scheduled Castes, the Scheduled Tribes, other backward classes, minorities and women;
ix. Contributions or funds provided to technology incubators located within academic institutions whichare approved by the Central Government;
x. Rural development projects

SOURCE OF FUND

The fund for the CSR should be allocated based on 2% of the average net profit of the Company for the three immediate preceding financial years or Rs. 2.00 per tone of Coal Production of previous year whichever is higher.

CURRENT STATUS

Healthcare: Annual CSR (Healthcare) Expenditure for the year 2015-16 and 2016-17.

I. Mobile Medical Van (MMV):

S. No.	Year (financial year)	No. of Mobile Medical VanCamp	Beneficiaries	Amount (inRs.)	Remarks
1	2015-16	229	7012	215927.76	Till Dec. 2016

II. General Medical Camps:

S. No.	Year (financial year)	Name of Medical Camp	Beneficiaries	Date
1.	2015-16	Family Planning Camp	33	03.02.2016
2.		Family Planning Camp	40	16.02.2016

Highlights of CSR Work under taken during 2015-16 and 2016-17 at Cluster-X

S. No.	Details	No. of units		Total Amount (in Rs.)	Remarks
		Girls	Boys		
1.	Construction of toilets in various schools in Saraikela-Kharsawan district of Jharkhand under "Swachh Vidyalaya Abhiyaan"under CSR activities of BCCL.	89	89	29,548,000	Work was done by state government.
	Total	178		29,548,000	

PROPOSED STATUS

CSR Work to be under taken during 2017-18 at Cluster- X

S. No.	Details	Remarks
1.	Construction of Marriage/Multipurpose Hall in Mayurdubhi (मयुरदुभी) village in Amai Nagar (आमाई नगर(Panchayat of Block Chandankyari	Proposed activity

*****

BCCL

C.S.R. PERFORMANCE REPORT MONTHWISE
April 2015 to December 2016
BHowrah REGIONAL HOSPITAL. E.J. AREA.

MOBILE MEDICAL VAN.

Date: 29.04.2016

SL.NO.	MONTH	NO.OF.CAMP	NO.OF.BENEFICIARIES	TOTAL EXPENDITURE
1.	April 15	26	1122	₹ 39,171.33
2.	May	25	937	₹ 35,270.12
3.	June	25	941	₹ 32,950.08
4.	July	27	1028	₹ 38,685.08
5.	August	25	1003	₹ 31,288.24
6.	September	26	634	₹ 17,211.73
7.	October	24	443	₹ 7,963.19
8.	November	24	517	₹ 7870.23
9.	December	27	387	₹ 5,517.76
10.	January 16			
11.	February			
12.	March			
	Total ---	229	7012	₹ 2,15,927.76

Dy.C.M.O. I/C
Sudamdih R/ Hospital
E.J.Area.

NAME OF VILLAGES COVERED UNDER CSR/MMV PROGRAMME

E.J. AREA - VILLAGES

1. Bhowrah 19 No. Basti.
2. Parghabad Basti
3. Supker Basti
4. Manjhi Basti.
5. Mohubani Basti.
6. Sheobabudih
7. Bhowrah 7No Basti.
8. Bhowrah 4 No Basti.
9. Bhowrah Jahaj Tand.
10. Thana Basti.
11. Manpur Basti.
12. Amlabad Basti.
13. New Riverside Basti.
14. Gourkhutti Basti.
15. Sawardih Basti
16. Hattala Basti.

Dy.C.M.O. I/C
Sudamdih R/Hospital

65959

FAMILY PLANNING CAMP

E.J.AREA

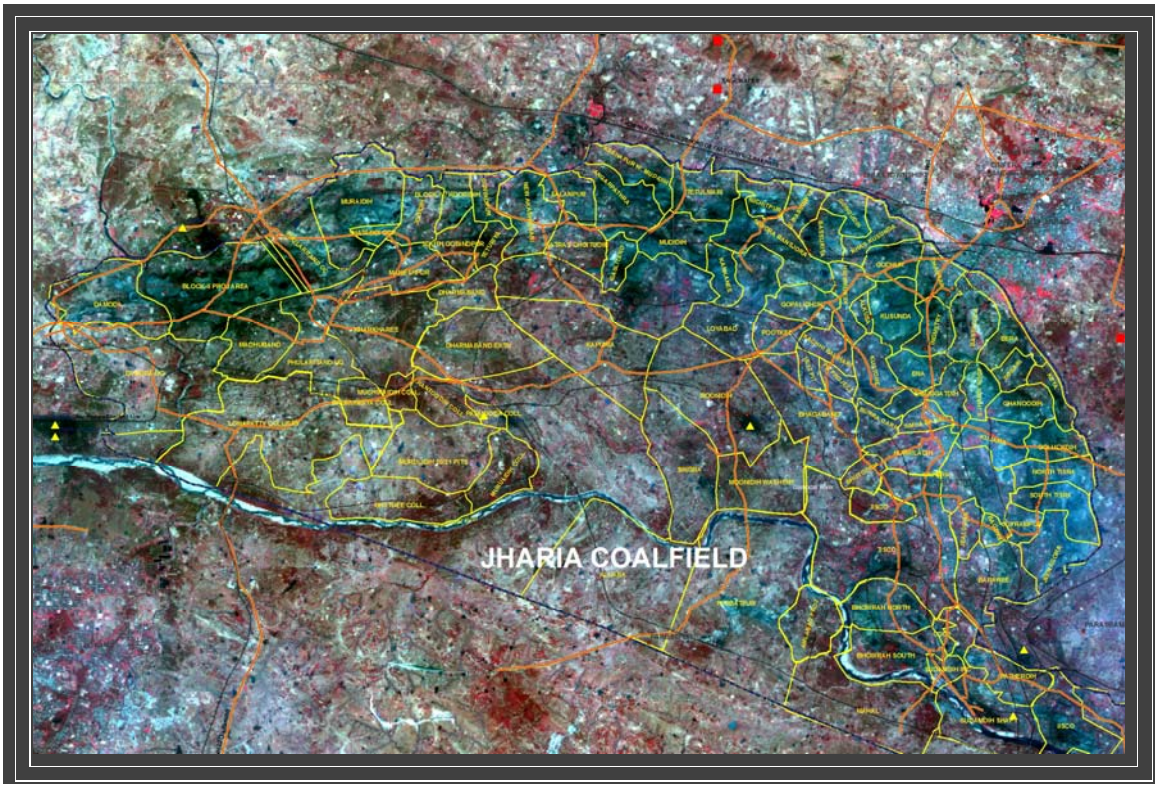
1. Sudamdih R/ Hospital date - 0 3.02.2016. Beneficiaries- 33
2. Bhowrah R/ Hospital date - 16.02.2016 Beneficiaries –40

Dy.C.M.O

Sudamdih R /Hospital

ANNEXURE - VII

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



Submitted to

Bharat Coking Coal Ltd (BCCL)

Dhanbad

March 2017

cmpdi

A Mini Ratna Company

Contents

Chapter 1

Introduction

1.1 Project Reference

To monitor the regional impact of coal mining on land use pattern and vegetation cover in the 28 major coalfields at regular interval of three years based on remote sensing satellite data, Coal India Ltd. issued a work order to CMPDI vide letter no.CIL/WBP/ENV/2011/4706 dated 12.10.12. As the Impact of coal mining on land environment has to be assessed regularly at interval of three years, Geo-environmental data base for Jharia coalfield based on satellite data was prepared earlier in the year 2010, 2012 under the above project. The present study is based on the satellite data of the year 2016. BCCL vide their letter No BCCL/ DGM(Env)/File-/16/276 dated 25.05.2016 requested that the map of each cluster under Jharia Coalfield shall also be incorporated in the report for EC compliance. Therefore cluster-wise land use/cover maps are also included in this report.

1.2 Objective

The objective of the present study is to prepare a regional land use and vegetation cover map of Jharia coalfield on 1:50,000 scale based on satellite data of the year 2016, using digital image processing technique for monitoring the impact of coal mining and other industrial activities on land use and vegetation cover in the coalfield area in period of last three years.

Chapter 3

Land Use/ Vegetation Cover Monitoring

3.1 Introduction

Land is one of the most important natural resource on which all human activities are based. Therefore, knowledge on different type of lands as well as its spatial distribution in the form of map and statistical data is vital for its geospatial planning and management for optimal use of the land resources. In mining industry, the need for information on land use/ vegetation cover pattern has gained importance due to the all-round concern on environmental impact of mining. The information on land use/vegetation cover inventory that includes type, spatial distribution, aerial extent, location, rate and pattern of change of each category is of paramount importance for assessing the impact of coal mining on land use/ cover.

Remote sensing data with its various spectral and spatial resolution offers comprehensive and accurate information for mapping and monitoring of land use/cover pattern, dynamics of changing pattern and trends over a period of time.. By analysing the data of different cut-off dates, impact of coal mining on land use and vegetation cover can be determined.

3.2 Land Use / Vegetation Cover Classification

The array of information available on land use/cover requires be arranging or grouping under a suitable framework in order to facilitate the creation of database. Further, to accommodate the changing land use/vegetation cover pattern, it becomes essential to develop a standardised classification system that is not only

flexible in nomenclature and definition, but also capable of incorporating information obtained from the satellite data and other different sources.

The present framework of land use/cover classification has been primarily based on the '***Manual of Nationwide Land Use/ Land Cover Mapping Using Satellite Imagery***' developed by National Remote Sensing Agency, Hyderabad, which has further been modified by CMPDI for coal mining areas. Land use/vegetation cover map was prepared on the basis of image interpretation carried out based on the satellite data for the year 2016. Following land use/cover classes are identified in the Jharia coalfield region (Table 3.1).

Table 3.1
Land use / Vegetation Cover classes identified in Jharia Coalfield

	LEVEL –I	LEVEL-II
1	Vegetation Cover	3.1 Dense Forest 3.2 Open Forest 3.3 Scrub 3.4 Plantation under Social Forestry 3.5 Plantation on OB Dumps
2	Mining Area	5.1 Coal Quarry 5.2 Barren OB Dump 5.3 Area Under Backfilling 5.4 Coal Dump 5.5 Water Filled Quarry
3	Agricultural Land	2.1 Crop Land 2.2 Fallow Land
4	Wasteland	4.1 Waste upland with/without scrubs 4.2 Slurry Pond 4.3 Sand Body
5	Settlements	1.1 Urban 1.2 Rural 1.3 Industrial
6	Water Bodies	6.1 River/Streams /Reservoir

3.3 Data Analysis of Jharia Coalfiled

Satellite data of the year 2016 was processed using ERDAS Imagine v.2014 image processing s/w in order to interpret the various land use and vegetation cover classes present in the Jharia coalfield. The analysis was carried out for entire coalfield covering about 393 sq. km.

The area of each class was calculated and analysed using *ERDAS Digital Image Processing* s/w and *ArcGIS* s/w. Analysis of land use / vegetation cover pattern in Jharia Coalfield in the year 2016 has been done and details are and shown in table 3.2.

TABLE – 3.2: STATUS OF LAND USE/COVER PATTERN IN JHARIA COALFIELD DURING YEAR 2013 & 2016

LAND USE CLASSES	Year 2013		Year 2016		Change		Reasons for change
SETTLEMENTS	**Area (Km^2)**	**%**	**Area (Km^2)**	**%**	**Area (Km^2)**	**%**	
Urban Settlement	35.05	8.92	35.05	8.92	0.00	0.00	No change
Rural Settlement	3.17	0.81	3.74	0.95	0.57	0.15	Migration of population to mining areas
Industrial Settlement	3.35	0.85	2.29	0.58	-1.06	-0.27	Dismantling of some industrial structures, eg Lodna Washery
Total Settlements	**41.57**	**10.58**	**41.08**	**10.46**	**-0.49**	**-0.12**	
VEGETATION COVER							
FORESTS							
Dense Forest	0.29	0.07	0.29	0.07	0.00	0.00	No Change
Open Forest	8.51	2.16	6.27	1.60	-2.24	-0.56	Minor decrease due to deforestation
Total Forest (A)	**8.8**	**2.23**	**6.56**	**1.67**	**-2.24**	**-0.56**	
SCRUBS							
Scrubs (B)	**122.5**	**31.2**	**105.87**	**26.95**	**-16.63**	**-4.25**	Coversion of UG mines into OC mines, Land with scrubs were used
PLANTATION							
Social forestry	19.41	4.94	19.52	4.97	0.11	0.03	Increase in plantation along roads, creation of ecological resoration parks
Plantation on OB Dump	11.94	3.04	8.59	2.19	-3.35	-0.85	Decrese due to increase in mining activity & conversion of UG mines into OC mines
Total Plantation (C)	**31.35**	**7.98**	**28.11**	7.16	-3.24	-0.82	
Total Vegetation (A+B+C)	**162.65**	**41.4**	**140.54**	**35.77**	**-22.11**	**-5.63**	
MINING AREA							
Coal Quarry	6.98	1.78	11.36	2.89	4.38	1.11	Increase in mining activity
Coal Dump	1.3	0.33	0.23	0.06	-1.07	-0.27	Places where coal dumps were obeserved have been shifted
Quarry filled with water	0.25	0.06	0.77	0.20	0.52	0.13	Minor change in places with water filled quarries
Barren OB Dump	19.06	4.85	12.55	3.19	-6.51	-1.66	Some area under small OB dumps coming under new amalgamated projects
Area Under Backfilling	7.36	1.87	15.62	3.98	8.26	2.10	Due to increase in excavation due to opencast mining activities
Toal Mining Area	**35.22**	**8.97**	**40.53**	**10.32**	**5.31**	**1.35**	
AGRICULTURE							
Crop Lands	3.94	1	3.71	0.94	-0.23	-0.06	Derease due to crop land being converted into fallow land
Fallow Lands	35.85	9.13	40.68	10.36	4.83	1.23	Conversion of scrub land into fallow land
Total Agriculture	**39.79**	**10.13**	**44.39**	**11.30**	**4.60**	**1.17**	
WASTELANDS							
Wastelands	100.05	25.47	113.97	29.01	13.92	3.54	Scrubland converted to wasteland
Ash pond/Slurry/ Tailing Ponds	0.26	0.07	0	0.00	-0.26	-0.07	
Sand Body	1.53	0.39	4.85	1.23	3.32	0.85	Temporal change over period
Total Wastelands	**101.84**	**25.92**	**118.82**	**30.25**	**16.98**	**4.32**	
WATERBODIES							
River, Lakes, Nallas, ponds, etc	11.78	3	7.48	1.90	-4.30	-1.09	Temporal change over period
TOTAL	**392.85**	**100**	**392.85**	**100.00**	**0.00**	**0.00**	

Table-3.8

(Area in Hectare)

		CLUSTER I		CLUSTER II		CLUSTER III		CLUSTER IV		CLUSTER V		CLUSTER VI		CLUSTER VII		CLUSTER VIII		CLUSTER IX		CLUSTER X		CLUSTER XI		CLUSTER XII		CLUSTER XIII		CLUSTER XIV		CLUSTER XV		TOTAL	
		Area	%	Area	%	Area	%	Area	%																					Area	%	Area	%
FORESTS	Dense Forest	14.56	2.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.56	0.06
	Open Forest	15.11	2.43	0.00	0.00	32.73	2.11	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.02	0.00	0.00	0.00	0.00	65.50	3.16	0.00	0.00	0.00	0.00	172.73	9.23	0.00	0.00	63.05	3.46	349.50	1.38
	Total Forest	29.67	4.77	0.00	0.00	32.73	2.11	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.02	0.00	0.00	0.00	0.00	65.50	3.16	0.00	0.00	0.00	0.00	172.73	9.23	0.00	0.00	63.05	3.46	364.06	1.44
SCRUBS	Scrubs	182.00	29.24	233.14	10.31	274.77	17.70	87.26	7.04	237.06	13.74	63.71	7.66	301.39	14.59	117.43	8.82	275.34	14.00	482.12	23.25	1470.72	40.79	256.27	29.60	583.41	31.19	494.37	34.86	610.87	33.58	5669.86	22.45
PLANTATION	Social Forestry	16.60	2.67	150.07	6.64	110.03	7.09	82.10	6.62	60.01	3.48	33.83	4.07	99.35	4.81	12.99	0.97	163.31	8.30	136.29	6.57	269.08	7.46	24.30	2.81	125.11	6.69	54.94	3.87	138.17	7.59	1476.18	5.85
	Plantation on OB Dump	47.32	7.60	105.98	4.69	23.17	1.49	38.25	3.08	20.80	1.21	21.03	2.53	20.08	0.97	23.80	1.79	30.68	1.56	92.78	4.47	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	424.01	1.68
	Plantation on Backfill	10.65	1.71	81.89	3.62	12.96	0.83	0.01	0.00	30.64	1.78	31.36	3.77	60.62	2.93	33.98	2.55	57.92	2.94	44.31	2.14	1.18	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	365.52	1.45
	Total Plantation *(Biological Reclamation)*	74.57	11.98	337.94	14.95	146.16	9.41	120.36	9.70	111.45	6.47	86.22	10.37	180.05	8.71	70.77	5.31	251.91	12.80	273.38	13.18	270.38	7.50	24.30	2.81	125.11	6.69	54.94	3.87	138.17	7.59	2265.71	8.97
	Total Vegetation	286.24	45.99	571.08	25.26	453.66	29.22	207.62	16.74	348.51	20.21	149.93	18.03	481.82	23.32	188.20	14.13	527.25	26.80	821.00	39.59	1741.10	48.29	280.57	32.41	881.25	47.11	549.31	38.73	812.09	44.63	8299.63	32.87
ACTIVE MINING	Coal Quarry	11.60	1.86	148.85	6.58	82.36	5.30	178.26	14.37	117.63	6.82	57.63	6.93	86.60	4.19	180.71	13.57	112.86	5.74	31.34	1.51	34.83	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1042.67	4.13
	Coal Face	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Coal Dump	0.00	0.00	9.32	0.41	1.94	0.13	0.62	0.05	1.03	0.06	0.65	0.08	2.99	0.14	3.13	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.68	0.08
	Advance Quarry Site	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Quarry Filled With Water	7.30	1.17	20.45	0.91	13.26	0.85	0.00	0.00	8.62	0.50	1.18	0.14	4.13	0.20	0.70	0.05	4.82	0.25	3.68	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	64.14	0.25
	Total Area under *Active Mining*	18.90	3.03	178.62	7.90	97.56	6.28	178.88	14.42	127.28	7.38	59.46	7.15	93.72	4.53	184.54	13.85	117.68	5.99	35.02	1.69	34.83	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1126.49	4.46
RECLAIMED	Barren OB Dump	16.32	2.62	194.48	8.60	93.67	6.03	181.14	14.61	150.31	8.72	64.88	7.80	81.38	3.94	112.23	8.42	135.88	6.91	94.20	4.54	18.22	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1142.71	4.53
	Area Under Backfilling	28.54	4.58	393.74	17.42	77.77	5.01	66.69	5.38	181.89	10.55	99.13	11.92	312.89	15.15	162.24	12.18	106.51	5.41	107.49	5.18	18.20	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1555.09	6.16
	Total Area under *Technical Reclamation*	44.86	7.20	588.22	26.02	171.44	11.04	247.83	19.99	332.20	19.27	164.01	19.72	394.27	19.09	274.47	20.60	242.39	12.32	201.69	9.72	36.42	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2697.80	10.68
	Total Area under Mine Operation	63.76	10.23	766.84	33.92	269.00	17.32	426.71	34.41	459.48	26.65	223.47	26.87	487.99	23.62	459.01	34.45	360.07	18.31	236.71	11.41	71.25	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3824.29	15.15
WASTELAND	Waste Lands	133.62	21.47	624.95	27.65	503.68	32.44	350.38	28.25	585.22	33.93	318.55	38.29	528.08	25.56	415.58	31.20	683.07	34.72	404.11	19.48	917.12	25.44	275.00	31.76	705.27	37.71	504.15	35.55	640.16	35.19	7588.94	30.05
	Sand Body	10.66	1.71	4.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.55	4.85	7.03	0.19	0.00	0.00	22.18	1.18	42.35	2.99	0.00	0.00	186.77	0.74
	Total Wasteland	144.28	23.18	628.95	27.83	503.68	32.44	350.38	28.25	585.22	33.93	318.55	38.29	528.08	25.56	415.58	31.20	683.07	34.72	504.66	24.33	924.15	25.63	275.00	31.76	727.45	38.89	546.50	38.54	640.16	35.19	7775.71	30.79
WATERBODIES	Reservoir, nallah, ponds	14.75	2.37	20.39	0.90	14.71	0.95	8.82	0.71	5.45	0.32	8.97	1.08	13.55	0.66	8.11	0.61	16.01	0.81	126.31	6.09	33.20	0.92	19.37	2.24	25.94	1.39	18.24	1.29	19.94	1.09	353.76	1.40
	Total Waterbodies	14.75	2.37	20.39	0.90	14.71	0.95	8.82	0.71	5.45	0.32	8.97	1.08	13.55	0.66	8.11	0.61	16.01	0.81	126.31	6.09	33.20	0.92	19.37	2.24	25.94	1.39	18.24	1.29	19.94	1.09	353.76	1.40
AGRICULTURE	Crop Lands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.88	0.40	0.00	0.00	39.16	1.89	16.12	1.21	0.31	0.02	19.11	0.92	94.10	2.61	2.90	0.33	60.45	3.23	6.88	0.48	6.51	0.36	252.42	1.00
	Fallow Lands	91.85	14.76	77.09	3.41	58.05	3.74	53.69	4.33	40.02	2.32	1.02	0.12	20.38	0.99	65.11	4.89	42.59	2.16	62.64	3.02	323.90	8.98	254.61	29.40	93.18	4.98	224.53	15.83	211.56	11.63	1620.22	6.42
	Total Agriculture	91.85	14.76	77.09	3.41	58.05	3.74	53.69	4.33	46.90	2.72	1.02	0.12	59.54	2.88	81.23	6.10	42.90	2.18	81.75	3.94	418.00	11.59	257.51	29.73	153.63	8.21	231.41	16.31	218.07	11.99	1872.64	7.42
SETTLEMENTS	Urban Settlement	0.00	0.00	163.66	7.24	243.23	15.67	192.99	15.56	269.93	15.65	113.08	13.59	475.46	23.02	169.76	12.75	332.56	16.91	243.91	11.76	375.11	10.40	23.83	2.75	26.10	1.40	0.00	0.00	83.80	4.61	2713.42	10.75
	Rural Settlement	20.73	3.33	24.84	1.10	8.33	0.54	0.00	0.00	0.00	0.00	0.00	0.00	1.35	0.07	0.00	0.00	0.00	0.00	41.47	2.00	12.11	0.34	9.64	1.11	54.28	2.90	72.37	5.10	42.38	2.33	287.50	1.14
	Industrial Settlement	0.87	0.14	7.69	0.34	1.87	0.12	0.00	0.00	9.03	0.52	16.81	2.02	17.90	0.87	10.06	0.76	5.36	0.27	18.27	0.88	30.76	0.85	0.00	0.00	1.82	0.10	0.42	0.03	2.86	0.16	123.72	0.49
	Total Settlement	21.60	3.47	196.19	8.68	253.43	16.33	192.99	15.56	278.96	16.17	129.89	15.61	494.71	23.96	179.82	13.51	337.92	17.18	303.65	14.64	417.98	11.59	33.47	3.86	82.20	4.40	72.79	5.13	129.04	7.10	3124.64	12.37
	Grand Total	622.48	100.00	2260.54	100.00	1552.53	100.00	1240.21	100.00	1724.52	100.00	831.83	100.00	2065.69	100.00	1331.95	100.00	1967.22	100.00	2074.08	100.00	3605.68	100.00	865.92	100.00	1870.47	100.00	1418.25	100.00	1819.30	100.00	25250.67	100.00

Chapter 4

Conclusion & Recommendations

4.1 Conclusion

In the present study, land use/ vegetation cover mapping has been carried out based on IRS-R2/ L4FMX satellite data of January, 2016 in order to monitor the impact of coal mining on land environment which may helps in formulating the mitigation measures required, if any.

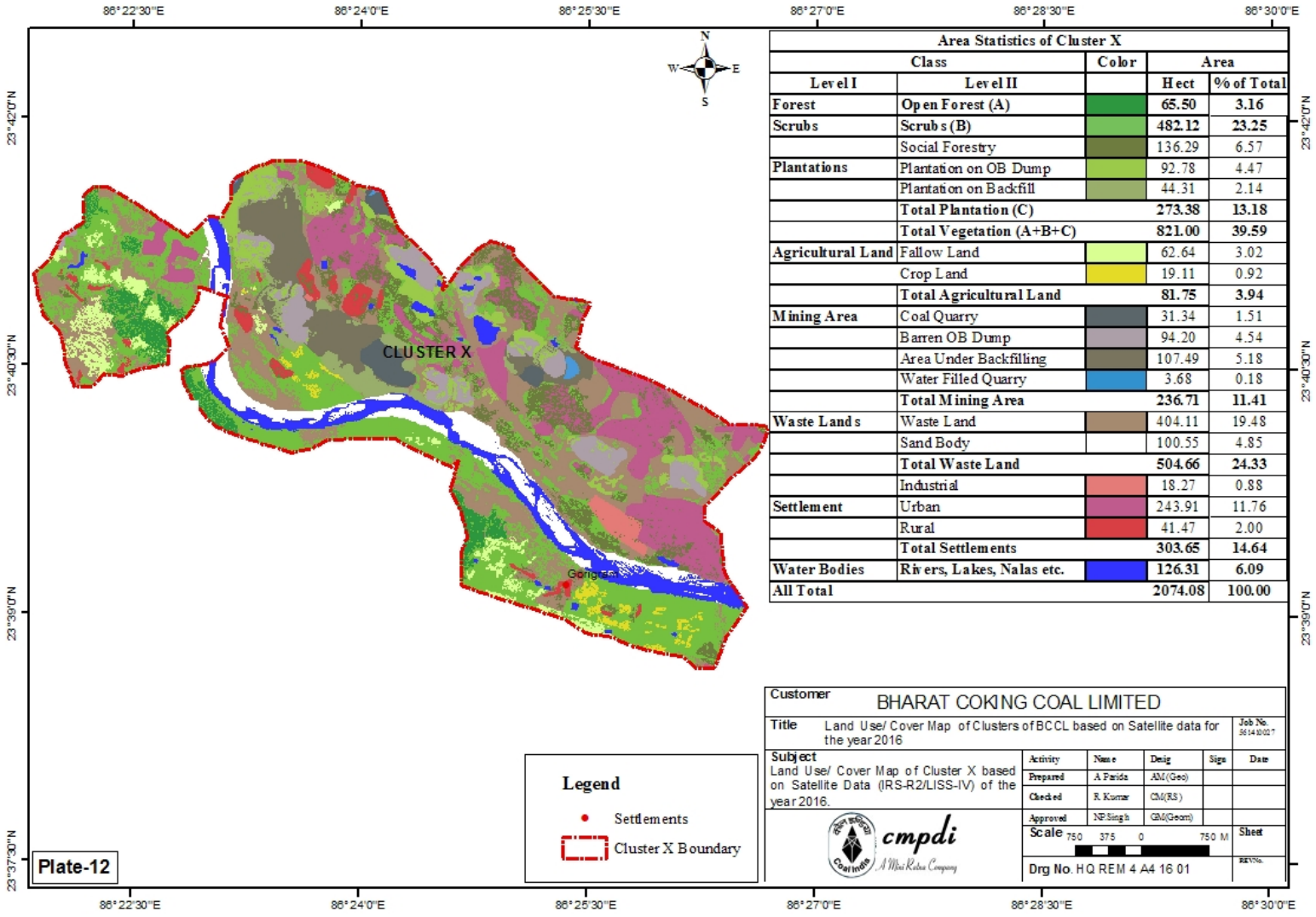
Study reveals that the total area of settlements which includes urban, rural and industrial settlements in the Jharia coalfields covers 41.08 km^2 (10.45%) area. There is a decrease in settlements by 0.49 sq km over the 2013 study primarily because dismantling of some industrial establishments. Vegetation cover which includes dense forests, open forests, scrubs, avenue plantation & plantation on over-burden dumps, covers an area of 140.54 km^2 (35.78%). As compared to 2013 study there is a decrease in overall vegetation cover by 22.11 sq km (5.62%) this is mainly because there is a reduction in scrubs areas. Area of scrubs has decreased by 16.63 sq km. because of its use in opencast mines and use of scrub land for agriculture. The analysis further indicates that total agricultural land which includes both crop and fallow land covers an area of 44.39km^2 (11.31%) has increased 4.60 sq km (1.19%) from that was in 2013. The increase in 4.60 sq km is due to some scrubland getting converted into agricultural land. The mining area which includes coal quarry, advance quarry site, barren OB dump, area under backfilling, covers 40.53 km^2 (10.32%). There is a significant increase in areas under mining operations because large areas have now been taken up for Open cast mining in BCCL. As compared to 2013 there is an increase of 5.31 sq km (1.35%) in the areas under mining operation. Wasteland covers 118.82 km^2

(30.24%). Waste lands have increased because some scrubland has been converted to wasteland. Surface water bodies covered area of 7.48 km^2 (1.90).

The detail statistical analysis is given under Table-3.2.

4.2 Recommendations

It is essential to maintain the ecological balance for sustainable development of the area together with coal mining in Jharia Coalfield. It is recommended that land reclamation of the mining area should be taken up on top priority by BCCL. Such studies should be carried out regularly to assess the impact of coal mining on land use pattern and vegetation cover in the coalfield to formulate and take remedial measures, if any, required for mitigating the adverse impact of coal mining on land environment. Regional study will also be helpful in assessing the environmental degradation / up gradation carried out by different industries operating in the coalfield area.



Area Statistics of Cluster X				
Class		Color	Area	
Level I	Level II		Hect	% of Total
Forest	Open Forest (A)		65.50	3.16
Scrubs	Scrubs (B)		482.12	23.25
	Social Forestry		136.29	6.57
Plantations	Plantation on OB Dump		92.78	4.47
	Plantation on Backfill		44.31	2.14
	Total Plantation (C)		273.38	13.18
	Total Vegetation (A+B+C)		821.00	39.59
Agricultural Land	Fallow Land		62.64	3.02
	Crop Land		19.11	0.92
	Total Agricultural Land		81.75	3.94
Mining Area	Coal Quarry		31.34	1.51
	Barren OB Dump		94.20	4.54
	Area Under Backfilling		107.49	5.18
	Water Filled Quarry		3.68	0.18
	Total Mining Area		236.71	11.41
Waste Lands	Waste Land		404.11	19.48
	Sand Body		100.55	4.85
	Total Waste Land		504.66	24.33
	Industrial		18.27	0.88
Settlement	Urban		243.91	11.76
	Rural		41.47	2.00
	Total Settlements		303.65	14.64
Water Bodies	Rivers, Lakes, Nalas etc.		126.31	6.09
All Total			2074.08	100.00

Customer: BHARAT COKING COAL LIMITED

Title: Land Use/ Cover Map of Clusters of BCCL based on Satellite data for the year 2016

Job No. 561410027

Subject: Land Use/ Cover Map of Cluster X based on Satellite Data (IRS-R2/LISS-IV) of the year 2016.

Activity	Name	Desig	Sign	Date
Prepared	A Parida	AM (Geo)		
Checked	R. Kumar	CM(RS)		
Approved	NP Singh	GM(Geom)		

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Scale 750 375 0 750 M

Sheet

Drg No. HQ REM 4 A4 16 01

REV No.

86°10'0"E
86°15'0"E
86°20'0"E
86°25'0"E
23°45'0"N
23°40'0"N
23°35'0"N
N
Cluster I
Cluster II
Cluster III
Cluster IV
Cluster V
Cluster VI
Cluster VII
Cluster VIII
Cluster IX
Cluster X
Cluster XI
Cluster XII
Cluster XIII
Cluster XIV
Cluster XV
Legend
Coal washeries
Eco restoration park
Settlements
Stream
Road
Railway line
Block boundary
Cluster boundary
Jharia coalfiled boundary
Customer
BHARAT COKING COAL LIMITED
Title
Vegetation Cover Map of Jharia Coalfield based on Satellite data for the year 2016
Job No. 561410027
Subject
FCC of Jharia Coalfield based on Satellite Data (IRS-R2/LISS-IV) of the year 2016.
Activity | Name | Desig | Sign | Date
Prepared | A. Parida | AM (Geo)
Checked | R. Kumar | CM(RS)
Approved | NP.Singh | GM(Geom)
cmpdi
A Mini Ratna Company
Coal India
Scale
2 1 0 2 Km
Sheet
REV.No.
Drg No. HQ REM 4 A1 16 01
Coalfield boundary is as per map provided by BCCL


86°10'0"E
86°15'0"E
86°20'0"E
86°25'0"E
23°45'0"N
23°40'0"N
23°35'0"N
N
Cluster I
Cluster II
Cluster III
Cluster IV
Cluster V
Cluster VI
Cluster VII
Cluster VIII
Cluster IX
Cluster X
Cluster XI
Cluster XII
Cluster XIII
Cluster XIV
Cluster XV
Damodar River
Jamunia River
Katri River
Dugda
Dugda 1 Washery
Dugda II Washery
Madhuband Washery
Patherdih Washery
Bhojudih Washery
Dhanbad
CIMFR
ISM
Koyla Nagar (BCCL)
Jharia
Block II proj.area
Phularitand OC
Shatabdi OCP
Muraidih
Lodna
Kusunda
Bera
Dobari
Patherdih
Bhowrah north
Bhowrah south
Sudamdih
Jeenagora
Joyrampur
Moonidih
Moonidih washery
Tetulmari
Nichitpur
Gondudih
Sendrabansjora
Kankanee
Godhur
Dhansar
Industry
Kustore
Bhagaband
Burragarh
Bhutgoria
Alkusa
Kujama
Goluckdih
Ghanoodih
Kesalpur west mudidih
Govindpur
Salanpur
Angarpatha
Katrasgarh
Gaslitand
Loyabad
Bansdeopur
Kendwadih
Gopalichuck
Pootkee
Bararee
Alamnagar
Jealgora
Bagdigi
Mahuda
Nudkhurkee
Kesargarh
Damoda Eco Rest Park
Barora
Dumra
Katras
Tundu
Teturiya
Madhuban

Area Statistics				
Class		**Color**	**Area**	
Level I	**Level II**		**Sq km**	**% of Total**
Forest	Dense Forest		0.29	0.07
	Open Forest		6.27	1.60
	Total Forest (A)		**6.56**	**1.67**
Scrubs	**Scrubs (B)**		**105.87**	**26.95**
	Social Forestry		19.52	4.97
Plantations	Plantation on OB Dump		4.91	1.25
	Plantation on Backfill		3.68	0.94
	Total Plantation (C)		**28.11**	**7.16**
	Total Vegetation (A+B+C)		**140.54**	**35.78**
Agricultural Land	Fallow Land		40.68	10.36
	Crop Land		3.71	0.95
	Total Agricultural Land		**44.39**	**11.31**
Mining Area	Coal Quarry		11.36	2.89
	Coal Dump		0.23	0.06
	Barren OB Dump		12.55	3.20
	Barren Backfilled Area		15.62	3.97
	Water Filled Quarry		0.77	0.20
	Total Mining Area		**40.53**	**10.32**
Waste Lands	Waste Land		113.97	29.01
	Sand Body		4.85	1.23
	Total Waste Land		**118.82**	**30.24**
	Industrial		2.29	0.58
Settlement	Urban		35.05	8.92
	Rural		3.74	0.95
	Total Settlements		**41.08**	**10.45**
Water Bodies	**Rivers, Lakes, Nalas etc.**		**7.48**	**1.90**
All Total			**392.85**	**100.00**

Legend

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

Customer BHARAT COKING COAL LIMITED

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

Job No. 561410027

Subject
Land Use/ Vegetation Cover Map of Jharia Coalfield based on Satellite Data (IRS-R2/LISS-IV) of the year 2016.

Activity	Name	Desig	Sign	Date
Prepared	A. Parida	AM (Geo)		
Checked	R. Kumar	CM(RS)		
Approved	NP.Singh	GM(Geom)		

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Coal India

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Sheet

REV No.

Drg No. HQ REM 4 A1 16 02

Coalfield boundary is as per map provided by BCCL

ANNEXURE - VIII

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

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

(FOR THE Q.E. DECEMBER, 2016)

E. C. no. J-11015/380/2010-IA.II (M) dated 06.02.2013.

March, 2017

CMPDI
ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

CLUSTER - X

(FOR THE Q.E. December, 2016)

CONTENTS

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) Bhowrah North (A14): Industrial Area

The location of the sampling station is 23º40.977' N 86º23.963'E. The sampler was placed at an elevated platform of around 1.5m height from ground level at Guest House of EJ Area. The station was selected to represent the impact of mining activities of Eastern Jharia area, Coal washery, poor roads condition, heavy public traffic, burning of coal by the surrounding habitants.

ii) Sudamdih Washery (A15): Industrial Area

The location of the sampling station is 23^0 39'32" N 86^0 26'13" E. The sampler was placed at elevated platform of around 1.5m height from ground level at Coal lab near washery. The station was selected to represent the impact of mining activities of Eastern Jharia area, Washery, poor roads condition.

II. BUFFER ZONE Monitoring Location

i) Jeenagora (A13): Industrial Area

The location of the sampling station is 23^0 42. 536' N & 86^0 24. 664' E. The sampler was placed elevated platform of around 1.5m height from ground level at Safety 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 92 to 116 µg/m^3
In **buffer zone** in **Industrial area** varies from 88 to 90 µg/m^3

Particulate Matter $PM_{2.5}$

In **core zone** under **Industrial area** varies from 48 to 55 µg/m^3
In **buffer zone** in **Industrial area** varies from 32 to 55 µg/m^3

Sulphur Dioxide:

In **core zone** under **Industrial area** varies from 10 to 11 µg/m^3
In **buffer zone** in **Industrial area** varies from 12 to 15 µg/m^3

Oxides of Nitrogen:

In **core zone** under **Industrial area** varies from 27 to 30 µg/m^3
In **buffer zone** in **Industrial area** varies from 23 to 27 µg/m^3

AMBIENT AIR QUALITY DATA

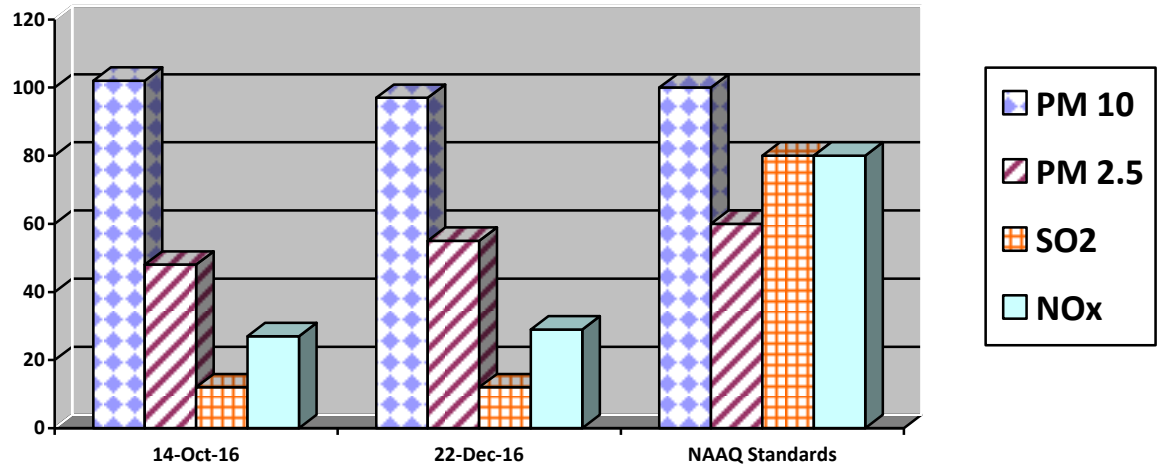
Name of the Company: **Bharat Coking Coal limited** Year : **2016-17.**
Name of the Cluster : **Cluster – X** Q.E.: **December, 2016**

Station Code/Name: (a) A14 Bhowrah North **Category: Industrial.**
(b) A15 Sudamdih Washery

ZONE: Core

(a). Station Code/Name: A14- Bhowrah North Category: Industrial[1].

Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	14 - Oct - 16	102	48	12	27
2	22 - Dec -16	97	55	12	29
NAAQ Standards		100	60	80	80



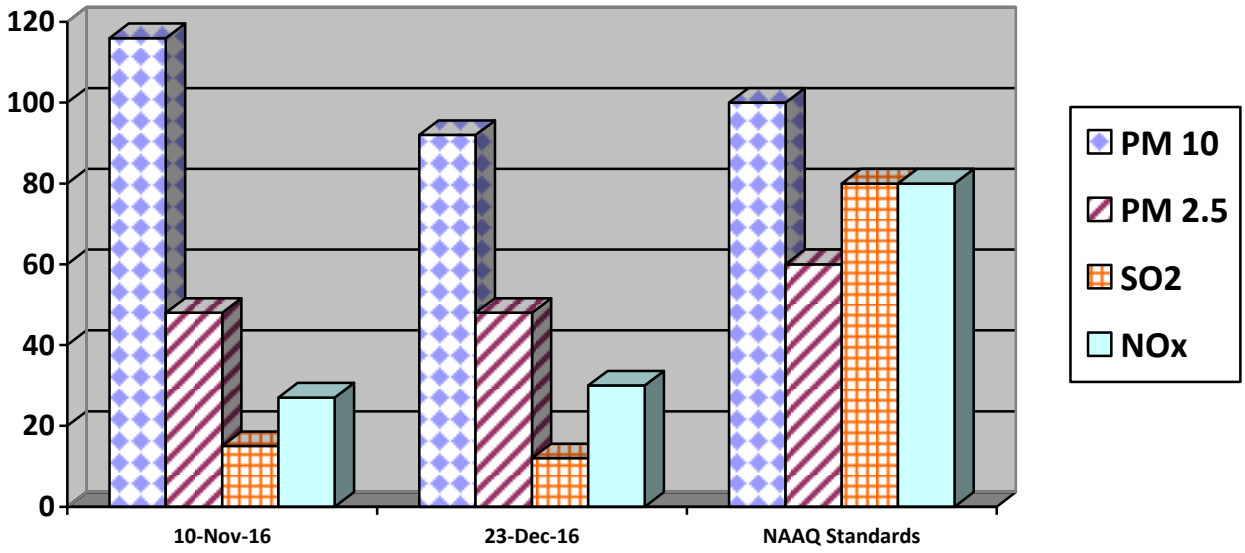
Note:

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

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

(b). Station Code/Name: A15- Sudamduh Washery Category: Industrial[2].

Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	10 - Nov - 16	116	48	15	27
2	23 - Dec -16	92	48	12	30
NAAQ Standards		100	60	80	80



Note:

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

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

AMBIENT AIR QUALITY DATA

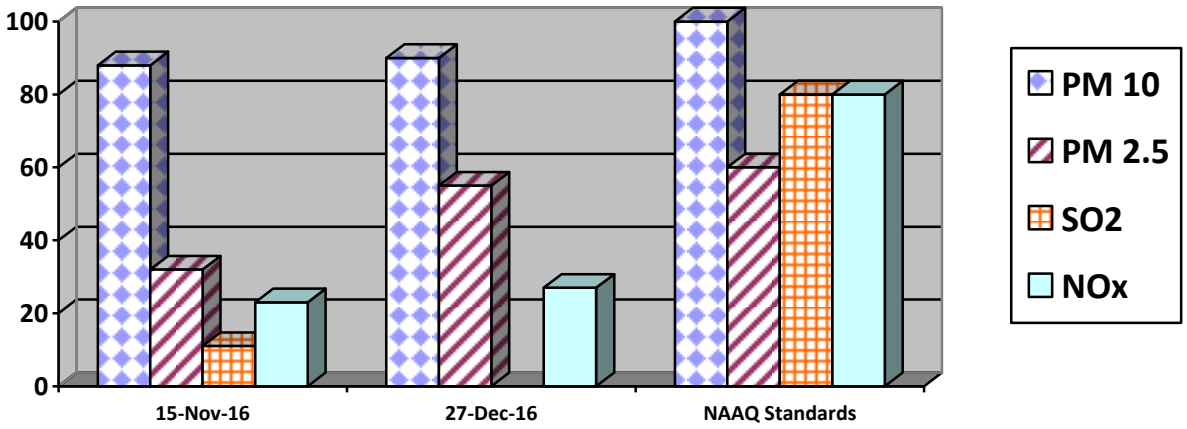
Name of the Company: **Bharat Coking Coal limited** Year : **2016-17.**
Name of the Cluster : **Cluster – X** Q.E.: **December, 2016**

Station Code/Name: (a) A13 Jeenagora **Category: Industrial.**

ZONE: BUFFER

(a). Station Code/Name: A13 – Jeenagora, Category: Industrial[3].

Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_X
1	15 - Nov - 16	88	32	11	23
2	27 - Dec -16	90	55	<10	27
	NAAQ Standards	100	60	80	80



Note:

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

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

CHAPTER – III

WATER QUALITY MONITORING

3.1 Location of sampling sites

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

i) **Mine Discharge of Bhowrah North (MW10)**
A sampling point is fixed to assess the effluent quality of Mine discharge. This location is selected to monitor effluent discharge in to Kashi jore.

ii) Drinking Water quality at **Bhowrah North (GW10)**

iii) Surface Water quality at **U/S of Damodar River (SW21)**

iv) Surface Water quality at **D/S of Damodar River (SW22)**

3.2 Methodology of sampling and analysis

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

3.3 Results & Interpretations

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

WATER QUALITY DATA

(*EFFLUENT WATER-FOUR PARAMETERS)*

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

Year : **2016-17.**

Name of the Cluster: **Cluster - X**

Month: **October, 2016.**

Name of the Stations & Code :

1. MW10- Mine Discharge of Bhowrah North

First Fortnight

Sl. No.	Parameters	MW10 (Mine Discharge) 13.10.2016	As per MOEF&CC General Standards for schedule VI
1	Total Suspended Solids	44	*100 (Max)*
2	pH	8.37	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	54	*250 (Max)*

Second Fortnight

Sl. No.	Parameters	MW10 (Mine Discharge) 19.10.2016	As per MOEF&CC General Standards for schedule VI
1	Total Suspended Solids	40	*100 (Max)*
2	pH	8.53	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	48	*250 (Max)*

All values are expressed in mg/lit unless specified.

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

Analysed By

WATER QUALITY DATA

(EFFLUENT WATER-FOUR PARAMETERS)

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

Name of the Cluster: **Cluster - X** Month: **November, 2016.**

Name of the Stations & Code : **1. MW10- Mine Discharge of Bhowrah North**

First Fortnight

Sl. No.	**Parameters**	**MW10** (Mine Discharge) 15.11.2016	**As per MOEF&CC General Standards for schedule VI**
1	Total Suspended Solids	36	*100 (Max)*
2	pH	8.29	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	46	*250 (Max)*

Second Fortnight

Sl. No.	**Parameters**	**MW10** (Mine Discharge) 23.11.2016	**As per MOEF&CC General Standards for schedule VI**
1	Total Suspended Solids	32	*100 (Max)*
2	pH	8.18	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	42	*250 (Max)*

All values are expressed in mg/lit unless specified.

Analysed By

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

WATER QUALITY DATA

(EFFLUENT WATER-FOUR PARAMETERS)

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

Year : **2016-17.**

Name of the Cluster: **Cluster - X**

Month: **December, 2016.**

Name of the Stations & Code :

1. MW10- Mine Discharge of Bhowrah North

First Fortnight

Sl. No.	Parameters	MW10 (Mine Discharge) 12.12.2016	As per MOEF&CC General Standards for schedule VI
1	Total Suspended Solids	28	*100 (Max)*
2	pH	8.81	*5.5 - 9.0*
3	Oil & Grease	<2.0	*10 (Max)*
4	COD	40	*250 (Max)*

Second Fortnight

Sl. No.	Parameters	MW10 (Mine Discharge) 22.12.2016	As per MOEF&CC General Standards for schedule VI
1	Total Suspended Solids	24	*100 (Max)*
2	pH	8.94	*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
JSA/SA/SSA

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

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

WATER QUALITY

(SURFACE WATER- ALL PARAMETERS)

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

Name of the Cluster: **Cluster - X** Period: **Q. E. December, 2016.**

Area : **Bhowrah South** **Project: Bhowrah South** **Cluster X**

Stations: **Date of Sampling:**

1. Upstream in Damodar river SW-21 07/12/2016
2. Downstream in Damodar river SW-22 07/12/2016

Sl.No	Parameter	Sampling Stations				Detection Limit	IS:2296 – 1982 (Inland surface water) Class C	BIS Standard & Method
		SW-21	SW-22					
1	Arsenic (as As), mg/l, Max	<0.002	<0.002			0.002	0.2	IS 3025/37:1988 R : 2003, AAS-VGA
2	BOD (3 days 27°C), mg/l, Max	2.6	2.8			2.00	300	IS 3025 /44: 1993, R : 2003 3 day incubation at 27°C
3	Colour (Hazen Unit)	colourless	colourless			Qualitative	300	Physical/Qualitative
4	Chlorides (as Cl), mg/l, Max	32	32			2.00	600	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	<0.03	<0.03			0.03	1.5	IS 3025 /42 : 1992 R : 2009, AAS-Flame
6	Disolved Oxygen, min.	5.2	4.1			0.10	4	IS 3025/381989, R : 2003, Winkler Azide
7	Fluoride (as F) mg/l, Max	0.95	0.93			0.02	1.5	APHA, 22nd Edition SPADNS
8	Hexavalent Chromium, mg/l, Max	0.018	0.015			0.01	0.05	APHA, 22nd Edition, 1,5 - Diphenylcarbohydrazide
9	Iron (as Fe), mg/l, Max	0.505	1.355			0.06	50	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
10	Lead (as Pb), mg/l, Max	0.020	0.032			0.005	0.1	APHA, 22nd Edition AAS-GTA
11	Nitrate (as NO_3), mg/l, Max	7.22	8.30			0.50	50	APHA, 22nd Edition, UV-Spectrphotometric
12	pH value	8.48	8.57			2.5	6.5-8.5	IS-3025/11:1983, R-1996, Electrometric
13	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.002	<0.002			0.002	0.0005	APHA, 22nd Edition 4-Amino Antipyrine
14	Selenium (as Se), mg/l, Max	<0.002	<0.002			0.002	0.05	APHA, 22nd Edition AAS-GTA
15	Sulphate (as SO_4) mg/l, Max	80	90			2.00	400	APHA, 22nd Edition Turbidity
16	Total Dissolved Solids, mg/l, Max	318	337			25.00	1500	IS 3025 /16:1984 R : 2006, Gravimetric
17	Zinc (as Zn), mg/l, Max	<0.01	<0.01			0.01	5.0	IS 3025 /49 : 1994, R : 2009, AAS-Flame

All values are expressed in mg/lit unless specified.

Analysed By
JSA/SA/SSA

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

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

WATER QUALITY

(DRINKING WATER- ALL PARAMETERS)

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

Name of the Cluster: **Cluster - X** Period: **Q. E. December, 2016.**

Area : **Bhowrah North** **Project: Bhowrah South** **Cluster X**

Stations: 1. Drinking Water from Bhowrah South GW-10 **Date of Sampling:** 22/12/2016

Sl. No	Parameter	Sampling Stations			Detection Limit	IS:10500 Drinking Water Standards	Standard / Test Method
		GW-10					
1	Boron (as B), mg/l, Max	<0.20			0.20	0.5	APHA, 22nd Edition ,Carmine
2	Colour,in Hazen Units	18			1	5	APHA, 22nd Edition ,Pt.-Co. Method
3	Calcium (as Ca), mg/l, Max	38.4			1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	32			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	0.81			0.02	1.0	APHA, 22nd Edition , SPADNS
7	Free Residual Chlorine, mg/l, Min	0.03			0.02	0.2	APHA, 22nd Edition, DPD
8	Iron (as Fe), mg/l, Max	1.850			0.06	0.3	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
9	Lead (as Pb), mg/l, Max	0.134			0.005	0.01	APHA, 22nd Edition, AAS-GTA
10	Manganese (as Mn), mg/l, Max	0.016			0.02	0.1	IS-3025/59:2006, AAS-Flame
11	Nitrate (as NO_3), mg/l, Max	6.2			0.5	45	APHA, 22nd Edition, UV-Spectrphotometric
12	Odour	Agreeable			Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
13	pH value	8.42			2.5	6.5 to 8.5	IS-3025/11:1983, R-1996, Electrometric
14	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.002			0.001	0.001	APHA, 22nd Edition,4-Amino Autipyrine
15	Selenium (as Se), mg/l, Max	<0.002			0.002	0.01	APHA, 22nd Edition, AAS-GTA
16	Sulphate (as SO_4) mg/l, Max	86			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	132			4.00	200	IS-3025/23:1986, Titration
19	Total Arsenic (as As), mg/l, Max	<0.002			0.002	0.01	IS 3025/ 37:1988 R : 2003, AAS-VGA
20	Total Chromium (as Cr), mg/l, Max	0.517			0.04	0.05	IS-3025/52:2003, AAS-Flame
21	Total Dissolved Solids, mg/l, Max	378			25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (c_aco_3), mg/l, Max	200			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	0.183			0.01	5.0	IS 3025/ 49 : 1994, R : 2009, AAS-Flame

All values are expressed in mg/lit unless specified.

Analysed By
JSA/SA/SSA

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

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

CHAPTER - IV

NOISE LEVEL QUALITY MONITORING

4.1 Location of sampling sites and their rationale

i) **Bhowrah North (N14)**
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) **Sudamdih Wahery (N15)**
To assess the noise level in mine site, the noise levels were recorded in the mine area where all mining activities are in progress.

iii) **Jeenagora (N13)**
To assess the noise level in mine site, the noise levels were recorded in the mine area where all mining activities are in progress.

4.2 Methodology of sampling and analysis

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

4.3 Results & Interpretations

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

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

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

NOISE LEVEL DATA

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

Name of the Cluster: **Cluster -X** Month: **October, 2016.**

Name of the Stations & Code : **1. Bhowrah North (N14)**

(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	**Bhowrah North (N14)**	**Industrial area**	14.10.2016	58.2	*75*

Permissible limits of Noise Level as per MOEF&CC 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 .**

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

NOISE LEVEL DATA

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

Name of the Cluster: **Cluster -X** Month: **November, 2016.**

Name of the Stations & Code :

1. **Sudamdih Washery (N15)**
2. **Jeenagora (N13)**

(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	**Sudamdih Washery (N15)**	**Industrial area**	10.11.2016	61.4	*75*
2	**Jeenagora (N13)**	**Industrial area**	15.11.2016	61.4	*75*

Permissible limits of Noise Level as per MOEF&CC 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 .**

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

NOISE LEVEL DATA

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

Year : **2016-17.**

Name of the Cluster: **Cluster -X**

Month: **December, 2016.**

Name of the Stations & Code :

1. **Bhowrah North (N14)**
2. **Sudamdih Washery (N15)**
3. **Jeenagora(N13)**

a. Second Fortnight data

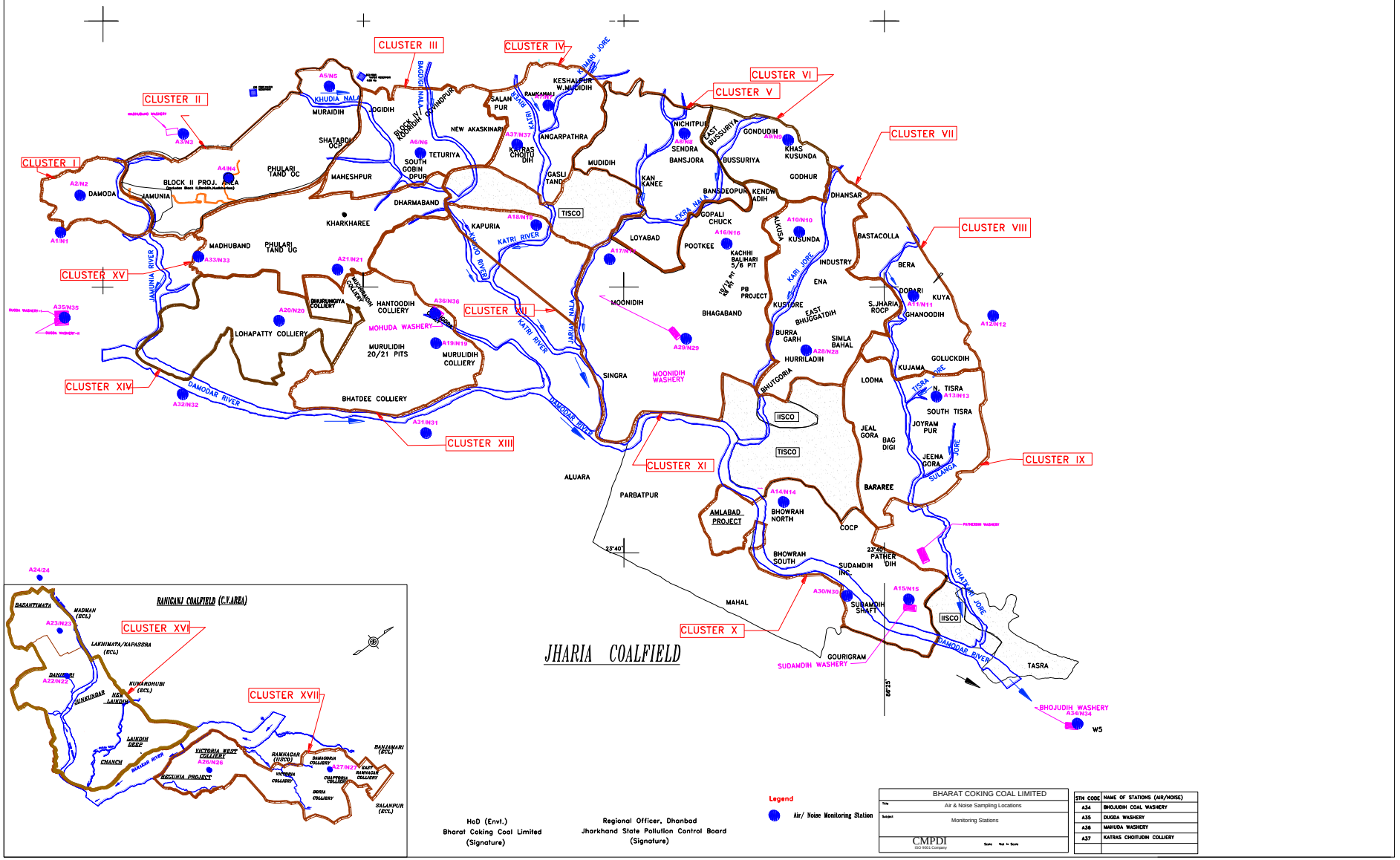
Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	**Permissible Limit of Noise level in dB(A)*
1	**Bhowrah North (N14)**	**Industrial area**	22.12.2016	60.3	*75*
2	**SudamdihWashery (N15)**	**Industrial area**	23.12.2016	62.8	*75*
3	**Jeenagora (N13)**	**Industrial area**	27.12.2016	62.8	*75*

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

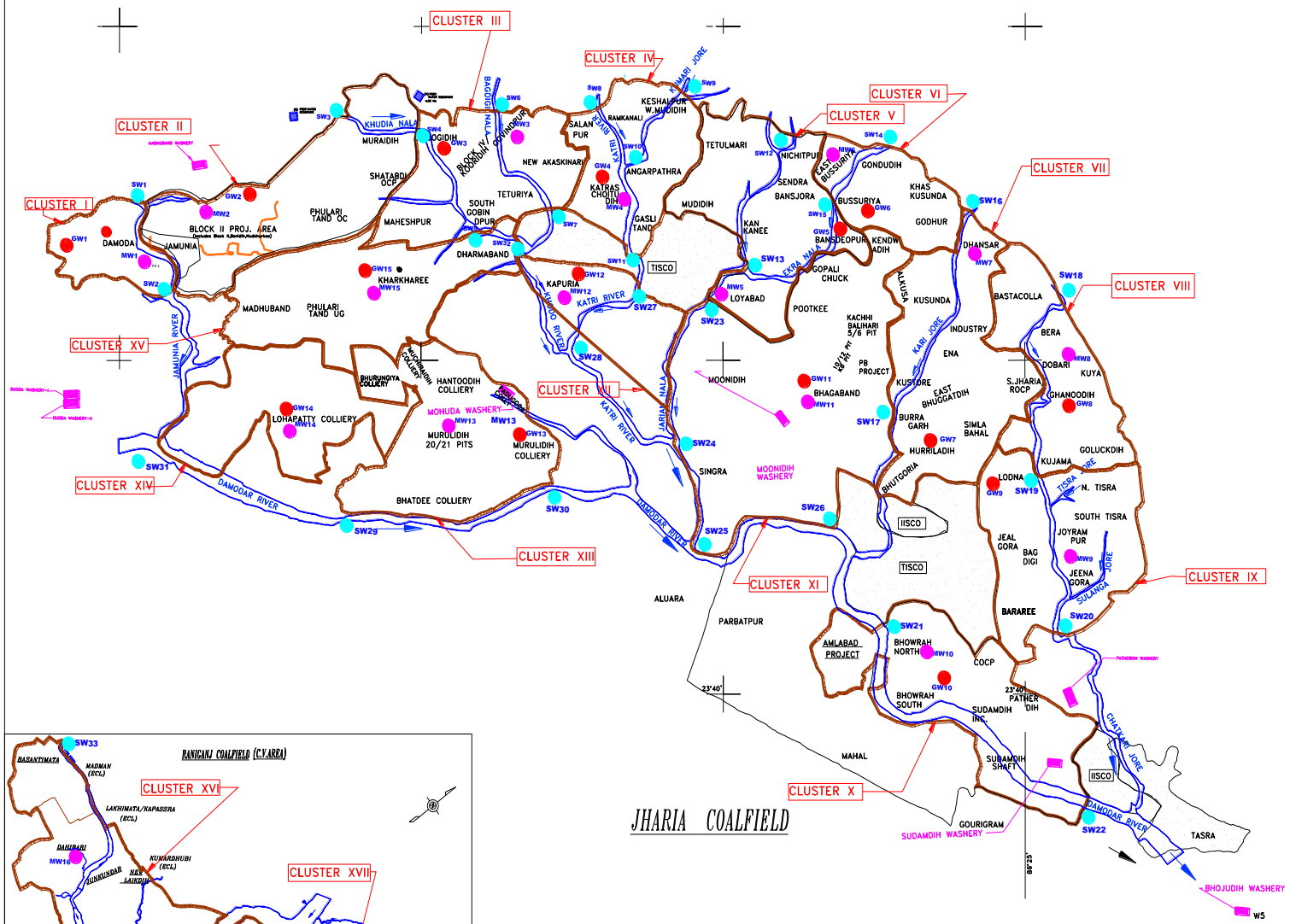
*** Day Time: 6.00 AM to 10.00 PM .**

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

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	Miner 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	Janian 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	Janian Nala, Damodar River	MW11	Bhagabandh 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

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

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

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

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

ANNEXURE - IX

LIST OF INITIAL MEDICAL EXAMINATION & PERIODICAL MEDICAL EXAMINATION FOR 2016-17

PME & VTC

	Target Annual	Target From April 16 to March17	Actual Up to March 17	Achievement
PME (2016-17)	951	951	993	>100%
VTC (2016-17)	472	472	488	>100%

Contractual Workers : Training		IME	
2014-15	15	2014-2015	15
2015-16	78	2015-2016	74
2016-17	78	2016-17 (till Dec.16)	62

ANNEXURE - X

भारत कोकिंग कोल लिमिटेड
(कोल इंडिया लिमिटेड का एक अंग)
BHARAT COKING COAL LIMITED
A Mini Ratna Company)
(A Subsidiary of Coal India Limited)
Office of the Project Officer, ASP Colliery (Smd. Inc.)

A.S-P Colliery
P.O.- Sudamdih
Dist.–Dhanbad
Jharkhand 828126

Ref No– EJA/ASP/SMD/16 / 45

Dated: 13/1/16

To,
The Member Secretory,
Jharkhand State Pollution Control Board,
TA. Division Building,
HEC, Dhurwa,
RANCHI - 834004

Sub. :- **Submission of Environmental Statement (From V) for the year 2014 15.**

Dear Sir,

Please find herewith the Environmental Statement duly filled in for the financial year 2014 – 15 in respect of Amal. S – P. Colliery(Patherdih Colliery, Sudamdih Incline Mine & COCP Patherdih).

Please acknowledge receipt.

Encl. - As Above

Yours faithfully

13/1/16

Project Officer
Amal. S – P. Colliery

1. J.S.P.C.B., R/Officer, Dhanbad.
2. Area Manager (Env.)E.J. Area.
3. Safety Officer, A.S – P. Colliery

13/1/16 Received on 11.1.16.

"FORM – V"

(See rule 14)

Environmental statement for the financial year ending the 31st March 2015

PART –A

I. Name and address of the owner /Occupier of the industry operation Or process. : SRI A. SARKAR, D.T., Koyla Bhawan, Koyla Nagar, B.C.C.L., Dhanbad.

II. Industry category primary - (STC Code) : Coal Mining Industry
Secondary – (STC Code).

III. Production capacity. : 0.473 MTY (Smd. Incline + Patherdih group of mines) E.C. Order Ref. No. J – 11015/380/2010 – 1A: IIM dated 06.02.2013.

IV. Year of establishment. : Colliery operating since pre – nationalization and vested in B.C.C.L. through Coal Mines nationalization Act.' 1972 – 73

V. Date of last environmental Statement submitted. : Dt. 30.09.2014. (Ref. No. – 1636/SMD/INC/F/51/14)

PART –B

Water and Raw Material Consumption.

Water Consumption	
1. Process (Dust Suppression)	80m^3/day. (Four Tankers of 20 KL daily except in rainy season)
2. Cooling	Nil
3. Domestic	700 m^3/day

Name of products	Process water consumption per unit of product point	
	During the previous Financial year (2013 – 14)	During the current Financial year (2014 – 15)
N/A	N/A	N/A

2. Raw Material consumption.

Name of Material	Name of Products	Consumption of Raw materials per unit of product output	
		During the previous Financial year (2013 – 14)	During the current Financial year (2014 – 15)
Diesel	Coal	0.65Litre./Ton	0.65Litre./Ton
Explosive	Coal	0.43 Kg./Ton	0.40 Kg./Ton
Timber & Sleeper	Coal	0.10 Nos./Ton	0.20 Nos./Ton

Industry may use codes if disclosing details of raw material would violate contractual obligations otherwise all industries have to name the materials used.

PART – C

Pollution discharged to environment/unit of output (Parameter as specified in the consent issued)

Pollution	Quantity of pollutants Discharged (mass/day)	Concentrations of Pollutants in discharges (mass/volume)	Percentage of variation from prescribed stack with reason.
a) Water	$300m^3$/Day	PH – 7.7 Total Suspended Solid - 25mg/litre Chloride – 49.9 mg/litre Temperature – 30.2^0C	Within the limit Within the limit Within the limit Within the limit
b) Air	$4 X10^6 m^3$/day	SPM – 126.7 $\mu g/m^3$ So_2 – 31.5 $\mu g/m^3$ No_x – 35.7 $\mu g/m^3$ RPM – 156 $\mu g/m^3$ TSPM – 284.7 $\mu g/m^3$	N/A Within the limit Within the limit Within the limit Within the limit

PART – D

Hazardous Waste (As specified under Hazardous Wastes / Management and Handling rules 1989)

Hazardous wastes	Total Quantity (in kg.)	
	During the previous Financial year (2013 – 14)	During the current Financial year (2014 – 15)
a) From process	Quantity of burnt oil – 3075 Litre Cotton Waste – 92 Kg. Oil Soaked Filters – 30 Nos.	Quantity of burnt oil – 200 Litre Cotton Waste – 23 Kg. Oil Soaked Filters – 20 Nos.
b) From pollution control facilities	N/A	N/A

PART – E

Solid Wastes	Total Quantity (in kg.)	
	During the previous Financial year (2013 – 14)	During the current Financial year (2014 – 15)
A) From process	Quantity of overburden generated :- 261808 m^3	Quantity of overburden generated - 77424 m^3
B) From pollution control facilities	Oil & Grease Trap's bottom sludge:- N/A	Oil & Grease Trap's bottom sludge – N/A
1. Quantity recycled or reutilized within the unit. 2. Solid 3. Disposal	Quantity of O/B used for back filling – 261808 m^3 Quantity of burnt oil for lubrication in u/g transportation system /Haulage system – 350 ltr.	Quantity of O/B used for back filling – 77424 m^3 Quantity of burnt oil for lubrication in u/g transportation system /Haulage system -560 ltr.

PART – F

Please specify the characterizations (in terms of composition of quantum) of hazardous as well as solid Wastes and indicate disposal practice adopted for both these categories of wastes.

(i) Type of Rock :- Sedimentary.
(ii) Type of soil :- There is no soil, All soil has been removed earlier.
(iii) Chemical properties of soil :- N/A
(iv) Disposal process for solid waste (Back filling practice) :- By dumper for backfilling of the excavated area.

PART – G

Impact of the pollution abatement measures taken on conservation of natural resources and on the cost of production.

(i) No. of plants planted :- 12964 Nos.
(ii) Cost of plants :- Rs. 1,94,460/-
(iii) Plantation cost incurred :- Rs. 1,66,290.52
(iv) Backfilling cost :- Rs. 24,93,070.82

PART – H

Additional measures/investment proposal for environmental protection including abatement of pollution, prevention of pollution.

(i) There are two water tankers of (a) 20 KL. Capacity . Which sprinkle 04 trips water daily (except rainy season).
(b) 12 KL. Capacity which sprinkle 02 trips water daily (except rainy season).

(ii) Fencing of ecological restoration site is being done.
(iii) There is no pressure filters.
(iv) Black Toping of Roads has not been done.
(v) Avenue plantation / Gabion plantation :- Nil.

PART – I

Any other particulars for improving the quality of the environment.
Carbon sequestration studies done at HQ. Level, Source appointment study and reduction in pollution load by reducing road transport study being done at H.Q. level.

BHARAT COKING COAL LIMITED
(A Subsidiary of Coal India Limited)
Office of the Project Officer
Bhowra (North) U/G.Mines
P.O(. - Bhowra, Dist. - Dhanbad (Jharkhand), Pin. - 828302

Ref. No. BH(N) /U.G.Mines/2015/ 523 Dated. 25/09/2015
27

To,
The Member Secretary,
Jharkhand State Pollution Control Board.
T.A. Division Building (Ground Floor)
H.E.C. Dhurwa,
RANCHI.-834004

Sub:- Submission of Environmental Statement in Form V.

Dear Sir,

Environmental statement in Form V is being submitted to you for the financial year 2014-2015 in respect of Bhowra (N) U.G. Mines.

Encl:- As above.

Yours Faithfully,

Project Officer / Manager
Bhowra (N) U.G.Mines.

Distribution:-
1. The Regional Officer, J.S.P.C.B. Office,H.I.G. Dhanbad.
2. Th General Manager, (Env), B.CCL, Koyla Bhawan, Dhanbad.
3. The Area Manager, (ENV) E.J. Area.
4. Office file.

BCCL

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FORM V

(See rule 14)

ENVIRONMENTAL STATEMENT FOR THE FINANCIAL YEAR ENDING THE 31ST MARCH....2015

Sri A. Sarkar, DT (P&P)
Bharat Coking Coal Ltd.
Koyala Bhawan
Koyala Nagar
Dhanbad.

PART A

(i) Name and address of the owner/occupier of the industry operation or process.

(ii) Industry category Primary—(STC Code) Secondary—(STC Code) Primary (Jharkhand)

(iii) Production capacity-Units— Coal-145000T (Target for 2015-2016)

(iv) Year of establishment. — 1971

(v) Date of the last environmental statement submitted. 26/9/2014

PART B

Water and Raw Material Consumption

(1) Water consumption m^3/d

Process

Cooling

Domestic

} 75 M^3/day Approx.

Name of products	Process water consumption per unit of product output	
	During the previous financial year	During the current financial year
	(1)	(2)
(1) Coal	0.11 M^3/T	0.11 M^3/T
(2)		
(3)		

(2) Raw material consumption

*Name of raw materials	Name of products	Consumption of raw material per unit	
		During the previous financial year	During the current financial year
H.S. Disel	Coal	3.25 L/T	
Explosive		1.57 Kg/Kg	

*Industry may use codes if disclosing details of raw material would violate contractual obligations, otherwise all industries have to name the raw materials used.

PART C

Pollution discharged to environment/unit of output.

(Parameter as specified in the consent issued)

(1) Pollution	Quantity of pollutants discharged (mass/day)	Concentrations of pollutants in discharges (mass/volume)	Percentage of variation from prescribed standards with reasons
(a) Water	Sampling is done by CIMFR, Dhanbad. (Report is awaited)		
(b) Air			

PART D

Hazardous Wastes

(as specified under Hazardous Wastes (Management and Handling) Rules, 1989)

Hazardous Wastes	Total Quantity (Kg)	
	During the previous financial year	During the current financial year
(a) From process	Used lubricant/oil (Burnt oil) is reused for tub wheel /pulley lubrication in U/G Mine.	
(b) From pollution control facilities.		

PART E

Solid Wastes

	Total Quantity	
	During the previous financial year	During the current financial year
(a) From Process (OB)	1157500 M^3 OB	7,50,000 M^3 OB Which will be reused for Back filling of OCP for reclaimation.
(b) From pollution control facility	NIL	
(c) (1) Quantity recycled or re-utilised within the unit		
(2) Sold		
(3) Disposed		

PART – F

Please specify the characterization (in term of composite and quantum) of Hazardous as well as solid wastes and also disposal practice adopted for both these categories of wastes.

(a) For Underground/Collieries - Not applicable as neither Hazardous Wastes nor solid wastes are generated.

PART –G

Impact of the pollution abatement measure taken on conservation of natural resource and on production.

Various pollution abatement measure are practiced by which the impacts on the environment has become positive. Due cares is taken to conserve the natural resources and protect the environment and all its component. The following pollution abatement measure are undertaken:-

1. Water Sprinkling is done in road , sidings , coal transportation points CHP crushers to control dust. The water sprinkling greatly reduces fugitive dust emission thereby reducing the air pollution levels. Water sprinklers are provided on tipplers and in coal stock.
2. Road maintenance:
   Maintenance of all roads within the unit lease hold area is being done to control dust. This also helps in reducing the vehicle exhausts.
3. Tree plantation :
   Tree plantation is done as a apart of biological reclamation. Plantation help in reducing noise, dust and soil erosion (check).
4. Noise abatement in done by proper maintenance of the vehicle, drills and other machines. Workers are provided with ear muffs. Tree planted near the work place which help in dampening the extra notice
5. **Soil erosion control** – various soil erosion control measure like tree plantation. Construction of diversion channels, Check dame, settling ponds/ditchen contour terrecting storm water discharge drain etc is done.
6. **Machine maintenance** – Proper and timely maintenance of the machine/ vehicles operating in the unit are done which help in reduction of vehicle exhausts and noise pollution.
7. **Vehicles exhaust control** – Exhaust monitoring in some vehicle exhaust are controlled by proper and timely maintenance of the vehicles.
8. **Ambient Air/Water and noise monitoring** – Monitoring for ambient air, water quality and noise levels are periodically done.
9. **Community Awareness** Welfare officers are there in the unit to propagate awareness regarding environment protection measures like tree plantation for soil erosion control, domestic exhaust control etc among colony/ villages residents and also nearby natives and tribats. Tree plantation and cultural programmes (June 5th) postres/ bannrers are displayed and tree plantation is done to create awareness.
10. **Occupational Health/Safety Measure** – Occupational Health and safety measure are taken care stipulated by DGMS in case of dust, fire, light, noise etc. Dust mask and Ear plugs/muffs are provided in critical zones.
11. **Improved sanitation and drainage and water treatment** – Improved sanitation and drainage is being practiced in all houses of the colony. Residents are advised to dispose minimum amount of wastes and river water is treated and supplied to the residents for drinking purpose.
12. All families are shifted/ being shifted to new and safe location/ sides as per the companies policy. The rehabilitation sites are provided with infrastructural facilities like water, electricity, roads parks, and dispensary.
13. **Environment impact Assessment (EIA) and preparation of environment impact statement (EIS)**
    EIS is being done at corporate levels. This helps in indentifying the environment impact and thereby adopting necessary mitigation measures. The EIA is also extended for a distance of 10 KM (Buffer zone) beyond the actual project/ unjts area for the project which requires clearance of MOBF.

Project officer
Bhowra (North) U/G Mines

परियोजना पदाधिकारी
भोरा (उत्तर) कोलियरी