भारत कोकिंग कोल लिमिटेड
(एक मिनिरत्न कंपनी)
(कोल इण्डिया लिमिटेड की एक अनुषंगी कंपनी)
(भारत सरकार का उपक्रम)

BCCL
भारत कोकिंग कोल लिमिटेड
Bharat Coking Coal Limited

Bharat Coking Coal Limited
(A Miniratna Company)
(A Subsidiary of Coal India Limited)
(A Government of India Undertaking)

बोर्ड सचिवालय/Board Secretariat

पत्रांक : बीसीसीएल/सीएस/एफ-1(A)/ 580 (H) दिनांक: 23.11.2025

सेवा में,
महाप्रबंधक (परियोजना व योजना)
बीसीसीएल, कोयला भवन, धनबाद।

विषय: **Certified copy of Minutes of 429th Board Meeting held on 15.11.2025.**

Dear Sir,

We send herewith certified copy of Minutes of Item No. 429.4E, 429.PoT-3 & 429.PoT-4 of 429th Meeting of the Board of Directors of Bharat Coking Coal Limited held at Registered office, Koyla Bhawan, Dhanbad on 15.11.2025 for taking necessary action at your end.

You are requested to send the Action Taken Report (ATR) on the above, duly approved by the concerned Director, for placing before the next Board Meeting as per the format given below. Soft copy of the same in MS word format to the mail id cos.bccl@coalindia.in .

Format of ATR:

Department:			
Item No.	**Subject**	**Decision of the Board**	**Action Taken**

भवदीय,

Encl: As above

बी.के.पारूई
कंपनी सचिव

Project Officer
Muraidih Colliery

Item No.429.PoT-4

Approval of Mining Plan of Muraidih Colliery, Barora Area.

Background

Muraidih Colliery is located in the north western corner of the Jharia coalfield under the administrative control of Barora Area of BCCL. Muraidih Colliery is a part of Open Cast Block III.

Life of the mine:

By OC	5 Years
By UG	19 Years
Overall	19 Years

Decision

The Board was apprised that the instant proposal was placed in 51st ESC(T) held on 15-11-2025 and after deliberation, ESC(T) recommended the proposal for approval of Board.

After deliberation the recommendation of the ESC(T) of the Mining Plan of Muraidih Colliery (Peak Capacity 6.081 MTPA, Leasehold Area 717.71 Ha, Project area 543.03 (UG-115.34 + OC-427.69) Ha, Overall balance Life of 19 year was approved by the Board.

Action: GM(P&P)

Certified to be True Copy

बी. के. पारूई
कंपनी सचिव
भारत कोकिंग कोल लिमिटेड
कोयला भवन
धनबाद– 826005

Project Officer
Muraidih Colliery

Item No.429.4E

Information regarding Agenda Note for Information regarding Approval for Head-wise Re-distribution of Mine closure cost of Damoda Colliery & Amalgamated Sudamdih Patherdih Colliery (as Minor Modification).

Board noted the information furnished in the agenda note.

Action: GM(P&P)

Item No.429.PoT-3

Approval of Mining Plan along with Mine Closure Plan of Cluster-IX Group of Mines, Lodna Area.

Background

Cluster-IX Group of Mines is located in Jharia Coalfield, Dhanbad under the administrative control of Lodna Area of BCCL. The area under consideration falls within the Mukunda exploration block in the eastern part of Jharia coalfield, District-Dhanbad, Jharkhand.

Presently following mines are situated within leasehold of Cluster IX:

1. NT-ST Expansion OCP
2. Amalgamated Joyrampur Colliery (OC)

Previously, separate MP/MCP for both NTST & Joyrampur Colliery are prepared and approved for implementation of guidelines issued by Ministry of Coal, Govt. of India.

Life of the mine:

By OC	4 Years
By UG	NIL
Overall	4 Years

Decision:

The Board was apprised that the instant proposal was placed in 51st ESC(T) held on 15-11-2025 and after deliberation, ESC(T) recommended the proposal for approval of Board.

After deliberation, considering the recommendation of the ESC(T), Board approved the Mining Plan along with Mine Closure Plan of Cluster-IX Group of Mines, Lodna Area, Rated Capacity 10.21MTPA & Peak Capacity 12.768 MTPA, Leasehold/Project area 1942.12 Ha, balance Life of 04 years with total Mine Closure cost ₹285.4740971 Croress, including already deposited amount being ₹118.93248 Crores till FY 2024-25 as placed in the agenda note.

Action: Action: GM(P&P)

Certified to be True Copy

बी. के. पारूइं
कंपनी सचिव
भारत कोकिंग कोल लिमिटेड
कोयला भवन
धनबाद– 826005

Project Officer
Muraidih Colliery

BHARAT COKING COAL LIMITED

MINING PLAN
OF
MURAIDIH COLLIERY
(Peak Capacity -6.081 Mtpa)

Block : Block III
Coalfield : Jharia Coalfield, Dhanbad, Jharkhand

CENTRAL MINE PLANNING & DESIGN INSTITUTE LTD.
(A Subsidiary of Coal India Limited)
REGIONAL INSTITUTE - II, DHANBAD

Project Officer
Muraidih Colliery

CHAPTER	PARTICULARS	PAGE NO.
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5	Infrastructure Facilities	1-12
6	Land Requirement	1-4
7	Environmental Management	1-12
	PLANS	

Project Officer
Muraidih Colliery

CHAPTER I

PROJECT INFORMATION

	Parameters	*Details*
1.1	INTRODUCTION	
1.1.1	Name of Coal / Lignite Block	Block III
1.1.2	Name of the Coalfield/Lignite Field	Jharia Coalfield
1.1.3	Base date of Mining Plan / Mine Closure Plan	01.04.2025
1.1.4	Linked End Use Plant	-
1.1.5	Distance of End use plant from the pit head of the project in "km"	-
1.1.6	Mode of Coal Transport	Rail /Road

1.2 LOCATION, TOPOGRAPHY AND COMMUNICATION

	Parameters	*Details*
1.2.1	Location of coal deposit (District and State)	Dhanbad, Jharkhand
1.2.2	Communication: PWD roads, railway lines, Air	PWD Road : Dhanbad-Chandrapura Hirak Road; Rail : DC Rail Line Air: Bokaro
1.2.3	Availability of power supply, water etc.	Power: Muraidih Substation
1.2.4	Prominent physiographic features, drainage pattern, natural water courses, rainfall data, highest flood level	Khudo Nalla passes through north central and eastern boundary of the colliery
1.2.5	Land use and ownership / occupancy & involvement of forest land	Provided in chapter VI
1.2.6	Important surface features within the project area and major diversion or shifting involved	NA

Project Officer
Muraidih Colliery

1.3 DETAILS OF THE ALLOTMENT AGREEMENT

	Parameters	*Details*
1.3.1	Name the Allottee	NA
1.3.2	Status of the Applicant Company	NA
1.3.3	Details of allotment / vesting order	NA
1.3.4	Name and address of the applicant	NA
1.3.5	Relationship between the applicant and allottee company	NA
1.3.6	Name of the previous allottee of the Block	NA
1.3.7	Starting Date of the Mine as per CMDPA	NA
1.3.8	Rated Capacity as per CMDPA	NA
1.3.9	Production Schedule as per opening permission (meeting provisions of CMDPA if any).	NA
1.3.10	End Use of Coal/Lignite as per allotment order if any	NA

1.4 DETAILS OF THE PREVIOUS APPROVAL OF MINING PLAN

	Parameters	*Details*
1.4.1	Date of Approval	NA
1.4.2	Conditions, if any	NA
1.4.3	Scheduled year of start of production	Already operational
1.4.4	Proposed year of achieving the targeted production	OC: Y4 UG: Y8
1.4.5	Date of actual commencement of mining operations, if operations already started	Operational before nationalisation
1.4.6	Likely date of mining operations, if operations not yet started & reasons for non-commencement of operations	NA

Project Officer
Muraidih Colliery

1.4.7	Planned production and actual levels achieved in last 3 years (Coal in Mte, OB in MM^3, SR in M^3/te	Year	Coal (Mt)	OB (Mm3)	SR
		2020-21	1.33	3.287	2.47
		2021-22	1.421	1.817	1.28
		2022-23	1.611	1.577	0.98
		2023-24	1.82	1.489	0.82
		2024-25	1.82	0.753	0.41
1.4.8	Statutory obligation vis-à-vis compliance status in a tabular form	NA			
1.4.9	Reasons for difference between the planned and actual production levels	NA			

1.5 PARAMETERS OF APPROVED MINING PLAN VIS-À-VIS PROPOSED MININ PLAN

	Parameters	*Details*	
		Approved Mining Plan	Proposed Mining Plan
1.5.1	Block Area in "Ha"		1400 Ha (OCP –III) ; 717.71 Ha (Muraidih leasehold)
1.5.2	Block Area Projectised "Ha"		427.69 Ha (OC) 115.34 Ha (exclusively UG)
1.5.3	Lease area "Ha"		717.71 Ha
1.5.4	Project Area "Ha"		427.69 Ha (OC) 115.34 Ha (exclusively UG)
1.5.5	Life of the Project "Yrs"		OC : 5 Years UG : 19 years Overall : 19 years
1.5.6	Minimum and Maximum Depth of working "m"		120 m
1.5.7	Net Geological Block "Ha"		1400 Ha (OCP –III)

Project Officer
Muraidih Colliery

1.5.8	Production Target "MTPA"		6.081 Mtpa (peak)
1.5.9	Seams Available "As per GR"		IX/X, VIII C, VIII B, VIII A, VIII, V/VI/VII, IV T, IV B, IV, III, II, I
1.5.10	Seams not considered for Mining with Reasons		Seam IV, IV T and IV B has not been considered for underground mining because of less than 60 m parting from the floor of V/VI/VII seam. Seam II has not been considered for mining due to less parting < 3.0 m from I seam and less workable area.
1.5.11	Gross Geological Reserve "Mt"		121.34 Mt
1.5.12	Net Geological Reserve "Mt"		109.21 Mt
1.5.13	Blocked/ Unprojectised Reserve "Mt"		64.646 Mt (batter and statutory barrier)
1.5.14	Net Geological Reserve "Mt" within delineated quarry		20.85 Mt
1.5.15	Extractable Reserve "Mt"		44.564 Mt
1.5.16	% of Extraction/recovery (of mineable)		100 % (for Opencast)
1.5.17	Reserve Depleted (till the		

Project Officer
Muraidih Colliery

	base date) Reserves "Mt"		
1.5.18	Balance Extractable reserves "Mt"		44.564 Mt
1.5.19	Average Grade		W-V and G-9
1.5.20	OB in MM^3		28.96 Mm^3 (in-situ) 17.72 Mm^3 (RH)
1.5.21	SR MM^3/te (Including RH)		2.48
1.5.22	Mining Technology		Opencast and Longwall
1.5.23	Coal Beneficiation envisaged		
1.5.24	Handling of Rejects		
1.5.25	Land use pattern "Ha"	**Present Land Use:**	

Land Use	Area (in Ha)	Remarks
Excavation Area	328.66	
Backfilled area	245.21	Included in Excavation area
Excavated void	83.45	Included in Excavation area
Top Soil dump	4.02	Included in Excavation area
Haul Road	3.6	Included in Excavation area
Plantation/Green Belt	99.29	Included in Excavation area
Plantation/Green Belt	30.51	
Settling Pond/Water Body	14.13	
Road Infrastructure Area	8.5	
Garland Drain	3.1	

Project Officer
Muraidih Colliery

		Embankment	0.05	
		UG Infrastructure	2.73	
		Undisturbed/ Barren/ Mining Right for UG	241.98	
		Resettlement/Bastee	4.15	
		Agricultural Land	83.9	
		Total	**717.71***	

*** Includes 133.69 Ha Forest land**

Component wise Breakup of Forest Land and Non Forest Land in leasehold area

Component	Forest Land (Ha)	Non-Forest Land (Ha)	Total Area(Ha)
Excavation Area(Backfilled Area, Excavated Void, Top Soil Dump, Haul Road, Plantation/Green Belt)	110.71	217.95	328.66
Plantation	0.17	30.34	30.51
Water Body, Settling Pond, Embankment	0.49	13.67	14.16
Infrastructure(Road)	0.20	8.14	8.34
Garland Drain	0	3.10	3.10
UG Infrastructure	0	2.73	2.73
Bastee	0	4.15	4.15
Agricultural Land	0	83.29	83.29
Undisturbed Land	21.47	212.33	233.80
Safety Zone	0.65	8.32	8.97
Total	**133.69**	**584.02**	**717.71**

Post Mining Land Use

Land Use	Area (Ha)
Plantation/Green belt	341.9
Void	98.71
Water body/River	5.03
Road	4.77
Habitation	25.4
Free space/Barren	241.9
Total	**717.71**

1.5.26	Reason for revision		NA

This Mining Plan has been prepared to comply the **statutory requirement** as per Rule 22A of Mineral Concession (Amendment) Rules 2020. This mining plan has also been prepared for forest clearance purpose.

Project Officer
Muraidih Colliery

Chapter II
EXPLORATION, GEOLOGY, SEAM SEQUENCE, COAL QUALITY AND RESOURCE

	Parameters	Details
2.1	DETAILS OF THE BLOCK	
2.1.1	Name of the Geological Report with month and year of preparation,	"Geological Report on Exploration for Coal in Opencast Block-III, Jharia coalfield, Dhanbad (March, 1982, prepared by CMPDI, RI-2)"
2.1.2	Name of GR Preparing Agency	CMPDI
2.1.3	Particulars of adjacent Area/ blocks: North, South, East, West	Muraidih mines share their boundary with following collieries/villages: North – Metamorphics South – Phularitand Colliery, Mahespur Colliery East – Jogidih Colliery West – Phularitand Colliery.
2.1.4	Location of the Block District / State	Dhanbad District, Jharkhand
2.1.5	Area of the Block "Ha"	1400 Ha (OCP –III) ; 717.71 Ha (Muraidih leasehold)
2.1.6	Area of the geological block projectised "in Ha" (Area of the geological block considered for liquidation of coal resource)	427.69 Ha (OC) 115.34 Ha (exclusively UG)
2.1.7	Balance area yet to be projectised "Ha"	174.68 Ha (out of the leasehold area)
2.1.8	Likely geological Resource in the area yet to be projectised "MTPA"	64.65 Mt.

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2.1.9	Cardinal Point Co-ordinates of the non-coal/lignite bearing area/ Coal/lignite bearing area within the existing mining lease outside the allotted Geological Coal/Lignite block. (Duly certified in line with Para 2.7 (c) of the Guideline, if fresh mining lease required)	Given In Annexure-A
2.1.10	Certificate of Qualified person/ Accredited Mining Plan preparing agency (MPPA) if the project area is confined within the vested/ allotted block boundary/ existing mining lease and Where the project area extends beyond the block boundary, a certificate of Qualified person/ Accredited Mining Plan preparing agency (MPPA) should be supported with a certificates i) As the State government is the custodian of exploration data under provisions of Rule 16 of MCR 1960, a No Objection Certificate from Mines and Geology Department of concerned State Government (ii) A certificate in proof of the non-existence of coal or lignite in the area beyond the vested or allocated boundary from CMPDIL (iii) In case of existence of coal or lignite, a certificate of technical-viability issued or certified by	Not Applicable.

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	CMPDIL (iv) In case of Coal bearing area, an undertaking or Affidavit by the project proponent that they will rehandle the OB in a specified time period.	
2.1.11	KML file of the Proposed lease area, Project Area and geological block.	Available Given in Annexure-B
2.1.12	Whether the proposed project area is confined within the allotted block boundary/existing mining lease, if not, the reason for deviation from allotted block boundary, may be given.	Yes
2.1.13	If the project area extends outside the allotted block boundary/existing mining lease, confirmation about non-occurrence of coal/lignite in the area under reference needs to be furnished	Not Applicable.
2.1.14	Type of the Project (Operating under implementation) and year of Starting.	Operating.

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2.2	EXPLORATION, GEOLOGY AND ASSESSMENT OF RESERVE	
2.2.1	Regional geological set up of the area, geology, structure, stratigraphic sequence, characteristics of the litho-logical units (coal seams/partings/overburden).	The Jharia coalfield (453 Km2) is sickle shaped on plan and occurs in the form of syncline with its axis trending broadly in E-W direction and plunging towards west. The southern flank of this coalfield is truncated by boundary fault having maximum throw about 2.5 Km at Mohuda Basin. The non-coal bearing Talchir formation is mainly exposed along the northern and western portion of the coalfield. The Barakar formation covering an area of 218 Km2 which is exposed in the northern, eastern and south-eastern part of the coalfield area contains over 40 coal horizons including local and persistent seams, some of which are exclusively store house of metallurgical coal in India. The Barakar formation is successively overlain by Barren Measure formation which is devoid of workable coal seams. This is mainly exposed in the central part of the coalfield. The Barren Measure is overlain by the coal bearing Raniganj formation (54 Km2). These are exposed within a sub elliptical basin the south-western part of the coalfield.
2.2.2	Local geology, Structure, Stratigraphic sequence, Characteristics of the litho-logical units (coal seams /partings/overburden).	The area under consideration is located in the north western corner of the Jharia coalfield, and it is primarily covered by the Barakar formation which is overlain by thin layers of sandy soil and clay. The thickness of soil ranges between <1.0 m. (MR-22) to 13.83.0 m. (BA009). Metamorphics is exposed as faulted contact in the north-western part of the leasehold area.

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		The rocks of Barakar formation consist of grits, fine to coarse grained sandstone, intercalation of sandstone and shale, sandy shale, grey shale, carbonaceous shale, and number of coal seams. Coal seams IX/X to I occur within the project area. Therefore seams IX/X to I are under the purview of this Geological note for their extraction by opencast method (Plate No. G-III). Good rock exposures are rather are observed extensively, particularly in the norther and north western portion area and in quarries. These rock exposure are mainly of sandstone. The thickness of soil and wethered mantle varies upto13.83m. The incrop position of the coal seams have been taken from the geological reports and are interpretative. Geology and correlation of the seams have been established mainly on the basis of sub-surface data obtained from borehole and mine workings.
2.2.3	Geological Block Area "Ha"	Open Cast Block III, 1400 Ha
2.2.4	Status of Exploration of the block	Fully explored in project area
2.2.5	Area covered by 'detailed' exploration within the block (sq. km)	The entire area under consideration detailed exploration up to basement.
2.2.6	Whether entire lease area has been covered by detailed' exploration.	The entire area under consideration has been covered by detailed exploration. "Geological Report on Exploration for Coal in Opencast Block-III, Jharia coalfield, Dhanbad (March, 1982, prepared by CMPDI, RI-2).
2.2.7	No. of boreholes drilled within the mining area of the block	A total of 79 boreholes have been drilled within Opencast block-III, out of which 42 boreholes fall within the leasehold of Muraidih mine

Project Officer
Muraidih Colliery

		involving a total meterage of 5277.36 meters.

Sl. No	Year of commencement of drilling	Series	No. of BH in Leasehold Area	Meterage drilled in Leasehold Area
1	1980	BA	17	2309.3
2	1980	MR	25	2,968.06
Total			42	5277.36

2.2.8	Whether any further exploration/study is required or suggested and time frame in which it is to be completed	Not applicable
2.2.9	Year wise future programme of exploration	Not applicable.
2.2.10	Overall borehole density within the mining area (no./ sq. km) approx.	06 BHs/Km^2.
2.2.11	No. of Seams available as per GR	The lay and deposition of coal seams is based primarily on the data available in the "Geological Report on Exploration for Coal in Opencast Block-III, Jharia coalfield, Dhanbad (March, 1982, prepared by CMPDI, RI-2) and also on the boreholes drilled at later stage as well as updated mine data provided by colliery authorities. Coal seams IX to I occur within the Open Cast block. Incrop of seam XI/XII occur outside the Western corner of the colliery boundary from outside and therefore does not lie within the colliery. Therefore, seams IX/X to I are under the purview of this Geological note for their extraction by opencast method.
2.2.12	Seams not considered for Mining with Reasons	Seams IX/X to V/VI/VII and Seam III and I have been proposed to be projectized of the

Project Officer
Muraidih Colliery

		leasehold area. Seam IV, IV T and IV B has not been considered for underground mining because of less than 60 m parting from the floor of V/VI/VII seam. Seam II has not been considered for mining due to less parting < 3.0 m from I seam and less workable area.
2.2.13	Dip of the Seam	The general strike of the area is E-W which swings to N-S locally in the central part and again swinging to NW-SE to almost E-W in the eastern part. The dip of the beds is varying from 5°-10° in the boundary regions to 10°-20° in the central part. The dip direction is generally towards SE. The relevant details of strike and dip of seams can be seen from the floor contour plans and geological cross sections.
2.2.14	Seam wise thickness, depth and reserve	
	Seam wise summary of in-band thickness (I-100) based on borehole data, depth range and reserve within Muraidih colliery leasehold are given in Table- 2.6 for their extraction by opencast method. 10 percent of the net geological resource available within the proposed quarry has been considered as mining losses. Therefore, 90 percent of net geological resource available within the proposed quarry has been considered as mineable reserve.	
2.2.15	Methodology of resources estimation (also mention if any software package has been used).	The reserve has been estimated through "MINEX" software. 1. The reserve has been calculated using "Detailed resource reporting" menu of **MINEX 6.5** software along with separate template for each individual seam.

Project Officer
Muraidih Colliery

		2. A deduction of 10% from the 'gross reserves' of coal has been made to account for unidentified geological uncertainties like structural disturbances, washout zones etc. to arrive at the 'net geological reserves.' 3. The seam wise status of developed depillared areas in addition to virgin patches has been identified on the basis of seam working plan supplied by the concerned area/colliery officials. These have been clearly marked on the seam folio plans and floor contour plans of all the seams. 4. Heave Zone: The areas falling within the heave zone of a fault has been excluded for the purpose of reserve estimation. 5. Reserve is calculated within the proposed project boundary demarcated by the mining department. **Status of fire** It is very difficult to know the extent underground fire and its quantitative and qualitative affect upon the seam under consideration. However, quantitative assessment of coal has been derived based on data as provided by the colliery authority regarding the extent of fire and percentage of coal damage due to fire. Since the effect of fire upon each seam are

Project Officer
Muraidih Colliery

<table>
<tr><td></td><td></td><td>not uniform, hence we considered the data of seam wise percentage of damage coal due to fire as provided by colliery authority.

Seam V/VI/VII has been considered to be under fire in Central part of the leasehold (C.K. Patch) Tentative loss of coal due to fire within extent of fire for Sean V/VI/VII as provided by the colliery authorities is 76 percent.
Grade of coal within the fire affected area cannot be assessed or confirmed, however the grade of coal within the fire area has been considered as per available data in Geological Report Open Cast Block-III (1982), which may be deteriorated later due to burning effect of fire and cannot be confirmed.

Coal resource estimation of individual seam within the proposed quarry limit has been assessed by taking the area of each seam extent marked in individual floor contour plan/seam folio plan and considering all the assumptions as discussed above.</td></tr>
<tr><td>2.2.16</td><td>Average GCV "KCal/kg"</td><td>
<table>
<tr><th>Seam</th><th>Average Thickness (m)</th><th>Average Ash% (Coking)</th><th>Average GCV(Kcal/Kg)</th></tr>
<tr><td>IX/X</td><td></td><td></td><td></td></tr>
<tr><td>VIIIC</td><td>1.86</td><td>31.65</td><td></td></tr>
<tr><td>VIIIB</td><td>2.26</td><td>39.68</td><td></td></tr>
<tr><td>VIIIA</td><td>3.31</td><td>39.94</td><td></td></tr>
<tr><td>VIII</td><td>0.39</td><td>31.28</td><td></td></tr>
</table>
</td></tr>
</table>

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Muraidih Colliery

		V/VI/VII	21.67	40.37	6042
		IVT	0.75	36.38	5027
		IVB	0.38	47.22	
		IV	1.17	44.21	4078
		III	4.09	42.19	4729
		II	1.01	21.97	6772
		I	2.48	38.12	5746
2.2.17	Gross Geological Reserve of the block "Mt"	121.34 Mt.			
2.2.18	Net Geological Reserve of the block "Mt" (Including Indicated Reserve)	109.21 Mt.			
2.2.19	Blocked Reserve "Mt"	64.646 Mt (batter and statutory barrier)			
2.2.20	Corresponding extractable Reserve of the block "Mt"	44.564 Mt.			
2.2.21	Percentage of Extraction	100 % of mineable (for Opencast)			
2.2.22	Resource already depleted (upto Base date of Mining Plan)	Nil			
2.2.23	Balance extractable Resource (as on Base Date 01.04.2025)	44.564 Mt.			

Project Officer
Muraidih Colliery

2.2.24 Sequence of Coal Seams (within the colliery boundary)

Table-2.1

Seam/Parting	Vertical Thickness (m)		Average Thickness (meter)	No. of BH intersection
	Minimum	Maximum		
IX/X	4.05(BA020)	4.05(BA020)	4.05	1
P	13.7(BA020)	13.7(BA020)	13.70	1
VIIIC	0.94(MR023)	2.98(BA004)	1.86	4
P	5.35(BA020)	20.92(MR023)	11.32	4
VIIIB	1.76(BA020)	3.15(BA004)	2.26	8
P	1.52(BA004)	15.65(BA020)	6.60	8
VIIIA	2.68(BA004)	5.45(MR017)	3.73	8
P	20.77(BA020)	28.3(BA004)	24.54	2
VIII	0.26(BA011)	0.58(BA020)	0.39	3
P(VIIIA-V/VI/VII)	31.91(BA016)	37.76(MR009)	33.81	6
P(VIII-V/VI/VII)	7.41(BA004)	9.5(BA011)	8.68	3
V/VI/VII	0.77(BA009)	28.05(MR013)	23.66	24
P(V/VI/VI-IVT)	27.9(MR013)	27.9(MR013)	27.90	1
P(V/VI/VII-IV)	3.56(BA014)	27.2(BA016)	20.83	6
IVT	0.2(MR008)	1.55(MR024)	0.73	22
P	1.04(BA010)	7(MR006)	4.05	22
IVB	0.12(BA001)	1.83(BA013)	0.66	23
IV	0.25(MR012)	3.21(BA003)	1.71	15
P(IVB-III)	22.33(MR024)	29.82(MR010)	26.46	23
P(IV-III)	21.79(BA003)	29.31(BA011)	26.21	14
III	2.16(BA004)	6(BA001)	4.11	41
P(III-II)	6.35(MR012)	16.73(MR006)	12.35	41
II	0.07(MR006)	1.95(BA011)	1.01	42
P(II-I)	1.25(BA020)	12.23(MR018)	5.61	41
I	1.05(MR002)	4.28(BA004)	2.48	41

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2.2.25 Net Geological Reserve of the Leasehold

Seamwise – Gradewise net geological reserve of coal and jhama within the leasehold of Muraidih is given in Table-2.2(A), (B),

Table No.- 2.2 (A)

Resource of Coking Coal Proved (in million tonnes) Within Leasehold Area								TOTAL
Seam	S-I	S-II	W-I	W-II	W-III	W-IV	W-V	
IX/X	0	0	0	0	0	0.15	0	0.15
VIIIC	0	0	0	0	0	0.1	0	0.1
VIIIB	0	0	0	0	0	0.09	1.06	1.15
VIIIA	0	0	0	0	0	0.67	1.77	2.44
VIII	0	0	0	0	0	0.13	0	0.13
Total	0	0	0	0	0	1.14	2.83	3.97

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Table No.- 2.2 (B)

Non Coking Coal Resource Proved (in million Tonnes) Within the Leasehold Area																			TOTAL
Seam	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	
V/VI/VII	0	0	0	1.67	31.31	0.86	0	0	0	0	0	0	0	0	0	0	0	0	33.84
IVT	0	0	0	0	0	0	0	0	0.02	0.11	0.28	0.25	0.17	0.13	0.13	0.11	0.09	0.97	2.26
IV	0	0	0	0	0	0	0.76	1.36	0.92	0.16	0.12	0.1	0.09	0.08	0.07	0.07	0.06	0.93	4.72
IVB									0.01	0.11	0.20	0.13	0.11	0.10	0.09	0.06	0.05	0.08	0.94
III	0	0	0	0.07	0.42	0.69	1.37	8.25	19.69	3.61	0.33	0.23	0.19	0.18	0.04	0	0	0	35.07
II	0.43	4.12	2.92	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.52
I	0	0	0.12	1.72	4.91	11.08	2.6	0.28	0.16	0.02	0	0	0	0	0	0	0	0	20.89
TOTAL	0.43	4.12	3.04	3.51	36.64	12.63	4.73	9.89	20.80	4.01	0.93	0.71	0.56	0.49	0.33	0.24	0.20	1.98	105.24

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2.2.26 Mineable Reserve

Table: 2.3 (A)
Quarry 1

Resource of Coking Coal Proved (in million tonnes) Within Leasehold Area								TOTAL
Seam	S-I	S-II	W-I	W-II	W-III	W-IV	W-V	
IX/X	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.06
VIIIC	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.06
VIIIB	0.00	0.00	0.00	0.00	0.00	0.07	0.54	0.61
VIIIA	0.00	0.00	0.00	0.00	0.00	0.28	1.18	1.46
VIII	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.05
Total	0.00	0.00	0.00	0.00	0.00	0.52	1.72	2.24

Table: 2.3 (B)
Quarry 1

Non Coking Coal Resource Proved (in million Tonnes) Within the Leasehold Area							TOTAL
Seam	G4	G5	G6	G7	G8	G9	
V/VI/VII	0.50364	14.5188	0	0	0	0	**15.02**

Table: 2.4 (A)
Quarry 2

Non Coking Coal Resource Proved (in million Tonnes) Within the Leasehold Area							TOTAL
Seam	G4	G5	G6	G7	G8	G9	
III	0.063	0.342	0.423	0.216	0.27	0.198	**1.51**

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Table 2.5
QUARRY 1&2

Minable Resource of Coking Coal Proved (in million tonnes)									
	Quarry 1			Quarry2			Combined (Quarry 1+ Quarry 2)		
Seam	Coking	Non coking	subtotal	Coking	Non coking	subtotal	Coking	Non coking	TOTAL
IX/X	0.06		0.06			0	0.06	0	0.06
VIIIC	0.06		0.06			0	0.06	0	0.06
VIIIB	0.61		0.61			0	0.61	0	0.61
VIIIA	1.46		1.46			0	1.46	0	1.46
VIII	0.05		0.05			0	0.05	0	0.05
V/VI/VII		15.02	15.02			0	0	15.02	15.02
III			0		1.51	1.51	0	1.51	1.51
TOTAL	2.24	15.02	17.26	0	1.51	1.51	2.24	16.53	18.77

Table 2.5
Mineable Resource from Underground

Seam	Resource (in Million Tonnes)	Average Grade
III	15.53	G9
I	10.264	G6
Total	25.794	

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ANNEXURE – A

Geo-Referenced Co-ordinates of the Leasehold Boundary

ID	LATTITUDE	LONGITUDE
0	23.78655683400	86.24157769830
1	23.78657992410	86.24138291870
5	23.78656861230	86.23974347940
10	23.78626996520	86.23875400610
15	23.78601337720	86.23842149320
20	23.78560942660	86.23814393980
25	23.78493674510	86.23785125540
30	23.78408721700	86.23693518100
35	23.78368163820	86.23638956470
40	23.78333189600	86.23608220480
45	23.78280348480	86.23558203980
50	23.78252917690	86.23485334090
55	23.78252270380	86.23372673170
60	23.78298282010	86.23325019990
65	23.78308327910	86.23278754480
70	23.78316538910	86.23192207080
75	23.78330853170	86.23114595510
80	23.78342928840	86.23043235510
85	23.78310602690	86.22970844820
90	23.78378295460	86.22929273190
100	23.78619170040	86.22774547110
105	23.78659173870	86.22761256430
110	23.78758244850	86.22752616950
115	23.79216007740	86.22779447350
120	23.79444828990	86.22613879690
125	23.79521747250	86.22555153800
130	23.80037295900	86.22538433120
140	23.80160663890	86.22438270860
150	23.80355789840	86.22420685170
160	23.80427792590	86.22443373250
170	23.80472770430	86.22468777590
175	23.80528095740	86.22486688570
180	23.80555299460	86.22529937890
190	23.80567336020	86.22578497120
200	23.80610511460	86.22638597900
210	23.80629755840	86.22721275090
215	23.80622835550	86.22763071050
220	23.80614135990	86.22824646540
230	23.80588403550	86.22918220060
235	23.80588664370	86.22918982500

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ID	LATTITUDE	LONGITUDE
240	23.80626555700	86.22984313430
250	23.80707992070	86.22995707370
260	23.80856796120	86.22925706400
270	23.80950549410	86.22998416850
280	23.80994084240	86.23104249520
290	23.81067024990	86.23127052030
300	23.81112889140	86.23118813080
310	23.81121036970	86.23106948140
320	23.81115421260	86.23043900160
330	23.81096406880	86.22945702030
340	23.81149774280	86.22888887690
350	23.81233501140	86.22877575580
360	23.81406754320	86.23464466000
370	23.81426753120	86.23912474310
380	23.81570357890	86.23923812650
390	23.81595874630	86.23994267770
400	23.81643115000	86.24153259470
410	23.81397477900	86.24350362210
420	23.81321064920	86.24535107670
430	23.81180719640	86.24672332530
435	23.81174712890	86.24657608980
440	23.81152034310	86.24654299510
445	23.81128792530	86.24616788720
450	23.81116863570	86.24654356400
460	23.80978733000	86.24725651810
470	23.80726088920	86.24993162870
480	23.80434447160	86.25002790090
490	23.80433969880	86.25021035430
500	23.80258687400	86.25089494080
510	23.80217507860	86.25171151590
515	23.80073957760	86.25172837110
520	23.80073381970	86.25173223170
525	23.79943281600	86.25341827350
530	23.79801128790	86.25426500190
535	23.79681238480	86.25311983980
540	23.79557652590	86.25160517750
550	23.79352958100	86.24827575980
560	23.79100166380	86.24759103420
565	23.79048887930	86.24715720010
570	23.78929992280	86.24621522310
575	23.78910969130	86.24637767510
580	23.78871337810	86.24693078670
590	23.78948597780	86.24409435380
599	23.78655683400	86.24157769830

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Geo-Referenced Co-ordinates of the Quarry 1

ID	LATTITUDE	LONGITUDE
0	23.79312808210	86.24711216650
1	23.79020919590	86.24500345620
5	23.78819179570	86.24303311370
10	23.78656798960	86.24159098510
15	23.78626930950	86.23875300160
20	23.78423020680	86.23715640320
25	23.78237339390	86.23442255690
30	23.78315870530	86.23166869890
35	23.78346264620	86.22995365780
40	23.78405716940	86.22875079980
45	23.78659173870	86.22761256430
50	23.78983946100	86.22896118530
55	23.79093009360	86.23146044740
60	23.79147820880	86.23222848410
65	23.79309186110	86.23199893550
70	23.79630483730	86.23000015020
75	23.79680735190	86.22938386340
80	23.79760897780	86.22914473810
85	23.79831939130	86.22912949640
90	23.79913512210	86.22894267200
92	23.79943935230	86.22888099900
100	23.80085742270	86.22940936760
105	23.80126443160	86.22986831990
110	23.80157576580	86.23023789360
115	23.80179270870	86.23062229740
120	23.80201850650	86.23098535060
125	23.80222783470	86.23150958170
130	23.80250496930	86.23314361760
135	23.80216979680	86.23499984120
140	23.80275582310	86.23636274550
145	23.80293908990	86.23675552340
150	23.80327556080	86.23757107130
155	23.80331569370	86.23828450650
160	23.80341226730	86.23896949610
165	23.80351856500	86.23991333330
170	23.80363995370	86.24094375530
175	23.80354146660	86.24169152780
180	23.80338892290	86.24298574390
185	23.80364767440	86.24451500900
190	23.80362951410	86.24552470150

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ID	LATTITUDE	LONGITUDE
195	23.80358344520	86.24668363930
200	23.80342623170	86.24835543000
205	23.80325022370	86.24990697780
210	23.80247440460	86.25079654740
215	23.80186249340	86.25088051720
220	23.80117456420	86.25079443730
225	23.79995943600	86.25153784190
230	23.79922225640	86.25257811160
235	23.79795264370	86.25342874680
240	23.79708491090	86.25277488660
245	23.79568747470	86.25147820240
250	23.79443969540	86.24998001300
255	23.79312805100	86.24711210180

Geo-Referenced Co-ordinates of the Quarry 2

ID	LATTITUDE	LONGITUDE
0	23.80809392660	86.23743572910
1	23.80809514310	86.23743480870
2	23.80814526040	86.23793525830
3	23.80820023640	86.23862238840
4	23.80822846150	86.24043713860
5	23.80824556280	86.24156067390
6	23.80827085930	86.24319157450
7	23.80830153800	86.24506024190
8	23.80826639650	86.24619110580
9	23.80826062340	86.24652723590
10	23.80765334460	86.24653911340
11	23.80763099860	86.24770003960
12	23.80538776470	86.24802035300
13	23.80528861420	86.23309634360
14	23.80618067710	86.23292149200
15	23.80627035750	86.23315752480
16	23.80652147170	86.23384652140
17	23.80715965370	86.23515678540
18	23.80763435470	86.23608121270
19	23.80794682020	86.23672320690
20	23.80797654800	86.23677767240
21	23.80808093630	86.23729294890
22	23.80809514310	86.23743480870
23	23.80809392660	86.23743572910

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CHAPTER III

MINING

	Parameters	Details
3.1	MINING METHOD	
3.1.1	Existing method of mining if the mine is under operation	Mine is being worked by opencast method with V/VI/VII/VIII seam as base.
3.1.2	Proposed method of mining with justification on suitability of method of mining	Seams to be worked: VIII C, VIII B, VIII A, V/VI/VII, III and I. As the existing mine is being worked by opencast method with V/VI/VII seam. The same will be extended with V/VI/VII seam as base. UG mining in III and I seam will be carried out as per existing contract. Seam IV, IV T and IV B has not been considered for underground mining because of less than 60 m parting from the floor of V/VI/VII seam. Seam II has not been considered for mining due to less parting < 3.0 m from I seam and less workable area. **Quarry Boundary Delineation:**

North	Existing quarry edge
South	7.5 m from mine boundary, 45 m from public road, railway acquired land
East	Existing quarry edge and 60 m from Khudo nallah
West	Existing quarry edge and incrop line of V/VI/VII seam.

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		MINING OPERATION The mine is currently being worked by opencast method with quarry upto V/VI/VII seam. In the mining plan it is proposed to continue with opencast working upto V/VI/VII seam. There is an existing contract to work III seam and I seam by longwall method. Underground coal production schedule has been adopted from last approved mining plan.
3.1.3	Coal production capacity proposed "Mtpa"	6.081 Mtpa (Peak)
3.1.4	Justification for optimization Coal production capacity	Production capacity has been fixed based on mine geometry, geology and available coal resource
3.1.5	Calendar year from which the production will start	In operation
3.1.6	Year of Achieving rated/peak production	Y-5
3.1.7	Coal production Plan "MT"	

Year		Quarry 1 (V/VI/VII seam base)			Quarry II (III Seam base)		Underground	Overall	
Year of Operation	Calendar Year	Coal (Mt)	In situ OB (Mm3)	RH OB (Mm3) (Solid term)	Coal (Mt)	In situ OB (Mm3)	Coal (Mt)	Coal (Mt)	OB (Mm3)
Y1	2025-26	2.5	2.90	2.57	0.5	2.96	0.000	3.000	8.430
Y2	2026-27	3	3.48	3.08	0.5	2.96	0.267	3.767	9.520
Y3	2027-28	3.59	4.16	3.69	0.51	3.02	0.285	4.385	10.870
Y4	2028-29	**4.3**	4.99	4.41			0.287	4.587	9.400
Y5	2029-30	3.87	4.49	3.97			2.211	**6.081**	8.460
Y6	2030-31						2.004	2.004	0.000
Y7	2031-32						2.019	2.019	0.000
Y8	2032-33						**2.224**	2.224	0.000

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Y9	2033-34						2.053	2.053	0.000
Y10	2034-35						1.989	1.989	0.000
Y11	2035-36						1.721	1.721	0.000
Y12	2036-37						0.359	0.359	0.000
Y13	2037-38						1.932	1.932	0.000
Y14	2038-39						1.966	1.966	0.000
Y15	2039-40						1.745	1.745	0.000
Y16	2040-41						1.960	1.960	0.000
Y17	2041-42						1.805	1.805	0.000
Y18	2042-43						0.724	0.724	0.000
Y19	2043-44						0.243	0.243	0.000
Total		17.26	20.02	17.72	1.51	8.94	25.794	44.564	46.68

SEAMWISE MINEABLE/EXTRACTABLE RESERVES

Seam	Mineable Reserve Within Delineated Quarry (in Mt)	Extractable Reserve through Underground (in Mt)
IX/X	0.06	
VIIIC	0.07	
VIIIB	0.61	
VIIIA	1.45	
VIII	0.05	
V/VI/VII	15.02	
III	1.51	15.53
I		10.264
Total	**18.77**	**25.794**

PARTING WISE IN-SITU OB TO BE REMOVED WITHIN DELINEATED QUARRY

Particulars	Q1 (Mm3)	Q2 (Mm3)
Top OB	6.52	8.94
Parting between VIII C and VIII B	1.27	
Parting between VIII B and VIII A	1.28	
Parting between VIII A and V/VI/VII	10.95	
Total	**20.02**	**8.94**

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REHANDLING INVOLVED

17.72 Mm^3 (in *In-situ* terms)

MINING PARAMETER OF THE PIT

Sl.No.	Description	Unit	Q1 (V/VI/VII base)	Q2 (III seam base)
1.	Area of Excavation	Ha	385.41	42.28
2.	Strike Length	m	2700	1500
3.	Dip Rise Width	m	1700	300
4.	Maximum depth	m	120	40
5.	Base of Quarry		V/VI/VII/VIII	III
6	Mineable Coal	Million Tonne	17.26	1.51
7	In-situ OB to be removed	Million Cum	20.02	8.94
8	OB to be re-handled (in *in situ* terms)	Million Cum	17.72	
9	Av. Stripping Ratio (considering *in situ* OB and RH OB in *in situ* terms)	Cum./T	2.18	5.92

IN-SITU OB DUMPING STRATEGY

In-pit dumping	28.84 Mm^3
External dumping within the leasehold (embankment and green belt)	0.12 Mm^3

REHANDLING OB DUMPING STRATEGY

OB will have to be re-handled to maintain safe distance of 100 m of the toe of the dump from the working face. Re-handled OB will be dumped within the pit.

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3.1.8	Peak/Rated Capacity	
	- By OC	4.3 Mtpa
	- By UG	2.224 Mtpa
	- Overall	6.081 Mtpa (as peak from OC and UG are in different years)
3.1.9	Life of the mine:	
	- By OC	5 Years
	- By UG	19 Years
	- Overall	19 Years
3.1.10	Whether the proposed external OB dump site is coal/lignite bearing: If so, whether coal/lignite below waste disposal area is extractable.	Not Applicable
3.1.11	Whether negative proving for coal / lignite in the proposed site for OB dump/infrastructure has been done.	Not Applicable
3.1.12	Results of any investigation carried out for scientific mining, conservation of minerals and protection of environment; future proposals.	Not Applicable
3.1.13	Type of Equipment/HEMM. proposed	Shovel – dumper combination(For OC) Longwall (UG)

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CHAPTER IV

SAFETY MANAGEMENT

	Parameters	Details
4.1	**Safety and Health Management System Audit**	Elaborate safety measures have been laid out as per statute concerning safety in mines. In addition to existing provisions, reference has been made here to some special precautionary measures which have been considered important and require special attention for the safety of men and machinery. Safety of men and machine deployed in the mining area should be properly taken care of irrespective of whether the mining activities are performed by departmental or by outsourcing option. All the provisions and precautionary measures as stipulated in CMR 2017, (especially Reg. 106 to 110) and orders made there under shall be strictly complied with. The important safety aspects have been deliberated subsequently. In addition to those relevant clauses as stipulated in Act & Regulation, all clauses and sub clauses as mentioned in the permission granted by DGMS, Min. of Labour and Employment, GOI for working of said Mines shall be followed strictly. The other rules / regulation applicable to mining industry shall be comply with like CEA Regulation 2023, Explosive Act etc.
4.1.1	**Important safety aspects:** Major Risks and uncertainties to the project viz. Proximity to river,	**a) Proximity to river** Khodo Nala is passing through the property along west to east direction in the northern side of the property **b) Adjacent working** Since the old workings of Seam–III are water-logged,

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	adjacent working, geo-mining disturbances, slope stability and remedial measures suggested. It should also include proposed overall slope of the quarry and OB dump, dump height, strata control, fire and spontaneous heating, gas monitoring, disaster management, danger from inrush of water etc.	and the proposed locations of the inclines lie between the old workings of Jogidih and those of Seam–III in Muraidih, necessary precautions are required. Although a safety barrier exists against the Jogidih workings, the safety margin with respect to the old underground workings of Seam–III in Muraidih is marginally inadequate. Therefore, the water accumulated within the old underground workings of Seam–III in Muraidih must be completely dewatered prior to the commencement of incline development. A submersible pump shall be installed at Jogidih to facilitate dewatering operations and to maintain the water level, thereby preventing any potential hazards of inundation from the underground workings. The standard procedures, permission from DGMS should be obtained before the start of work in the proposed colliery. c) Gassiness of the seam I will have to be ascertained as soon as mine is developed and necessary precaution as per statute will have to be taken. **d) Geo-mining disturbances** It is suggested to design and implement the support system after a thorough scientific investigations ans study as the working progress to greater depths. **e) Slope stability and remedial measures suggested** The slopes of the quarry and dumps have been proposed on the basis of experience in the adjoining areas. However, to ascertain optimum slope angles for stability of quarry batter and OB dumps a scientific study needs to be carried out (Ref. Regulation 106(2) of CMR 2017). Recommendation of this study report should be followed strictly to avert any slope failure in the mine.

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		DGMS (Tech.) circular No. 03 of 2020 dated 16.01.2020 and other circular issued by DGMS from time to time for slope stability should be adhered to in letter and spirit. Monitoring being the most effective mitigation measures against any impending slope failure, a constant vigil in this regard should be maintained during active mine operation. **f) Disaster management** Mining is a hazardous industry. There is risk to life and property associated with various mining and allied activities of the project. The mining plan has been drawn in conformity with the prevailing statutory provisions as per Mines Act, 1952 & CMR 2017 applicable for safety in mines. A detailed study has been carried out covering identification and assessment of risk, and recommendation of measures to prevent damage to life and property against such risks. Safety Audit is an integrated component of Risk Assessment and Safety Management, which is required to be undertaken on regular basis by System Study and Safety Audit (SYSSA). Such System Study and Safety Audit (SYSSA) should be conducted at least once in every year, after every major accident or disaster or dangerous occurrence, before implementation of any new technology or use of any new system or machinery in the mine. Such Study may be subject wise as well as an integrated report of the mine incorporating all subjects such as mining, mechanical, electrical, personel, occupational Health & Hygiene, and any other subject applicable to the mine and the system prevailing or to be used therein.

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Risk Reduction Programme (RRP) is an ongoing process to achieve Zero Harm Status of Safety in any mine and should be incorporated in the Disaster Management Programme.

g) Danger from inrush of water

The eastern and northern boundary of Muraidih Longwall underground Project is bounded by Khodo nala which is a seasonal one but during rainy season, huge water from catchment area of northern side flows through this nala. In the western side of the property there are local nala's which are feeding this khodo nala. This might a vulnerable source of danger towards inundation by surface water as such it will be necessary to keep round the clock vigil during monsoon especially when the water flows near the danger level. The Khodo nala has a past record of 197.43m as highest flood level as shown in surface plan. As per DGMS stipulation, substantial coal to be left as safety barrier if mining to be done below. In order to maximize the coal recovery & ensure higher safety, it has been planned to divert the Khodo nala beyond the Northern boundary. The coal whatever is available within the economic range of open cast mine are to be taken out before the last few panels of Seam III are extracted.

The excavation of the respective seams may lead to inrush of water into the quarry from connected galleries. For safety point of view the quarry edge is proposed at a distance of 60 m from the edge of Khodo Nala. But along with standard procedures permission from DGMS should be obtained before the start of work in the proposed quarries along the Khodo Nala. Adequate

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		precaution has been taken into account while deciding the quarry boundary and the final pit floor limit so that the operational area of the quarry does not come within 60m of any operational underground workings which is likely to contain an accumulation of water or other liquid matter or any material that is likely to flow when wet. A 60m distance between the said workings shall mean the shortest distance between the workings of the same seam or between any two seams or sections, as the case may be, measured in any direction whether horizontal, vertical or inclined. **g) Existing underground mine fire** Surface fire / Underground fire is reported within the leasehold area of Cluster II Mine. In addition to all statutory provisions, following measures for fire-fighting and prevention of fires should be established and maintained in the mine premises. 1) Organisation of special cell for systematic observations to examine and prevent fire. 2) Removal of spillage of coal on benches and cleaning of coal horizons to prevent cases of coal heating. 3) Storage of lubricants and cotton waste in enclosed fireproof containers in working places. 4) Provision of fire extinguishers The recommendation made in the DGMS (Approval) Circular No. 02, 2013 should strictly be followed in the mine to prevent fire in HEMM. It says that "all types of fire fighting and fire suppression system including automatic fire detection and suppression systems to be used in HEMMs, materials and chemicals to be used in fire-fighting or suppression system in mines both on

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		surface and below ground including oil and gas mines/fields shall conform to the following minimum requirement". a) All types of fire fighting and fire suppression systems including automatic fire detection and suppression systems to be used in HEMMs, materials and chemicals to be used in fire-fighting or suppression systems shall have valid test certificate(s) from any Government or Government approved Laboratory in compliance with relevant Indian Standards. b) All material used in the fire-fighting/ fire suppressant systems shall be non-toxic and in no manner harmful to human beings during handling and use. The high-pressure storage vessels and hoses, if used with fire-fighting and fire suppressant systems, shall conform to the requirements stipulated in the relevant Indian Standards.
4.1.2	A Commitment from the Company Board that entire mining operation will be carried out as per the Statutory provision given under Mines Act 1952, Coal Mine Regulation 2017 and wherever specific permission will be required the company will approach the concerned authorities.	A Commitment from the Company Board that entire mining operation will be carried out as per the Statutory provision given under Mines Act 1952, Coal Mine Regulation 2017 and wherever specific permission will be required and the company will approach the concerned authorities for the same. The same will be furnished as a part of Annexure during the approval of the Mining Plan.

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CHAPTER V

INFRASTRUCTURE FACILITIES

	Parameters	Details		
5.1	Mine infrastructure required e.g. Equipment maintenance planning, Office buildings, Workshop, Power supply arrangement, Water supply etc.	Sl. No.	Facilities/Infrastructure to be retained	Area, Ha
		1	**Road Infrastructure** **Local Roads (Colliery level):** The colliery is served by a network of internal roads (approx. 2 km within the Muraidih area) that connect it to the immediate vicinity and nearby state government roads. **District and State Roads:** The local roads connect to broader district and state road networks, facilitating access to nearby towns like Baghmara (2 km away), the Barora Area, and the district headquarters, Dhanbad (30 km away). **National Highway:** The area is connected to major transport routes via National Highways. A key connection is the **NH-18**, a major highway in Jharkhand, which is part of an important corridor connecting Ranchi to Patna and links to other national networks like the Golden Quadrilateral. The colliery's transport uses this existing NH network. **Grand Trunk Road (NH-19):** The Grand Trunk Road (GT Road), now largely corresponding to National Highway 19 is available for transportation in this region.	NA
		2	**Rail Infrastructure** **Nearest Railway Station**: The closest minor railway station to Muraidih is Phularitand Railway Station, which is approximately 3 km away. **Major Junctions and Lines**: The colliery is well-connected to major railway lines and junctions, which are	NA

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		part of the Dhanbad Railway Division of the East Central Railway (ECR) zone. **Dhanbad Junction** This is the primary and major railway junction in the district, located about 30 km from Muraidih. **Mahuda Junction** Another nearby junction that serves as an alternative station for the region. **Gomoh Junction (GMO) / NSC Bose J Gomoh:** A major junction on the Howrah-Delhi Grand Chord line, which is a key freight and passenger route. **Adra Junction and Bhojudih Junction** These junctions are part of the South Eastern Railway network and are nearby, facilitating movement towards West Bengal and other parts of the region.
	3	**Water Filter Plants** There are two operating water treatment plants available near the premises of Muraidih colliery, detailed as follows: One plant is located 1 km away from the colliery office, at Muraidih Hanuman Mandir. Another plant is located at a distance of approximately 5 km from the colliery office, at Shatabdi Check Post. These plants are likely intended for industrial use, such as treating mine water for reuse or dust suppression.

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		4	**Pit/Shaft Infrastructure in the Leasehold Area** There are two operating inclines available as Incline-1 and Incline-2 at the Muraidih Underground (U/G) mine, which serve as key infrastructure for accessing the coal seams.	
		5	**Workshop and Store** Two workshop and store are available for repair and maintenance jobs.	
		6	**Magazine House** There is no magazine house located on the premises of the Muraidih colliery. The magazine house for storing explosives is situated at Kessargah, which is approximately 5 km away from the colliery office.	
		7.	**Water supply infrastructure** The water supply infrastructure at the Muraidih Colliery operates a self-contained system managed by Bharat Coking Coal Limited (BCCL), relying primarily on internal mine water.	
5.2	Power supply & illumination	**5.2.1 PRESENT POWER SUPPLY** **I. Power Supply:** At present, the colliery receives electrical power at 11 kV from the 33 kV Madhuband DG Sub-station of Block-II Area. The supply is delivered through Feeder No. 11, which distributes power to various substations within the colliery. **There are main Three sub-station namely**: - **1.** Shatabadi section Sub-station. **2.** Muraidih section Sub-station. **3.** Feeder Breaker Sub-station. **II. Existing Power Supply System: -** Presently, there are three nos. substation are installed at Muraidih Colliery to cater all electrical equipment & lighting loads.			

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- **Shatabadi section Sub-station.: -**

There are three main transformers installed at this substation. These transformers receive power at 11 kV from the Madhuband DG substation through Feeder No. 11.

Details are as given below: -

A. 3 MVA,11KV/6.6 kV Transformer.
B. 2 MVA,11KV/3.3 kV Transformer
C. 1 MVA,11KV/3.3 kV Transformer

A. 3 MVA,11KV/6.6 kV Transformer is supplying power to the HEMM, Pump and lighting load of the colliery.
Details of loads are as under:-
a. 700 KW,6.6KV,3 Phase,4000GPM Pump – 03 Nos.for dewatering of the mines.
b. 715 KW,6.6KV,3 Phase, HMBB 10 Cubic mtr. Shovel – 01 no.
c. 10 kVA ,6.6/220V, transformer supplying power to the lighting Loads of the colliery.

B. 2 MVA,11KV/3.3 kV Transformer is supplying power to the Pump and lighting load of the colliery.
Details of the loads are as under:-
a. 660 KW,3.3 kV,3 Phase,4000GPM Pump – 02 Nos. for dewatering of mines.
b. 10 kVA, ,3.3/0.220 kV, transformer supplying power to the lighting loads of the colliery.

C. 1 MVA,11KV/3.3 kV Transformer is supplying power to the Pump and lighting load of the different location.
Details are as under:-

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a. 170 KW,3.3KV,3 Phase,2000GPM Pump – 01 No for domestic supply.
b. 500 kVA, ,3.3/440V, transformer supplying power to the lighting loads of the Chitahi Basti.
c. 500 kVA, ,3.3/440V, transformer supplying power to the Lighting loads of the departmental workshop, Weigh Bridge, Deparmental Haul road, Face Lighting and Deco workshop.
d. 100 kVA, ,3.3/440V, transformer supplying power to the lighting load of the MP and MLA Residence.
e. 100 kVA, ,3.3/440V, transformer supplying power to the lighting load of the Chitahi Ram mandir.

- **Muraidih section Sub-station.: -**

There are main three nos. Transformer are installed at this sub-station, which are receiving power at 11 kV from Madhuband DG substation through 11 no. Feeder.

Details are as given below: -

A. 2 MVA,11KV/6.6 kV Transformer.
B. 1.5MVA,11KV/3.3 kV Transformer.
C. 500 KVA,11KV/0.440 kV Transformer.

A. 2 MVA,11KV/6.6 kV Transformer is supplying power to the Pump of the colliery.

Details of loads are as under:-

a. 700 KW,6.6KV,3 Phase,4000GPM Pump – 01 No. for Domestic supply of the Muraidih worker's colony and Barora worker' colony.

B. 1.5 MVA,11KV/3.3 kV Transformer is supplying power to the Pump of the colliery.

Details of loads are as under:-

a. 170 KW,3.3 kV,3 Phase,2000GPM Pump – 01 No. for domestic supply of colony.

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a. 170 KW,3.3KV,3 Phase,2000GPM Pump – 01 No for domestic supply.
b. 500 kVA, ,3.3/440V, transformer supplying power to the lighting loads of the Chitahi Basti.
c. 500 kVA, ,3.3/440V, transformer supplying power to the Lighting loads of the departmental workshop, Weigh Bridge, Deparmental Haul road, Face Lighting and Deco workshop.
d. 100 kVA, ,3.3/440V, transformer supplying power to the lighting load of the MP and MLA Residence.
e. 100 kVA, ,3.3/440V, transformer supplying power to the lighting load of the Chitahi Ram mandir.

- **Muraidih section Sub-station.: -**

There are main three nos. Transformer are installed at this sub-station, which are receiving power at 11 kV from Madhuband DG substation through 11 no. Feeder.

Details are as given below: -

A. 2 MVA,11KV/6.6 kV Transformer.
B. 1.5MVA,11KV/3.3 kV Transformer.
C. 500 KVA,11KV/0.440 kV Transformer.

A. 2 MVA,11KV/6.6 kV Transformer is supplying power to the Pump of the colliery.

Details of loads are as under:-

a. 700 KW,6.6KV,3 Phase,4000GPM Pump – 01 No. for Domestic supply of the Muraidih worker's colony and Barora worker' colony.

B. 1.5 MVA,11KV/3.3 kV Transformer is supplying power to the Pump of the colliery.

Details of loads are as under:-

a. 170 KW,3.3 kV,3 Phase,2000GPM Pump – 01 No. for domestic supply of colony.

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C. 500 KVA,11KV/0.440 kV Transformer is supplying power to the Pump and lighting load of the colliery. The transformer is located at the Dozer Section.

Details of loads are as under:-

a. 120 KW,0.440 kV,3 Phase, Pump – 01 No. for Domestic supply.
b. 30 KW,440 kV,3 Phase, Pump – 01 No. for domestic supply.
c. Supplying power to the lighting load of the Muraidih workshop and Weigh bridge.

◦ **Feeder Breaker Sub-station.: -**

Two main transformers are installed at this substation, which receive power at 11 kV from the Madhuband DG Substation through Feeder No. 11.

Details are as given below: -

a. 750 kVA,11KV/0.440 kV Transformer, is Supplying lighting loads of Khado Beli Colony, Balahdih Basti & Muraidih workshop.
b. 1750 kVA,11/0.440 kV Transformer- Idle (Available as standby or for future expansion).

11 kV Muraidih UG Feeder.: - There are two nos. 2 MVA,11/6.6kV transformers installed at this substation, which receive power at 11 kV from the Madhuband DG Substation through the 11 No. Feeder. These transformers supply power to the Muraidih UG Mine.

- Power is being supplied to the lighting loads of the Muraidih office building, Regional Store, Muraidih workers' colony, Barora workers' colony, and Harina officers' colony through Feeder No. 5.

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III. Existing Electrically Operated HEMM Equipment in Muraidih:

01 no HMBB 10 cum Shovel.

5.2.2 PROPOSED POWER SUPPLY:

In the proposed system the existing supply system will continue as per requirements.

Sl. No.	Facilities/Infrastructure to be Dismanteled	Area, Ha
NIL		

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5.3 Drainage & Pumping: Assessment of Volume of Water for Pumping, Pumping Capacity and Pump Selection

Present Pumping Arrangement

Available water Pumps as Mine Infrastructure are detailed as Below: -

Sl. No.	Type of Pump/ location	Qty.	Capacity (GPM)	Power(KW/KV)	Discharge
1	Main Pump/ Jharna, 04 no. patch, (Muraidih)	01+ 01*	4000	700 KW/6.6KV	Water supply to Muraidih and Shatabdi Water filter plant , after purification goes for domestic supply

*Standbye

Proposed Pumping Arrangement

Estimation of Surface Make of Water for Quarry

Quarry-I

Sl. No.	Particulars	Unit	Value
1	**Water accumulation in the quarry:**		
1.1	**Maximum daily rainfall, h :**	m	0.180
1.2	**Catchment Areas :**		
a)	Maximum depth, d :	m	120
b)	Total Quarry Area to be Excavated, A	m^2	3854100
c) ,	Maximum exposed area at any point of time = A1 (33% of total quarry area)	m^2	1271853
d)	Area beyond Excavation = A2 (5% Of A)	m^2	192705
e)	Internal Dump Area A3	m^2	3223500
1.3	**Assumed Run-off co-efficient:**		
a)	For level terrain with thick soil cover	n_1	0.70
b)	For area beyond Excavation	n_2	0.15
c)	For Internal dump area	n_3	0.10
1.4	**Volume of Water accumulation in mine Q :**		
a)	Volume of water likely to fall in Quarry, Q = ($A_1xn_1xh + A_2xn_2xh + A_3xn_3xh$) Cum/day per day	Cum/day	223480
b)	Considering 10% seepage from surrounding strata, total water accumulation will be Q_1 = 1.1Q	Cum/day	245827
2.1	**Pumping capacity in Quarry :**		
a)	Water accumulation in the quarry,	Cum/day	245827
b)	Pumping capacity required to dewater the above accumulated water in 5 days with 18 hours of pumping per day.	Cum/min	46
		gpm	10000
		Say	10000
c)	Considering 25% as stand- bye capacity	gpm	2500
d)	Total pumping capacity	gpm	12500

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2.2	**Pump selection**		
a)	Working pumps 02 nos. of 4000 gpm each and 1 no. 2000 gpm		**10000**
b)	Stand bye pump 01 no. of 2000 gpm and 1 no. 500 gpm		**2500**

Quarry-II

Sl. No.	Particulars	Unit	Value
1	**Water accumulation in the quarry:**		
1.1	Maximum daily rainfall, h :	m	0.180
1.2	Catchment Areas :		
a)	Maximum depth, d :	m	40
b)	Total Quarry Area to be Excavated, A	m^2	422800
c)	Maximum exposed area at any point of time = A1 (33% of total quarry area)	m^2	139524
d)	Area beyond Excavation = A2 (5% Of A)	m^2	21140
e)	Internal Dump Area A3	m^2	201100
1.3	**Assumed Run-off co-efficient:**		
a)	For level terrain with thick soil cover	n_1	0.70
b)	For area beyond Excavation	n_2	0.15
c)	For Internal dump area	n_3	0.10
1.4	**Volume of Water accumulation in mine Q :**		
a)	Volume of water likely to fall in Quarry, Q = ($A_1xn_1xh + A_2xn_2xh + A_3xn_3xh$) Cum/day per day	Cum/day	21771
b)	Considering 10% seepage from surrounding strata, total water accumulation will be $Q_1 = 1.1Q$	Cum/day	23948
2.1	**Pumping capacity in Quarry :**		
a)	Water accumulation in the quarry,	Cum/day	23948
b)	Pumping capacity required to dewater the above accumulated water in 5 days with 18 hours of pumping per day.	Cum/min	4
		gpm	1000
		Say	1000
c)	Considering 25% as stand- bye capacity	gpm	250
d)	Total pumping capacity	gpm	1250
2.2	**Pump selection**		
a)	Working pumps 02 nos. of 500 gpm each		**1000**
b)	Stand bye pump 01 no. of 500 gpm		**500**

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Thus details of total proposed pumping are summarized as below: -

Sl. No.	Location	Details of Pumps	Quantity	Remarks
01	Quarry-I	4000 GPM, 180 M, 750 KW/3.3 KV	02	Both working,
02	Quarry-I	2000 GPM,180 M, 450 KW/3.3 KV	02	01 working, 01 Stand by
03	Quarry-I	500GPM, 180 M, 110 KW/3.3 KV	01	Stand by
03	Quarry-II	500 gpm, 80 m, 45 kw/550V	03	02 Working, 01 Stand by

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5.4	Coal Handling Arrangement: Brief detail of the CHP/Mode of Dispatch, Coal quality and Coal staking and handling arrangement	Coal mined from the mine is stacked at the Coal Dump Yard using either contractual or departmental dumpers. Afterwards, it is reclaimed by loaders and transferred to various dumpers for transportation to the nearest KKC link railway siding. At KKC link siding, the coal is crushed to a size of (-100 mm). For crushing, there are two departmental feeder breakers and a sufficient number of outsourced feeder breakers available. After crushing, the coal is again loaded into dumpers and transported to the railway siding, where it is stacked along the wharf wall. Finally, the coal is loaded into railway wagons for dispatch to various customers of BCCL.
5.5	Coal washing and the proposed handling/disposal of rejects.	No coal washing Facility available at Mine.
5.6	Water consumption and Wastewater generation (for coal handling/ washing as applicable, manpower engaged, utilities, firefighting requirements, HEMM	Data not received

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	washing/ maintenance, dust suppression as well as plantation, etc.)	
5.7	Other infrastructures for air pollution control (fog cannons, fixed water spraying systems, cold fog, Vertical Greenery System (VGS), wind barriers, or other relevant technologies)	Not available

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CHAPTER VI

LAND REQUIREMENT

6.1 LAND REQUIREMENT

6.1.1 Total Land

The breakup of land ownership is given below:

Particulars	Area (in Ha)
BCCL	361.23
Forest (Clearance Obtained)	7.6
Forest Land	133.69*
Private Land	83.43
GM Land	129.24
GM Land (Leased)	2.52
Total	**717.71**

* Includes Notified forest, GM JJ, Raiyati JJ

(Leasehold area of Muraidih colliery is 717.71 Ha after amalgamation of erstwhile Muraidih (536.41 Ha) and Shatabdi (181.30 Ha) colliery)

6.1.2 : Existing Mining use details of Project Area

Land Use	Area (in Ha)	Remarks
Excavation Area	328.66	
Backfilled area	245.21	Included in Excavation area
Excavated void	83.45	Included in Excavation area
Top Soil dump	4.02	Included in Excavation area
Haul Road	3.6	Included in Excavation area
Plantation/Green Belt	101.93	Included in backfilled area
Plantation/Green Belt	30.51	
Settling Pond/Water Body	14.13	
Road Infrastructure Area	8.5	
Garland Drain	3.1	
Embankment	0.05	
UG Infrastructure	2.73	
Undisturbed/ Barren/ Mining Right for UG	241.98	
Resettlement/Bastee	4.15	
Agricultural Land	83.9	
Total	**717.71***	

*** Includes 133.69 Ha Forest land**

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Component wise Breakup of Forest Land and Non Forest Land in leasehold area

Component	Forest Land (Ha)	Non-Forest Land (Ha)	Total Area (Ha)
Excavation Area(Backfilled Area, Excavated Void, Top Soil Dump, Haul Road, Plantation/Green Belt)	110.71	217.95	328.66
Plantation	0.17	30.34	30.51
Water Body, Settling Pond, Embankment	0.49	13.67	14.16
Infrastructure(Road)	0.20	8.14	8.34
Garland Drain	0	3.10	3.10
UG Infrastructure	0	2.73	2.73
Bastee	0	4.15	4.15
Agricultural Land	0	83.29	83.29
Undisturbed Land	21.47	212.33	233.80
Safety Zone	0.65	8.32	8.97
Total	**133.69**	**584.02**	**717.71**

Post Mining Land Use

Land Use	Area (Ha)
Plantation/Green belt	341.9
Void	98.71
Water body/River	5.03
Road	4.77
Habitation	25.4
Free spce/Barren	241.9
Total	**717.71**

6.1.3 Surface features over the block area

Important surface features in the mine are discussed below:

Road:

Chandrapura Dhanbad Hirak road passes along the northern portion of the mine. This road will remain unaffected by the mining operations.

River/ Nala/Jore

Khodo Nalla flows through the north-central and along eastern boundary of the mine. It is proposed to be diverted northwards to make space for a small quarry with III seam base.

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6.1.4 No. of villages/Houses to be shifted

Following villages will be affected by the mining process and may have to be re-habilitated:

1. Mandal Kenduadih Village
2. Barora Village
3. Khodo valley colony
4. Bhaldih Village
5. Part of Chitahi Village

6.1.5 Population to be affected by the project

Total number of PAF : 805.

6.1.6 Proposed Rehabilitation programme

PAFs will be re-habilitated suitably at location to be decided by colliery/area management.

6.2	**DETAILS OF LEASE**	
6.2.1	Status of Lease	Active
6.2.2	Existing Lease Area "Ha"	717.71 Ha
6.2.3	Period for which Mining Lease has been granted/~~is to be renewed/is to be applied for.~~	30 Years, as per relaxation granted by the Central Govt. U/S-31 of MMDR Act,1957 vide letter No. 13016415 2002 CA dt. 10.08.04 issued by the Ministry of Coal & Mines Deptt. Of Coal, Govt. of India.
6.2.4	Date of expiry of earlier Mining Lease, if any	Not applicable

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6.2	DETAILS OF LEASE	
6.2.5	Whether the lease boundary/required boundary is same as mentioned in the allotment order	Mining lease has been granted by nationalisation.
6.2.6	Lease Area (~~applied~~/required) as per the Mining Plan under consideration (Ha)	717.71 Ha
6.2.7	Whether the applied lease area falls within the allotted block	Not applicable
6.2.8	Area (Ha) of lease which falls outside the delineated block/sub-block	Not Applicable
6.2.9	**Details of outside area:**	No outside block area has been considered for project area of this mine
	▪ Whether forms part of any other coal block	Not Applicable
	▪ Whether it contains any coal/lignite reserves	Not Applicable
	▪ Purpose for which it is required, e.g. roads/ OB dumps/ service buildings/ colony/ safety zone/ others(specify)	Not Applicable
6.2.10	**Whether some part(s) of the allotted block has not been applied for mining lease.**	The whole area in the existing lease area has been proposed for mining lease
	- Total area in Ha of such part(s).	Not Applicable
	- Total reserves in such part(s). (Mt)	Not Applicable
	- Brief reasoning for leaving such part(s)	Not Applicable

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Chapter VII

ENVIRONMENTAL MANAGEMENT

	Parameters	Details
16	**ENVIRONMENTAL MANAGEMENT**	
a.	Commitment from the project proponent that the company will comply Environment and Forest Condition stipulated in the respective clearances	The Muraidih Colliery falls in Cluster II group of mines of BCCL under the administrative control of Barora Area. The impacts (both beneficial and adverse) of mining and its allied activities of the project have been assessed and presented in respect of biophysical & socio-economic environment. **Air Quality Management:** The impact assessment has been carried out dealing with the following points: (a) Phase-wise inventory of air pollution emission sources (b) Impact assessment **Sources:** ➢ **During Operational Phase** (i) Drilling & Blasting : Noise & Dust and SO_2 ,NO_2 (ii) Handling of coal : Noise & Dust and SO_2 ,NO_2 (iii) Movement of vehicles : Noise & Dust and SO_2 ,NO_2 ➢ **During Post Operational Stage** (i) Movement of dozers for physical reclamation of subsided area : Noise & Dust and SO_2 ,NO_2 (ii) Movement of vehicles for shifting and salvaging operation of OC Machineries and other equipment : Noise & Dust and SO_2 ,NO_2 (iii) Movement of vehicles for clearing of coal and other materials : Noise & Dust and SO_2 ,NO_2 **Impact Assessment** The ambient air quality is influenced due to the presence of PM_{10}, $PM_{2.5}$, SO_2, NO_2, etc. which are generated from above sources in operational and post operational stages of coal mining. Further, the ambient air quality is affected to a varying degree due to the mining activities of other nearby opencast and underground coal mines of the same coalfield. The concentration of pollutants

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may vary depending upon the various micro-meteorological parameters and the seasons of a year.

Fortnightly Ambient Air Quality Monitoring of Cluster – II group of mines consisting of Muraidih Colliery is being carried out at following stations as part of routine Environmental Monitoring by CMPDI RI-II, Dhanbad:

Core Zone Stations:

- **Block II OCP (A4): Industrial Area**
- **Muraidih OCP (A5): Industrial Area**

Buffer Zone Stations:

- **Madhuband Washery (A3) : Industrial area**
- **Madhuband UGP (A33) : Industrial area**

Air quality monitoring data at above stations for the period June 2025 to August 2025 is as given in the following tables.

Station Name : Block II OCP (A4)		Zone : Core		Category : Industrial	
Sl No.	Date of sampling	PM 10	PM 2.5	SO_2	NO_x
1	06.06.2025	94	48	<10	25
2	20.06.2025	98	52	<10	29
3	11.07.2025	65	29	<10	34
4	22.07.2025	70	33	<10	31
5	12.08.2025	72	31	<10	31
6	26.08.2025	73	32	10	34
	NAAQ Standard	100	60	80	80

Station Name : Muraidih OCP (A5): Industrial area		Zone : Core		Category : Industrial	
Sl No.	Date of sampling	PM 10	PM 2.5	SO_2	NO_x
1	09.06.2025	75	40	<10	31
2	23.06.2025	92	50	<10	29
3	03.07.2025	65	29	<10	32
4	18.07.2025	58	25	<10	28
5	13.08.2025	71	30	<10	28
6	27.08.2025	69	29	<10	28
	NAAQ Standard	100	60	80	80

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Station Name : Madhuband Washery (A3): Industrial area		Zone : Buffer		Category : Industrial	
Sl. No.	Date of sampling	PM 10	PM 2.5	SO_2	NO_x
1	10.06.2025	106	61	<10	28
2	24.06.2025	91	48	<10	30
3	03.07.2025	77	39	<10	33
4	18.07.2025	75	39	<10	32
5	13.08.2025	77	37	<10	32
6	27.08.2025	80	44	10	32
	NAAQ Standard	100	60	80	80

Station Name : Madhuband UGP (A33) Industrial Area		Zone : Buffer		Category : Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	03.06.2025	91	56	<10	24
2	18.06.2025	89	50	<10	33
3	03.07.2025	86	45	<10	31
4	18.07.2025	84	42	10	33
5	13.08.2025	82	37	<10	33
6	27.08.2025	83	37	<10	35
	NAAQ Standards	100	60	80	80

Keeping in view the above data it is evident that the air pollution in and nearby Cluster – II group of mines is generally within the GSR 742(E) Standards for Coal Mines of Jharia Coalfield but occasionally exceed the NAAQS standards. Following measures will be adopted to mitigate Air pollution from Muraidih Colliery:

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- At the points of dust generation, Fog Cannon/Mist Sprinklers shall be installed along with water sprinkling / spraying.
- Development of Greenbelt around quarry.
- Plantation will be done on external dump and reclaimed area.
- Regular maintenance of HEMM.
- Controlled blasting will usually be done in daytime during the shift change over period.
- Appropriate design of the geometry of blast holes.
- Coal transportation will be done through covered trucks/conveyor belt to washery and also to the siding.
- Wet Drilling.

Water Quality Management:

Sources

(i)	Sanitary (domestic) wastewater	:	Suspended solids and BOD.
(ii)	Water pumped out from Mine	:	Suspended solids of coal, clay and oil.
(iii)	Surface run-off passing through coal stockpiles	:	Suspended solids.
(iv)	Storm water from leasehold area and built-up area	:	Suspended solids.

Water Quality Report

Any adverse impact or pollution consequence of water will have serious effect on the environment. Hence, it becomes important to assess the water quality periodically in the mining area. Thus, to assess the water quality, samples were collected from one (01) location (for mine water) and analysed for physico-chemical characteristics. The water sampling points were selected by

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consultation between BCCL & JSPCB officials. The different sources of water were identified for water quality characterization depending on their use for potable/industrial purposes and considering likely impact on these sources due to project activities. Based on these considerations, it was thought necessary to assess the existing quality of different water sources in the study area including both up & down stream of surface water body, ground water and mine water.

Water pollution control measures:

- Garland drains will be made around the periphery of the quarry and OB dump to collect and carry the contaminated water to treatment/settling pond shall be provided.
- Oil & Grease trap to treat effluent from Workshop.
- Entire domestic effluent will be treated in septic tanks and soaked into soak pits.
- Industrial water will be put into a closed circuit.
- Properly designed system to collect and divert the storm water shall be provided.

Name of the Cluster: **Cluster - II**		Month : **June - August**		Name of the Station : **Block II**			
Observed Values (in µg/m3)							
Sl. No.	**Parameter**	**1st FN**	**2nd FN**	**1st FN**	**2nd FN**	**1st FN**	**2nd FN**
		09.06.25	**23.06.25**	**07.07.25**	**21.07.25**	**04.08.25**	**18.08.25**
1	Total Suspended Solids	47	45	46	40	41	46
2	pH	8.01	8	8.05	8.01	7.88	7.91
3	Oil & Grease	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
4	COD	36	32	36	32	40	36

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Ground water resources:

In coal mines, the different aquifers overlying the working coal seam would be contributing groundwater to the mine by gravity drainage which need to be pumped out for safe operation of the mines.

Generally steep draw down cone would be formed in poor potential aquifers thereby the influence area is to small distance and reverse is established in respect of aquifers with high hydraulic conductivity. The Impact of mining activities is likely to be pronounced in the dip side which are estimated by utilising aquifer and mine parameters at final mine depth. It may be appropriate to mention here that the presence of prominent boundaries/water bodies, faults and also interfringing of sandstone and shale beds may restrict the propagation of draw down cone.

Further, the ground water level decline is more in the close vicinity of the pit. The effect will be pronounced in the down – dip side and milder in the up – dip side. But this effect will be temporary in nature and once the project is over, after 2-3 rains, the regime will regain its almost original status.

Water conservation measures

- Provision of Rain water Harvesting system has been made for conservation of water.
- Settling pond for surface run-off with drainage system shall be provided.
- Closed water circuit will be provided.

Impact on Noise level

Fortnightly Noise Level Monitoring of Cluster – II group of mines consisting of Muraidih Colliery is being carried out at following stations as part of Routine Environmental Monitoring by CMPDI RI-II, Dhanbad:

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Core Zone Stations:

- Block II OCP (N4): Industrial Area
- Muraidih OCP (N5): Industrial Area

Buffer Zone Stations:

- Madhuband Washery (N3) : Industrial area
- Madhuband UGP (N33) : Industrial area

Noise level data at the aforementioned stations is as given below:

Name of the Project : Cluster - II					Permissible Limit of Noise level in dB(A)	
Station Name/ Code	Category of area	Date	Noise level dB(Day) LEQ	Noise level dB(Night) LEQ	Day (06AM - 10PM)	Night (10PM - 06AM)
Block II OCP (N4)	Industrial area	06.06.2025	62.1	56	75	70
	Industrial area	20.06.2025	63.4	54.7	75	70
	Industrial area	11.07.2025	58.2	41.7	75	70
	Industrial area	22.07.2025	59.7	42.1	75	70
	Industrial area	12.08.2025	55.7	47.2	75	70
	Industrial area	26.08.2025	56.2	47.4	75	70

Name of the Project : Cluster - II					Permissible Limit of Noise level in dB(A)	
Station Name/ Code	Category of area	Date	Noise level dB(Day) LEQ	Noise level dB(Night) LEQ	Day (06AM-10PM)	Night (10PM - 06AM)
Muraidih OCP (N5)	Industrial area	09.06.2025	53.7	43.5	75	70
	Industrial area	23.06.2025	54.2	42.3	75	70
	Industrial area	03.07.2025	58.8	41.4	75	70
	Industrial area	18.07.2025	59.3	41.9	75	70
	Industrial area	13.08.2025	44.8	37.5	75	70
	Industrial area	27.08.2025	45.5	37.5	75	70

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Name of the Project : Cluster - II					Permissible Limit of Noise level in dB(A)	
Station Name/Code	Category of area	Date	Noise level dB(Day) LEQ	Noise level dB(Night) LEQ	Day (06AM-10PM)	Night (10PM - 06AM)
Madhuband Washery (N3)	Industrial area	10.06.25	63.2	57.7	75	70
	Industrial area	24.06.25	64.4	58.0	75	70
	Industrial area	03.07.25	60.0	43.0	75	70
	Industrial area	18.07.25	60.1	42.3	75	70
	Industrial area	13.08.25	52.6	47.7	75	70
	Industrial area	27.08.25	53.7	47.5	75	70

Name of the Project : Cluster - II					Permissible Limit of Noise level in dB(A)	
Station Name/Code	Category of area	Date	Noise level dB(Day)LEQ	Noise level dB(Night)LEQ	Day (06AM-10PM)	Night (10PM-06AM)
Madhuband UGP (N33)	Industrial area	03.06.25	50.3	43.4	75	70
	Industrial area	18.06.25	50.5	43.7	75	70
	Industrial area	10.07.25	51.4	39.5	75	70
	Industrial area	25.07.25	51.7	39.8	75	70
	Industrial area	06.08.25	42.0	38.4	75	70
	Industrial area	21.08.25	42.1	38.6	75	70

Noise pollution control measures:

- Adequate and regular maintenance of plants and machineries will be carried out.
- The noise absorbing pads at foundations will be provided.
- Green belt has been proposed to prevent the propagation of sound and also to dampening its intensity.
- Proper blasting techniques by designing a suitable blasting pattern after actual field observation would be followed to

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minimize adverse effects of ground vibration and noise if required.

- Personal protective gears are given to workmen exposed to dusty and noise work environment.

Hazardous Waste:

Details of Hazardous waste generated and their method of disposal:

Sl No.	Waste description	Method of disposal
1.	Used oil	Will be stored in drums safely in store for disposal through auction to the authorized re-processors
2.	Oil and grease	
3.	Used batteries	To be stored safely for auction to the authorized re-processors.
4.	Oily sludge	To be disposed in impervious layer lined pits.
5.	Filters & filter materials containing oil during maintenance of vehicles	

- Door to door Municipal Solid Waste will be collected and subsequently this waste will be disposed by Municipal Corporation as per existing Rules.
- Sewage will be treated in Septic Tank cum Soak Pit prior to disposal.

Socio - Economic Issues:

The project is likely to give a boost to the economy of the area by providing primary and secondary employment to local people. The infra-structural facilities including healthcare facilities provided by the project will benefit local villagers. The progressive mine closure activity is likely to significantly reduce the impact of mining activity on the land apart from increasing the green cover and surface water availability. The yearly CSR expenditure as per existing CIL Policy is 2% of average net profit of the company for the immediate three preceeding years or Rs 2.00 per tonne of coal production of previous

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		year whichever is higher, which is proposed to be spent in vicinity of Muraidih UG Colliery will help in bringing about better socio-economic benefits to the local population. **Biological reclamation:** For successful biological reclamation of the reclaimed area, preference will be given to endemic species and mixed culture. The species will be selected carefully from the following groups for quick reclamation: ➢ Nitrogen fixing tree species for fuel wood, timber and fodder ➢ Fruit bearing tree species ➢ Tree species with dense foliage for shade ➢ Flowering and ornamental tree species

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	YEAR		PLANTATION		TOTAL PLANTATION
			Area (ha)	Trees/saplings (2500 Nos./ha)	
EXISTING PLANTATION (BCCL OWNED LAND)	Till Date		99.29	248225	248225
PROGRESSIVE PLANTATION	1	2025-26	2.5	6250	6250
	2	2026-27	2.5	6250	6250
	3	2027-28	3	7500	7500
	4	2028-29	3	7500	7500
	5	2029-30	3	7500	7500
	6	2030-31	10	25000	25000
	7	2031-32	10	25000	25000
	8	2032-33	10	25000	25000
	9	2033-34	10	25000	25000
	10	2034-35	10	25000	25000
	11	2035-36	10	25000	25000
	12	2036-37	10	25000	25000
	13	2037-38	10	25000	25000
	14	2038-39	10	25000	25000
	15	2039-40	10	25000	25000
	16	2040-41	15	37500	37500
	17	2041-42	15	37500	37500
	18	2042-43	15	37500	37500
	19	2043-44	15	37500	37500
POST MINING PLANTATION	PM-1	2046-47	22.87	57175	57175
	PM-2	2047-48	22.87	57175	57175
	PM-3	2048-49	22.87	57175	57175
	Total		341.9	854750	854750

***Plantation detail as per plantation plan**

Monitoring & Management Organisation:

To have a close watch on the environmental condition and implementation of the various measures suggested, a multi-disciplinary approach is essential.

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ORGANISATION CHART

Sl. No.	Measures/Actions		Agency
1.	Environmental Pollution Control	1	General Manager, Barora Area
		2	Nodal Officer (Environment), Barora Area
		3	Project Officer, Muraidih Colliery
		4	Area Manager (Civil), Barora Area
		5	Environment Cell (BCCL H.Q.)
2.	Environmental Monitoring	1	General Manager, Barora Area
		2	Area Manager (Civil), Barora Area
		3	Nodal Officer (Environment), Barora Area
		4	Project Officer, Muraidih Colliery
		5	Environment Cell of BCCL Headquarters
		6	Environmental Laboratory of CMPDI, RI-II, Dhanbad
3.	Reclamation	1	Project Officer, Muraidih Colliery
		2	Nodal Officer (Environment), Barora Area

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