

भारत कोकिंग कोल लिमिटेड

एक मिनी रत्न कम्पनी
(महारात्न कम्पनी कोल इंडिया का एक उपक्रम)
पंजीकृत कार्यालय : कोयला भवन, कोयला नगर,
धनबाद-826005
सीआइएन : U10101JH1972GO1000918

परियोजना पदाधिकारी का कार्यालय
महुडा ग्रुप

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

फोन नं. 0326 2273483; फेक्स: 0326 2273445, ई-मेल: gmwj.bcci@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

PHONE NO: 0326 2273483, FAX NO: 0326 2273445, e-mail : gmwj.bcci@coalindia.in

"For uploading online on "parivesh portal" of MoEF&CC and send by e-mail"

Ref:- BCCL/WJA/ENV/2024/ 185 (B)

Date:- 31/05/2024

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 **October'2023 to March'2024** with respect to **Cluster-XII** of Kapuria UG project, M/s. Bharat Coking Coal Limited.

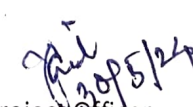
Ref: EC Order No. – J-11015/184/2012-IA.II (M) **Dated:** - 10.12.2014.

Respected Sir,

Please find enclosed herewith the six-monthly reports on compliance of Environment Clearances for the period from **October'2023 to March'2024** in respect of **Cluster XII** of Kapuria UG of M/s Bharat Coking Coal Limited. We hope you will find in order. 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 (Cluster-XII, BCCL)

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

(October'23 – March'24)

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 soillsuitable 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 CMPDI Ranchi 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 PM ₁₀ , PM _{2.5} , SO ₂ and NO _x 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.

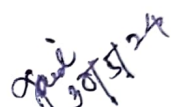
	sensitive targets in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months,	
iv.	Data on ambient air quality (PM ₁₀ , PM _{2.5} , SO ₂ and NO _x) and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring 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. Monitoring report enclosed.
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 PM ₁₀ , PM _{2.5} , SO ₂ and NO _x (ambient) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mine office and in corporate office and on company's website.	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 Form -V is mandated to be submitted by the project proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the 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 and 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


 Project Officer
 Kapuria Mine
 Mohuda Group Office
 B.C.C.L

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 OCTOBER, 2023)

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



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

CONTENTS

SL. NO.	CHAPTER	PARTICULARS	PAGE NO.
1.	CHAPTER - I	EXECUTIVE SUMMARY	3-5
2.	CHAPTER-II	INTRODUCTION	6
3.	CHAPTER-III	RESULTS	7-18
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 ($\text{PM}_{2.5}$ sampler) were used for sampling of PM_{10} , SO_2 , & NO_x and Fine Dust Sampler ($\text{PM}_{2.5}$ sampler) were used for sampling of $\text{PM}_{2.5}$ at 24 hours interval once in a fortnight and the same for the gaseous pollutants. The samples were analysed in Environmental Laboratory of CMPDI, RI-II, Dhanbad.

3.2 Water quality

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

3.3 Noise level monitoring

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

4.0 Results and interpretations

4.1 Air quality

It has been seen from the analysis results that the 24 hours average concentration parameters like PM_{10} , $\text{PM}_{2.5}$, SO_2 and NO_x are mostly within the permissible limits in all sampling locations as per MoEF&CC Gazette Notification No. GSR 742(E) dt 25.09.2000 Standards for Coal Mines and National Ambient Air Quality Standard -2009. Sometimes the concentration of PM_{10} & $\text{PM}_{2.5}$ 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 $23^{\circ} 45' 26.60''$ N & $86^{\circ} 18' 39.90''$ 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 $23^{\circ} 47' 54.00''$ N & $86^{\circ} 16' 20.00''$ 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 $23^{\circ} 44' 30.00''$ N & $86^{\circ} 20' 56.00''$ 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 $23^{\circ} 43' 51.82''$ N & $86^{\circ} 16' 21.87''$ 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

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

Test Report for Ambient Air Samples

Month & Year		10/2023	Cluster	Cluster XII			ULR No.	TC1012223000000283F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	11.12.2023	
Project		Rudhi Basti		Sample Ref. No.	REM/BCCL/2023/10	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		12.10.23		25.10.23	Period of Analysis	12.10.2023	28.11.2023	Zone of Station:	Core 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		86	84	90	92	90	92
2	PM _{2.5}	IS -5182(Part 24):2019		44	41	37	45	37	45
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		<10	<10	<10	<10	<10	<10
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		20	19	21	22	21	22

* LDL indicates Lower Detection Limit,

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

[Signature]

ANALYSED BY

[Signature]

(Gaurav Kant)
REVIEWED BY

[Signature]

(Amit Raj Mishra)
Authorised Signature

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

---- End of Report ----

Page -1 of 1



cmpdi
A Min. Ratna Company

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

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

Test Report for Ambient Air Samples

Month & Year		10/2023	Cluster	Cluster XII		ULR No.		TC1012223000000283F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue		11.12.2023
Project		Block IV		Sample Ref. No.	REM/BCCL/2023/	Sampling Method		CMPDI/RI-II/LPM 13 . (IS 5182)	
Date of Sampling		06.10.23		17.10.23	Period of Analysis	06.10.2023	28.11.2023	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		96	92	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		57	51	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		23	26	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)
REVIEWED BY

(Amit Raj Mishra)
Authorised 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



cmpdi
A Mini Ratna Company

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

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

Test Report for Ambient Air Samples

Month & Year		10/2023	Cluster	Cluster XII			ULR No.	TC1012223000000283F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	11.12.2023
Project		Moonidih UGP		Sample Ref. No.	REM/BCCL/2023/10		Sampling Method		
Date of Sampling		13.10.23		23.10.23	Period of Analysis	13.10.2023	28.11.2023	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method of Analysis	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	95	125	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	52	68	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	12	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	33	32	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.

[Signature]

ANALYSED BY

[Signature]

(Gaurav Kant)
REVIEWED BY

[Signature]

(Amit Raj Mishra)
Authorised 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



cmpdi
A Min. Ratna Company

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

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

Test Report for Ambient Air Samples

Month & Year		10/2023	Cluster	Cluster XII			ULR No.	TC1012223000000283F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	11.12.2023	
Project		Murlidih 20/21 Pit		Sample Ref. No.	REM/BCCL/2023/10	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		13.10.23		27.10.23	Period of Analysis	13.10.2023	28.11.2023	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		121	96	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		68	56	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	25	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,

[Signature]

ANALYSED BY

[Signature]

REVIEWED BY
(Gaurav Kant)

[Signature]

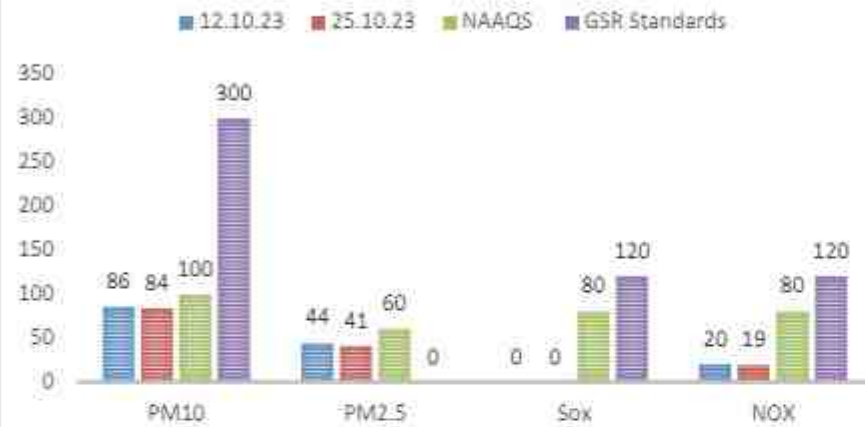
Authorised Signature
(Amit Raj Mishra)

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.

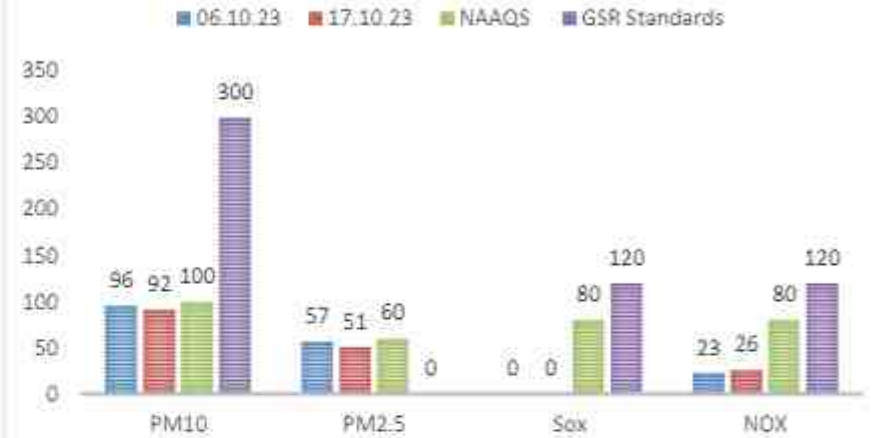
---- End of Report ----

Page -1 of 1

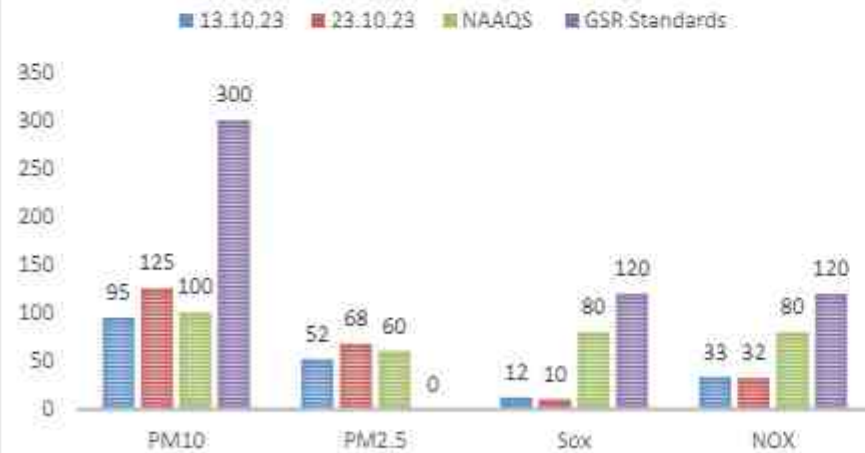
AMBIENT AIR QUALITY AT RUDHI BASTI



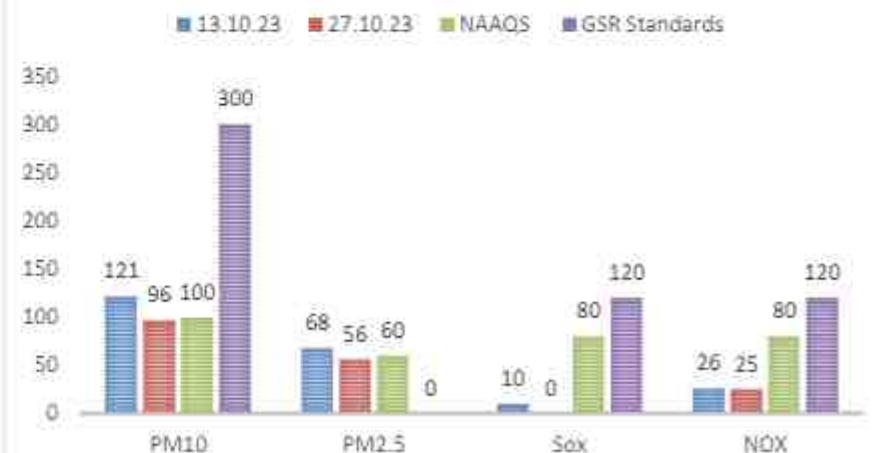
AMBIENT AIR QUALITY AT BLOCK IV



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 during day time & night time. Noise levels were measured for the complete day & night time, the Intergration time taken was one hour or 3600 seconds. 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 & night time and the observed values were compared with standards prescribed by MoEF&CC. The results of Noise levels recorded during day & night time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{EQ} are presented. The observed values at all the monitoring locations are found to be within permissible limits.



cmpdi
A Mine Rules 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: rdri2cmpdi@coalindia.in

Month & Year	10/2023	Cluster	Cluster XII					ULR No.	TC1012223000000317F
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	11.12.2023
Project			Sample Ref. No.	REM/BCCL/2023/10		Sampling Method		CMPDI/RI-II/LPM 22	
Sampling Stations	I	Rudhi Basti		Date of Sampling		12.10.23	25.10.23	Zone Category of Station:	Core 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	46.4	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	49.9	50.2					
3		08:00 - 09:00	51.1	52.5					
4		09:00 - 10:00	47.3	48					
5		10:00 - 11:00	52.5	52.9					
6		11:00 - 12:00	56.3	55.5					
7		12:00 - 13:00	54.2	54.6					
8		13:00 - 14:00	55.5	56.1					
9		14:00 - 15:00	57.7	56.8					
10		15:00 - 16:00	59.9	60.2					
11		16:00 - 17:00	55.2	55					
12		17:00 - 18:00	52.6	52.9					
13		18:00 - 19:00	46.4	47.7					
14		19:00 - 20:00	47.1	47.3					
15		20:00 - 21:00	44.5	45.3					
16		21:00 - 22:00	44.4	45.4					
		Leq Day	53.7	53.8					
1	Noise Level dB(A)Leq - Night	22:00-23:00	41.9	42.8	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 65 45 50
2		23:00-00:00	42	42.7					
3		00:00-01:00	41.4	41.5					
4		01:00-02:00	41.4	41					
5		02:00-03:00	41	40.8					
6		03:00-04:00	41.2	42.3					
7		04:00-05:00	41.3	42.4					
8		05:00-06:00	41.4	42.4					
		Leq Night	41.5	42.1					

**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)
REVIEWED BY

Raj Mishra
Authorized Signature

(Amit)

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



cmpdi
A Min India 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: cmpdi@coalindia.in

Month & Year	10/2023	Cluster	Cluster XII	ULR No.	TC1012223000000317F				
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)				Date of Issue	11.12.2023			
Project		Sample Ref. No.	REM/BCCL/2023/10	Sampling Method	CMPDI/RI-II/LPM 22				
Sampling Stations	i	Block IV	Date of Sampling	06.10.23	17.10.23	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	55.5	54.2	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	59.7	58.7					
3		08:00 - 09:00	60.7	59.6					
4		09:00 - 10:00	64.2	63.3					
5		10:00 - 11:00	63.7	62.7					
6		11:00 - 12:00	65.1	64.5					
7		12:00 - 13:00	64.7	63.3					
8		13:00 - 14:00	63	65.7					
9		14:00 - 15:00	65.4	64.4					
10		15:00 - 16:00	68.4	66.5					
11		16:00 - 17:00	69.1	68.9					
12		17:00 - 18:00	70	69.3					
13		18:00 - 19:00	68.7	66.5					
14		19:00 - 20:00	68.3	67.6					
15		20:00 - 21:00	61.6	60.6					
16		21:00 - 22:00	54.5	52.9					
		Leq Day	65.8	65.0					
1	Noise Level dB(A) Leq - Night	22:00-23:00	50.2	49.8	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00-00:00	49.4	47.3					
3		00:00-01:00	47.7	46.7					
4		01:00-02:00	42.7	43					
5		02:00-03:00	42.3	42.5					
6		03:00-04:00	45.3	43.8					
7		04:00-05:00	43.5	42.9					
8		05:00-06:00	43.8	44.7					
		Leq Night	46.6	45.5					

**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) REVIEWED BY	 (Amit Raj Mishra) Authorised 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



cmpdi
A Mine India Company

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: rdri2cmpdi@coalindia.in

Month & Year	10/2023	Cluster	Cluster XII	ULR No.	TC1012223000000317F			
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bcd@coalindia.in)				Date of Issue	11.12.2023		
Project		Sample Ref. No.	REM/BCCL/2023/10	Sampling Method	CMPDI/RI-II/LPM 22			
Sampling Stations	I	Moonidih UGP	Date of Sampling	13.10.23	23.10.23	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
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	52.2	52.9	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence
2		07:00 - 08:00	47.7	48.5				
3		08:00 - 09:00	55.5	57.2				
4		09:00 - 10:00	53.5	51				
5		10:00 - 11:00	56.7	55.6				
6		11:00 - 12:00	60.1	61				
7		12:00 - 13:00	58.2	57.9				
8		13:00 - 14:00	59.9	58.9				
9		14:00 - 15:00	56	55.6				
10		15:00 - 16:00	54.2	53.5				
11		16:00 - 17:00	53.8	54				
12		17:00 - 18:00	53.3	54				
13		18:00 - 19:00	52.5	52.9				
14		19:00 - 20:00	53.1	52.8				
15		20:00 - 21:00	51.6	51.4				
16		21:00 - 22:00	51.1	51.3				
	Leq Day		55.5	55.5				
1	Noise Level dB(A)Leq - Night	22:00-23:00	45.3	45.3	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence
2		23:00-00:00	44.7	44.9				
3		00:00-01:00	44	44.9				
4		01:00-02:00	43.1	43.8				
5		02:00-03:00	42.9	43				
6		03:00-04:00	42.9	43.1				
7		04:00-05:00	44.4	44.5				
8		05:00-06:00	44.7	44.9				
	Leq Night		44.1	44.4				

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

Sampling Assistants	 (Gaurav Kant)	 (Amit Raj Mishra)
ANALYSED BY	REVIEWED BY	Authorised 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



cmpdi
A Min. Ratna Company

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: rdri2cmpdi@coalindia.in

Month & Year	10/2023	Cluster	Cluster XII				ULR No.	TC1012223000000317	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bcl@coalindia.in)						Date of Issue	11.12.2023	
Project		Sample Ref. No.	REM/BCCL/2023/10			Sampling Method	CMPDI/RI-II/LPM 22		
Sampling Stations	i	Murliidih(20/21)	Date of Sampling	18.10.23	27.10.23	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	50.3	50.2	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	50.4	50.6					
3		08:00 - 09:00	52.5	53.5					
4		09:00 - 10:00	51.7	52.7					
5		10:00 - 11:00	54.7	54.7					
6		11:00 - 12:00	55.1	54.8					
7		12:00 - 13:00	56.7	57.8					
8		13:00 - 14:00	57.2	57.3					
9		14:00 - 15:00	57.6	57.8					
10		15:00 - 16:00	58.8	59.9					
11		16:00 - 17:00	58.6	58.1					
12		17:00 - 18:00	56.1	56.1					
13		18:00 - 19:00	52.7	53.5					
14		19:00 - 20:00	52.4	52.7					
15		20:00 - 21:00	51.3	51.3					
16		21:00 - 22:00	51.1	51					
1	Noise Level dB(A)Leq - Night	Leg Day	55.2	55.5	CPCB, Protocol for Ambient Level Noise Monitoring -2015	35 dB- 135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		22:00-23:00	38.3	38.5					
3		23:00-00:00	37.9	38.4					
4		00:00-01:00	37.6	38.1					
5		01:00-02:00	37.5	38					
6		02:00-03:00	37.4	37.6					
7		03:00-04:00	37.9	37.4					
8		04:00-05:00	38.1	37.9					
		05:00-06:00	38.3	38					
		Leg Night	37.9	38.0					

**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) REVIEWED BY	 (Amit Raj Mishra) Authorised 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

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 Improved west and Gaeke method 2 Ultraviolet fluorescence
	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 Chemiluminescence

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.

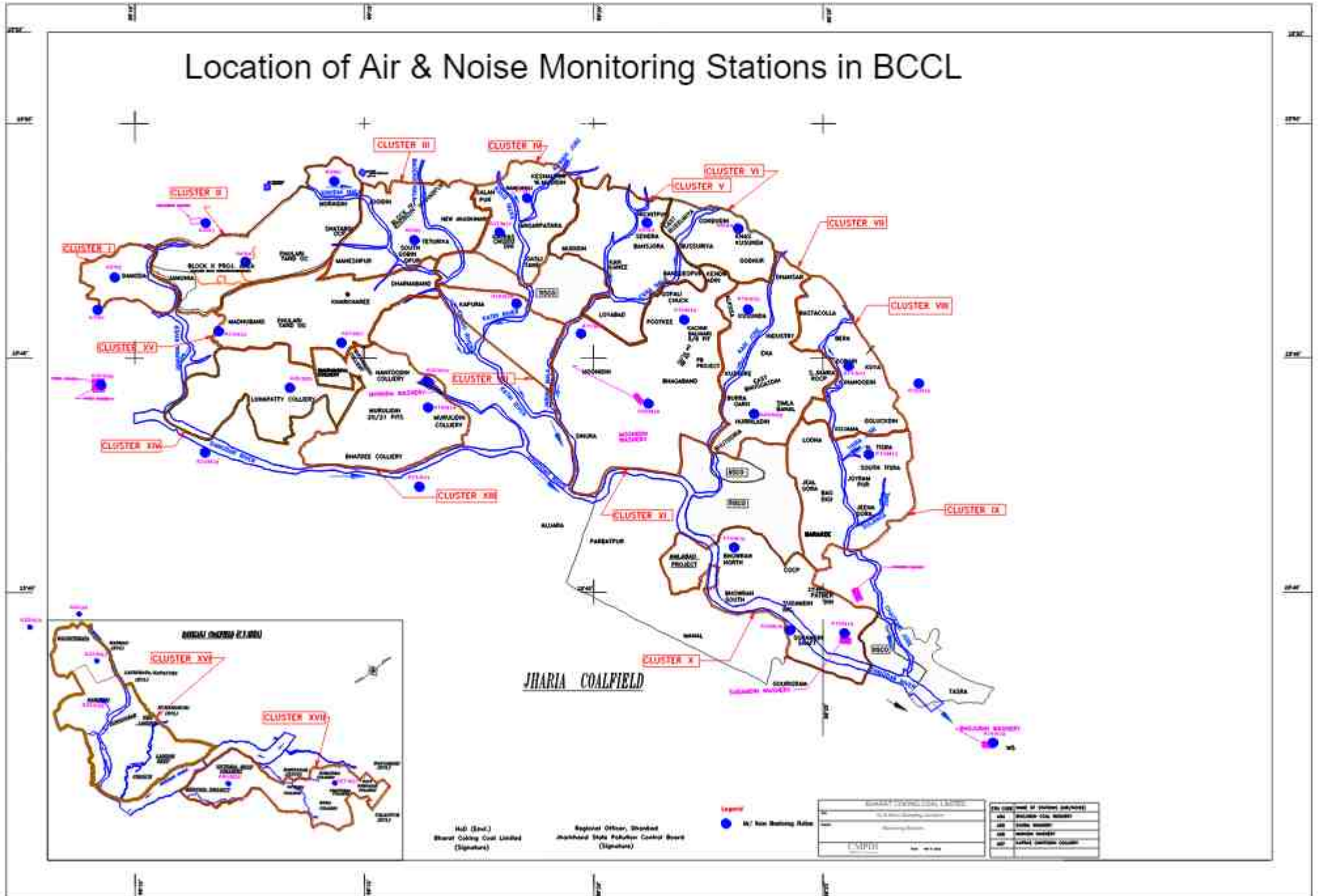
Pollutant	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
		Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO ₂), µg/m ³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogen dioxide (NO ₂), µg/m ³	Annual * 24 Hours **	40 80	30 80	-Jacob & Hochheiser modified (NaOH-NaAsO ₂) Method -Gas Phase Chemiluminescence
Particulate Matter (Size less than 10µm) or PM ₁₀ , µg/m ³	Annual * 24 Hours **	60 100	60 100	-Gravimetric -TEOM -Beta attenuation
Particulate Matter (Size less than 2.5µm) or PM _{2.5} , µg/m ³	Annual * 24 Hours **	40 60	40 60	-Gravimetric -TEOM -Beta attenuation
Ozone (O ₃), µg/m ³	8 Hours * 1 Hour **	100 180	100 180	-UV Photometric -Chemiluminescence -Chemical Method
Lead (Pb), µg/m ³	Annual * 24 Hours **	0.50 1.0	0.50 1.0	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper -ED-XRF using Teflon filter
Carbon Monoxide (CO), mg/m ³	8 Hours ** 1 Hour **	02 04	02 04	-Non dispersive Infrared (NDIR) Spectroscopy
Ammonia (NH ₃), µg/m ³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C ₆ H ₆), µg/m ³	Annual *	05	05	-Gas Chromatography (GC) based continuous analyzer -Adsorption and desorption followed by GC analysis
Benzo(a)Pyrene (BaP) Particulate phase only, ng/m ³	Annual *	01	01	-Solvent extraction followed by HPLC/GC analysis
Arsenic (As), ng/m ³	Annual *	06	06	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel (Ni), ng/m ³	Annual *	20	20	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

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

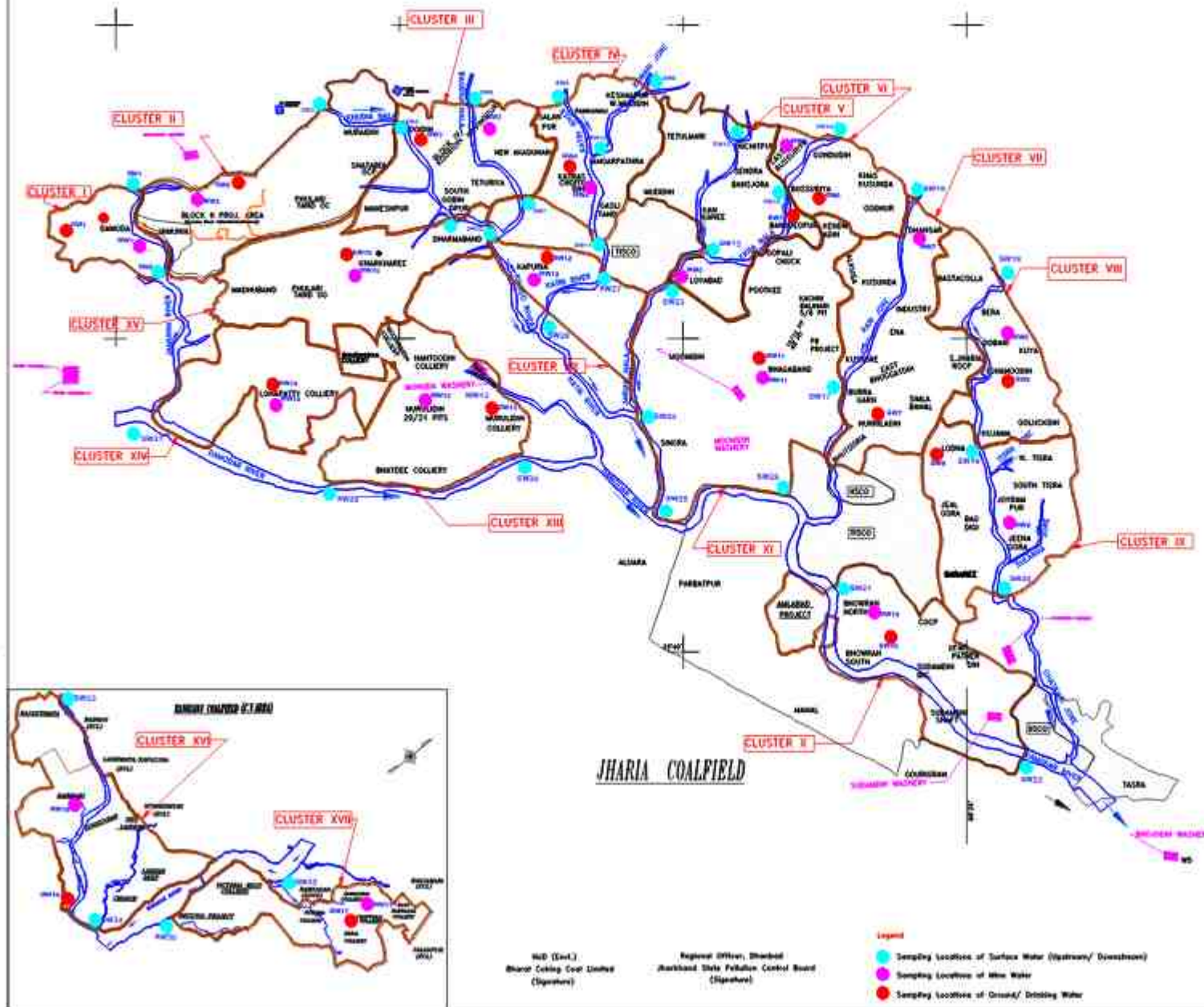
** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

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

Location of Air & Noise Monitoring Stations in BCCL



Water Sampling Locations in BCCL



INDEX

Sl. No.	Cluster	Water Type	Location	Sample No.	Sample Date
1	CLUSTER I	Surface Water	Block 6 Prol Area	SW1	2014-01-10
2	CLUSTER II	Surface Water	Block 6 Prol Area	SW2	2014-01-10
3	CLUSTER III	Surface Water	Block 6 Prol Area	SW3	2014-01-10
4	CLUSTER IV	Surface Water	Block 6 Prol Area	SW4	2014-01-10
5	CLUSTER V	Surface Water	Block 6 Prol Area	SW5	2014-01-10
6	CLUSTER VI	Surface Water	Block 6 Prol Area	SW6	2014-01-10
7	CLUSTER VII	Surface Water	Block 6 Prol Area	SW7	2014-01-10
8	CLUSTER VIII	Surface Water	Block 6 Prol Area	SW8	2014-01-10
9	CLUSTER IX	Surface Water	Block 6 Prol Area	SW9	2014-01-10
10	CLUSTER X	Surface Water	Block 6 Prol Area	SW10	2014-01-10
11	CLUSTER XI	Surface Water	Block 6 Prol Area	SW11	2014-01-10
12	CLUSTER XII	Surface Water	Block 6 Prol Area	SW12	2014-01-10
13	CLUSTER XIII	Surface Water	Block 6 Prol Area	SW13	2014-01-10
14	CLUSTER XIV	Surface Water	Block 6 Prol Area	SW14	2014-01-10
15	CLUSTER XV	Surface Water	Block 6 Prol Area	SW15	2014-01-10
16	CLUSTER XVI	Surface Water	Block 6 Prol Area	SW16	2014-01-10
17	CLUSTER XVII	Surface Water	Block 6 Prol Area	SW17	2014-01-10

MD (Env.)
Bharat Coking Coal Limited
(Signature)

Regional Officer, Bhadrak
Bharat Coking Coal Limited
(Signature)

Legend

- Sampling locations of Surface Water (Rivers/Lakes/Streams)
- Sampling locations of Mine Water
- Sampling locations of Ground/Drilling Water

Project Name	JHARIA COALFIELD
Project No.	BCCL/ENV/2014/001
Scale	1:50,000
Sheet No.	1 of 1
Revision	1.0

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 NOVEMBER, 2023)

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



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

CONTENTS

SL. NO.	CHAPTER	PARTICULARS	PAGE NO.
1.	CHAPTER - I	EXECUTIVE SUMMARY	3-5
2.	CHAPTER-II	INTRODUCTION	6
3.	CHAPTER-III	RESULTS	7-18
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 ($\text{PM}_{2.5}$ sampler) were used for sampling of PM_{10} , SO_2 , & NO_x and Fine Dust Sampler ($\text{PM}_{2.5}$ sampler) were used for sampling of $\text{PM}_{2.5}$ at 24 hours interval once in a fortnight and the same for the gaseous pollutants. The samples were analysed in Environmental Laboratory of CMPDI, RI-II, Dhanbad.

3.2 Water quality

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

3.3 Noise level monitoring

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

4.0 Results and interpretations

4.1 Air quality

It has been seen from the analysis results that the 24 hours average concentration parameters like PM_{10} , $\text{PM}_{2.5}$, SO_2 and NO_x are mostly within the permissible limits in all sampling locations as per MoEF&CC Gazette Notification No. GSR 742(E) dt 25.09.2000 Standards for Coal Mines and National Ambient Air Quality Standard -2009. Sometimes the concentration of PM_{10} & $\text{PM}_{2.5}$ 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

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

Test Report for Ambient Air Samples

Month & Year		11/2023	Cluster	Cluster XII			ULR No.	TC1012223000000335F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	24.01.2024	
Project		Rudhi Basti		Sample Ref. No.	REM/BCCL/2023/11	Sampling Method		CMPDI/RI-II/LPM 13, (IS 5182)	
Date of Sampling		07.11.2023		16.11.2023	Period of Analysis	07.11.2023	31.12.2023	Zone of Station:	Core 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		109	107	90	92	90	92
2	PM _{2.5}	IS -5182(Part 24):2019		56	57	37	45	37	45
3	SO ₂	IS-5182(Part-2): 2001, R-2017		<10	<10	<10	<10	<10	<10
4	NO ₂	IS-5182 (Part-6): 2006, R-2017		20	22	21	22	21	22

* LDL indicates Lower Detection Limit,

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

[Signature]

ANALYSED BY

[Signature]

(Gaurav Kant)
REVIEWED BY

[Signature]

(Amit Raj Mishra)
Authorised Signature

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

---- End of Report ----

Page -1 of 1



cmpdi
A Min. Ratna Company

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

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

Test Report for Ambient Air Samples

Month & Year		11/2023	Cluster	Cluster XII			ULR No.	TC1012223000000335F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	24.01.2024	
Project		Block IV	Sample Ref. No.	REM/BCCL/2023/11		Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Date of Sampling		11.11.2023	22.11.2023	Period of Analysis	11.11.2023	31.12.2023	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	89	134	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	47	72	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	11	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	28	29	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,

[Signature]
ANALYSED BY

[Signature]
(Gaurav Kant)
REVIEWED BY

[Signature]
(Amit Raj Mishra)
Authorised 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



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

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

Test Report for Ambient Air Samples

Month & Year		11/2023	Cluster	Cluster XII			ULR No.	TC1012223000000335F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	24.01.2024	
Project		Moonidih UGP		Sample Ref. No.	REM/BCCL/2023/11	Sampling Method	CMPDI/RI-II/LPM 13, (IS 5182)		
Date of Sampling		13.11.2023		29.11.2023	Period of Analysis	13.11.2023	31.12.2023	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method of Analysis	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	110	150	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	64	78	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	12	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	20	18	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)
 REVIEWED BY

(Amit Raj Mishra)
 Authorised 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



cmpdi
A Min. Ratna Company

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		11/2023	Cluster	Cluster XII			ULR No.	TC1012223000000335F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	24.01.2024	
Project		Murlidih 20/21 Pit		Sample Ref. No.	REM/BCCL/2023/11	Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Date of Sampling		08.11.2023		23.11.2023	Period of Analysis	08.11.2023	31.12.2023	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		124	116	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		63	61	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		12	12	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		33	34	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,

[Signature]
ANALYSED BY

[Signature]
(Gaurav Kant)
REVIEWED BY

[Signature]
(Amit Raj Mishra)
Authorised Signature

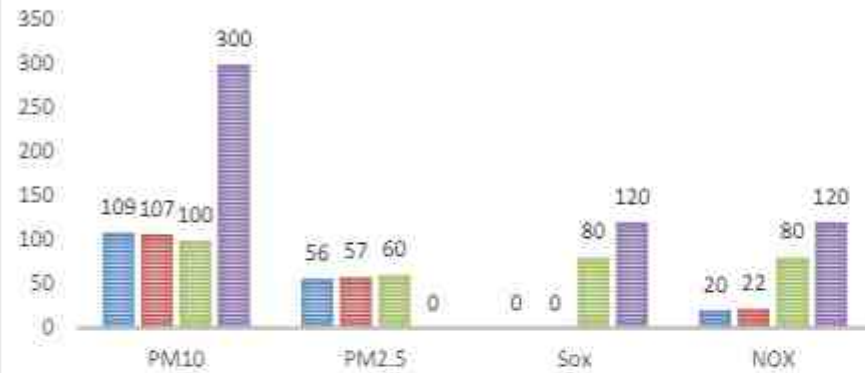
Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env), CMPDI, RI-II.

---- End of Report ----

Page -1 of 1

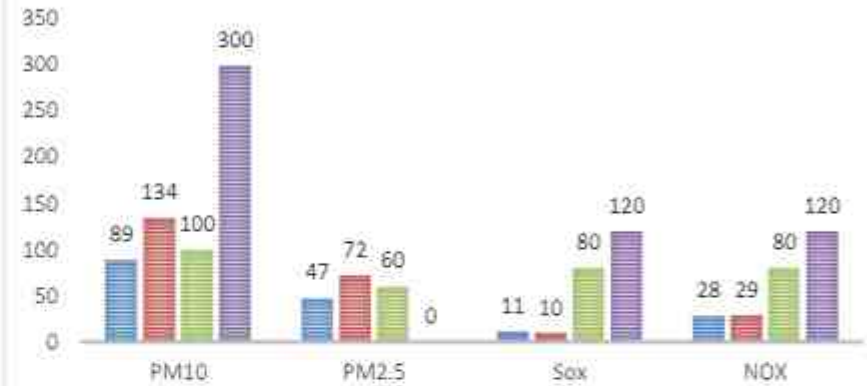
AMBIENT AIR QUALITY AT RUDHI BASTI

07.11.2023 16.11.2023 NAAQS GSR Standards



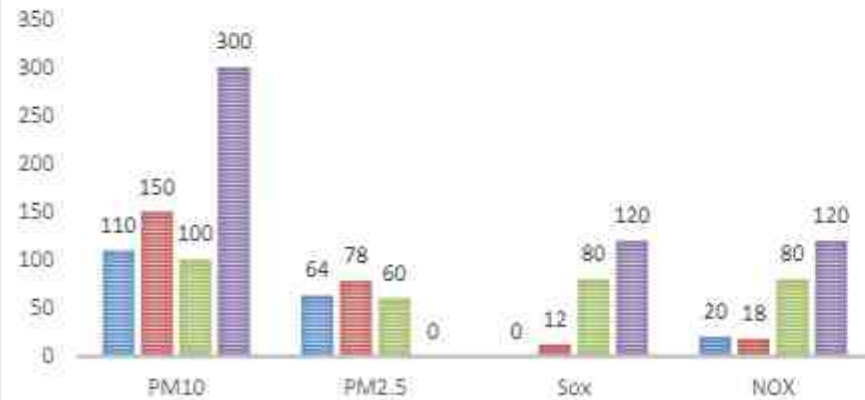
AMBIENT AIR QUALITY AT BLOCK IV

11.11.2023 22.11.2023 NAAQS GSR Standards



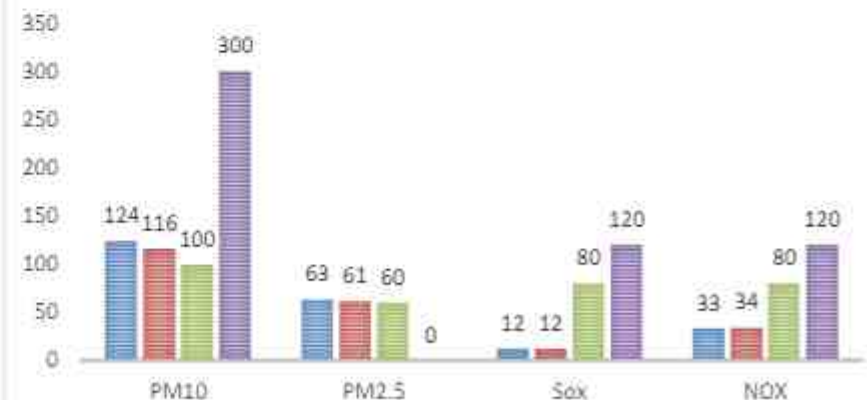
AMBIENT AIR QUALITY AT MOONIDIH UGP

13.11.2023 29.11.2023 NAAQS GSR Standards



AMBIENT AIR QUALITY AT MURLIDIH 20/21 PIT

08.11.2023 23.11.2023 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 during day time & night time. Noise levels were measured for the complete day & night time, the Intergration time taken was one hour or 3600 seconds. 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 & night time and the observed values were compared with standards prescribed by MoEF&CC. The results of Noise levels recorded during day & night time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{EQ} are presented. The observed values at all the monitoring locations are found to be within permissible limits.



cmpdi
A Coal India Company

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: rdri2cmpdi@coalindia.in

Month & Year	11/2023	Cluster	Cluster XII				ULR No.	TC101222300000369F	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	24.01.2024	
Project			Sample Ref. No.	REM/BCCL/2023/11		Sampling Method		CMPDI/RI-II/LPM 22	
Sampling Stations	i	Rudhi Basti		Date of Sampling		07.11.2023	16.11.2023	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	44.3	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	47.7	47.9					
3		08:00 - 09:00	48.7	50.1					
4		09:00 - 10:00	45.1	45.8					
5		10:00 - 11:00	50.1	50.5					
6		11:00 - 12:00	53.8	53					
7		12:00 - 13:00	51.7	52.1					
8		13:00 - 14:00	53	53.6					
9		14:00 - 15:00	55	54.2					
10		15:00 - 16:00	57.2	57.5					
11		16:00 - 17:00	52.7	52.5					
12		17:00 - 18:00	50.2	50.5					
13		18:00 - 19:00	44.3	45.5					
14		19:00 - 20:00	44.9	45.1					
15		20:00 - 21:00	42.5	43.2					
16		21:00 - 22:00	42.4	43.3					
		Leq Day	51.2	51.3					
1	Noise Level dB(A)Leq -Night	22:00-23:00	43.5	44.4	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial/ Commercial/ Residential/ Silence	70/ 65/ 45/ 50
2		23:00-00:00	43.6	44.3					
3		00:00- 01:00	43	43.1					
4		01:00-02:00	43	42.6					
5		02:00-03:00	42.6	42.4					
6		03:00-04:00	42.8	44.1					
7		04:00-05:00	42.9	44					
8		05:00-06:00	43	44					
		Leq Night	43.1	43.7					

**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)
REVIEWED BY

Raj Mishra
Authorised 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

  cmpdi A Mine Rules Company		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			
Month & Year	11/2023	Cluster	Cluster XII			ULR No.	TC1012223000000369F		
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bcl@coalindia.in)					Date of Issue	24.01.2024		
Project		Sample Ref. No.	REM/BCCL/2023/11		Sampling Method	CMPDI/RI-II/LPM 22			
Sampling Stations	i	Block IV	Date of Sampling		11.11.2023	22.11.2023	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	53	51.7	CPCB Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	57	56					
3		08:00 - 09:00	57.9	56.9					
4		09:00 - 10:00	61.2	60.4					
5		10:00 - 11:00	60.8	59.8					
6		11:00 - 12:00	62.1	61.5					
7		12:00 - 13:00	61.7	60.4					
8		13:00 - 14:00	62	62.7					
9		14:00 - 15:00	62.4	61.4					
10		15:00 - 16:00	65.3	63.5					
11		16:00 - 17:00	65.9	65.7					
12		17:00 - 18:00	66.8	66.6					
13		18:00 - 19:00	65.5	63.5					
14		19:00 - 20:00	65.2	64.5					
15		20:00 - 21:00	58.8	57.8					
16		21:00 - 22:00	52	50.5					
		Leq Day	62.7	62.0					
1	Noise Level dB(A) Leq - Night	22:00-23:00	52.1	50.7	CPCB Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00-00:00	51.3	49.1					
3		00:00-01:00	49.5	48.5					
4		01:00-02:00	44.3	44.6					
5		02:00-03:00	43.9	44.1					
6		03:00-04:00	47.1	45.5					
7		04:00-05:00	45.2	44.5					
8		05:00-06:00	45.5	46.5					
		Leq Night	48.4	47.3					
<i>**All noise measurements are integrated for a 01 hour period. All units in dB(A). *LDL indicates Lower Detection Limit.</i>									
Sampling Assistants ANALYSED BY		 (Gaurav Kant) REVIEWED BY			 (Amit Raj Mishra) Authorised 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									



cmpdi
A Most Reputed 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: rdri2cmpdi@coalindia.in

Month & Year	11/2023	Cluster	Cluster XII				ULR No.	TC1012223000000369F	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bcl@coalindia.in)						Date of Issue	24.01.2024	
Project			Sample Ref. No.	REM/BCCL/2023/11		Sampling Method	CMPDI/RI-II/LPM 22		
Sampling Stations	1	Moonidih UGP		Date of Sampling	13.11.2023	29.11.2023	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	49.8	50.5	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	45.5	46.3					
3		08:00 - 09:00	53	54.5					
4		09:00 - 10:00	51.1	48.6					
5		10:00 - 11:00	54.1	53.1					
6		11:00 - 12:00	57.4	58.2					
7		12:00 - 13:00	55.5	55.2					
8		13:00 - 14:00	57.2	56.2					
9		14:00 - 15:00	53.5	53.1					
10		15:00 - 16:00	51.7	51.1					
11		16:00 - 17:00	51.3	51.5					
12		17:00 - 18:00	50.9	51.5					
13		18:00 - 19:00	50.1	50.5					
14		19:00 - 20:00	50.7	50.4					
15		20:00 - 21:00	49.2	49					
16		21:00 - 22:00	48.7	48.9					
		Leq Day	52.9	52.9					
1	Noise Level dB(A)Leq - Night	22:00-23:00	47.1	47.1	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	46.5	46.7					
3		00:00-01:00	45.7	46.7					
4		01:00-02:00	44.7	45.5					
5		02:00-03:00	44.5	44.6					
6		03:00-04:00	44.5	44.7					
7		04:00-05:00	46.1	46.2					
8		05:00-06:00	46.5	46.7					
		Leq Night	45.8	46.1					

**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
(Gaurav Kant)
REVIEWED BY

Amit Raj Mishra
(Amit Raj Mishra)
Authorised 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



cmpdi
A Min. Ratna Company

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: rdri2cmpdi@coalindia.in

Month & Year	11/2023	Cluster	Cluster XII				ULR No.	TC1012223000000369F	
Customer Project	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmeov.bccl@coalindia.in)						Date of Issue	24.01.2024	
		Sample Ref. No.	REM/BCCL/2023/11			Sampling Method	CMPDI/RI-II/LPM 22		
Sampling Stations	1	Murlidih(20/21)	Date of Sampling	08.11.2023	23.11.2023	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	47.9	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	48.1	48.3					
3		08:00 - 09:00	50.1	51.1					
4		09:00 - 10:00	49.3	50.3					
5		10:00 - 11:00	52.2	52.2					
6		11:00 - 12:00	52.6	52.3					
7		12:00 - 13:00	54.1	55.1					
8		13:00 - 14:00	54.5	54.6					
9		14:00 - 15:00	54.9	55.1					
10		15:00 - 16:00	56.1	57.1					
11		16:00 - 17:00	55.9	55.4					
12		17:00 - 18:00	53.6	53.6					
13		18:00 - 19:00	50.3	51.1					
14		19:00 - 20:00	50	50.3					
15		20:00 - 21:00	48.9	48.9					
16		21:00 - 22:00	48.7	48.6					
		Leq Day	52.6	52.9					
1	Noise Level dB(A)Leq -Night	22:00-23:00	39.8	40	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	39.4	39.9					
3		00:00- 01:00	39.1	39.6					
4		01:00-02:00	39	39.5					
5		02:00-03:00	38.9	39.1					
6		03:00-04:00	39.4	38.9					
7		04:00-05:00	39.6	39.4					
8		05:00-06:00	39.8	39.5					
		Leq Night	39.4	39.5					

**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) REVIEWED BY	 (Amit Raj Mishra) Authorised 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

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 Improved west and Gaeke method 2 Ultraviolet fluorescence
	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 Chemiluminescence

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

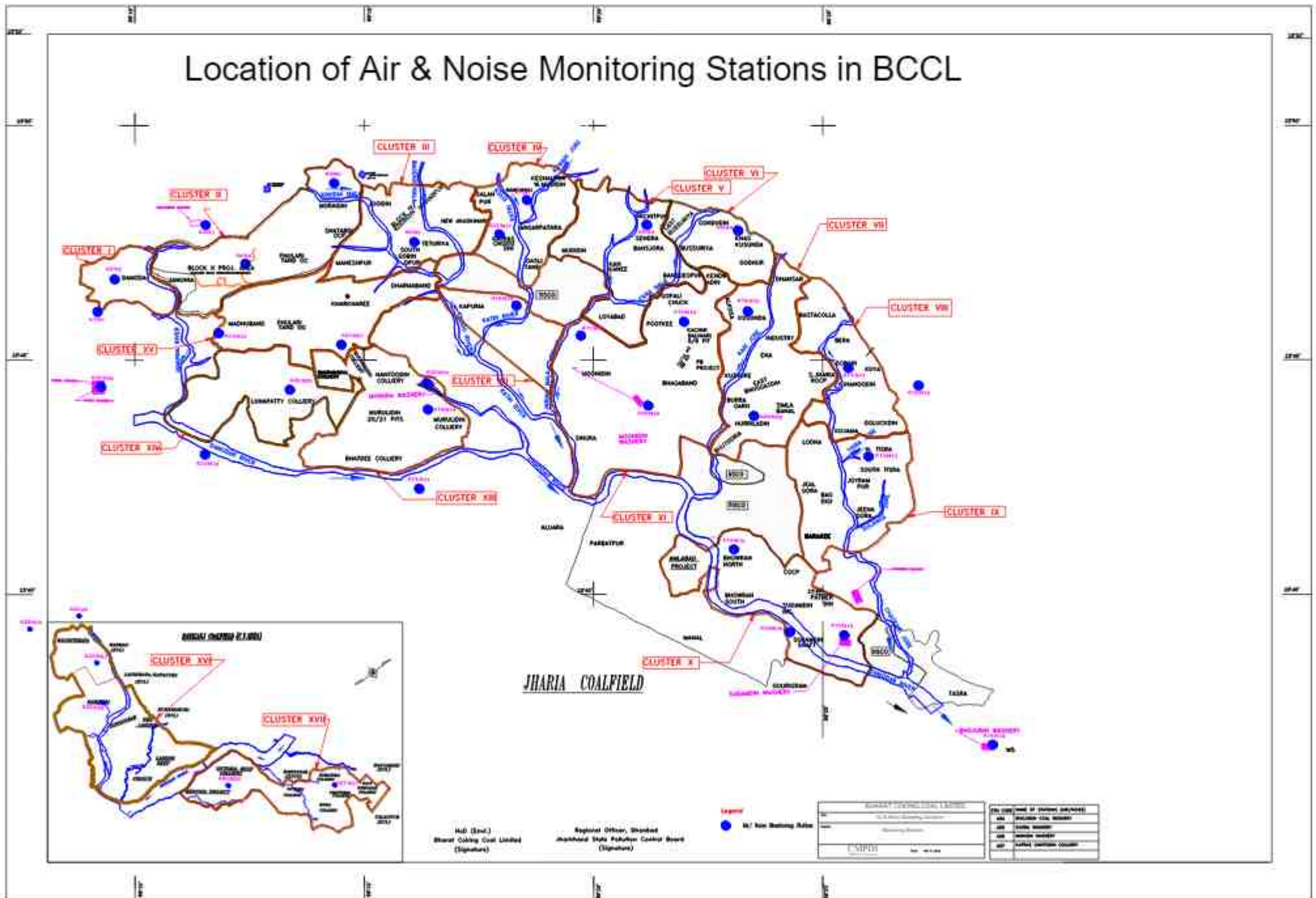
In exercise of the powers conferred by Sub-section (2) (h) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No. 14 of 1981), and in supersession of the notification No(s).S.O.384(E), dated 11th April 1994 and S.O.935(E), dated 14th NOVEMBER 1998, the Central Pollution Control 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 (SO ₂), µg/m ³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogen dioxide (NO ₂), µg/m ³	Annual * 24 Hours **	40 80	30 80	-Jacob & Hochheiser modified (NaOH-NaAsO ₂) Method -Gas Phase Chemiluminescence
Particulate Matter (Size less than 10µm) or PM ₁₀ , µg/m ³	Annual * 24 Hours **	60 100	60 100	-Gravimetric -TEOM -Beta attenuation
Particulate Matter (Size less than 2.5µm) or PM _{2.5} , µg/m ³	Annual * 24 Hours **	40 60	40 60	-Gravimetric -TEOM -Beta attenuation
Ozone (O ₃), µg/m ³	8 Hours * 1 Hour **	100 180	100 180	-UV Photometric -Chemiluminescence -Chemical Method
Lead (Pb), µg/m ³	Annual * 24 Hours **	0.50 1.0	0.50 1.0	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper -ED-XRF using Teflon filter
Carbon Monoxide (CO), mg/m ³	8 Hours ** 1 Hour **	02 04	02 04	-Non dispersive Infrared (NDIR) Spectroscopy
Ammonia (NH ₃), µg/m ³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C ₆ H ₆), µg/m ³	Annual *	05	05	-Gas Chromatography (GC) based continuous analyzer -Adsorption and desorption followed by GC analysis
Benzo(a)Pyrene (BaP) Particulate phase only, ng/m ³	Annual *	01	01	-Solvent extraction followed by HPLC/GC analysis
Arsenic (As), ng/m ³	Annual *	06	06	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel (Ni), ng/m ³	Annual *	20	20	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

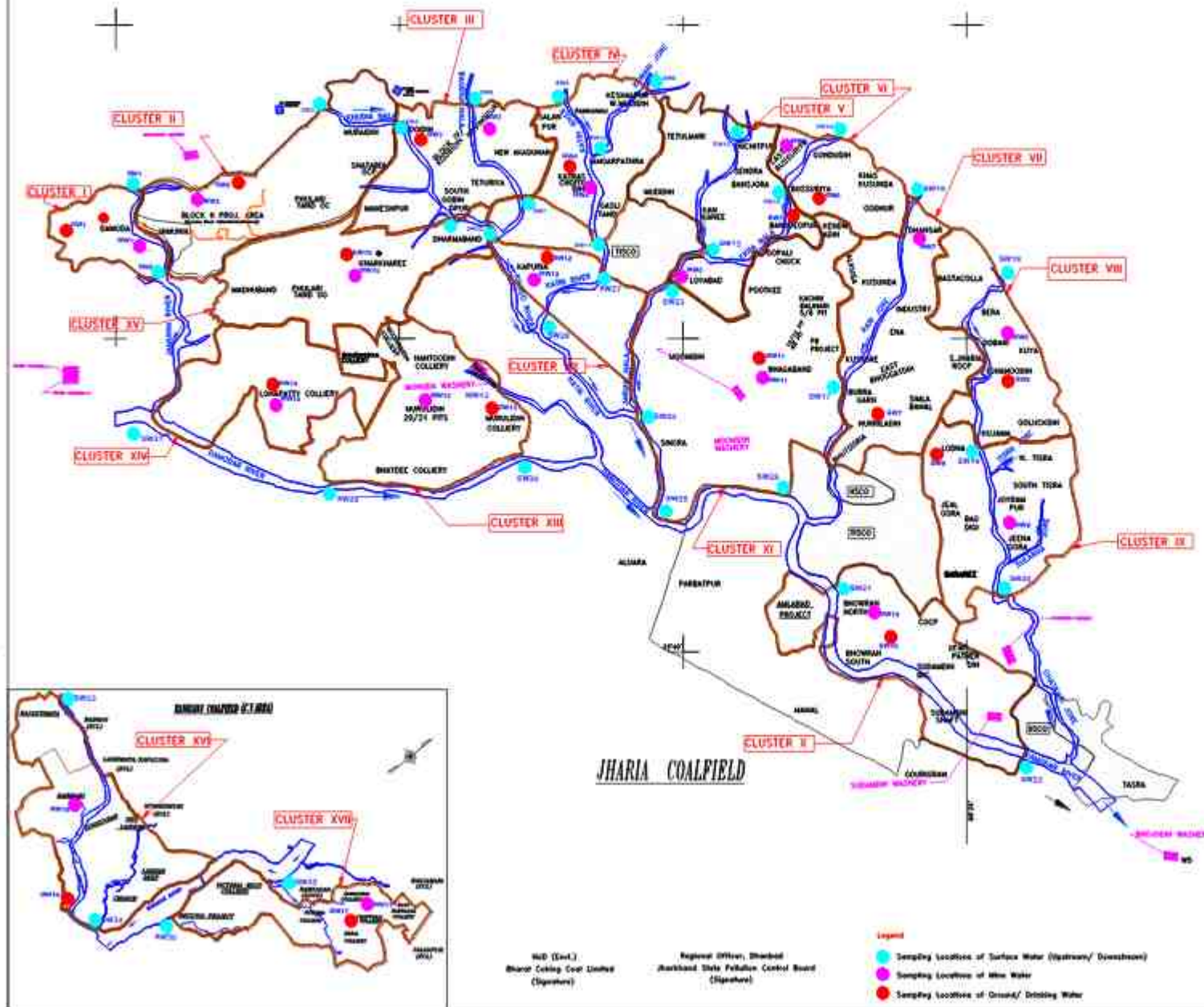
* Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

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

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



Water Sampling Locations in BCCL



INDEX

Sl. No.	Cluster	Water Type	Location	Sampling Date	Sampling Time	Sampling Method	Sampling Frequency	Sampling Location
1	CLUSTER I	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
2	CLUSTER II	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
3	CLUSTER III	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
4	CLUSTER IV	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
5	CLUSTER V	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
6	CLUSTER VI	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
7	CLUSTER VII	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
8	CLUSTER VIII	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
9	CLUSTER IX	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
10	CLUSTER X	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
11	CLUSTER XI	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
12	CLUSTER XII	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
13	CLUSTER XIII	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
14	CLUSTER XIV	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
15	CLUSTER XV	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
16	CLUSTER XVI	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area
17	CLUSTER XVII	Surface Water	Block 6 Prol Area	2014-2015	10:00	Grab	Quarterly	Block 6 Prol Area

Name: JHARIA COALFIELD
 Date: / /
 Signature: _____
 Designation: _____

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 DECEMBER, 2023)

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



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

CONTENTS

SL. NO.	CHAPTER	PARTICULARS	PAGE NO.
1.	CHAPTER - I	EXECUTIVE SUMMARY	3-5
2.	CHAPTER-II	INTRODUCTION	6
3.	CHAPTER-III	RESULTS	7-18
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 ($\text{PM}_{2.5}$ sampler) were used for sampling of PM_{10} , SO_2 , & NO_x and Fine Dust Sampler ($\text{PM}_{2.5}$ sampler) were used for sampling of $\text{PM}_{2.5}$ at 24 hours interval once in a fortnight and the same for the gaseous pollutants. The samples were analysed in Environmental Laboratory of CMPDI, RI-II, Dhanbad.

3.2 Water quality

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

3.3 Noise level monitoring

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

4.0 Results and interpretations

4.1 Air quality

It has been seen from the analysis results that the 24 hours average concentration parameters like PM_{10} , $\text{PM}_{2.5}$, SO_2 and NO_x are mostly within the permissible limits in all sampling locations as per MoEF&CC Gazette Notification No. GSR 742(E) dt 25.09.2000 Standards for Coal Mines and National Ambient Air Quality Standard -2009. Sometimes the concentration of PM_{10} & $\text{PM}_{2.5}$ 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 $23^{\circ} 45' 26.60''$ N & $86^{\circ} 18' 39.90''$ 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 $23^{\circ} 47' 54.00''$ N & $86^{\circ} 16' 20.00''$ 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 $23^{\circ} 44' 30.00''$ N & $86^{\circ} 20' 56.00''$ 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 $23^{\circ} 43' 51.82''$ N & $86^{\circ} 16' 21.87''$ 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

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

Test Report for Ambient Air Samples

Month & Year		12/2023	Cluster	Cluster XII			ULR No.	TC1012223000000399F
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	24.02.2024
Project		Rudhi Basti	Sample Ref. No.	REM/BCCL/2023/12	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		4.12.2023	23.12.2023	Period of Analysis	04.12.2023	30.01.2024	Zone of Station:	Core 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	112	117	90	92	90	92
2	PM _{2.5}	IS -5182(Part 24):2019	55	61	37	45	37	45
3	SO ₂	IS-5182(Part-2): 2001 , R-2017	<10	<10	<10	<10	<10	<10
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017	26	28	21	22	21	22

* LDL indicates Lower Detection Limit,

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

[Signature]

ANALYSED BY

[Signature]

(Gaurav Kant)

REVIEWED BY

[Signature]

(Amit Raj Mishra)

Authorised Signature

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

---- End of Report ----

Page -1 of 1



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

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

Test Report for Ambient Air Samples

Month & Year		12/2023	Cluster	Cluster XII			ULR No.	TC1012223000000399F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	24.02.2024	
Project		Block IV	Sample Ref. No.	REM/BCCL/2023/12		Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Date of Sampling		02.12.2023	29.12.2023	Period of Analysis	02.12.2023	30.01.2024	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		87	138	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		48	73	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	12	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		33	35	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)
 REVIEWED BY


 (Amit Raj Mishra)
 Authorised 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



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

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

Test Report for Ambient Air Samples

Month & Year		12/2023	Cluster	Cluster XII			ULR No.	TC1012223000000399F		
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	24.02.2024		
Project		Moonidih UGP		Sample Ref. No.	REM/BCCL/2023/12		Sampling Method		CMPDI/RI-II/LPM 13, (IS 5182)	
Date of Sampling		02.12.2023		30.12.2023	Period of Analysis	02.12.2023	30.01.2024	Zone of Station:	Buffer Zone	
Sl. No.	Parameter	Method of Analysis	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	121	150	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	67	73	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	31	32	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.

[Signature]
 ANALYSED BY

[Signature]
 (Gaurav Kant)
 REVIEWED BY

[Signature]
 (Amit Raj Mishra)
 Authorised 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



cmpdi
A Min Ratna Company

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		12/2023	Cluster	Cluster XII			ULR No.	TC1012223000000399F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	24.02.2024
Project		Murlidih 20/21 Pit	Sample Ref. No.	REM/BCCL/2023/12		Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		04.12.2023		19.12.2023	Period of Analysis	04.12.2023	30.01.2024	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		129	99	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		63	54	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		29	28	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,

[Signature]
ANALYSED BY

[Signature]
(Gaurav Kant)
REVIEWED BY

[Signature]
(Amit Raj Mishra)
Authorised Signature

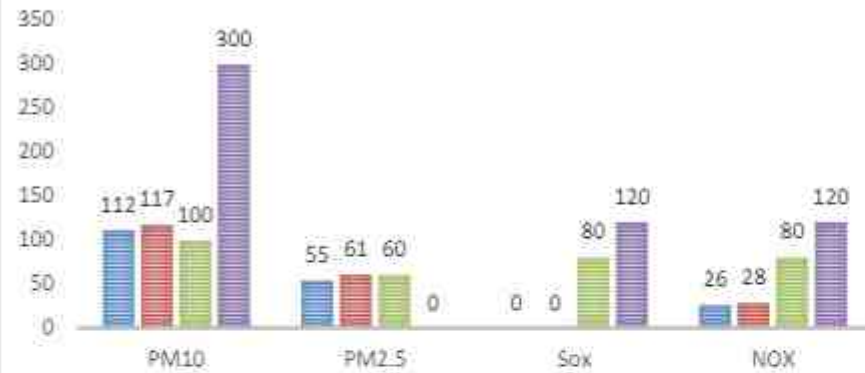
Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env), CMPDI, RI-II.

---- End of Report ----

Page -1 of 1

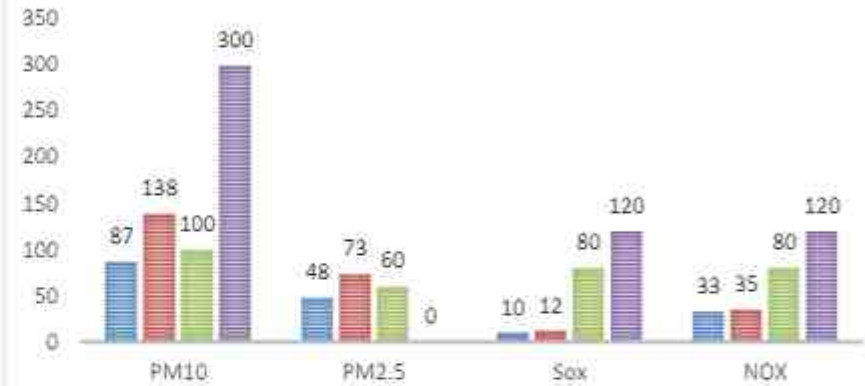
AMBIENT AIR QUALITY AT RUDHI BASTI

04.12.2023 23.12.2023 NAAQS GSR Standards



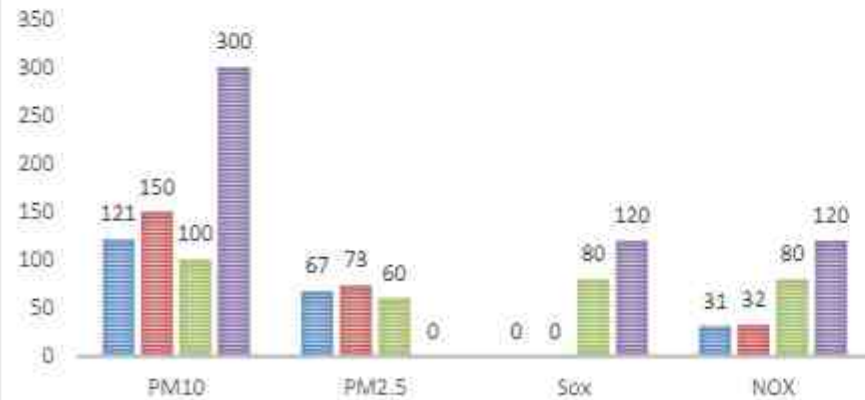
AMBIENT AIR QUALITY AT BLOCK IV

02.12.2023 29.12.2023 NAAQS GSR Standards



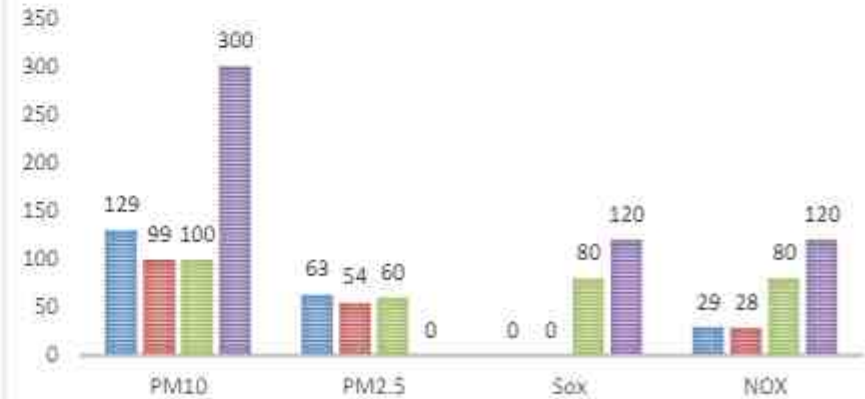
AMBIENT AIR QUALITY AT MOONIDIH UGP

02.12.2023 30.12.2023 NAAQS GSR Standards



AMBIENT AIR QUALITY AT MURLIDIH 20/21 PIT

04.12.2023 19.12.2023 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 during day time & night time. Noise levels were measured for the complete day & night time, the Intergration time taken was one hour or 3600 seconds. 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 & night time and the observed values were compared with standards prescribed by MoEF&CC. The results of Noise levels recorded during day & night time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{EQ} are presented. The observed values at all the monitoring locations are found to be within permissible limits.



cmpdi
A Coal India Company

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: rdri2cmpdi@coalindia.in

Month & Year	12/2023	Cluster	Cluster XII				ULR No.	TC1012223000000433F	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	24.02.2024	
Project			Sample Ref. No.	REM/BCCL/2023/12		Sampling Method		CMPDI/RI-II/LPM 22	
Sampling Stations	i	Rudhi Basti		Date of Sampling		04.12.2023	23.12.2023	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	46.2	47.4	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	49.6	49.8					
3		08:00 - 09:00	50.8	52.2					
4		09:00 - 10:00	47	47.7					
5		10:00 - 11:00	52.2	52.6					
6		11:00 - 12:00	56	55.2					
7		12:00 - 13:00	53.8	54.3					
8		13:00 - 14:00	55.2	55.8					
9		14:00 - 15:00	57.3	56.5					
10		15:00 - 16:00	59.6	59.9					
11		16:00 - 17:00	54.9	54.7					
12		17:00 - 18:00	52.3	52.6					
13		18:00 - 19:00	46.2	47.4					
14		19:00 - 20:00	46.8	47					
15		20:00 - 21:00	44.2	45					
16		21:00 - 22:00	44.1	45.1					
		Leq Day	53.4	53.5					
1	Noise Level dB(A)Leq -Night	22:00-23:00	42.4	43.2	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 65 45 50
2		23:00-00:00	42.5	43.1					
3		00:00- 01:00	41.9	42					
4		01:00-02:00	41.9	41.5					
5		02:00-03:00	41.5	41.3					
6		03:00-04:00	41.7	42.9					
7		04:00-05:00	41.8	42.8					
8		05:00-06:00	41.9	42.8					
		Leq Night	42.0	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)
REVIEWED BY

Raj Mishra
Authorised 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

  cmpdi A Mine Rules Company										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	
Month & Year	12/2023	Cluster	Cluster XII					ULR No.	TC1012223000000433F						
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	24.02.2024						
Project		Sample Ref. No.	REM/BCCL/2023/12	Sampling Method		CMPDI/RI-II/LPM 22									
Sampling Stations	i	Block IV		Date of Sampling	02.12.2023	29.12.2023	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	55.2	53.8	CPCB Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50						
2		07:00 - 08:00	59.4	58.3											
3		08:00 - 09:00	60.3	59.3											
4		09:00 - 10:00	63.8	63											
5		10:00 - 11:00	63.4	62.3											
6		11:00 - 12:00	64.7	64.1											
7		12:00 - 13:00	64.3	63											
8		13:00 - 14:00	64.6	65.3											
9		14:00 - 15:00	65	64											
10		15:00 - 16:00	68	66.1											
11		16:00 - 17:00	68.7	68.5											
12		17:00 - 18:00	69.6	69.4											
13		18:00 - 19:00	68.3	66.1											
14		19:00 - 20:00	67.9	67.1											
15		20:00 - 21:00	61.2	60.2											
16		21:00 - 22:00	54.1	52.6											
		Leq Day	65.4	64.6											
1	Noise Level dB(A) Leq - Night	22:00-23:00	50.7	49.3	CPCB Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50						
2		23:00-00:00	49.9	47.8											
3		00:00-01:00	48.2	47.2											
4		01:00-02:00	43.1	43.4											
5		02:00-03:00	42.7	42.9											
6		03:00-04:00	45.8	44.2											
7		04:00-05:00	43.9	43.3											
8		05:00-06:00	44.2	45.2											
		Leq Night	47.1	46.0											

**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) REVIEWED BY	 (Gaurav Kant) REVIEWED BY  (Amit Raj Mishra) Authorised 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



cmpdi
A Mine Safety 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: rdri2cmpdi@coalindia.in

Month & Year	12/2023	Cluster	Cluster XII				ULR No.	TC1012223000000433F	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bcd@coalindia.in)						Date of Issue	24.02.2024	
Project			Sample Ref. No.	REM/BCCL/2023/12		Sampling Method		CMPDI/RI-II/LPM 22	
Sampling Stations	i	Moonidih UGP		Date of Sampling		02.12.2023	30.12.2023	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	51.9	52.6	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	47.4	48.2					
3		08:00 - 09:00	55.2	56.8					
4		09:00 - 10:00	53.2	50.7					
5		10:00 - 11:00	56.4	55.3					
6		11:00 - 12:00	59.8	60.6					
7		12:00 - 13:00	57.8	57.5					
8		13:00 - 14:00	59.6	58.5					
9		14:00 - 15:00	55.7	55.3					
10		15:00 - 16:00	53.8	53.2					
11		16:00 - 17:00	53.4	53.6					
12		17:00 - 18:00	53	53.6					
13		18:00 - 19:00	52.2	52.6					
14		19:00 - 20:00	52.8	52.5					
15		20:00 - 21:00	51.3	51.1					
16		21:00 - 22:00	50.8	51					
		Leq Day	55.2	55.1					
1	Noise Level dB(A)Leq - Night	22:00-23:00	45.8	45.8	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	45.2	45.4					
3		00:00- 01:00	44.4	45.4					
4		01:00-02:00	43.5	44.2					
5		02:00-03:00	43.3	43.4					
6		03:00-04:00	43.3	43.5					
7		04:00-05:00	44.8	44.9					
8		05:00-06:00	45.2	45.4					
		Leq Night	44.5	44.8					

**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
(Gaurav Kant)
REVIEWED BY

(Amit Raj Mishra)
Authorised 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



cmpdi
A Mine Safety 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: rdri2cmpdi@coalindia.in

Month & Year	12/2023	Cluster	Cluster XII				ULR No.	TC1012223000000433F	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bcd@coalindia.in)						Date of Issue	24.02.2024	
Project			Sample Ref. No.	REM/BCCL/2023/12		Sampling Method	CMPDI/RI-II/LPM 22		
Sampling Stations	i	Murlidih(20/21)		Date of Sampling		04.12.2023	19.12.2023	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	50	49.8	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	50.1	50.3					
3		08:00 - 09:00	52.2	53.2					
4		09:00 - 10:00	51.4	52.4					
5		10:00 - 11:00	54.4	54.4					
6		11:00 - 12:00	54.8	54.5					
7		12:00 - 13:00	56.4	57.4					
8		13:00 - 14:00	56.8	56.9					
9		14:00 - 15:00	57.2	57.4					
10		15:00 - 16:00	58.4	59.5					
11		16:00 - 17:00	58.2	57.7					
12		17:00 - 18:00	55.8	55.8					
13		18:00 - 19:00	52.4	53.2					
14		19:00 - 20:00	52.1	52.4					
15		20:00 - 21:00	51	51					
16		21:00 - 22:00	50.8	50.7					
		Leq Day	54.8	55.1					
1	Noise Level dB(A)Leq -Night	22:00-23:00	38.7	38.9	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	38.3	38.8					
3		00:00-01:00	38	38.5					
4		01:00-02:00	37.9	38.4					
5		02:00-03:00	37.8	38					
6		03:00-04:00	38.3	37.8					
7		04:00-05:00	38.5	38.3					
8		05:00-06:00	38.7	38.4					
		Leq Night	38.3	38.4					

** 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
(Gaurav Kant)
REVIEWED BY

Amit Raj Mishra
(Amit Raj Mishra)
Authorised 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

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. Improved wet and Gaeke method 2. Ultraviolet fluorescence
	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 Chemiluminescence

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.

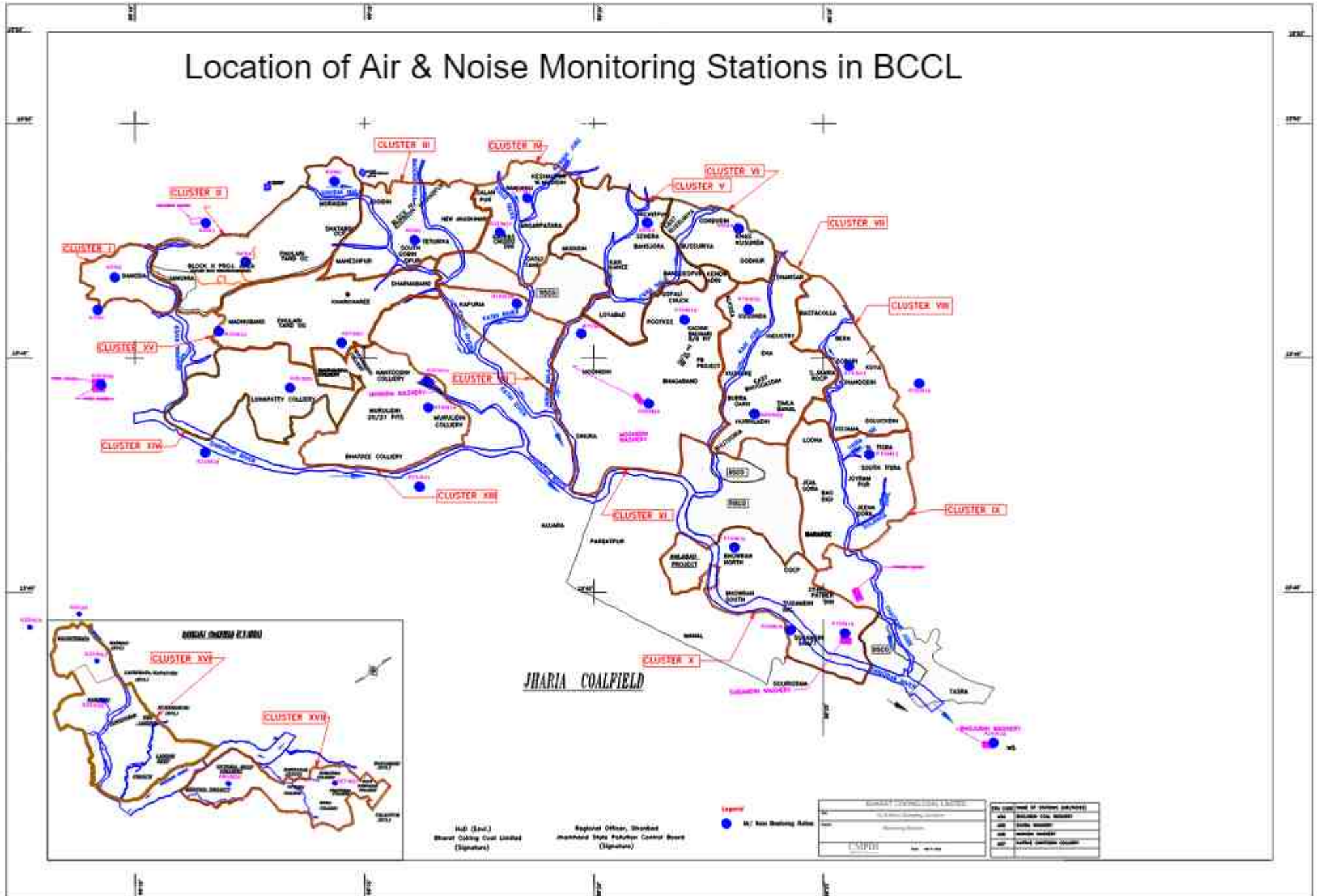
Pollutant	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
		Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO ₂), µg/m ³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogen dioxide (NO ₂), µg/m ³	Annual * 24 Hours **	40 80	30 80	-Jacob & Hochheiser modified (NaOH-NaAsO ₂) Method -Gas Phase Chemiluminescence
Particulate Matter (Size less than 10µm) or PM ₁₀ , µg/m ³	Annual * 24 Hours **	60 100	60 100	-Gravimetric -TEOM -Beta attenuation
Particulate Matter (Size less than 2.5µm) or PM _{2.5} , µg/m ³	Annual * 24 Hours **	40 60	40 60	-Gravimetric -TEOM -Beta attenuation
Ozone (O ₃), µg/m ³	8 Hours * 1 Hour **	100 180	100 180	-UV Photometric -Chemiluminescence -Chemical Method
Lead (Pb), µg/m ³	Annual * 24 Hours **	0.50 1.0	0.50 1.0	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper -ED-XRF using Teflon filter
Carbon Monoxide (CO), mg/m ³	8 Hours ** 1 Hour **	02 04	02 04	-Non dispersive Infrared (NDIR) Spectroscopy
Ammonia (NH ₃), µg/m ³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C ₆ H ₆), µg/m ³	Annual *	05	05	-Gas Chromatography (GC) based continuous analyzer -Adsorption and desorption followed by GC analysis
Benzo(a)Pyrene (BaP) Particulate phase only, ng/m ³	Annual *	01	01	-Solvent extraction followed by HPLC/GC analysis
Arsenic (As), ng/m ³	Annual *	06	06	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel (Ni), ng/m ³	Annual *	20	20	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

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

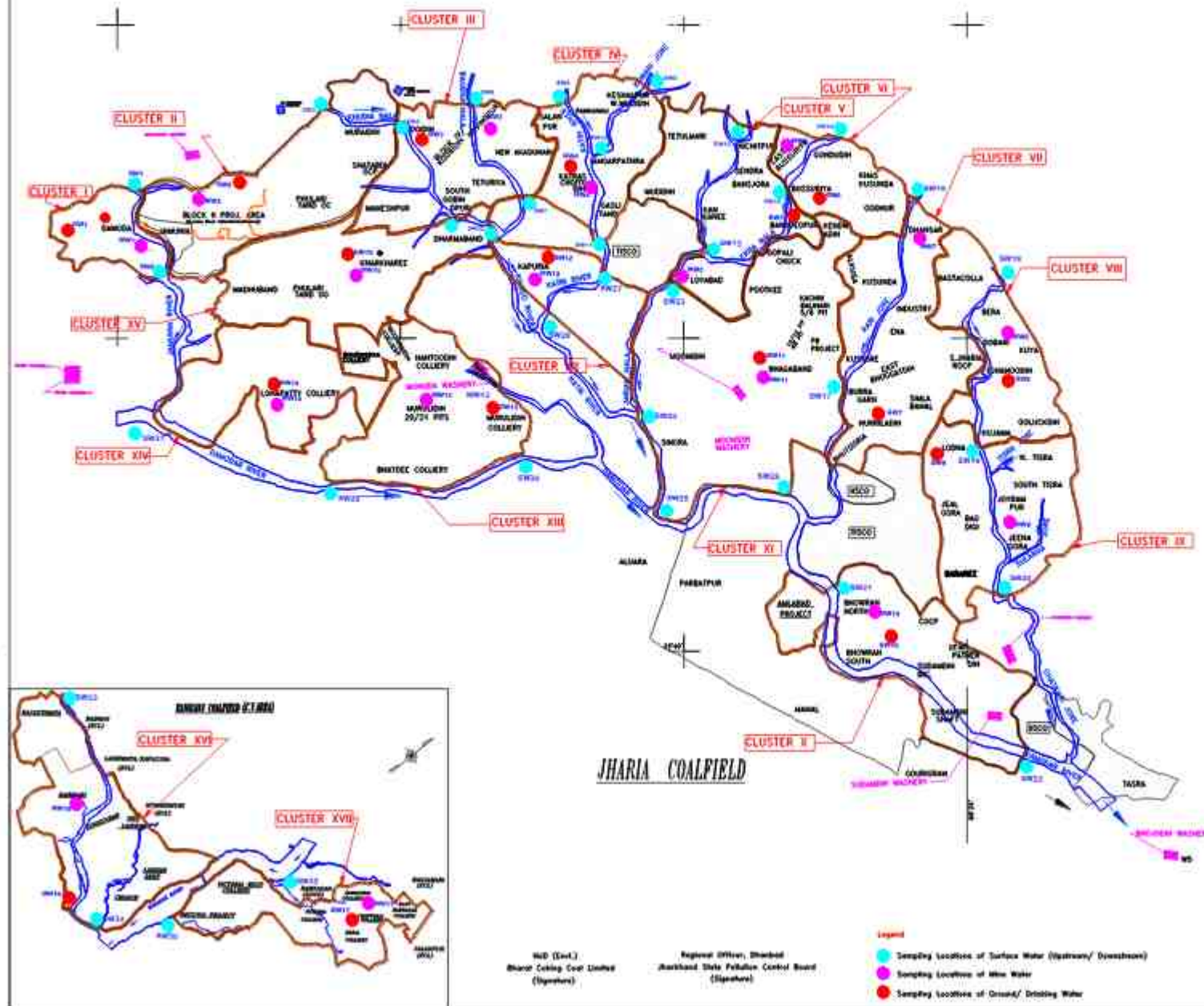
** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

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

Location of Air & Noise Monitoring Stations in BCCL



Water Sampling Locations in BCCL



INDEX

Sl. No.	Cluster	Water Type	Location	Sample No.	Sample Date
1	CLUSTER I	Surface Water	Block B Prol Area	SW1	2014.01.15
2	CLUSTER II	Surface Water	Block B Prol Area	SW2	2014.01.15
3	CLUSTER III	Surface Water	Block B Prol Area	SW3	2014.01.15
4	CLUSTER IV	Surface Water	Block B Prol Area	SW4	2014.01.15
5	CLUSTER V	Surface Water	Block B Prol Area	SW5	2014.01.15
6	CLUSTER VI	Surface Water	Block B Prol Area	SW6	2014.01.15
7	CLUSTER VII	Surface Water	Block B Prol Area	SW7	2014.01.15
8	CLUSTER VIII	Surface Water	Block B Prol Area	SW8	2014.01.15
9	CLUSTER IX	Surface Water	Block B Prol Area	SW9	2014.01.15
10	CLUSTER X	Surface Water	Block B Prol Area	SW10	2014.01.15
11	CLUSTER XI	Surface Water	Block B Prol Area	SW11	2014.01.15
12	CLUSTER XII	Surface Water	Block B Prol Area	SW12	2014.01.15
13	CLUSTER XIII	Surface Water	Block B Prol Area	SW13	2014.01.15
14	CLUSTER XIV	Surface Water	Block B Prol Area	SW14	2014.01.15
15	CLUSTER XV	Surface Water	Block B Prol Area	SW15	2014.01.15
16	CLUSTER XVI	Surface Water	Block B Prol Area	SW16	2014.01.15
17	CLUSTER XVII	Surface Water	Block B Prol Area	SW17	2014.01.15

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 JANUARY, 2024)

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



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

CONTENTS

SL. NO.	CHAPTER	PARTICULARS	PAGE NO.
1.	CHAPTER - I	EXECUTIVE SUMMARY	3-5
2.	CHAPTER-II	INTRODUCTION	6
3.	CHAPTER-III	RESULTS	7-18
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 ($\text{PM}_{2.5}$ sampler) were used for sampling of PM_{10} , SO_2 , & NO_x and Fine Dust Sampler ($\text{PM}_{2.5}$ sampler) were used for sampling of $\text{PM}_{2.5}$ at 24 hours interval once in a fortnight and the same for the gaseous pollutants. The samples were analysed in Environmental Laboratory of CMPDI, RI-II, Dhanbad.

3.2 Water quality

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

3.3 Noise level monitoring

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

4.0 Results and interpretations

4.1 Air quality

It has been seen from the analysis results that the 24 hours average concentration parameters like PM_{10} , $\text{PM}_{2.5}$, SO_2 and NO_x are mostly within the permissible limits in all sampling locations as per MoEF&CC Gazette Notification No. GSR 742(E) dt 25.09.2000 Standards for Coal Mines and National Ambient Air Quality Standard -2009. Sometimes the concentration of PM_{10} & $\text{PM}_{2.5}$ 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 $23^{\circ} 45' 26.60''$ N & $86^{\circ} 18' 39.90''$ 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 $23^{\circ} 47' 54.00''$ N & $86^{\circ} 16' 20.00''$ 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 $23^{\circ} 44' 30.00''$ N & $86^{\circ} 20' 56.00''$ 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 $23^{\circ} 43' 51.82''$ N & $86^{\circ} 16' 21.87''$ 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

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

Test Report for Ambient Air Samples

Month & Year		01/2024	Cluster	Cluster XII			ULR No.	TC1012223000000535F		
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	11.03.2024		
Project		Rudhi Basti		Sample Ref. No.	REM/BCCL/2024/01		Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		02.01.2024		24.01.2024	Period of Analysis	02.01.2024		29.02.2024	Zone of Station:	Core Zone
Sl. No.	Parameter	Method of Analysis	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 A1671	2nd FN A1723						
1	PM ₁₀	IS -5182(Part 23):2006, R-2017	97	92	90	92	90	92		
2	PM _{2.5}	IS -5182(Part 24):2019	54	51	37	45	37	45		
3	SO ₂	IS-5182(Part-2): 2001, R-2017	10	<10	<10	<10	<10	<10		
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017	20	13	21	22	21	22		

* LDL Indicates Lower Detection Limit,

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


ANALYSED BY


(Gaurav Kant)
REVIEWED BY


(Amit Raj Mishra)
Authorised Signature

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

--- End of Report ---

Page -1 of 1



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

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

Test Report for Ambient Air Samples

Month & Year		01/2024	Cluster	Cluster XII			ULR No.	TC1012223000000535F
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	11.03.2024
Project		Block IV	Sample Ref. No.	REM/BCCL/2024/01	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		08.01.2024	23.01.2024	Period of Analysis	08.01.2024	29.02.2024	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method of Analysis	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 A1692	2nd FN A1743				
1	PM ₁₀	IS-5182(Part 23):2006, R-2017	84	121	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	49	68	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	28	29	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.

[Signature]
 ANALYSED BY

[Signature]
 (Gaurav Kant)
 REVIEWED BY

[Signature]
 (Amit Raj Mishra)
 Authorised 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



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

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

Test Report for Ambient Air Samples

Month & Year		01/2024	Cluster	Cluster XII			ULR No.	TC1012223000000535F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	11.03.2024	
Project		Moonidih UGP		Sample Ref. No.	REM/BCCL/2024/01	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		13.01.2024		29.01.2024	Period of Analysis	13.01.2024	29.02.2024	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method of Analysis	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 A1710	2nd FN A1761					
1	PM ₁₀	IS -5182(Part-23):2006, R-2017	86	127	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	46	65	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	42	39	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)
 REVIEWED BY


 (Amit Raj Mishra)
 Authorised 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



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

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

Test Report for Ambient Air Samples

Month & Year		01/2024	Cluster	Cluster XII			ULR No.	TC1012223000000535F
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	11.03.2024
Project		Murlidih 20/21 Pit	Sample Ref. No.	REM/BCCL/2024/01	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		03.01.2024	18.01.2024	Period of Analysis	03.01.2024	29.02.2024	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method of Analysis	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 A1676	2nd FN A1728				
1	PM ₁₀	IS-5182(Part 23):2006, R-2017	93	96	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	57	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	11	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 _x	IS-5182 (Part-6): 2006 , R-2017	34	21	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,

[Signature]
 ANALYSED BY

[Signature]
 (Gaurav Kant)
 REVIEWED BY

[Signature]
 (Amit Raj Mishra)
 Authorised Signature

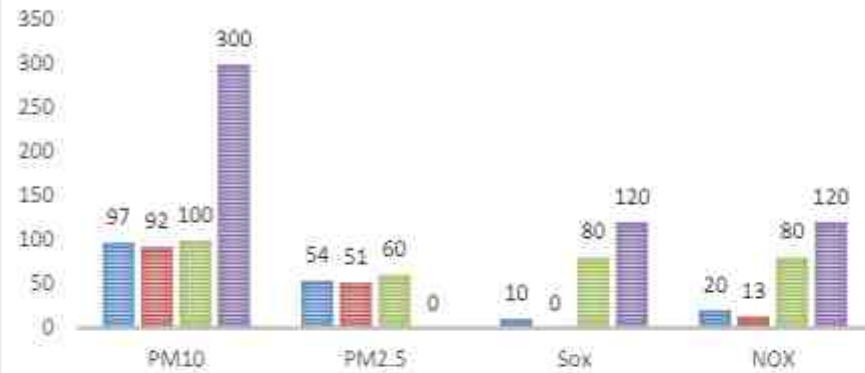
Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env), CMPDI, RI-II.

--- End of Report ---

Page -1 of 1

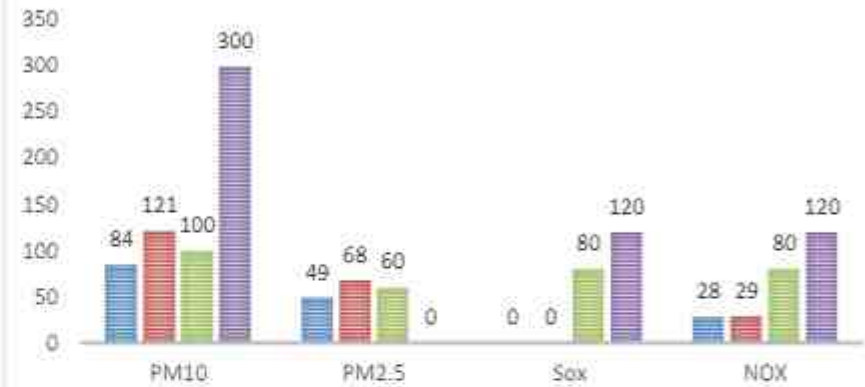
AMBIENT AIR QUALITY AT RUDHI BASTI

02.01.2024 24.01.2024 NAAQS GSR Standards



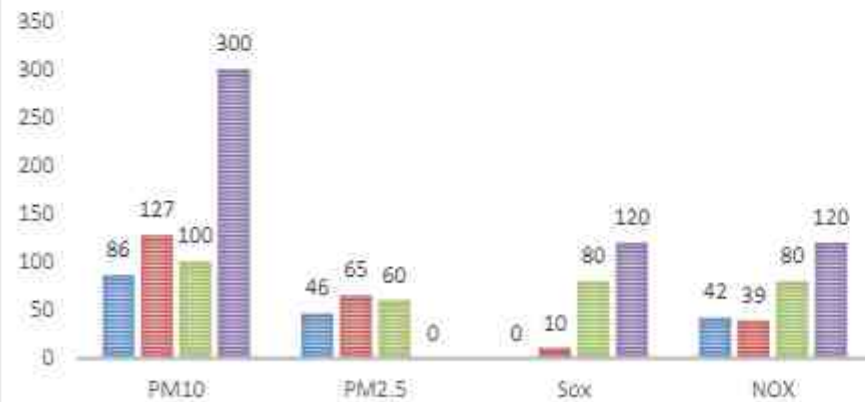
AMBIENT AIR QUALITY AT BLOCK IV

08.01.2024 23.01.2024 NAAQS GSR Standards



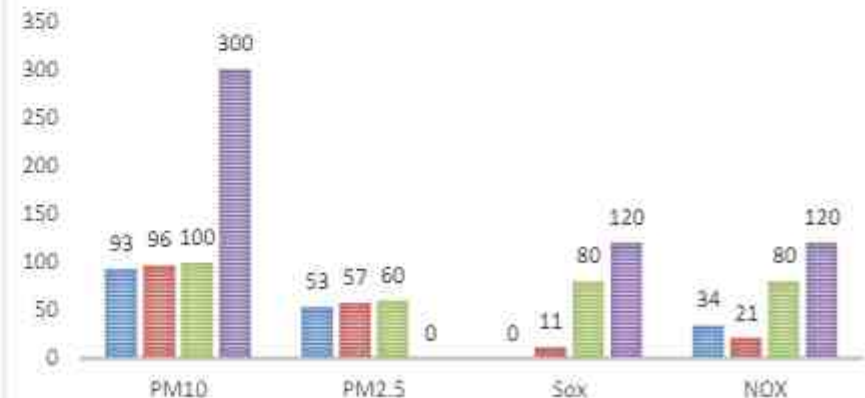
AMBIENT AIR QUALITY AT MOONIDIH UGP

13.01.2024 29.01.2024 NAAQS GSR Standards



AMBIENT AIR QUALITY AT MURLIDIH 20/21 PIT

03.01.2024 18.01.2024 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 during day time & night time. Noise levels were measured for the complete day & night time, the Intergration time taken was one hour or 3600 seconds. 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 & night time and the observed values were compared with standards prescribed by MoEF&CC. The results of Noise levels recorded during day & night time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{EQ} are presented. The observed values at all the monitoring locations are found to be within permissible limits.



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: rdri2cmpdi@coalindia.in

Month & Year	01/2024	Cluster	Cluster XII					ULR No.	TC1012223000000569F
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	11.03.2024
Project			Sample Ref. No.	REM/BCCL/2024/01		Sampling Method		CMPDI/RI-II/LPM 22	
Sampling Stations	i	Rudhi Basti		Date of Sanpling		02.01.2024	24.01.2024	Zone Category of Station:	Core 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	48.3	49.5	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	51.9	52.1					
3		08:00 - 09:00	53.1	54.6					
4		09:00 - 10:00	49.1	49.8					
5		10:00 - 11:00	54.6	55					
6		11:00 - 12:00	58.5	57.7					
7		12:00 - 13:00	56.3	56.8					
8		13:00 - 14:00	57.7	58.3					
9		14:00 - 15:00	59.9	59.1					
10		15:00 - 16:00	62.3	62.6					
11		16:00 - 17:00	57.4	57.2					
12		17:00 - 18:00	54.7	55					
13		18:00 - 19:00	48.3	49.5					
14		19:00 - 20:00	48.9	49.1					
15		20:00 - 21:00	46.3	47.2					
16		21:00 - 22:00	46.2	47.3					
		Leq Day	55.9	56.1					
1	Noise Level dB(A)Leq -Night	22:00-23:00	45.4	46.3	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 65 45 50
2		23:00-00:00	45.5	46.2					
3		00:00- 01:00	44.9	45					
4		01:00-02:00	44.9	44.5					
5		02:00-03:00	44.5	44.3					
6		03:00-04:00	44.7	46					
7		04:00-05:00	44.8	45.9					
8		05:00-06:00	44.9	45.9					
		Leq Night	45.0	45.6					

**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)
REVIEWED BY

(Amit)
Raj Mishra
Authorised 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



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: rdri2cmpdi@coalindia.in

Month & Year	01/2024	Cluster	Cluster XII					ULR No.	TC1012223000000569F
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bcd@coalindia.in)							Date of Issue	11.03.2024
Project			Sample Ref. No.	REM/BCCL/2024/01		Sampling Method		CMPDI/RI-II/LPM 22	
Sampling Stations	i	Block IV		Date of Sampling		08.01.2024	23.01.2024	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	57.7	56.3	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	62.1	61					
3		08:00 - 09:00	63	62					
4		09:00 - 10:00	66.7	65.9					
5		10:00 - 11:00	66.3	65.2					
6		11:00 - 12:00	67.7	67					
7		12:00 - 13:00	67.2	65.9					
8		13:00 - 14:00	67.5	68.3					
9		14:00 - 15:00	68	66.9					
10		15:00 - 16:00	71.1	69.2					
11		16:00 - 17:00	71.8	71.6					
12		17:00 - 18:00	72.8	72.6					
13		18:00 - 19:00	71.4	69.2					
14		19:00 - 20:00	71	70.2					
15		20:00 - 21:00	64	62.9					
16		21:00 - 22:00	56.6	55					
		Leq Day	68.5	67.6					
1	Noise Level dB(A)Leq - Night	22:00-23:00	54.2	52.8	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	53.4	51.1					
3		00:00 - 01:00	51.6	50.5					
4		01:00-02:00	46.2	46.5					
5		02:00-03:00	45.8	46					
6		03:00-04:00	49	47.4					
7		04:00-05:00	47.1	46.4					
8		05:00-06:00	47.4	48.5					
		Leq Night	50.5	49.3					

**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)
REVIEWED BY

(Amit Raj Mishra)
Authorised 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



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

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

Month & Year	01/2024	Cluster	Cluster XII					ULR No.	TC1012223000000569F
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	11.03.2024
Project			Sample Ref. No.	REM/BCCL/2024/01			Sampling Method	CMPDI/RI-II/LPM 22	
Sampling Stations	1	Moonidih UGP			Date of Sampling	13.01.2024	29.01.2024	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	54.2	55	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	49.5	50.4					
3		08:00 - 09:00	57.7	59.4					
4		09:00 - 10:00	55.6	53					
5		10:00 - 11:00	59	57.8					
6		11:00 - 12:00	62.5	63.4					
7		12:00 - 13:00	60.5	60.1					
8		13:00 - 14:00	62.3	61.2					
9		14:00 - 15:00	58.2	57.8					
10		15:00 - 16:00	56.3	55.6					
11		16:00 - 17:00	55.9	56.1					
12		17:00 - 18:00	55.4	56.1					
13		18:00 - 19:00	54.6	55					
14		19:00 - 20:00	55.2	54.9					
15		20:00 - 21:00	53.6	53.4					
16		21:00 - 22:00	53.1	53.3					
		Leq Day	57.8	57.7					
1	Noise Level dB(A)Leq - Night	22:00-23:00	49	49	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	48.5	48.7					
3		00:00-01:00	47.6	48.7					
4		01:00-02:00	46.6	47.4					
5		02:00-03:00	46.4	46.5					
6		03:00-04:00	46.4	46.6					
7		04:00-05:00	48.1	48.2					
8		05:00-06:00	48.5	48.7					
		Leq Night	47.7	48.1					

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

Sampling Assistants

Gaurav Kant
 (Gaurav Kant)
 REVIEWED BY

Amit Raj Mishra
 (Amit Raj Mishra)
 Authorised Signature

ANALYSED BY

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



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: rdri2cmpdi@coalindia.in

Month & Year	01/2024	Cluster	Cluster XII					ULR No.	TC1012223000000569F
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bcci@coalindia.in)							Date of Issue	11.03.2024
Project			Sample Ref. No.	REM/BCCL/2024/01		Sampling Method		CMPDI/RI-II/LPM 22	
Sampling Stations	i	Murlidih(20/21)		Date of Sampling		03.01.2024	18.01.2024	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	52.3	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	52.4	52.6					
3		08:00 - 09:00	54.6	55.6					
4		09:00 - 10:00	53.7	54.8					
5		10:00 - 11:00	56.9	56.9					
6		11:00 - 12:00	57.3	57					
7		12:00 - 13:00	59	60					
8		13:00 - 14:00	59.4	59.5					
9		14:00 - 15:00	59.8	60					
10		15:00 - 16:00	61.1	62.2					
11		16:00 - 17:00	60.9	60.4					
12		17:00 - 18:00	58.3	58.3					
13		18:00 - 19:00	54.8	55.6					
14		19:00 - 20:00	54.5	54.8					
15		20:00 - 21:00	53.3	53.3					
16		21:00 - 22:00	53.1	53					
		Leq Day	57.4	57.7					
1	Noise Level dB(A)Leq - Night	22:00-23:00	41.5	41.7	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	41	41.6					
3		00:00 - 01:00	40.7	41.2					
4		01:00-02:00	40.6	41.1					
5		02:00-03:00	40.5	40.7					
6		03:00-04:00	41	40.5					
7		04:00-05:00	41.2	41					
8		05:00-06:00	41.5	41.1					
		Leq Night	41.0	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)
REVIEWED BY

(Amit Raj Mishra)
Authorised 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

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. Improved wet and Gaeke method 2. Ultraviolet fluorescence
	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 Chemiluminescence

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

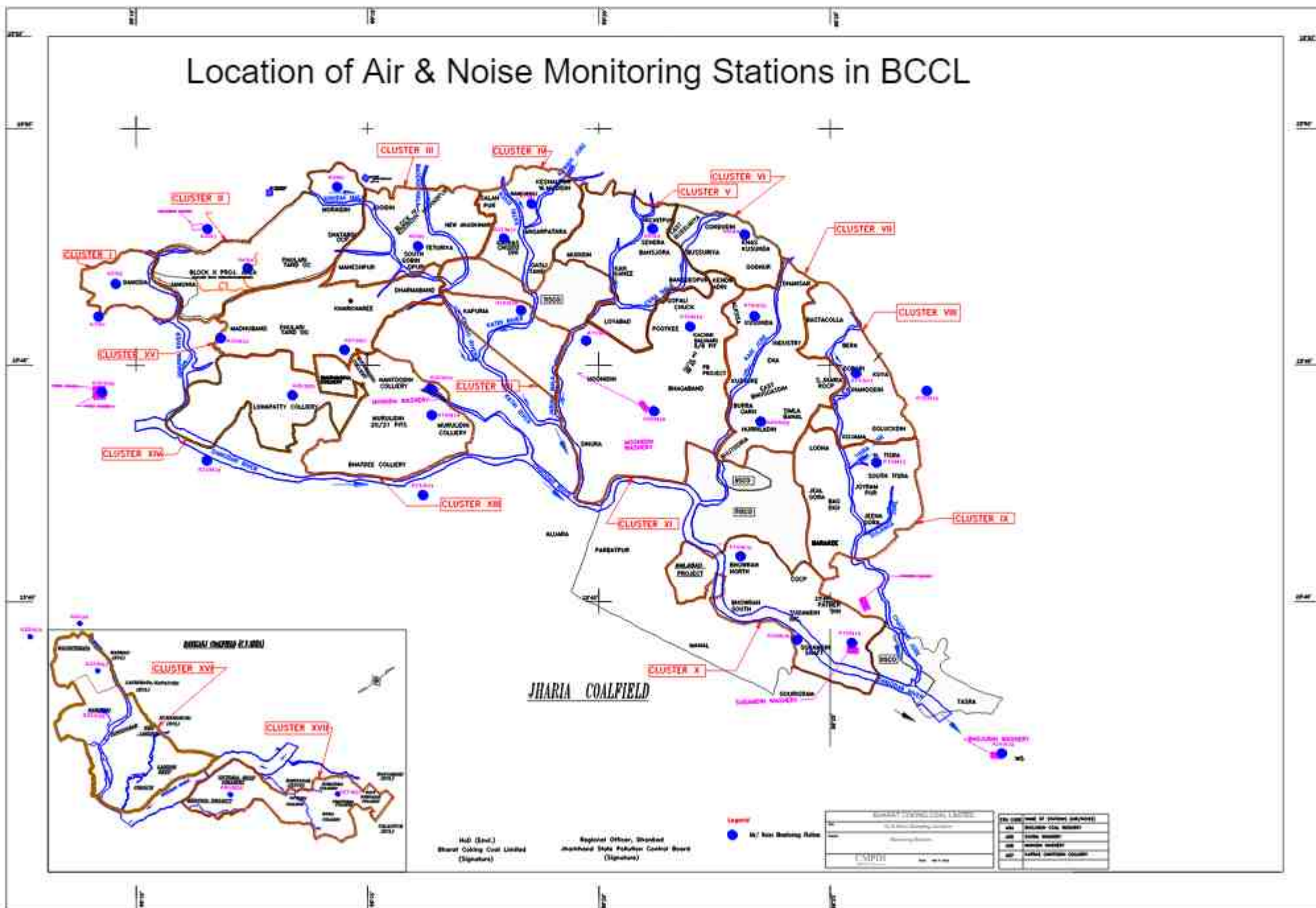
In exercise of the powers conferred by Sub-section (2) (h) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No. 14 of 1981), and in supersession of the notification No(s).S.O.384(E), dated 11th April 1994 and S.O.935(E), dated 14th NOVEMBER 1998, the Central Pollution Control 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 (SO ₂), µg/m ³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogen dioxide (NO ₂), µg/m ³	Annual * 24 Hours **	40 80	30 80	-Jacob & Hochheiser modified (NaOH-NaAsO ₂) Method -Gas Phase Chemiluminescence
Particulate Matter (Size less than 10µm) or PM ₁₀ , µg/m ³	Annual * 24 Hours **	60 100	60 100	-Gravimetric -TEOM -Beta attenuation
Particulate Matter (Size less than 2.5µm) or PM _{2.5} , µg/m ³	Annual * 24 Hours **	40 60	40 60	-Gravimetric -TEOM -Beta attenuation
Ozone (O ₃), µg/m ³	8 Hours * 1 Hour **	100 180	100 180	-UV Photometric -Chemiluminescence -Chemical Method
Lead (Pb), µg/m ³	Annual * 24 Hours **	0.50 1.0	0.50 1.0	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper -ED-XRF using Teflon filter
Carbon Monoxide (CO), mg/m ³	8 Hours ** 1 Hour **	02 04	02 04	-Non dispersive Infrared (NDIR) Spectroscopy
Ammonia (NH ₃), µg/m ³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C ₆ H ₆), µg/m ³	Annual *	05	05	-Gas Chromatography (GC) based continuous analyzer -Adsorption and desorption followed by GC analysis
Benzo(a)Pyrene (BaP) Particulate phase only, ng/m ³	Annual *	01	01	-Solvent extraction followed by HPLC/GC analysis
Arsenic (As), ng/m ³	Annual *	06	06	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel (Ni), ng/m ³	Annual *	20	20	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

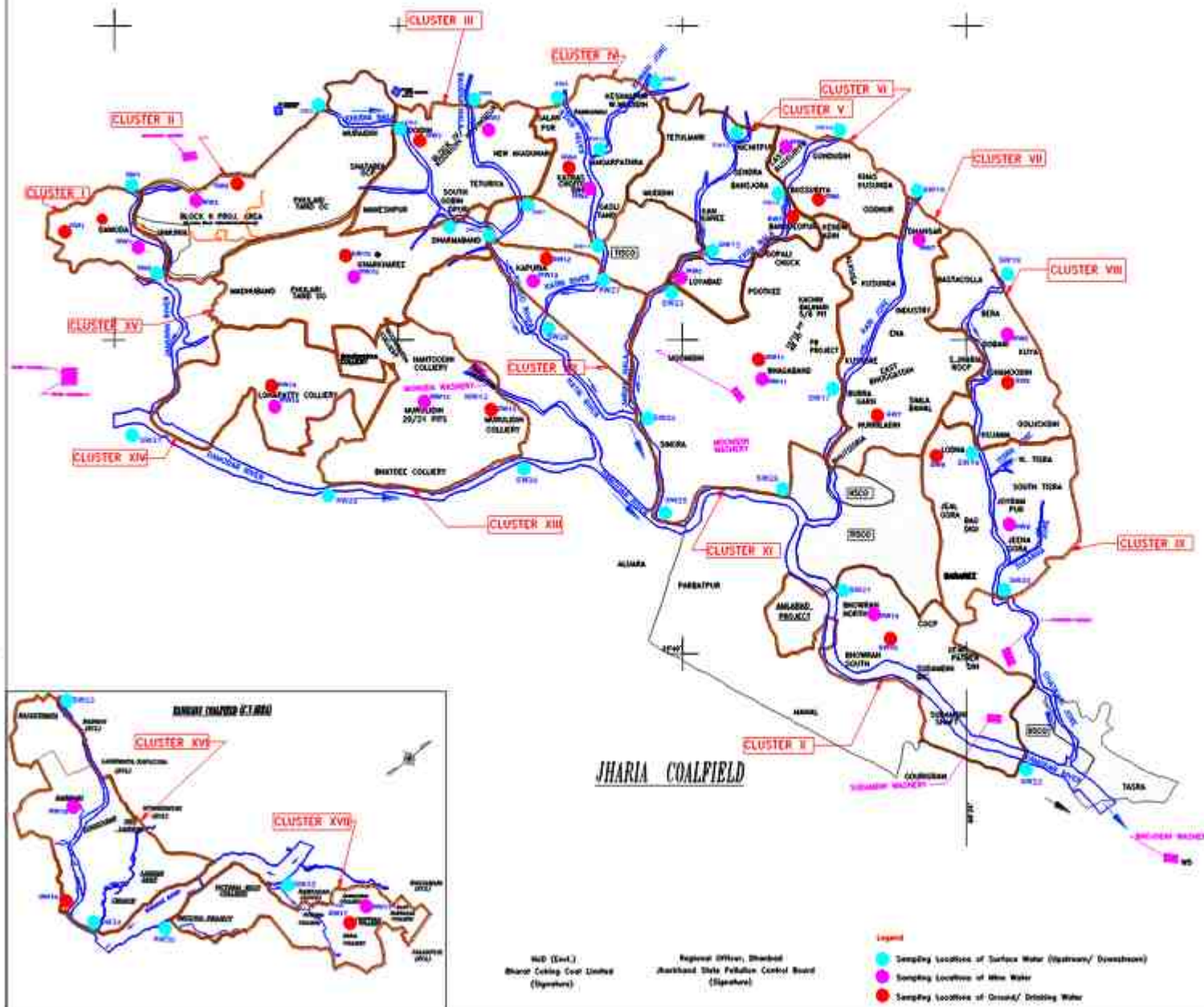
* Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

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

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



Water Sampling Locations in BCCL

[illegible]

NAME	WILLIAM J. BROWN
NO.	100-100000-100000
DATE	100-100000-100000
EXPIRE	100-100000-100000

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 FEBRUARY, 2024)

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



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

CONTENTS

SL. NO.	CHAPTER	PARTICULARS	PAGE NO.
1.	CHAPTER - I	EXECUTIVE SUMMARY	3-5
2.	CHAPTER-II	INTRODUCTION	6
3.	CHAPTER-III	RESULTS	7-18
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 ($\text{PM}_{2.5}$ sampler) were used for sampling of PM_{10} , SO_2 , & NO_x and Fine Dust Sampler ($\text{PM}_{2.5}$ sampler) were used for sampling of $\text{PM}_{2.5}$ at 24 hours interval once in a fortnight and the same for the gaseous pollutants. The samples were analysed in Environmental Laboratory of CMPDI, RI-II, Dhanbad.

3.2 Water quality

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

3.3 Noise level monitoring

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

4.0 Results and interpretations

4.1 Air quality

It has been seen from the analysis results that the 24 hours average concentration parameters like PM_{10} , $\text{PM}_{2.5}$, SO_2 and NO_x are mostly within the permissible limits in all sampling locations as per MoEF&CC Gazette Notification No. GSR 742(E) dt 25.09.2000 Standards for Coal Mines and National Ambient Air Quality Standard -2009. Sometimes the concentration of PM_{10} & $\text{PM}_{2.5}$ 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 $23^{\circ} 45' 26.60''$ N & $86^{\circ} 18' 39.90''$ 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 $23^{\circ} 47' 54.00''$ N & $86^{\circ} 16' 20.00''$ 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 $23^{\circ} 44' 30.00''$ N & $86^{\circ} 20' 56.00''$ 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 $23^{\circ} 43' 51.82''$ N & $86^{\circ} 16' 21.87''$ 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

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

Test Report for Ambient Air Samples

Month & Year		02/2024	Cluster	Cluster XII			ULR No.	TC1012224000000588F
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	30.03.2024
Project		Rudhi Basti	Sample Ref. No.	REM/BCCL/2024/02	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		08.02.2024	22.02.2024	Period of Analysis	08.02.2024	15.03.2024	Zone of Station:	Core 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	67	88	90	92	90	92
2	PM _{2.5}	IS -5182(Part 24):2019	38	44	37	45	37	45
3	SO ₂	IS-5182(Part-2): 2001 , R-2017	<10	<10	<10	<10	<10	<10
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017	24	25	21	22	21	22

* LDL indicates Lower Detection Limit,

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

[Signature]

ANALYSED BY

[Signature]

(Gaurav Kant)
REVIEWED BY

[Signature]

(Amit Raj Mishra)
Authorised Signature

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

---- End of Report ----

Page -1 of 1



cmpdi
A Coal India Company

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

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

Test Report for Ambient Air Samples

Month & Year		02/2024	Cluster	Cluster XII			ULR No.	TC1012224000000588F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	30.03.2024	
Project		Block IV	Sample Ref. No.	REM/BCCL/2024/02		Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Date of Sampling		07.02.2024	19.02.2024	Period of Analysis	07.02.2024	15.03.2024	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	155	134	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	70	63	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	28	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,

[Signature]

ANALYSED BY

[Signature]

(Gaurav Kant)
REVIEWED BY

[Signature]

(Amit Raj Mishra)
Authorised 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



cmpdi
A Coal India Company

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

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

Test Report for Ambient Air Samples

Month & Year		02/2024	Cluster	Cluster XII			ULR No.	TC1012224000000588F
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	30.03.2024
Project		Moonidih UGP		Sample Ref. No.	REM/BCCL/2024/02	Sampling Method	CMPDI/RI-II/LPM 13, (IS 5182)	
Date of Sampling		03.02.2024		24.02.2024	Period of Analysis	03.02.2024	15.03.2024	Zone of Station: Buffer Zone
Sl. No.	Parameter	Method of Analysis	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	98	90	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	55	52	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	31	34	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)
REVIEWED BY

(Amit Raj Mishra)
Authorised 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



cmpdi
A Min India Company

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

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

Test Report for Ambient Air Samples

Month & Year		02/2024	Cluster	Cluster XII			ULR No.	TC1012224000000588F
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	30.03.2024
Project		Murlidih 20/21 Pit	Sample Ref. No.	REM/BCCL/2024/02	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		08.02.2024	22.02.2024	Period of Analysis	08.02.2024	15.03.2024	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method of Analysis	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	80	95	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	35	45	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	32	30	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.

[Signature]
ANALYSED BY

[Signature]
(Gaurav Kant)
REVIEWED BY

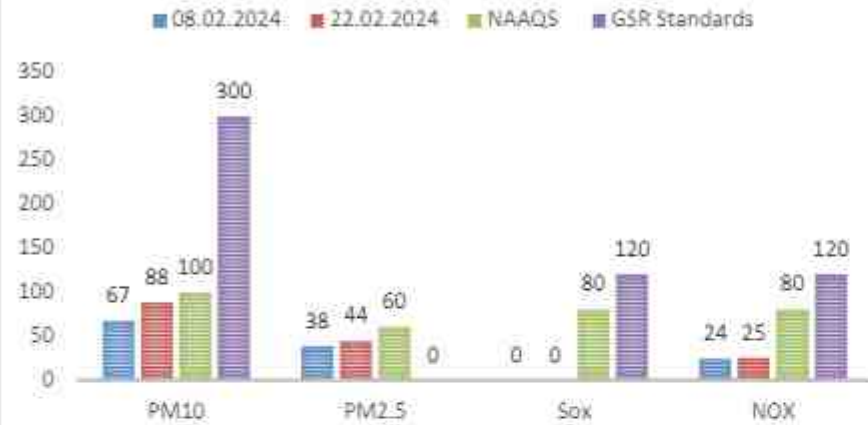
[Signature]
(Amit Raj Mishra)
Authorised Signature

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.

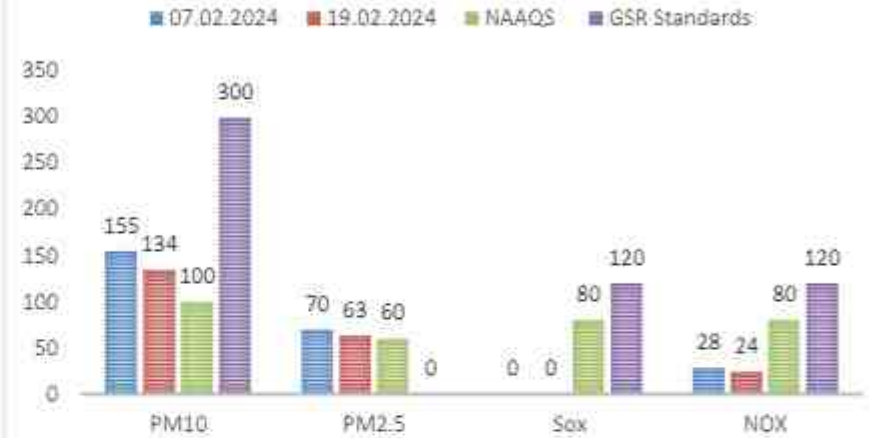
----- End of Report -----

Page -1 of 1

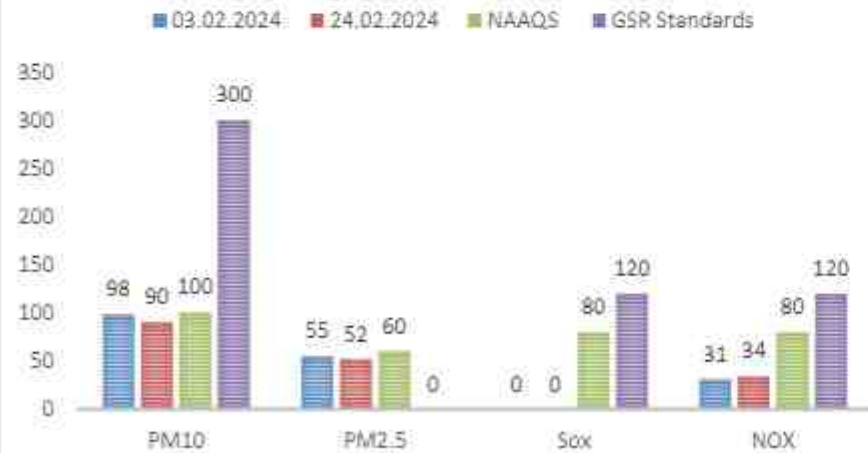
AMBIENT AIR QUALITY AT RUDHI BASTI



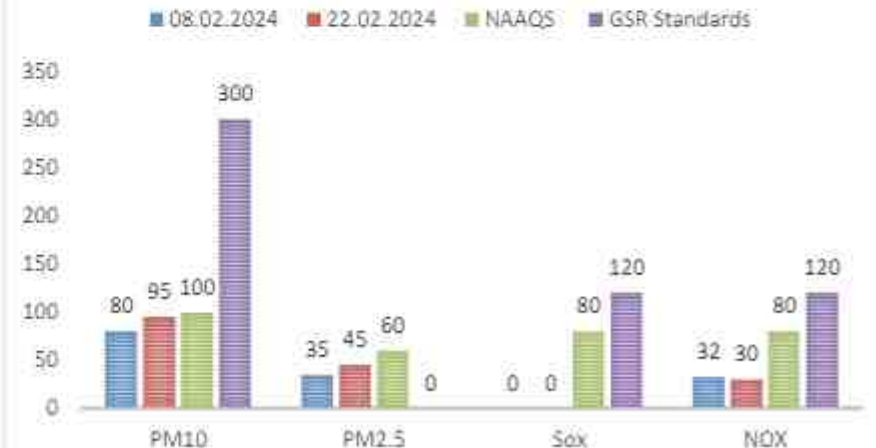
AMBIENT AIR QUALITY AT BLOCK IV



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 during day time & night time. Noise levels were measured for the complete day & night time, the Intergration time taken was one hour or 3600 seconds. 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 & night time and the observed values were compared with standards prescribed by MoEF&CC. The results of Noise levels recorded during day & night time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{EQ} are presented. The observed values at all the monitoring locations are found to be within permissible limits.



cmpdi
A Coal India 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: rdri2cmpdi@coalindia.in

Month & Year	02/2024	Cluster	Cluster XII					ULR No.	TC1012224000000622F
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	30.03.2024
Project			Sample Ref. No.	REM/BCCL/2024/02		Sampling Method		CMPDI/RI-II/LPM 22	
Sampling Stations	i	Rudhi Basti		Date of Sampling		08.02.2024	22.02.2024	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	47.2	48.4	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	50.7	50.9					
3		08:00 - 09:00	51.9	53.3					
4		09:00 - 10:00	48	48.7					
5		10:00 - 11:00	53.3	53.7					
6		11:00 - 12:00	57.2	56.4					
7		12:00 - 13:00	55	55.5					
8		13:00 - 14:00	56.4	57					
9		14:00 - 15:00	58.5	57.7					
10		15:00 - 16:00	60.9	61.2					
11		16:00 - 17:00	56.1	55.9					
12		17:00 - 18:00	53.4	53.7					
13		18:00 - 19:00	47.2	48.4					
14		19:00 - 20:00	47.8	48					
15		20:00 - 21:00	45.2	46.1					
16		21:00 - 22:00	45.1	45.2					
		Leq Day	54.6	54.7					
1	Noise Level dB(A) Leq - Night	22:00-23:00	44.4	45.2	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 65 45 50
2		23:00-00:00	44.5	45.1					
3		00:00-01:00	43.9	44					
4		01:00-02:00	43.9	43.5					
5		02:00-03:00	43.5	43.3					
6		03:00-04:00	43.7	44.9					
7		04:00-05:00	43.8	44.8					
8		05:00-06:00	43.9	44.8					
		Leq Night	44.0	44.5					

**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
(Gaurav Kant)
REVIEWED BY

Raj Mishra
(Amit)
Raj Mishra
Authorised 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



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: rdri2cmpdi@coalindia.in

Month & Year	02/2024	Cluster	Cluster XII					ULR No.	TC1012224000000622F
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bcl@coalindia.in)							Date of Issue	30.03.2024
Project			Sample Ref. No.		REM/BCCL/2024/02		Sampling Method		CMPDI/RI-II/LPM 22
Sampling Stations	1	Block IV		Date of Sampling		07.02.2024	19.02.2024	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	56.4	55	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	60.7	59.6					
3		08:00 - 09:00	61.6	60.6					
4		09:00 - 10:00	65.2	64.4					
5		10:00 - 11:00	64.8	63.7					
6		11:00 - 12:00	66.1	65.5					
7		12:00 - 13:00	65.7	64.4					
8		13:00 - 14:00	66	66.7					
9		14:00 - 15:00	66.4	65.4					
10		15:00 - 16:00	69.5	67.6					
11		16:00 - 17:00	70.2	70					
12		17:00 - 18:00	71.1	70.9					
13		18:00 - 19:00	69.8	67.6					
14		19:00 - 20:00	69.4	68.6					
15		20:00 - 21:00	62.5	61.5					
16		21:00 - 22:00	55.3	53.7					
		Leq Day	66.9	66.1					
1	Noise Level dB(A)Leq - Night	22:00-23:00	53	51.6	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	52.2	49.9					
3		00:00- 01:00	50.4	49.3					
4		01:00-02:00	45.1	45.4					
5		02:00-03:00	44.7	44.9					
6		03:00-04:00	47.9	46.3					
7		04:00-05:00	46	45.3					
8		05:00-06:00	46.3	47.4					
		Leq Night	49.3	48.2					

**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)
REVIEWED BY

(Amit Raj Mishra)
Authorised 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



cmpdi
A Min-Rohm Company

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

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

Month & Year	02/2024	Cluster	Cluster XII					ULR No.	TC1012224000000622F	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bcd@coalindia.in)								Date of Issue	30.03.2024
Project		Sample Ref. No.	REM/BCCL/2024/02			Sampling Method	CMPDI/RI-II/LPM 22			
Sampling Stations	i	Moonidih UGP		Date of Sampling	03.02.2024	24.02.2024	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	53	53.7	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	48.4	49.2						
3		08:00 - 09:00	56.4	58						
4		09:00 - 10:00	54.3	51.8						
5		10:00 - 11:00	57.6	56.5						
6		11:00 - 12:00	61.1	61.9						
7		12:00 - 13:00	59.1	58.7						
8		13:00 - 14:00	60.9	59.8						
9		14:00 - 15:00	56.9	56.5						
10		15:00 - 16:00	55	54.3						
11		16:00 - 17:00	54.6	54.8						
12		17:00 - 18:00	54.1	54.8						
13		18:00 - 19:00	53.3	53.7						
14		19:00 - 20:00	53.9	53.6						
15		20:00 - 21:00	52.4	52.2						
16		21:00 - 22:00	51.9	52.1						
		Leq Day	56.4	56.3						
1	Noise Level dB(A)Leq - Night	22:00-23:00	47.9	47.9	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	47.4	47.6						
3		00:00-01:00	46.5	47.6						
4		01:00-02:00	45.5	46.3						
5		02:00-03:00	45.3	45.4						
6		03:00-04:00	45.3	45.5						
7		04:00-05:00	47	47.1						
8		05:00-06:00	47.4	47.6						
		Leq Night	46.6	47.0						

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

Sampling Assistants	 (Gaurav Kant) REVIEWED BY	 (Amit Raj Mishra) Authorised Signature
ANALYSED BY		

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

  cmpdi <i>A Mine Safety Company</i>										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: rdri2cmpdi@coalindia.in	
Month & Year	02/2024	Cluster	Cluster XII					ULR No.	TC1012224000000622F						
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bcl@coalindia.in)							Date of Issue	30.03.2024						
Project		Sample Ref. No.	REM/BCCL/2024/02			Sampling Method	CMPDI/RI-II/LPM 22								
Sampling Stations	i	Murlidih(20/21)	Date of Sampling		08.02.2024	22.02.2024	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	51.1	50.9	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	51.2	51.4											
3		08:00 - 09:00	53.3	54.3											
4		09:00 - 10:00	52.5	53.5											
5		10:00 - 11:00	55.6	55.6											
6		11:00 - 12:00	56	55.7											
7		12:00 - 13:00	57.6	58.6											
8		13:00 - 14:00	58	58.1											
9		14:00 - 15:00	58.4	58.6											
10		15:00 - 16:00	59.7	60.8											
11		16:00 - 17:00	59.5	59											
12		17:00 - 18:00	57	57											
13		18:00 - 19:00	53.5	54.3											
14		19:00 - 20:00	53.2	53.5											
15		20:00 - 21:00	52.1	52.1											
16		21:00 - 22:00	51.9	51.8											
		Leq Day	56.0	56.3											
1	Noise Level dB(A)Leq - Night	22:00-23:00	40.5	40.7	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	40.1	40.6											
3		00:00-01:00	39.8	40.3											
4		01:00-02:00	39.7	40.2											
5		02:00-03:00	39.6	39.8											
6		03:00-04:00	40.1	39.6											
7		04:00-05:00	40.3	40.1											
8		05:00-06:00	40.5	40.2											
		Leq Night	40.1	40.2											
<i>**All noise measurements are integrated for a 01 hour period. All units in dB(A) *LDL Indicates Lower Detection Limit</i>															
Sampling Assistants		(Gaurav Kant)		(Amit Raj Mishra)											
ANALYSED BY		REVIEWED BY		Authorised 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 HQD(Env), CMPDI, RI-II.															
----- End of Report ----- Page -1 of 1															

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 Improved west and Gaeke method 2 Ultraviolet fluorescence
	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 Chemiluminescence

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.

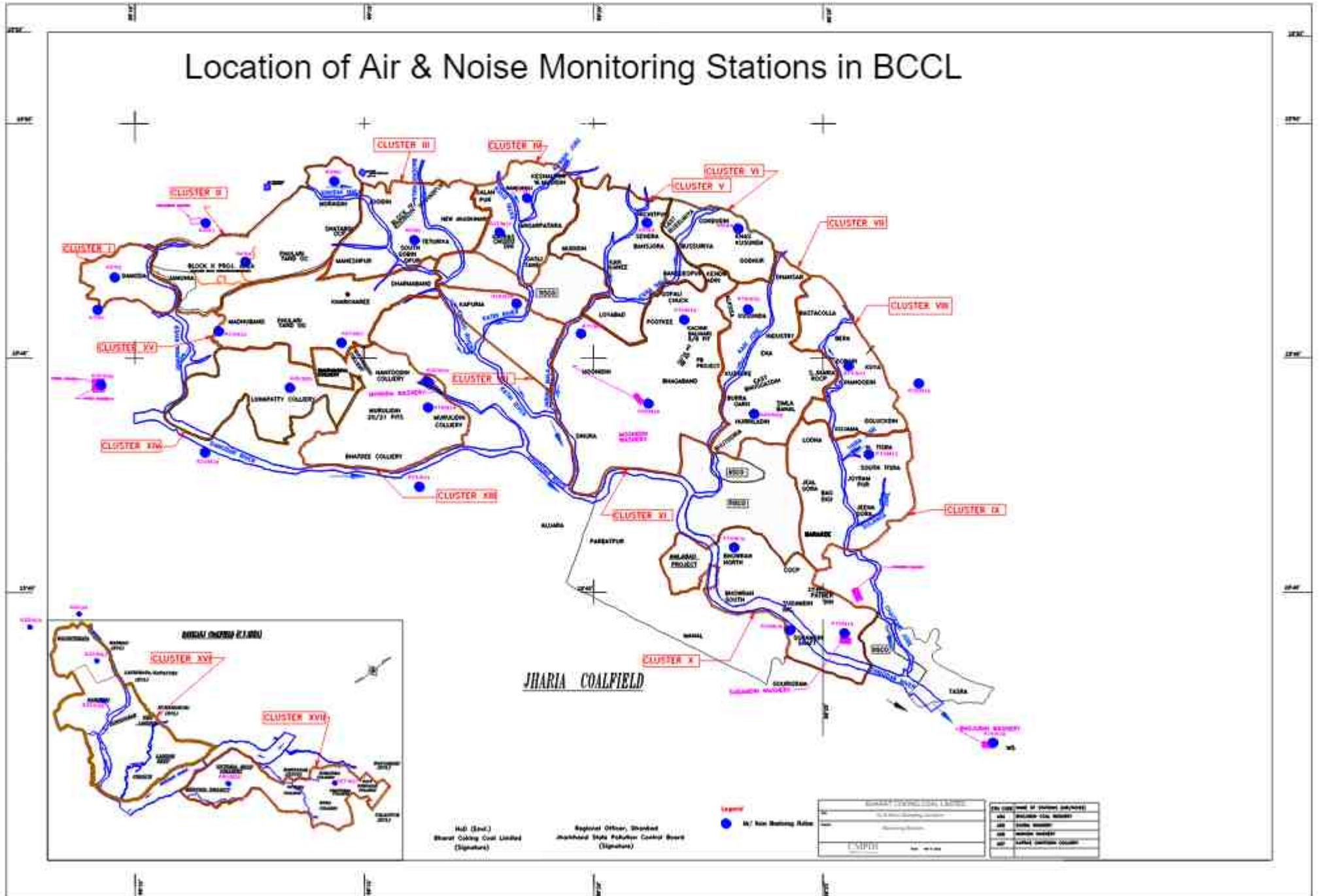
Pollutant	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
		Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO ₂), µg/m ³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogen dioxide (NO ₂), µg/m ³	Annual * 24 Hours **	40 80	30 80	-Jacob & Hochheiser modified (NaOH-NaAsO ₂) Method -Gas Phase Chemiluminescence
Particulate Matter (Size less than 10µm) or PM ₁₀ , µg/m ³	Annual * 24 Hours **	60 100	60 100	-Gravimetric -TEOM -Beta attenuation
Particulate Matter (Size less than 2.5µm) or PM _{2.5} , µg/m ³	Annual * 24 Hours **	40 60	40 60	-Gravimetric -TEOM -Beta attenuation
Ozone (O ₃), µg/m ³	8 Hours * 1 Hour **	100 180	100 180	-UV Photometric -Chemiluminescence -Chemical Method
Lead (Pb), µg/m ³	Annual * 24 Hours **	0.50 1.0	0.50 1.0	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper -ED-XRF using Teflon filter
Carbon Monoxide (CO), mg/m ³	8 Hours ** 1 Hour **	02 04	02 04	-Non dispersive Infrared (NDIR) Spectroscopy
Ammonia (NH ₃), µg/m ³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C ₆ H ₆), µg/m ³	Annual *	05	05	-Gas Chromatography (GC) based continuous analyzer -Adsorption and desorption followed by GC analysis
Benzo(a)Pyrene (BaP) Particulate phase only, ng/m ³	Annual *	01	01	-Solvent extraction followed by HPLC/GC analysis
Arsenic (As), ng/m ³	Annual *	06	06	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel (Ni), ng/m ³	Annual *	20	20	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

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

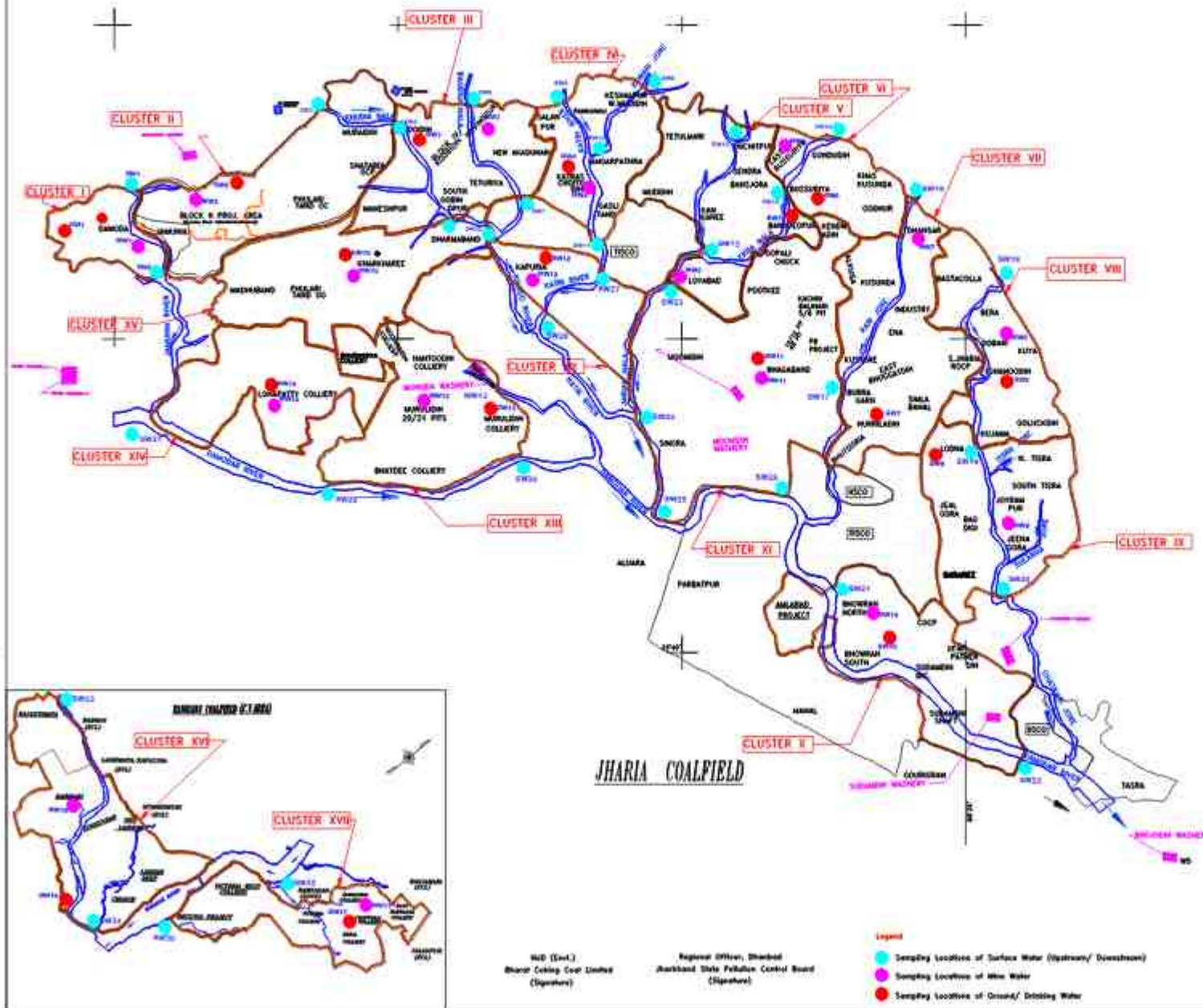
** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they JUNE exceed the limits but not on two consecutive days of monitoring.

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

Sl. No.	Cluster	Water Type	Location	Sample No.	Sample Date
1	CLUSTER I	Surface Water	Block 6 Prol Area	SW1	2014-01-10
2	CLUSTER II	Surface Water	Block 6 Prol Area	SW2	2014-01-10
3	CLUSTER III	Surface Water	Block 6 Prol Area	SW3	2014-01-10
4	CLUSTER IV	Surface Water	Block 6 Prol Area	SW4	2014-01-10
5	CLUSTER V	Surface Water	Block 6 Prol Area	SW5	2014-01-10
6	CLUSTER VI	Surface Water	Block 6 Prol Area	SW6	2014-01-10
7	CLUSTER VII	Surface Water	Block 6 Prol Area	SW7	2014-01-10
8	CLUSTER VIII	Surface Water	Block 6 Prol Area	SW8	2014-01-10
9	CLUSTER IX	Surface Water	Block 6 Prol Area	SW9	2014-01-10
10	CLUSTER X	Surface Water	Block 6 Prol Area	SW10	2014-01-10
11	CLUSTER XI	Surface Water	Block 6 Prol Area	SW11	2014-01-10
12	CLUSTER XII	Surface Water	Block 6 Prol Area	SW12	2014-01-10
13	CLUSTER XIII	Surface Water	Block 6 Prol Area	SW13	2014-01-10
14	CLUSTER XIV	Surface Water	Block 6 Prol Area	SW14	2014-01-10
15	CLUSTER XV	Surface Water	Block 6 Prol Area	SW15	2014-01-10
16	CLUSTER XVI	Surface Water	Block 6 Prol Area	SW16	2014-01-10
17	CLUSTER XVII	Surface Water	Block 6 Prol Area	SW17	2014-01-10

MD (Env.)
Bharat Coking Coal Limited
(Signature)

Regional Officer, Bhadrak
Bharat Coking Coal Limited
(Signature)

Legend
Sampling locations of Surface Water (Rivers/Lakes/Streams)
Sampling locations of Mine Water
Sampling locations of Ground/Drilling Water

JHARIA COALFIELD	
DATE	2014-01-10
TIME	10:00 AM
LOCATION	Block 6 Prol Area
CLUSTER	CLUSTER I
SAMPLE NO.	SW1
SAMPLE DATE	2014-01-10

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 MARCH, 2024)

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



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

CONTENTS

SL. NO.	CHAPTER	PARTICULARS	PAGE NO.
1.	CHAPTER - I	EXECUTIVE SUMMARY	3-5
2.	CHAPTER-II	INTRODUCTION	6
3.	CHAPTER-III	RESULTS	7-18
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 ($\text{PM}_{2.5}$ sampler) were used for sampling of PM_{10} , SO_2 , & NO_x and Fine Dust Sampler ($\text{PM}_{2.5}$ sampler) were used for sampling of $\text{PM}_{2.5}$ at 24 hours interval once in a fortnight and the same for the gaseous pollutants. The samples were analysed in Environmental Laboratory of CMPDI, RI-II, Dhanbad.

3.2 Water quality

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

3.3 Noise level monitoring

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

4.0 Results and interpretations

4.1 Air quality

It has been seen from the analysis results that the 24 hours average concentration parameters like PM_{10} , $\text{PM}_{2.5}$, SO_2 and NO_x are mostly within the permissible limits in all sampling locations as per MoEF&CC Gazette Notification No. GSR 742(E) dt 25.09.2000 Standards for Coal Mines and National Ambient Air Quality Standard -2009. Sometimes the concentration of PM_{10} & $\text{PM}_{2.5}$ 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 $23^{\circ} 45' 26.60''$ N & $86^{\circ} 18' 39.90''$ 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 $23^{\circ} 47' 54.00''$ N & $86^{\circ} 16' 20.00''$ 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 $23^{\circ} 44' 30.00''$ N & $86^{\circ} 20' 56.00''$ 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 $23^{\circ} 43' 51.82''$ N & $86^{\circ} 16' 21.87''$ E. The samplers were placed at a height of approx. 1.5m above ground level at project office.

AMBIENT AIR QUALITY DATA



cmpdi
A Mine Rules Company

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		03/2024	Cluster	Cluster XII			ULR No.	TC1012224000000642F
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	14.05.2024
Project		Rudhi Basti	Sample Ref. No.	REM/BCCL/2024/03	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		01.03.2024	16.03.2024	Period of Analysis	01.03.2024	15.04.2024	Zone of Station:	Core 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	69	67	90	92	90	92
2	PM _{2.5}	IS -5182(Part 24):2019	35	30	37	45	37	45
3	SO ₂	IS-5182(Part-2): 2001 , R-2017	<10	<10	<10	<10	<10	<10
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017	21	20	21	22	21	22

* LDL indicates Lower Detection Limit,

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

[Signature]

ANALYSED BY

[Signature]

(Gaurav Kant)
REVIEWED BY

[Signature]

(Amit Raj Mishra)
Authorised Signature

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

---- End of Report ----

Page -1 of 1



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

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

Test Report for Ambient Air Samples

Month & Year		03/2024	Cluster	Cluster XII			ULR No.	TC1012224000000642F
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	14.05.2024
Project		Block IV	Sample Ref. No.	REM/BCCL/2024/03		Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		12.03.2024	26.03.2024	Period of Analysis	12.03.2024	15.04.2024	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	94	78	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	55	49	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	11	11	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	29	28	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,

[Signature]
 ANALYSED BY

[Signature]
 (Gaurav Kant)
 REVIEWED BY

[Signature]
 (Amit Raj Mishra)
 Authorised 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



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

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

Test Report for Ambient Air Samples

Month & Year		03/2024	Cluster	Cluster XII			ULR No.	TC1012224000000642F
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	14.05.2024
Project		Moonidih UGP		Sample Ref. No.	REM/BCCL/2024/03	Sampling Method	CMPDI/RI-II/LPM 13, (IS 5182)	
Date of Sampling		08.03.2024		21.03.2024	Period of Analysis	08.03.2024	15.04.2024	Zone of Station: Buffer Zone
Sl. No.	Parameter	Method of Analysis	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	112	72	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	59	39	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	29	31	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.

[Signature]
 ANALYSED BY

[Signature]
 (Gaurav Kant)
 REVIEWED BY

[Signature]
 (Amit Raj Mishra)
 Authorised 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



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

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

Test Report for Ambient Air Samples

Month & Year		03/2024	Cluster	Cluster XII			ULR No.	TC1012224000000642F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	14.05.2024	
Project		Murlidih 20/21 Pit		Sample Ref. No.	REM/BCCL/2024/03	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		15.03.2024		29.03.2024	Period of Analysis	15.03.2024	15.04.2024	Zone of Station:	Buffer Zone
Sl. No.	Parameter	Method of Analysis	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	81	80	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	27	28	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	31	30	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.

[Signature]
 ANALYSED BY

[Signature]
 (Gaurav Kant)
 REVIEWED BY

[Signature]
 (Amit Raj Mishra)
 Authorised Signature

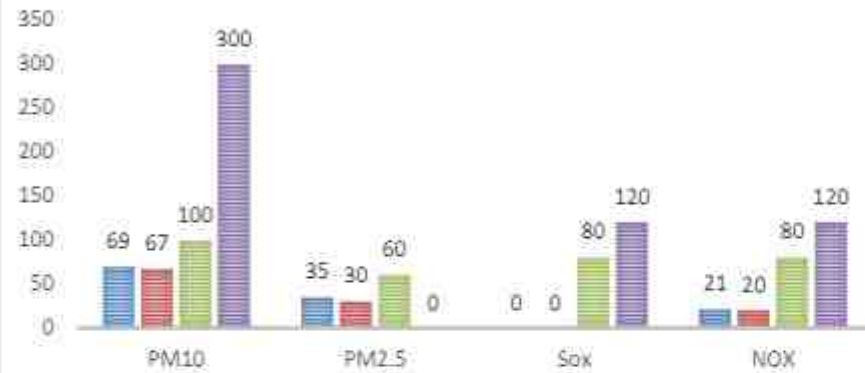
Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env), CMPDI, RI-II.

----- End of Report -----

Page -1 of 1

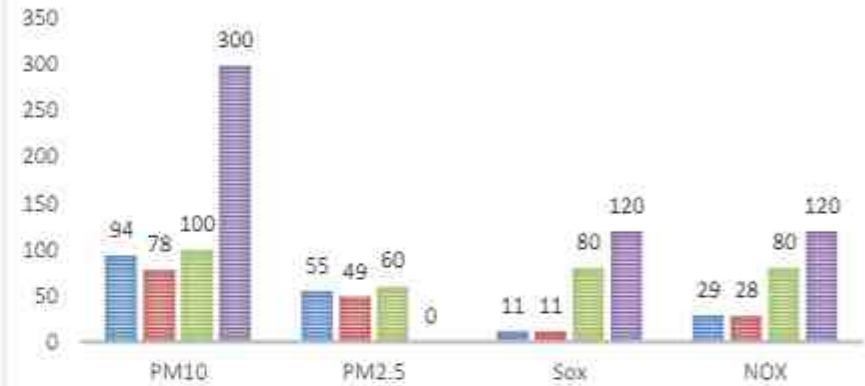
AMBIENT AIR QUALITY AT RUDHI BASTI

01.03.2024 16.03.2024 NAAQS GSR Standards



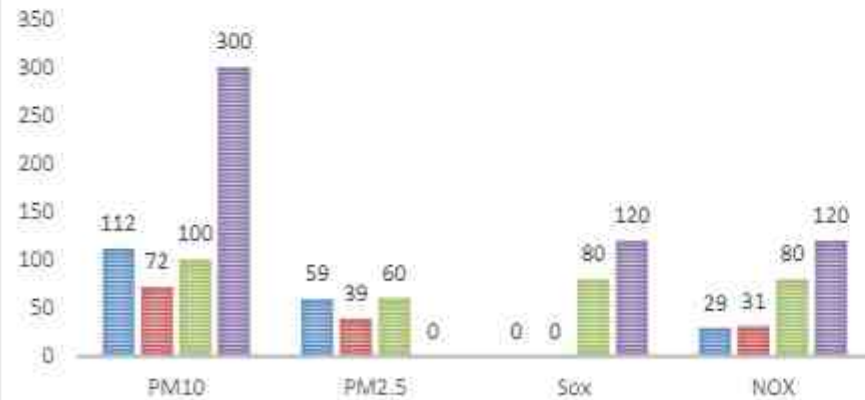
AMBIENT AIR QUALITY AT BLOCK IV

12.03.2024 26.03.2024 NAAQS GSR Standards



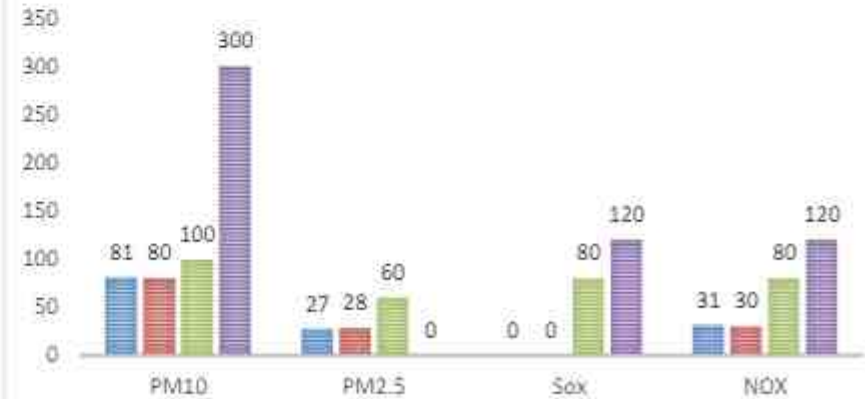
AMBIENT AIR QUALITY AT MOONIDIH UGP

08.03.2024 21.03.2024 NAAQS GSR Standards



AMBIENT AIR QUALITY AT MURLIDIH 20/21 PIT

15.03.2024 29.03.2024 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 during day time & night time. Noise levels were measured for the complete day & night time, the Intergration time taken was one hour or 3600 seconds. 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 & night time and the observed values were compared with standards prescribed by MoEF&CC. The results of Noise levels recorded during day & night time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{EQ} are presented. The observed values at all the monitoring locations are found to be within permissible limits.



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: rdri2cmpdi@coalindia.in

Month & Year	03/2024	Cluster	Cluster XII				ULR No.	TC1012224000000676F	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	14.05.2024	
Project			Sample Ref. No.	REM/BCCL/2024/03		Sampling Method		CMPDI/RI-II/LPM 22	
Sampling Stations	i	Rudhi Basti		Date of Sampling		01.03.2024	16.03.2024	Zone Category of Station:	Core 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	47.2	48.4	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	50.7	50.9					
3		08:00 - 09:00	51.9	53.3					
4		09:00 - 10:00	48	48.7					
5		10:00 - 11:00	53.3	53.8					
6		11:00 - 12:00	57.2	56.4					
7		12:00 - 13:00	55	55.4					
8		13:00 - 14:00	56.4	57					
9		14:00 - 15:00	58.6	57.7					
10		15:00 - 16:00	60.9	61.2					
11		16:00 - 17:00	56.1	55.8					
12		17:00 - 18:00	53.4	53.8					
13		18:00 - 19:00	47.2	48.4					
14		19:00 - 20:00	47.8	48					
15		20:00 - 21:00	45.2	46					
16		21:00 - 22:00	45.1	46.1					
		Leq Day	54.6	54.7					
1	Noise Level dB(A) Leq - Night	22:00-23:00	43.1	44	CPCB, Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 65 45 50
2		23:00-00:00	43.2	43.9					
3		00:00-01:00	42.6	42.7					
4		01:00-02:00	42.6	42.2					
5		02:00-03:00	42.2	42					
6		03:00-04:00	42.4	43.7					
7		04:00-05:00	42.5	43.6					
8		05:00-06:00	42.6	43.6					
		Leq Night	42.7	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)
 REVIEWED BY

(Amit Raj Mishra)
 Authorised 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



cmpdi
A Mine Safety Company

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: rdri2cmpdi@coalindia.in

Month & Year	03/2024	Cluster	Cluster XII	ULR No.	TC1012224000000676F				
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bcd@coalindia.in)				Date of Issue	14.05.2024			
Project		Sample Ref. No.	REM/BCCL/2024/03	Sampling Method	CMPDI/RI-II/LPM 22				
Sampling Stations	i	Block IV	Date of Sampling	12.03.2024	26.03.2024	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	56.4	55	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	60.7	59.6					
3		08:00 - 09:00	61.6	60.6					
4		09:00 - 10:00	65.2	64.3					
5		10:00 - 11:00	64.7	63.7					
6		11:00 - 12:00	66.1	65.5					
7		12:00 - 13:00	65.7	64.3					
8		13:00 - 14:00	66	66.7					
9		14:00 - 15:00	66.4	65.4					
10		15:00 - 16:00	69.4	67.6					
11		16:00 - 17:00	70.2	70					
12		17:00 - 18:00	71.1	70.9					
13		18:00 - 19:00	69.8	67.6					
14		19:00 - 20:00	69.3	68.6					
15		20:00 - 21:00	62.5	61.5					
16		21:00 - 22:00	55.3	53.8					
		Leq Day	66.9	66.1					
1	Noise Level dB(A) Leq - Night	22:00-23:00	51.6	50.2	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	50.8	48.6					
3		00:00-01:00	49	48					
4		01:00-02:00	43.9	44.2					
5		02:00-03:00	43.5	43.7					
6		03:00-04:00	45.6	45					
7		04:00-05:00	44.7	44.1					
8		05:00-06:00	45	46					
		Leq Night	47.9	46.8					

**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) REVIEWED BY	 (Amit Raj Mishra) Authorised 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



cmpdi
A Mine Safety Company

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: rdri2cmpdi@coalindia.in

Month & Year	03/2024	Cluster	Cluster XII				ULR No.	TC1012224000000676F	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	14.05.2024	
Project		Sample Ref. No.	REM/BCCL/2024/03		Sampling Method	CMPDI/RI-II/LPM 22			
Sampling Stations	I	Moonidih UGP		Date of Sampling	08.03.2024	21.03.2024	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	53	53.8	CPCB Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	48.4	49.3					
3		08:00 - 09:00	56.4	58					
4		09:00 - 10:00	54.4	51.8					
5		10:00 - 11:00	57.6	56.5					
6		11:00 - 12:00	61.1	61.9					
7		12:00 - 13:00	59.1	58.8					
8		13:00 - 14:00	60.9	59.8					
9		14:00 - 15:00	56.9	56.5					
10		15:00 - 16:00	55	54.4					
11		16:00 - 17:00	54.6	54.8					
12		17:00 - 18:00	54.2	54.8					
13		18:00 - 19:00	53.3	53.8					
14		19:00 - 20:00	54	53.6					
15		20:00 - 21:00	52.4	52.2					
16		21:00 - 22:00	51.9	52.1					
		Leq Day	56.4	56.4					
1	Noise Level dB(A)Leq - Night	22:00-23:00	46.6	46.6	CPCB Protocol for Ambient Level Noise Monitoring - 2015	55 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00-00:00	46	46.2					
3		00:00-01:00	45.2	46.2					
4		01:00-02:00	44.3	45					
5		02:00-03:00	44.1	44.2					
6		03:00-04:00	44.1	44.3					
7		04:00-05:00	45.6	45.7					
8		05:00-06:00	46	46.2					
		Leq Night	45.3	45.6					

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

Sampling Assistants	 (Gaurev Kant) REVIEWED BY	 (Amit Raj Mishra) Authorised Signature
---------------------	---	--

ANALYSED BY

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



cmpdi
A Mini Ratna Company

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: rdri2cmpdi@coalindia.in

Month & Year	03/2024	Cluster	Cluster XII					ULR No.	TC1012224000000676F
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	14.05.2024
Project			Sample Ref. No.	REM/BCCL/2024/03		Sampling Method		CMPDI/RI-II/LPM 22	
Sampling Stations	1	Murlidih(20/21)		Date of Sampling		15.03.2024	29.03.2024	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	51	50.9	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	51.1	51.3					
3		08:00 - 09:00	53.3	54.4					
4		09:00 - 10:00	52.5	53.5					
5		10:00 - 11:00	55.5	55.5					
6		11:00 - 12:00	56	55.6					
7		12:00 - 13:00	57.6	58.7					
8		13:00 - 14:00	58	58.1					
9		14:00 - 15:00	58.5	58.7					
10		15:00 - 16:00	59.7	60.8					
11		16:00 - 17:00	59.5	59					
12		17:00 - 18:00	57	57					
13		18:00 - 19:00	53.5	54.4					
14		19:00 - 20:00	53.2	53.5					
15		20:00 - 21:00	52.1	52.1					
16		21:00 - 22:00	51.9	51.8					
		Leq Day	56.0	56.4					
1	Noise Level dB(A)Leq -Night	22:00-23:00	39.4	39.6	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	39	39.5					
3		00:00- 01:00	38.7	39.2					
4		01:00-02:00	38.6	39.1					
5		02:00-03:00	38.5	38.7					
6		03:00-04:00	39	38.5					
7		04:00-05:00	39.2	39					
8		05:00-06:00	39.4	39.1					
		Leq Night	39.0	39.1					

**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)
REVIEWED BY

(Amit Raj Mishra)
Authorised 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

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. Improved wet and Gaeke method 2. Ultraviolet fluorescence
	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 Chemiluminescence

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.

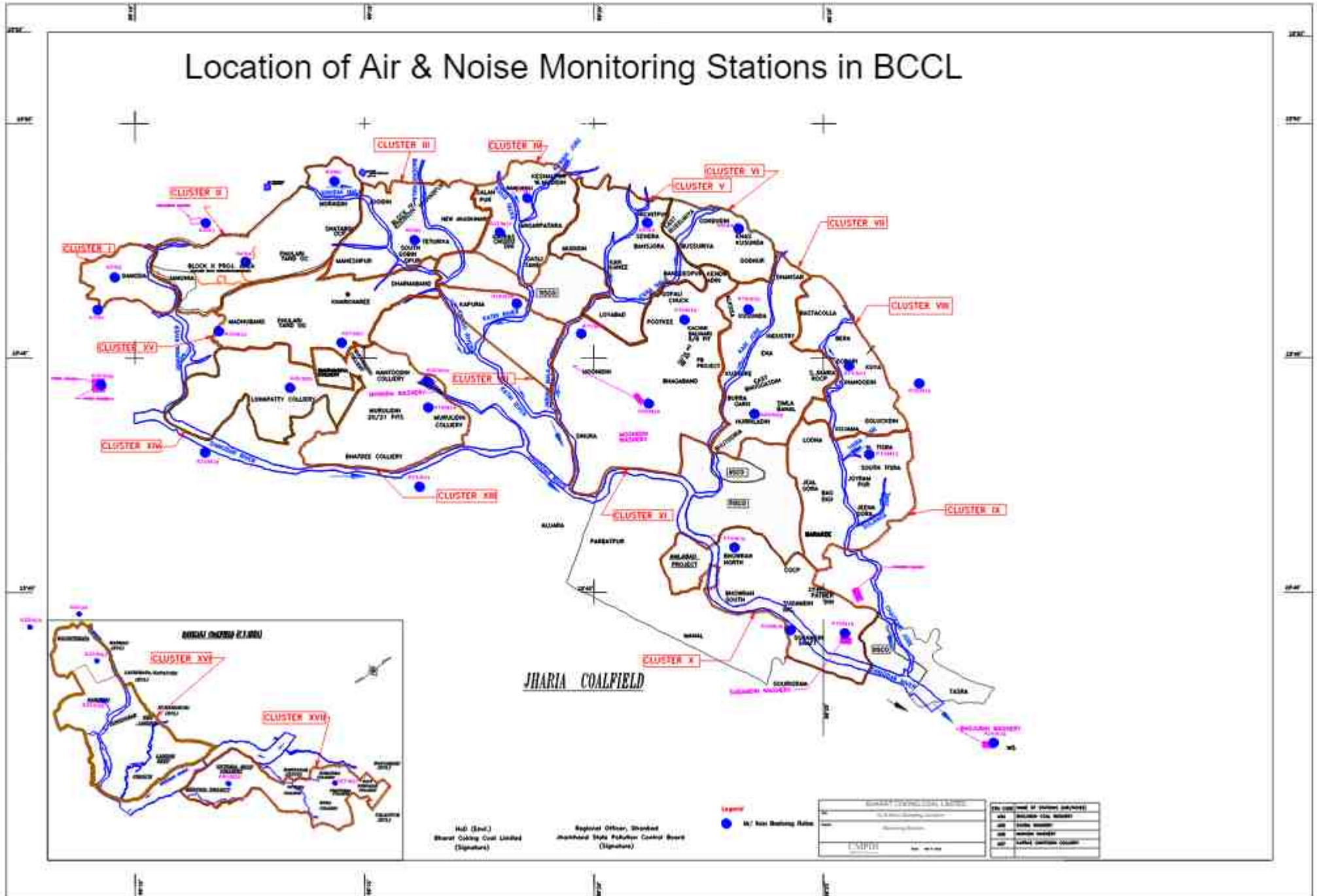
Pollutant	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
		Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO ₂), µg/m ³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogen dioxide (NO ₂), µg/m ³	Annual * 24 Hours **	40 80	30 80	-Jacob & Hochheiser modified (NaOH-NaAsO ₂) Method -Gas Phase Chemiluminescence
Particulate Matter (Size less than 10µm) or PM ₁₀ , µg/m ³	Annual * 24 Hours **	60 100	60 100	-Gravimetric -TEOM -Beta attenuation
Particulate Matter (Size less than 2.5µm) or PM _{2.5} , µg/m ³	Annual * 24 Hours **	40 60	40 60	-Gravimetric -TEOM -Beta attenuation
Ozone (O ₃), µg/m ³	8 Hours * 1 Hour **	100 180	100 180	-UV Photometric -Chemiluminescence -Chemical Method
Lead (Pb), µg/m ³	Annual * 24 Hours **	0.50 1.0	0.50 1.0	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper -ED-XRF using Teflon filter
Carbon Monoxide (CO), mg/m ³	8 Hours ** 1 Hour **	02 04	02 04	-Non dispersive Infrared (NDIR) Spectroscopy
Ammonia (NH ₃), µg/m ³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C ₆ H ₆), µg/m ³	Annual *	05	05	-Gas Chromatography (GC) based continuous analyzer -Adsorption and desorption followed by GC analysis
Benzo(a)Pyrene (BaP) Particulate phase only, ng/m ³	Annual *	01	01	-Solvent extraction followed by HPLC/GC analysis
Arsenic (As), ng/m ³	Annual *	06	06	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel (Ni), ng/m ³	Annual *	20	20	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

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

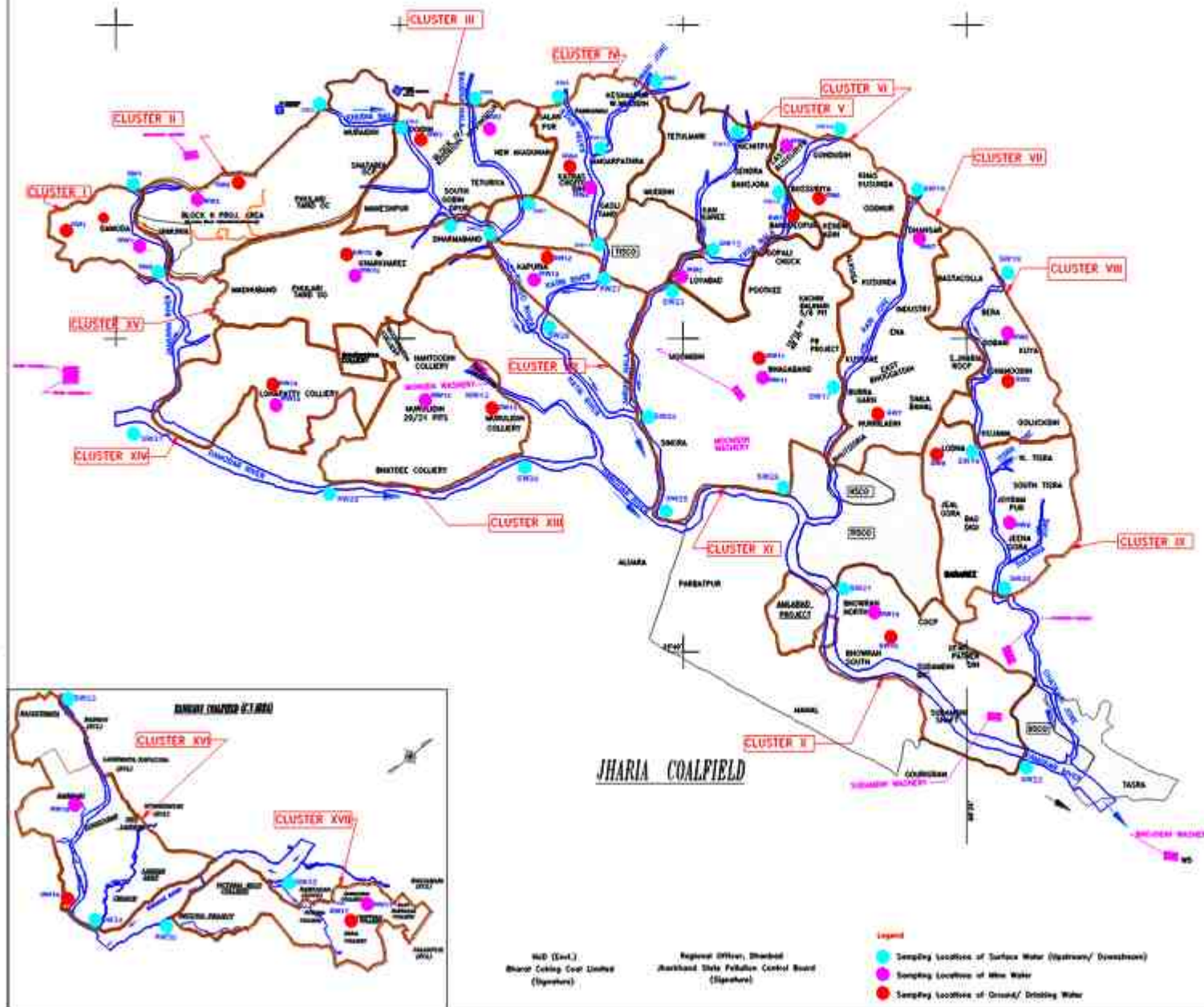
** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

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

Location of Air & Noise Monitoring Stations in BCCL



Water Sampling Locations in BCCL



INDEX

Sl. No.	Cluster	Location	Water Type	Sampling Date	Remarks
1	CLUSTER I	Block 6 Prol Area	Surface Water	20/11/2017	
2	CLUSTER II	Block 6 Prol Area	Surface Water	20/11/2017	
3	CLUSTER III	Block 6 Prol Area	Surface Water	20/11/2017	
4	CLUSTER IV	Block 6 Prol Area	Surface Water	20/11/2017	
5	CLUSTER V	Block 6 Prol Area	Surface Water	20/11/2017	
6	CLUSTER VI	Block 6 Prol Area	Surface Water	20/11/2017	
7	CLUSTER VII	Block 6 Prol Area	Surface Water	20/11/2017	
8	CLUSTER VIII	Block 6 Prol Area	Surface Water	20/11/2017	
9	CLUSTER IX	Block 6 Prol Area	Surface Water	20/11/2017	
10	CLUSTER X	Block 6 Prol Area	Surface Water	20/11/2017	
11	CLUSTER XI	Block 6 Prol Area	Surface Water	20/11/2017	
12	CLUSTER XII	Block 6 Prol Area	Surface Water	20/11/2017	
13	CLUSTER XIII	Block 6 Prol Area	Surface Water	20/11/2017	
14	CLUSTER XIV	Block 6 Prol Area	Surface Water	20/11/2017	
15	CLUSTER XV	Block 6 Prol Area	Surface Water	20/11/2017	
16	CLUSTER XVI	Block 6 Prol Area	Surface Water	20/11/2017	
17	CLUSTER XVII	Block 6 Prol Area	Surface Water	20/11/2017	

MD (Env.)
Bharat Coking Coal Limited
(Signature)

Regional Officer, Bhadrak
Bharat Coking Coal Limited
(Signature)

Legend
Sampling locations of Surface Water (Rivers/Lakes/Streams)
Sampling locations of Mine Water
Sampling locations of Ground/Drilling Water

Project	JHARIA COALFIELD
Report No.	BCCL/Env/2017/001
Date	20/11/2017
Page	1 of 1

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.

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

(FOR THE Q.E. DEC 2023)

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. DEC 2023)

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

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.

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

(FOR THE Q.E. DEC 2023)

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



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

EXECUTIVE SUMMARY

1.0 Introduction

The purpose of environmental monitoring is to assess the quality of various attributes that affects the 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.**

.....

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
GROUND WATER ANALYSIS TEST REPORT

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

Month & Year		QUARTER ENDING DEC 2023		Cluster		CLUSTERXII					ULR No.		TC1013423000000 454P		
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)										Date of Issue		11.03.2024	
Project		Kapuria				Sample Ref. No.		REM/BCCL/23-24/GW/03			Sampling Method		CMPDI/RI-II/LPM 13,(IS 3025:Part -1)		
Sampling Stations		GW12		Date of Sampling		20.11.2023									
				Period of Analysis				20.11.2023		to		09.01.2024			
Sl. No.	Parameter	Method of Analysis		Observed Values							IS 10500: 2012				
				GW12 G0080		Range Of Testing		LDL		Acceptable Limit (Max)*		Permissible Limit in the Absence of Alternate Source (Max)			
1	Colour, Hazen unit	APHA, 24 th Edition ,2120-c-Spectrophotometric Single Wavelength Method ,2023		3		1-500.0		1		5		15			
2	Calcium, mg/l	IS 3025, (Part 40): 1991 R:2019,AAS-Flame Method & EDTA Method		52		2.0-800.0		2		75		200			
3	Chlorides, mg/l	IS-3025(Part 32):1988, R-2019 , Argentometric Method		74		2.0-1500.0		5		250		1000			
4	Fluoride, mg/l	APHA, 24 th Edition, SPADNS Method,2023		0.53		0.2-2.00		0.2		1		1.5			
5	Iron, mg/l	IS 3025 (Part 53) : 2003, R: 2019 , AAS-Flame Method		<0.2		0.2-10		0.2		1		No relaxation			
6	Magnesium	APHA 24 th Edition, 3500-Mg B: Calculation Method,2023		93		6.0-700		6		30		100			
7	Nitrate , mg/l	APHA, 24 th Edition, UV-Spectrophotometric Method,2023		11.23		0.5-45.0		0.5		45		No relaxation			
8	Odour	APHA, 24 th Edition, , 2150-C,2023		Agreeable		Qualitative		Qualitative		Agreeable		Agreeable			
9	pH value	IS 3025, Part 11 : 1983 R 2023 Electrometric(pH Meter) Method		7.39		1-14		0.1		6.5-8.5		No relaxation			
10	Sulphate, mg/l	APHA ~24 th Edition, 4500 S , Turbidity Method,2023		214		10.0-400.0		10		200		400			
11	Taste	APHA,24 th Edition, 2160-C , 2023		Acceptable		Qualitative		Qualitative		Acceptable		Agreeable			
12	Total Alkalinity (CaCO ₃), mg/l, Max	IS 3025, Part 23: 1986 R 2019 Titration Method		500		4.0-2000.0		4		200		600			
13	Total Dissolved Solids, mg/l	IS 3025, Part 16: 1984 R 2023 Gravimetric method		801		25.0-5000.0		25		500		2000			
14	Total Hardness, mg/l	IS 3025, (Part 21): 2019 EDTA Method		461		4.0-2000.0		4		200		600			
15	Turbidity, NTU	IS 3025, (Part 10):1984, R-2023 Nephelometric/Turbiditimetric Method		2.5		1-800		0.1		1		5			
16	Zinc, mg/l	IS 3025(Part 49) : 1994,R:2019, AAS-Flame Method		<0.1		0.10 – 10.0		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,

ANALYSED BY

(Kumar Vaibhav)
REVIEWED BY

(Amit Raj Mishra)

AUTHORISED SIGNATORY

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.

Page -1 of 2

---- End of Report ----



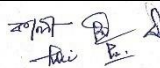
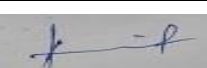
CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
GROUND WATER ANALYSIS TEST REPORT

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

Month & Year	QUARTER ENDING DEC 2023		Cluster	CLUSTER XII			Report No.	RI-2/GW/23-24/QE/03
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	11.03.2024
Project	Kapuria			Sample Ref. No.	REM/BCCL/22-24/GW/	Sampling Method	CMPDI/RI-II/LPM 13,(IS 3025:Part -1)	
Sampling Stations	GW12		Date of Sampling	20.11.2023	Sample Collected in 5 Ltr Jerricane , Color as observed is transparent			
				Period of Analysis		20.11.2023	to	09.01.2024
Sl. No.	Parameter	Method of Analysis	Observed Values			IS 10500: 2012		
			GW12 G0080	Range Of Testing	LDL	Acceptable Limit (Max)*		Permissible Limit in the Absence of Alternate Source (Max)
1	Boron (as B), mg/l, Max	APHA, 24 th d Edition ,Carminc,2023	<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, 24th edition, AAS-GTA	<0.01	0.20-10.0	0.01	0.05	1.5	
3	Free Residual Chlorine, mg/l, Min	APHA, 24 th Edition, , 4500-Cl-B. (Iodometric Method-I),2023	<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, 24th edition, AAS-GTA	<0.005	0.005-10	0.005	0.01	No relaxation	
5	Phenolic compounds (as C6H5OH), mg/l, Max	APHA, 24 th Edition,4-Amino Autipyrine	<0.001	0.001-10	0.001	0.002	0.002	
6	Selenium, mg/l, Max	APHA 24 th Edition IS-3025,part 56:2003, R-2019/, AAS-VGA,2023	<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 24th 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, 24 th Edition, AAS-GTA,2023	<0.01	0.10-10.0	0.01	0.05	No relaxation	
9	Nickel as Ni, mg/l Max	IS 3025 Part 54 : 2003,R : 2019, AAS-Flame APHA, 24 th Edition, AAS-GTA,2023	<0.005	0.10-10	0.005	0.02	No relaxation	
10	Manganese as Mn, mg/l, Max	IS 3025(Part 59) : 2006,R:2019, AAS-Flame Method	0.14	0.10-10.0	0.02	0.1	0.3	

***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,

 ANALYSED BY	 (Kumar Vaibhav) REVIEWED BY	 (Amit Raj Mishra) AUTHORISED SIGNATORY
---	---	--

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



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

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

Month & Year		QUARTE ENDI NG DEC 2023		Cluster		XII		ULR No.		TC1016623000000 486P TC1016723000000 487P		
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue		11.03.2024	
Project		Sample Ref. No.				REM/BCCL/23-24/SW /		Sampling Method		(IS 3025 , Part-1) CMPDI/RI-II/LPM 13		
Sampling Stations		(i)	Upstream in Katri River(SW27)			Date of Sampling		18.12.2023		Period of Analysis		
		(ii)	Downstream in Katri River(SW28)			Date of Sampling		18.12.2023		18.12.2023 to 09.01.2024		
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	2.00-100.00		2	
2	Colour,Hazen Units		APHA 24 th Edition , 2120-B-:2023			4	3	10	1-500.0		1	
3	Chlorides, mg/l		IS-3025(Part 32):1988, R-2019 Argentometric Method			68	60	600	2.0-1500.0		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			5.4	5.3	4	1.0-10.0		0.1	
6	Fluoride, mg/l		APHA, 24 th Edition, SPADNS Method,2023			0.44	0.81	1.5	0.2-2.00		0.2	
7	Hexavalent Chromium, mg/l		APHA 24 th Edition, 1,5-Diphenylcarbohydrazide Method IS 3025 (Part 52) : 2003,R-2023			<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			<0.2	<0.2	50	0.2-10		0.2	
9	Nitrate, mg/l		APHA, 24 th Edition, UV-Spectrophotometric Method,2023			3.77	3.86	50	0.5-45.0		0.5	
10	pH value		IS 3025, (Part 11) : 1983 R-2023 Electrometric (Ph Meter) method			7.12	7.19	6.5-8.5	1.0-14.0		2	
11	Sulphate, mg/l		APHA –24 th Edition,4500- S, Turbidity Method,2023			77	33	400	10.0-400.0		10	
12	Total Dissolved Solids, mg/l		IS 3025, (Part 16): 1984 R-2023 Gravimetric method			635	498	1500	25.0-10000.0		25	
13	Zinc, mg/l		IS 3025(Part 49) : 1994, R : 2019, AAS-Flame Method			<0.1	<0.1	15	0.10 – 10.0		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 Jerrycane , Color as observed is transparent**

(Kumar Vaibhav)

(Amit Raj Mishra)

Analysed by

REVIEWED BY

AUTHORISED SIGNATORY

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
A Mini Ratna Company

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

CMPDIL, RI-II
KOYLA BHAWAN COMPLEX
DHANBAD. -826005
Phone: 0326-223-850
email: rdri2.cmpdi@coalindia.in

Month & Year		QUARTE Ending DEC 2023		Cluster	XII			Report No.	RI-2/SW/23- 24/QE/03	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	11.03.2024
Project		Sample Ref. No.			REM/BCCL/23-24/SW /		Sampling Method	(IS 3025 , Part-1) CMPDI/RI-II/LPM 13		
Sampling Stations		(i)	Upstream in Katri River(SW27)			Date of Sampling		18.12.2023	Period of Analysis	
		(ii)	Downstream in Katri River(SW28)			Date of Sampling		18.12.2023	18.12.2023 to 09.01.2024	
Sl. No.	Paramet er	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 24 th Edition AAS-VGA		<0.006	<0.006	0.2	0.006-10	0.006		
2	Lead (as Pb), mg/l, Max	APHA, 24 th Edition, AAS- GTA		<0.005	<0.005	0.1	0.005-10	0.005		
3	Phenolic compounds (as C6H5OH), mg/l, Max	APHA, 24 th 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 24 th 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 Jerricane , Color as observed is transparent**


Kumar Vaibhav

(Kumar Vaibhav)


Amit Raj Mishra

(Amit Raj Mishra)

**Analysed
by**

REVIEWED BY

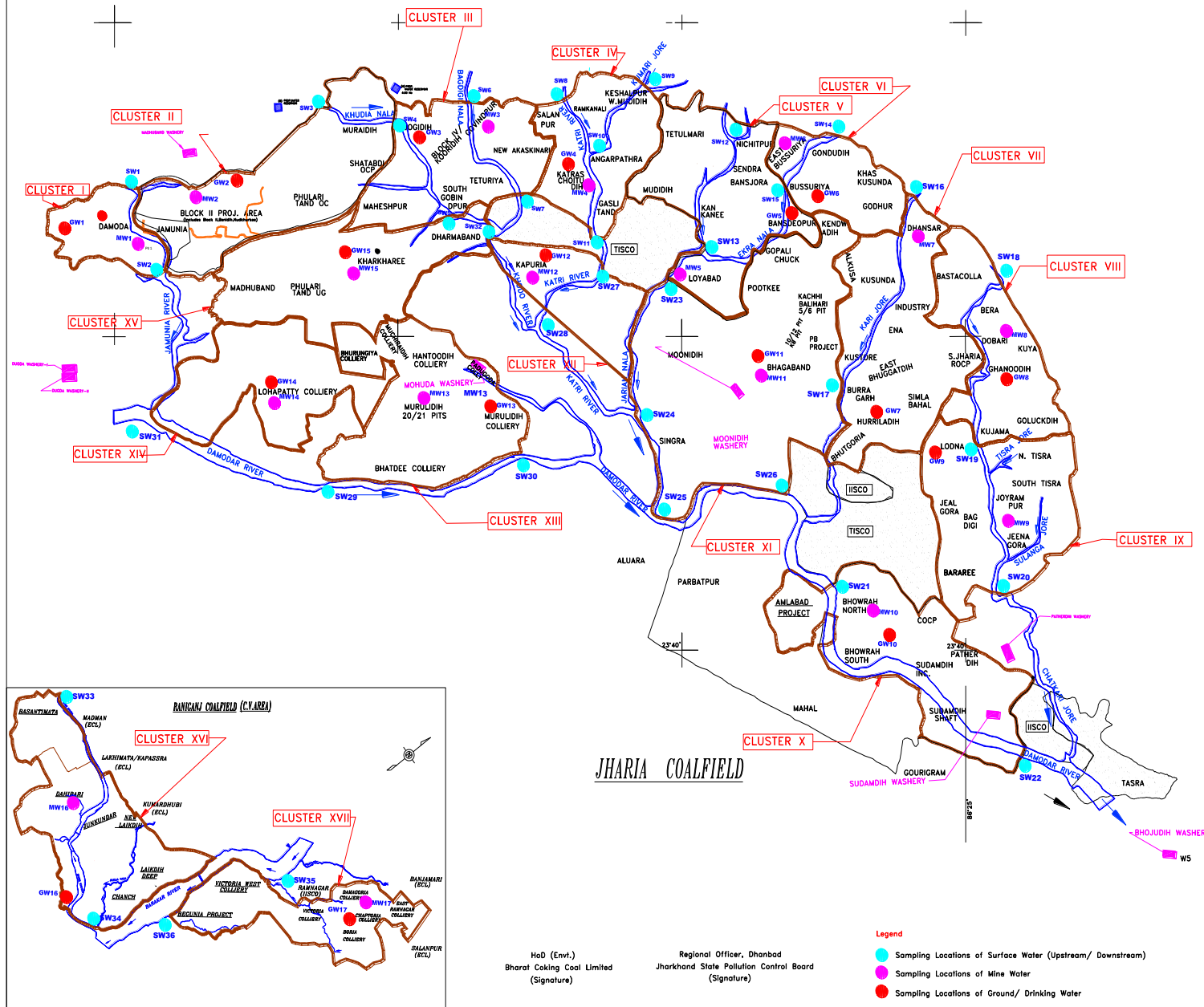
AUTHORISED SIGNATORY

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 -2of 2

Water Sampling Locations in BCCL



INDEX

Cluster	Surface Water (UIS, DIS)	Name of River/Nala/ Effluent Water	Miner Location	Sampling Location	Ground Water	Sampling Location
I	SW1, SW2	Jamuna River	MW1	Damoda Area Block II OCP	GW1	Shutway Village
II	SW3, SW4	Khudra Nala, Bagdigi Nala	MW2	Govindpur Colliery	GW2	Joyrampur Village
III	SW4, SW5, SW6, SW7	Kanti River, Kuntari Jore	MW3	Mudidi	GW3	Kankanee Village
IV	SW8, SW11, SW9, SW10	Janari Nala, Ekra Nala	MW4	Mudidi	GW4	Nichtpur
V	SW12, SW13, SW15	Ekra Nala	MW5	East Bessuria UGP	GW5	Banspora Borewell
VI	SW14, SW15	Kanti Jore	MW6	Dhansar UGP	GW6	Humliadi
VII	SW16, SW17	Kanti Jore	MW7	Dohari UGP	GW7	Ghanudih
VIII	SW18, SW19	Kanti Jore	MW8	Jeenagora	GW8	Lodna
IX	SW19, SW20	Kanti Jore	MW9	Showah North	GW9	Showah South
X	SW21, SW22	Damodar River	MW10	Bhagabandh UGP	GW10	Bhagabandh
XI	SW23, SW24, SW25, SW26	Kanti River	MW11	Kapurna	GW11	Kapurna
XII	SW27, SW28	Damodar River	MW12	Muridih (20/21)	GW12	Muridih
XIII	SW29, SW30	Damodar River	MW13	Lohapatti	GW13	Lohapatti
XIV	SW31, SW32	Khudra Nala	MW14	Dhansar UGP	GW14	Kharkharee
XV	SW33, SW34	Khudra Nala	MW15	Dohari UGP	GW15	Palsani Village
XVI	SW35, SW36	Barakar River	MW16	Damagone Colliery	GW16	Chaptoria
XVII	SW35, SW36	Barakar River	MW17		GW17	

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.

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

(FOR THE Q.E. MARCH 2024)

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. MAR 2024)

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

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.

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

(FOR THE Q.E. MARCH 2024)

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



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

EXECUTIVE SUMMARY

1.0 Introduction

The purpose of environmental monitoring is to assess the quality of various attributes that affects the 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.**

.....

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
GROUND WATER ANALYSIS TEST REPORT

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

Month & Year		QUARTER ENDING MARCH 2024		Cluster		CLUSTERXII					ULR No.		TC1012224000000 694P		
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)										Date of Issue		20.05.2024	
Project		Kapuria				Sample Ref. No.		REM/BCCL/23-24/GW/			Sampling Method		CMPDI/RI-II/LPM 13,(IS 3025:Part -1)		
Sampling Stations		GW12		Date of Sampling		12.02.2024									
				Period of Analysis				12.02.2024		TO		26.03.2024			
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, 24 th Edition, 2120-c-Spectrophotometric Single Wavelength Method, 2023		2		1-500.0		1		5		15			
2	Calcium, mg/l	IS 3025, (Part 40): 1991 R:2019,AAS-Flame Method & EDTA Method		32		2.0-800.0		2		75		200			
3	Chlorides, mg/l	IS-3025(Part 32):1988, R-2019, Argentometric Method		159		2.0-1500.0		5		250		1000			
4	Fluoride, mg/l	APHA, 24 th Edition, SPADNS Method, 2023		0.78		0.2-2.00		0.2		1		1.5			
5	Iron, mg/l	IS 3025 (Part 53) : 2003, R: 2019, AAS-Flame Method		<0.2		0.2-10		0.2		1		No relaxation			
6	Magnesium	APHA 24 th Edition, 3500-Mg B: Calculation Method, 2023		78		6.0-700		6		30		100			
7	Nitrate, mg/l	APHA, 24 th Edition, UV-Spectrophotometric Method, 2023		2.33		0.5-45.0		0.5		45		No relaxation			
8	Odour	APHA, 24 th Edition, 2150-C, 2023		Agreeable		Qualitative		Qualitative		Agreeable		Agreeable			
9	pH value	IS 3025, Part 11 : 1983 R 2023 Electrometric(pH Meter) Method		7.39		1-14		0.1		6.5-8.5		No relaxation			
10	Sulphate, mg/l	APHA -24 th Edition, 4500 S, Turbidity Method, 2023		126		10.0-400.0		10		200		400			
11	Taste	APHA, 24 th Edition, 2160-C, 2023		Acceptable		Qualitative		Qualitative		Acceptable		Agreeable			
12	Total Alkalinity (CaCO ₃), mg/l, Max	IS 3025, Part 23: 1986 R 2019 Titration Method		335		4.0-2000.0		4		200		600			
13	Total Dissolved Solids, mg/l	IS 3025, Part 16: 1984 R 2023 Gravimetric method		938		25.0-5000.0		25		500		2000			
14	Total Hardness, mg/l	IS 3025, (Part 21): 2019 EDTA Method		400		4.0-2000.0		4		200		600			
15	Turbidity, NTU	IS 3025, (Part 10):1984, R-2023 Nephelometric/Turbiditimetric Method		2.6		1-800		0.1		1		5			
16	Zinc, mg/l	IS 3025(Part 49) : 1994,R:2019, AAS-Flame Method		<0.1		0.10 – 10.0		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,

ANALYSED BY

(Kumar Vaibhav)
REVIEWED BY

(Amit Raj Mishra)

AUTHORISED SIGNATORY

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.

Page -1 of 2

---- End of Report ----



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

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

Month & Year	QUARTER ENDING MARCH 2024		Cluster	CLUSTER XII			Report No.	RI-2/GW/23-24/QE/04
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	20.05.2024
Project	Kapuria			Sample Ref. No.	REM/BCCL/22-24/GW/	Sampling Method	CMPDI/RI-II/LPM 13,(IS 3025:Part -1)	
Sampling Stations	GW12		Date of Sampling	12.02.2024	Sample Collected in 5 Ltr Jerricane , Color as observed is transparent			
				Period of Analysis		12.02.2024	TO	26.03.2024
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, 24 th d Edition ,Carminc,2023	<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, 24th edition, AAS-GTA	<0.01	0.20-10.0	0.01	0.05	1.5	
3	Free Residual Chlorine, mg/l, Min	APHA, 24 th Edition, , 4500-Cl-B. (Iodometric Method-I),2023	<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, 24th edition, AAS-GTA	<0.005	0.005-10	0.005	0.01	No relaxation	
5	Phenolic compounds (as C6H5OH), mg/l, Max	APHA, 24 th Edition,4-Amino Autipyrine	<0.001	0.001-10	0.001	0.002	0.002	
6	Selenium, mg/l, Max	APHA 24 th Edition IS-3025,part 56:2003, R-2019/, AAS-VGA,2023	<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 24th 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, 24 th Edition, AAS-GTA,2023	<0.01	0.10-10.0	0.01	0.05	No relaxation	
9	Nickel as Ni, mg/l Max	IS 3025 Part 54 : 2003,R : 2019, AAS-Flame APHA, 24 th Edition, AAS-GTA,2023	<0.005	0.10-10	0.005	0.02	No relaxation	
10	Manganese as Mn, mg/l, Max	IS 3025(Part 59) : 2006,R:2019, AAS-Flame Method	<0.02	0.10-10.0	0.02	0.1	0.3	

***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,

ANALYSED BY

(Kumar Vaibhav)
REVIEWED BY
(Amit Raj Mishra)
AUTHORISED SIGNATORY

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



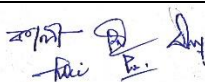
CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
SURFACE WATER ANALYSIS TEST REPORT

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

Month & Year		QUARTE ENDI NG MAR 2024		Cluster		XII		ULR No.		TC10122240000 00726P TC10122240000 00727P		
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue		20.05.2024	
Project		Sample Ref. No.				REM/BCCL/23-24/SW /		Sampling Method		(IS 3025 , Part-1) CMPDI/RI-II/LPM 13		
Sampling Stations		(i)	Upstream in Katri River(SW27)			Date of Sampling		18.03.2024		Period of Analysis		
		(ii)	Downstream in Katri River(SW28)			Date of Sampling		18.03.2024		18.03.2024 TO 10.04.2024		
Sl. No.	Parameter		Method of Analysis		Observed Values		IS : 2296 INLAND SURFACE WATER [1982] Class 'C	Range of Testing		LDL		
1	BOD (3 days 27°C), mg/l		IS 3025 (Part 44) : 1993, R-2019 , 3 day incubation at 27°C		2.3	2.3	3	2.00-100.00		2		
2	Colour,Hazen Units		APHA 24 th Edition , 2120-B-:2023		3	3	10	1-500.0		1		
3	Chlorides, mg/l		IS-3025(Part 32):1988, R-2019 Argentometric Method		59	67	600	2.0-1500.0		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		5.9	5.8	4	1.0-10.0		0.1		
6	Fluoride, mg/l		APHA, 24 th Edition, SPADNS Method,2023		0.49	0.73	1.5	0.2-2.00		0.2		
7	Hexavalent Chromium, mg/l		APHA 24 th Edition, 1,5-Diphenylcarbohydrazide Method IS 3025 (Part 52) : 2003,R-2023		<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		<0.2	<0.2	50	0.2-10		0.2		
9	Nitrate , mg/l		APHA, 24 th Edition, UV-Spectrophotometric Method,2023		5.35	4.69	50	0.5-45.0		0.5		
10	pH value		IS 3025, (Part 11) : 1983 R-2023 Electrometric (Ph Meter) method		7.08	7.79	6.5-8.5	1.0-14.0		2		
11	Sulphate, mg/l		APHA –24 th Edition,4500- S, Turbidity Method,2023		58	49	400	10.0-400.0		10		
12	Total Dissolved Solids, mg/l		IS 3025, (Part 16): 1984 R-2023 Gravimetric method		712	539	1500	25.0-10000.0		25		
13	Zinc, mg/l		IS 3025(Part 49) : 1994, R : 2019, AAS-Flame Method		<0.1	<0.1	15	0.10 – 10.0		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

REVIEWED BY

AUTHORISED SIGNATORY

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 2



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

CMPDIL, RI-II
KOYLA BHAWAN COMPLEX
DHANBAD. -826005
Phone: 0326-223-850
email: rdri2 cmpdi@coalindia.in

Month & Year		QUARTE Ending MAR 2024		Cluster	XII		Report No.	RI-2/SW/23- 24/QE/04	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	20.05.2024
Project		Sample Ref. No.			REM/BCCL/23-24/SW		Sampling Method	(IS 3025 , Part-1) CMPDI/RI-II/LPM 13	
Sampling Stations		(i)	Upstream in Katri River(SW27)			Date of Sampling		18.03.2024	Period of Analysis
		(ii)	Downstream in Katri River(SW28)			Date of Sampling		18.03.2024	18.03.2024 TO 10.04.2024
Sl. No.	Paramet er	Method of Analysis		Observed Values		IS : 2296 INLAND SURFACE WATER [1982] Class 'C	Range of Testing	LDL	
1	Arsenic (as As), mg/l, Max	IS-3025,Part 37:1988, R- 2019/ APHA 24 th Edition AAS-VGA		<0.006	<0.006	0.2	0.006-10	0.006	
2	Lead (as Pb), mg/l, Max	APHA, 24 th Edition, AAS- GTA		<0.005	<0.005	0.1	0.005-10	0.005	
3	Phenolic compounds (as C6H5OH), mg/l, Max	APHA, 24 th 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 24 th 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 Jerricane , Color as observed is transparent**

(Kumar Vaibhav)

(Amit Raj Mishra)

Analysed by

REVIEWED BY

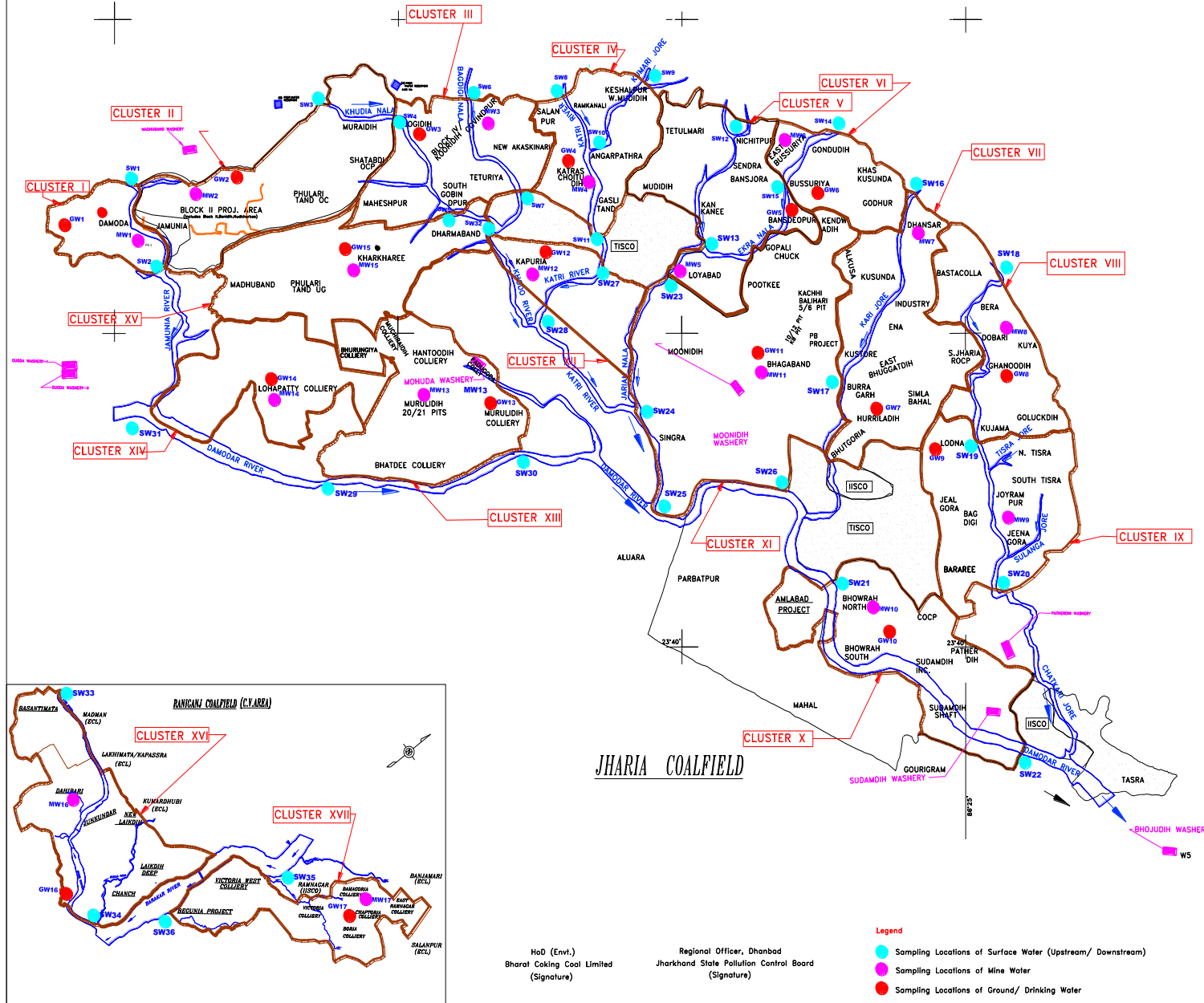
AUTHORISED SIGNATORY

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 -2of2

Water Sampling Locations in BCCL



INDEX

Cluster	Surface Water (UIS, DIS)	Name of River/Nala/Jore	Miner Effluent Water	Sampling Location	Ground Water	Sampling Location
I	SW1, SW2	Jamuna River	MW1	Damoda Area Block II OCP	GW1	Shunway Village
II	SW3, SW4	Khudra Nala	MW2	Govindpur Colliery	GW2	Joyrampur Village
III	SW4, SW5, SW6, SW7	Kanti River, Kuntari Jore	MW3	Mudidi	GW3	Nichtpur
IV	SW8, SW11, SW9, SW10	Khudra Nala, Bagdigi Nala	MW4	Chotudih	GW4	Kankanee Village
V	SW12, SW13, SW15	Khudra Nala, Ekra Nala	MW5	Mudidi	GW5	Nichtpur
VI	SW14, SW15	Ekra Nala	MW6	East Bussuria UGP	GW6	Banspora Borewell
VII	SW16, SW17	Kanti Jore	MW7	Dhanwar UGP	GW7	Humliadih
VIII	SW18, SW19	Kanti Jore	MW8	Dhanwar UGP	GW8	Ghanudih
IX	SW19, SW20	Kanti Jore	MW9	Jeenagora	GW9	Lodna
X	SW21, SW22	Damodar River	MW10	Showah North	GW10	Showah South
XI	SW23, SW24, SW25, SW26	Jarjan Nala, Damodar River	MW11	Bhagabandh UGP	GW11	Bhagabandh
XII	SW27, SW28	Kanti River	MW12	Kapuna	GW12	Kapuna
XIII	SW29, SW30	Damodar River	MW13	Muraidih (20/21)	GW13	Muraidih
XIV	SW31, SW32	Damodar River	MW14	Lohapatti	GW14	Lohapatti
XV	SW33, SW34	Khudra Nala	MW15	Kharkharee UGP	GW15	Kharkharee
XVI	SW35, SW36	Khudra River	MW16	Dhanwar OCP	GW16	Palabari Village
XVII	SW37, SW38	Barakar River	MW17	Damagone Colliery	GW17	Chaptoria

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

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

Legend

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

Company: BHARAT COKING COAL LIMITED

Title: WATER SAMPLING LOCATIONS

Subject: MONITORING STATIONS

Scale: Not to Scale

CMPTDI
Coal India Limited

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.

**TRACE METAL CONCENTRATION OF
AMBIENT AIR QUALITY REPORT
OF
BHARAT COKING COAL LIMITED,
(FOR THE HALF YEAR ENDING, DECEMBER, 2023)**



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

(FOR THE Q.E. DECEMBER, 2023)

CONTENTS

SL. NO.	CHAPTER	PARTICULARS
1.	CHAPTER - I	EXECUTIVE SUMMARY INTRODUCTION
2.	CHAPTER-II	AIR SAMPLING & ANALYSIS
3.	PLATES: PLATE NO. - I	SURFACE PLAN SHOWING AIR & NOISE MONITORING LOCATIONS

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 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.

3.0 Methodology of sampling and analysis

3.1 Heavy Metal in Ambient Air

Parameters chosen for assessment of Heavy metal in Ambient Air Quality were Cadmium (Cd), Mercury (Hg), Arsenic (As), Chromium (Cr), Nickel (Ni), and Lead (Pb). Respirable Dust Samplers (RDS) were used for sampling these heavy metals on EPM filter paper. These heavy metals are analyzed regularly on half yearly basis. The samples were analyzed in Environment Laboratory of CMPDI, RI-II, Dhanbad.

4.0 Results and interpretations

4.1 Heavy Metal in Ambient Air

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

CHAPTER - 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, 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 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.

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

CHAPTER – II

AMBIENT AIR QUALITY MONITORING

2.1 Results and interpretations

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

TRACE METAL CONCENTRATION IN AMBIENT AIR QUALITY

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

Year : **2023-24.**

PERIOD: **HALF YEAR ENDING DEC. 23**

HEAVY METAL ANALYSIS REPORT OF AMBIENT AIR QUALITY

Station No.	Station Name	Date	Hg ($\mu\text{g}/\text{m}^3$)	Cr ($\mu\text{g}/\text{m}^3$)	As (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)	Cd ($\mu\text{g}/\text{m}^3$)
A1	Karmatand Village	28.11.2023	<0.001	<0.01	<1	0.017	12	<0.001
A2	Damoda	29.11.2023	<0.001	<0.01	<1	0.033	11	<0.001
A3	Madhuband Washery	24.11.2023	<0.001	<0.01	<1	0.028	2	<0.001
A4	Block-II	29.11.2023	<0.001	<0.01	<1	0.024	<2	<0.001
A5	Muraidih	17.11.2023	<0.001	<0.01	<1	0.017	11	<0.001
A6	Block-IV	22.11.2023	<0.001	<0.01	<1	0.034	8	<0.001
A7	Govindpur/Ramkanali	30.11.2023	<0.001	<0.01	<1	0.06	16	<0.001
A8	Nichitpur	27.11.2023	0.002	<0.01	<1	0.031	9	<0.001
A9	East Basseriya	27.11.2023	<0.001	<0.01	<1	0.019	8	<0.001
A10	Dhansar/Kusunda	28.11.2023	<0.001	0.02	<1	0.029	15	<0.001
A11	Dobari	28.11.2023	<0.001	<0.01	<1	0.044	9	<0.001
A12	Kusmatand Village	28.11.2023	<0.001	<0.01	<1	0.029	14	<0.001
A13	Jeenagora	28.11.2023	<0.001	<0.01	<1	0.052	9	<0.001
A14	Bhowrah North	23.11.2023	<0.001	0.01	<1	0.047	<2	<0.001
A15	Sudamdih Washery	22.11.2023	<0.001	<0.01	<1	0.024	11	<0.001
A16	Pootki	25.11.2023	<0.001	0.02	<1	0.053	14	<0.001
A17	Moonidih UGP	29.11.2023	<0.001	0.01	<1	0.032	3	<0.001
A18	Rudih Basti	16.11.2023	<0.001	<0.01	<1	0.006	10	<0.001
A19	Murlidih 20/21	23.11.2023	<0.001	<0.01	<1	0.058	12	<0.001
A20	Lohapatti	18.11.2023	0.001	<0.01	<1	0.074	13	<0.001
A21	Kharkharee	20.11.2023	<0.001	<0.01	<1	0.068	9	<0.001
A22	Dahibari	17.11.2023	<0.001	<0.01	<1	0.045	10	<0.001
A23	Basantimata	17.11.2023	<0.001	<0.01	<1	0.029	14	<0.001
A24	Gopinathpur	27.11.2023	<0.001	<0.01	<1	0.057	4	<0.001

Station No.	Station Name	Date	Hg ($\mu\text{g}/\text{m}^3$)	Cr ($\mu\text{g}/\text{m}^3$)	As (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)	Cd ($\mu\text{g}/\text{m}^3$)
A25	Guliardih	27.11.2023	<0.001	<0.01	<1	0.007	15	<0.001
A26	Begunia	16.11.2023	<0.001	<0.01	<1	0.012	12	<0.001
A27	Damagoria	16.11.2023	<0.001	<0.01	<1	0.036	3	<0.001
A28	Hurriladih	21.11.2023	<0.001	<0.01	<1	0.039	12	<0.001
A29	Moonidih Washery	29.11.2023	0.005	0.01	<1	0.024	13	<0.001
A30	Sitanala	23.11.2023	<0.001	<0.01	<1	0.038	10	<0.001
A31	Dumarda	17.11.2023	<0.001	<0.01	<1	0.048	14	<0.001
A32	Telmacho Bridge	18.11.2023	<0.001	<0.01	<1	0.022	10	<0.001
A33	Madhuband UGP	25.11.2023	<0.001	<0.01	<1	0.044	14	<0.001
A34	Bhojudih Washery	21.11.2023	0.004	<0.01	<1	0.013	13	<0.001
A35	Dugda Washery	28.11.2023	0.002	<0.01	<1	0.043	8	<0.001
A36	Mahuda	16.11.2023	<0.001	0.01	<1	0.054	9	<0.001
A37	Katras Choitudih	22.11.2023	<0.001	<0.01	<1	0.063	8	<0.001
A38	Sinidih Workshop	21.11.2023	<0.001	0.01	<1	0.042	3	<0.001
A39	Patherdih	24.11.2023	<0.001	<0.01	<1	0.082	11	<0.001
A40	Koyla Nagar	18.11.2023	<0.001	<0.01	<1	0.015	<2	<0.001
A41	Sudamdih Shaft	22.11.2023	<0.001	<0.01	<1	0.061	3	<0.001
A42	RHB	23.11.2023	<0.001	<0.01	<1	0.053	11	<0.001
A43	Pandwabhita	24.11.2023	<0.001	<0.01	<1	0.03	9	<0.001
A44	Sadariadih	25.11.2023	<0.001	<0.01	<1	0.013	7	<0.001
A45	Bhojudih Buffer	21.11.2023	<0.001	<0.01	<1	0.048	4	<0.001
A46	C.H.D	20.11.2023	<0.001	<0.01	<1	0.027	<2	<0.001

<i>Metal (Unit)</i>	<i>LDL</i>	<i>Standard as per NAAQS</i>
Hg ($\mu\text{g}/\text{m}^3$)	0.001	*Standard Not defined
Cr ($\mu\text{g}/\text{m}^3$)	0.01	*Standard Not defined
As (ng/m^3)	1	6
Pb ($\mu\text{g}/\text{m}^3$)	0.005	0.5
Ni (ng/m^3)	2	20
Cd ($\mu\text{g}/\text{m}^3$)	0.001	*Standard Not defined

सुमान रंजन राय

Analysed By
JSA/SA/SSA

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

अमित

Approved By
HOD(In-charge) Environment
RI-2, CMPDI, Dhanbad

Location of Air & Noise Monitoring Stations in BCCL

