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MINE PROFILE- Begunia Colliery

1.0 GENERAL MINE INFORMATION

1.1 MINE / PROJECT

Begunia Colliery which comes under Begunia Coal Block is located in the western part of Raniganj Coalfield, Paschim Bardhaman district, West Bengal. The colliery is about 45 Km from Dhanbad town and is well connected by both rail and road. The nearest railway station is Barakar railway station, which is about 2 Km away from the colliery. The Barakar town of Burdwan District, West Bengal and Chirkunda town of Dhanbad district, Jharkhand are located towards northern boundary of the block.

Begunia Colliery falls under the command of Area-XII (Chanch-Victoria Area) of BCCL, a subsidiary of Coal India Limited. Begunia U/G mine covers a leasehold area of 364.45 Ha. Coal production started in 1981and production from the mine is kept under suspension since 2013. At the time of suspension of production, Bord and Pillar depillaring with stowing (manual) was being practiced in this mine as a method of work. Development was done by Bord and Pillar method; depillaring was done by driving a level split at the middle of the pillar and extraction was done by driving slices.

Both Begunia and Laikdih seams within the property of Begunia Colliery have been extensively worked to the north of fault F2-F2 through 4 & 5 pits and 6 & 7 pits. Both the seams are largely depillared, abandoned and water logged in this area.

At the time of closure of Begunia Colliery, winning of coal was done from Begunia seam on the down throw side of 130m throw fault which was approached through a pair of stone drift of cross-section 5.0 m x 3.0 m driven 37.5 m apart at a gradient of 1 in 30 & 1 in 200 respectively from No. 6 & No. 7 Pit sunk up to Laikdih seam on the up throw side of the 130 m throw fault. The Pits were fitted with steam winders. No. 6 Pit is up-cast and man winding while Pit No. 7 is downcast as well as production pit. The reserve in Begunia seam is exhausted and exploitation of Laikidih seam requires driving a pair of shaft.

Barakar River flowing from north to south through the western part of the area forms the main drainage system of the area

1.2 MINE LOCATION

Begunia Colliery UG Mine is situated in Paschim Bardhaman district of WB. The mine is approachable from Koyla Bhawan HQ, Dhanbad by all weather roads. The nearest railway station is Barakar railway station, which is about 2 Km from the colliery.

Location

Latitude : 23°43'25.22" N to 23°43'57.88" N

Longitude	:	86°48'9.99" E to 86°49'48.91”E.
Nearest Airport	:	Ranchi (180 Km.) and Kolkata Airport 240Kms
Nearest Railway Station	:	Barakar 2Kms and Dhanbad (45 Km)
Approach by Road	:	(NH-2).
Nearest Seaport	:	Kolkata (270 Km.)

1.4 COMMUNICATION

The area is well connected by both rail and road. The Grand Trunk Road passes through the northern part of the area and the Barakar-Purulia Road, originating from G.T. Road, passes through the central part of the area.

1.5 MINING BLOCK

The existing mine falls under Begunia Underground Block-V as per the Master Plan of Jharia Coal Field Reconstruction.

1.6 MINING LEASE

The lease has been further extended by THE COAL INDIA (REGULATION OF TRANSFERS AND VALIDATION) ACT, 2000.

1.7 STATUS OF ENVIRONMENTAL CLEARANCE

Begunia Colliery comes under cluster XVII of CV Area, BCCL. Environment Clearance of Cluster XVII is granted by MoEF&CC on 01.02.2021. There is no forest land under Cluster XVII of CV Area BCCL hence no FC is required.

1.8 LAND ACQUISITION STATUS

The existing leasehold boundary of Begunia Colliery has been shown on the Surface Plan. The area of land under the heads of Private Land / Tenancy Land, Railway Land, Government Land and BCCL Land within the Colliery lease hold area has been considered as per the records from the mine/BCCL.

The existing land status under the different heads in the lease hold area of the mine is as under:

Sl. No.	Type/Ownership of Land	Area in Ha.
1	Government Land	61.86
2	BCCL Land	59.94
3	Private Land	242.65
Total Land in the lease hold Area		364.45

1.9 CLIMATE

The area belongs to humid tropical climatic region. The maximum temperature during summer shoots upto 48ºC and during winter the temperature falls between 12ºC to 5ºC. The average annual rainfall is about 1490mm.

1.10 TOPOGRAPHY AND DRAINAGE

The area is marked by general undulating topography with gentle southerly and south westerly slope. The maximum ground elevation is observed towards north eastern corner at triangulation station BT-9 having RL 125.55 m whereas the minimum ground elevation has been observed at BH No. RBG-5 where RL is 99.86 m.

The Barakar River flowing from north to south along the western boundary of the block forms the main drainage of the area. In addition to the Barakar River, there is one small nala flowing along eastern and southern part of the block and finally drained into Barakar River.

1.11 PRODUCTION OF THE LAST FIVE YEARS PRIOR TO SUSPENSION OF PRODUCTION.

Financial Year	Production (in Te)	Name of the seam
2008-09	33375	Begunia
2009-10	34658	Begunia
2010-11	28869	Begunia
2011-12	33970	Begunia
2012-13	19572	Begunia

2.0 GEOLOGY

2.1 SCOPE AND LIMITATION

1. The geological details given subsequently is confined to the assessment of local above Chanch-Begunia seam to Laikdih Bottom seams within the block/mine boundary. However, correlation and reserves of the lower seams (below Laikdih Bottom seam) has been calculated on the basis of limited available data. Therefore, reserves of these seams may be considered as tentative.
2. Only Standard Geological Nomenclature has been made use of in this report.
3. This report is mainly based on the data available in the GR on Exploration for Coal, Begunia Block, RCF, March, 1984 prepared by MECL.
4. The updated working plans of different seams supplied by the colliery authorities have been considered for preparing this report. An amount of approximation exists in the superimposition of the surface features on these plans.
5. The extent of pyrolitisation of the coal seams is based on the data obtained from boreholes and is interpretative. In view of the erratic behaviour of the burning pattern of the seams, there is possibility of changes in these zones (pyrolitised zone), if additional data is generated.
6. Grade lines/isochore lines in the pyrolitised zones have not been drawn and the reserves of coal in these zones have been assessed separately.
7. Faults with less than 5 m throw have not been interpreted unless there is a positive evidence of their occurrence in mine workings / boreholes data. Existence of such faults in the virgin area of seam is not ruled out.
8. In the absence of coordinated survey of underground workings with reference to surface features / boreholes, same extent of approximation exits in the superimposition of these workings with surface features on the plans of this report.

2.2 GEOLOGICAL BOUNDARY OF THE MINE / BLOCK

Geological boundary of the mine is as follows:

North : Victoria West Colliery

South : IISCO Property

East : IISCO's Ramnagar Colliery

West : Laikdih Deep Colliery & Chanch Colliery

2.3 DRILLING DETAILS

(a) Total Assessment Area - 4.1 Sq. Km.
(b) Total No. of boreholes - 28 of RBG, RKB & RKC series
(c) Total Meterage drilled - 14197.45 m
(d) Borehole density - 7 BHs /$Km^{2.}$

Details of boreholes:

MECL	:	23 BHs.	11373.05 m.
GSI	:	5 BHs.	2824.40 m
Total	:	28 BHs.	14197.45 m.

The borehole density within the project area is about 7 BHs. /Sq.Km. Total meterage drilled 14197 meter.

2.4 GEOLOGY OF THE COAL FIELD

The area under consideration occurs in the western part of Raniganj Coalfield and is completely covered with alluvium except at a few places where rocks of Barren Measure formation are exposed. The general stratigraphic sequence in this part of the coalfield is given in Table below.

General Stratigraphic Sequences in Begunia Block, Raniganj Coalfield

		Formation	**Lithologs**
Lower Gondwana Group	Damuda Sub-Group	Barren Measure Formation	Thick, Dark Grey to black ferruginous laminated shale with clay and Iron stone band at places
		Barakar Formation	Very Coarse grained conglomerratic Sandstone to fine grained feldspathic sandstone, sandy shale, carb shale and coal seam
		Talchir Formation	Fine grained greenish sandstone.
Un-confomity			
		Archean	Granite Gneiss, Amphibolite and Schists.

The Barren Measure formation, which occupies major portion of the area on surface, is identified by the typical lithology of monotonous black, micaceous shale weathering to brown with numerous thin bands of hard clayey iron stone projecting out and breaking into fragments. It is devoid of any coal seams.

The Barakar formation, which under lies Barren Measure formation with its sandstones, shale and coal seams is exposed toward the northern boundary of the exploration block. The Barakars are predominantly arenaceous with thick beds of different type of sandstone, shale and coal seam.

2.5 GEOLOGY OF THE MINING BLOCK

The Begunia Block is covered by the rocks of Barakar and Barren Measure formations of western Raniganj coal field. Barakar formation consisting sandstone, shale along with their intermediate facies and coal seams is exposed in the northern boundary of the block.

2.5.1 DIP AND STRIKE

The strike of the formation in Begunia varies from WNW-ESE in the western part to almost East-West in Central part. The dip, which is always southerly, is observed to be comparatively higher in the southern area where it is 10° than in the northern part of the exploration block, where it is 4° – 5° only.

2.5.2 INCROP/ OUTCROP OF COAL SEAM(S)

No seam incrops/outcrops in the leasehold except a local seam above Chanch Begunia seam.

2.5.3 COAL SEAM(S)

The generalized sequence and thickness of existing coal seam(s) and intervening partings in descending order are shown in the table below.

Seam/ Parting (Geological name)	**Thickness Range (m)***	****Quality/ Grade of seam**	**Depth range (m)**	**Remarks**	**Status of working**	**Avg. Grade of Mine**
Local above Chanch Begunia	0.30 - 1.05	S-II to W-IV	Incrop to 310	Mainly coal except around borehole RBG-10 where it is Jh. & M.P.		
parting	57 to 79					
Chanch	2.25 -	S-I to W-	10 -390	Mainly coal	Chanch	

Seam/ Parting (Geological name)	Thickness Range (m)*	**Quality/ Grade of seam	Depth range (m)	Remarks	Status of working	Avg. Grade of Mine
Begunia (B-VII)	4.15	III		except at a few places where it is Jh. & M.P.	Begunia (BVII) 2.51- 3.75 S-I to W-I 20-330 Seam developed in part area	**S-II**
Parting	**56 to 76**					
Chanch Begunia Special (B-VIIA)	0.64 - 2.01	W-I to U.G.	20 - 460	Coal, Jhama, M.P.		
Parting	79 to 97					
Jograd (B-VIA)	0.05 - 1.15	W-II to W-IV	70 - 530	Coal, Jhama, M.P.		
Parting	44 to 81					
Laikdih Top (B-VI)	3.50 - 6.55	S-IV to W-III	110 - 570	Jhama, M.P. Except inRBG-20 where it is Coal + Jh. & M.P.		**S-II**
Parting	40					
Laikdih Bot & Top/Bot (B-V)	18.50 - 32.03	S-I to W-II	160- 600	Coal, Jhama, M.P.	Seam is partially or completely pyrolitised	
Parting	48 to 66					
New Seam (B-VA)	11.55 - 18.20	S-II to W-III	Due to limited data depth can't be ascertained firmly	Jhama, M.P., Coal		
Parting	66 to 92					
Local	1.00 - 3.06	C - E	-do-	Coal		
Parting	4 to 17					
Gopinathpur Top (B-IV)	1.17 - 2.93	C - E	-do-	Coal, Jhama, M.P.		
Parting	2 to 20					
Gopinathpur (Bot) (B-IV)	1.12-3.03	D - E	-do-	Coal, Jhama, M.P.		

Seam/ Parting (Geological name)	Thickness Range (m)*	**Quality/ Grade of seam	Depth range (m)	Remarks	Status of working	Avg. Grade of Mine
Parting	6 to 69					
Brindawanpur Group (B-III)	14.95 - 19.46		-do-	Contains 4 to 7 horizons of coal beds.		
Parting	15-40					
Local	0.62 - 6.15	E - F	-do-	Coal		
Parting	12-50					
Kalimati/ Salanpur Group (B-II)	21.87 - 33.02		-do-	C, Jh, M.P. in borehole RCB-7, it is found to split into three.		
*Including pyrolitised portion. **Grade of only coal portion / unburnt portion only.						

N.B. : S: Steel grade, W: Washery grade, UG: Ungraded.

1. In India the ash content forms the basis of grading of coking coal mentioned as follows:

Grade	Ash % Range
Steel Grade-I	Upto 15
Steel Grade-II	> 15 upto 18
Washery Grade-I	> 18 upto 21
Washery Grade-II	> 21 upto 24
Washery Grade-III	> 24 upto 28
Washery Grade-IV	> 28 upto 35
Washery Grade-V	> 35 upto 42
Washery Grade-VI	> 42 upto 49
Ungraded	> 49

2.5.4 FAULTS

Total 12 faults have been deciphered in the area with throw up to 270 m.

Sl, No.	Fault	Location of the fault	Strike and dip of the fault	Max. throw of the fault (m)	Nature of the fault / Evidence

1.	F1-F1	400m west of RCB-13, passes south of RCB-7 and splits into two F1a-F1b at about 200 m west of RBG-14 and again merges together at about 120m north of RBG-20 and also merge with Fault F-2 and continue eastward.	ENE-WSW 60°towards south.	60 m in the west to 130m towards the east.	-Seam Laikdih & New Seam faulted in RCB-13. -Seam above Laikdih faulted due to combined effect of F-1 & F-2 in RBG-20.
2.	F1a-F1a	Splits from fault F-1 at about 200m west of RBG-14, passes 220m north of RKB-4 and merges with fault F-1b at about 120m north of RBG-20 to form fault F-1.	ENE-WSW 60°due South.	20m near RBG-14 and increases to 70m near — RBG-2	-Parting between Seams Chanch-Begunia Special and Jograd faulted in RBG-14. —Floor of Laikdih Seam Faulted in RKB-4. -Seam Laikdih and New Seam faulted due to combined effect of F-1a and F-1b in RKB-2.
3.	F1b-F1b	Splits from F1-F1 about 200m west of RBG-14, passes 160m north of RKB-4 and runs more or less parallel to Fault F-1a and merges with it at about 120m north of RBG-20. This fault itself splits into two, F-1b and F-1c with depth near RKB-4.	ENE-WSW 60°due South.	90m near RBG-14 and decreases to 30m towards east.	-Seam Chanch-Begunia Faulted in RBG-14. -Seam Laikdih and New Seam faulted due to combined effect of fault F-1a and F-1b in RKB-2. -Chanch-Begunia Special seam is faulted in RKB-4. -Floor of Laikdih seam faulted due to combined effect of fault 1b & 1c in RBG-2.
4.	F1c-F1c	This fault splits from fault F-1b at depth near RKB-4 and again merges with it north of RKB-2. It is not outcropping on surface	ENE-WSW 60° -45° due south	25 m	-Parting between Chanch-Begunia Special and Jograd faulted in RBG-1. -Seam Jograd faulted in RBG-2. - Chanch-Begunia Special seam is faulted due to combined effect of fault 1b & 1c in RKB-4.

5.	F2-F2	130 m south east of RKB-6, passes 60m South east of RKB-1A and splits into three faults, F-2a, F-2b, F-2c at about 120m south of RBG-19, which passes North of RKB-2 and again merges together as well as with Fault F1 at about 120 m north of RBG-20.	NE-SW to ENE-WSW towards east 60° due south east.	165 m to 240 m	-Local above Chanch- Begunia and Chanch- Begunia seams faulted in RBG-7. -Local above Chanch- Begunia faulted in RBG-9. - Seams above Laikdih (Top) faulted due to combined effect of fault F1 & F2 in RBG-20. -Seam Jograd to Laikdih and part of New Seam faulted in RBG-12.
6.	F2a-F2a	Splits from fault F-2 at about 120m south of RBG-19, passes 260m north west of RKB-5, 220m north of RKB-2 and merges with fault F-2b, F-2c and F-1 at about 120m north of RBG-20.	NE-SW to ENE-WSW 60° due south east.	100m to 110m	-Jograd seam is faulted in RKB-2. -Seam Chanch Begunia Jograd faulted due to combined offset of F-2a, F-2b and F-2c in RKB-5.
7.	F2b-F2b	Splits from fault F-2 at about 120m south of RBG-19, passes 240m north west of RKB-5, 190m north of RKB-2 and merges with fault F-1a and F-1c at about 120m north of RBG-20.	NE-SW to ENE-WSW 60° due south east.	115m	-Chanch-Begunia seam faulted in RKB-2 -Seams from Chanch Begunia to Jograd faulted faulted due to combined effect of fault F-2a, F-2b and F-2c in RKB-5.
8.	F2c-F2c	Splits from fault F-2 at about 120m south of RBG-19, passes 250m west of RKB-5, 160m north of RKB-2 and merges with fault F-1a and F-1b at about 120m north of RBG-20.	NE-SW to ENE-WSW 60° due south east.	115m	-Seams from Chanch Begunia to Jograd faulted faulted due to combined effect of fault F-2a, F-2b and F-2c in RKB-5.
9.	F3-F3	Originates 360m north-west of RBG- 14, passes 300m north-west of RBG-8 and 100 north west of RBG-13.	NE-SW, 60° due North-West.	30 m, increase towards north east	-Parting between Laikdih and New Seam faulted in RBG-10. -Encountered in the working of Chanch- Begunia seam in Begunia Colliery (Begunia

					Seam working).
10.	F4-F4	Located in the Western part of the block, passes 100m west of RCB-7, 75m west of RBG-11, 120m west of RBG-10 and 10m west of RCB-33.	NNE-SSW to NE-SW. 60° due East.	60 m in north to 60m towards south	-Local above Chanch- Begunia faulted along with part of Barren Measure strata in RCB-7. -Seams from Chanch Begunia to Jograd faulted due to combined effect of F4, F5 and F6 in RBG-11.
11.	F5-F5	Located almost parallel to F4-F4 towards west, passes 115m west of RCB-7, 90m west of RBG-11, 130m west of RBG-10 and 85m west of RCB- 33.	NNE-SSW to NE-SW 60° due East.	55m	-Jograd Seam faulted in RBG-10 -Seam Chanch-Begunia Special faulted in RCB-7 - Seams from Chanch Begunia to Jograd faulted due to combined effect of F4, F5 and F6 in RBG-11. -Roof of Laikdih seam faulted in RBG-10 -Jograd seam faulted due to combined effect of F-5 and F-6 in RCB-33.
12.	F6-F6	Located almost parallel to fault F-4 and F-5, passes 120m west of RBG-11, 200m west of RBG-10 and 100m west of RCB-33.	NNE-SSW to NE-SW. 60° due East.	50m to70m, increases towards south	-Jograd seam faulted due to combined effect of F-5 and F-6 in RCB-33. -Chanch Begunia to Jograd seams faulted due to combined effect of F-4, F-5 and F-6 in RCB-11. -Parting between New Seam and Gopinathpur faulted in RBG-10 -New Seam faulted in RCB-7.
13.	F7-F7	Located South of the Block, passes 470m south of RBC-13, the 125m south of RBG-15 and 200m south of RBG-9.	NE-SW, in the west to almost east-west towards east, 60° due west.	10m in the east to 50m in the west.	-Parting between Chanch-Begunia and Chanch- Begunia special seams faulted in RBG-9. -Seam Local above Chanch-Begunia faulted in RKB-6.
14.	F8-F8	Located 160m south of RBG-6.	ENE-WSW 60° due north.	0-5 m	-Parting between Chanch-Begunia and Chanch- Begunia Special faulted in RBG-6.

					-Encountered in the main drift of Begunia Colliery.

Altogether eleven faults with throw more than 5 m have been deciphered in the assessment area on the basis of boreholes and mine workings data. However, existence of faults with less than 5 m throw is not ruled out in the virgin area.

2.5.5 OTHER GEOLOGICAL DISTURBANCES

Igneous Intrusion / Pyrolitisation

11 out of 13 coal seams are partly or completely pyrolitised due to intrusion of mica-peridotite.

2.5.6 COAL SEAMS INFORMATION

2.5.6.1 Nomenclature

2.5.6.2 Description of Coal Seams

Seam Local (Above Chanch-Begunia) : This is the youngest seam of the Barakar formation in Begunia Block occurring normally within 10m to 15m below Barakar-Barren Measure contact. The seam has been intersected in 20 nos of borehole in the assessment area.

The roof of the seam is sandstone / shale and intercalation of shale & sandstone while the floor is shale or intercalations of shale and sandstone.

The seam is free from any pyrolitisation in major part of the block except around borehole RBG-10 where it is completely pyrolitised.

	Thickness (m.)	**Ash%**	**Grade**	**Reserve (MT) Coking (Inband)**
In Band	0 - 1.05	17-32.20	S-II to W-IV	2.076 [Virgin]

Seam Chanch-Begunia (B-VII): This is the most important seam of area occurring below seam 'Local above Chanch-Begunia' with a parting of 57 to 79m. The seam has been intersected in 22 no.s of borehole in the assessment area.

The roof of the seam is sandstone / shale and intercalation of shale & sandstone while the floor is shale or intercalations of shale and sandstone.

The seam is partially or completely pyrolitised in western part of the block due to mica peridotite intrusion.

This seam has been worked in the northern part of the block as Begunia seam by Begunia Colliery.

	Thickness (m.)	Ash%	Grade	Reserve (MT) Coking (Inband)
In Band	0 - 3.53	13.5-24.20	S-I to W-III	6.323 [Virgin]
				0.357 [Developed]
				6.680 [Total]

Seam Chanch-Begunia Special (B-VIIA): This seam occurs 56m to 76m below seam Chanch-Begunia. The seam has been intersected in 21 nos. of borehole in the assessment area.

The roof of the seam is mainly shale while the floor is intercalations of shale and sandstone or shale arenaceous and shale.

The seam is partially or completely pyrolitised in major part of the block due to mica peridotite intrusion. Except northwestern and southwestern part of the area.

This seam is a virgin seam.

	Thickness (m.)	Ash%	Grade	Reserve (MT)
In Band	0 - 1.20	19.5-36.60	W-I to W-V	1.732 [Virgin]

Seam Jograd (B-VIA): This seam occurs 79m to 97m below seam Chanch-Begunia Special. The seam has been intersected in 18 no.s of borehole in the assessment area.

The roof of the seam is mainly sandstone while the floor is medium to coarse grained sandstone.

The seam is completely pyrolitised in 4 boreholes [RBG-1, 4, 6 and RKB-4] at the central part of the area, rest of the area is unaffected.

	Thickness (m.)	Ash%	Grade	Reserve (MT)
In Band	0 - 1.15	23.4-33.10	W-II to W-IV	0.744 [Virgin]

Seam Laikdih (Top) [B-VI]: This seam occurs 44m to 81m below seam Jograd. This seam is the upper split of seam Laikdih which has splited into Top and Bottom towards the eastern part of the area. The seam has been intersected in 8 nos. of borehole in the assessment area.

The seam is partially or completely pyrolitised in the area.

	Thickness (m.)		Ash%		Grade	
	Top	**Bottom**	**Top**	**Bottom**	**Top**	**Bottom**
In Band	0.72	2.19	26.9	13.95	W-III	S-I

Seam Laikdih (Bottom and Top & Bottom Combined [B-V]: This seam occurs as a combined seam in the western part of the block. The maximum parting observed between Top and Bottom portion is 40m. The complete thickness of the seam has been intersected in 19 no.s of borehole in the assessment area.

The roof of the seam is mainly shale or shale arenaceous while the floor is sandstone, shale or intercalations of shale and sandstone.

The seam is partially or completely pyrolitised by mica peridotite intrusion in almost all the boreholes.

	Thickness	Ash%	Grade		
In Band	0 – 23.65	15-22.60	S-I to W-II	Laikdih Top & Bottom Combined	13.208 [Virgin]
					0.298
					13.506 [Total]
				Laikdih Bottom	8.936 [Virgin]
					0.624
					9.560 [Total]

New Seam [B-VA]: This seam occurs 49m to 66m below Seam Laikdih (Bottom and Top & Bottom Combined). This seam has been intersected in 6 no.s of borehole in the assessment area.

The seam is affected by mica peridotite intrusion in almost all the boreholes.

	Thickness (m.)	Ash%	Grade	Reserve (MT) Coking (Inband)
In Band	4.10 –7.80	15.55-24.40	S-II to W-III	2.022 [Virgin, Inferred]

Seam Local (Above Gopinathpur): This seam occurs 66m to 92m below New seam. The seam has been intersected in 4 no.s of borehole in the assessment area.

The seam is completely free from pyrolitisation.

	Thickness (m.)	Ash%	Reserve (MT) Non-Coking
In Band	1.00 – 3.06	32.2-37.07	1.301 [Virgin, Inferred]

Seam Gopinathpur (Top) [B-IV]: This seam occurs 4m to 17m below the Local seam. The seam has been intersected in 8 no.s of borehole in the assessment area.

The seam is partially affected due to mica peridotite intrusion.

	Thickness (m.)	Ash%	Reserve (MT) Non-Coking
In Band	0.57 – 2.52	26.1-33.65	7.466 [Virgin, Inferred]

Seam Gopinathpur (Bottom): This seam occurs 2m to 19m below seam Gopinathpur (Top). The seam has been intersected in 8 no.s of borehole in the assessment area.

The seam is partially affected due to mica peridotite intrusion.

	Thickness (m.)	Ash%	Reserve (MT) Non-Coking
In Band	1.12 – 2.40	29.11-45.7	8.455 [Virgin, Inferred]

Brindawanpur group of seams (B-III): This seam occurs 6m to 68m below seam Gopinathpur (Bottom). This is a group of seams consisting of 4 to 7 coal bands emplaced within a strata of 47m to 54m. The seam has been intersected in 5 no.s of borehole in the assessment area.

The seam is partially affected due to mica peridotite intrusion.

	Thickness (m.)	Reserve (MT) Non-Coking
In Band	15 – 19	

Seams Local (Above Salanpur): These one or two local coal bands occurs 15m to 40m below Brindawanpur group of seams. The seam has been intersected in 5 no.s of borehole in the assessment area.

The seam is free from pyrolitisation.

	Thickness (m.)	Ash%	Reserve (MT) Non-Coking
In Band	0.62 –6.15	32.6 – 44.0	16.353 [Virgin, Inferred]

Seam Kalimati/Salanpur Group (B-II): This is the lowermost seam occurring 12m to 50m below Local seams. The seam has been intersected in 5 no.s of borehole in the assessment area.

The seam is partially or completely pyrolitised in the area.

	Thickness (m.)	Reserve (MT) Non-Coking
In Band	2.77 –14.09	4.915 [Virgin, Inferred]

2.5.7 PHYSICO-MECHANICAL PROPERTIES

30 meters length of roof rock cores and 2.20 meters length of floor rock cores of 2.65 meters thick Begunia coal seam as encountered in borehole no. RBG-18 were analysed for Physico Mechanical properties study.

2.6 RESERVES OF COAL

2.6.1 IN-SITU COAL QUALITY

The quality of coal seams in this Geological Note is primarily based on GR on Exploration for Coal, Begunia Block (March'1984), Raniganj Coalfield prepared by MECL.

In case of coking coal, Iso-ash lines have been drawn, while in non-coking coal area, GCV / grade lines have been drawn.

Baked coal/Jhama, irrespective of their thickness has been excluded from the seam thickness.

Faulted, part faulted, & worked seam/part worked seam thickness encountered in the boreholes have not been considered for the purpose of quality assessment.

In case of seams, which are pyrolitised in part of the area, the "Full Jhama", "Part coal-part Jhama" areas have been delineated seam wise tentatively.

2.6.2 RESERVES ESTIMATION CRITERIA

a) The seam wise status of developed, depillared and quarried out areas in addition to virgin patches have 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 under consideration, if worked.

b) Goaf & Quarries: These areas have been considered as devoid of coal reserves.

c) Developed Areas: In developed areas, where reserves are standing on pillars & stooks, seam wise dimension of extraction have been decided on the basis of seam working plan made available by Area/Colliery authorities and after detailed discussion with them. The percentage of extraction has been taken as 30 % in standing on pillar and 70 % in stooks.

In case of part coal/part Jhama zone which is a demarcated zone, reserves in this zone may change, if additional data is generated.
The Reserves of Jhama in pyrolitisation zone have not been assessed separately.

The Gross Geological Reserves of coal have been calculated as follows:

Gross Geological Reserves = Area (Sq.Km) x Thickness (m) x Sp.Gr. (in million tonnes)

The specific gravity of coal has been arrived at by adding 1% of average ash% to 1.28.

2.6.3 GEOLOGICAL RESERVES

Out of the 13 coal horizons proved in Begunia Block, only 6 seams and their merged section (upto Laikdih Bottom) have been considered for reserve estimation under proved category. In case of lower seams where the intersections are less, the reserves are kept in inferred category.

Seam wise/Grade wise Net Geological Reserve is given below:

Seam	COKING										Non-Coking	
	Proved								Inferred	Total Coking	Inferred	Total
	S-I	S-II	W-I	W-II	W-III	W-IV	W-V	Subtotal	Subtotal			
Local above Chanch-Begunia		0.01	0.03	0.21	1.50	0.33		2.08		2.08		2.08
Chanch-Begunia (B-VII)	1.43	2.49	2.37	0.39				6.68		6.68		6.68
Chanch-Begunia Spl. (B-VIIA)			0.67	0.52	0.30	0.23	0.02	1.73		1.73		1.73
Jograd B-VI A				0.04	0.29	0.37	0.05	0.74		0.74		0.74
Laikdih(Comb)		9.05	4.04	0.41				13.51		13.51		13.51
Laikdih Bot		7.42	2.14					9.56		9.56		9.56
New Seam (B-VA)									2.02	2.02		2.02
LOCAL											1.30	1.30
Gopinathpur Top (B-IV)											7.47	7.47
Gopinathpur Bot (B-IV)											8.46	8.46
Brindawanpur Group (B-III)											71.62	71.62
LOCAL											16.35	16.35
Kalimati-Salanpur (B-II)											4.92	4.92
TOTAL	**1.43**	**18.97**	**9.25**	**1.57**	**2.08**	**0.93**	**0.07**	**34.30**	**2.02**	**36.32**	**110.11**	**146.43**

JHAMA RESERVE:

SEAM	Reserves (MT)
Local (Above Chanch/Begunia)	0.199
Chanch/Begunia	4.618
Chanch/Begunia Spl.	1.188
Jograd	0.386
Laikdih (Top + Bott)	23.624
Laikdih Bottom	9.268
TOTAL	39.283

2.6.4 TENTATIVE EXTRACTABLE RESERVE

1. Seam Considered: Laikdih Bot & Combined

2. Tentative minimum Extractable Reserve: 4.25 Million Tonne

3. Average Grade: S-II (As per Geological Report)

2.6.5 WATER REGIME

No data on hydrology and hydrogeology is available for the mine.

2.7 DEGREE OF GASSINESS

Degree of gassiness-III

3.0 PRESENT MINING STATUS

3.1 MINE ENTRIES

At present production from mine is suspended, all the entries to the mine has been effectively sealed off to avoid any accident and to prevent access to any unauthorized person. However, the particulars of outlets are as given below:.

Present Mine Entries

Pit no	Sunk upto seam	Depth (m)	Dia. (m)	Present Landing	Winder	Conveyance	Purpose	Present Status
6	Up to decking Level. Up to Laikdih seam	197.18 Total depth 286.89	5.49	Chanch Begunia seam	Steam 30” x 20”	Men & Material	Upcast & Man winding	open, Air locked

7	Up to decking Level. Up to Laikdih seam	209.88 Total depth 290.88	5.49	Chanch Begunia seam	Steam 54" x 22"	Coal & Material	Downcast & coal & material winding	Open, fenced with wire
4	Chanch/ Begunia seam	53.4	4.27	NA	Not available	NA	NA	Sealed off and ground levelled.
5	Chanch/ Begunia seam	64.0	4.27	NA	Not available	NA	NA	Being used for pumping and water level monitoring

3.2 MINING METHOD

At the time of suspension of production, Bord and Pillar depillaring with stowing (manual) was being practiced in this mine as a method of work. Development had been done by Bord and Pillar method; depillaring has been done by driving a level split at the middle of the pillar and extraction was being done by driving slices. At present no production activity is going on in the mine. However, prior to suspension of production (2013), working was going on in Begunia seam in the down throw side of fault F2-F2. Both the seams were extensively worked to the North of fault F2-F2 through 4&5 Pits and 6&7 pits. Also, Begunia seam was extensively worked to the South of fault F2-F2 through 6&7 pits and a pair of drifts. Coal preparation at coal faces were done by manual drilling and blasting. Roof supporting was done by roof bolting. The other technical details associated with the method of work were as follows:

Systematic support rules under Coal Mines Regulation 1957.

1. Basis of framing Systematic Support Rules. The systematic support rules had been framed on the basis of rock mass rating studies as recommended in DGMS circular No. 3 of 1993.

2. Support of every development workings within 10 m of face:

   2.1 The roof was supported by full column grouted roof bolts of at least 1.5 metres long and diameter 22 mm and placed in grid pattern of 1.2 metres.

   2.2 The spacing between the adjacent rows of support was not more than 1.20 M. The distance of first row of support from the face was not more than 0.60 M.

3. Support of junction including those immediately out bye of development face:

3.1 Junctions being formed or likely to be formed were supported by full column grouted bolts and placed in grid pattern of 1.2 metres. Additional roof bolts were grouted at the centre of each set of four bolts at the junction so that density of roof bolts was increased by 25%.

4. General Precautions

4.1 Prior to roof bolting, roof and sides were dressed and temporarily supported by props and if necessary by cogs.

4.2 Where slip planes or other geological disturbances were encountered, the roof bolts were provided at closer interval to give adequate support to either side of the weak plane. Alternatively, W-straps / channels were provided to strengthen the support system.

4.3 A suitable number of indicator props were erected and observed for tendency of bed separation.

5. Monitoring of support performance.

5.1 Anchorage capacity test was conducted at random and for not less than 10% of the installed bolts. The bolts which were subjected to above test were demarcated in underground.

5.2 Testing was always carried out under a properly supported roof with suitably designed anchorage testing equipment. For this purpose sufficiently long hose such that the testing personnel could take shelter at least two rows away.

5.3 The tests were conducted under direct supervision of a competent person holding Manager’s Certificate.

5.4 Record of anchorage test conducted on the bolts with special reference to the location, strength obtained & other details were kept in a bound paged book kept for this purpose and were singed by the persons making the tests & countersigned by the Manager.

6. Miscellaneous.

6.1 Provisions of amended Regulation 109 of the Coal Mines Regulation 1957 in respect of setting of supports were strictly complied with.

6.2 Additional supports were provided as and when necessary both in roof & sides.

6.3 Provisions of Regulations 108 (6) and 110 of the Coal Mines Regulation, 1957 in respect of formulation and implementation of code of standing orders for procurement and supply of support material, erection, maintenance, withdrawal of supports and also deployment and training of workmen and supervisors etc. and DGMS (Tech) circular No. 3 of 1993 and No. 3 of 1996 were strictly complied with.

3.3 STATUS OF MINING (SEAM WISE)

Both Begunia and Laikdih seams within the property of Begunia Colliery have been extensively worked to the north of fault F2-F2 through 4 & 5 pits and 6 & 7 pits. Both the seams are largely depillared, abandoned and water logged in this area.

At the time of closure of Begunia Colliery, winning of coal was done from Begunia seam on the down throw side of 130m throw fault which was approach through a pair of stone drift of cross-section 5.0 m x 3.0 m driven 37.5 m apart at a gradient of 1 in 30 & 1 in 200 respectively from No. 6 & No. 7 Pit sunk upto Laikdih seam on the up throw side of the 130 m throw fault .The Pits are fitted with steam winders. No. 6 Pit was up cast and used for man winding while No. 7 Pit was downcast as well as production pit.

The status of exploitation of different seams at Begunia Colliery is as follows:

Chanch Begunia (BVII)-
Prior to suspension of production, the mine was producing around 150 TPD from B&P depillaring by stowing from down throw side of this Seam. Thus Chanch Begunia (BVII) seam (both up throw and down throw side of fault) is completely exhausted and now it is abandoned and water logged.

Chanch Begunia (BVIIA)-Not workable due to very limited reserve.

Laikidih Seam-Seam is fully exhausted on the up throw side of the fault F2-F2. There is very limited reserve on the down throw side of the fault F2-F2 i.e., below Begunia seam on the down throw side of the fault F2-F2 is mostly virgin and pyrolitised.

Rest all seams of Begunia colliery are still virgin.

3.4 VENTILATION

At present, no ventilation arrangement exists in the mine. Earlier, two PV-200 fans were in operation. These fans have been transferred to neighbouring U/G mines for their gainful deployment.

3.5 STOWING INSTALLATION

At present, no stowing installation exists in the mine. Earlier, there was one old stowing installation at the mine near Pit no-6. The specification of stowing arrangement was.

Sand Bunker	:	1600 m^3
Water Reservoir	:	972 m^3

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3.6 MAGAZINE

Presently, there is no operational magazine available at Begunia Colliery but prior to suspension there was an operational magazine at Begunia Colliery.

3.7 TRANSPORT

3.7.1 VERTICAL TRANSPORT

At present, no vertical transport arrangement exists in the mine. Prior to suspension of production from the mine Pit no 6 &7 were equipped with steam winder. Pit 7 was used for coal and material transportation. The major components of the winder has been transferred to neighbouring mine for its gainful deployment.

3.7.2 UNDERGROUND TRANSPORT

At present, no underground transport arrangement exists in the mine. Prior to suspension of production from the mine, coal from begunia seam was transported by tubs through a series of tugger and direct haulages. At surface coal was unloaded to trucks through tippler for onward transport to Depot. These haulages have been transferred to other mines for their gainful deployment.

3.8 PUMPING & DRAINAGE

3.8.1 EXISTING PUMPING SYSTEM

At present, no underground pumping arrangement exists in the mine. However, to meet the domestic water demand, pumping is being carried out through Pit no 5 by installing a submersible pump of 100HP.

3.9 POWER SUPPLY AND DISTRIBUTION

3.9.1 SOURCE OF SUPPLY

Begunia Colliery receives 11 KV power supply from India Power Corporation Ltd. at Begunia Sub-station which is stepped down through 11KV/3.3 KV and 3.3 KV/550V transformers. The 3.3 KV power supply is used for feeding power to the HT equipments associated with operation of the mines. The 550V power is fed to the pumping stations for other purposes.

As per requirement the 550V power is stepped down to 440V and 220V for domestic requirement in the adjacent areas.

3.9.2 EARTHING & ILLUMINATION:

Solidly earthed neutral system is being used for different voltages in this colliery.

3.10 WORKSHOP

One workshop present at area level.

3.11 STORE FACILITIES:

There is a store room available.

3.12 COAL HANDLING PLANT

There is no surface coal handling arrangement in the mine at present.

3.13 WATER TREATMENT PLANT

There is a filter plant present in Begunia Colliery which receives raw water from Barakar River by 2 pumps of 40HP each and after filtration supplies the same to the River side colony and Dishergarh new colony by 2 pumps of 20HP.

3.14 LIST OF CIVIL ASSETS WHICH CAN BE HANDED OVER TO THE MINE OPERATOR

SL.NO	Name of the civil assets	Nos.
1	A Tintala colony of Dahibari-Basantimata colliery quater	220
2	Winding Engine Room	02
3	Fan House	01
4	Sand Bunker	01
5	Transformer Room	01

3.15 MANPOWER

At present, a small number of manpower are available in the roll of Begunia Colliery of CV Area to look after the township maintenance and sub stations.

3.16 Circle Rate of Private Land of Begunia Colliery

Sl no.	Mouza	Area of land (plot)	Govt. rate of private land to be used for industry	Rate per Decimal	Remarks
01	Barakar	0.40	51,70,176	1,29,254	As per govt. rate
02	Chungari	0.02	3,27,852	1,63,926	As per govt. rate
03	Kapasara	-	-	20,097	As per govt. rate

Note : There is an overlapping of claim of government land between state of Jharkhand and state of West Bengal. However, the rate of government land of Jharkhand is attached in the Mine Profile.

LIST OF PLATES

PLATE NO.	PLATE DESCRIPTION	R.F
I	LOCATION PLAN	>1:50000
II	SURFACE + GEOLOGICAL PLAN	1:4000

III-A TO C	**GRAPHIC LITHOLOG**	1:1000
V-A TO C	**GEOLOGICAL CROSS SECTION**	1:4000
	FLOOR CONTOUR PLAN OF SEAMS	
VI-1	SEAM LOCAL ABOVE CHANCH- BEGUNIA	1:4000
VI-2	CHANCH-BEGUNIA	1:4000
VI-3	CHANCH-BEGUNIA SPECIAL	1:4000
VI-4	JOGRAD	1:4000
VI-5	LAIKDIH BOTTOM & TOP+BOT(COMBINED)	1:4000
	SEAM FOLIO PLAN OF SEAMS	
VII-1	SEAM LOCAL ABOVE CHANCH- BEGUNIA	1:4000
VII-2	CHANCH-BEGUNIA	1:4000
VII-3	CHANCH-BEGUNIA SPECIAL	1:4000
VII-4	JOGRAD	1:4000
VII-5	LAIKDIH BOTTOM & TOP+BOT(COMBINED)	1:4000
	WORKING PLAN COMBINED	1:2000
	MAUZA PLAN, Circle Rate	1:3960
	Electrical Layout Plan	
	List of assets(Civil, Electrical and Mechanical Assets)	
	Government land rate of state of Jharkhand	