BHARAT COKING COAL LIMITED
(A SUBSIDIARY OF COAL INDIA LIMITED)
OFFICE OF THE GENERAL MANAGER
LODNA AREA

Ref. No: - BCCL/LA/GM/18/ 250 Dated :- 29/05/18

To,
The Director,
Ministry of Environment, Forest & Climate Change, Govt. Of India.
Regional Office (ECZ), Bunglow No. A-2,
Shyamli Colony,
Ranchi-834002

Sub:- Six monthly compliance report on implementation of Environmental Measures for the period from 1st Oct. 2017 to 31th March 2018 in respect of Cluster – IX Group of Mines, Lodna Area of BCCL.

Ref. No. 1: EC Order No.-J-11015/307/2010-IA.II(M), dated – 21st May, 2013.
Ref. No. 2: EC Order No.- J-11015/307/2010-IA.II(M), dated – 1st March, 2018.

Dear Sir,

Please find enclosed herewith the Six Monthly Compliance report on implementation of Environmental Measures for the period from 1st Oct. 2017 to 31th March 2018 in respect of Cluster – IX Group of Mines, Lodna Area of BCCL.

Hope you will find the same in order.

Enclosure: as above.

Yours faithfully,

29/5/18
General Manager
Lodna Area.

Cc to :-

1. Director 1A monitoring cell, Paryavaran Bhawan CGO Complex, New Delhi-110003.
2. General Manager (Env) BCCL, Koyla Bhawan, Dhanbad.
3. General Manager (Min), Lodna Area.
4. Nodal Officer (Env), Lodna Area.

5. Office Copy.

ENVIRONMENTAL CLEARANCE COMPLIANCE OF CLUSTER – IX.
(GRANTED VIDE – J-11015/307/2010-IA.II(M), DATED – 1ST March, 2018.
(Period - From 01st Oct. , 2017 to 31th March, 2018.

Sl. No.	A.) Specific conditions by MOEF	Compliance
i	The Maximum production shall not exceed beyond that for which environmental clearance has been granted.	The production from the cluster is within the limit for which environment clearance has been granted.
ii	Action should be taken to segregate and isolate the fire areas eg. Trench cutting for isolation of fire. Area-wise Action Taken report for extinguishing the fire should be provided.	It is being complied. Thereafter the coal is excavated and fire is doused by water. The doused coal is then loaded into trucks for transportation
iii	"Mission Mode Programme' for extinguishing fire is required wherein scientists and other experts be involved. Any international agency may also be contacted for their expertise in extinguishing the fire in such big area.	Amalgamated Joyrampur colliery comprising of all five UG collieries has been selected for Mission Mode Programme. This project has been approved by EAC in Jan'2018. The recommendations are underway for implementation.
iv	The recommendations of Indira Gandhi Centre of Atomic Research, Kalpakam should followed dealing with fire in coal mine in Jharia coalfield.	The said agency has been contacted for dealing with fire in coal mine in jharia coalfield. The agency has shown its inability to deal with such fire incidences. Henceforth the present practice of isolating the coal fire area by cutting trenches, excavating the coal and dousing with water is being done
v	Transportation Plan should be submitted to the MOEF.	Coal from various quarries are transported to dump yard and from dump yard dumpers transport the coal to feeder breakers at railway siding. Crushed coal is loaded into wagons by pay loaders. Transportation plan is enclosed.
vi	The finalized Mine Closure Plan of Cluster – IX should be submitted to MOEF. The void should be in 30 ha. area with 30 mt. depth.	Mine closure plan as per the guideline of Ministry of coal and on the basis of cluster concept has been prepared and submitted by CMPDIL and progressive mine closure plan is being followed.

vii	The road transportation of coal during phase – 1 should be by mechanically covered trucks. The road used for coal transportation should be developed with avenue plantation on both sides.	It shall be complied. However transportation of coal is being done by tarpaulin covered trucks at present. Avenue plantation is being done along the transportation route from South Tisra W/S to Thakur More (Jharia –Baliapur road).

viii	The company must give priority to capacity building both within the company and to the local youth, who are motivated to carry out the work in future.	It is being done. Training and skill development programs are being conducted by VTCs and HRD of BCCL on regular basis. There are 02 Handloom Training Centres in Lodna area at Alakdiha and Mukunda, Dhanbad. Presently, 40 numbers of women are engaged with these training centres belonging to nearby villages like Alakdiha, Mukunda, Surunga and Rakshakali Dham, belonging to underprivileged class of the society. Another scheme known as BCCL ke Lal-Ladli has been launched. A centre at New MT Hostel, Denobili More, Jharia, Dhanbad in Lodna Area has been established under BCCL scheme for engineering aspirant under CSR initiative of BCCL. The target of this scheme is to provide free quality education support to meritorious students of PAPs (Project affected Persons) and students residing in the command area of BCCL. The centre of Lodna Area has started from 15th September, 2017 where presently 11 students (02 girls and 09 boys) are studying at the centre who have been selected through scrutiny test. The coaching classes is being provided by the faculties of Ranchi Centre (IIT'ans and NIT'ans) and class timings is from 4.00 PM to 7.30 PM from Monday to Friday. The doubt clearing classes/sessions is being conducted on every Saturday and Sunday from 3 PM onwards by Sri Manish Kumar Meena, Asst Manager (Excv), B Tech from IIT(ISM), Dhanbad at the centre. The coaching centre is fully air conditioned and enabled with digital equipments. The centre is Wi-FI enabled. Facilities like snacks, tea and drinking water to students and faculty is being provided by the Lodna Area Management. A separate toilet facility for boys and girls is available at the Centre.
ix	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 from.	It is being complied. The booklet has been prepared for CSR and R&R and also uploaded on CIL website.

x	A study should be initiated to analyze extent of reduction in pollution load every year by reducing road transport.	This is being done by CMPDIL and final report yet to be submitted.
xi	The expertise available internationally should be utilized for control of fire in Jharia coalfields and for their reclamation and to further minimize time for fire and subsidence control.	It shall be complied. Presently Master Plan Approved by Govt. of India is under implementation for this purpose.
xii	The abandoned pits and voids should be backfilled with OB and reclaimed with plantation and or may be used for pisciculture.	Back filling is being done. Reclamation of old dump has been taken up. Plantation at reclaimed old dump has been started. About 29,000 Nos. of plants have been planted at Gokul Park in NT-ST till Sept, 2017.
xiii	BCCL may consider setting up a separate management structure for implementing environment policy and socio-economic issues and the capacity building required in this regard.	A full-fledged Environment Department, headed by a HOD (Environment) along with a suitable, qualified multidisciplinary team of executives (30 Nos.) which includes Environment, Mining, Excavation, Civil, Survey, Electrical & Mechanical, Forestry disciplines executives and technicians (4 Nos.) has been established. They are also trained in ecological restoration, methods sustainable development, rainwater harvesting methods etc. At the project level, one Executive in each area has also been nominated as Nodal Officer (Environment) and 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.
xiv	The locations of monitoring stations in the Jharia Coalfields should be finalized in consultation with the Jharkhand State Pollution Control Board.	Complied.

xv	The 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 get carried out for the entire Jharia Coalfields.	Tender for conducting source appointment study for BCCL was floated twice, however, none of the bidders qualified. Therefore, as per MoU "Sustainable Coal Mining in Coal India Ltd" entered between CIL and NEERI, NEERI Nagpur was approached for conducting Source Appointment Study of Clusters of BCCL for compliance of EC conditions. The proposal regarding conducting Source Appointment Study has been submitted by NEERI, Presently it has been submitted to CIL for further scrutiny and approval.
xvi	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 air pollution, based on which appropriate mitigative measures could be taken.	Tender for conducting source appointment study for BCCL was floated twice, however, none of the bidders qualified. Therefore, as per MoU "Sustainable Coal Mining in Coal India Ltd" entered between CIL and NEERI, NEERI Nagpur was approached for conducting Source Appointment Study of Clusters of BCCL for compliance of EC conditions. The proposal regarding conducting Source Appointment Study has been submitted by NEERI, Presently it has been submitted to CIL for further scrutiny and approval.
xvii	The proponent shall prepare time-series maps of the Jharia Coalfields through NRSA to monitor and prevent fire problems in the Jharia Coalfields by isothermal mapping / imaging and monitoring temperatures of the coal seams (whether they are close to spontaneous ignition temperatures) and based on which, areas with potential fire problems shall be identified.	Work order has been issued to NRSA for the work of "Delineation of Surface Coal Fire and associated land Subsidence in Jharia Coal field, Jharkhand using satellite based remote –sensing techniques".
xviii	Measures to prevent ingress of air (Ventilation) in such areas, to prevent restart fresh / spread fires in other areas including in mines of cluster VIII shall be undertaken.	It is being complied.
xix	Underground mining should be taken up after completion of reclamation of Opencast mine area after 15 Years.	It is complied.
xx	No mining shall be undertaken where underground fires continue. Measure shall be taken to prevent / check such fire including in old OB dump areas where the fire could start due to presence of coal / shale with sufficient carbon content.	Measures are being taken to prevent/check fires.

xxi	The rejects of washeries in Cluster – IX should be sent to FBC based plant.	Coal washery does not exist in this cluster at present.
xxii	There shall be no external OB dumps. At the end of the mining there shall be no void and the entire mined out area shall be re-vegetated. Areas where opencast mining was carried out and completed shall be reclaimed immediately thereafter.	Action is being taken as specified in EMP. Backfilling of OB is going on with mining. At the end of Mining there shall be no void and area will be re-vegetated and reclaimed.
xxiii	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 – IX shall be drawn up and implemented.	Calendar Plan has been prepared. Mine closure plan as per the guidelines of Ministry of Coal has been prepared by Central Mine Planning and Design Institute (CMPDI) Progressive mine closure plan is being implemented.
xxiv	The void shall be converted into a water reservoir of a maximum depth of 15-20 m and shall be gently sloped and the upper benches of the reservoir shall be stabilized with plantation and the periphery of the reservoir fenced. The abandoned pits and voids should be backfilled with OB and biologically reclaimed with plantation and or may be used for pisciculture.	It shall be complied. A part of the void will be converted into the water body as specified in EMP.
xxv	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 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 as per statutes.
xxvi	Active OB dumps near water bodies and rivers should be rehandled for backfilling abandoned mines voids. However, those which have been biologically reclaimed need not be disturbed.	No active dumps near water bodies exist. The Chhat Ghat Talab is located on the coal bearing area towards north of Patch-B quarry. Embankment has been made all around the Talab and it is fully covered with aquatic weeds.

xxvii	Thick green belt shall be developed along undisturbed areas, mine boundary and in mine reclamation. During post mining stage, a total of 937.84 ha. area would be reclaimed. The total additional area under plantation would be 367.95 ha. (189.95) ha. abandoned quarry area, 178 ha. active quarry area, 104.34 OB dump outside quarry area, 36.49 ha. service building / Mine infrastructure area / coal dump etc, 165.88 ha. green belt around OCP, 263.22 ha. barren area), by panting 2344700 plants at a total cost Rs. 10830.45 lakhs.	It is being complied. Yearly plantation is being done for development of green belts as per EMP.
xxviii	The road should be provided with avenue plantation on both side as trees act as sink of carbon and other pollutant.	It shall be complied.
xxix	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 IX shall be implemented.	It shall be compiled. Dhanbad Action Plan is being implemented. The salient actions of this cluster. 1. Covered transportation of coal. 2. Water sprinkling. 3. Plantation.
xxx	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 very 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 the entire Jharia Coalfields. Mineralogical composition study should be undertaken on the composition for suspended particulate matter (PM 10 and PM 2.5) in Jharia coalfields and also qualified. 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 with the Jharkhand State Pollution Control Board. The work of monitoring of ambient environment had been started by Central Institute of Mining & Fuel Research (CIMFR), Dhanbad which is having CSIR Laboratory recognized under the EP Rules. CMPDIL is now on work since 2015.

xxxi	No ground water 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.	It is being compiled and Mine water is being used for the industrial purpose. Pressure filters are installed for converting the mine water to portable water. Few lagoons are developed as ground water recharge structure. Further Mine Water is also utilized for the community and irrigation purpose. 1. Three pressure filters have been installed at South Tisra , North Tisra underground and Joyrampur colliery for utilization of Mine Water. 2. Rain water Harvesting.
xxxii	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 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.	The work of monitoring was started by Central Institute of Mining & Fuel Research (CIMFR), Dhanbad which has CSIR Laboratory, recognized under the EP Rules. Presently CMPDIL is monitoring the ground water level. The locations of monitoring stations have been finalized.
xxxiii	Mine discharge water shall be treated to meet standards prescribed standards before discharge into natural water coursed / 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.	It is being complied.
xxxiv	ETP shall also be provided for workshop, and CHP, if any. Effluents shall be treated to confirm to prescribed standards in case discharge into the natural water course.	01 no of ETP/Oil grease Trap is in operation.

xxxv	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.	Complied.
xxxvi	Sufficient coal pillars shall be left un-extracted around the air shaft (within the subsidence influence area) to protect from any damage from subsidence, if any.	Sufficient coal pillars have been left around air shafts as per the statutes and DGMS guidelines.
xxxvii	High root density tree species shall be selected and planted over areas likely to be affected by subsidence.	Identification of high root density plants and their plantation in subsidence prone area will be taken-up.
xxxviii	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. However No such subsidence has been recorded in the area.
xxxix	Solid barriers shall be left below the roads falling within the blocks to avoid any damage to the roads.	Sufficient barriers are left for saving the surface installation and infra structures as per the statute and DGMS guidelines.
xL	No depillaring operation shall be carried out below the township / colony.	At present no depillaring operation is going on.
xLi	The transportation plan for conveyor-cum-rail for Cluster-IX should be dovetailed with Jharia Action plan. Road transportation of coal during Phase – 1 should be by mechanically covered trucks, which should be introduced at the earliest. The plan for conveyor-cum-rail for Cluster – IX should be dovetailed with Jharia Action Pan. The road transportation of coal during Phase – 1 should be done by mechanically covered trucks.	Action has been taken for formulating adequate transportation plan for conveyor-cum-rail system of dispatch. CMPDIL has been requested to prepare the plan. Till that time transportation is being done by covering vehicle with tarpaulin cover.
xLii	A study should be initiated to analyze extent of reduction in pollution load every year by reducing road transport.	This is being done by CMPDIL

xLiii	R&R of 12246 Nos. of PAF's involved. They should be rehabilitated at cost of Rs. 126092.027 Lakhs as per the approved Jharia Action Plan.	Implementation is being done as per the Master Plan. As per the approved Master Plan prepared for dealing with fire subsidence and rehabilitation in the leasehold of BCCL for Jharia Coal Field, the master plan has identified 595 unstable sites in the entire Jharia Coal Field. Out of these, 98 sites covering an area of 224.56 Ha consisting of 12246 no. of houses/families fall in Cluster-IX mines. The cost for rehabilitation for the families is estimated to be Rs. 126092.03 lakhs. In the NTSTJeenagora mining block, 1716 houses have to be rehabilitated. The cost for rehabilitation is estimated to be Rs. 6989.88 lakhs with an affected area of 22.74 ha. 113 Nos. of Quarters have been allotted for shifting of PAFs by JRDA at Belgaria Township, out of which 99 have shifted to this site. The shifted PAFs belongs to the fire affected areas of DB road and Bengal Jharia section of NT-ST OCP.

xLiv	A detailed CSR Action plan shall be prepared for Cluster IX group of mines. Specific activities shall be identified for CSR the budget of RS. 142.55 Lakhs per year @ Rs. 5/T of coal as recurring expenditure. The 391.28 ha. of area within Cluster IX Ml existing as waste land and not being acquired shall be put to productive use under CSR and developed with fruit bearing and other useful species for the local communities. In addition to afforesting 1942.12 ha. of area at the post-mining stage, the waste land / barren land within Cluster IX ML. shall be rehabilitated / reclaimed as forest / agricultural land under CSR Plan in consultation with local communities. Third party evaluation shall be got carried out regularly for the proper implementation of activities undertaken in the project area under CSR. Issue raised in the public Hearing shall also be integrated with activities being taken up under CSR. The details of CSR undertaken along with budgetary provisions for the village-wise various activities and expenditure thereon shall be uploaded on the company website every year. The company must give priority to capacity building both within the company and to the company and to the local youth, who are motivated to carry out the work in future.	It shall be complied. BCCL is implementing CSR activities. A separate CSR committee has been formed for this purpose. TISS has conducted the survey for effective and need based CSR activities implementation. Recommendations of TISS shall be followed. A handloom weaving project (JHARCRAFT) has been started in the area which provides employment to local womenfolk. Under the CSR activities in the purview of NTST-Jeenagora OC, the handloom making projects (Jharkraft) at Mukunda at an expenditure of about Rs.10.38 lakhs during the year 2015-17 and at Alakdiha at an expenditure of about Rs.10.72 lakhs during the year 2016-18 have been established. At these centres, local women are getting training for making of clothes through the handloom.
xLv	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 3years (for any one particular season which is consistent in the time series), and the report submitted to MOEF and its Regional office at Bhubaneswar.	Complied. Presently a time series map of vegetation cover in the Jharia Coal Field is being carried out through CMPDI Ranchi. Further CMPDI has been requested to prepare "Time series of Land use maps based on satellite imagery of the core zone and buffer zone in the scale 1:50000 for every 3 years.
xLvi	A final Mines Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forest 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 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 Central Mine Planning and Design Institute (CMPDI) and progressive mine closure plan is being implemented.

xLvii	A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company for implementing environment policy and socio-economic issues and the capacity building required in this regard.	A full-fledged Environment Department, headed by a HOD (Environment) along with a suitable qualified multidisciplinary team of Executives (30 nos.) which includes Environment, Mining, Excavation, Civil, Survey, Electrical & Mechanical, Forestry disciplines Executives and Technicians (4 Nos.) has been established. They are also trained in ecological restoration, sustainable development, rainwater harvesting methods etc. At the project level, one Executive in each area has also been nominated as Project Nodal Officer (Environment) and is also entrusted with the responsibility of compliance and observance of the environmental Acts / Laws including environment protection measures. The activities are monitored on regular basis at Area and at Head Quarters levels. GM (Environment) at Head Quarter level Co-ordinates with all the Areas and reports to the Director (Technical) and in turn he reports to the CMD of the company. The team is multidisciplinary and very much motivated under the guidance of company's Director (Technical) and CMD. Further capacity building at both corporate and operating level is being done.
xLviii	Implementation of final mine closure plan for Cluster IX, subject to obtaining prior approval of the DGMS in regard to mine safety issues.	Mine closure plan as per the guidelines of Ministry of Coal has been prepared by Central Mine Planning and Design Institute (CMPDIL) and progressive mine closure plan is being implemented.

xLix	**Corporate Environment Responsibility** :- The company shall have a well laid down Environment Police approved by the Board of Directors. 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. 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. 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 also posted on BCCL website. Complied. A hierarchical system of the company to deal with environmental issue from corporate level to mine level already exists. Being complied.
Sl. No.	**B.) General Conditions**	**Compliance**
i	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.	Being complied.
ii	No change in the calendar plan of production for quantum of mineral coal shall be made.	Being complied.
iii	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM 10, PM 2.5, SO_2 and ND_X monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the state Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.	The locations of monitoring stations have been finalized. The work of monitoring of ambient environment had been started by Central Institute of Mining & Fuel Research (CIMFR), Dhanbad which is having CSIR Laboratory recognized under the EP Rules. Currently CMPDIL is carrying out the work of monitoring. Quarter Ending Reports is attached in Annexure.

iv	Data on ambient air quality (PM 10, PM 2.5, SO_2 and NO_X) and heavy metals such as HG, As, Ni, Cd, Cr and other monitoring data shall be regularly submitted to the Ministry including its Regional Office at Bhubaneswar and to the State Pollution Control Board and the Central Pollution Control Board once in six months. Random verification of samples through analysis from independent laboratories recognized under the EPA rules, 1986 shall be furnished as part of compliance report.	It is being complied.
v	Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs / muffs.	Being complied.
vi	Industrial wastewater (workshop and wastewater from the Mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.	The locations of monitoring stations have been finalized. The work of monitoring of ambient environment has been started by Central Institute of Mine & Fuel Research (CIMFR), Dhanbad which is having Laboratory recognized under the EO Rules. CMPDI is currently carrying out the work of monitoring the ambient environment.
vii	Vehicular emission shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.	It is being complied.
viii	Monitoring of environment quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board and data got analyzed through a laboratory recognized under EPA Rules, 1986.	It is complied.
ix	Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.	Being Complied. Vocational training Centers under separate Human Resource Development Dept. is conducting regular training programme on these issues.

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 measure, 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) guidelines.
xi	A separate environment 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 HOD (Environment) along with a suitable qualified multidisciplinary team of executives (30 Nos.) which includes Environment, Mining, Excavation, Civil, Survey, Electrical & Mechanical, Forestry disciplines Executives and Technicians (4 Nos.) has been established. They are also trained in ecological restoration, sustainable development, rainwater harvesting methods etc. At the project level, one Executive in each area has also been nominated as Project Nodal Officer (Environment) and is also entrusted with the responsibility of compliance and observance of the environmental Acts / Laws including environment protection measures. The activities are monitored on regular basis at Area and at Head Quarters levels. GM (Environment) at Head Quarter level Co-ordinates with all the Areas and reports to the Director (Technical) and in turn he reports to the CMD of the company. The team is multidisciplinary and very much motivated under the guidance of company's Director (Technical) and CMD. Further capacity building at both corporate and operating level is being done.
xii	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its Regional Office at Bhubaneswar.	It is being complied.

xiii	The project authorities shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and may also be seen at the website of the ministry of Environment & Forests at http://envfor.nic.in.	It has been complied.
xiv	A copy of the environmental clearance letter shall be marked to concern Panchayat/ZilaParished, 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 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 environmental quality parameter (air, water, noise and soil) and critical pollutant such as PM_{10}, $PM_{2.5}$, SO_2 and NO_x (ambient) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mine office and in corporate office and on company's website.	Complied.

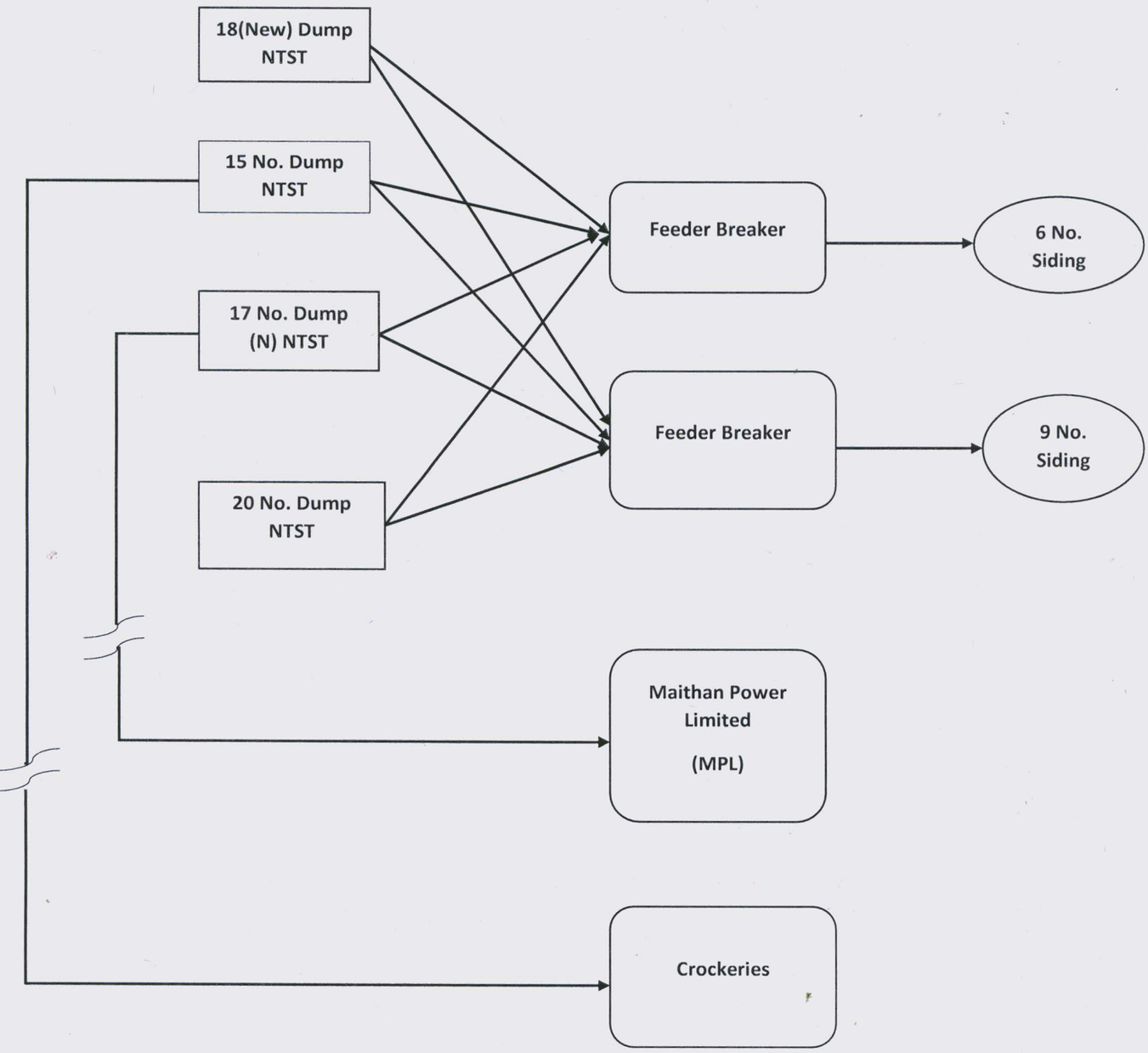
xvii	The project proponent shall submit six monthly compliance reports on status of compliance of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office o the Ministry, respective Zonal Offices of CPCB and the SPCB.	Being complied.
xviii	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.	It is being complied.
xix	The Environment Statement for each financial year ending 31 March in for-V is mandated to be submitted by the project proponent for the concerned State Pollution Control Board as prescribed under the Environment (protection) Rules, 1996, as amended subsequently, shall also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MOEF by E-mail.	Being complied.
Sl. No.	**C.) Other Conditions by MOEF :**	**Compliance**
i	The Ministry or any other Competent Authority may stipulate any further condition(s) for environmental protection.	Agree.
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.	Agree.

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.	Agree.

29/05/2018

General Manager (Mining)
Lodna Area
BCCL. Dhanbad

Transportation Plan (Cluster-IX)
Lodna Area, BCCL



Amalgamated NT-ST Jeenagora Colliery

28/5/18
AO(Surv)
L. Area

29/05/2018
GM (Mtg)
L. Area

भारत कोकिंग कोल लिमिटेड
एक मिनीरत्न कंपनी
(कोल इंडिया लिमिटेड का एक अंग)
पंजीकृत 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/17 327 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

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

(FOR THE MONTH FEBRUARY, 2018)

E. C. no. J-11015/307/2010-IA.II (M) dated 21.05.2013.

CMPDI
ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

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EXECUTIVE SUMMARY

1.0 Introduction

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

Bharat Coking Coal Limited (BCCL), a Subsidiary company of Coal India Limited is operating Underground and Opencast Mines in Jharia Coalfield (JCF) is a part of Gondwana Coalfields located in Dhanbad district of Jharkhand, the JCF is bounded by $23^0$37' N to $23^0$52' N latitudes and $86^0$09' E to $86^0$30' E longitude occupying an area of 450 Sq.km. BCCL has awarded Environmental monitoring work of Jharia Coalfield (JCF) to Central Mine Planning & Design Institute Limited (CMPDIL). The environmental monitoring has been carried out as per the conditions laid down by the MoEF&CC while granting environmental clearance of project, consent letter issued by the respective SPCB, and other statutory requirements.

2.0 Sampling location and rationale

2.1 Ambient air sampling locations

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

2.2 Water sampling stations

The Water sampling stations were selected for mine sump water.

2.3 Noise level monitoring locations

Noise levels vary depending on the various activities in mining areas. The monitoring of noise level in different locations will be helpful to take appropriate mitigating measures. The rationale has been based on the guidelines stipulated by MoEF&CC, consent letter of SPCB, as well as other statutory requirements

3.0 Methodology of sampling and analysis

3.1 Ambient air quality

Parameters chosen for assessment of ambient air quality were Particulate Matter (PM_{10}), Fine Particulate Matter ($PM_{2.5}$), Sulphur Di-oxide (SO_2) and Nitrogen Oxides (NO_x). Respirable Dust Samplers (RDS) and Fine Dust Sampler ($PM_{2.5}$

sampler) were used for sampling of PM_{10}, SO_2, & NO_X and Fine Dust Sampler ($PM_{2.5}$ sampler) were used for sampling of $PM_{2.5}$ at 24 hours interval once in a fortnight and the same for the gaseous pollutants. The samples were analysed in Environmental Laboratory of CMPDI, RI-II, Dhanbad.

3.2 Water quality

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

3.3 Noise level monitoring

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

4.0 Results and interpretations

4.1 Air quality

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

4.2 Water quality

The test results indicate that the major parameters compared with MoEF&CC Gazette Notification No. GSR 742(E) dt.25.09.2000 Standards for Coal Mines were within permissible limits.

4.3 Noise Level

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

INTRODUCTION

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

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

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

1.1 The Cluster-IX is in the Eastern part of the Jharia coalfield. It includes a group of 7 Mines (viz. Lodna, S. Tisra/NTST OC, Jealgora, Joyrampur, Jeenagora, Bararee, S.Tisra/NTST Expan. OC. The Cluster – IX is situated about 25 - 30 kms from Dhanbad Railway Station. The mines of this Cluster – IX are operating since pre nationalization period (prior to 1972-73). It is connected by both Railway and Road. The drainage pattern of the area is governed by Kashi Jore.

1.2 The Cluster-IX is designed to produce 6.548 MTPA (normative) and 8.512 MTPA (peak) capacity of coal.

The Project has Environmental Clearance from Ministry of Environment, Forest and Climate Change (MoEF&CC) for a rated capacity 6.548 MTPA (normative) and 8.512 MTPA (peak) capacity of coal production vide letter no. J-11015/307/2010-IA.II (M) dated 21st May, 2013.

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

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

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) Jeenagora (A13) : Industrial Area

The location of the sampling station is 23^0 42' 31.00" N & 86^0 25' 48.00" E. The sampler was placed at a height of 1.5 m from the ground level at the Safety Office.

II. BUFFER ZONE Monitoring Location

i) Kusmatand Village (A12): Industrial Area

The location of the sampling station is 23^{0}45' 4.65" N & 86^0 26' 42.10" E. The sampler was placed at a height of 1.5 m from the ground level of the village.

ii) Bhowrah North (A14) : Industrial Area

The location of the sampling station is 23^{o}41' 37.00" N & 86^{o}23' 54.00"E. The sampler was placed at 1.5 m above the ground level of Project Office.

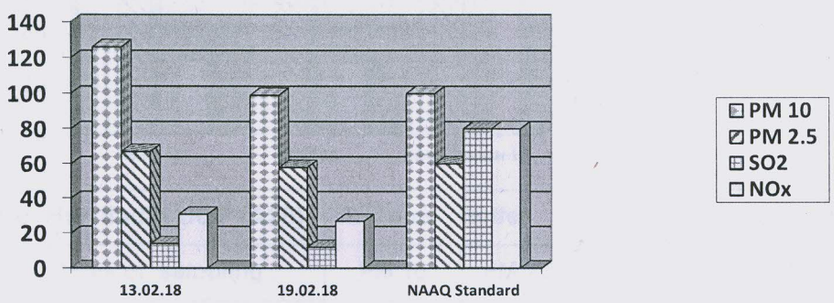
Iii) Hurriladih UGP (A28) : Industrial Area

The location of the sampling station is 23^{0}44' 4.18" N & 86^0 24' 6.21" E. The sampler was placed at a height of 1.5 m from the ground level of the mine office.

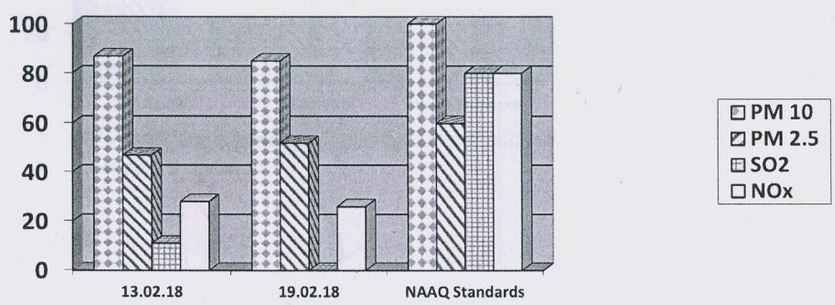
AMBIENT AIR QUALITY DATA

Cluster – IX,Bharat Coking Coal limited Month: February, 2018 Year : **2017-18.**

Station Name: A13 – Jeenagora		Zone: Core		Category: Residential	
Sl. No.	**Dates of sampling**	**PM 10**	**PM 2.5**	**SO_2**	**NO_x**
1	13.02.18	126	67	14	31
2	19.02.18	99	58	12	27
	NAAQ Standard	100	60	80	80



StationName:A12 Kusmatand Village		Zone: Buffer		Category: Industrial	
Sl. No.	**Dates of sampling**	**PM 10**	**PM 2.5**	**SO2**	**NOx**
1	13.02.18	87	47	11	28
2	19.02.18	85	52	<10.0	26
	NAAQ Standards	100	60	80	80

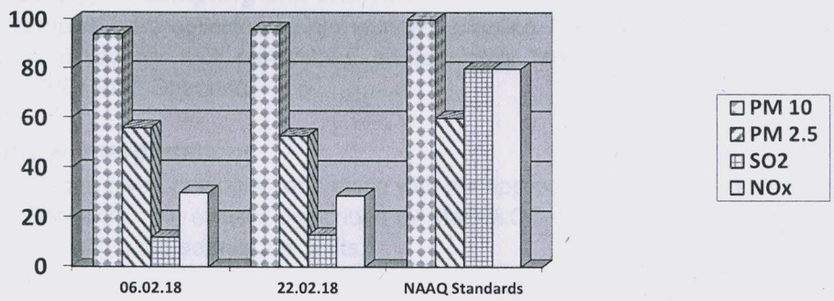


Analysed By
JSA/SA/SSA

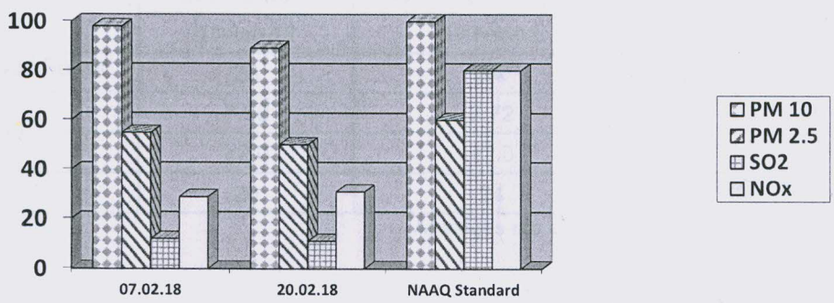
Checked By
Lab In Charge
RI-2, CMPDI, Dhanbad

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

Station Name:A14- Bhowrah North		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	06.02.18	94	56	12	30
2	22.02.18	96	53	13	29
	NAAQ Standards	100	60	80	80



Station Name: Hurriladih UGP (A28)		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_x
1	07.02.18	98	55	12	29
2	20.02.18	89	50	11	31
	NAAQ Standard	100	60	80	80



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

Analysed By
JSA/SA/SSA

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

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

WATER QUALITY MONITORING

3.1 **Location of sampling sites**

(Refer **Plate No. – II**)

i) **Mine Discharge of Jeenagora (MW9)**

A sampling point is fixed to assess the effluent quality of Mine discharge.

3.2 **Methodology of sampling and analysis**

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

3.3 **Results & Interpretations**

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

WATER QUALITY DATA

(EFFLUENT WATER- FOUR PARAMETERS)

Name of the Cluster: **Cluster -IX**		Month: **February, 2018**	Name of the Station: **Mine Discharge of Jeenagora**	
Sl. No.	**Parameters**	**MW9** First Fortnight	**MW9** Second Fortnight	**As per MOEF General Standards for schedule VI**
		13-Feb-18	19-Feb-18	
1	Total Suspended Solids	23	34	*100 (Max)*
2	pH	7.96	7.72	*5.5 - 9.0*
3	Oil & Grease	<2.0	<2.0	*10 (Max)*
4	COD	20	24	*250 (Max)*

All values are expressed in mg/lit except pH.

Analysed By
JSA/SA/SSA

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

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

NOISE LEVEL QUALITY MONITORING

4.1 Location of sampling sites

1. **Jeenagora (N13)**
2. **Kusmatand Village (N12)**
3. **Bhowrah North (N14)**
4. **Hurriladih UGP (N28)**

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 Project: **Cluster -IX**			Month: **February, 2018**		
Sl. No.	**Station Name/Code**	**Category of area**	**Date**	**Noise level dB(A)LEQ**	***Permissible Limit of Noise level in dB(A)***
1	**Kusmatand Village (N12)**	**Residential area**	13.02.18	51.7	*55*
2	**Kusmatand Village (N12)**	**Residential area**	19.02.18	50.6	*55*
3	**Jeenagora (N13)**	**Industrial area**	13.02.18	63.6	*75*
4	**Jeenagora (N13)**	**Industrial area**	19.02.18	60.2	*75*
5	**Bhowrah North(N14)**	**Industrial area**	06.02.18	64.4	*75*
6	**Bhowrah North(N14)**	**Industrial area**	22.02.18	61.3	*75*
7	**Hurriladih UGP (N28)**	**Industrial area**	07.02.18	62.6	*75*
8	**Hurriladih UGP (N28)**	**Industrial area**	20.02.18	61.8	*75*

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

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

Analysed By
JSA/SA/SSA

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

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

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

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

Note:

* Annual Arithmetic mean for the measurements taken in a year, following the guidelines for frequency of sampling laid down in clause2.

** 24hourly/8hourlyvaluesshallbemet92%ofthetimeinayear.However,8% of the time it may exceed but not on two consecutivedays.

NATIONAL AMBIENT AIR QUALITY STANDARDS

New Delhi the 18th November 2009

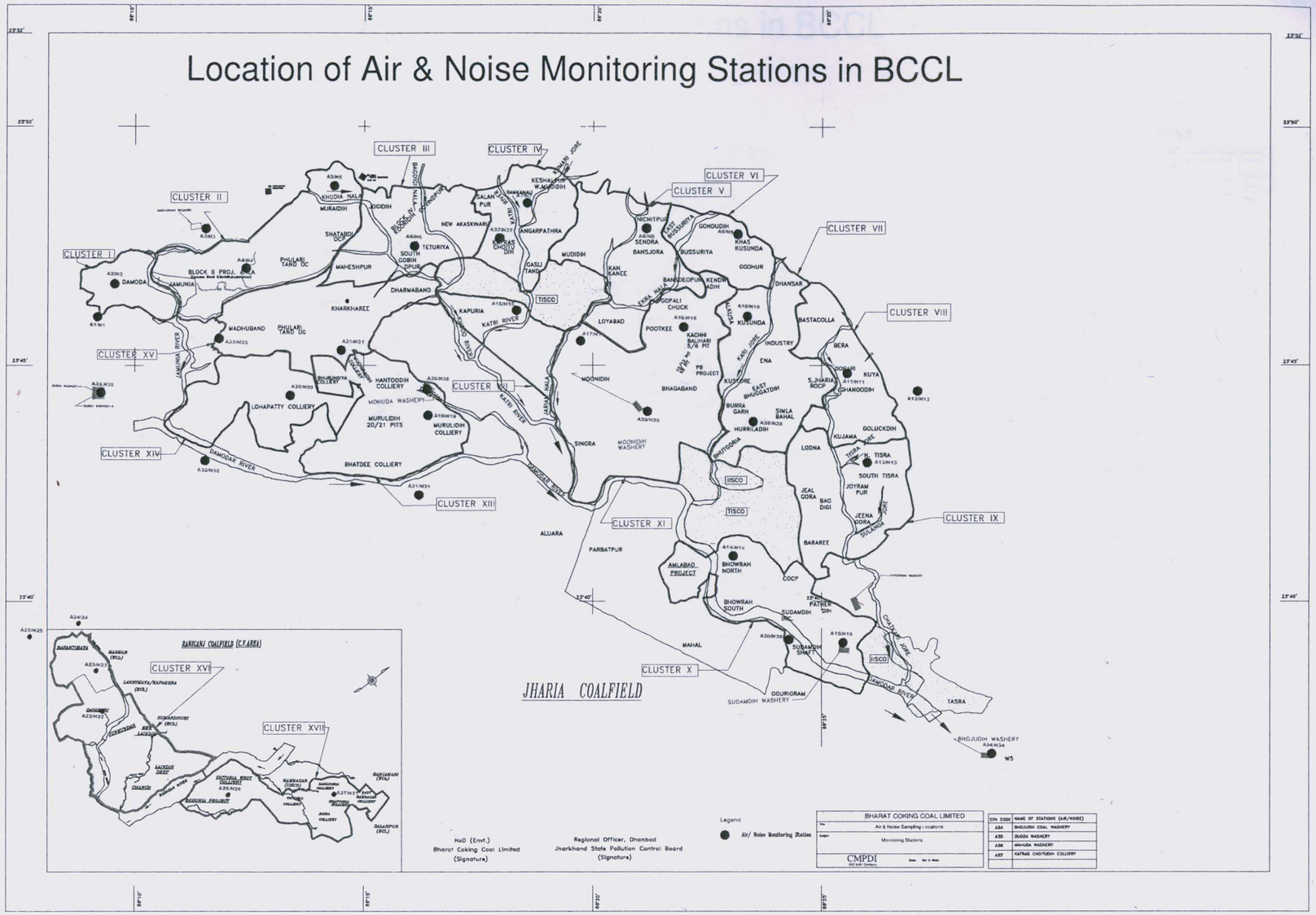
In exercise of the powers conferred by Sub-section (2) (h) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No. 14 of 1981), and in supersession of the notification No(s).S.O.384(E), dated 11th April 1994 and S.O.935(E), dated 14th October 1998, the Central Pollution Control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

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

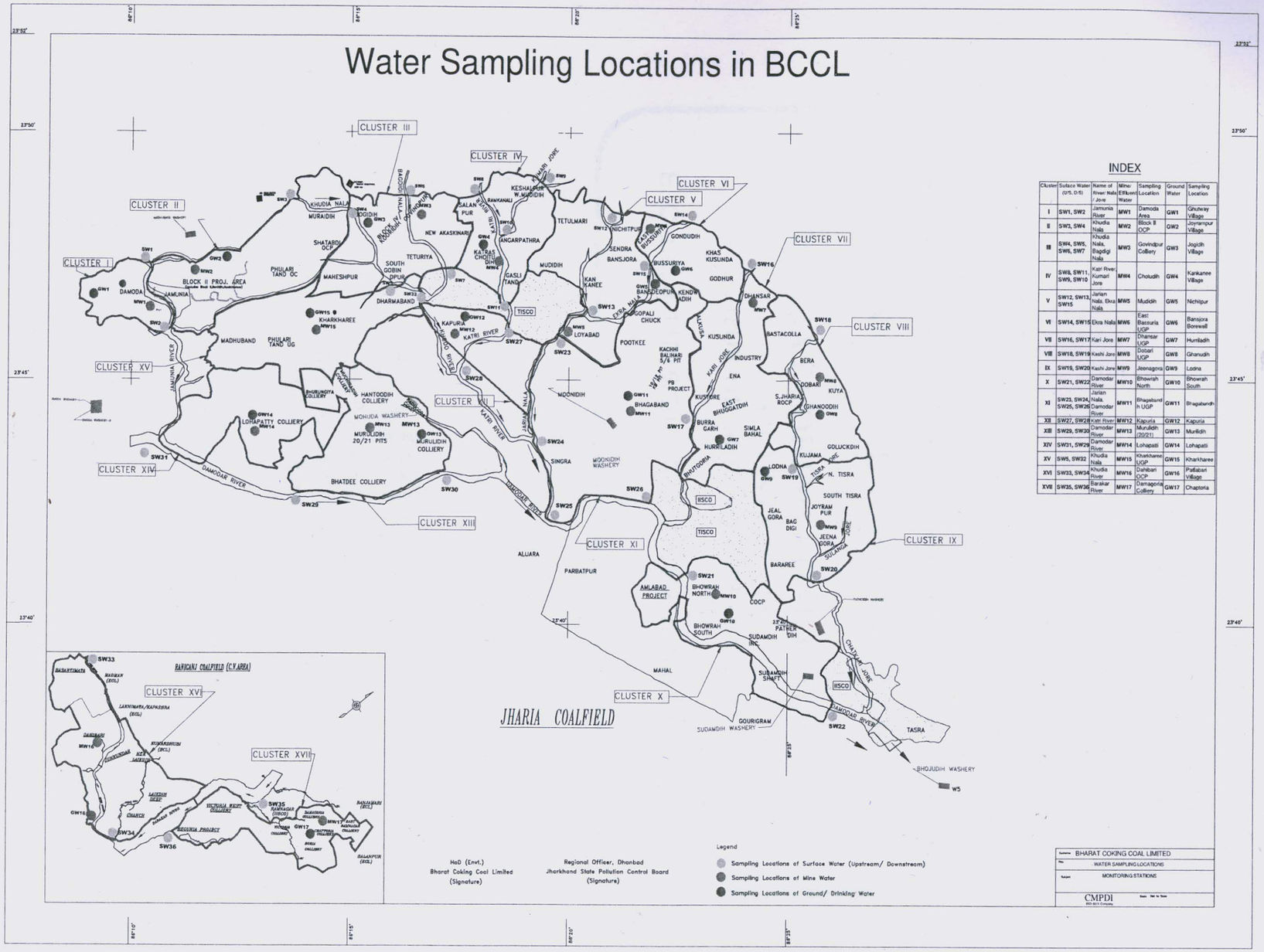
* Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

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

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


Location of Air & Noise Monitoring Stations in BCCL
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
CLUSTER XVI
CLUSTER XVII
JHARIA COALFIELD
RANIGANJ COALFIELD (C.F.AREA)
DAMODAR RIVER
KATRI RIVER
JAMUNIA RIVER
BARAKAR RIVER
BHOJUDIH WASHERY
MOHUDA WASHERY
MOONIDIH WASHERY
SUDAMDIH WASHERY
HoD (Envt.)
Bharat Coking Coal Limited
(Signature)
Regional Officer, Dhanbad
Jharkhand State Pollution Control Board
(Signature)
Legend
Air/ Noise Monitoring Station
BHARAT COKING COAL LIMITED
Air & Noise Sampling Locations
Monitoring Stations
CMPDI
STN CODE
NAME OF STATIONS (AIR/NOISE)
A24 BHOJUDIH COAL WASHERY
A35 DUGDA WASHERY
A36 MOHUDA WASHERY
A37 KATRAS CHOITUDIH COLLIERY

Water Sampling Locations in BCCL



INDEX

Cluster	Surface Water (SW1-SW36)	Name of River/ Nala / Jore	Mine Effluent Water	Sampling Location	Ground Water	Sampling Location
I	SW1, SW2	Jamunia River	MW1	Damoda Area	GW1	Ghuteay Village
II	SW3, SW4	Khudia Nala	MW2	Block II OCP	GW2	Joynarpur 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	Choludih	GW4	Kankanee Village
V	SW12, SW13, SW15	Jarian Nala, Ekra Nala	MW5	Mudidih	GW5	Nichitpur
VI	SW14, SW15	Ekra Nala	MW6	East Bassuria UGP	GW6	Bansjora Borewell
VII	SW16, SW17	Kari Jore	MW7	Dhansar UGP	GW7	Hurriladih
VIII	SW18, SW19	Kashi Jore	MW8	Dobari UGP	GW8	Ghanudih
IX	SW19, SW20	Kashi Jore	MW9	Jeenagora	GW9	Lodna
X	SW21, SW22	Damodar River	MW10	Bhowrah North	GW10	Bhowrah South
XI	SW23, SW24, SW25, SW26	Jarian Nala, Damodar River	MW11	Bhagaband h UGP	GW11	Bhagabandh
XII	SW27, SW28	Katri River	MW12	Kapuria	GW12	Kapuria
XIII	SW29, SW30	Damodar River	MW13	Muruldih (20/21)	GW13	Murlidih
XIV	SW31, SW32	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