

भारत कोकिंग कोल लिमिटेड

एक मिनी रत्न कंपनी

(महाराष्ट्र कंपनी कोल इंडिया का एक उपक्रम)

पंजीकृत कार्यालय : कोयला भवन, कोयला नगर,

धनबाद-826005.

सीआइएन : U10101JH1972GO1000918

परियोजना पदाधिकारी का कार्यालय
महुदा ग्रुप

पोस्ट / थाना: महुदा, जिला: धनबाद (झारखण्ड)-828305

फोन नं. 0326 2273483; फेक्स: 0326 2273445, ई-मेल: gmwj.bcc@coalindia.in



Bharat Coking Coal Limited

A Mini Ratna Company

(A Subsidiary of Coal India Limited: A Maharatna Company)

Regd. Off. : Koyla Bhawan, Koyla Nagar

Dhanbad - 826005

CIN : U10101JH1972GO1000918

OFFICE OF THE PROJECT OFFICER
MAHUDA GROUP

PO & PS: Mahuda, DISTT: Dhanbad (Jharkhand)-828305

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"For uploading on MOEF&CC 'parivesh portal' and send e-mail"

Ref: BCCL/WJA/ENV/2022/ 234 (B)

Date: 29/11/2022

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

Sub:- Submission of six-monthly reports on compliance of Environment Clearance for the period from **April'2022 to Sept'2022** with respect to **Cluster-XII** of Kapuria UG project, M/s Bharat Coking coal Limited.

Ref: EC Order No. - J-11015/184/2012-IA.II (M) Dated:- 10.12.2014.

Dear Sir,

Please find enclosed herewith the six-monthly reports on compliance of Environment Clearance for the period from **April'2022 to Sept'2022** in respect of **Cluster XII of Kapuria UG of M/s Bharat Coking Coal Limited** for your kind perusal and further needful action please. It is also to bring to your kind notice that the project has been delayed due to the delay in physical possession of land. The work has not started yet.

Thanking you,

Encl:- As Above

Yours faithfully,

Project Officer
Kapuria Project

CC to:-

1. The Director, 1A Monitoring Cell, Paryavaran Bhawan, CGO Complex, New Delhi - 110003.
2. The Member Secretary, Jharkhand State Pollution Control Board, TA - Division Building, Dhruwa-Ranchi - 834004.
3. HoD (Env.), BCCL, Koyla Bhawan Dhanbad.
4. GM, W.J. Area.
5. Nodal Officer (Env.), WJ Area.

**ENVIRONMENTAL CLEARANCE COMPLIANCE OF CLUSTER-XII
GRANTED VIDE LETTER NO. J-11015/184/2012-IA.II (M) DATED
10.12.2014**

(April' 22 – Sept'22)

Sl. No	A. Specific Conditions by MOEF:	Compliance
i.	The maximum production from the mine at any given time shall not exceed the limit as prescribed in the EC	Project has not started yet. Project is under tendering process.
ii	A separate team for subsidence monitoring and surface mitigation measures be constituted and continuous monitoring and mitigation measures be carried out.	Shall be complied. Project is under construction phase.
iii.	The validity of the EC is for the life of the Mine or as specified in the EIA Notification, 2006, whichever is earlier.	Agreed.
iv.	The coal transportation from the mine to the siding shall be by conveyor belt and coal transportation from to the washery shall be by rail.	Shall be complied.
v.	Piezometers be installed upto the depth of mining to facilitate monitoring of ground water.	The work of monitoring of ground water is being carried out by CMPDI.
Vi.	Water sprinkler be used for coal dust suppression along the haul roads.	Shall be complied.
vii.	Thick green belt shall be developed around proposed washery within the Cluster-XII lease area and plantation shall be undertaken along NR-32.	Shall be complied.
Viii	Subsidence study shall be taken up with reputed scientific agency as per stipulation of DGMS	Shall be complied.
ix.	Various CSR works that will be carried out shall include education, healthcare water supply etc.	Shall be complied.
x.	The project should have ecologist/social scientists to monitor the project.	BCCL is following the roadmap prepared by FRI, Dehradun to restore ecology in the region and conducting the work of ecological restoration in the mined out areas.
xi.	Coal produced from the mine will be directly loaded into a CHP at the incline top. From the CHP at incline top, coal will be transported to the proposed Kapuria Coal Washery linked to the mine by covered conveyor system of length of 250m. Washed coal from the washer will be transported by conveyor to the railway siding and loaded	Shall be complied.

	into the wagons by CHP.	
xii.	The production shall be within the same Mining Lease area	Shall be complied.
xiii.	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 clay soilsuitable material.	Shall be complied.
xiv.	If subsidence is found exceeding the permitted limits, then the land owners shall be adequately compensated with mutual agreement of the landowners.	Shall be complied.
xv.	Mining shall be carried out as per statuette at a safe distance from river/nalla following within adjacent to the lease boundary at the time of depillaring, protective bunds and garland drains shall be provided so that no water from the surface enters the subsidence area and the shaft.	Mining shall be done as per DGMS statute.
xvi.	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.	Shall be complied.
xvii.	Solid barriers shall be left below the roads falling within the blocks to avoid any damage to the roads.	Shall be complied.
xviii.	Diversion of Land shall be done with approval of the Competent Authorities.	Shall be complied.
xix.	Coal Extraction shall be optimised in areas where agricultural production is continuing. Some pillars shall be left below the agricultural land. No depillaring & coal extraction should be carried out below habitation, H.T. Lines & beneath road,	It will be done as per the statute and DGMS Guidelines.

	water bodies, railway track.	
xx.	The mined out land should be used for agriculture purpose.	Shall be complied
xxi.	Safety measures and health issues need to be addressed for workers and surrounding villagers.	Shall be complied.
xxii.	Proponent shall implement all the lated safety measures with safety equipment.	It will be done as per the statute and DGMS guidelines.
xxiii.	At the time of establishing the CRP, it is proposed to establish mist spray arrangements and also enclosing the ground level bunkers up to the level of gantry	Shall be complied.
Xxiv.	An afforestation plan to be prepared for implementation after stabilization of subsidence	Shall be complied.
Xxv.	Water spraying arrangements at loading points and mist spray arrangements are to be provided.	Shall be complied.
xxvi.	No additional land, manpower and equipment and water shall be used for the expansion project.	Shall be complied.
xxvii.	Mine closures activities include sealing of incline mouth dismantling of haulage system, clearing and afforestation of coal stock area, plantation on barren land and old abandoned mine.	Mine closure plan will be formulated as per the guidelines of ministry of coal GoI.
xxviii.	3-tier plantation should be developed 2 km stretch of road from the mine using native species	Shall be complied.
.xxix.	Garland drains (size, gradient and length) around the safety areas such as mine shaft and low lying areas and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine sites. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.	It will be done as per EMP.

Xxx.	Water sprinkling system shall be provided to check fugitive emissions from loading operations, conveyor system, haulage roads, transfer points, etc. Major approach roads shall be black topped and properly maintained.	Shall be complied.
.Xxxi.	A progressive afforestation plan shall be prepared and implemented over the mine lease area acquired and shall include areas under green belt development, areas along roads, infrastructure, along ML boundary and township etc., by planting native species in consultation with the local DFO/Agriculture Department,	Shall be done. EMP and mine closure plan will be followed.
xxxii.	Regular monitoring of groundwater level and quality 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 in May. Data thus collected shall be submitted to the Ministry of Environment, Forests & Climate Change and to the Central Pollution Control Board quarterly within one month of monitoring.	It will be complied. At present CMPDI is working to establish a network of piezometer well.
xxxiii.	Acid Water Treatment Plant, volume of water to be treated and disposal of brine should be provided.	Shall be provided if acid water treatment is required.
xxxiv.	High root density tree species shall be selected and planted over areas likely to be affected by subsidence.	Shall be provided.
xxxv.	Monitoring of drinking water should be carried out regularly.	Environmental parameters are being monitored by CMPDI, as per the MoEF&CC standards.
Xxxvi.	Sewage treatment plant shall be installed in the township. ETP shall also be provided for treating workshop	Shall be complied.
xxxvii.	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 anyone particular season which is consistent in the time series), and the report	Presently a time series map of vegetation cover in the Jharia coal field is being carried out through CMPDIRanchi using satellite imagery for every 3 years and is being uploaded on the official website of company. 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 1:5000.

	submitted to MOEF&CC and its Regional office at Bangalore.	
xxxviii	If the water quality parameters such as F, pH, heavy metals, etc. exceed the prescribed limits, suitable measures by the proponent be taken to ensure that the local communities are provided alternate source of water for their livelihood	Shall be complied.
xxxix	Medical camps should be organized in the area for regular check-up of workers/villagers/population. Detailed prevalent disease pattern in the area should be documented and details of medical facilities provided for the same be made available to the MoEF&CC	It is being done.
xl.	Mine discharge water outside the ML shall be monitored, particularly for TDS and treated to conform to prescribed levels before discharge into the natural environment.	Environmental parameters are being monitored by CMPDI, as per the MoEF&CC standard.
xli.	The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource, in case water table shows a declining trend. The project authorities shall meet water requirement of nearby villagers) in case the village wells go dry due to dewatering of mine.	It will be provided and regular monitoring shall be done
xlii.	Besides carrying out regular periodic health check-up of their workers, 10% of the workers identified from Workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, through an agency such as NIOH, Ahmadabad within a period of one year and the results reported to this Ministry and to DGMS.	It will be complied, however BCCL has engaged NIOH for other cluster of BCCL to health checkup for occupational disease and hearing impairment.
xliii.	The mining in the existing mines should be phased out after expiry of the current mining lease and after reclamation of mined over area. The operating mines may be analysed and monitored for compliance of conditions, bearing with movement of wildlife and until such time they are closed/phased out.	Agree, Shall be complied
xliv.	Project specific CSR for an amount of Rs5/Tonne of coal production, as adjusted as per the annual inflation, should be provided for the CSR activities	It will be done as per the CSR policy of organization.

	undertaken and the progress made thereon shall be uploaded annually on the company website. Monitoring of the impacts of activities under CSR shall be carried out periodically.	
xliv.	A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment, Forests & Climate Change 5 years in advance of final mine closure for approval.	shall be complied
xlvi.	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.	Bharat Coking Coal Ltd is a subsidiary of Coal India Ltd which is having a well laid down Environmental Policy It is being complied It already exists within the company. It will be done, if any.
Sl. No	B. General Conditions Conditions by MOEF:	Compliance
i.	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment, Forests & Climate Change.	Shall be complied
ii.	No change in the calendar plan of production for quantum of mineral coal shall be made.	Shall be complied when coal production will start.
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	Being complied. Monitoring is being done by CMPDI. Monitoring report enclosed.

	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,	
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 concerned Regional Office and to the State Pollution Control Board and the Central Pollution Control Board once in six months. Random verification of samples through analysis from independent laboratories recognized under the EPA rules, 1986 shall be furnished as part of compliance report.	Being complied
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.	Shall be 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 19 th May 1993 and 31 st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.	Shall be complied
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.	Shall be complied
viii.	Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board and data got analyzed through a laboratory recognized under EPA Rules, 1986.	Environmental parameters are being monitored as per NAAQS standards. Monitoring stations have been finalized with Jharkhand State Pollution Control Board, Ranchi.
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.	Shall be complied

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.	Shall be complied
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 HoD (Environment) along with a suitable qualified multidisciplinary team with of executive has been established in the headquarters. They are trained in ecological restoration, sustainable development, rainwater harvesting methods etc.
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 concerned Regional Office.	Shall be complied
xiii.	http://envfor.nic.in. 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 & Climate Change at http://envfor.nic.in.	It is complied
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.	It is complied
xv.	A copy of the environmental clearance letter shall be shall also be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the Regional Office, District Industry Sector and Collector's Office/Tehsildar's Office for 30 days	It is 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, PM_{2.5}, SO₂ and NO_x (ambient) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mine office and in corporate office and on company's website.	It is being complied The monitoring data of environment parameters to be display at project premises shall be complied once the project starts.
xvii.	The project proponent shall submit six monthly compliance reports on status of compliance of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office of the Ministry, respective Zonal Office s of CPCB and the SPCB.	It is being complied
xviii.	The Regional Office of this Ministry located in the Region shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the officers) of the Regional Office by furnishing the requisite data information/monitoring reports,	It is being complied
xix.	The Environmental statement for each financial year ending 31 March in For -V is mandated to be submitted by the project proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MoEFCC by e-mail.	It is being complied

	C. Other Conditions by MoEF&CC	
4	The proponent shall abide by all the commitments and recommendations made in the ETA/EMP report so along during their presentation to the EAC.	Agreed
5	The commitment made by the Proponent to the issue raised during Public Hearing shall be implemented by the Proponent	Shall be implemented
6	The proponent is required to obtain all necessary clearances/approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection	Agreed
7	The Ministry or any other competent authority may stipulate any further condition for environmental protection.	Agreed
8	The Proponent shall setup an Environment Audit cell with responsibility and accountability to ensure implementation of all the EC Conditions.	It will be done
9	Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Agreed
10	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 and any other orders passed by the Hon'ble Supreme Court of India, High Courts and any other Court of Law relating to the subject matter. The proponent shall ensure to undertake and provide for the costs incurred for taking	Shall be complied

up remedial measures in case of soil contamination, contamination of groundwater and surface water, and occupational and other diseases due to the mining operations.

11

Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

Agreed


29/11/22
Project Officer
Kapuria Mine
KAPURIA PROJECT
W.J. Area

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 /GOVERNMENT.

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

(FOR THE MONTH APRIL, 2022)

E. C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.



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°37' N to 23°52' N latitudes and 86°09' E to 86°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 (PM₁₀), Fine Particulate Matter (PM_{2.5}), Sulphur Di-oxide (SO₂)

and Nitrogen Oxides (NO_x). Respirable Dust Samplers (RDS) and Fine Dust Sampler (PM_{2.5} sampler) were used for sampling of PM₁₀, SO₂, & 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 'LEQ' 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 PM₁₀, PM_{2.5}, SO₂ 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 PM₁₀ & 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.

The following preventive and suppressive mitigative measures can be undertaken to contain the pollution level within prescribed level:-

- Wet drilling and controlled blasting should be practice.
- Explosive used should be optimised to restrict the dust generation.
- Transportation roads should be permanently asphalted free of ruts, potholes etc.
- Water should be sprayed on coal transportation road, service road more frequently and at regular interval.
- Dust from roads should be removed physically or mechanically.
- Greenbelts around industrial sites, service building area besides Avenue plantation along roads should be created.
- Coal dust should be suppressed by using fixed sprinklers.
- Regular maintenance of plant and machinery should be undertaken.

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

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 XII is in the Central part of the Jharia coalfield. It includes Kapuria UG Mine. The cluster – XII is situated about 30 - 35 kms from Dhanbad Railway Station. The mines of this cluster - XII are operating since pre nationalization period (prior to 1972-73). It is connected by both Railway and Road. The drainage of the area is governed by Katri River.

1.2 The cluster XII is designed to produce 2.4 Mtpa (normative) and 3.12 Mtpa peak capacity of coal. The average grade of coal W-II to W-IV.

The Project has Environmental Clearance from Ministry of Environment, Forests and Climate Change (MoEF&CC) for a rated capacity of 2.4 MTPA (normative) and 3.12 MTPA peak capacity of coal production vide letter no E.C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.

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 PM₁₀, PM_{2.5}, SO₂, NO_x 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) Rudhi basti (A18): Industrial Area

The location of the sampling station is 23° 45' 26.60" N & 86° 18' 39.90" E. The samplers were placed at a height of approx. 1.5m above ground level at Rudhi basti.

II. BUFFER ZONE Monitoring Location

i) Block IV (A6) : Industrial area

The location of the sampling station is 23° 47' 54.00" N & 86° 16' 20.00" E The samplers were placed at a height of approx. 1.5m above ground level at Safety Office.

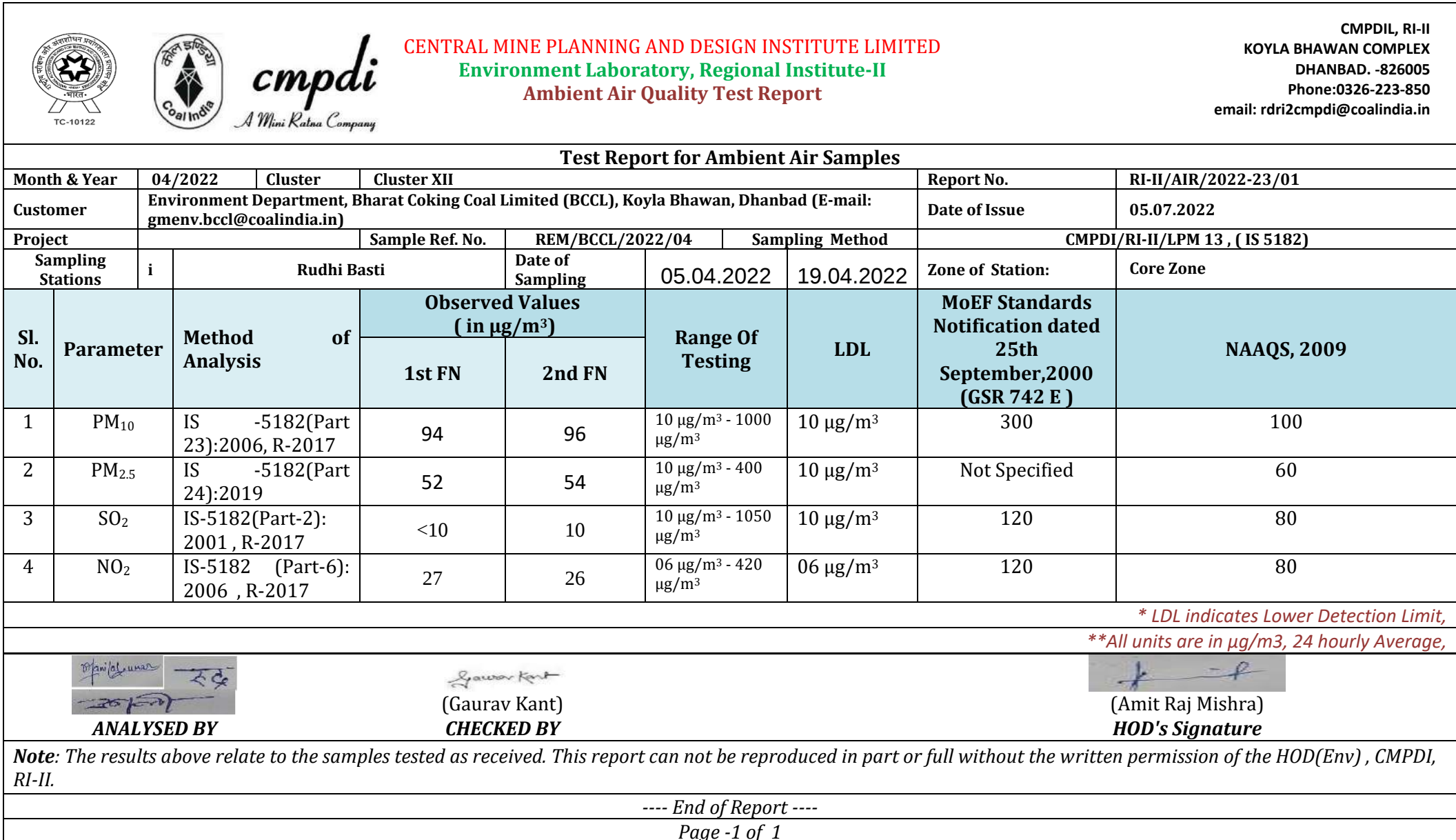
ii) Moonidih UGP (A17) : Industrial area

The location of the sampling station is 23° 44' 30.00" N & 86° 20' 56.00" E. The samplers were placed at a height of approx. 1.5m above ground level at project office.

iii) Murlidih 20/21 Pit(A19): Industrial Area

The location of the sampling station is 23° 43' 51.82" N & 86° 16' 21.87" E. The samplers were placed at a height of approx. 1.5m above ground level at project office.

AMBIENT AIR QUALITY DATA





cmpdi
A Mini Ratna Company

CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
Ambient Air Quality Test Report

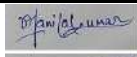
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email: rdri2cmpdi@coalindia.in

Test Report for Ambient Air Samples

Month & Year		04/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/01	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	05.07.2022	
Project				Sample Ref. No.	REM/BCCL/2022/04	Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Block IV		Date of Sampling	07.04.2022	22.04.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017		94	97	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	PM _{2.5}	IS -5182(Part 24):2019		54	56	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		13	14	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		21	19	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,




ANALYSED BY



(Gaurav Kant)
CHECKED BY



(Amit Raj Mishra)
HOD's Signature

Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env), CMPDI, RI-II.

---- End of Report ----

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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
Ambient Air Quality Test Report

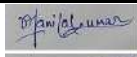
CMPDIL, RI-II
KOYLA BHAWAN COMPLEX
DHANBAD. -826005
Phone:0326-223-850
email: rdri2cmpdi@coalindia.in

Test Report for Ambient Air Samples

Month & Year		04/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/01	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	05.07.2022	
Project				Sample Ref. No.	REM/BCCL/2022/04	Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Moonidih UGP		Date of Sampling	12.04.2022	29.04.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017		114	133	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	PM _{2.5}	IS -5182(Part 24):2019		64	74	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		<10	<10	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		23	22	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,




ANALYSED BY



(Gaurav Kant)
CHECKED BY



(Amit Raj Mishra)
HOD's Signature

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Environment Laboratory, Regional Institute-II
Ambient Air Quality Test Report

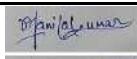
CMPDIL, RI-II
KOYLA BHAWAN COMPLEX
DHANBAD. -826005
Phone:0326-223-850
email: rdri2cmpdi@coalindia.in

Test Report for Ambient Air Samples

Month & Year		04/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/01	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	05.07.2022	
Project				Sample Ref. No.	REM/BCCL/2022/04	Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Murlidih 20/21 Pit		Date of Sampling	04.04.2022	18.04.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in $\mu\text{g}/\text{m}^3$)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017		93	97	10 $\mu\text{g}/\text{m}^3$ - 1000 $\mu\text{g}/\text{m}^3$	10 $\mu\text{g}/\text{m}^3$	300	100
2	PM _{2.5}	IS -5182(Part 24):2019		53	55	10 $\mu\text{g}/\text{m}^3$ - 400 $\mu\text{g}/\text{m}^3$	10 $\mu\text{g}/\text{m}^3$	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		<10	<10	10 $\mu\text{g}/\text{m}^3$ - 1050 $\mu\text{g}/\text{m}^3$	10 $\mu\text{g}/\text{m}^3$	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		26	24	06 $\mu\text{g}/\text{m}^3$ - 420 $\mu\text{g}/\text{m}^3$	06 $\mu\text{g}/\text{m}^3$	120	80

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,




ANALYSED BY



(Gaurav Kant)
CHECKED BY



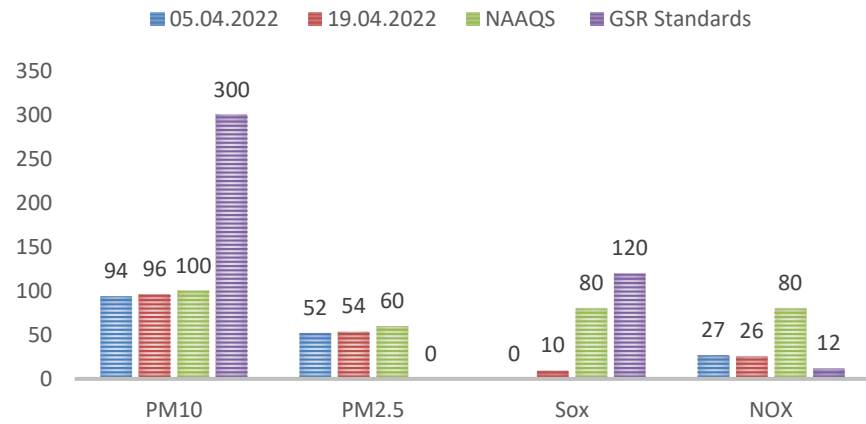
(Amit Raj Mishra)
HOD's Signature

Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env) , CMPDI, RI-II.

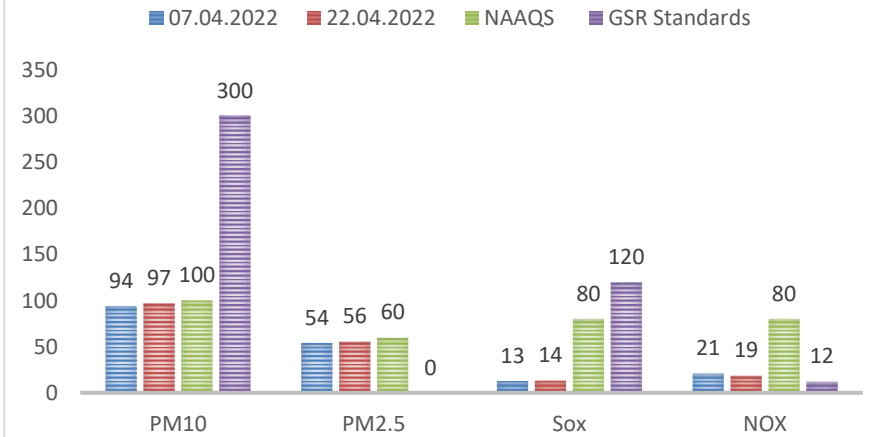
---- End of Report ----

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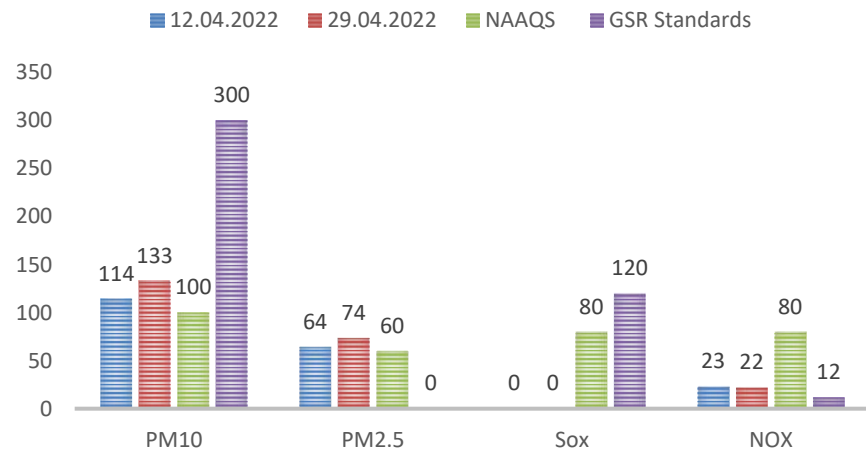
AMBIENT AIR QUALITY AT RUDHI BASTI



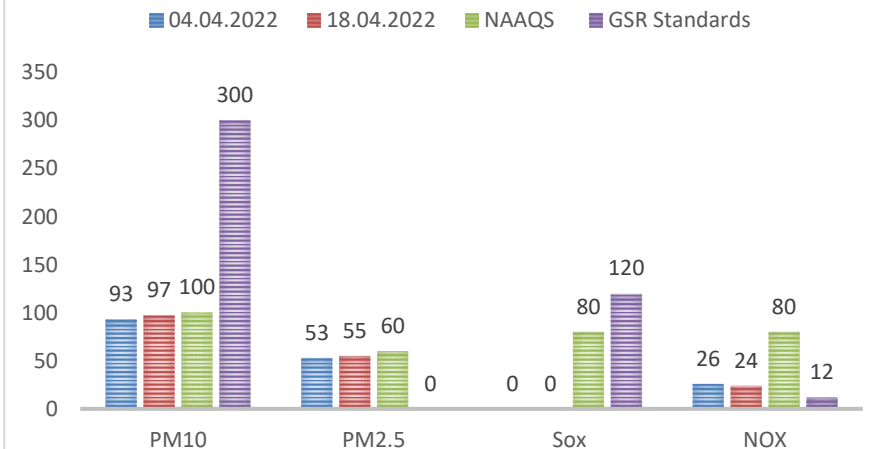
AMBIENT AIR QUALITY AT BLOCK IV



AMBIENT AIR QUALITY AT MOONIDIH UGP



AMBIENT AIR QUALITY AT MURLIDIH 20/21 PIT



NOISE LEVEL QUALITY MONITORING

4.1 Location of sampling sites

- i) **Rudhi basti (N18)**
- ii) **Block IV(N6)**
- iii) **Moonidih UGP(N17)**
- iv) **Murlidih 20/21 (N19)**

4.2 Methodology of sampling and analysis

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

4.3 Results & Interpretations

Ambient noise levels were recorded during day time and the observed values were compared with standards prescribed by MoEFCC. The results of Noise levels recorded during day time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{EQ} are presented. The observed values at all the monitoring locations are found to be within permissible limits.



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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
Ambient Noise Level Test Report

CMPDI, RI-II
KOYLA BHAWAN COMPLEX
DHANBAD. -826005
Phone:0326-223-850
email: rdri2cmndi@coalindia.in

Month & Year	04/2022	Cluster	Cluster XII					Report No.	RI-II/WATER/2022-23/01
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	05.07.2022
Project			Sample Ref. No.		REM/BCCL/2022/04		Sampling Method		CMPDI/RI-II/LPM 13
Sampling Stations	i	Rudhi Basti		Date of Sampling		05.04.2022	19.04.2022	Zone Category of Station:	Core Zone
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A))	Observed Values (in Leq dB(A))	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
			First Fortnight	Second Fortnight				Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	46.3	45.5	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	48.7	47.8					
3		08:00 - 09:00	51.1	50.1					
4		09:00 - 10:00	56.7	55.7					
5		10:00 - 11:00	51.6	57.0					
6		11:00 - 12:00	56.7	55.7					
7		12:00 - 13:00	59.4	61.2					
8		13:00 - 14:00	60.7	59.6					
9		14:00 - 15:00	55.4	54.3					
10		15:00 - 16:00	53.5	53.1					
11		16:00 - 17:00	54.0	53.0					
12		17:00 - 18:00	53.5	52.5					
13		18:00 - 19:00	52.7	51.8					
14		19:00 - 20:00	51.8	50.8					
15		20:00 - 21:00	49.9	50.4					
16		21:00 - 22:00	51.3	50.3					
		Leq Day	54.9	55.0					
1	Noise Level dB(A)Leq -Night	22:00-23:00	43.6	42.8	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	42.9	42.1					
3		00:00- 01:00	42.3	41.5					
4		01:00-02:00	43.2	41.2					
5		02:00-03:00	41.6	40.8					
6		03:00-04:00	40.7	40.0					
7		04:00-05:00	40.5	40.1					
8		05:00-06:00	40.1	39.3					
		Leq Night	42.0	41.1					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants

ANALYSED BY

(Gaurav Kant)

CHECKED BY

Raj Mishra)

HOD's Signature

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  		CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED Environment Laboratory, Regional Institute-II Ambient Noise Level Test Report					CMPDIL, RI-II KOYLA BHAWAN COMPLEX DHANBAD. -826005 Phone:0326-223-850		
Month & Year	04/2022	Cluster	Cluster XII				Report No.	RI-II/NOISE/2022-23/01	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	05.07.2022	
Project		Sample Ref. No.	REM/BCCL/2022/04		Sampling Method	CMPDI/RI-II/LPM 13			
Sampling Stations	i	Block IV		Date of Sampling	07.04.2022	22.04.2022	Zone Category of Station:	Buffer Zone	
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A)) First Fortnight	Observed Values (in Leq dB(A)) Second Fortnight	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
								Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	51.2	48.5	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	53.9	52.4					
3		08:00 - 09:00	55.0	54.9					
4		09:00 - 10:00	62.7	56.4					
5		10:00 - 11:00	64.2	61.2					
6		11:00 - 12:00	62.7	60.9					
7		12:00 - 13:00	65.7	63.9					
8		13:00 - 14:00	66.4	63.2					
9		14:00 - 15:00	67.2	59.5					
10		15:00 - 16:00	60.2	58.5					
11		16:00 - 17:00	59.7	58.0					
12		17:00 - 18:00	59.2	57.5					
13		18:00 - 19:00	58.1	56.6					
14		19:00 - 20:00	57.2	55.6					
15		20:00 - 21:00	56.4	54.1					
16		21:00 - 22:00	52.1	52.9					
		Leq Day	61.9	58.8					
1	Noise Level dB(A)Leq -Night	22:00-23:00	48.2	46.8	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	47.5	46.1					
3		00:00- 01:00	46.8	45.5					
4		01:00-02:00	46.4	45.0					
5		02:00-03:00	46.0	44.7					
6		03:00-04:00	45.0	43.8					
7		04:00-05:00	44.8	43.5					
8		05:00-06:00	42.1	43.0					
		Leq Night	46.2	45.0					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

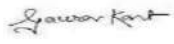
Sampling Assistants ANALYSED BY	 (Gaurav Kant) CHECKED BY	 (Amit Raj Mishra) HOD's Signature
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  cmpdi <i>A Mini Ratna Company</i> CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED Environment Laboratory, Regional Institute-II Ambient Noise Level Test Report CMPDIL, RI-II KOYLA BHAWAN COMPLEX DHANBAD. -826005 Phone:0326-223-850 <i>email: rdi2cmpdi@coalindia.in</i>									
Month & Year	04/2022	Cluster	Cluster XII					Report No.	RI-II/NOISE/2022-23/01
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	05.07.2022
Project		Sample Ref. No.	REM/BCCL/2022/04		Sampling Method	CMPDI/RI-II/LPM 13			
Sampling Stations	i	Moonidih UGP		Date of Sampling	13.04.2022	30.04.2022	Zone Category of Station:	Buffer Zone	
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A)) First Fortnight	Observed Values (in Leq dB(A)) Second Fortnight	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
								Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	46.9	44.8	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	49.4	47.1					
3		08:00 - 09:00	52.3	49.4					
4		09:00 - 10:00	57.5	54.8					
5		10:00 - 11:00	58.8	56.1					
6		11:00 - 12:00	57.5	54.8					
7		12:00 - 13:00	60.2	57.5					
8		13:00 - 14:00	61.5	58.7					
9		14:00 - 15:00	62.3	53.5					
10		15:00 - 16:00	55.2	52.7					
11		16:00 - 17:00	54.7	52.2					
12		17:00 - 18:00	54.2	51.7					
13		18:00 - 19:00	53.4	51.0					
14		19:00 - 20:00	52.4	50.0					
15		20:00 - 21:00	51.2	50.0					
16		21:00 - 22:00	50.6	49.6					
		Leq Day	56.9	53.5					
1	Noise Level dB(A)Leq -Night	22:00-23:00	44.2	42.1	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	43.5	41.5					
3		00:00- 01:00	42.9	40.9					
4		01:00-02:00	43.1	40.6					
5		02:00-03:00	42.1	40.2					
6		03:00-04:00	41.3	40.2					
7		04:00-05:00	41.0	39.1					
8		05:00-06:00	40.6	38.7					
		Leq Night	42.5	40.5					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants ANALYSED BY	 (Gaurav Kant) CHECKED BY	 (Amit Raj Mishra) HOD's Signature
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Month & Year	04/2022	Cluster	Cluster XII					Report No.	RI-II/NOISE/2022-23/01
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	05.07.2022
Project		Sample Ref. No.	REM/BCCL/2022/04			Sampling Method	CMPDI/RI-II/LPM 13		
Sampling Stations	i	Murlidih(20/21)		Date of Sampling	05.04.2022	18.04.2022	Zone Category of Station:	Buffer Zone	
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A)) First Fortnight	Observed Values (in Leq dB(A)) Second Fortnight	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
								Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	48.7	49.7	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB- 135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	51.3	52.3					
3		08:00 - 09:00	53.7	55.8					
4		09:00 - 10:00	55.7	60.8					
5		10:00 - 11:00	61.1	62.3					
6		11:00 - 12:00	59.7	60.8					
7		12:00 - 13:00	61.2	66.5					
8		13:00 - 14:00	63.9	65.1					
9		14:00 - 15:00	58.2	59.4					
10		15:00 - 16:00	57.3	58.4					
11		16:00 - 17:00	57.1	57.9					
12		17:00 - 18:00	56.3	57.4					
13		18:00 - 19:00	55.5	55.5					
14		19:00 - 20:00	54.4	55.5					
15		20:00 - 21:00	53.5	55.2					
16		21:00 - 22:00	53.2	55.0					
		Leq Day	58.0	60.1					
1	Noise Level dB(A)Leq -Night	22:00-23:00	45.8	46.7	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB- 135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	45.1	46.0					
3		00:00- 01:00	44.7	45.4					
4		01:00-02:00	44.2	45.0					
5		02:00-03:00	43.7	44.0					
6		03:00-04:00	42.9	43.7					
7		04:00-05:00	42.6	43.4					
8	05:00-06:00	42.1	43.0						
		Leq Night	44.1	44.8					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Samplings Assistants ANALYSED BY	 (Gaurav Kant) CHECKED BY	 (Amit Raj Mishra) HOD's Signature
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Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env) , CMPDI, RI-II.

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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 clause 2.

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

NATIONAL AMBIENT AIR QUALITY STANDARDS

New Delhi the 18th November 2009

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

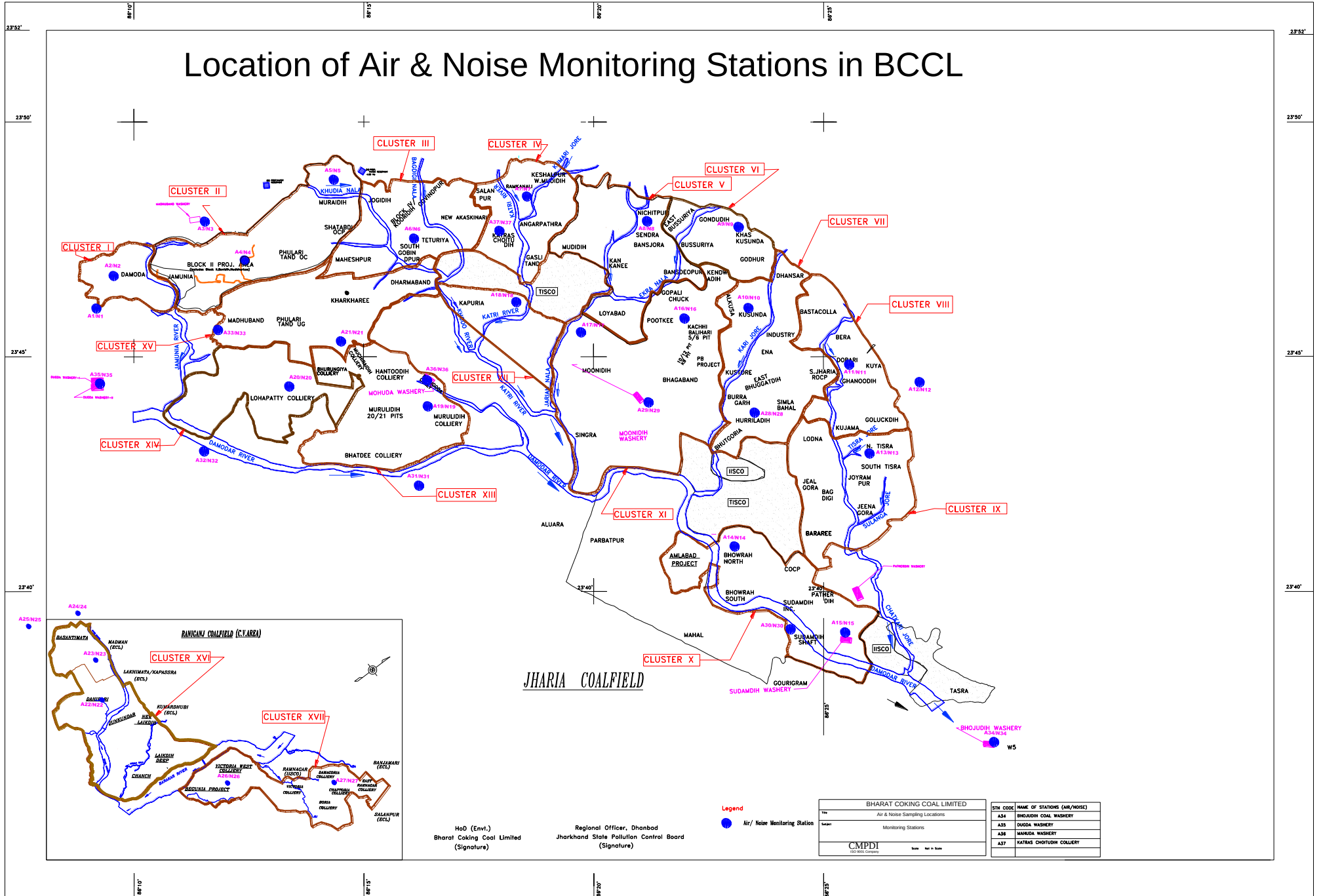
Pollutant	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
		Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO₂), µg/m³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogendioxide (NO₂), 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 PM₁₀, 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 (O₃) , 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 (NH₃), µg/m³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C₆H₆), 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 JUNE 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.

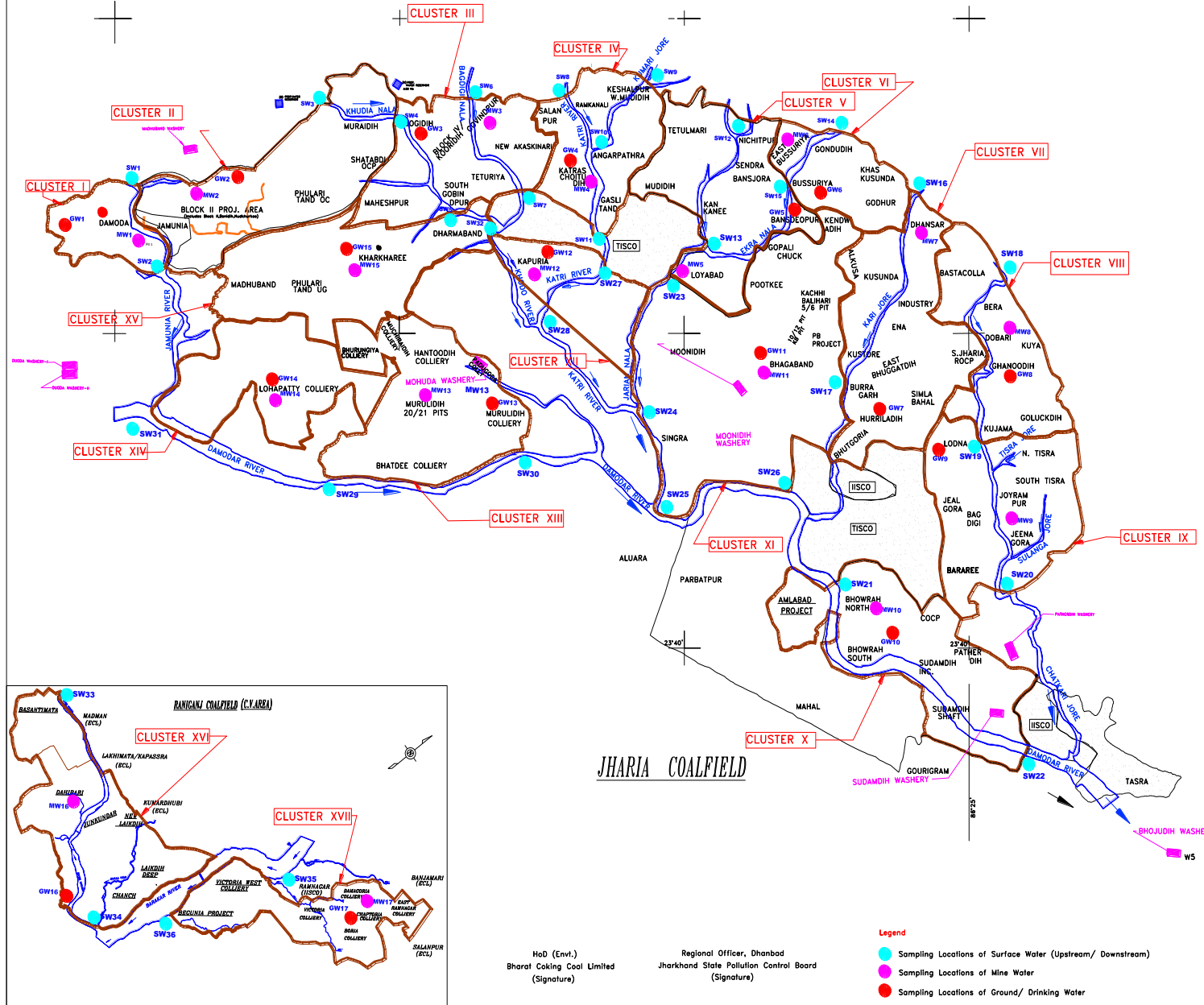
Location of Air & Noise Monitoring Stations in BCCL



Water Sampling Locations in BCCL

INDEX

Cluster	Surface Water (JUS, DIS)	Name of River/Nala/Jore	Mine/ Effluent Water	Sampling Location	Ground Water	Sampling Location
I	SW1, SW2	Damodar River	MW1	Damodar Area	GW1	Chakraborty Village
II	SW3, SW4	Khudra Nala	MW2	Block II OCP	GW2	Joyrampur Village
III	SW4, SW5, SW6, SW7	Khudra Nala, Bagdigi Nala	MW3	Govindpur Colliery	GW3	Jogdih Village
IV	SW8, SW11, SW9, SW10	Kain River, Kuman Jore	MW4	Chotudih	GW4	Kankanee Village
V	SW12, SW13, SW15	Jarian Nala, Ekra Nala	MW5	Mudih	GW5	Nichitpur
VI	SW14, SW15	Ekra Nala	MW6	East Bassuria UGP	GW6	Bansjora Borewell
VII	SW16, SW17	Kain Jore	MW7	Dhanbari UGP	GW7	Humladih
VIII	SW18, SW19	Kain Jore	MW8	Doban UGP	GW8	Ghanudih
IX	SW19, SW20	Kain Jore	MW9	Jeevagrah	GW9	Lodna
X	SW21, SW22	Damodar River	MW10	Bhowrah North	GW10	Bhowrah South
XI	SW23, SW24, SW25, SW26	Jarian Nala, Damodar River	MW11	Bhagaband UGP	GW11	Bhagaband
XII	SW27, SW28	Kain River	MW12	Kapuria	GW12	Kapuria
XIII	SW29, SW30	Damodar River	MW13	Murudih	GW13	Murudih
XIV	SW31, SW32	Damodar River	MW14	Lohapatti	GW14	Lohapatti
XV	SW5, SW32	Kharkhar Nala	MW15	Kharkhar UGP	GW15	Kharkhar
XVI	SW33, SW34	Khudra River	MW16	Dahiban OCP	GW16	Palabani Village
XVII	SW35, SW36	Barakar River	MW17	Damagoria Colliery	GW17	Chaptoria



Customer	BHARAT COKING COAL LIMITED
Title	WATER SAMPLING LOCATIONS
Subject	MONITORING STATIONS
Scale	Scale: Not to Scale

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

(FOR THE MONTH MAY, 2022)

E. C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

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4.	CHAPTER-IV	STANDARDS AND PLANS	19-20

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°37' N to 23°52' N latitudes and 86°09' E to 86°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 (PM₁₀), Fine Particulate Matter (PM_{2.5}), Sulphur Di-oxide (SO₂)

and Nitrogen Oxides (NO_x). Respirable Dust Samplers (RDS) and Fine Dust Sampler (PM_{2.5} sampler) were used for sampling of PM₁₀, SO₂, & 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 'LEQ' 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 PM₁₀, PM_{2.5}, SO₂ 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 PM₁₀ & 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.

The following preventive and suppressive mitigative measures can be undertaken to contain the pollution level within prescribed level:-

- Wet drilling and controlled blasting should be practice.
- Explosive used should be optimised to restrict the dust generation.
- Transportation roads should be permanently asphalted free of ruts, potholes etc.
- Water should be sprayed on coal transportation road, service road more frequently and at regular interval.
- Dust from roads should be removed physically or mechanically.
- Greenbelts around industrial sites, service building area besides Avenue plantation along roads should be created.
- Coal dust should be suppressed by using fixed sprinklers.
- Regular maintenance of plant and machinery should be undertaken.

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

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 XII is in the Central part of the Jharia coalfield. It includes Kapuria UG Mine. The cluster – XII is situated about 30 - 35 kms from Dhanbad Railway Station. The mines of this cluster - XII are operating since pre nationalization period (prior to 1972-73). It is connected by both Railway and Road. The drainage of the area is governed by Katri River.

1.2 The cluster XII is designed to produce 2.4 Mtpa (normative) and 3.12 Mtpa peak capacity of coal. The average grade of coal W-II to W-IV.

The Project has Environmental Clearance from Ministry of Environment, Forests and Climate Change (MoEF&CC) for a rated capacity of 2.4 MTPA (normative) and 3.12 MTPA peak capacity of coal production vide letter no E.C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.

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 PM₁₀, PM_{2.5}, SO₂, NO_x 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) Rudhi basti (A18): Industrial Area

The location of the sampling station is 23° 45' 26.60" N & 86° 18' 39.90" E. The samplers were placed at a height of approx. 1.5m above ground level at Rudhi basti.

II. BUFFER ZONE Monitoring Location

i) Block IV (A6) : Industrial area

The location of the sampling station is 23° 47' 54.00" N & 86° 16' 20.00" E The samplers were placed at a height of approx. 1.5m above ground level at Safety Office.

ii) Moonidih UGP (A17) : Industrial area

The location of the sampling station is 23° 44' 30.00" N & 86° 20' 56.00" E. The samplers were placed at a height of approx. 1.5m above ground level at project office.

iii) Murlidih 20/21 Pit(A19): Industrial Area

The location of the sampling station is 23° 43' 51.82" N & 86° 16' 21.87" E. The samplers were placed at a height of approx. 1.5m above ground level at project office.

AMBIENT AIR QUALITY DATA



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Ambient Air Quality Test Report

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Test Report for Ambient Air Samples

Month & Year		05/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/02	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	10.08.2022	
Project				Sample Ref. No.	REM/BCCL/2022/05	Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Rudhi Basti		Date of Sampling	03.05.2022	28.05.2022	Zone of Station:	Core Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017		91	93	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	PM _{2.5}	IS -5182(Part 24):2019		50	52	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		12	13	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		24	25	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

* LDL indicates Lower Detection Limit,

****All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,**

M. J. A. Umar

ANALYSED BY

Gawar Kart

(Gaurav Kant)

CHECKED BY~~f - p~~

(Amit Raj Mishra)

HOD's Signature

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Test Report for Ambient Air Samples

Month & Year		05/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/02	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	10.08.2022	
Project			Sample Ref. No.	REM/BCCL/2022/05	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Block IV		Date of Sampling	14.05.2022	19.05.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017		79	94	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	PM _{2.5}	IS -5182(Part 24):2019		46	54	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		<10	11	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		20	22	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,

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(Gaurav Kant)
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(Amit Raj Mishra)
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Test Report for Ambient Air Samples

Month & Year		05/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/02	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	10.08.2022	
Project				Sample Ref. No.	REM/BCCL/2022/05	Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Moonidih UGP		Date of Sampling	11.05.2022	25.05.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017		98	138	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	PM _{2.5}	IS -5182(Part 24):2019		57	71	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		<10	12	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		20	21	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,

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Ambient Air Quality Test Report

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Test Report for Ambient Air Samples

Month & Year		05/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/02	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	10.08.2022	
Project				Sample Ref. No.	REM/BCCL/2022/05	Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Murlidih 20/21 Pit		Date of Sampling	04.05.2022	28.05.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017		89	94	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	PM _{2.5}	IS -5182(Part 24):2019		50	53	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		11	<10	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		29	28	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,

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(Gaurav Kant)
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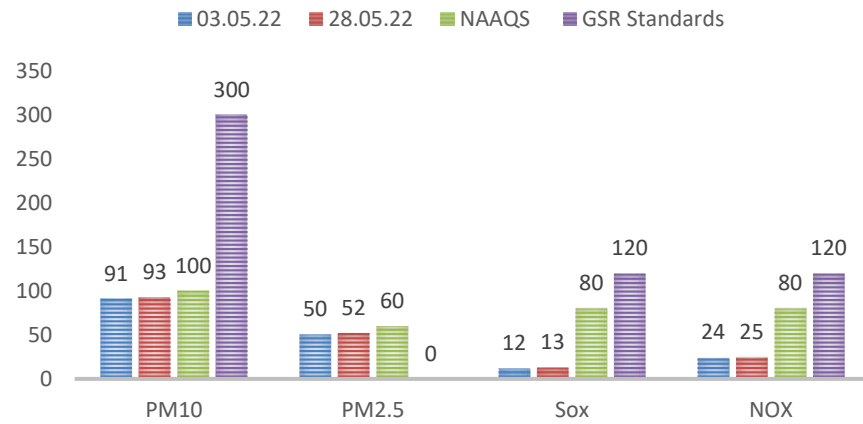
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(Amit Raj Mishra)
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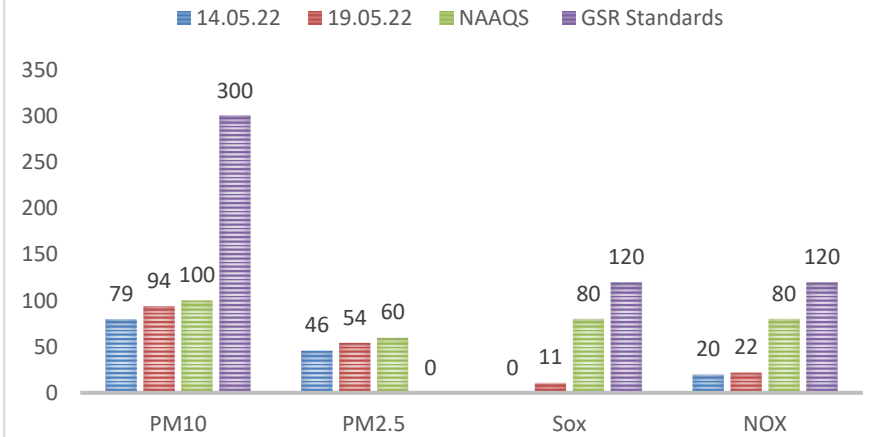
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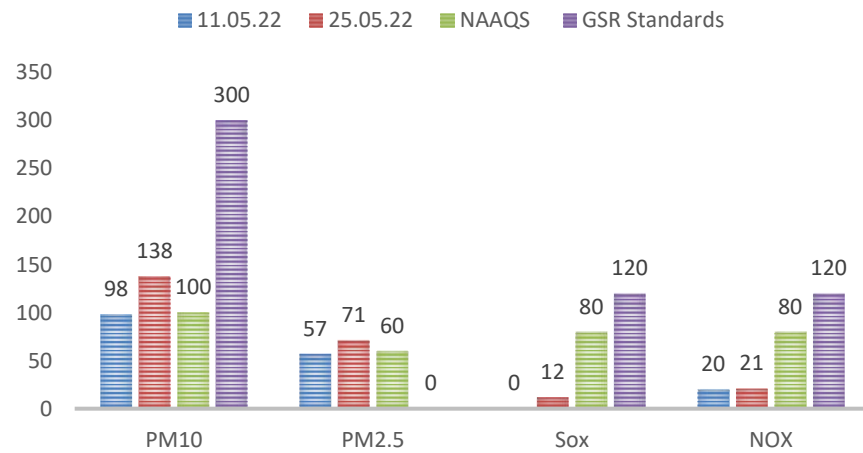
AMBIENT AIR QUALITY AT RUDHI BASTI



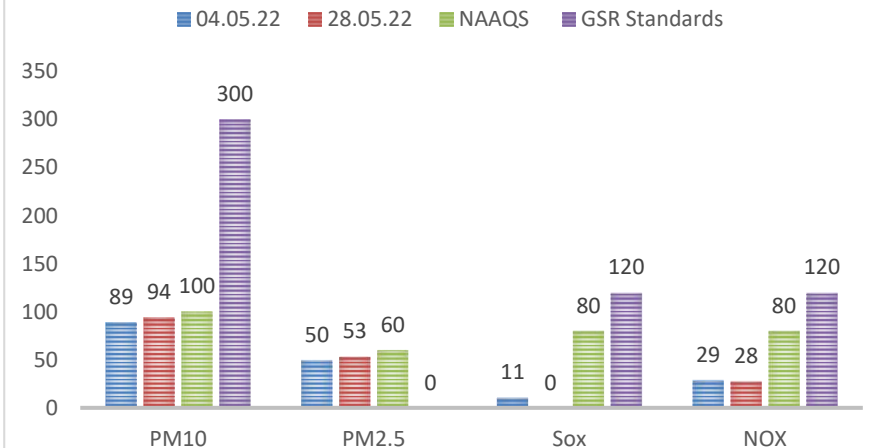
AMBIENT AIR QUALITY AT BLOCK IV



AMBIENT AIR QUALITY AT MOONIDIH UGP



AMBIENT AIR QUALITY AT MURLIDIH 20/21 PIT



NOISE LEVEL QUALITY MONITORING

4.1 Location of sampling sites

- i) **Rudhi basti (N18)**
- ii) **Block IV(N6)**
- iii) **Moonidih UGP(N17)**
- iv) **Murlidih 20/21 (N19)**

4.2 Methodology of sampling and analysis

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

4.3 Results & Interpretations

Ambient noise levels were recorded during day time and the observed values were compared with standards prescribed by MoEFCC. The results of Noise levels recorded during day time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{EQ} are presented. The observed values at all the monitoring locations are found to be within permissible limits.



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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
Ambient Noise Level Test Report

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Month & Year	05/2022	Cluster	Cluster XII					Report No.	RI-II/WATER/2022-23/02
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	10.08.2022
Project			Sample Ref. No.		REM/BCCL/2022/05		Sampling Method		CMPDI/RI-II/LPM 13
Sampling Stations	i	Rudhi Basti		Date of Sampling		02.05.2022	27.05.2022	Zone Category of Station:	Core Zone
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A))	Observed Values (in Leq dB(A))	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
			First Fortnight	Second Fortnight				Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	49.6	41.5	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	46.5	42.5					
3		08:00 - 09:00	41.8	43.2					
4		09:00 – 10:00	45.2	50.4					
5		10:00 - 11:00	44.2	47.2					
6		11:00 - 12:00	50.7	49.2					
7		12:00 - 13:00	51.2	51.4					
8		13:00 - 14:00	46.0	44.9					
9		14:00 - 15:00	53.5	51.2					
10		15:00 - 16:00	50.8	50.8					
11		16:00 - 17:00	51.0	47.2					
12		17:00 - 18:00	46.0	46.2					
13		18:00 - 19:00	44.0	43.9					
14		19:00 - 20:00	42.5	43.2					
15		20:00 - 21:00	40.8	42.6					
16		21:00 - 22:00	41.5	42.0					
		Leq Day	48.3	47.5					
1	Noise Level dB(A)Leq -Night	22:00-23:00	44.3	44.3	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	43.2	43.2					
3		00:00- 01:00	41.9	43.0					
4		01.00-02.00	42.5	42.9					
5		02.00-03.00	43.0	42.0					
6		03.00-04.00	40.9	41.6					
7		04.00-05.00	40.1	41.2					
8		05:00-06:00	40.2	41.0					
		Leq Night	42.2	42.5					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants

ANALYSED BY

(Gaurav Kant)

CHECKED BY

Raj Mishra)

HOD's Signature

Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env), CMPDI, RI-II.

--- End of Report ---

  cmpdi <i>A Mini Ratna Company</i> CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED Environment Laboratory, Regional Institute-II Ambient Noise Level Test Report CMPDIL, RI-II KOYLA BHAWAN COMPLEX DHANBAD. -826005 Phone:0326-223-850									
Month & Year	05/2022	Cluster	Cluster XII					Report No.	RI-II/NOISE/2022-23/02
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	10.08.2022
Project		Sample Ref. No.	REM/BCCL/2022/05			Sampling Method	CMPDI/RI-II/LPM 13		
Sampling Stations	i	Block IV		Date of Sampling	13.05.2022	18.05.2022	Zone Category of Station:	Buffer Zone	
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A)) First Fortnight	Observed Values (in Leq dB(A)) Second Fortnight	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
								Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	51.9	52.1	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	54.6	53.6					
3		08:00 - 09:00	57.2	56.2					
4		09:00 - 10:00	64.2	62.5					
5		10:00 - 11:00	65.1	63.9					
6		11:00 - 12:00	63.6	62.4					
7		12:00 - 13:00	66.6	65.4					
8		13:00 - 14:00	64.2	66.8					
9		14:00 - 15:00	62.0	60.9					
10		15:00 - 16:00	68.2	59.9					
11		16:00 - 17:00	60.5	57.6					
12		17:00 - 18:00	62.3	58.9					
13		18:00 - 19:00	59.1	58.0					
14		19:00 - 20:00	58.0	56.9					
15		20:00 - 21:00	56.4	55.3					
16		21:00 - 22:00	57.5	56.4					
		Leq Day	62.7	61.1					
1	Noise Level dB(A)Leq -Night	22:00-23:00	47.5	45.2	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	45.9	43.0					
3		00:00- 01:00	44.5	45.0					
4		01:00-02:00	43.0	43.2					
5		02:00-03:00	42.5	41.0					
6		03:00-04:00	41.9	40.8					
7		04:00-05:00	40.5	40.1					
8	05:00-06:00	40.2	40.5						
		Leq Night	43.9	42.8					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants ANALYSED BY	 (Gaurav Kant) CHECKED BY	 (Amit Raj Mishra) HOD's Signature
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Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env) , CMPDI, RI-II.

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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
Ambient Noise Level Test Report

CMPDIL, RI-II
KOYLA BHAWAN COMPLEX
DHANBAD. -826005
Phone:0326-223-850
email: rdi2@cmpdi.coalindia.in

Month & Year	05/2022	Cluster	Cluster XII				Report No.	RI-II/NOISE/2022-23/02	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	10.08.2022	
Project		Sample Ref. No.	REM/BCCL/2022/05		Sampling Method	CMPDI/RI-II/LPM 13			
Sampling Stations	i	Moonidih UGP		Date of Sampling	10.05.2022	24.05.2022	Zone Category of Station:		Buffer Zone
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A)) First Fortnight	Observed Values (in Leq dB(A)) Second Fortnight	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
								Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	46.3	45.5	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	48.7	47.8					
3		08:00 - 09:00	51.1	50.1					
4		09:00 - 10:00	56.7	55.7					
5		10:00 - 11:00	51.6	57.0					
6		11:00 - 12:00	56.7	55.7					
7		12:00 - 13:00	56.5	61.2					
8		13:00 - 14:00	55.4	59.6					
9		14:00 - 15:00	59.5	54.3					
10		15:00 - 16:00	52.0	53.1					
11		16:00 - 17:00	51.5	53.0					
12		17:00 - 18:00	45.6	52.5					
13		18:00 - 19:00	54.5	51.8					
14		19:00 - 20:00	48.5	50.8					
15		20:00 - 21:00	54.0	50.4					
16		21:00 - 22:00	49.2	50.3					
		Leq Day	54.0	55.0					
1	Noise Level dB(A)Leq -Night	22:00-23:00	46.1	45.6	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	43.5	46.0					
3		00:00- 01:00	42.8	42.6					
4		01:00-02:00	40.8	42.0					
5		02:00-03:00	41.0	40.8					
6		03:00-04:00	40.5	40.2					
7		04:00-05:00	40.1	40.0					
8	05:00-06:00	40.0	38.9						
		Leq Night	42.4	42.7					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants ANALYSED BY (Gaurav Kant) CHECKED BY (Amit Raj Mishra) HOD's Signature	Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env), CMPDI, RI-II. ---- End of Report ---- Page -1 of 1
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  cmpdi <i>A Mini Ratna Company</i> CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED Environment Laboratory, Regional Institute-II Ambient Noise Level Test Report CMPDIL, RI-II KOYLA BHAWAN COMPLEX DHANBAD. -826005 Phone:0326-223-850 <i>email: rdi2cmpdi@coalindia.in</i>									
Month & Year	05/2022	Cluster	Cluster XII					Report No.	RI-II/NOISE/2022-23/02
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	10.08.2022
Project		Sample Ref. No.	REM/BCCL/2022/05			Sampling Method	CMPDI/RI-II/LPM 13		
Sampling Stations	i	Murlidih(20/21)		Date of Sampling	03.05.2022	27.05.2022	Zone Category of Station:	Buffer Zone	
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A)) First Fortnight	Observed Values (in Leq dB(A)) Second Fortnight	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
								Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	51.4	52.7	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB- 135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	54.8	55.4					
3		08:00 - 09:00	57.4	58.1					
4		09:00 - 10:00	63.8	64.5					
5		10:00 - 11:00	65.3	66.1					
6		11:00 - 12:00	64.5	64.5					
7		12:00 - 13:00	62.5	67.6					
8		13:00 - 14:00	65.0	67.2					
9		14:00 - 15:00	66.1	63.0					
10		15:00 - 16:00	64.2	62.0					
11		16:00 - 17:00	60.7	61.4					
12		17:00 - 18:00	64.2	60.9					
13		18:00 - 19:00	59.3	60.0					
14		19:00 - 20:00	58.2	58.9					
15		20:00 - 21:00	57.6	58.8					
16		21:00 - 22:00	57.6	58.3					
		Leq Day	62.4	62.9					
1	Noise Level dB(A)Leq -Night	22:00-23:00	44.6	45.2	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB- 135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	43.5	44.1					
3		00:00- 01:00	43.0	42.3					
4		01:00-02:00	42.6	42.0					
5		02:00-03:00	42.0	41.6					
6		03:00-04:00	41.9	40.8					
7		04:00-05:00	40.5	40.2					
8	05:00-06:00	40.2	40.1						
		Leq Night	42.5	42.4					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants ANALYSED BY	 (Gaurav Kant) CHECKED BY	 (Amit Raj Mishra) HOD's Signature
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Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env) , CMPDI, RI-II.

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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 $\mu\text{g}/\text{m}^3$ 700 $\mu\text{g}/\text{m}^3$	- 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 $\mu\text{g}/\text{m}^3$ 300 $\mu\text{g}/\text{m}^3$	Respirable Particulate Matter sampling and analysis
	Sulphur Dioxide (SO_2)	Annual Average * 24 hours **	80 $\mu\text{g}/\text{m}^3$ 120 $\mu\text{g}/\text{m}^3$	1.Improvedwest and Gaeke method 2.Ultraviolet fluorescene
	Oxide of Nitrogen as NO_2	Annual Average * 24 hours **	80 $\mu\text{g}/\text{m}^3$ 120 $\mu\text{g}/\text{m}^3$	1. Jacob & Hochheiser Modified (Na-Arsenic) Method 2. Gas phase Chemilumine-scence

Note:

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

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

NATIONAL AMBIENT AIR QUALITY STANDARDS

New Delhi the 18th November 2009

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

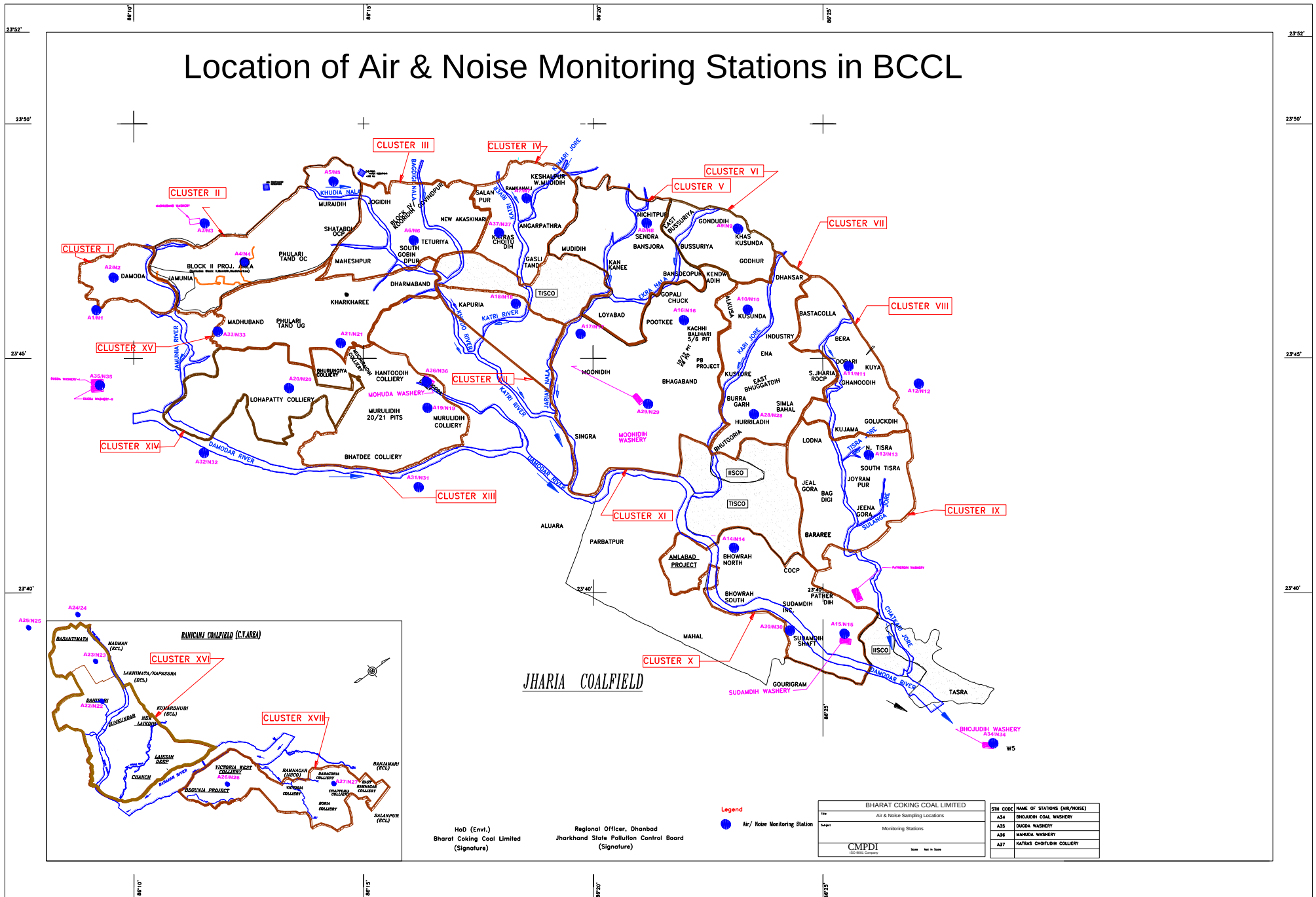
Pollutant	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
		Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO₂), µg/m³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogen dioxide (NO₂), 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 PM₁₀, 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 (O₃), 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 (NH₃), µg/m³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C₆H₆), 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 by HPLC/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.

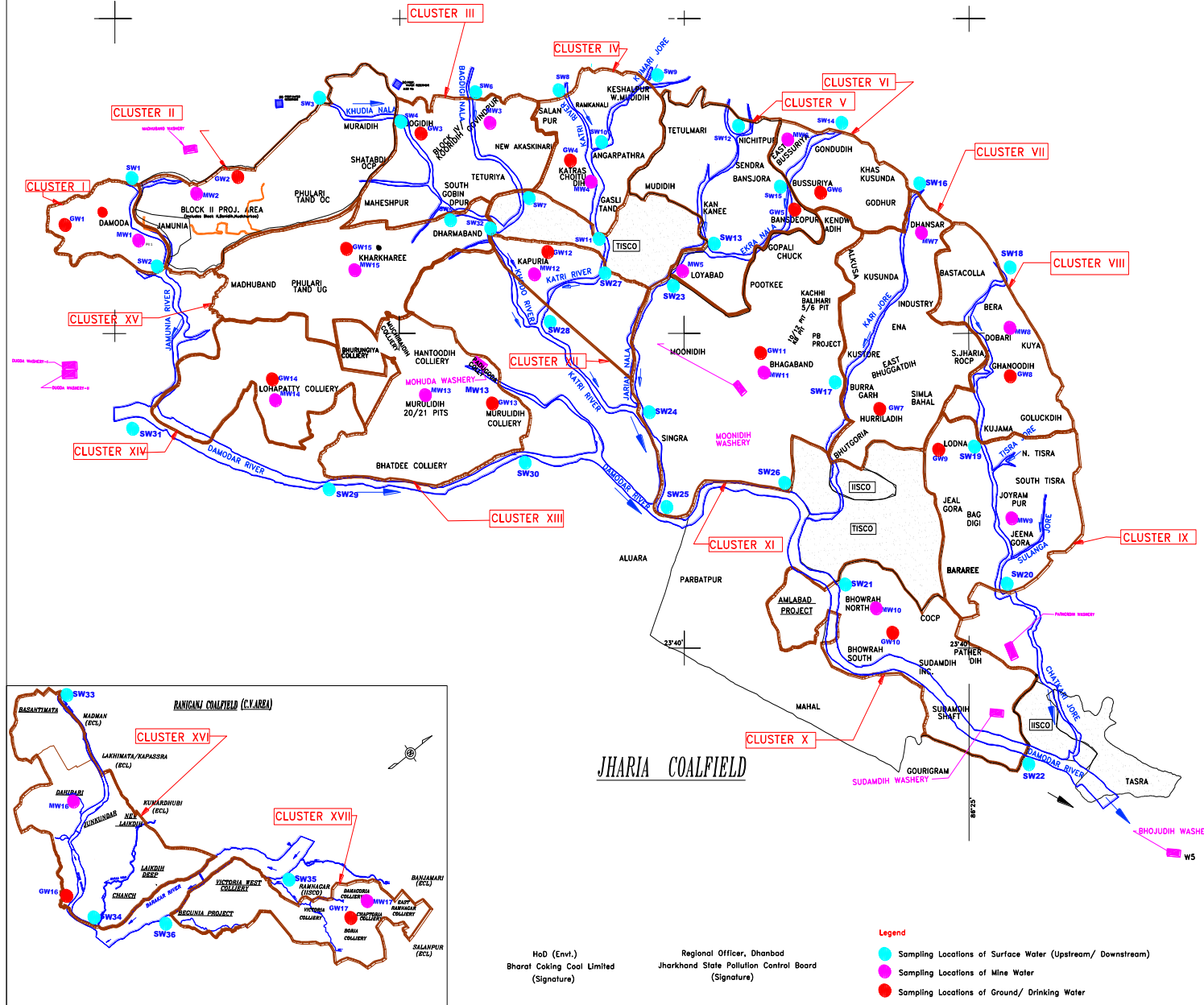
Location of Air & Noise Monitoring Stations in BCCL



Water Sampling Locations in BCCL

INDEX

Cluster	Surface Water (JUS, DIS)	Name of River/ Nala / Jore	Mine/ Effluent Water	Sampling Location	Ground Water	Sampling Location
I	SW1, SW2	Damodar River	MW1	Damodar Area	GW1	Chakraborty Village
II	SW3, SW4	Khudra Nala	MW2	Block II OCP	GW2	Joyrampur Village
III	SW4, SW5, SW6, SW7	Khudra Nala, Bagdigi Nala	MW3	Govindpur Colliery	GW3	Jogdih Village
IV	SW8, SW11, SW9, SW10	Kain River, Kuman Jore	MW4	Chotudih	GW4	Kankanee Village
V	SW12, SW13, SW15	Jarian Nala, Ekra Nala	MW5	Mudih	GW5	Nichitpur
VI	SW14, SW15	Ekra Nala	MW6	East Bassuria UGP	GW6	Bansjora Borewell
VII	SW16, SW17	Kain Jore	MW7	Dhanbari UGP	GW7	Humladih
VIII	SW18, SW19	Kain Jore	MW8	Doban UGP	GW8	Ghanudih
IX	SW19, SW20	Kain Jore	MW9	Jeevagrah	GW9	Lodna
X	SW21, SW22	Damodar River	MW10	Bhowrah North	GW10	Bhowrah South
XI	SW23, SW24, SW25, SW26	Jarian Nala, Damodar River	MW11	Bhagaband UGP	GW11	Bhagaband
XII	SW27, SW28	Kain River	MW12	Kapura	GW12	Kapura
XIII	SW29, SW30	Damodar River	MW13	Murudih	GW13	Murudih
XIV	SW31, SW32	Damodar River	MW14	Lohapatti	GW14	Lohapatti
XV	SW5, SW32	Kharkhar Nala	MW15	Kharkhar UGP	GW15	Kharkhar
XVI	SW33, SW34	Khudra River	MW16	Dahiban OCP	GW16	Palabani Village
XVII	SW35, SW36	Barakar River	MW17	Damagoria Colliery	GW17	Chaptoria



Customer	BHARAT COKING COAL LIMITED
Title	WATER SAMPLING LOCATIONS
Subject	MONITORING STATIONS
Scale	Not to Scale

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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 – XII**

(FOR THE MONTH JUNE, 2022)

E. C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.



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°37' N to 23°52' N latitudes and 86°09' E to 86°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 (PM₁₀), Fine Particulate Matter (PM_{2.5}), Sulphur Di-oxide (SO₂)

and Nitrogen Oxides (NO_x). Respirable Dust Samplers (RDS) and Fine Dust Sampler (PM_{2.5} sampler) were used for sampling of PM₁₀, SO₂, & 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 'LEQ' 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 PM₁₀, PM_{2.5}, SO₂ 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 PM₁₀ & 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.

The following preventive and suppressive mitigative measures can be undertaken to contain the pollution level within prescribed level:-

- Wet drilling and controlled blasting should be practice.
- Explosive used should be optimised to restrict the dust generation.
- Transportation roads should be permanently asphalted free of ruts, potholes etc.
- Water should be sprayed on coal transportation road, service road more frequently and at regular interval.
- Dust from roads should be removed physically or mechanically.
- Greenbelts around industrial sites, service building area besides Avenue plantation along roads should be created.
- Coal dust should be suppressed by using fixed sprinklers.
- Regular maintenance of plant and machinery should be undertaken.

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

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 XII is in the Central part of the Jharia coalfield. It includes Kapuria UG Mine. The cluster – XII is situated about 30 - 35 kms from Dhanbad Railway Station. The mines of this cluster - XII are operating since pre nationalization period (prior to 1972-73). It is connected by both Railway and Road. The drainage of the area is governed by Katri River.

1.2 The cluster XII is designed to produce 2.4 Mtpa (normative) and 3.12 Mtpa peak capacity of coal. The average grade of coal W-II to W-IV.

The Project has Environmental Clearance from Ministry of Environment, Forests and Climate Change (MoEF&CC) for a rated capacity of 2.4 MTPA (normative) and 3.12 MTPA peak capacity of coal production vide letter no E.C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.

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 PM₁₀, PM_{2.5}, SO₂, NO_x 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) Rudhi basti (A18): Industrial Area

The location of the sampling station is 23° 45' 26.60" N & 86° 18' 39.90" E. The samplers were placed at a height of approx. 1.5m above ground level at Rudhi basti.

II. BUFFER ZONE Monitoring Location

i) Block IV (A6) : Industrial area

The location of the sampling station is 23° 47' 54.00" N & 86° 16' 20.00" E The samplers were placed at a height of approx. 1.5m above ground level at Safety Office.

ii) Moonidih UGP (A17) : Industrial area

The location of the sampling station is 23° 44' 30.00" N & 86° 20' 56.00" E. The samplers were placed at a height of approx. 1.5m above ground level at project office.

iii) Murlidih 20/21 Pit(A19): Industrial Area

The location of the sampling station is 23° 43' 51.82" N & 86° 16' 21.87" E. The samplers were placed at a height of approx. 1.5m above ground level at project office.

AMBIENT AIR QUALITY DATA

  		CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED Environment Laboratory, Regional Institute-II Ambient Air Quality Test Report				CMPDIL, RI-II KOYLA BHAWAN COMPLEX DHANBAD. -826005 Phone:0326-223-850 email: rdri2cmpdi@coalindia.in					
Test Report for Ambient Air Samples											
Month & Year		06/2022		Cluster		Cluster XII		Report No.		RI-II/AIR/2022-23/03	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue		07.09.2022	
Project				Sample Ref. No.		REM/BCCL/2022/06		Sampling Method		CMPDI/RI-II/LPM 13, (IS 5182)	
Sampling Stations		i		Rudhi Basti		Date of Sampling		01.06.2022		17.06.2022	
Zone of Station:				Core Zone							
Sl. No.		Parameter		Method of Analysis		Observed Values (in $\mu\text{g}/\text{m}^3$)		Range Of Testing		LDL	
						1st FN 2nd FN					
										MoEF Standards Notification dated 25th September, 2000 (GSR 742 E) NAAQS, 2009	
1		PM ₁₀		IS -5182(Part 23):2006, R-2017		92		94		10 $\mu\text{g}/\text{m}^3$ - 1000 $\mu\text{g}/\text{m}^3$	
2		PM _{2.5}		IS -5182(Part 24):2019		51		54		10 $\mu\text{g}/\text{m}^3$ - 400 $\mu\text{g}/\text{m}^3$	
3		SO ₂		IS-5182(Part-2): 2001, R-2017		<10		11		10 $\mu\text{g}/\text{m}^3$ - 1050 $\mu\text{g}/\text{m}^3$	
4		NO ₂		IS-5182 (Part-6): 2006, R-2017		23		21		06 $\mu\text{g}/\text{m}^3$ - 420 $\mu\text{g}/\text{m}^3$	
* LDL indicates Lower Detection Limit,											
**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,											
 ANALYSED BY				 CHECKED BY (Gaurav Kant)				 HOD's Signature (Amit Raj Mishra)			
Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env) , CMPDI, RI-II.											
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Environment Laboratory, Regional Institute-II
Ambient Air Quality Test Report

CMPDIL, RI-II
KOYLA BHAWAN COMPLEX
DHANBAD. -826005
Phone:0326-223-850
email: rdri2cmpdi@coalindia.in

Test Report for Ambient Air Samples

Month & Year		06/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/03	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	07.09.2022	
Project			Sample Ref. No.	REM/BCCL/2022/06	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Block IV		Date of Sampling	15.06.2022	27.06.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017		98	94	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	PM _{2.5}	IS -5182(Part 24):2019		58	43	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		<10	11	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		24	23	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,

[Signature]
ANALYSED BY

[Signature]
(Gaurav Kant)
CHECKED BY

[Signature]
(Amit Raj Mishra)
HOD's Signature

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Environment Laboratory, Regional Institute-II
Ambient Air Quality Test Report

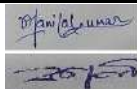
CMPDIL, RI-II
KOYLA BHAWAN COMPLEX
DHANBAD. -826005
Phone:0326-223-850
email: rdri2cmpdi@coalindia.in

Test Report for Ambient Air Samples

Month & Year		06/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/03	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	07.09.2022	
Project				Sample Ref. No.	REM/BCCL/2022/06	Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Moonidih UGP		Date of Sampling	02.06.2022	24.06.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017		98	97	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	PM _{2.5}	IS -5182(Part 24):2019		59	53	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		11	<10	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		18	20	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,


ANALYSED BY


(Gaurav Kant)
CHECKED BY


(Amit Raj Mishra)
HOD's Signature

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Environment Laboratory, Regional Institute-II
Ambient Air Quality Test Report

CMPDIL, RI-II
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Phone:0326-223-850
email: rdri2cmpdi@coalindia.in

Test Report for Ambient Air Samples

Month & Year		06/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/03	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	07.09.2022	
Project				Sample Ref. No.	REM/BCCL/2022/06	Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Murlidih 20/21 Pit		Date of Sampling	01.06.2022	16.06.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017		87	93	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	PM _{2.5}	IS -5182(Part 24):2019		47	51	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		11	10	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		26	25	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,

ANALYSED BY

(Gaurav Kant)
CHECKED BY

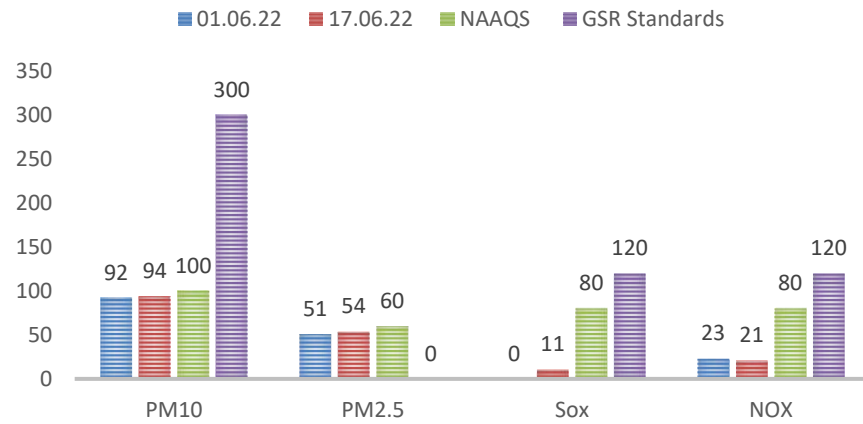
(Amit Raj Mishra)
HOD's Signature

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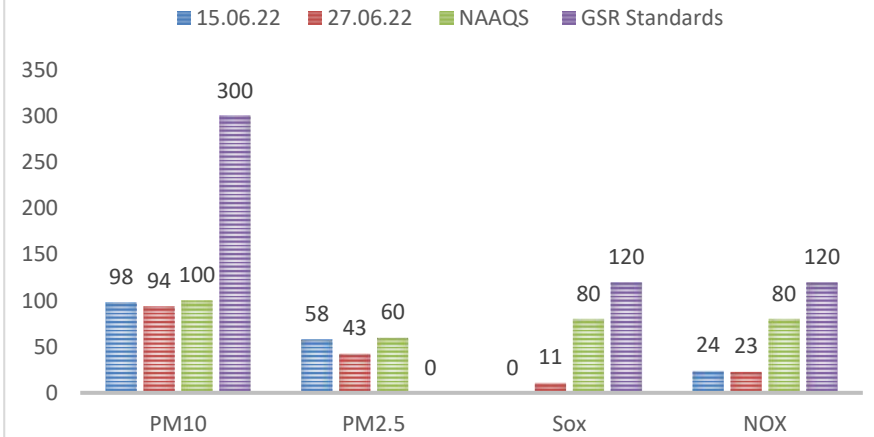
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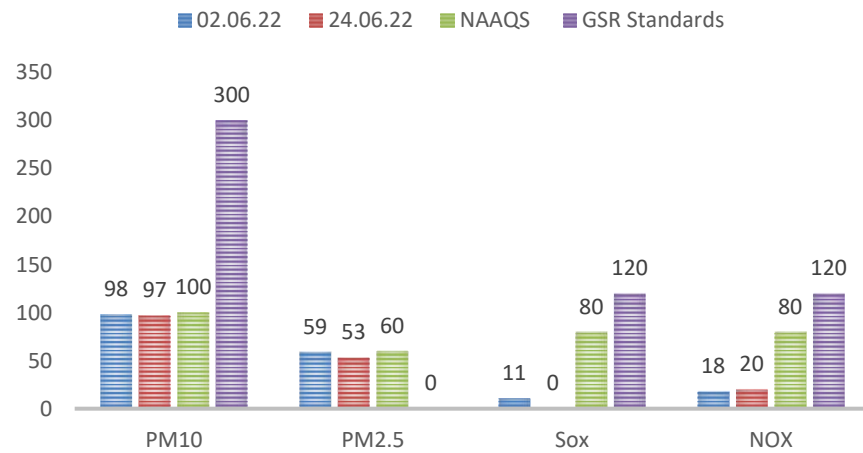
AMBIENT AIR QUALITY AT RUDHI BASTI



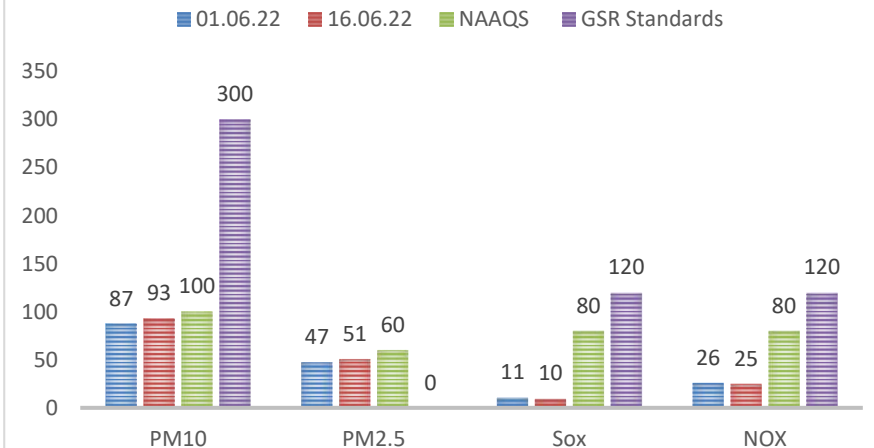
AMBIENT AIR QUALITY AT BLOCK IV



AMBIENT AIR QUALITY AT MOONIDIH UGP



AMBIENT AIR QUALITY AT MURLIDIH 20/21 PIT



NOISE LEVEL QUALITY MONITORING

4.1 Location of sampling sites

- i) **Rudhi basti (N18)**
- ii) **Block IV(N6)**
- iii) **Moonidih UGP(N17)**
- iv) **Murlidih 20/21 (N19)**

4.2 Methodology of sampling and analysis

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

4.3 Results & Interpretations

Ambient noise levels were recorded during day time and the observed values were compared with standards prescribed by MoEFCC. The results of Noise levels recorded during day time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{EQ} are presented. The observed values at all the monitoring locations are found to be within permissible limits.



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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
Ambient Noise Level Test Report

CMPDI, RI-II
KOYLA BHAWAN COMPLEX
DHANBAD. -826005
Phone:0326-223-850
email: rdri2cmndi@coalindia.in

Month & Year	06/2022	Cluster	Cluster XII					Report No.	RI-II/WATER/2022-23/03
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	07.09.2022
Project			Sample Ref. No.	REM/BCCL/2022/06		Sampling Method		CMPDI/RI-II/LPM 13	
Sampling Stations	i	Rudhi Basti		Date of Sampling	01.06.2022	17.06.2022	Zone Category of Station:		Core Zone
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A))	Observed Values (in Leq dB(A))	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
			First Fortnight	Second Fortnight				Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	49.8	41.7	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	46.4	42.4					
3		08:00 - 09:00	41.9	43.3					
4		09:00 - 10:00	45.1	50.3					
5		10:00 - 11:00	46.3	49.5					
6		11:00 - 12:00	55.2	53.5					
7		12:00 - 13:00	51.3	51.5					
8		13:00 - 14:00	45.9	44.8					
9		14:00 - 15:00	56.5	54.0					
10		15:00 - 16:00	51.2	51.2					
11		16:00 - 17:00	50.4	46.8					
12		17:00 - 18:00	46.4	46.6					
13		18:00 - 19:00	43.9	43.8					
14		19:00 - 20:00	44.9	45.6					
15		20:00 - 21:00	40.9	42.7					
16		21:00 - 22:00	41.9	42.4					
		Leq Day	49.8	48.8					
1	Noise Level dB(A)Leq -Night	22:00-23:00	44.5	44.5	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	43.1	43.1					
3		00:00- 01:00	42.0	43.1					
4		01:00-02:00	42.4	42.8					
5		02:00-03:00	44.9	44.0					
6		03:00-04:00	44.5	45.2					
7		04:00-05:00	40.2	41.3					
8		05:00-06:00	40.1	40.9					
		Leq Night	43.0	43.3					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants
ANALYSED BY

(Gaurav Kant)
CHECKED BY

Raj Mishra)
HOD's Signature

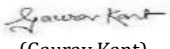
(Amit

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  		CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED Environment Laboratory, Regional Institute-II Ambient Noise Level Test Report					CMPDIL, RI-II KOYLA BHAWAN COMPLEX DHANBAD. -826005 Phone:0326-223-850		
Month & Year	06/2022	Cluster	Cluster XII				Report No.	RI-II/NOISE/2022-23/03	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	07.09.2022	
Project		Sample Ref. No.	REM/BCCL/2022/06		Sampling Method	CMPDI/RI-II/LPM 13			
Sampling Stations	i	Block IV		Date of Sampling	15.06.2022	27.06.2022	Zone Category of Station:	Buffer Zone	
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A)) First Fortnight	Observed Values (in Leq dB(A)) Second Fortnight	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
								Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	52.1	52.3	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	54.5	53.5					
3		08:00 - 09:00	57.4	56.3					
4		09:00 - 10:00	64.1	62.4					
5		10:00 - 11:00	68.2	67.0					
6		11:00 - 12:00	69.1	67.8					
7		12:00 - 13:00	66.7	65.5					
8		13:00 - 14:00	64.1	66.7					
9		14:00 - 15:00	65.5	64.3					
10		15:00 - 16:00	68.7	60.4					
11		16:00 - 17:00	59.8	57.0					
12		17:00 - 18:00	62.9	59.4					
13		18:00 - 19:00	59.0	57.9					
14		19:00 - 20:00	61.3	60.2					
15		20:00 - 21:00	56.5	55.4					
16		21:00 - 22:00	58.0	57.0					
		Leq Day	64.3	62.6					
1	Noise Level dB(A)Leq -Night	22:00-23:00	47.7	45.4	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	45.6	42.9					
3		00:00- 01:00	44.6	45.1					
4		01:00-02:00	42.9	43.1					
5		02:00-03:00	44.5	42.8					
6		03:00-04:00	45.5	44.4					
7		04:00-05:00	40.6	40.2					
8		05:00-06:00	40.1	40.4					
		Leq Night	44.6	43.4					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants ANALYSED BY	 (Gaurav Kant) CHECKED BY	 (Amit Raj Mishra) HOD's Signature
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Environment Laboratory, Regional Institute-II
Ambient Noise Level Test Report

CMPDIL, RI-II
KOYLA BHAWAN COMPLEX
DHANBAD. -826005
Phone:0326-223-850
email: rdi2cmpdi@coalindia.in

Month & Year	06/2022	Cluster	Cluster XII					Report No.	RI-II/NOISE/2022-23/03
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	07.09.2022
Project			Sample Ref. No.	REM/BCCL/2022/06		Sampling Method		CMPDI/RI-II/LPM 13	
Sampling Stations	i	Moonidih UGP		Date of Sampling		02.06.2022	24.06.2022	Zone Category of Station:	Buffer Zone
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A))	Observed Values (in Leq dB(A))	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
			First Fortnight	Second Fortnight				Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	46.5	45.6	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	48.6	47.7					
3		08:00 - 09:00	51.1	50.2					
4		09:00 - 10:00	56.6	55.6					
5		10:00 - 11:00	54.1	59.7					
6		11:00 - 12:00	61.7	60.5					
7		12:00 - 13:00	56.6	61.3					
8		13:00 - 14:00	55.3	59.5					
9		14:00 - 15:00	62.8	57.3					
10		15:00 - 16:00	52.4	53.5					
11		16:00 - 17:00	50.9	52.4					
12		17:00 - 18:00	45.9	52.9					
13		18:00 - 19:00	54.4	51.6					
14		19:00 - 20:00	51.2	53.7					
15		20:00 - 21:00	54.1	50.5					
16		21:00 - 22:00	49.7	50.8					
		Leq Day	55.9	56.2					
1	Noise Level dB(A)Leq -Night	22:00-23:00	46.3	45.8	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	44.5	45.9					
3		00:00- 01:00	42.9	42.7					
4		01.00-02.00	40.7	41.9					
5		02.00-03.00	43.0	42.8					
6		03.00-04.00	44.0	43.7					
7		04.00-05.00	40.2	40.1					
8		05:00-06:00	39.9	38.8					
		Leq Night	43.2	43.3					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants

ANALYSED BY

(Gaurav Kant)

CHECKED BY

(Amit Raj Mishra)

HOD's Signature

Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env), CMPDI, RI-II.

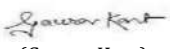
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Month & Year	06/2022	Cluster	Cluster XII					Report No.	RI-II/NOISE/2022-23/03
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	07.09.2022
Project		Sample Ref. No.	REM/BCCL/2022/06			Sampling Method	CMPDI/RI-II/LPM 13		
Sampling Stations	i	Murlidih(20/21)	Date of Sampling	01.06.2022	16.06.2022	Zone Category of Station:	Buffer Zone		
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A)) First Fortnight	Observed Values (in Leq dB(A)) Second Fortnight	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
								Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	51.6	52.9	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB- 135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	54.7	55.3					
3		08:00 - 09:00	57.5	58.2					
4		09:00 - 10:00	63.7	64.4					
5		10:00 - 11:00	68.4	69.2					
6		11:00 - 12:00	70.1	70.1					
7		12:00 - 13:00	62.7	67.7					
8		13:00 - 14:00	64.9	67.1					
9		14:00 - 15:00	69.7	66.4					
10		15:00 - 16:00	64.7	62.4					
11		16:00 - 17:00	60.0	60.7					
12		17:00 - 18:00	64.8	61.4					
13		18:00 - 19:00	59.1	59.8					
14		19:00 - 20:00	61.5	62.2					
15		20:00 - 21:00	57.7	58.9					
16		21:00 - 22:00	58.2	58.9					
		Leq Day	64.5	64.6					
1	Noise Level dB(A)Leq -Night	22:00-23:00	44.8	45.4	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB- 135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	43.4	44.0					
3		00:00- 01:00	43.1	43.0					
4		01:00-02:00	42.5	41.9					
5		02:00-03:00	44.0	43.6					
6		03:00-04:00	45.4	44.4					
7		04:00-05:00	40.6	40.3					
8		05:00-06:00	40.1	40.0					
		Leq Night	43.3	43.2					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants
ANALYSED BY


(Gaurav Kant)
CHECKED BY


(Amit Raj Mishra)
HOD's Signature

Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env) , CMPDI, RI-II.

---- End of Report ----

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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 $\mu\text{g}/\text{m}^3$ 700 $\mu\text{g}/\text{m}^3$	- 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 $\mu\text{g}/\text{m}^3$ 300 $\mu\text{g}/\text{m}^3$	Respirable Particulate Matter sampling and analysis
	Sulphur Dioxide (SO_2)	Annual Average * 24 hours **	80 $\mu\text{g}/\text{m}^3$ 120 $\mu\text{g}/\text{m}^3$	1.Improvedwest and Gaeke method 2.Ultraviolet fluorescene
	Oxide of Nitrogen as NO_2	Annual Average * 24 hours **	80 $\mu\text{g}/\text{m}^3$ 120 $\mu\text{g}/\text{m}^3$	1. Jacob & Hochheiser Modified (Na-Arsenic) Method 2. Gas phase Chemilumine-scence

Note:

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

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

NATIONAL AMBIENT AIR QUALITY STANDARDS

New Delhi the 18th November 2009

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

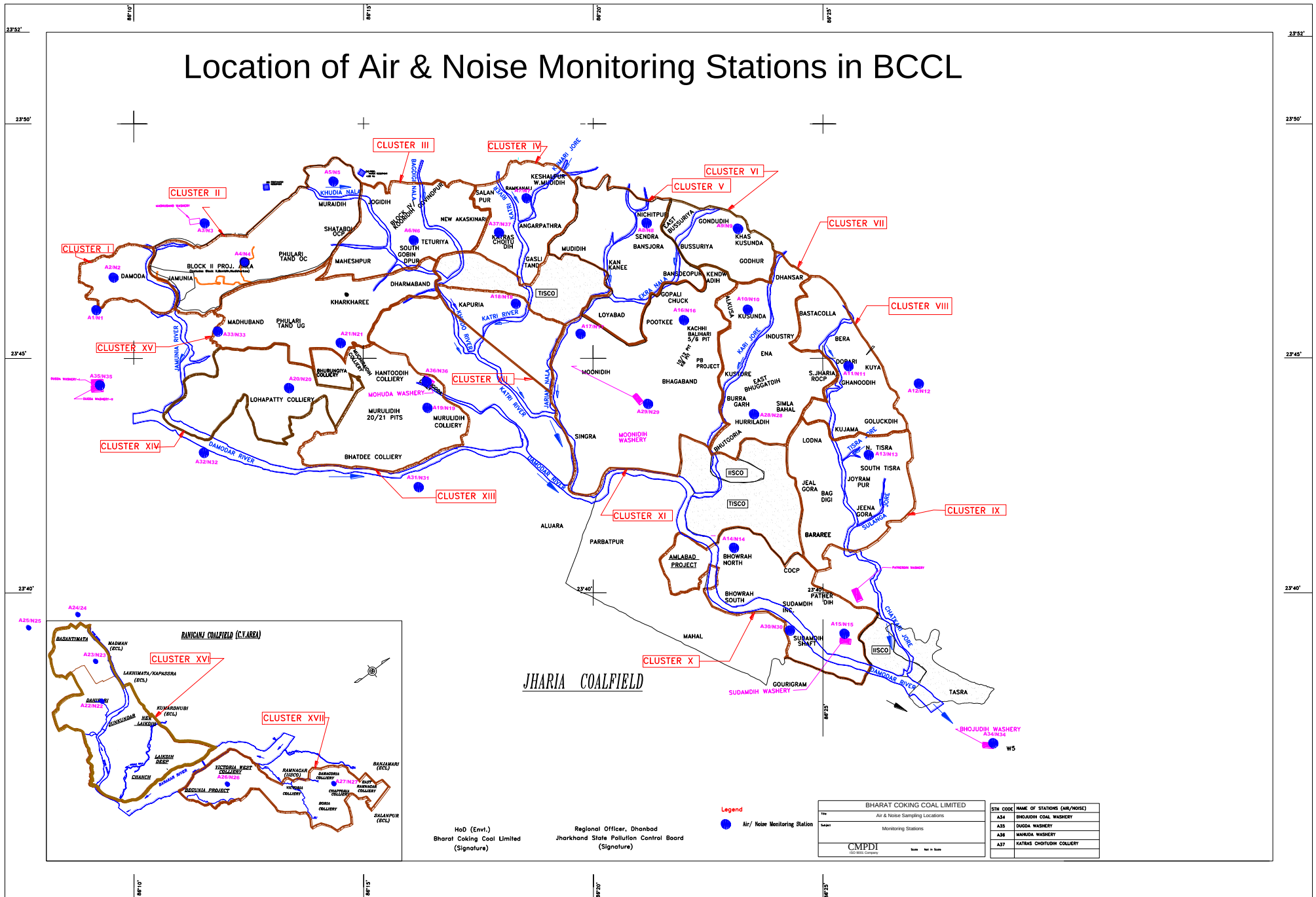
Pollutant	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
		Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO₂), µg/m³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogendioxide (NO₂), 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 PM₁₀, 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 (O₃) , 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 (NH₃), µg/m³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C₆H₆), 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 JUNE 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.

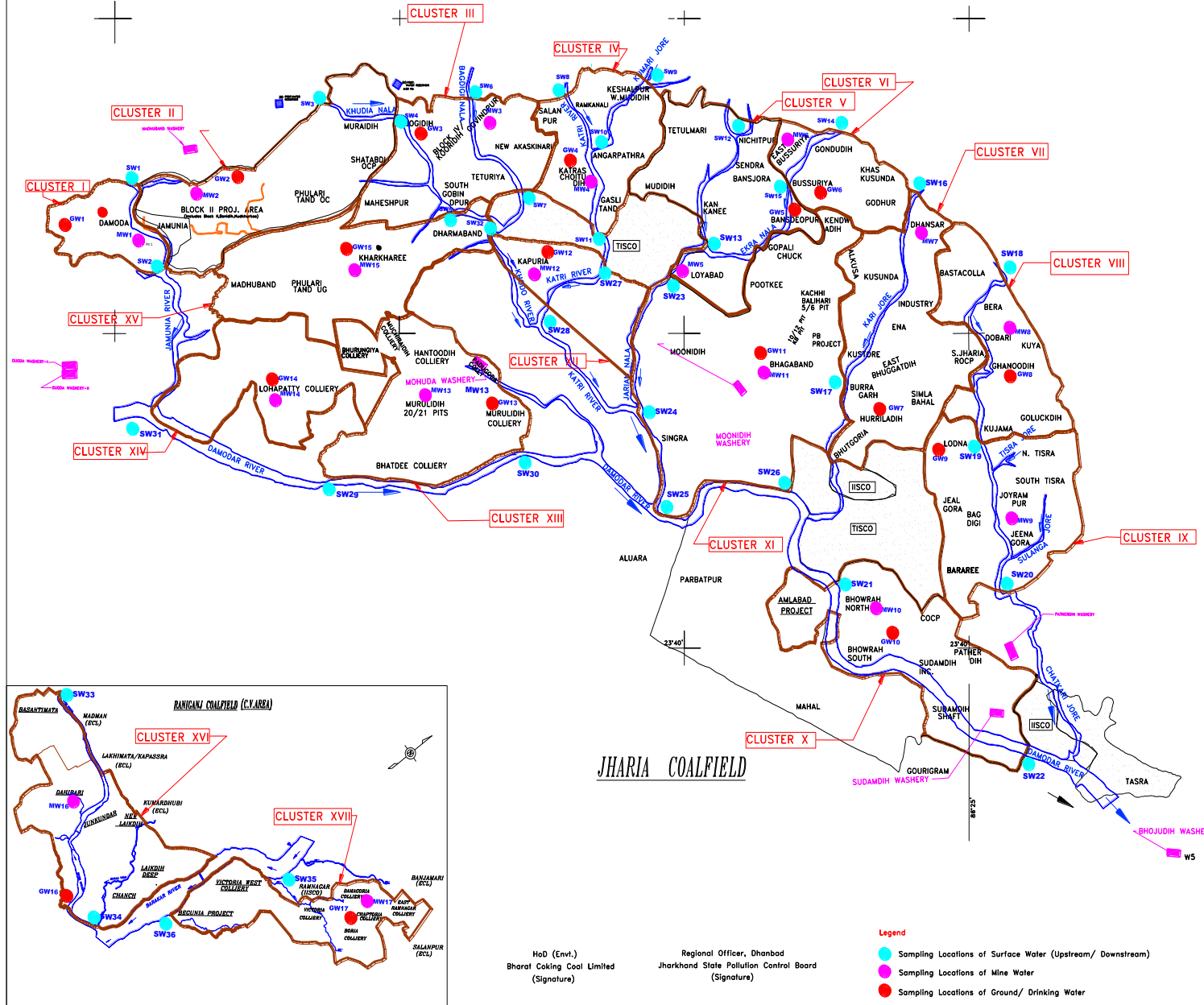
Location of Air & Noise Monitoring Stations in BCCL



Water Sampling Locations in BCCL

INDEX

Cluster	Surface Water (JUS, DIS)	Name of River/Nala/Jore	Mine/ Effluent Water	Sampling Location	Ground Water	Sampling Location
I	SW1, SW2	Damodar River	MW1	Damodar Area	GW1	Chakraborty Village
II	SW3, SW4	Khudra Nala	MW2	Block II OCP	GW2	Joyrampur Village
III	SW4, SW5, SW6, SW7	Khudra Nala, Bagdigi Nala	MW3	Govindpur Colliery	GW3	Jogdih Village
IV	SW8, SW11, SW9, SW10	Kain River, Kuman Jore	MW4	Chotudih	GW4	Kankanee Village
V	SW12, SW13, SW15	Jarian Nala, Ekra Nala	MW5	Mudih	GW5	Nichitpur
VI	SW14, SW15	Ekra Nala	MW6	East Bassuria UGP	GW6	Bansjora Borewell
VII	SW16, SW17	Kain Jore	MW7	Dhanbari UGP	GW7	Humladih
VIII	SW18, SW19	Kain Jore	MW8	Doban UGP	GW8	Ghanudih
IX	SW19, SW20	Kain Jore	MW9	Jeevagrah	GW9	Lodna
X	SW21, SW22	Damodar River	MW10	Bhowrah North	GW10	Bhowrah South
XI	SW23, SW24, SW25, SW26	Jarian Nala, Damodar River	MW11	Bhagaband UGP	GW11	Bhagaband
XII	SW27, SW28	Kain River	MW12	Kapura	GW12	Kapura
XIII	SW29, SW30	Damodar River	MW13	Murudih	GW13	Murudih
XIV	SW31, SW32	Damodar River	MW14	Lohapatti	GW14	Lohapatti
XV	SW5, SW32	Kharkhar Nala	MW15	Kharkhar UGP	GW15	Kharkhar
XVI	SW33, SW34	Khudra River	MW16	Dahiban OCP	GW16	Palabani Village
XVII	SW35, SW36	Barakar River	MW17	Damagoria Colliery	GW17	Chaptoria



Customer	BHARAT COKING COAL LIMITED
Title	WATER SAMPLING LOCATIONS
Subject	MONITORING STATIONS
Scale	Not to Scale

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

(FOR THE MONTH JULY, 2022)

E. C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

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4.	CHAPTER-IV	STANDARDS AND PLANS	19-20

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°37' N to 23°52' N latitudes and 86°09' E to 86°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 (PM₁₀), Fine Particulate Matter (PM_{2.5}), Sulphur Di-oxide (SO₂)

and Nitrogen Oxides (NO_x). Respirable Dust Samplers (RDS) and Fine Dust Sampler (PM_{2.5} sampler) were used for sampling of PM₁₀, SO₂, & 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 'LEQ' 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 PM₁₀, PM_{2.5}, SO₂ 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 PM₁₀ & 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.

The following preventive and suppressive mitigative measures can be undertaken to contain the pollution level within prescribed level:-

- Wet drilling and controlled blasting should be practice.
- Explosive used should be optimised to restrict the dust generation.
- Transportation roads should be permanently asphalted free of ruts, potholes etc.
- Water should be sprayed on coal transportation road, service road more frequently and at regular interval.
- Dust from roads should be removed physically or mechanically.
- Greenbelts around industrial sites, service building area besides Avenue plantation along roads should be created.
- Coal dust should be suppressed by using fixed sprinklers.
- Regular maintenance of plant and machinery should be undertaken.

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

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 XII is in the Central part of the Jharia coalfield. It includes Kapuria UG Mine. The cluster – XII is situated about 30 - 35 kms from Dhanbad Railway Station. The mines of this cluster - XII are operating since pre nationalization period (prior to 1972-73). It is connected by both Railway and Road. The drainage of the area is governed by Katri River.

1.2 The cluster XII is designed to produce 2.4 Mtpa (normative) and 3.12 Mtpa peak capacity of coal. The average grade of coal W-II to W-IV.

The Project has Environmental Clearance from Ministry of Environment, Forests and Climate Change (MoEF&CC) for a rated capacity of 2.4 MTPA (normative) and 3.12 MTPA peak capacity of coal production vide letter no E.C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.

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 PM₁₀, PM_{2.5}, SO₂, NO_x 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) Rudhi basti (A18): Industrial Area

The location of the sampling station is 23° 45' 26.60" N & 86° 18' 39.90" E. The samplers were placed at a height of approx. 1.5m above ground level at Rudhi basti.

II. BUFFER ZONE Monitoring Location

i) Block IV (A6) : Industrial area

The location of the sampling station is 23° 47' 54.00" N & 86° 16' 20.00" E The samplers were placed at a height of approx. 1.5m above ground level at Safety Office.

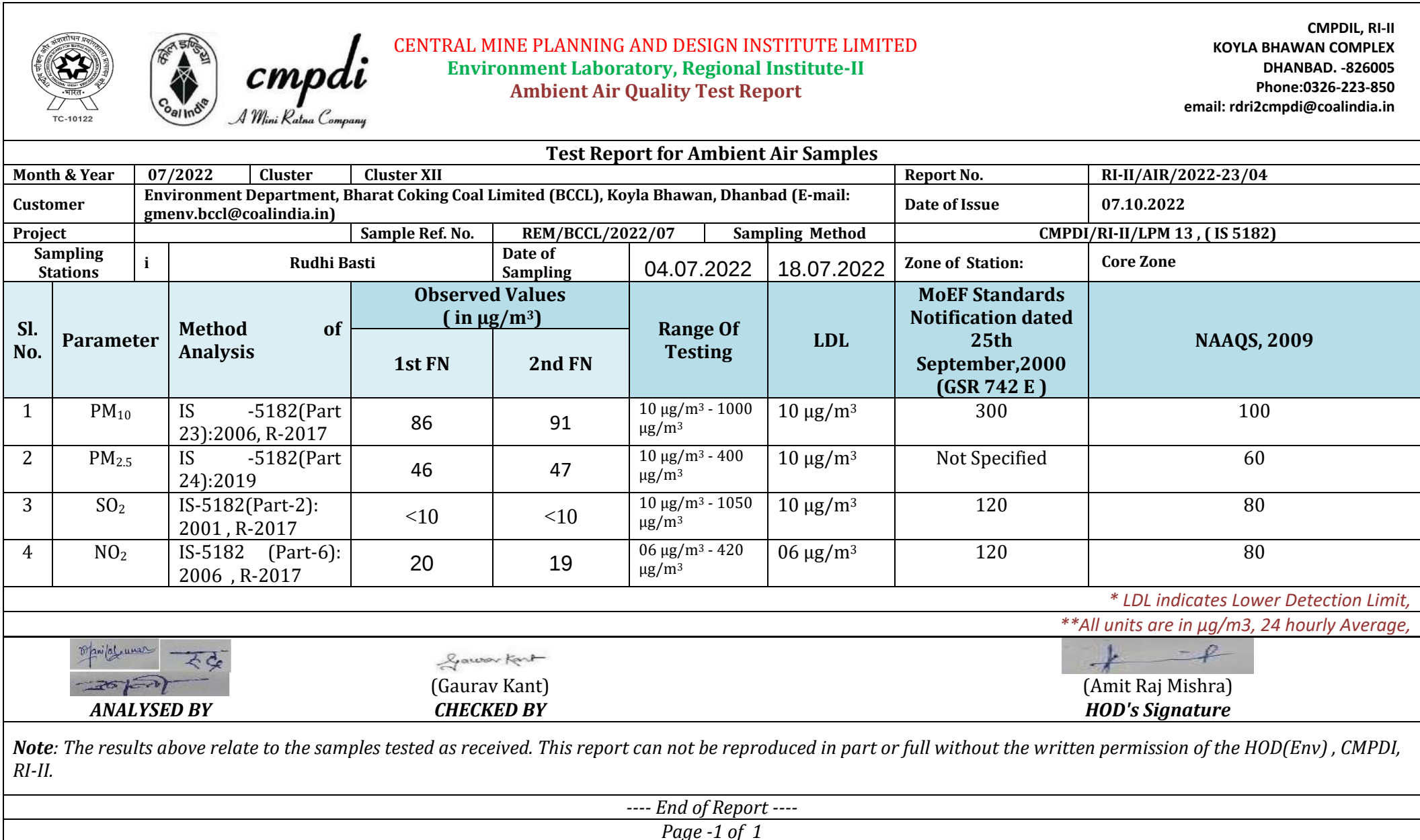
ii) Moonidih UGP (A17) : Industrial area

The location of the sampling station is 23° 44' 30.00" N & 86° 20' 56.00" E. The samplers were placed at a height of approx. 1.5m above ground level at project office.

iii) Murlidih 20/21 Pit(A19): Industrial Area

The location of the sampling station is 23° 43' 51.82" N & 86° 16' 21.87" E. The samplers were placed at a height of approx. 1.5m above ground level at project office.

AMBIENT AIR QUALITY DATA





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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
Ambient Air Quality Test Report

CMPDIL, RI-II
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Phone:0326-223-850
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Test Report for Ambient Air Samples

Month & Year		07/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/04	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	07.10.2022	
Project			Sample Ref. No.	REM/BCCL/2022/07	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Block IV		Date of Sampling	08.07.2022	22.07.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017		96	112	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	PM _{2.5}	IS -5182(Part 24):2019		63	54	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		10	12	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		16	17	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,

ANALYSED BY

(Gaurav Kant)
CHECKED BY

(Amit Raj Mishra)
HOD's Signature

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Ambient Air Quality Test Report

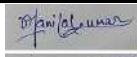
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Test Report for Ambient Air Samples

Month & Year		07/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/04	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	07.10.2022	
Project				Sample Ref. No.	REM/BCCL/2022/07	Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Moonidih UGP		Date of Sampling	11.07.2022	22.07.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017		94	75	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	PM _{2.5}	IS -5182(Part 24):2019		54	48	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		<10	<10	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		16	15	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,




ANALYSED BY



(Gaurav Kant)
CHECKED BY



(Amit Raj Mishra)
HOD's Signature

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Ambient Air Quality Test Report

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Test Report for Ambient Air Samples

Month & Year		07/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/04	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	07.10.2022	
Project				Sample Ref. No.	REM/BCCL/2022/07	Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Murlidih 20/21 Pit		Date of Sampling	05.07.2022	19.07.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017		87	97	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	PM _{2.5}	IS -5182(Part 24):2019		45	54	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		<10	<10	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		25	22	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,

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[Signature]
(Gaurav Kant)
CHECKED BY

[Signature]
(Amit Raj Mishra)
HOD's Signature

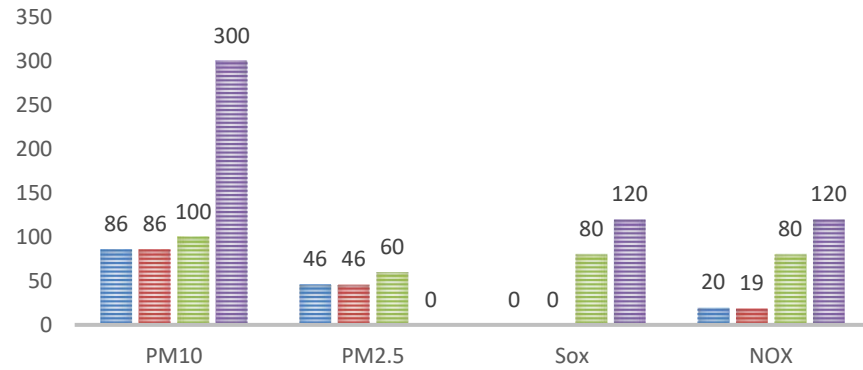
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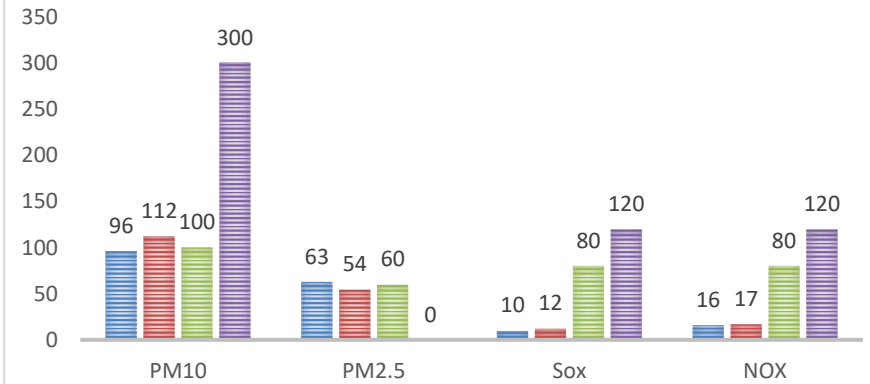
AMBIENT AIR QUALITY AT RUDHI BASTI

04.07.2022 18.07.2022 NAAQS GSR Standards



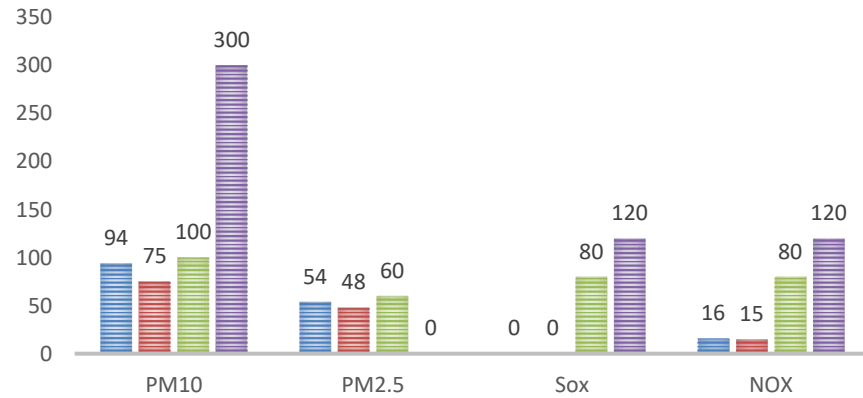
AMBIENT AIR QUALITY AT BLOCK IV

08.07.2022 22.07.2022 NAAQS GSR Standards



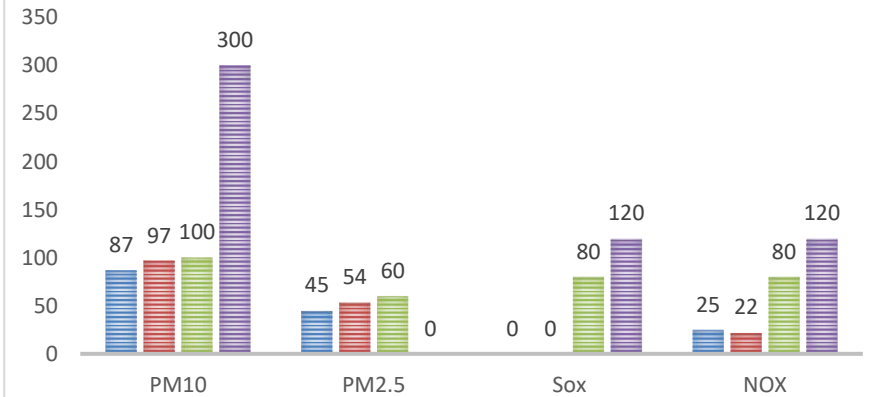
AMBIENT AIR QUALITY AT MOONIDIH UGP

11.07.2022 22.07.2022 NAAQS GSR Standards



AMBIENT AIR QUALITY AT MURLIDIH 20/21 PIT

05.07.2022 19.07.2022 NAAQS GSR Standards



NOISE LEVEL QUALITY MONITORING

4.1 Location of sampling sites

- i) **Rudhi basti (N18)**
- ii) **Block IV(N6)**
- iii) **Moonidih UGP(N17)**
- iv) **Murlidih 20/21 (N19)**

4.2 Methodology of sampling and analysis

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

4.3 Results & Interpretations

Ambient noise levels were recorded during day time and the observed values were compared with standards prescribed by MoEFCC. The results of Noise levels recorded during day time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{EQ} are presented. The observed values at all the monitoring locations are found to be within permissible limits.



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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
Ambient Noise Level Test Report

CMPDI, RI-II
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Phone:0326-223-850
email: rdri2cmpdi@coalindia.in

Month & Year	07/2022	Cluster	Cluster XII					Report No.	RI-II/WATER/2022-23/04
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	07.10.2022
Project			Sample Ref. No.	REM/BCCL/2022/07		Sampling Method		CMPDI/RI-II/LPM 13	
Sampling Stations	i	Rudhi Basti		Date of Sampling	04.07.22	18.07.22	Zone Category of Station:		Core Zone
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A))	Observed Values (in Leq dB(A))	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
			First Fortnight	Second Fortnight				Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	41.2	40.2	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	43.2	45.8					
3		08:00 - 09:00	44.5	51.2					
4		09:00 – 10:00	46.5	53.4					
5		10:00 - 11:00	51.5	53.4					
6		11:00 - 12:00	55.3	56.6					
7		12:00 - 13:00	53.2	53.4					
8		13:00 - 14:00	54.5	53.6					
9		14:00 - 15:00	56.6	55.4					
10		15:00 - 16:00	57.8	58.8					
11		16:00 - 17:00	58.5	52.8					
12		17:00 - 18:00	50.4	50.1					
13		18:00 - 19:00	48.2	45.6					
14		19:00 - 20:00	42.3	44.1					
15		20:00 - 21:00	41.5	41.2					
16		21:00 - 22:00	40.1	40.2					
		Leq Day	52.8	52.7					
1	Noise Level dB(A)Leq -Night	22:00-23:00	44.3	44.9	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	43.2	43.2					
3		00:00- 01:00	41.9	43.0					
4		01.00-02.00	42.5	42.9					
5		02.00-03.00	43.0	42.0					
6		03.00-04.00	40.9	41.6					
7		04.00-05.00	40.1	41.2					
8		05:00-06:00	40.2	41.0					
		Leq Night	42.2	42.7					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants
ANALYSED BY

(Gaurav Kant)
CHECKED BY

Raj Mishra)
HOD's Signature

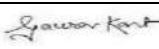
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  		CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED Environment Laboratory, Regional Institute-II Ambient Noise Level Test Report				CMPDIL, RI-II KOYLA BHAWAN COMPLEX DHANBAD. -826005 Phone:0326-223-850		
Month & Year	07/2022	Cluster	Cluster XII			Report No.	RI-II/NOISE/2022-23/04	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	07.10.2022	
Project		Sample Ref. No.	REM/BCCL/2022/07		Sampling Method	CMPDI/RI-II/LPM 13		
Sampling Stations	i	Block IV		Date of Sampling	08.07.22	22.07.22	Zone Category of Station:	Buffer Zone
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A)) First Fortnight	Observed Values (in Leq dB(A)) Second Fortnight	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards Zones Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	51.9	52.1	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence 75 65 55 50
2		07:00 - 08:00	54.6	53.6				
3		08:00 - 09:00	57.2	56.2				
4		09:00 - 10:00	64.2	62.5				
5		10:00 - 11:00	65.1	63.9				
6		11:00 - 12:00	63.6	62.4				
7		12:00 - 13:00	66.6	65.4				
8		13:00 - 14:00	64.2	66.8				
9		14:00 - 15:00	62.0	60.9				
10		15:00 - 16:00	68.2	59.9				
11		16:00 - 17:00	60.5	57.6				
12		17:00 - 18:00	62.3	58.9				
13		18:00 - 19:00	59.1	58.0				
14		19:00 - 20:00	58.0	56.9				
15		20:00 - 21:00	56.4	55.3				
16		21:00 - 22:00	57.5	56.4				
		Leq Day	62.7	61.1				
1	Noise Level dB(A)Leq -Night	22:00-23:00	45.5	45.8	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence 70 55 45 50
2		23:00- 00:00	44.5	44.9				
3		00:00- 01:00	44.5	44.2				
4		01:00-02:00	43.0	43.6				
5		02:00-03:00	42.5	42.7				
6		03:00-04:00	41.9	41.2				
7		04:00-05:00	40.5	39.5				
8		05:00-06:00	40.2	39.4				
		Leq Night	43.2	43.2				

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants ANALYSED BY	 (Gaurav Kant) CHECKED BY	 (Amit Raj Mishra) HOD's Signature
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A Mini Ratna Company

CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
Ambient Noise Level Test Report

CMPDIL, RI-II
KOYLA BHAWAN COMPLEX
DHANBAD. -826005
Phone:0326-223-850
email: rdi2cmpdi@coalindia.in

Month & Year	07/2022	Cluster	Cluster XII					Report No.	RI-II/NOISE/2022-23/04
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	07.10.2022
Project			Sample Ref. No.	REM/BCCL/2022/07		Sampling Method		CMPDI/RI-II/LPM 13	
Sampling Stations	i	Moonidih UGP		Date of Sampling		11.07.22	22.07.22	Zone Category of Station:	Buffer Zone
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A))	Observed Values (in Leq dB(A))	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
			First Fortnight	Second Fortnight				Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	47.0	47.7	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	50.1	50.2					
3		08:00 - 09:00	52.3	52.6					
4		09:00 - 10:00	56.7	56.3					
5		10:00 - 11:00	58.1	59.8					
6		11:00 - 12:00	58.2	58.4					
7		12:00 - 13:00	62.0	61.2					
8		13:00 - 14:00	62.6	63.2					
9		14:00 - 15:00	57.1	57.0					
10		15:00 - 16:00	55.3	56.1					
11		16:00 - 17:00	54.8	55.6					
12		17:00 - 18:00	54.3	55.1					
13		18:00 - 19:00	52.0	51.8					
14		19:00 - 20:00	50.1	49.8					
15		20:00 - 21:00	49.8	50.0					
16		21:00 - 22:00	47.1	47.2					
		Leq Day	56.6	56.9					
1	Noise Level dB(A)Leq -Night	22:00-23:00	46.2	45.5	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	44.0	44.8					
3		00:00- 01:00	43.2	43.9					
4		01.00-02.00	41.3	43.4					
5		02.00-03.00	42.0	40.4					
6		03.00-04.00	40.7	40.2					
7		04.00-05.00	40.5	40.1					
8		05:00-06:00	40.2	40.6					
		Leq Night	42.7	42.9					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants

ANALYSED BY

(Gaurav Kant)

CHECKED BY

(Amit Raj Mishra)

HOD's Signature

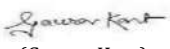
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  		CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED Environment Laboratory, Regional Institute-II Ambient Noise Level Test Report				CMPDIL, RI-II KOYLA BHAWAN COMPLEX DHANBAD. -826005 Phone:0326-223-850 email: rdi2cmpdi@coalindia.in			
Month & Year	07/2022	Cluster	Cluster XII			Report No.	RI-II/NOISE/2022-23/04		
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	07.10.2022		
Project		Sample Ref. No.	REM/BCCL/2022/07		Sampling Method	CMPDI/RI-II/LPM 13			
Sampling Stations	i	Murlidih(20/21)		Date of Sampling	05.07.22	19.07.22	Zone Category of Station:		Buffer Zone
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A)) First Fortnight	Observed Values (in Leq dB(A)) Second Fortnight	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
								Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	51.4	52.8	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB- 135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	55.1	55.5					
3		08:00 - 09:00	56.7	63.5					
4		09:00 - 10:00	62.9	64.6					
5		10:00 - 11:00	63.4	66.2					
6		11:00 - 12:00	62.9	64.6					
7		12:00 - 13:00	66.0	67.7					
8		13:00 - 14:00	66.2	69.2					
9		14:00 - 15:00	67.4	63.1					
10		15:00 - 16:00	60.4	62.4					
11		16:00 - 17:00	59.9	61.5					
12		17:00 - 18:00	59.4	61.0					
13		18:00 - 19:00	57.5	60.1					
14		19:00 - 20:00	57.4	59.1					
15		20:00 - 21:00	57.1	59.0					
16		21:00 - 22:00	56.9	58.4					
		Leq Day	62.1	63.6					
1	Noise Level dB(A)Leq -Night	22:00-23:00	44.8	44.7	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB- 135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	43.5	44.1					
3		00:00- 01:00	43.0	42.3					
4		01:00-02:00	42.6	42.0					
5		02:00-03:00	42.0	41.6					
6		03:00-04:00	41.9	40.8					
7		04:00-05:00	40.5	40.2					
8		05:00-06:00	40.2	40.1					
		Leq Night	42.5	42.3					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants ANALYSED BY  (Gaurav Kant)	CHECKED BY  (Amit Raj Mishra) HOD's Signature
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Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env) , CMPDI, RI-II.

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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 $\mu\text{g}/\text{m}^3$ 700 $\mu\text{g}/\text{m}^3$	- 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 $\mu\text{g}/\text{m}^3$ 300 $\mu\text{g}/\text{m}^3$	Respirable Particulate Matter sampling and analysis
	Sulphur Dioxide (SO_2)	Annual Average * 24 hours **	80 $\mu\text{g}/\text{m}^3$ 120 $\mu\text{g}/\text{m}^3$	1.Improvedwest and Gaeke method 2.Ultraviolet fluorescene
	Oxide of Nitrogen as NO_2	Annual Average * 24 hours **	80 $\mu\text{g}/\text{m}^3$ 120 $\mu\text{g}/\text{m}^3$	1. Jacob & Hochheiser Modified (Na-Arsenic) Method 2. Gas phase Chemilumine-scence

Note:

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

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

NATIONAL AMBIENT AIR QUALITY STANDARDS

New Delhi the 18th November 2009

In exercise of the powers conferred by Sub-section (2) (h) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No. 14 of 1981), and in supersession of the notification No(s).S.O.384(E), dated 11th April 1994 and S.O.935(E), dated 14th NOVEMBER 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 (SO₂), µg/m³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogendioxide (NO₂), 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 PM₁₀, 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 (O₃) , 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 (NH₃), µg/m³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C₆H₆), 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.

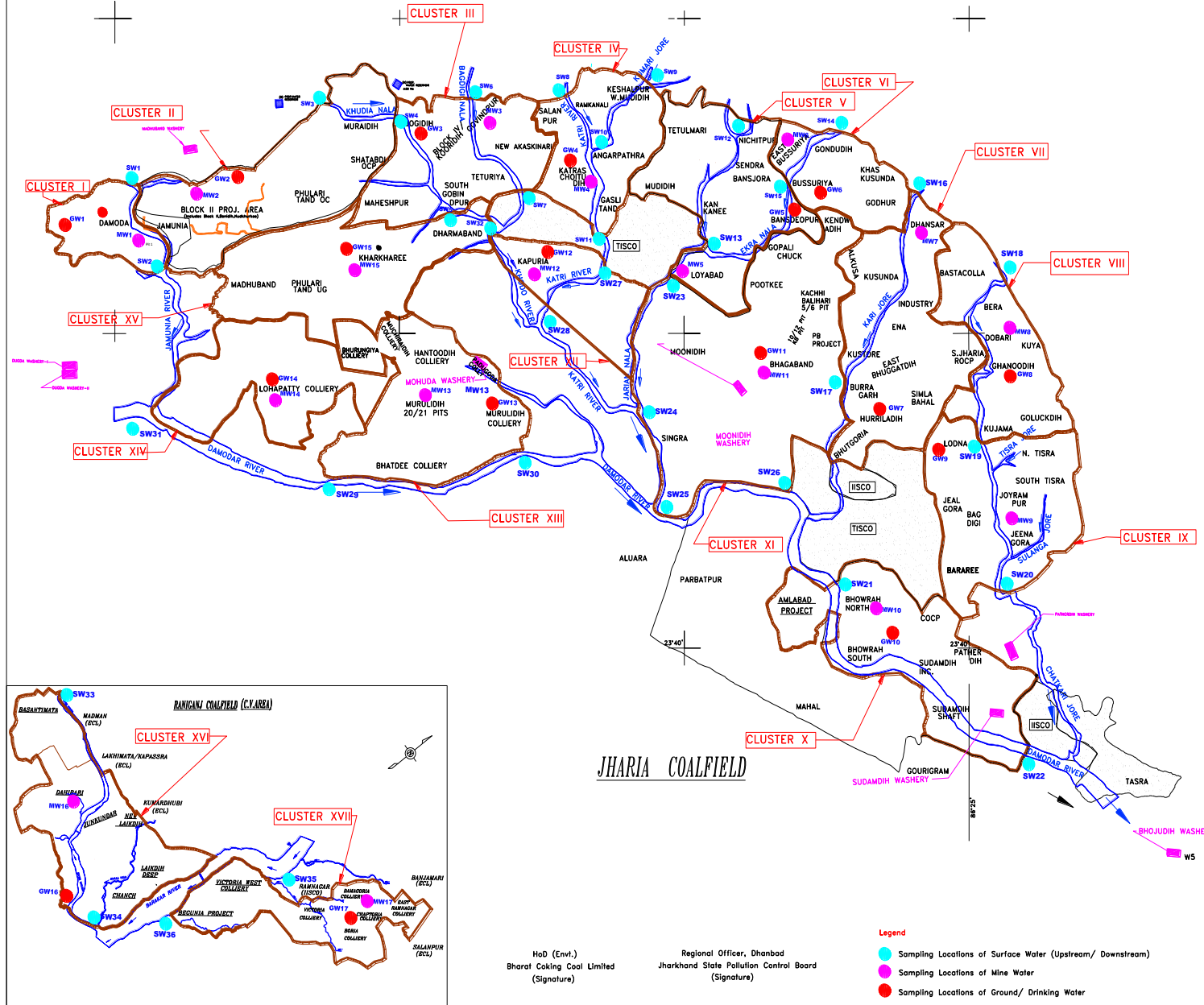
** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they JUNE exceed the limits but not on two consecutive days of monitoring.

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.

Water Sampling Locations in BCCL

INDEX

Cluster	Surface Water (JUS, DIS)	Name of River/Nala/Jore	Mine/ Effluent Water	Sampling Location	Ground Water	Sampling Location
I	SW1, SW2	Damodar River	MW1	Damodar Area	GW1	Chakraborty Village
II	SW3, SW4	Khudra Nala	MW2	Block II OCP	GW2	Joyrampur Village
III	SW4, SW5, SW6, SW7	Khudra Nala, Bagdigi Nala	MW3	Govindpur Colliery	GW3	Jogdih Village
IV	SW8, SW11, SW9, SW10	Kain River, Kuman Jore	MW4	Chotudih	GW4	Kankanee Village
V	SW12, SW13, SW15	Jarian Nala, Ekra Nala	MW5	Mudih	GW5	Nichitpur
VI	SW14, SW15	Ekra Nala	MW6	East Bassuria UGP	GW6	Bansjora Borewell
VII	SW16, SW17	Kain Jore	MW7	Dhanbari UGP	GW7	Humladih
VIII	SW18, SW19	Kain Jore	MW8	Doban UGP	GW8	Ghanudih
IX	SW19, SW20	Kain Jore	MW9	Jeevagrah	GW9	Lodna
X	SW21, SW22	Damodar River	MW10	Bhowrah North	GW10	Bhowrah South
XI	SW23, SW24, SW25, SW26	Jarian Nala, Damodar River	MW11	Bhagaband UGP	GW11	Bhagaband
XII	SW27, SW28	Kain River	MW12	Kapura	GW12	Kapura
XIII	SW29, SW30	Damodar River	MW13	Murudih	GW13	Murudih
XIV	SW31, SW32	Damodar River	MW14	Lohapatti	GW14	Lohapatti
XV	SW33, SW34	Khudra Nala	MW15	Kharkharree UGP	GW15	Kharkharree
XVI	SW35, SW36	Khudra River	MW16	Dahiban OCP	GW16	Palabani Village
XVII	SW37, SW38	Barakar River	MW17	Damagoria Colliery	GW17	Chaptoria



Customer	BHARAT COKING COAL LIMITED
Title	WATER SAMPLING LOCATIONS
Subject	MONITORING STATIONS
Scale	Not to Scale

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 /GOVERNMENT.

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

(FOR THE MONTH AUGUST, 2022)

E. C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

CONTENTS

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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°37' N to 23°52' N latitudes and 86°09' E to 86°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 (PM₁₀), Fine Particulate Matter (PM_{2.5}), Sulphur Di-oxide (SO₂)

and Nitrogen Oxides (NO_x). Respirable Dust Samplers (RDS) and Fine Dust Sampler (PM_{2.5} sampler) were used for sampling of PM₁₀, SO₂, & 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 'LEQ' 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 PM₁₀, PM_{2.5}, SO₂ 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 PM₁₀ & 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.

The following preventive and suppressive mitigative measures can be undertaken to contain the pollution level within prescribed level:-

- Wet drilling and controlled blasting should be practice.
- Explosive used should be optimised to restrict the dust generation.
- Transportation roads should be permanently asphalted free of ruts, potholes etc.
- Water should be sprayed on coal transportation road, service road more frequently and at regular interval.
- Dust from roads should be removed physically or mechanically.
- Greenbelts around industrial sites, service building area besides Avenue plantation along roads should be created.
- Coal dust should be suppressed by using fixed sprinklers.
- Regular maintenance of plant and machinery should be undertaken.

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

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 XII is in the Central part of the Jharia coalfield. It includes Kapuria UG Mine. The cluster – XII is situated about 30 - 35 kms from Dhanbad Railway Station. The mines of this cluster - XII are operating since pre nationalization period (prior to 1972-73). It is connected by both Railway and Road. The drainage of the area is governed by Katri River.

1.2 The cluster XII is designed to produce 2.4 Mtpa (normative) and 3.12 Mtpa peak capacity of coal. The average grade of coal W-II to W-IV.

The Project has Environmental Clearance from Ministry of Environment, Forests and Climate Change (MoEF&CC) for a rated capacity of 2.4 MTPA (normative) and 3.12 MTPA peak capacity of coal production vide letter no E.C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.

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 PM₁₀, PM_{2.5}, SO₂, NO_x 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) Rudhi basti (A18): Industrial Area

The location of the sampling station is 23° 45' 26.60" N & 86° 18' 39.90" E. The samplers were placed at a height of approx. 1.5m above ground level at Rudhi basti.

II. BUFFER ZONE Monitoring Location

i) Block IV (A6) : Industrial area

The location of the sampling station is 23° 47' 54.00" N & 86° 16' 20.00" E The samplers were placed at a height of approx. 1.5m above ground level at Safety Office.

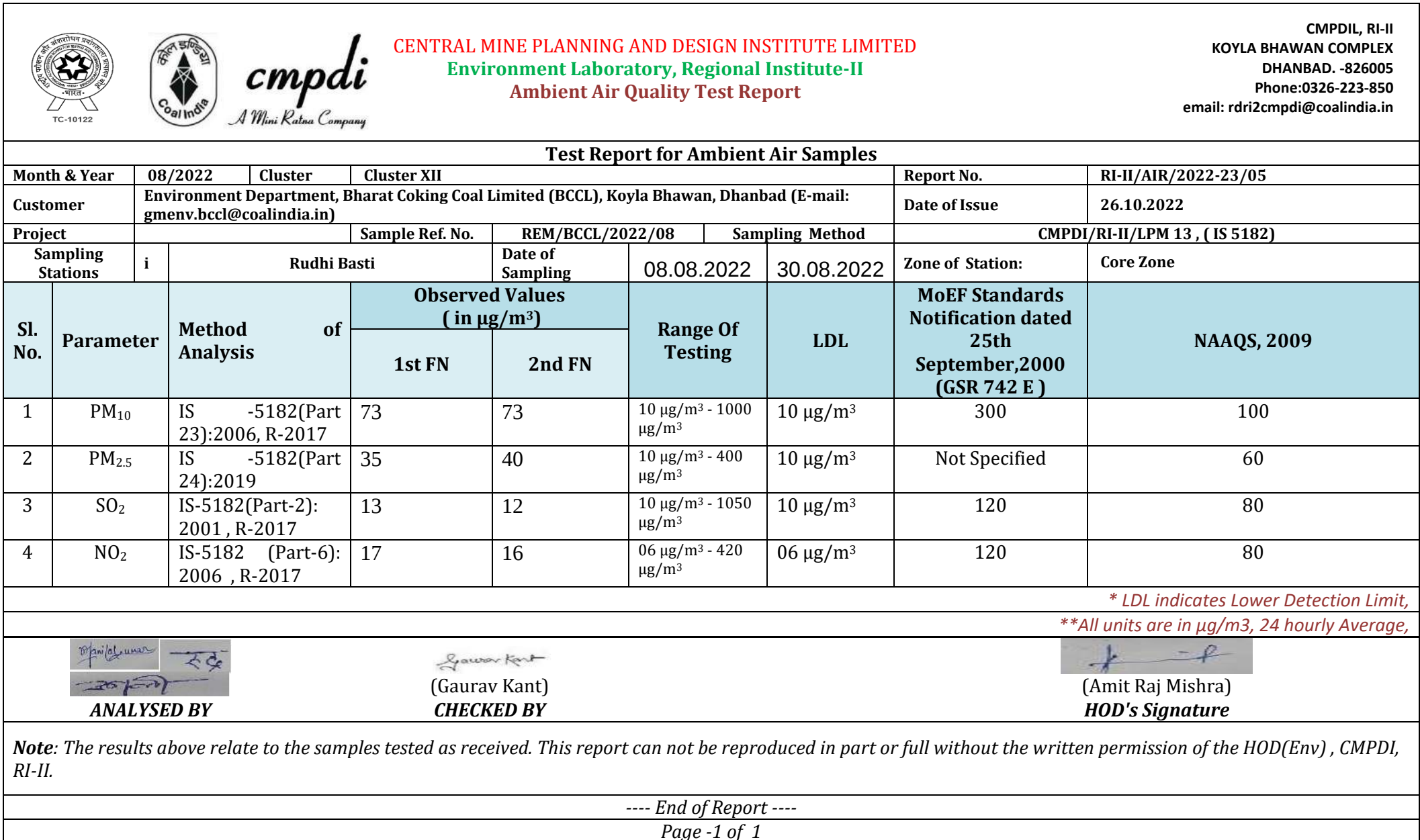
ii) Moonidih UGP (A17) : Industrial area

The location of the sampling station is 23° 44' 30.00" N & 86° 20' 56.00" E. The samplers were placed at a height of approx. 1.5m above ground level at project office.

iii) Murlidih 20/21 Pit(A19): Industrial Area

The location of the sampling station is 23° 43' 51.82" N & 86° 16' 21.87" E. The samplers were placed at a height of approx. 1.5m above ground level at project office.

AMBIENT AIR QUALITY DATA





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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
Ambient Air Quality Test Report

CMPDIL, RI-II
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Test Report for Ambient Air Samples

Month & Year		08/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/05	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	26.10.2022	
Project				Sample Ref. No.	REM/BCCL/2022/08	Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Block IV		Date of Sampling	02.08.2022	18.08.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017	82	108	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100	
2	PM _{2.5}	IS -5182(Part 24):2019	41	62	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60	
3	SO ₂	IS-5182(Part-2): 2001 , R-2017	<10	13	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80	
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017	19	20	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80	

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,

ANALYSED BY

(Gaurav Kant)
CHECKED BY

(Amit Raj Mishra)
HOD's Signature

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Test Report for Ambient Air Samples

Month & Year		08/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/05	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	26.10.2022	
Project				Sample Ref. No.	REM/BCCL/2022/08	Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Sampling Stations		i	Moonidih UGP		Date of Sampling	12.08.2022	24.08.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017	79	64	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100	
2	PM _{2.5}	IS -5182(Part 24):2019	38	34	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60	
3	SO ₂	IS-5182(Part-2): 2001 , R-2017	<10	10	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80	
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017	18	19	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80	

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,

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ANALYSED BY

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(Gaurav Kant)
CHECKED BY

[Signature]
(Amit Raj Mishra)
HOD's Signature

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Ambient Air Quality Test Report

CMPDIL, RI-II
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Test Report for Ambient Air Samples

Month & Year		08/2022	Cluster	Cluster XII			Report No.	RI-II/AIR/2022-23/05	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	26.10.2022	
Project				Sample Ref. No.	REM/BCCL/2022/08	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Sampling Stations		i	Murlidih 20/21 Pit		Date of Sampling	09.08.2022	30.08.2022	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017	74	82	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100	
2	PM _{2.5}	IS -5182(Part 24):2019	37	44	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60	
3	SO ₂	IS-5182(Part-2): 2001 , R-2017	<10	<10	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80	
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017	19	20	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80	

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,

[Signature]
ANALYSED BY

[Signature]
(Gaurav Kant)
CHECKED BY

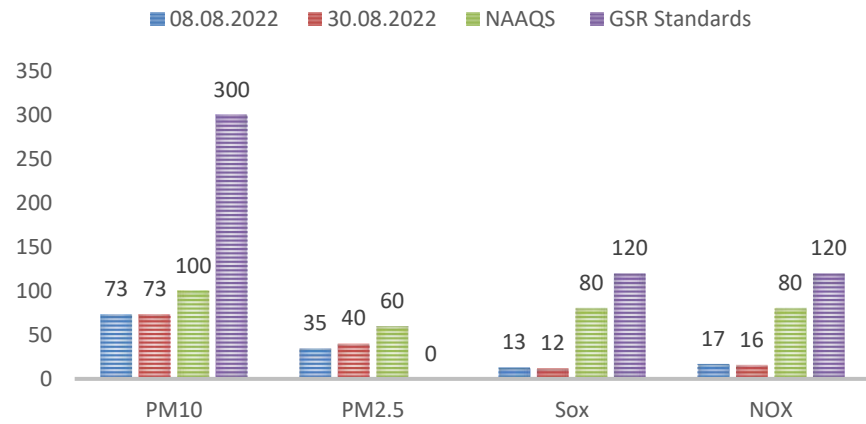
[Signature]
(Amit Raj Mishra)
HOD's Signature

Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env) , CMPDI, RI-II.

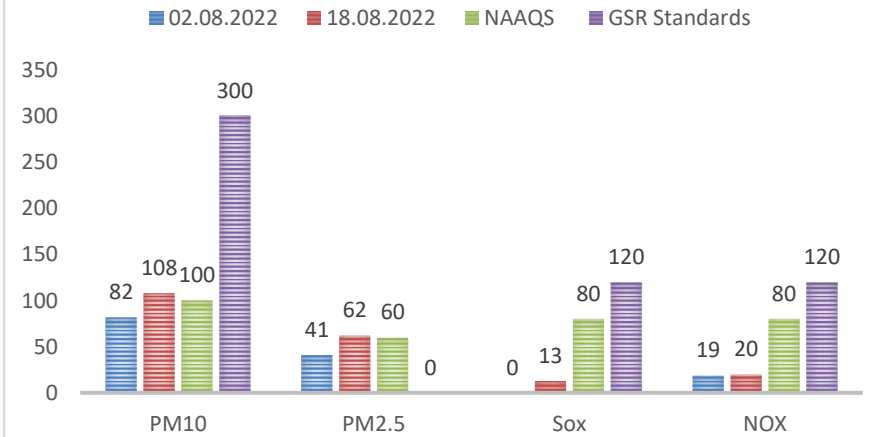
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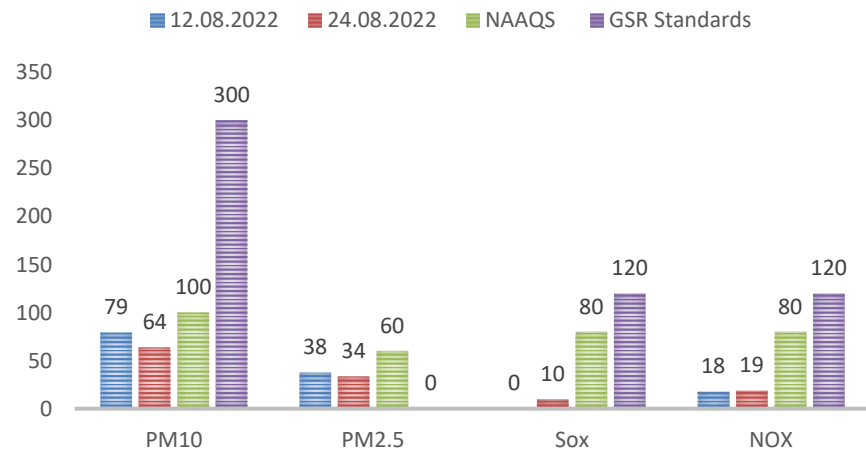
AMBIENT AIR QUALITY AT RUDHI BASTI



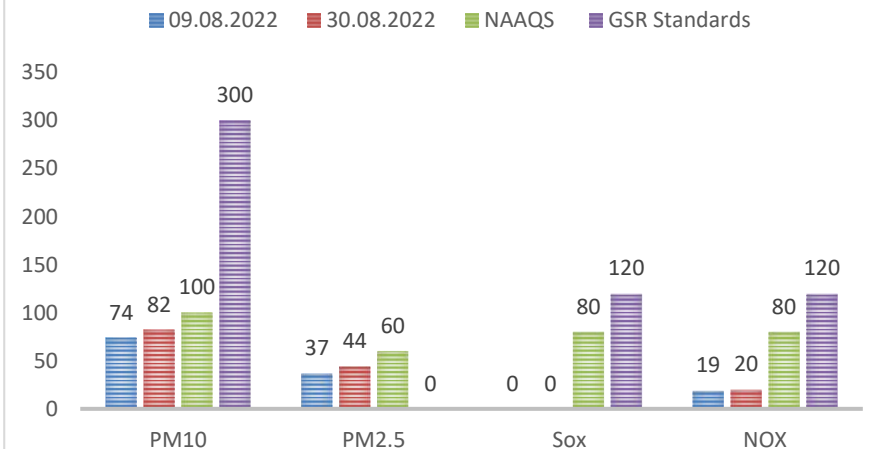
AMBIENT AIR QUALITY AT BLOCK IV



AMBIENT AIR QUALITY AT MOONIDIH UGP



AMBIENT AIR QUALITY AT MURLIDIH 20/21 PIT



NOISE LEVEL QUALITY MONITORING

4.1 Location of sampling sites

- i) **Rudhi basti (N18)**
- ii) **Block IV(N6)**
- iii) **Moonidih UGP(N17)**
- iv) **Murlidih 20/21 (N19)**

4.2 Methodology of sampling and analysis

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

4.3 Results & Interpretations

Ambient noise levels were recorded during day time and the observed values were compared with standards prescribed by MoEFCC. The results of Noise levels recorded during day time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{EQ} are presented. The observed values at all the monitoring locations are found to be within permissible limits.



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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
Ambient Noise Level Test Report

CMPDI, RI-II
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Phone:0326-223-850
email: rdri2cmndi@coalindia.in

Month & Year	08/2022	Cluster	Cluster XII					Report No.	RI-II/WATER/2022-23/05
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	26.10.2022
Project			Sample Ref. No.	REM/BCCL/2022/08		Sampling Method		CMPDI/RI-II/LPM 13	
Sampling Stations	i	Rudhi Basti		Date of Sampling	08.08.22	30.08.22	Zone Category of Station:		Core Zone
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A))	Observed Values (in Leq dB(A))	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
			First Fortnight	Second Fortnight				Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	45.8	46.7	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	48.2	49.2					
3		08:00 - 09:00	53.4	51.6					
4		09:00 – 10:00	56.1	57.2					
5		10:00 - 11:00	57.4	58.6					
6		11:00 - 12:00	62.3	57.2					
7		12:00 - 13:00	58.8	60.0					
8		13:00 - 14:00	60.0	61.3					
9		14:00 - 15:00	55.6	55.9					
10		15:00 - 16:00	53.9	55.0					
11		16:00 - 17:00	53.4	54.5					
12		17:00 - 18:00	52.9	54.0					
13		18:00 - 19:00	52.1	53.2					
14		19:00 - 20:00	51.2	52.2					
15		20:00 - 21:00	50.6	52.2					
16		21:00 - 22:00	50.4	51.7					
		Leq Day	55.9	56.0					
1	Noise Level dB(A)Leq -Night	22:00-23:00	44.3	44.9	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	43.9	43.2					
3		00:00- 01:00	41.9	42.7					
4		01.00-02.00	42.5	42.9					
5		02.00-03.00	43.0	42.0					
6		03.00-04.00	40.9	41.6					
7		04.00-05.00	40.1	41.2					
8		05:00-06:00	40.2	41.0					
		Leq Night	42.4	42.6					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants
ANALYSED BY


(Gaurav Kant)
CHECKED BY

Raj Mishra)
HOD's Signature

(Amit

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  		CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED Environment Laboratory, Regional Institute-II Ambient Noise Level Test Report				CMPDIL, RI-II KOYLA BHAWAN COMPLEX DHANBAD. -826005 Phone:0326-223-850		
Month & Year	08/2022	Cluster	Cluster XII			Report No.	RI-II/NOISE/2022-23/05	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	07.10.2022	
Project		Sample Ref. No.	REM/BCCL/2022/08		Sampling Method	CMPDI/RI-II/LPM 13		
Sampling Stations	i	Block IV		Date of Sampling	02.08.22	18.08.22	Zone Category of Station:	Buffer Zone
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A)) First Fortnight	Observed Values (in Leq dB(A)) Second Fortnight	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards Zones Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	50.4	50.3	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence 75 65 55 50
2		07:00 - 08:00	53.6	53.0				
3		08:00 - 09:00	55.2	55.5				
4		09:00 - 10:00	62.0	61.7				
5		10:00 - 11:00	62.9	63.1				
6		11:00 - 12:00	60.7	61.7				
7		12:00 - 13:00	62.8	64.6				
8		13:00 - 14:00	64.1	65.2				
9		14:00 - 15:00	60.1	60.2				
10		15:00 - 16:00	60.7	59.2				
11		16:00 - 17:00	65.8	67.2				
12		17:00 - 18:00	59.1	58.2				
13		18:00 - 19:00	57.4	57.3				
14		19:00 - 20:00	56.3	56.3				
15		20:00 - 21:00	55.9	55.6				
16		21:00 - 22:00	54.1	55.7				
		Leq Day	60.6	61.3				
1	Noise Level dB(A)Leq -Night	22:00-23:00	45.5	45.8	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence 70 55 45 50
2		23:00- 00:00	44.5	44.9				
3		00:00- 01:00	44.5	44.2				
4		01:00-02:00	43.0	43.2				
5		02:00-03:00	41.8	42.7				
6		03:00-04:00	41.9	41.2				
7		04:00-05:00	40.5	39.5				
8		05:00-06:00	40.2	39.4				
		Leq Night	43.1	43.2				

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants ANALYSED BY	 (Gaurav Kant) CHECKED BY	 (Amit Raj Mishra) HOD's Signature
--	--	--

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Environment Laboratory, Regional Institute-II
Ambient Noise Level Test Report

CMPDIL, RI-II
KOYLA BHAWAN COMPLEX
DHANBAD. -826005
Phone:0326-223-850
email: rdi2cmpdi@coalindia.in

Month & Year	08/2022	Cluster	Cluster XII					Report No.	RI-II/NOISE/2022-23/05
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	26.10.2022
Project			Sample Ref. No.	REM/BCCL/2022/07		Sampling Method		CMPDI/RI-II/LPM 13	
Sampling Stations	i	Moonidih UGP		Date of Sampling	12.08.22	24.08.22	Zone Category of Station:	Buffer Zone	
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A))	Observed Values (in Leq dB(A))	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
			First Fortnight	Second Fortnight				Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	46.6	45.3	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	48.3	47.7					
3		08:00 - 09:00	51.4	48.6					
4		09:00 - 10:00	57.0	55.5					
5		10:00 - 11:00	58.4	56.8					
6		11:00 - 12:00	57.0	55.5					
7		12:00 - 13:00	60.2	58.1					
8		13:00 - 14:00	61.0	57.2					
9		14:00 - 15:00	55.7	59.3					
10		15:00 - 16:00	54.8	53.3					
11		16:00 - 17:00	54.2	52.8					
12		17:00 - 18:00	53.8	52.3					
13		18:00 - 19:00	53.0	51.6					
14		19:00 - 20:00	52.0	52.1					
15		20:00 - 21:00	52.3	50.6					
16		21:00 - 22:00	51.6	50.1					
		Leq Day	55.8	54.5					
1	Noise Level dB(A)Leq -Night	22:00-23:00	45.6	44.4	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	43.5	44.2					
3		00:00- 01:00	42.8	42.6					
4		01.00-02.00	40.8	42.0					
5		02.00-03.00	41.0	40.8					
6		03.00-04.00	40.5	40.2					
7		04.00-05.00	40.1	40.0					
8		05:00-06:00	40.0	38.9					
		Leq Night	42.2	42.0					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants

ANALYSED BY

(Gaurav Kant)

CHECKED BY

(Amit Raj Mishra)

HOD's Signature

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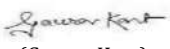
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Month & Year	08/2022	Cluster	Cluster XII					Report No.	RI-II/NOISE/2022-23/05
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	07.10.2022
Project		Sample Ref. No.	REM/BCCL/2022/08			Sampling Method	CMPDI/RI-II/LPM 13		
Sampling Stations	i	Murlidih(20/21)		Date of Sampling	09.08.22	30.08.22	Zone Category of Station:		Buffer Zone
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A)) First Fortnight	Observed Values (in Leq dB(A)) Second Fortnight	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
								Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	51.4	52.8	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB- 135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	55.1	55.5					
3		08:00 - 09:00	56.7	63.5					
4		09:00 - 10:00	62.9	64.6					
5		10:00 - 11:00	63.4	66.2					
6		11:00 - 12:00	62.9	64.6					
7		12:00 - 13:00	66.0	67.7					
8		13:00 - 14:00	66.2	69.2					
9		14:00 - 15:00	67.4	63.1					
10		15:00 - 16:00	60.4	62.4					
11		16:00 - 17:00	59.9	61.5					
12		17:00 - 18:00	59.4	61.0					
13		18:00 - 19:00	57.5	60.1					
14		19:00 - 20:00	57.4	59.1					
15		20:00 - 21:00	57.1	59.0					
16		21:00 - 22:00	56.9	58.4					
		Leq Day	62.1	63.6					
1	Noise Level dB(A)Leq -Night	22:00-23:00	44.8	44.7	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB- 135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	43.5	44.1					
3		00:00- 01:00	43.0	42.3					
4		01:00-02:00	42.9	42.0					
5		02:00-03:00	42.0	42.0					
6		03:00-04:00	41.9	40.8					
7		04:00-05:00	40.5	40.2					
8		05:00-06:00	40.2	40.1					
		Leq Night	42.6	42.3					

**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit

Sampling Assistants
ANALYSED BY


(Gaurav Kant)
CHECKED BY


(Amit Raj Mishra)
HOD's Signature

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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 $\mu\text{g}/\text{m}^3$ 700 $\mu\text{g}/\text{m}^3$	- 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 $\mu\text{g}/\text{m}^3$ 300 $\mu\text{g}/\text{m}^3$	Respirable Particulate Matter sampling and analysis
	Sulphur Dioxide (SO_2)	Annual Average * 24 hours **	80 $\mu\text{g}/\text{m}^3$ 120 $\mu\text{g}/\text{m}^3$	1.Improvedwest and Gaeke method 2.Ultraviolet fluorescene
	Oxide of Nitrogen as NO_2	Annual Average * 24 hours **	80 $\mu\text{g}/\text{m}^3$ 120 $\mu\text{g}/\text{m}^3$	1. Jacob & Hochheiser Modified (Na-Arsenic) Method 2. Gas phase Chemilumine-scence

Note:

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

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

NATIONAL AMBIENT AIR QUALITY STANDARDS

New Delhi the 18th November 2009

In exercise of the powers conferred by Sub-section (2) (h) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No. 14 of 1981), and in supersession of the notification No(s).S.O.384(E), dated 11th April 1994 and S.O.935(E), dated 14th NOVEMBER 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 (SO₂), µg/m³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogendioxide (NO₂), 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 PM₁₀, 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 (O₃) , 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 (NH₃), µg/m³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C₆H₆), 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 by HPLC/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.

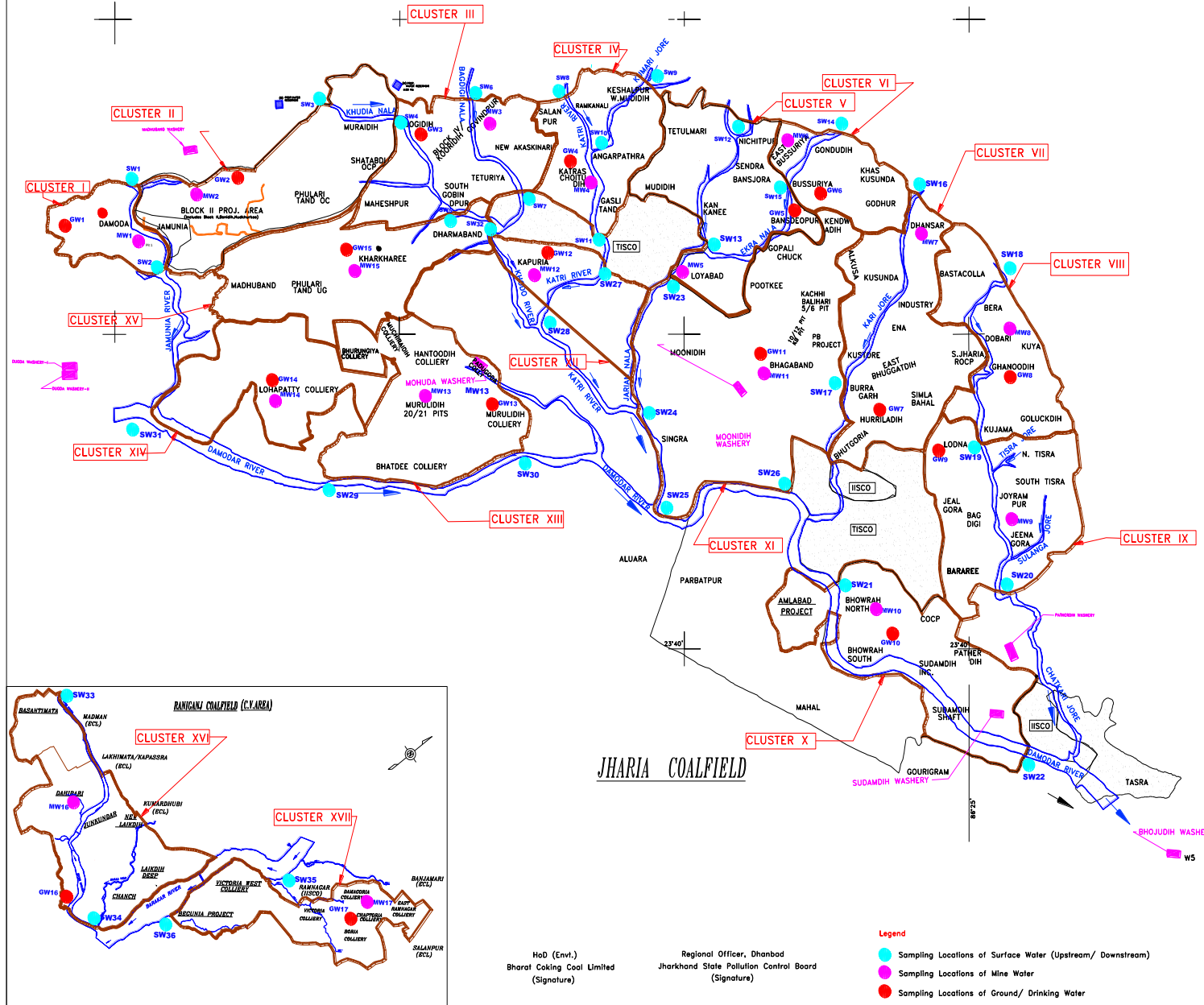
** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

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.

Water Sampling Locations in BCCL

INDEX

Cluster	Surface Water (JUS, DIS)	Name of River/Nala/Jore	Mine/Effluent Water	Sampling Location	Ground Water	Sampling Location
I	SW1, SW2	Damodar River	MW1	Damodar Area	GW1	Chakraborty Village
II	SW3, SW4	Khudra Nala	MW2	Block II OCP	GW2	Joyrampur Village
III	SW4, SW5, SW6, SW7	Khudra Nala, Bagdigi Nala	MW3	Govindpur Colliery	GW3	Jogdih Village
IV	SW8, SW11, SW9, SW10	Kain River, Kuman Jore	MW4	Chotudih	GW4	Kankanee Village
V	SW12, SW13, SW15	Jarian Nala, Ekra Nala	MW5	Mudih	GW5	Nichitpur
VI	SW14, SW15	Ekra Nala	MW6	East Bassuria UGP	GW6	Bansora Borewell
VII	SW16, SW17	Kain Jore	MW7	Dhanbari UGP	GW7	Humladih
VIII	SW18, SW19	Kain Jore	MW8	Doban UGP	GW8	Ghanudih
IX	SW19, SW20	Kain Jore	MW9	Jeevagrah	GW9	Lodna
X	SW21, SW22	Damodar River	MW10	Bhowrah North	GW10	Bhowrah South
XI	SW23, SW24, SW25, SW26	Jarian Nala, Damodar River	MW11	Bhagaband UGP	GW11	Bhagaband
XII	SW27, SW28	Kain River	MW12	Kapura	GW12	Kapura
XIII	SW29, SW30	Damodar River	MW13	Muridih	GW13	Muridih
XIV	SW31, SW32	Damodar River	MW14	Lohapatti	GW14	Lohapatti
XV	SW5, SW32	Kharkhar Nala	MW15	Kharkhar UGP	GW15	Kharkhar
XVI	SW33, SW34	Khudra River	MW16	Dahiban OCP	GW16	Palabani Village
XVII	SW35, SW36	Barakar River	MW17	Damagoria Colliery	GW17	Chaptoria



Customer	BHARAT COKING COAL LIMITED
Title	WATER SAMPLING LOCATIONS
Subject	MONITORING STATIONS
Scale	Not to Scale

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**WATER QUALITY REPORT
OF
BHARAT COKING COAL LIMITED,
CLUSTER – XII**

(FOR THE Q.E. JUNE 2022)

E. C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

CLUSTER - XII

(FOR THE Q.E. JUNE 2022)

CONTENTS

SL. NO.	CHAPTER	PARTICULARS
1.		EXECUTIVE SUMMARY
2.	CHAPTER - I	INTRODUCTION
3.	CHAPTER-II	WATER SAMPLING & ANALYSIS
4.	Plate: Plate NO. - I	SURFACE PLAN SHOWING WATER MONITORING LOCATIONS

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Dhanbad, Jharkhand

EXECUTIVE SUMMARY

1.0 Introduction

The purpose of environmental monitoring is to assess the quality of various attributes that affects the environment around us. In accordance with the quality of these attributes appropriate strategy is to be developed to control the pollution level within the permissible limits. One of these major attributes is water.

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°37' N to 23°52' N latitudes and 86°09' E to 86°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 Water sampling stations

The Water sampling stations were selected for Ground water supply, well/ Hand pump water & also surface water samples.

3.0 Methodology of sampling and analysis

3.1 Water quality

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

4.0 Results and interpretations

4.1 Water quality

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

CHAPTER - I

INTRODUCTION

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

Bharat Coking Coal Limited (BCCL), a subsidiary company of Coal India Limited (CIL) is operating UG Mines and Opencast Mines in Jharia Coalfield (JCF). The Jharia Coalfield (JCF) having an area of 450 Sq.KM.

Bharat Coking Coal has awarded Environmental Monitoring work of all Projects, Cluster wise, to Central Mine Planning & Design Institute Limited (CMPDIL). The environmental monitoring has been carried out as per conditions laid down by 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 XII is in the Central part of the Jharia coalfield. It includes Kapuria UG Mine. The cluster – XII is situated about 30 - 35 kms from Dhanbad Railway Station. The mines of this cluster - XII are operating since pre nationalization period (prior to 1972-73). It is connected by both Railway and Road. The drainage of the area is governed by Katri River.
- 1.2 The cluster XII is designed to produce 2.4 Mtpa (normative) and 3.12 Mtpa peak capacity of coal. The average grade of coal W-II to W-IV.

The Project has Environmental Clearance from Ministry of Environment, Forests and Climate Change (MoEF&CC) for a rated capacity of 2.4 MTPA (normative) and 3.12 MTPA peak capacity of coal production vide letter no **E.C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.**

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CHAPTER – II

WATER QUALITY MONITORING

2.1 Location of sampling sites (Refer **Plate No. - I**)

- i) Surface water quality at **U/S of Katri River (SW27)**
- ii) Surface water quality at **D/S of Katri River (SW28)**
- iii) Ground Water quality at **Kapuria (GW12)**

2.2 Methodology of sampling and analysis

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

2.3 Results & Interpretations

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



CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
SURFACE WATER ANALYSIS TEST REPORT

CMPDI, RI-II
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 DHANBAD. -826005
 Phone: 0326-223-850
 email: rdri2.cmpdi@coalindia.in

Month & Year		JUNE 2022		Cluster		XII			Report No.	RI-2/SW/22-23/QE/01	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	14.10.2022	
Project		Sample Ref. No.			REM/BCCL/2022/ 06 /SW /011		Sampling Method	(IS 3025 , Part-1) CMPDI/RI-II/LPM 13			
Sampling Stations		(i)	Upstream in Katri River(SW27)		Date of Sampling		20.06.22	Period of Analysis			
		(ii)	Downstream in Katri River(SW28)		Date of Sampling		20.06.22	June'2022 TO Sept'2022			
Sl. No.	Parameter	Method of Analysis		Observed Values		IS : 2296 INLAND SURFACE WATER [1982] Class 'C	Range of Testing	LDL			
				(i)	(ii)						
1	BOD (3 days 27°C), mg/l	IS 3025 (Part 44) : 1993, R-2019 , 3 day incubation at 27°C		<2.0	<2.0	3	2.00-10.00	2			
2	Colour,Hazen Units	APHA 23rd Edition , 2120-B-:2017		3	3	10	1-100.0	1			
3	Chlorides, mg/l	IS-3025(Part 32):1988, R-2019 Argentometric Method		57	38	600	5.0-1500.0	5			
4	Copper, mg/l	IS 3025 (Part 42) : 1992 R : 2019, AAS-Flame Method		<0.2	<0.2	1.5	0.2-10.0	0.2			
5	Dissolved Oxygen, mg/L	IS 3025 (Part 38) : 1989, R:2003 Winkler Azide Method		5.2	5.4	4	0.1-10.0	0.1			
6	Fluoride, mg/l	APHA, 23rd Edition, SPADNS Method		0.81	0.89	1.5	0.2-2.00	0.2			
7	Hexavalent Chromium, mg/l	APHA 23rd Edition, 1,5-Diphenylcarbohydrazide Method IS 3025 (Part 52) : 2003,R-2019		<0.01	<0.01	0.05	0.01-1.4	0.01			
8	Iron, mg/l	IS 3025 (Part 53):2003,R:2019, AAS-Flame Method		0.44	0.34	50	0.2-10	0.2			
9	Nitrate , mg/l	APHA, 23rd Edition, UV-Spectrophotometric Method		2.80	3.14	50	0.5-45.0	0.5			
10	pH value	IS 3025, (Part 11) : 1983 R-2017 Electrometric (Ph Meter) method		8.25	8.31	6.5-8.5	2.0-12.0	2			
11	Sulphate, mg/l	APHA -23rd Edition,4500- S, Turbidity Method		310	260	400	10.0-400.0	10			
12	Total Dissolved Solids, mg/l	IS 3025, (Part 16): 1984 R-2017 Gravimetric method		541	457	1500	25.0-5000.0	25			
13	Zinc, mg/l	IS 3025(Part 49) : 1994, R : 2019, AAS-Flame Method		<0.2	<0.2	15	0.1 - 3.0	0.1			

****Grab sampling carried out for water samples. *LDL indicates Lower Detection Limit & BDL indicates Below Detection Limit**

*****All units in mg/L unless specified otherwise Sample Collected in 5 Ltr Jerricane , Color as observed is transparent**

(Kumar Vaibhav)

(Kumar Vaibhav)

(Amit Raj Mishra)

(Amit Raj Mishra)

Analysed by

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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
SURFACE WATER ANALYSIS REPORT

CMPDIL, RI-II
KOYLA BHAWAN COMPLEX
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Month & Year		Jun 2022		Cluster		XII		Report No.		RI-2/SW/22-23/QE/01		
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue		14.10.2022	
Project		Sample Ref. No.				REM/BCCL/2022/ 06 /SW /011		Sampling Method		(IS 3025 , Part-1) CMPDI/RI-II/LPM 13		
Sampling Stations		(i)	Upstream in Katri River(SW27)			Date of Sampling		20.06.22		Period of Analysis		
		(ii)	Downstream in Katri River(SW28)			Date of Sampling		20.06.22		June'2022 TO Sept'2022		
Sl. No.	Parameter	Method of Analysis			Observed Values		IS : 2296 INLAND SURFACE WATER [1982] Class 'C	Range of Testing		LDL		
					(i)	(ii)						
1	Arsenic (as As), mg/l, Max	IS-3025,Part 37:1988, R-2019/ APHA 23rd Edition AAS-VGA			<0.006	<0.006	0.2	0.006-10		0.006		
2	Lead (as Pb), mg/l, Max	APHA, 23rd Edition, AAS-GTA			<0.005	<0.005	0.1	0.005-10		0.005		
3	Phenolic compounds (as C6H5OH), mg/l, Max	APHA, 22nd Edition 4-Amino Antipyrine			<0.002	<0.002	0.005	0.002-10		0.002		
4	Selenium, mg/l, Max	IS-3025 ,Part 56:2003, R-2019/ APHA 23rd Edition, AAS-VGA			<0.007	<0.007	0.05	0.007-10		0.007		

***Grab sampling carried out for water samples. *LDL indicates Lower Detection Limit & BDL indicates Below Detection Limit*

****All units in mg/L unless specified otherwise **Sample Collected in 5 Ltr Jerrycan , Color as observed is transparent***

(Kumar Vaibhav)

(Amit Raj Mishra)

Analysed by

CHECKED BY

HOD's Initial/Signature

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---- End of Report ----

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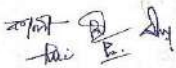
CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
GROUND WATER ANALYSIS TEST REPORT

CMPDIL, RI-II
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Month & Year	QUARTER ENDING JUNE 2022		Cluster	CLUSTERXII			Report No.	RI-2/GW/22-23/QE/01
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	25.10.2022
Project	Kapuria Village			Sample Ref. No.	REM/BCCL/2022/DW/06/01	Sampling Method	CMPDI/RI-II/LPM 13,(IS 3025:Part -1)	
Sampling Stations	GW12		Date of Sampling	09.05.22	Sample Collected in 5 Ltr Jerricane , Color as observed is transparent			
				Period of Analysis		June	to	Sept'2022
Sl. No.	Parameter	Method of Analysis	Observed Values				IS 10500: 2012	
			GW12	Range Of Testing	LDL	Acceptable Limit (Max)*	Permissible Limit in the Absence of Alternate Source (Max)	
1	Colour, Hazen unit	APHA, 23 rd Edition ,2120-c-Spectrophotometric Single Wavelength Method ,2017	1	1-500.0	1	5	15	
2	Calcium, mg/l	IS 3025, (Part 40): 1991 R:2019,AAS-Flame Method & EDTA Method	105	2.0-800.0	2	75	200	
3	Chlorides, mg/l	IS-3025(Part 32):1988, R-2019 , Argentometric Method	146	2.0-1500.0	5	250	1000	
4	Fluoride, mg/l	APHA, 23 rd Edition, SPADNS Method	0.45	0.2-2.00	0.2	1	1.5	
5	Iron, mg/l	IS 3025 (Part 53) : 2003, R : 2019 , AAS-Flame Method	0.21	0.2-10	0.2	1	No relaxation	
6	Magnesium	APHA 23 rd Edition, 3500-Mg B: Calculation Method	0.05	6.0-700	6	30	100	
7	Nitrate , mg/l	APHA, 23 rd Edition, UV-Spectrophotometric Method	21.34	0.5-45.0	0.5	45	No relaxation	
8	Odour	APHA, 23 rd Edition, , 2150-C	Agreeable	Qualitative	Qualitative	Agreeable	Agreeable	
9	pH value	IS 3025, Part 11 : 1983 R 2017 Electrometric (pH Meter) Method	8.34	1-14	0.1	6.5-8.5	No relaxation	
10	Sulphate, mg/l	APHA -23 rd Edition, 4500 S , Turbidity Method	150	10.0-400.0	10	200	400	
11	Taste	APHA,23 rd Edition, 2160-C	Acceptable	Qualitative	Qualitative	Acceptable	Agreeable	
12	Total Alkalinity (CaCO ₃), mg/l, Max	IS 3025, Part 23: 1986 R 2019 Titration Method	248	4.0-2000.0	4	200	600	
13	Total Dissolved Solids, mg/l	IS 3025, Part 16: 1984 R 2017 Gravimetric method	789	25.0-5000.0	25	500	2000	
14	Total Hardness, mg/l	IS 3025, (Part 21): 2019 EDTA Method	540	4.0-2000.0	4	200	600	
15	Turbidity, NTU	IS 3025, (Part 10):1984, R-2017 Nephelometric/Turbidititmetic Method	2.7	1-800	0.1	1	5	
16	Zinc, mg/l	IS 3025(Part 49) : 1994,R:2019, AAS-Flame Method	0.61	0.1 - 2.0	0.1	5	15	

***All units in mg/L unless specified otherwise,

**Grab sampling carried out for water samples. *LDL indicates Lower Detection Limit & BDL indicates Below Detection Limit,

		
	(Kumar Vaibhav)	(Amit Raj Mishra)
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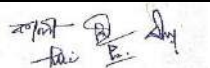
CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
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GROUND WATER ANALYSIS TEST REPORT

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Month & Year	QUARTER ENDING JUNE 2022	Cluster	CLUSTER XII				Report No.	RI-2/GW/22-23/QE/01	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	25.10.2022	
Project	Kapuria Village		Sample Ref. No.	REM/BCCL/2022/DW/06/01	Sampling Method	CMPDI/RI-II/LPM 13,(IS 3025:Part -1)			
Sampling Stations	GW12		Date of Sampling	09.05.22	Sample Collected in 5 Ltr Jerricane , Color as observed is transparent				
				Period of Analysis		June		to	Sept'2022
Sl. No.	Parameter	Method of Analysis	Observed Values				IS 10500: 2012		
			GW12	Range Of Testing	LDL	Acceptable Limit (Max)*		Permissible Limit in the Absence of Alternate Source (Max)	
1	Boron (as B), mg/l, Max	APHA, 23rd Edition ,Carmine	<0.2	0.2-10	0.2	0.5		1	
2	Copper (as Cu), mg/l, Max	IS 3025 Part 42 : 1992 R : 2019, AAS-Flame APHA, 23rd Edition, AAS-GTA	<0.03	0.01-10	0.01	0.05		1.5	
3	Free Residual Chlorine, mg/l, Min	APHA, 23rd Edition, , 4500-Cl-B. (Iodometric Method-I)	<0.04	0.04-5	0.04	0.2		1	
4	Lead (as Pb), mg/l, Max	IS:3025(Part 47):1994 (Reaffirmed 2019) APHA, 23rd Edition, AAS-GTA	<0.005	0.005-10	0.005	0.01		No relaxation	
5	Phenolic compounds (as C6H5OH), mg/l, Max	APHA, 22nd Edition,4-Amino Autipyrine	<0.001	0.001-10	0.001	0.002		0.002	
6	Selenium, mg/l, Max	APHA 23rd Edition IS-3025,part 56:2003, R-2019/, AAS-VGA	<0.007	0.007-10	0.007	0.01		No relaxation	
7	Total Arsenic (as As), mg/l, Max	IS-3025,part 37:1988, R-2019/ APHA 23rd Edition AAS-VGA	<0.006	0.006-10	0.006	0.01		0.05	
8	Total Chromium (as Cr), mg/l, Max	IS-3025 Part 52:2003, R:2019,AAS-Flame APHA, 23rd Edition, AAS-GTA	<0.04	0.01-10	0.01	0.05		No relaxation	
9	Nickel as Ni, mg/l Max	IS 3025 Part 54 : 2003,R : 2019, AAS-Flame APHA, 23rd Edition, AAS-GTA	<0.01	0.005-10	0.005	0.02		No relaxation	

***All units in mg/L unless specified otherwise,

**Grab sampling carried out for water samples. *LDL indicates Lower Detection Limit & BDL indicates Below Detection Limit,



(Kumar Vaibhav)
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 (Amit Raj Mishra)

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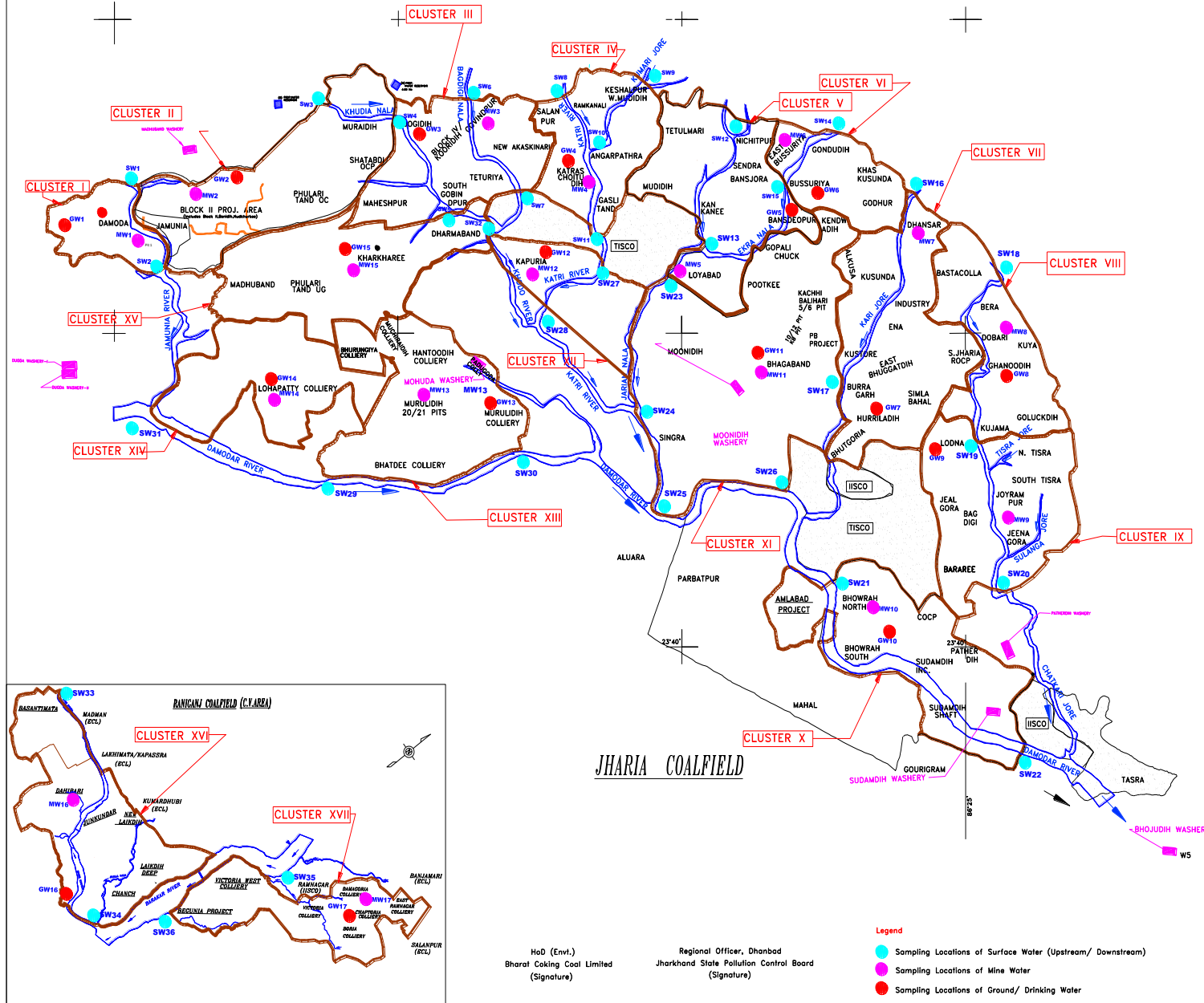
HOD's Signature

Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env) , CMPDI, RI-II.

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---- End of Report ----

Water Sampling Locations in BCCL



INDEX

Cluster	Surface Water (UIS, DIS)	Name of River/Nala	Miner Effluent Water	Sampling Location	Ground Water	Sampling Location
I	SW1, SW2	Jamunia River	MW1	Damoda Area	GW1	Shutway 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	Jogdih Village
IV	SW8, SW11, SW9, SW10	Kari River, Kumari Jore	MW4	Chotudih	GW4	Kankanee Village
V	SW12, SW13, SW15	Jarian Nala, Ekra Nala	MW5	Mudidih	GW5	Nichtpur
VI	SW14, SW15	Ekra Nala	MW6	East Bessuria UGP	GW6	Bansgora Borewell
VII	SW16, SW17	Kari Jore	MW7	Dhanbar UGP	GW7	Humliadhi
VIII	SW18, SW19	Kashi Jore	MW8	Dobari UGP	GW8	Ghanudih
IX	SW19, SW20	Kashi Jore	MW9	Jeenagora	GW9	Lodna
X	SW21, SW22	Damodar River, Jarian Nala	MW10	Showah North	GW10	Showah South
XI	SW23, SW24, SW25, SW26	Damodar River	MW11	Bhagabandh UGP	GW11	Bhagabandh
XII	SW27, SW28	Kari River	MW12	Kapurna	GW12	Kapurna
XIII	SW29, SW30	Damodar River	MW13	Muridih (20/21)	GW13	Muridih
XIV	SW31, SW29	Damodar River	MW14	Lohapatti	GW14	Lohapatti
XV	SW5, SW32	Khudia Nala	MW15	Dhanbar UGP	GW15	Kharkharee
XVI	SW33, SW34	Khudia Nala	MW16	Dhanbar OCP	GW16	Palasani Village
XVII	SW35, SW36	Barakar River	MW17	Damagoria Colliery	GW17	Chaptoria

JHARIA COALFIELD

HoD (Env.)
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

Company: BHARAT COKING COAL LIMITED

Title: WATER SAMPLING LOCATIONS

Subject: MONITORING STATIONS

Scale: Not to Scale

CMPDI