



**सीएमपीडीआई**  
मिनी रत्न  
**cmpdi**  
Mini Ratna

सेन्ट्रल माईन प्लानिंग एण्ड डिजाइन इन्स्टीच्यूट लिमिटेड  
(कोल इण्डिया लिमिटेड की अनुषंगी कम्पनी / भारत सरकार का एक लोक उपक्रम)  
गोन्दवाना प्लेस, कान्के रोड, राँची - 834 008, झारखंड (भारत)  
Central Mine Planning & Design Institute Limited  
(A Subsidiary of Coal India Limited / Govt. of India Public Sector Undertaking)  
Gondwana Place, Kanke Road, Ranchi - 834 008, Jharkhand (INDIA)  
CORPORATE IDENTITY NUMBER - U14292JH1975GOI001223

An ISO 9001: 2015 & ISO 37001: 2016 Certified Company

पत्रांक : सीएमपीडीआई/ युएमडी/ 2026 / E-1876152

दिनांक: 15.01.2026

सेवा मे,  
General Manager (UG&MC),  
Central Coalfields Limited,  
Darbhanga House, Ranchi — 834001.

विषय : Preparation of the Mining Plan of Churi Benti UG mine

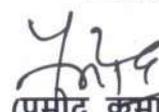
महोदय,

This is in reference to your email dated 14.01.2026 regarding the preparation of the Mining Plan of Churi Benti UG mine and the calculation process. As suggested by CCL that Mining Plan and Mine Closure Plan of some other projects of CCL has been accepted by CCO that a minimum of 25% of the escrow amount from the current year onwards deposited shall be utilized for community development and livelihood-related activities. Accordingly Mining Plan and Mine Closure Plan of Churi Benti UG Mine has been modified.

Please find the attachment of the modified Mining Plan of Churi Benti UG mine (765.13 ha).

सधन्यवाद।

Encl.: As above

भवदीय,  
  
(प्रदीप कुमार) 15/01/26  
महाप्रबंधक (यूएमडी)

Copy to: -

1. Director Technical (P&D), CMPDI, for kind Information.
2. Director Technical (P&P), CCL, for kind Information.
3. Regional Director, RI — III, CMPDI, Ranchi
4. General Manager, P&P, CCL
5. Area General Manager, N.K.Area, CCL
6. Project Officer, Churi Benti UG Mine, CCL.

  
Project Officer  
Churi Benti UG Project  
N.K. Area, CCL



फोन नम्बर/Phone No. :

ई-मेल/E-mail:

वेब साईट/Website :



सीएमपीडीआई  
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A Mini Ratna Company

**MINING PLAN AND MINE CLOSURE PLAN**  
**FOR**  
**CHURI-BENTI UG MINE**

(AREA: 765.13 Ha)

**NORTH KARANPURA COALFIELD**  
**RANCHI & CHATRA DISTRICT, JHARKHAND**  
(Peak Rated Capacity: 1.0 Mty)

**CENTRAL COALFIELDS LIMITED**  
**DARBHANGA HOUSE, KUTCHERY ROAD**  
**RANCHI, JHARKHAND, 834001**

Prepared By  
**CENTRAL MINE PLANNING & DESIGN INSTITUTE**  
**GONDWANA PLACE, KANKE ROAD**  
**RANCHI – 834008, INDIA**

  
Project Officer  
Churi Benti UG Project  
N.K. Area, CCL

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**Project Officer**  
**Chun Benti UG Project**  
**N.K. Area, CCL**

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Sl. No.	Parameters	Details	Annexure No.
1.	Copy of allotment order/vesting order		<b>Annexure – I</b>
2.	<p>Certificate of <b>Qualified person (QP)/ Accredited Mining Plan preparing agency (MPPA)</b> if the project area is confined within the vested/allotted block boundary/existing mining lease area</p> <p>Where the project area extends beyond the block boundary, a certificate of <b>Qualified person (QP)/ Accredited Mining Plan preparing agency (MPPA)</b> should be supported with a certificate of State Government mines and Geology department must be attached, which should specify</p> <p>(a) intent of the state government for grant of lease beyond the vested geological boundary;</p> <p>(b) non-existence of Coal/Lignite in the area beyond the vested/allotted geological block boundary/existing mining lease to rule out the issue of encroachment and use of coal bearing area (beyond the vested/allotted block boundary/existing mining lease) in the mining plan</p>	Certificate by Mining Plan preparing agency (MPPA)	<b>Annexure – II</b>
3.	Approval of the Company Board Approval:		<b>Annexure – III</b>
4.	Copy of earlier approval of mining plan.		<b>Annexure – IV</b> (Not Applicable)
5.	Plan/chart showing schedule of Implementation of Mine closure activities (progressive and final closure) with duration of important activities	Mandatory Document	<b>Annexure – V</b>
6.	Non-refundable Application fee	Proof of the payment	<b>Annexure – VI</b> (Not Applicable)
7.	Expert-Review Report	Carried out by Mining Plan Preparing Agency (MPPA)	<b>Annexure – VII</b> (Not Applicable)
8	<b>Other documents:</b>		
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 Project Officer  
 Churi Benti UG Project  
 N.K. Area, CGL

## CHAPTER 1

### 1.1 PROJECT INFORMATION

Sl. No.	Parameters	Details
<b>1.1</b>	<b>INTRODUCTION</b>	
1.1.1	Name of Coal / Lignite Block	Churi - Benti UG mine
1.1.2	Name of the Coalfield / Lignite Field	North Karanpura Coalfield
1.1.3	Base date of Mining Plan / Mine Closure Plan	April 2026
1.1.4	Linked End Use Plant	The coal block is not linked to any end use project.
1.1.5	Distance of End use plant from the pit head of the project in "km"	Not applicable
1.1.6	Mode of Coal Transport	It is proposed to transport coal by means of rail and road.

### 1.2 LOCATION, TOPOGRAPHY AND COMMUNICATION

1.2.1	Location of coal deposit (District and State)	The Churi-Benti U/G mine is located in the South-central part of North Karanpura coalfield between the 23°40'27" and 23°42'51" and the longitudes 85°01'48" and 85°03'37" covering a leasehold area of about 7.65 sq.kms. in Ranchi & Chatra district of Jharkhand state. It is covered by topo sheet Nos. 73E/2 and 73A/14 (Scale 1"=1 mile) of Survey of India. Saphi River forms the south-eastern boundary and arbitrary line beyond Fault F11A and along the fault plane of F11A of Benti Block forms the western boundary of the project. Ray Bachra colliery and Ashok OCP of Piparwar area is situated to the North / North-east and
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		Manki colliery (now exhausted) to the south/south- west of Churi project.
1.2.2	Communication: PWD roads, railway lines, Air	Churi-Benti UG mine is situated at a distance of 8 km on fair weather road connecting Khalari and Ray railway stations on the Gomoh-Dehri-on-Sone loop line of the East Central Railway. An all weathered 25 km long road links Khalari with Bijupara village on the state highway connecting Ranchi and Daltonganj. The P.W.D. road connecting Khalari and Barkagaon in Hazaribagh district also passes through the Churi block. CCL Hq. at Ranchi is situated at a distance of about 73km from Churi UG project.
1.2.3	Availability of power supply, water etc.	At present, power is being supplied to the Churi-Benti UG mine from the Piparwar source substation through two 33 kV overhead transmission line (OHTL) feeders. These feeders provide power to the existing surface substation of the mine. The existing surface substation for the Churi-Benti UG mine is equipped with two transformers, each with a capacity of 5.0 MVA, 33 kV/3.3 kV, along with one transformer of 25 kVA, 3.3 KV/230V. The existing surface sub-station is supplying power to all surface and underground loads of the mine
1.2.4	Prominent physiographic features, drainage pattern, natural water courses, rainfall data, highest flood level	<p>❖ <b>TOPOGRAPHY:</b></p> <p>The Benti block is characterized by more or less flat terrain with gentle undulations. In general, the ground slopes towards the south and east of the block. Maximum elevation of 458m is noticed in the north western corner of the block near borehole No. NNKA-332. The minimum elevation of 407m is noticed in the eastern part of the block near borehole No. NNKP-13 and NNKA-59. Because of the outcrop of soft rocks as well as- thick alluvium covers, gullies have developed at places leading to adverse land forms. This is more pronounced in the south western part of the block.</p> <p>❖ <b>DRAINAGE:</b></p> <p>The drainage of the block is controlled by the mighty Damodar River flowing west to east along the southern and eastern boundaries of the block. There are four important nalas within</p>

		<p>the block of which two are flowing almost north-south in the western part and the remaining two are flowing roughly north west-south east in the eastern part of the property. These nalas receive about 80% of the total precipitation within the block. About 10% of the run off goes into the Benti nala of Piparwar Project flowing near the north-eastern boundary of the Benti property. The balance 10% of the precipitation goes directly into the Damodar River. During acute summer, only detached pools of water is seen in Damodar. A spring with meagre discharge is also present in the north eastern part near NNKA-373.</p> <p><b>CLIMATE:</b></p> <p>The climate is tropical with severe summer. The temperature during summer (March to June) goes as high as 45°C. Summer days are hot with dusty winds but nights are generally pleasant. The minimum summer temperature is around 20°C. The winter (November to February) are cold and the minimum temperature recorded is 1°C. The rainy season is generally from June to October.</p> <p>The total rainfall in a year on an average is about 1050mm. of which 69% precipitation is during rainy season only.</p> <p><b>HFL:</b></p> <p>The High Flood Level of Saphi River as recorded close to the incline mouth by the colliery authorities in 1976 and supplied to the Exploration Division is 420.93m above the M.S.L. Part of developed working of Churi UG in W7, W8, and W9 panels falls below HFL. One seasonal nala is also passing over the panels of W8, W9, and W10. While working below it safety care should be taken.</p> <p>Incline No.1 in the Lower Bachra seam was driven from the area falling under high flood level of Saphi River. It has since been sealed and six numbers of check dams between 2nd and 3rd</p>
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		levels have been constructed as protective measures. Records of the H.F.L. on Damodar river (413.12-416.16m) have been taken from the adjoining Hesalong block.
1.2.5	Important surface features within the project area and major diversion or shifting involved	<ul style="list-style-type: none"> <li>• Damodar River passes through the proposed boundary dividing the Churi- Benti area into two parts – Benti lying on the west of Damodar River and the Churi lying on the west-east of Damodar River.</li> <li>• In addition to Damodar river, several roads over the allocated area on both sides of this river.</li> <li>• Rehabilitation site of Piparwar lies on the northern part of the allocated area.</li> <li>• Surface infrastructures for CCL mines lie on the western part of the allocated area. Additionally, there are a number of villages, roads, HT transmission line over the allocated area.</li> </ul>

  
**Project Officer**  
**Churi Benti UG Project**  
**N.K. Area, CCL**

**1.3 DETAILS OF THE ALLOTMENT AGREEMENT**

1.3.1	Name of the Allottee	<b>Central Coalfields Limited</b>																									
1.3.2	Details of allotment/ vesting order	NA																									
1.3.3	Name and address of the applicant	Churi Benti UG Mine Address: Office of Project Officer, Village – Ray, Near Khalaria Railway Station Ranchi, Jharkhand - 829209 Email – pochuri2017@gmail.com																									
1.3.4	Name of the Previous Allottee of the Block	CCL( Central Coalfields Limited)																									
1.3.5	Starting date of the Mine as per CMDPA	April 2026																									
1.3.6	Rated Capacity	1.0 Mty																									
1.3.7	Production Schedule as per opening permission	<table border="1"> <thead> <tr> <th>Year</th> <th>Churi Benti UG Mine</th> </tr> </thead> <tbody> <tr><td>Y1</td><td>1.0</td></tr> <tr><td>Y2</td><td>1.0</td></tr> <tr><td>Y3</td><td>1.0</td></tr> <tr><td>Y4</td><td>1.0</td></tr> <tr><td>Y5</td><td>0.60</td></tr> <tr><td>Y6</td><td>0.60</td></tr> <tr><td>Y7</td><td>0.60</td></tr> <tr><td>Y8</td><td>0.60</td></tr> <tr><td>Y9</td><td>0.60</td></tr> <tr><td>Y10</td><td>0.30</td></tr> <tr><td>Total</td><td>7.30 Mt</td></tr> </tbody> </table>	Year	Churi Benti UG Mine	Y1	1.0	Y2	1.0	Y3	1.0	Y4	1.0	Y5	0.60	Y6	0.60	Y7	0.60	Y8	0.60	Y9	0.60	Y10	0.30	Total	7.30 Mt	
Year	Churi Benti UG Mine																										
Y1	1.0																										
Y2	1.0																										
Y3	1.0																										
Y4	1.0																										
Y5	0.60																										
Y6	0.60																										
Y7	0.60																										
Y8	0.60																										
Y9	0.60																										
Y10	0.30																										
Total	7.30 Mt																										
1.3.8	End Use of Coal/Lignite as per Allotment order if any	The coal block is not linked to any end use project.																									
1.3.9	Cardinal Points co- ordinates of the Block boundary	Cardinal Points co-ordinates in national grid of the allocated mine boundary are tabulated below																									
		WGS84																									
		ID	Longitude																								
		C1	85° 2' 45.099" E																								
			Latitude																								
			23° 40' 30.480" N																								

		C2	85° 2' 44.876" E	23° 40' 30.203" N
		C3	85° 2' 44.662" E	23° 40' 29.959" N
		C4	85° 2' 44.557" E	23° 40' 29.845" N
		C5	85° 2' 44.533" E	23° 40' 29.816" N
		C6	85° 2' 43.105" E	23° 40' 28.172" N
		C7	85° 2' 42.792" E	23° 40' 28.322" N
		C8	85° 2' 37.573" E	23° 40' 30.777" N
		C9	85° 2' 35.474" E	23° 40' 31.764" N
		C10	85° 2' 33.864" E	23° 40' 32.521" N
		C11	85° 2' 25.865" E	23° 40' 36.355" N
		C12	85° 2' 24.809" E	23° 40' 36.861" N
		C13	85° 2' 18.364" E	23° 40' 40.053" N
		C14	85° 2' 17.386" E	23° 40' 40.537" N
		C15	85° 2' 16.355" E	23° 40' 41.048" N
		C16	85° 2' 14.980" E	23° 40' 41.729" N
		C17	85° 2' 8.929" E	23° 40' 53.063" N
		C18	85° 2' 8.711" E	23° 40' 53.472" N
		C19	85° 2' 7.938" E	23° 40' 54.920" N
		C20	85° 2' 5.400" E	23° 40' 59.674" N
		C21	85° 2' 5.108" E	23° 41' 0.220" N
		C22	85° 2' 4.723" E	23° 41' 0.917" N
		C23	85° 2' 4.185" E	23° 41' 1.892" N
		C24	85° 2' 2.346" E	23° 41' 5.225" N
		C25	85° 2' 0.803" E	23° 41' 8.021" N
		C26	85° 2' 0.301" E	23° 41' 8.930" N
		C27	85° 1' 59.085" E	23° 41' 11.133" N
		C28	85° 1' 58.419" E	23° 41' 12.340" N
		C29	85° 1' 56.281" E	23° 41' 16.213" N
		C30	85° 1' 53.552" E	23° 41' 21.129" N

		C31	85° 1' 53.539" E	23° 41' 21.152" N
		C32	85° 1' 54.049" E	23° 41' 21.195" N
		C33	85° 1' 54.095" E	23° 41' 21.197" N
		C34	85° 1' 54.477" E	23° 41' 21.224" N
		C35	85° 1' 54.513" E	23° 41' 21.226" N
		C36	85° 1' 54.650" E	23° 41' 21.243" N
		C37	85° 1' 55.479" E	23° 41' 21.300" N
		C38	85° 1' 55.957" E	23° 41' 21.333" N
		C39	85° 1' 56.088" E	23° 41' 21.338" N
		C40	85° 1' 56.286" E	23° 41' 21.346" N
		C41	85° 1' 57.875" E	23° 41' 21.454" N
		C42	85° 1' 59.738" E	23° 41' 21.615" N
		C43	85° 2' 0.265" E	23° 41' 21.685" N
		C44	85° 2' 1.047" E	23° 41' 21.789" N
		C45	85° 2' 1.708" E	23° 41' 21.833" N
		C46	85° 2' 1.827" E	23° 41' 21.857" N
		C47	85° 2' 2.084" E	23° 41' 21.860" N
		C48	85° 2' 2.299" E	23° 41' 21.852" N
		C49	85° 2' 2.793" E	23° 41' 21.858" N
		C50	85° 2' 3.393" E	23° 41' 21.904" N
		C51	85° 2' 3.819" E	23° 41' 21.905" N
		C52	85° 2' 4.276" E	23° 41' 21.924" N
		C53	85° 2' 4.700" E	23° 41' 21.955" N
		C54	85° 2' 5.300" E	23° 41' 22.016" N
		C55	85° 2' 5.833" E	23° 41' 22.093" N
		C56	85° 2' 6.025" E	23° 41' 22.107" N
		C57	85° 2' 6.103" E	23° 41' 22.151" N
		C58	85° 2' 6.520" E	23° 41' 22.210" N
		C59	85° 2' 6.946" E	23° 41' 22.279" N

		C60	85° 2' 7.391" E	23° 41' 22.341" N
		C61	85° 2' 7.998" E	23° 41' 22.425" N
		C62	85° 2' 8.406" E	23° 41' 22.484" N
		C63	85° 2' 8.408" E	23° 41' 22.485" N
		C64	85° 2' 11.821" E	23° 41' 27.247" N
		C65	85° 2' 12.243" E	23° 41' 27.837" N
		C66	85° 2' 11.050" E	23° 41' 29.725" N
		C67	85° 2' 11.059" E	23° 41' 29.736" N
		C68	85° 1' 59.582" E	23° 41' 48.137" N
		C69	85° 1' 57.544" E	23° 41' 51.404" N
		C70	85° 1' 57.467" E	23° 41' 51.526" N
		C71	85° 1' 55.409" E	23° 41' 54.826" N
		C72	85° 1' 49.552" E	23° 42' 12.528" N
		C73	85° 1' 49.771" E	23° 42' 13.539" N
		C74	85° 1' 52.772" E	23° 42' 27.381" N
		C75	85° 1' 53.871" E	23° 42' 32.451" N
		C76	85° 2' 6.568" E	23° 42' 43.441" N
		C77	85° 2' 14.191" E	23° 42' 50.038" N
		C78	85° 2' 40.734" E	23° 42' 25.892" N
		C79	85° 2' 40.926" E	23° 42' 25.717" N
		C80	85° 2' 40.882" E	23° 42' 25.756" N
		C81	85° 2' 44.349" E	23° 42' 22.559" N
		C82	85° 2' 45.475" E	23° 42' 21.520" N
		C83	85° 2' 45.497" E	23° 42' 21.559" N
		C84	85° 2' 46.838" E	23° 42' 20.339" N
		C85	85° 2' 47.001" E	23° 42' 20.191" N
		C86	85° 2' 47.378" E	23° 42' 20.924" N
		C87	85° 2' 47.436" E	23° 42' 21.004" N
		C88	85° 2' 47.616" E	23° 42' 21.283" N

		C89	85° 2' 47.848" E	23° 42' 21.558" N
		C90	85° 2' 48.097" E	23° 42' 22.066" N
		C91	85° 2' 48.239" E	23° 42' 22.295" N
		C92	85° 2' 48.416" E	23° 42' 22.715" N
		C93	85° 2' 48.581" E	23° 42' 23.013" N
		C94	85° 2' 48.694" E	23° 42' 23.308" N
		C95	85° 2' 48.732" E	23° 42' 23.468" N
		C96	85° 2' 48.799" E	23° 42' 23.557" N
		C97	85° 2' 48.892" E	23° 42' 23.767" N
		C98	85° 2' 49.003" E	23° 42' 24.045" N
		C99	85° 2' 49.127" E	23° 42' 24.325" N
		C100	85° 2' 49.391" E	23° 42' 24.840" N
		C101	85° 2' 49.404" E	23° 42' 24.858" N
		C102	85° 2' 49.413" E	23° 42' 24.883" N
		C103	85° 2' 52.263" E	23° 42' 30.427" N
		C104	85° 2' 53.975" E	23° 42' 35.048" N
		C105	85° 2' 54.012" E	23° 42' 35.092" N
		C106	85° 2' 54.182" E	23° 42' 35.305" N
		C107	85° 2' 54.575" E	23° 42' 35.894" N
		C108	85° 2' 55.230" E	23° 42' 36.652" N
		C109	85° 2' 55.336" E	23° 42' 36.757" N
		C110	85° 3' 5.551" E	23° 42' 27.685" N
		C111	85° 3' 14.256" E	23° 42' 19.960" N
		C112	85° 3' 17.920" E	23° 42' 16.737" N
		C113	85° 3' 18.591" E	23° 42' 16.147" N
		C114	85° 3' 29.622" E	23° 42' 6.321" N
		C115	85° 3' 31.721" E	23° 42' 4.455" N
		C116	85° 3' 35.710" E	23° 42' 0.912" N
		C117	85° 3' 35.731" E	23° 42' 0.893" N

		C118	85° 3' 26.053" E	23° 41' 52.135" N
		C119	85° 3' 34.151" E	23° 41' 44.241" N
		C120	85° 3' 33.875" E	23° 41' 43.942" N
		C121	85° 3' 33.706" E	23° 41' 43.714" N
		C122	85° 3' 33.482" E	23° 41' 43.350" N
		C123	85° 3' 33.321" E	23° 41' 43.057" N
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		C127	85° 3' 32.699" E	23° 41' 41.705" N
		C128	85° 3' 32.547" E	23° 41' 41.466" N
		C129	85° 3' 32.408" E	23° 41' 41.103" N
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		C189	85° 3' 21.081" E	23° 41' 22.970" N
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		C210	85° 3' 15.072" E	23° 41' 21.456" N
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		C214	85° 3' 13.161" E	23° 41' 20.857" N
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		C216	85° 3' 12.108" E	23° 41' 20.421" N
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		C221	85° 3' 10.745" E	23° 41' 19.483" N
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		C225	85° 3' 10.403" E	23° 41' 18.788" N
		C226	85° 3' 10.349" E	23° 41' 18.568" N
		C227	85° 3' 10.314" E	23° 41' 18.462" N
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		C229	85° 3' 10.051" E	23° 41' 17.595" N
		C230	85° 3' 9.918" E	23° 41' 17.131" N
		C231	85° 3' 9.706" E	23° 41' 16.375" N
		C232	85° 3' 9.278" E	23° 41' 15.081" N
		C233	85° 3' 9.175" E	23° 41' 14.774" N

		C234	85° 3' 8.681" E	23° 41' 13.909" N
		C235	85° 3' 8.222" E	23° 41' 13.094" N
		C236	85° 3' 7.842" E	23° 41' 12.576" N
		C237	85° 3' 7.684" E	23° 41' 12.465" N
		C238	85° 3' 7.544" E	23° 41' 12.296" N
		C239	85° 3' 7.180" E	23° 41' 11.860" N
		C240	85° 3' 6.912" E	23° 41' 11.540" N
		C241	85° 3' 6.790" E	23° 41' 11.430" N
		C242	85° 3' 5.509" E	23° 41' 15.069" N
		C243	85° 2' 59.708" E	23° 41' 5.714" N
		C244	85° 2' 58.118" E	23° 41' 3.195" N
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		C246	85° 2' 57.103" E	23° 41' 1.589" N
		C247	85° 2' 52.365" E	23° 40' 53.984" N
		C248	85° 2' 51.567" E	23° 40' 52.655" N
		C249	85° 2' 51.463" E	23° 40' 51.359" N
		C250	85° 2' 51.406" E	23° 40' 50.864" N
		C251	85° 2' 51.391" E	23° 40' 50.707" N
		C252	85° 2' 51.327" E	23° 40' 50.034" N
		C253	85° 2' 51.296" E	23° 40' 49.718" N
		C254	85° 2' 50.928" E	23° 40' 48.608" N
		C255	85° 2' 50.624" E	23° 40' 47.423" N
		C256	85° 2' 50.489" E	23° 40' 46.472" N
		C257	85° 2' 50.298" E	23° 40' 45.930" N
		C258	85° 2' 49.611" E	23° 40' 44.313" N
		C259	85° 2' 49.416" E	23° 40' 43.798" N
		C260	85° 2' 49.274" E	23° 40' 43.562" N
		C261	85° 2' 48.893" E	23° 40' 42.656" N
		C262	85° 2' 48.506" E	23° 40' 41.306" N

		C263	85° 2' 48.130" E	23° 40' 39.895" N
		C264	85° 2' 47.831" E	23° 40' 38.811" N
		C265	85° 2' 47.702" E	23° 40' 38.499" N
		C266	85° 2' 47.083" E	23° 40' 36.918" N
		C267	85° 2' 46.983" E	23° 40' 36.630" N
		C268	85° 2' 46.892" E	23° 40' 36.386" N
		C269	85° 2' 46.419" E	23° 40' 35.118" N
		C270	85° 2' 46.101" E	23° 40' 33.709" N
		C271	85° 2' 46.048" E	23° 40' 32.733" N
		C272	85° 2' 45.651" E	23° 40' 31.495" N
		C273	85° 2' 45.627" E	23° 40' 31.450" N
		C274	85° 2' 45.599" E	23° 40' 31.332" N
		C275	85° 2' 45.386" E	23° 40' 30.894" N
		C276	85° 2' 45.364" E	23° 40' 30.855" N

#### 1.4 DETAILS OF THE PREVIOUS APPROVAL OF MINING PLAN

1.4.1	Date of Approval	This is the first Mining Plan of Combined Churi Benti UG Mine submitted for approval
1.4.2	Conditions, if any	Not Applicable
1.4.3	Scheduled year of start of production	Not Applicable
1.4.4	Proposed year of achieving the targeted production	Not Applicable
1.4.5	Date of actual commencement of mining operations, if operations already started	Not Applicable

1.4.6	Likely date of mining operations, if operations not yet started & reasons for non-commencement of operations	Not Applicable
1.4.7	Planned production and actual levels achieved in last 3 years (Coal in Mte, OB in Mm <sup>3</sup> , SR in m <sup>3</sup> /te)	Not Applicable
1.4.8	Statutory obligations vis-à-vis compliance status in a tabular form	Not Applicable
1.4.9	Reasons for difference between the planned and actual production levels	Not Applicable

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

		Approved Mining Plan	Proposed Mining Plan
1.5.1	Block Area in "Ha"	NA	765.13
1.5.2	Block Area Projectised "Ha"	NA	765.13
1.5.3	Lease area "Ha"	NA	765.13
1.5.4	Project Area "Ha"	NA	765.13
1.5.5	Life of the Project "Yrs"	NA	10

		Approved Mining Plan	Proposed Mining Plan
1.5.6	Minimum and Maximum Depth of working "m"	NA	30.00 m to 132.84 m
1.5.7	Net Geological Block "Ha"	NA	765.13 ( Project Area)
1.5.8	Production Target "MTPA"	NA	1.0
1.5.9	Seams Available "As per GR"	NA	<p><b>There are two seams in Churi Benti UG Mine namely Upper and Lower Bachra seams</b></p> <ol style="list-style-type: none"> <li>1. <b>Upper Bachra</b> seam has workable thickness in Churi Area and unmineable thickness of less than 1 m in Benti Area and</li> <li>2. <b>Lower Bachra Seam:</b> The Lower Bachra seam in Benti Block splits into two parts. <ol style="list-style-type: none"> <li>A. Top Lower Bachra seam(TLB), and</li> <li>B. Bottom Lower Bachra seam(BLB)</li> </ol> <p><b>The Top Lower Bachra seam has again splitted into two distinct sections designated as:</b></p> <ol style="list-style-type: none"> <li>a. Upper Section of Top Lower Bachra (UTLB)</li> <li>b. Lower section of Top Lower Bachra ( LTLB)</li> </ol> </li> </ol>
1.5.10	Seams not considered for Mining with Reasons	NA	Lower Bachra and Upper Bachra Seam are considered for Mining.

		Approved Mining Plan	Proposed Mining Plan		
1.5.11	Gross Geological Reserve "Mt"	NA	62.39 MT in Project Boundary		
1.5.12	Net Geological Reserve "Mt"	NA	Seam	Total	Av. Seam Thickness
			Upper Bachra seam	17.33	3.5 m
			Bottom Lower Bachra seam (BLB)	4.47	< 2.5 m
			Top Lower Bachra (TLB)	6.59	4.5 m
			Lower Bachra Seam	34.00	4.6m
			Total	<b>62.39</b>	
1.5.13	Blocked Reserve "Mt"	NA	20.39 MT (3.2 MT blocked Under Surface Infrastructure and 17.19 MT under River and Half Pillar Barrier.)		
1.5.14	Mineable Reserve "Mt"	NA	42.0 MT		
1.5.15	Extractable Reserves "Mt"	NA	Seam	Total	Av. Seam Thickness
			Upper Bachra seam	1.59	3.5 m
			Bottom Lower Bachra seam (BLB)	0	< 2.5 m
			Top Lower Bachra (TLB)	3.62	4.5 m
			Lower Bachra Seam	2.09	4.6m
			Total	<b>7.30</b>	
			<i>Note : Net extractable reserve considered is excluding the reserve of BLB due to low thickness and parting with TLB varies form 0.2 M – 5.9 M</i>		
1.5.16	% of Extraction/ recovery	NA	36.4% w.r.t estimated mineable reserve of 42 MT		

		Approved Mining Plan	Proposed Mining Plan
1.5.17	Reserve Depleted (till the base date Reserves " Mt)"	NA	8.0 MT extracted till 2024-25.
1.5.18	Balance / Net Extractable reserve "Mt"	NA	7.30 (For Combined section of Seam UTLB and LTLB in Benti Side and LB & UB in Churi Side)
1.5.19	Average Grade	NA	Lower Bachra seam & Upper Bachra seam: G7
1.5.20	OB in Mm <sup>3</sup>	NA	NA
1.5.21	SR m <sup>3</sup> /te	NA	NA
1.5.22	Mining Technology	NA	Proposed to be worked by UG Method as given below: <ul style="list-style-type: none"> <li>Lower Bachra seam: <p><b>Benti Part:</b> Development and Depillaring of combined section of UTLB &amp; LTLB using Standard Height Continuous Miner / any other suitable blast-free technology.</p> <p><b>Churi Part:</b> Depillaring has been proposed already developed pillar of Lower Bachra seam by standard height continuous miner.</p> </li> <li>Upper Bachra seam: <p>Depillaring has been proposed already developed pillar of Upper Bachra seam by LHD with drilling and blasting.</p> </li> </ul>
1.5.23	Coal Beneficiation envisaged	NA	NA
1.5.24	Handling of Rejects	NA	NA

		Approved Mining Plan	Proposed Mining Plan		
1.5.25	Land use pattern "Ha"	NA	<b>Pre mining Land use pattern:</b>		
			<b>SL. No.</b>	<b>Type of land</b>	<b>Area (in ha)</b>
			1	GMA + GMK	44.80
			2	Tenancy Land	126.40
			3	Forest Land	593.93
	<b>Total</b>	<b>765.13</b>			
1	Excavation Area	NA	NA		
2	Top Soil Dump	NA	NA		
3	External Dump	NA	NA		
4	Safety Zone	NA	4.88		
5	Below River (a)	NA	29.23		
6	Undisturbed/Mining right for UG (b)	NA	675.41		
	Total Area for mining including area below river (a+b)	NA	704.64		
7	Road & Infrastructure Area (c)	NA	50.61		
8	UG Entry (d)	NA	5		
	Total Area including Road, Infrastructure, incline mouth, etc (c+d)	NA	55.61		
9	Water harvesting	NA	-- (included in the infrastructure area)		
10	Garland Drain	NA	--		

		<b>Approved Mining Plan</b>	<b>Proposed Mining Plan</b>
11	Green Belt	NA	--
	<b>Total</b>	NA	765.13
1.5.26	<b>Reasons for revision</b>	For Extension of existing Environmental Clearance of 244 Ha to 765.13 Ha land.	

  
**Project Officer**  
**Churi Benti UG Project**  
**N.K. Area, CCL**

## CHAPTER 2

## EXPLORATION, GEOLOGY, SEAM SEQUENCE, COAL QUALITY AND RESERVE

	<i>Parameters</i>	<i>Details</i>
<b>2.1</b>	<b>DETAILS OF THE BLOCK</b>	
2.1.1	Particulars of adjacent blocks: North, South, East, West	North : Ashok OCP & Piparwar Mangardaha South : Karkatta East : Bachra West : Purnadih
2.1.2	Location of the Block District /State	Churi-Benti U/G project is located in the South-central part of North Karanpura coalfield between the latitudes 23°40'27" and 23°42'51" and the longitudes 85°01'48" and 85°03'37". in the district of Ranchi & Chatra, Jharkhand State.
2.1.3	Area of the Block "Ha"	765.13 ( Project Area)
2.1.4	Area of the geological block projectized "in Ha" (Area of the geological block considered for liquidation of coal reserve)	765.13 ( Project Area)
2.1.5	Balance area yet to be projectized "Ha"	Nil
2.1.6	Likely reserve in the area yet to be projectized "in Ha"	Nil
2.1.7	Cardinal Points Co-ordinates of the non-coal/lignite bearing area/ existing mine lease outside the allotted Geological Coal Lignite block (Duly certified in line with para 1.9 of the Guideline, if fresh mining lease required)	Not applicable (As no area outside the proposed Mine boundary is involved).

2.1.8	<p>Certificate of <b>Qualified person/ Accredited Mining Plan preparing agency (MPPA)</b> if the project area is confined within the vested/allotted block boundary/existing mining lease and</p> <p>Where the project area extends beyond the block boundary, a <b>certificate of Qualified person/ Accredited Mining Plan preparing agency (MPPA)</b> should be supported with a certificate of State Government mines and Geology department must be attached, which should specify (a) intent of the state government for grant of lease beyond the vested geological boundary;(b)non-existence of Coal/ Lignite in the area beyond the vested/allotted geological block boundary/ existing mining lease to rule out the issue of encroachment and use of coal bearing area (beyond the vested / allotted block boundary /existing mining lease in the mining plan.</p> <p>The Project area, Lease area and geological block area in "Ha" shall also be envisaged.</p>	Certificate attached as Annexure-II
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2.1.9	KML file of the Proposed lease area, Project Area and geological block.	It is annexed as 'Plate III – Google Earth Image using KML file of the Project Boundary'.
2.1.10	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.	Proposed project area is confined within the proposed mine boundary
2.1.11	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	NA
2.1.12	Type of the Project (Operating /under Implementation) and year of Starting.	Underground Mining Project is under Operation
<b>2.2</b>	<b>EXPLORATION, GEOLOGY AND ASSESSMENT OF RESERVE</b>	
2.2.1	Regional geological set up of the area, local geology, structure, stratigraphic sequence, characteristics of the litho-logical units (coal seams/ partings/ / overburden)	
	<p><b>Regional geological set up of the coalfield:</b></p> <p>The North Karanpura Coalfield forms a prominent east- west trending valley between Hazaribagh plateau in the north and Ranchi plateau in the south. The Aswa Pahar in the south-east, separates the North and South Karanpura Coalfields* by east-west elongated metamorphic patch. However, they are inter-connected near Bachra and Hindegir by a narrow tongue of Talchir outcrops (Plate-I). On the eastern side, North Karanpura Coalfield is separated from the West Bokaro Coalfield by narrow stretch of metamorphic rocks having several outliers of Talchir Formation. In the west, it is separated by a stretch of about 20 Kms. wide metamorphic belt from the Auranga Coalfield.</p> <p>the coalfield, the coal bearing Formations viz. Karharbari, Barakar and Raniganj crop-out over an area of about 500 sq.km. (Plate.I). The Karharbari Formation is well developed in the south- central and eastern part of the coalfield. It contains only one coal</p>	

seam which is often splitted in two to three sections. The Barakar Formation contains good number of coal horizons and contributes the major bulk of reserves of this coalfield. Nine important coal seams have been established in the south central part of the coalfield in this Formation. In remaining part of the coalfield, only five persistent coal horizons have been established so far. However, the total coal column is more or less the same in both these regions. Raniganj Formation contains three to four thin coal seams which are generally shaly in nature and often impersistent. The coalfield is mostly free of igneous intrusions excepting small dolerite intrusives around Nawak-hap, Sarendag, Raham & Manatu villages near Tandwa and Beltu village in Keredari Geological Block. Mica periodite have also been reported by GSI from boreholes KBM-16 and 27 of the Badam Block.

The coalfield, the coal bearing Formations viz. Karharbari, Barakar and Raniganj crop-out over an area of about 500 sq.km. (Plate.I). The Karharbari Formation is well developed in the south- central and eastern part of the coalfield. It contains only one coal seam which is often splitted in two to three sections. The Barakar Formation contains good number of coal horizons and contributes the major bulk of reserves of this coalfield. Nine important coal seams have been established in the south central part of the coalfield in this Formation. In remaining part of the coalfield, only five persistent coal horizons have been established so far. However, the total coal column is more or less the same in both these regions. Raniganj Formation contains three to four thin coal seams which are generally shaly in nature and often impersistent. The coalfield is mostly free of igneous intrusions excepting small dolerite intrusives around Nawak-hap, Sarendag, Raham & Manatu villages near Tandwa and Beltu village in Keredari Geological Block. Mica periodite have also been reported by GSI from boreholes KBM-16 and 27 of the Badam Block.

The present structural set up of the coalfield, indicates that it has undergone substantial modification mainly due to faulting which took place after the deposition. The southern boundary of the coalfield is characterised by east-west trending major fault between Khalari and Mahuamilan villages. It has brought the Raniganj Formation at places in direct juxtaposition of Metamorphics. The northern boundary of the coalfield is also faulted but mostly causing repetition of out-crops of Barakar, Karharbari/Talchir Formations. Besides, above there are two more important structural features viz.

Karkata-Piparwar anticline in the south-central part and Indratoli Dome near Ronhe block in the eastern part of the coalfield. The Karkata-Piparwar anticline is a WNW plunging anticline whose southern limb is steeper ( $3^{\circ}$  to  $9^{\circ}$  dip) than the northern limb ( $2^{\circ}$  to  $4^{\circ}$ ). The Manki colliery is situated almost on the axis of this anticline. The axial region of this anticline can be seen in the cuttings of southern bank of Damodar river about 1 Km. north-east of Jaindh village where both the limbs are clearly exposed. Indratoli Dome exhibits a metamorphic core at the centre with quaquaversal centrifugal dips of Gondwana rocks. It is dissected by numerous radial faults.

### **Local Geology**

The surface and sub-surface data generated for Benti block have established the existence of Barakar and Karharbari Formations. Only Karharbari Formation is coal bearing within the present block having Bachra seam normally in 2 to 4 splits. The rocks of basal Barakars are exposed almost over the entire block. Thickness of this column varies widely on account of a series of step faults down throwing towards the updip side of the property. The sloping ground towards the south and east also add to this variation. Its thickness normally varies from 10 to 60m. as inferred from the boreholes. It is composed mainly of fine to medium grained sandstones, shales, Intercalation of shale and sandstone, carbonaceous horizons, fire clays etc. The Lower Dakra seam in the adjoining Ashok block and Purnadih block was very much available in this column also but due to extensive surface burning, it is now represented by burnt clay only. The basal Barakars are characterised by argillaceous and arenaceous facies in almost equal proportions whereas the underlying Karharbaris are predominantly arenaceous in nature. The Karharbaries are normally differentiated from the Barakars on the basis of occurrence of conglomerates, gritty sandstones, very coarse grained sandstones etc. with large pebbles of quartz embedded in them. The thickness of Karharbari Formation generally varies from 70 to 120 metres. The Bachra seam occurs in splits in a column of about 10 to 30 metres within the block.

Talchir Formation as encountered in few boreholes, depicts large variation in its thickness and overlying parting with the Bachra seam. It occurs after a parting of 18.80 to 25.25m with respect to Bottom Lower Bachra seam. This parting is normally 15 to 25m in the western part which decreases to around 6 metres in the extreme west in NNKA-379. It has increasing trend towards the east and has attained a thickness of

79.99m in borehole KP-1. The thickness of Talchir is about 7-15m in the south central part in NNKP-5 & NNKA-323 which increases to more than 61.22m. as recorded in KP-1 located in the north eastern part of the block. Talchirs are characterised by shales and fine to medium grained sandstones or their intermediate varieties which often exhibit greenish tinge in them. At times boulders of metamorphics embedded in largely fine to medium grained matrix are also noticed with thin layers of greenish materials showing orientations for short distances. Metamorphics have been recorded only in two boreholes i.e. NNKP-5 and NNKA-323 located in the south central part of the property.

A total of 101 boreholes were drilled over an area of 8.55 km<sup>2</sup> in Benti Block. Out of the total boreholes, 93 boreholes were coring and remaining 8 boreholes were partly coring/non-coring. The borehole density works out to 11.81 bore hole per square kilometer. The borehole density for the area proposed to be mined in Benti block (Sector-A) through Churi is 12.7 boreholes/km<sup>2</sup>.

#### **Geological structure**

The present structural set up of the coalfield, indicates that it has undergone substantial modification mainly due to faulting which took place after the deposition. The southern boundary of the coalfield is characterised by east-west trending major fault between Khalari and Mahuamilan villages. It has brought the Raniganj Formation at places in direct juxtaposition of Metamorphics. The northern boundary of the coalfield is also faulted but mostly causing repetition of out-crops of Barakar, Karharbari/Talchir Formations. Besides, above there are two more important structural features viz. Karkata-Piparwar anticline in the south-central part and Indratoli Dome near Ronhe block in the eastern part of the coalfield. The Karkata-Piparwar anticline is a WNW plunging anticline whose southern limb is steeper (3° to 9° dip) than the northern limb (2° to 4°). The Manki colliery is situated almost on the axis of this anticline. The axial region of this anticline can be seen in the cuttings of southern bank of Damodar river about 1 Km. north-east of Jaindih village where both the limbs are clearly exposed. Indratoli Dome exhibits a metamorphic core at the centre with quaquaversal centrifugal dips of Gondwana rocks. It is dissected by numerous radial faults.

#### **Geology Succession of North Karanpura Coalfield**

The generalised stratigraphic sequence of rock formation of N.K. Coalfield is as follows:

Period	Group	Sub Group	Formation	Lithology
Recent			Alluvium	Detrital & alluvi-el soil and sub-soil.
Jurassic		Coovals of Raj-mahal Trap	Igneous intrusi-sives	Delorite & Mica periodotite
Triassic	Upper Gondwana		Mahadeva	Massive coarse to conglomeratic feld-spathic ferruginous sandstone with shale intercala-
Upper Permian to Lower Triassic	Lower Gondwana		Panchet	Yellowish to white coarse grained sandstone, red, chocolate coloured plastic clays. In upper part, yellowish friable sand-stone whereas greenish yellow sandy shale in the lower part with 6and dune structure.
Upper Permian		Damuda	Raniganj	Fine to medium grained quartzo-feldspathic and quartzitic sand stone often micaceous and matured, inter banded shale and sandstone, carbonaceous shale and thin coal seams.
		Damuda	Barren Measures	Dark shale, sandy mica-eous shale with side-rite, interbaded shale and sandstones.
Lower Permian		Damuda	Barakar	Conglomerates, shale, grey-wackes, sandstones. Inter banded with shale, Carbonaceous shale. fire clay and coal seams.
		Damuda	Karhar-bari	Grey wackes, dark mot-led sandstone with occasional

				shale bands.fireclay, chocolate coloured clays and coal seams.
Permo-Carboniferous		Damuda	Talchir	Rikba plant beds, boulder conglomerates, varvites, sandstone, Tilloids , and Tillites.
Un-conformity				
Pre-Cambrian			Metamorphics	Granite gneisses, pegmatites, phyllites, mica-schist & limestones.Chromite bearing rocks,ambhibolites and quartz-ites.

### Characteristics of the litho-logical units (coal seams)

Seam / Parting	Thickness (Min)	Thickness (Max)	Generalised Range (m)
Strata between Baarakar & Upper Bachra/ Lower Bachra	47.5	62.35	
Upper Bachra (UB)	0.13 (NNK 035)	4.42 (NNKC047)	3.0 – 3.5
Parting	0.68 (NNKC049)	12.15 (NNKC003)	
Lower Bachra (LB)	2.30 (NNKC 031)	11.24 (NNKC048)	4.0 – 4.5
Combined Top Lower Bachra (TLB)	0.80 (NNKA 075)	5.10 (KP 001)	4.0 - 5.0
Parting	0.15 (NNKA 375)	6.2 (NNKA 075)	
Bottom Lower Bachra	0.16 (NNKA-401)	4.25 (NNKA-375)	0.9 - 2.5
Upper Section of Top Lower Bachra (UTLB)	0.17 (NNKA 351)	5.09 (NNKA 063)	3.0 – 4.0
Parting*	0.50 (NNKA 068)	2.0 (NNKA 364)	
Bottom Lower Bachra	0.16 (NNKA-401)	4.25 (NNKA-375)	0.9-2.5
Lower Section of Top Lower Bachra (LTLB)	0.14 (NNKA-396)	2.89 (NNKA 365)	1.5 – 2.0

2.2.2

**Local geology, Structure, Stratigraphic sequence, Characteristics of the litho-logical units (coal seams /partings/overburden) .**

#### Local Geology

In the Benti Block, only Karharbari formation is coal bearing having Bachra seam normally in 2 to 4 splits. The Benti block is a part of the northern limb of Karkatta-

Piparwar plunging anticline. The strike in the northern and south central part is roughly N-S with westerly dip, which swings to NW-SE in the northeastern corner of the block. The N-S strike of the northern part swings to almost NE-SW strike before becoming E-W in the north-western part of the block. The strike again swings to more or less NE-SW strike in the western part. In sector-'A', the strike varies from N-S to NW-SE and dip ranges from 1 degree to 3 degree (1 in 60 to 1 in 20) due SW to west. In Benti Block, 18 faults have been established.

### **Geological Structure**

The present structural set up of the coalfield, indicates that it has undergone substantial modification mainly due to faulting which took place after the deposition. The southern boundary of the coalfield is characterised by east-west trending major fault between Khalari and Mahuamilan villages. It has brought the Raniganj Formation at places in direct juxtaposition of Metamorphics. The northern boundary of the coalfield is also faulted but mostly causing repetition of out-crops of Barakar, Karharbari/Talchir Formations. Besides, above there are two more important structural features viz. Karkata-Piparwar anticline in the south-central part and Indratoli Dome near Ronhe block in the eastern part of the coalfield. The Karkata-Piparwar anticline is a WNW plunging anticline whose southern is steeper ( $3^{\circ}$  to  $9^{\circ}$  dip) than the northern limb ( $2^{\circ}$  to  $4^{\circ}$ ). The Manki colliery is situated almost on the axis of this anticline. The axial region of this anticline can be seen in the cuttings of southern bank of Damodar river about 1 Km. north-east of Jaindh village where both the limbs are clearly exposed. Indratoli Dome exhibits a metamorphic core at the centre with quaquaversal centrifugal dips of Gondwana rocks. It is dissected by numerous radial faults.

### **Strike and Dip of seams**

The strike of the Seams varies from N to S with westerly dip of  $2^{\circ}$  -  $4^{\circ}$  (1 in 30 to 1 in 14). Local swings in strike is mainly due to rolls or increase/decrease in the intervening partings between coal seams.

### **Faults**

The area under consideration in Churi Benti UG Mine i.e. 7.65 Sq. Km lies between faults F1 and F15. Fault F15 is in the north-western part of the block, while fault F1 is in

the southern and south-western part. The throw of fault F15 is about 20m towards the south-east in the northern part. The throw of fault F1 is about 20m and is towards the southern part of the block. The area between these two faults has a simple geological structure. There are thirteen more faults F14 to F2 in addition to above two faults which trend almost NE-SW with a south-easterly throw of 10m to 30m. .

### **Intrusive**

No Igneous Intrusion was found in proposed mining area of Benti.

### **Fire Clay**

The fire clay horizons have been encountered in few boreholes in isolated patches above the Bachra seam. It may be seen that one to five thin horizons of fire clay occur in isolated patches within the block. The prominent patch is located in the south eastern part of the block where normally 3 to 5 horizons of fire clays have been noticed. The other patches are very small and scattered over the block. The thickness of individual fire clay horizons varies widely. Normally, it varies from 0.25m. to 0.75m. except in few cases where it has attained thickness upto a maximum of 1.73m. Because of thin and impersistent behaviours of the fire clays as well as patchy occurrence.

### **Stratigraphic Sequence**

The existence of the Barakar and Karharbari Formations has been confirmed by the Benti block. The only coal-bearing formation in the current block is the Karharbari Formation, which typically has two to four splits in the Bachra seam. Nearly the whole block is covered in exposed basal Barakars rocks.

The predominant rock types of Karharbari Formation are coarse to vary coarse grained sandstones, conglomerates, greywackes and medium grained sandstone. These rocks contain pebbles of quartz also at times. Thin bands of sandy shale, alternate bands of shale and sandstone, carbonaceous shale, fire clay etc. also occur within this formation.

<b>Formation</b>	<b>Broad Lithology</b>	<b>Thickness</b>
Recent	Soil and sub-soil	0.23 (CBH003) to 12.20 (NNKC003)

Barakar	Conglomerate, sandstone, alternate bands of sandstone & shale, grey shale, fire clay etc.	30.03 (NNKC027) to 84.61 (NNKC031)
Karharbari	Sandstone, fire clay, grey shale, conglomerate	20.22 (NNKC015) to 47.42 (NNKC027)
	Upper Bachra seam	0.13 (NNK035) to 4.42 (NNKC047)
	Parting of conglomerate, alternating bands of sandstone & shale, sandy shale, grey shale & carbonaceous shale	0.68 (NNKC049) to 12.15 (NNKC003)
	Lower Bachra seam	2.30 (NNKC031) to 11.24 (NNKC048)
	Sandstone & shale	Not drilled
Talcher	Khaki green sandstone, shale & boulder bed.	Not drilled

**Characteristics of the litho-logical units (coal seams /partings/overburden) .**

Seam / Parting	Thickness (Min)	Thickness (Max)	Generalised Range (m)
Strata between Baarakar & Upper Bachra/ Lower Bachra	47.5	62.35	
Upper Bachra (UB)	0.13 (NNK 035)	4.42 (NNKC047)	3.0 – 3.5
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Combined Top Lower Bachra (CTLB)	0.80 (NNKA 075)	5.10 (KP 001)	4.0 - 5.0
Parting	0.15 (NNKA 375)	6.2 (NNKA 075)	
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Upper Section of Top Lower Bachra (UTLB)	0.17 (NNKA 351)	5.09 (NNKA 063)	3.0 – 4.0
Parting*	0.50 (NNKA 068)	2.0 (NNKA 364)	
Bottom Lower Bachra	0.16 (NNKA-401)	4.25 (NNKA-375)	0.9-2.5
Lower Section of Top Lower Bachra (LTLB)	0.14 (NNKA-396)	2.89 (NNKA 365)	1.5 – 2.0

**Description of coal seams in the allocated area**

❖ **Coal Seams in the Churi Block** : two seams namely Upper Bachra and Lower Bachra have been encountered.

1. **Upper Bachra Seam:** It varies in thickness from 0.13 m (NNKC-35) to 4.84 m (CCPS-10) and is mostly devoid of any dirt bands. Generally, it is 2 to 3 m in thickness in major part of area. The seam thickness decreases to less than 1.2m in the south-western part (NNKC- 26,28, 33, 35, 40, 48) and in the northern part of the property (NNKC- 43, 44, 49). The immediate roof of UBS is generally grey shale, sandy shale, conglomerate, medium to coarse grained sands ton, carbonaceous shale etc. The immediate floor is predominantly carbonaceous shale and grey shale. The calculated GCV varies from 3929k.cal/kg in NNKC029 to 5707k.cal/kg in NNKC025. The overall grade of the seam ranges from G6 to G12
2. **Lower Bachra Seam:** It is the bottom most seam having thickness from 1.71m to 11.24m (NNKC-48) and occurs 0.68m to 20.27m (CCPS-4) below Upper Bachra seam. The Iso-parting indicates that the parting gradually increases from 3m in the middle of the property to about 18m in the south-eastern region. In the north-western part, parting varies from 1 to 3m. The thickness normally varies from 3-5m, which gradually increases to 9m in the western part near Damodar river.

It has been observed from the seam structure plans that there is generally a persistent dirt band of carbonaceous shale/grey shale occurring about 2 to 2.5m below the roof. The bottom section of the seam is generally clean and better in quality than the upper section which is commonly inter banded and often contains thick shaly coal horizons.

The immediate roof of LBS is carbonaceous shale, grey shale, fine to medium grained sandstone. Floor is generally grey shale, intercalation of shale and sandstone, carbonaceous shale, sandy shale and at times by medium to coarse grained sandstone. The calculated GCV varies from 4678k.cal/kg in NNKC - 3 to 5851k.cal/kg in NNKC - 26. The overall grade of the seam ranges from G5 to G9

❖ **Coal Seams in the Benti Block:** two seams namely Upper Bachra and Lower Bachra have been encountered.

1. **Upper Bachra Seam:** It occurs in a small patch in sector-A along the eastern block boundary. This has completely pinched out near the boundary of Benti and Churi mine. This seam has not been considered in this Report due to low thickness (<1m). The grade of coal varies from 'G 6' to 'G 7'.
2. **Lower Bachra Seam:** The Lower Bachra seam in Benti Block splits into two parts.
  - A. Top Lower Bachra seam(TLB), and
  - B. Bottom Lower Bachra seam(BLB)

**The Top Lower Bachra seam has again splitted into two distinct sections designated as:**

- a. Upper Section of Top Lower Bachra (UTLB)
- b. Lower section of Top Lower Bachra ( LTLB)

However, both the above upper and lower sections have merged together in small isolated patches in Sector 'A' and designated as combined Top Lower Bachra(CTLB).

The Bottom Lower Bachra seam has thickness range of 0.24 to 4.18m and is persistent throughout the property.

- a. **Upper Section of Top Lower Bachra (UTLB):** It is persistent throughout the property as well as in sector-A, except near the western block boundary where it has pinched out completely.
  - **Thickness:** It varies generally from 0.17m – 5.09m.
  - **Dirt Bands:** It is normally less than 0.30m in thickness and are carbonaceous shale in nature.
  - **Roof & floor:** The immediate roof is represented by medium to coarse grained sandstone, carbonaceous shale, grey shale and conglomerates. The floor is marked by carbonaceous shale, sandy shale, grey shale, medium shale to coarse

	<p>grained sandstone and alternate bands of shale and sandstone.</p> <ul style="list-style-type: none"> <li>➤ <b>Quality:</b> The calculated GCV varies from 3350k.cal/kg in NNKA058 to 6485k.cal/kg in NNKP005. The overall grade of the seam ranges from G3 to G14.</li> </ul> <p>b. <b>Lower Section of Top Lower Bachra (LTLB):</b> This section is overlain by Upper section of Top Lower Bachra seam after a parting of 0.50m to 2.00m and pinches out completely in the western part of the block.</p> <ul style="list-style-type: none"> <li>➤ <b>Thickness:</b> It varies generally from 0.14m – 2.89m.</li> <li>➤ <b>Dirt Bands:</b> The seam is mostly free from dirt bands. It has been found in only 3 bore holes and is generally less than 0.38m in thickness.</li> <li>➤ <b>Roof &amp; floor:</b> The immediate roof is represented by carbonaceous shale, sandy shale, medium to coarse grained sandstone and alternate bands of shale and sandstone. The floor is normally sandy shale, alternate bands of shale and sandstone, medium grained sandstone and gray wackes.</li> <li>➤ <b>Quality:</b> The calculated GCV varies from 3710K.cal/kg in NNKA-325 and 6215K.cal/kg in NNKA391. The overall grade of the seam ranges from G4 to G12.</li> </ul> <p>c. <b>Combine Top Lower Bachra (CTLB):</b> The Upper and Lower sections of Top Lower Bachra seam have merged together in three narrow isolated patches in the sector.</p> <ul style="list-style-type: none"> <li>➤ <b>Thickness:</b> The thickness of the combined Top Lower Bachra seam varies from 1.10m (NNKA-372) to 5.10m (KP-1). The combined seam is generally around 4.0m in thickness in the north-eastern patch in Sector-A.</li> <li>➤ <b>Dirt Bands:</b> The thickness of the dirt bands is less than 0.19m. The dirt bands have been found in 4 boreholes out of the 15 boreholes.</li> <li>➤ <b>Roof &amp; floor:</b> Immediate roof is generally represented by carbonaceous shale and coarse to very coarse-grained</li> </ul>
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	<p>sandstone. The floor is marked by the sandy shale, carbonaceous shale and greywacke.</p> <p>➤ <b>Quality:</b> The calculated GCV varies from 4460K.cal/kg in NNKA375 to 5150K.cal/kg in NNKA370. The overall grade of the seam ranges from G8 to G10.</p>	
2.2.3	Geological Block Area “ Ha”	765.13
2.2.4	Status of Exploration of the block	Explored
2.2.5	Area covered by ‘detailed’ exploration within the block (sq. km)	765.13
2.2.6	Whether entire lease area has been covered by ‘detailed’ exploration.	Yes
2.2.7	No. of boreholes drilled within the block	<b>157</b> (56 in Churi Area & 101 in Benti Area)
2.2.8	Whether any further exploration/study is required or suggested and time frame in which it is to be completed	No
2.2.9	Year wise future programme of exploration	No
2.2.10	Overall borehole density within the block (no./ sq. km) approx	<b>11.1</b> (9.5 BH per Sq.Km in Churi Area & 12.7 BH in Sq.Km in Benti Area)
2.2.11	No of Seams available as per GR (Geological Report)	<p><b>Upper and Lower Bachra seams</b></p> <p>1. <b>Upper Bachra</b> seam has unmineable thickness of less than 1 m in Benti Area and has workable thickness in Churi Area</p> <p><b>2. Lower Bachra Seam:</b></p> <p>The Lower Bachra seam in Benti Block splits into two parts.</p> <p>A. Top Lower Bachra seam(TLB), and</p> <p>B. Bottom Lower Bachra seam(BLB)</p>

		<p><b>The Top Lower Bachra seam has again split into two distinct sections designated as:</b></p> <p>a. Upper Section of Top Lower Bachra (UTLB)</p> <p>b. Lower section of Top Lower Bachra (LTLB)</p>																																			
2.2.12	Seams not considered for Mining with Reasons	Bottom Lower Bachra Seam: The parting between Combined Section of Top Lower Bachra (TLB) and Bottom Lower Bachra Seam varies from 0.2 – 5.9 M. As the Combined Thickness of TLB is greater than BLB and sufficient parting is not present to work in both the seams, BLB is not considered for mining.																																			
2.2.13	Dip of the Seam	around 1 in 14 or flatter																																			
2.2.14	Seam wise thickness, depth and reserve:																																				
	<table border="1"> <thead> <tr> <th>Seam Name</th> <th>Av. Seam Thick. (m)</th> <th>Depth (m)</th> <th>Mineable Reserve (Mt)</th> <th>Extractable Reserve (Mt)</th> </tr> </thead> <tbody> <tr> <td>Upper Bachra seam</td> <td>3.5 m</td> <td>30.00-95.00</td> <td>12.9</td> <td>1.59</td> </tr> <tr> <td>Bottom Lower Bachra seam (BLB)</td> <td>&lt; 2.5 m</td> <td>77.9-132.84</td> <td>3.5</td> <td>0</td> </tr> <tr> <td>Top Lower Bachra Seam (TLB)</td> <td>4.5 m</td> <td>62.51-93.37</td> <td>5.8</td> <td>3.62</td> </tr> <tr> <td>Lower Bachra Seam (LB)</td> <td>4.6 m</td> <td>64.96-95.23</td> <td>19.8</td> <td>2.09</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Total</b></td> <td><b>42.0</b></td> <td><b>7.30</b></td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Net Extractable Reserve Considered (M.Te)</b></td> <td colspan="2" style="text-align: center;"><b>7.30</b></td> </tr> </tbody> </table> <p><b>NOTE: The Total Extractable reserves of Churi Benti UG Mine is 15.3 MT out of which 8.0 MT has already been extracted and balance extractable reserves is 7.3 MT</b></p>		Seam Name	Av. Seam Thick. (m)	Depth (m)	Mineable Reserve (Mt)	Extractable Reserve (Mt)	Upper Bachra seam	3.5 m	30.00-95.00	12.9	1.59	Bottom Lower Bachra seam (BLB)	< 2.5 m	77.9-132.84	3.5	0	Top Lower Bachra Seam (TLB)	4.5 m	62.51-93.37	5.8	3.62	Lower Bachra Seam (LB)	4.6 m	64.96-95.23	19.8	2.09	<b>Total</b>			<b>42.0</b>	<b>7.30</b>	<b>Net Extractable Reserve Considered (M.Te)</b>			<b>7.30</b>	
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<b>Net Extractable Reserve Considered (M.Te)</b>			<b>7.30</b>																																		
2.2.15	Methodology of reserves estimation (also mention if any software package has been used)	<p>For the estimation of mineable and extractable reserves, the following are some of the major considerations:</p> <ul style="list-style-type: none"> <li>• For Churi Benti UG mine under</li> </ul>																																			

		<p>consideration, the mineable reserve has been estimated considering the old working areas that have been considered mineable as well as virgin mineable areas;</p> <ul style="list-style-type: none"><li>• Mineable reserve in old working areas has been estimated based on the reserve standing on pillars which have been considered mineable.</li><li>• Mineable reserve for the developed panels of CRO has been estimated considering the standing on pillars reserve.</li><li>• For estimation of mineable reserve in virgin areas, the minable area has been multiplied by average seam thickness and specific gravity of coal.</li><li>• Coal blocked in barrier against mine boundary, Surface Infrastructure faults, water logged workings, etc. has been excluded while estimating the mineable reserve;</li><li>• While estimating the extractable reserve, coal blocked into the panel barriers and barrier against trunk roadways, has been excluded. Further, coal blocked due to various reasons like inaccessible places, odd shaped areas, surface structures, other mining losses, coal left in roof where thickness is greater than 4.6m, etc. has also been excluded for obtaining the</li></ul>
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		<p>approximate extractable reserve; and</p> <ul style="list-style-type: none"> <li>The above estimations of mineable reserve and extractable reserve also exclude reserves falling vertically below Damodar River.</li> </ul> <p><b>Note:</b> <i>The estimated total amount of extractable reserve is approximately 7.30 million tons. The Bottom Lower Bachra seam (BLB) has not been taken into account in this report, because of their low average seam thickness.</i></p> <p><b>**</b> <i>The estimated extractable reserve around (3.62 million tons) of combined section of Upper Section of the Top Lower Bachra seam (UTLB) and Lower section of Top Lower Bachra seam(LTLB) have been taken into account for preparation of mining plan.</i></p> <p><b>**Seam / Section Considered for Mining:</b></p> <p><i>In Churi side Lower Bachra Seam and Upper Bachra seam has been considered for mining where as in Benti Side individual section of Top section of lower Bachra (i.e UTLB &amp; LTLB) has been considered for mining. The average grade of each seam / section considered for mining comes around G7. However, while discussing the draft mining plan with CCL management, it has been told by the Project Authority that even extraction of combined section UTLB &amp; LTLB), there is no slippage of grade. Hence, combined section of UTLB &amp; LTLB should be considered for extraction in Benti part for the proposed</i></p>
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		<p><i>Mining Plan. This has also been communicated in writing by the project authority. Accordingly, combined section of UTLB &amp; LTLB has been considered for extraction this Mining Plan.</i></p> <p><b>** The estimated extractable reserve are calculated leaving statutory protective barrier from Service Buildings, Roads, HT Power Lines and Rehabilitation Site of Pipparwar as decided by CCL Management.</b></p>														
2.2.16	Wt .Average GCV "KCal/kg"	The <b>weighted average grade</b> for Lower Bachra Seam and Upper Bachra Seam (G7 Grade). UTLB Section (G7 Grade) & LTLB is also G7 grade).														
2.2.17	Gross Geological Reserve of the block "Mte"	62.39														
2.2.18	Net Geological Reserve of the block "Mte"	62.39														
2.2.19	Mineable Reserve of the block "Mte" as on	42.0														
2.2.20	Blocked Reserve "Mte"	20.39 MT Blocked Reserve below Surface Infrastructure and Pipparwar rehabilitation site <table border="1" data-bbox="874 1473 1347 1697"> <thead> <tr> <th>Seam</th> <th>Total (MT)</th> </tr> </thead> <tbody> <tr> <td>Upper Bachra seam</td> <td>1.10</td> </tr> <tr> <td>Lower Bachra seam</td> <td>2.10</td> </tr> <tr> <td><b>Total</b></td> <td><b>3.20</b></td> </tr> </tbody> </table>			Seam	Total (MT)	Upper Bachra seam	1.10	Lower Bachra seam	2.10	<b>Total</b>	<b>3.20</b>				
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2.2.21	Corresponding extractable reserve of the block "Mte"	<table border="1" data-bbox="847 1697 1369 2027"> <thead> <tr> <th>Seam</th> <th>Total</th> <th>Av. Seam Thickness</th> </tr> </thead> <tbody> <tr> <td>Upper Bachra seam</td> <td>1.59</td> <td>3.5 m</td> </tr> <tr> <td>Bottom Lower Bachra seam (BLB)</td> <td>0</td> <td>&lt; 2.5 m</td> </tr> <tr> <td>Top Lower Bachra (TLB)</td> <td>3.62</td> <td>4.5 m</td> </tr> </tbody> </table>			Seam	Total	Av. Seam Thickness	Upper Bachra seam	1.59	3.5 m	Bottom Lower Bachra seam (BLB)	0	< 2.5 m	Top Lower Bachra (TLB)	3.62	4.5 m
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		Lower Bachra Seam	2.09	4.6m
		Total	<b>7.30</b>	
2.2.22	Percentage of Extraction	36.4 % w.r.t to Mineable reserves.		
2.2.23	Reserve already depleted (Base date of Mining Plan)	8.0 MT till extracted from Churi Benti UG Mine till 2024-25.		
2.2.24	Balance Reserve (as on Base Date)	7.30 MT Extractable reserves left as on date		

  
**Project Officer**  
**Churi Benti UG Project**  
**N.K. Area, CGL**

**CHAPTER 3****MINING**

3.1	<b>MINING METHOD</b>	
3.1.1	Existing method of mining if the mine is under operation	<p>The Existing method of Mining in Churi – Benti UG Mine is Development and Depillaring with Bord and Pillar Method by using Continuous Miner and its ancillary equipment. Also few galleries were developed by LHD/SDL with drilling / blasting operation.</p> <p>The production of coal has started from 24.03.2019 with the help of Continuous Miner in conjunction with Battery Hauler. The existing belt conveyors systems were already replaced with higher capacity belt conveyors to cater the need of more transportation of coal. CMP-W/16(only heightening and widening), CMP-W/15, CMP-W/14, CMP-W/13, CMP-W/12, CMP-W/11 &amp; CMP-W/10 were already depillared successfully. For depillaring, Modified Nevid Angle Method was used for pillar extraction. Currently coal production is going on through heightening &amp; widening of previously developed main dip galleries of Benti Block.</p> <p>Mine was sealed off due to occurrence of fire in third shift of 08/08/2020. In record time mine had been reopened with full effort of Rescue Team and Churi team Under leadership of Mr. Sanjay Kumar, GM ,NK Area , guidance of CMD, CCL, Director(T/O) and with the help of CMDs of Other Subsidiaries like ECL and WCL On 08/04/2021 and the mine had been declared safe.</p> <p>Reopening of W-09 &amp; W-10 (Sealed off Area) was started on 30th July, 2022 &amp; ended on 08.08.2022 under cover of Rescue Team. W-09 &amp; W-10 (Sealed off Area) had been reopened successfully &amp; after safe declaration of the panel, production resumed on 08.08.2022.</p>
3.1.2	Proposed method of mining with	<p>In the allocated mining area, as mentioned earlier, two seams namely Top Lower Bachra and Bottom Lower Bachra in Benti Block of Churi – Benti UG Mine have been considered for extraction.</p>

	justification on suitability of method of mining	<p><b>Proposed method of mining</b></p> <p><b>Churi – Benti UG Mine:</b></p> <p><b>Continuous Miner District :</b></p> <p>This mine has been developed in the trunk roads namely BT -1 and BT-2 Panels in Sector –A of Benti Block. This position lies to the western bank of Damodar River. This mine has been worked by bord and pillar method of mining and the same is proposed to be continued for extraction of coal from virgin as well as developed area with Standard height continuous miner, a mass production technology. Heightening and widening of galleries will be done by Standard Height Continuous Miner if required. Depillaring in this mine has been proposed with Nevid method of extraction with Standard height continuous miner for Benti part as well as in Churi part and the production capacity is envisaged to be 0.6 Mty.</p> <p>The above method of mining has been proposed considering the following:</p> <ol style="list-style-type: none"> <li>1. Available virgin area on the western bank of damodar river of this mine along with already developed area in Sector –A of Benti Block with bord and pillar method.</li> <li>2. As the extractable thickness of the seam is around 3.5 m in most of the virgin property in Benti Side and around 4.5 m in Churi side, development and depillaring operation with Standard Height Continuous Miner is proposed for the same. This technology was already successfully implemented on the eastern side of damodar river in Churi – Benti UG mine and successfully achieved 0.60 Mty of production.</li> </ol> <p><b>LHD District :</b></p> <p>Upper Bachra seam the mine is mostly developed and lying standing on pillars. Production from this seam, therefore, has been envisaged from depillaring operation only and development is only proposed where parting with lower Bachra seam is greater than 3m.</p>
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The mine has been developed with semi-mechanised system of mining in association with drilling and blasting. The same semi-mechanised system of mining with LHD has been proposed for depillaring.

**Mine entries:**

Churi – Benti UG Mine is an ongoing project. It has been approached through a pair of inclines (Inc.No-6 & Inc. No-7). Presently the mine is operating in Bottom Lower Bachra seam in Benti block and with above-mentioned entries. The Entry to Benti Block beneath the damodar river were made via 3 trunk roads each in Panel W-6 and W-9. Trunk Belt is installed in Panel W-9 for transportation of coal along with another trunk road for transportation of manpower with FSV. It is proposed to continue with same set of mine entries for Churi-Benti UG Mine. The brief detail of the existing entries along with their proposed utility is shown in table.

Existing entries to cross Damodar river in panel W6 is proposed for installation endless haulage for transportation of material.

Mine Entry	Grad. (1 in )	Length / Depth (m)	Area (m <sup>2</sup> ) / Dia (m)	Purpose
<b>Existing Mine Entries</b>				
Inc. No 6	4.0	400	4.8 X 3.0	Haulage (Material Supply) & Intake
Inc. No 7	4.5	450	4.8 X 2.8	Coal Transport (Belt Conveyor) , Travelling and Intake
Airshaft 1	Vertical	51.82	4.26 m dia	Return airway

**Proposed method of development:**

It is proposed to widen and heighten the existing galleries on the western bank of damodar river to 5.5 m x 3.3 m thickness of seam to cater the deployment of continuous miner for further development.

Development of trunk headings and development of panels on either sides of trunk headings have been proposed with deployment of continuous miner. A set of five headings is being developed as trunk headings. Pillars of trunk headings are of 25mx25m (Centre to Centre) as as per the provisions under CMR. Out of 5 headings, three headings

		<p>will be used as intake airways and for transportation purpose and the remaining two headings shall be used as return airways. Those panels which have been partially developed, shall be developed in the same alignment with continuous miner.</p> <p>Continuous miner will be used as the winning machine and shuttle cars/battery haulers will be used for coal transportation from working face to the feeder-breaker for out by transport through gate belt conveyor. Mobile roof bolting machine will be used for installing the roof bolts as support. LHD will be used for material supply to the active working areas and for floor cleaning.</p> <p><b><u>SEQUENCE TO BE FOLLOWED DURING EXTRACTION OF PILLARS BY MODIFIED NEVID METHOD</u></b></p> <ol style="list-style-type: none"> <li>a) Extraction of pillar will be commenced from left side and shall systematically proceed towards right side in the panel following straight line of extraction of pillars along the row. Extraction design shown in plate no-15.</li> <li>b) Two pillars adjoining to each other shall be taken at a time and each pillar shall be cut alternatively in the manner as shown on enclosed plan. Extraction of pillar will be carried out in following manner.</li> <li>c) The length, width and height of the cut shall be 14.0m, 3.3m and 4.6m respectively.</li> <li>d) Driving of slice shall be at an angle of 45<sup>o</sup> to the dips and levels.</li> <li>e) As shown on above plan, 1st slice (3A) of width 3.3m shall be driven at an angle of 45<sup>o</sup> to the gallery by leaving at least 3.0m distance from the dip side corner of pillar of 1st pillar so that a snook of not less than 5.5 sq. m shall be left. After that 2nd slice (4A) of width 3.3m shall be driven parallel to slice no. 6.</li> <li>f) Subsequently 4th slice (no. 1) of 3.3m width shall be driven at an angle of 45<sup>o</sup> to the gallery as shown on the above mentioned plan leaving at least 3.0m distance on both side from corner of pillar</li> </ol>
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		<p>so that not less than 7.0 sq. m snook shall be left. Subsequently, 5th slice (no. 2 ) of 3.3 m width shall be driven parallel to 4th (no. 1)</p> <p>g) Subsequently, 7th slice (3A) in 2nd pillar of 3.3m width shall be driven at an angle of 45<sup>o</sup> to the gallery as shown in the above mentioned plan leaving at least 3.0m distance from dip side corner of the pillar so that a snook of not less than 5.5 sq. m shall be left. Subsequently, 8th slice (3B) in 1st pillar of 3.3m width shall be driven leaving at least 3.0m in the level side from the corner so that not less than 5.5 sq. m snook shall be left. Subsequently, slice no. 4A in 2nd pillar parallel to 3A and slice 4B in 1st pillar parallel to shall be driven.</p> <p>h) The size of the final snook shall not be less than 35.0 sq. m. Slice no. 7 in 1st pillar may be driven judiciously as shown on the above mentioned plan. Similar sequence shall be followed between 2nd and 3rd pillar and so on.</p> <p>i) Each time after completion of row of pillars, extraction of next row of pillars shall be resumed, following the same manner of extraction as above.</p> <p>j) The line of extraction shall be straight line.</p> <p>k) Pillars containing Isolation Stoppings shall not be reduced/ split/extracted in any manner.</p> <p>l) Pillars lying within 15m of any fault shall not be reduced/split/extracted in any manner.</p> <p>m) Pillars lying fully or partly beneath and within 45m of any building(s)/road(s)/nullah(s) /ropeway trustle(s)/transmission tower(s) shall not be split, reduced or extracted.</p> <p>n) Unhindered access of men, material and machinery shall be ensured for any protective work required over and within 45m of</p>
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		<p>the proposed panel on surface before commencement, during and after the completion of extraction of pillars in the panel.</p> <p>o) Surface cracks/pot holes formed as a result of extraction of pillars shall be filled up expeditiously and the filling material shall be well rammed into the cracks/pot holes are kept topped up as often as necessary thereafter to prevent leakage/seepage of air/water into the goaf/mine.</p> <p>p) Only experience/trained Assistant manager, Overmen and Sirdars shall be deputed in extraction of pillars and they shall be provided with a tracing of off-set plan of the panel, on a scale of R.F. 1:500, showing the up to date position of splitting, heightening and slicing, and it shall be updated in each shift The off-set plan shall contain all statutory restrictions, pillars to be left intact, manner of extraction, Systematic Support Rules, ventilation circuit, escape routes, geological disturbances, surface features, etc.</p> <p><b>Depillaring in LHD District :</b></p> <p>In Upper Bachra Seam, panelisation of the developed pillars is done as far as practicable such that each of such panel shall have independent ventilation and transport arrangement. The depillaring has been proposed with the common splitting and slicing method. Splitting of pillars, at the start, will commence from the dip-most end of the panel.</p> <p>Pillars shall be splitted by driving level split gallery having width not more than the original gallery width dividing the pillar in two equal halves. The split gallery shall be systematically supported primarily with roof bolts and additional supports shall also be erected as and when required. Splitting of pillars can be done in advance for a maximum distance of 2 pillars from the pillar under extraction. One half of the pillar shall be extracted by driving slices of 4.5m/4.8m width from the split gallery and the other from the original gallery. A rib pillar of minimum width of 1.8m shall be left between two adjacent slices.. Extraction from the adjacent slice in the</p>
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		<p>same half of the pillar shall not be started till the previous slice is extracted. The sequence of extraction within the panel would be such that a diagonal line of extraction is maintained. Coal getting during splitting and slicing shall be by drilling and solid blasting. The blasted coal shall be loaded by LHDs on to the pony belt conveyor which will deliver coal to the gate belt conveyor within the panel for outbye transportation. All operations within the depillaring panel shall be carried out as per the provisions under the CMR, 2017 and as per the relevant recommendations in DGMS circulars.</p> <p><b>Mine transport:</b></p> <p><b>Coal transport:</b> Face transportation machinery is required for transporting the coal cut by continuous miner at the face to the feeder-breaker for onward transport. Such face transportation machinery may be electrically-operated shuttle cars or battery-operated coal haulers/ ram cars or diesel-operated ram cars. When the transportation machinery is available for loading, it positions itself behind the continuous miner for being loaded with mined out coal by the continuous miner. On having the required payload, it moves on its path to the feeder-breaker where it unloads coal and retraces its path back to the continuous miner. In case of electrically-operated shuttle cars, a maximum of two shuttle cars can be deployed in a district. Each of the two shuttle cars will have to ply along a separate and distinct route to avoid mingling of cables. However, with other machinery, there is no such restriction. In this case, a pair of electrically-operated shuttle cars with ventilated cable reel have been proposed, which will have a payload capacity of around 15 tonnes.</p> <p>If, however, it is observed during actual mining operation that due to frequent plying of shuttle cars and other face machinery the floor condition deteriorates (muddy floor), coal in the floor may be considered to be left to provide hard floor for efficient operation in CM district.</p> <p>On receiving coal from the face transportation machinery, the feeder-breaker sizes the coal as per the machine specifications and feed to the gate belt conveyor for out bye transportation of coal.</p>
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Incline belt TB-1 is installed in the 7 no. incline, TB-2 and TB-3 are installed in the main dip of Churi block. Conveyor Belt TB-4 and TB-5 are installed between the Churi and Benti Block to transport the coal from Benti block to Churi block's trunk belt conveyors and finally to surface through TB-1. Belt conveyor TB-6 is installed in the Benti Block. Apart from these existing belts 2 new belts TB-7 and TB-8 are proposed for Benti Block. Out of these two belts, one belt TB-7, 1000mm wide, 800m length, 30 lift, 2x110kW will be installed in the trunk road BT-2 and other one TB-8, 1000mm wide, 1000m length, 10m lift, 2x110 kW will be used as the gate belt in the Benti Block panels.

Details of the existing and proposed belts are given in the table below:

Sl. No.	Name	Width (mm)	Length (m)	Power (kW)	Location	New/Existing
1	SB-1	1000	120	1x75	Surface	Existing
2	TB-1	1000	500	2x150	Incline Belt	Existing
3	TB-2	1000	1000	2x110	Trunk Belt	Existing
4	TB-3	1000	1000	2x75	Trunk Belt	Existing
5	TB-4	1000	620	1x110	Trunk Belt	Existing
6	TB-5	1000	500	1x110	Trunk Belt	Existing
7	TB-6	1000	1000	2x110	Trunk Belt	Existing
8	TB-7	1000	800	2x110	Trunk Belt	Existing
9	TB-8	1000	1000	2x110	Gate Belt	Existing
10	GB 1	1000	600	1x75 FLP	Gate Belt	New
11	GB 2/3	1000	400	1x55 FLP	Gate Belt	New
12	TB1 UB	1000	550	1x90 FLP	Trunk Belt	New
13	DB	1000	300	1X55 FLP	Drift Belt	New
14	CB 1/2	1000	550	1X75 FLP	Connecting Belt	New
15	LB 1/2/3	1000	200	1X37 FLP	Link Belt	New

		<p>Gate belts GB1, GB2 and GB3 are proposed for coal transportation from face to trunk gateway of upper bachra seam. When both the sets of LHDs will be working in the long panels like S6, S7 and S8. Small length gate belts will be insufficient and create a bottle neck in operation. Hence one long and two small gate belts have been proposed for the smooth coal evacuation from Upper Bachra seam.</p> <p>Gate belt 2 and 3 are of equal length of 400m and these are proposed to use in panels which are greater than 600m, when panel length is greater than 1000m then GB1 is proposed to be used with GB2 or GB3. Coal transported by gate belts are proposed to be transferred onto the trunk belt conveyor TB1UB of 1000mm width. This trunk belt of 1000mm is broken into two parts of equal length of 550m and proposed to be installed in the panel T-1.</p> <p>There are one drift belt DB and 2 connecting belts CB1 &amp; CB2 of 1000mm width. These belts have been proposed for transferring the coal from Upper Bachhra seam to Lower Bachra seam. Drift belt DB is proposed to be installed in the drift between Lower Bachra and Upper Bachra seam. Coal transported by trunk belt TB1UB of 1000m belt is proposed to be transferred on to this drift belt conveyor DB. This Drift belt DB will transfer the coal onto the series of two connecting belts CB1 and CB2. Finally, these connecting belts will further transfer the coal onto the series of trunk belt conveyor of 1000mm width of Lower Bachra seam. These trunk belts will further transfer and transport the coal of Upper Bachra and Lower Bachra seam to surface via incline belt conveyor TB-1 of 1000mm width.</p> <p>All these belts are arranged in the series manner. Firstly, coal will be loaded onto the TB-8 with the help of feeder breaker, from here coal will be transferred to series of belt which are arranged in the fashion of TB-7 to TB-6 to TB-5 to TB-4 to TB-3 to TB-2 to TB-1 and finally TB-1 will transfer the coal onto the surface belt SB-1. Surface belt will load the coal into the surface bunker of 5x125 Te capacity.</p>
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		<p><b><u>Men &amp; material transport:</u></b></p> <p>The existing Free steered vehicle shall be used as man-riding system which has been proposed to maintain the worker's efficiency and to reduce time lost due to travelling.</p> <p>In addition to the free-steered vehicle, a chairlift man-riding system with an approximate length of 1500 meters may be installed in Incline No. 6 (Haulage Route), subject to approval from the Directorate General of Mines Safety (DGMS). This chairlift man-riding system will facilitate the transportation of personnel from the pit top to the pit bottom of the incline. Implementing this system will significantly reduce the travel time for workers and enhance overall operational efficiency.</p> <p>In no condition simultaneous use of direct haulage and man riding system will be allowed for safe transport of man and material.</p> <p>For transportation of material in the mine, additionally MUV is proposed along with existing rope haulage system will be used for material such as roof bolting consumables, spare parts, cables, lubricants, ventilation-stopping material, etc. will be transported to within the panel. One new endless haulage of 1200m length, 55kW is proposed to be installed in the trunk road BT-1 and one direct haulage of 800m length, 37kW is proposed to be installed in the trunk road BT-2.</p> <p><b><u>Mine supports:</u></b></p> <p>After completing a cut at a place, the continuous miner will march out of the area and the mobile roof bolting machine will enter for drilling and installing roof bolts for supporting the roof.</p> <p>For supporting the roof during development stage, system will be designed based on the RMR of immediate roof strata and the span of the gallery. However, a fresh study in the continuous miner panel needs to be conducted to confirm this and if the RMR varies considerably, the support design will have to be suitably modified. The guidelines for design of support system are laid down in the DGMS circulars. However, a support system consisting of 4 roof bolts of 2.4m length in a row (with full</p>
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		<p>column resin encapsulated) forming a grid of 1.5mx1.5m may be considered. The support density at junction shall be increased by about 25%. Additional support may be provided as when the condition warrants. This support system is, however, proposed for the development faces in this mine to serve as guideline only and is subject to approval of DGMS. For monitoring roof strata movement, system of tell-tale should also be installed. The Support system provided is tentative and may be adopted only after scientific study.</p> <p>For the purpose of roof bolting, mobile roof bolters have been proposed for the continuous miner district. Considering comparatively more time requirement for bolting a freshly exposed roof at a place than completing a cut at a place by continuous miner, two mobile roof bolting machine may be considered such that the continuous miner does not have to wait for being a place ready for deployment.</p> <p>In LHD District, The splits will be supported with roof bolts of 1.65m in length. Four roof bolts will be installed in a row in 4.8m wide splits and the interval between bolts in a row and that between rows of bolts will be 1.2m. The goaf edges will be supported by skin-to-skin cogs with corner props. The 4.5m/4.8m wide slices will be supported by four roof bolts of 1.65m in length in a grid of 1.2mx1.2m. In slices, roof on the rib side will be supported by wooden cogs at 2.4m spacing while on the solid side a row of props will be installed at 1.2m spacing. Additional supports would be provided as condition warrants. The support patterns mentioned here above are indicative only and will need to be approved by DGMS after scientific study.</p> <p><b><u>Mine ventilation:</u></b></p> <p>For ventilating the working faces, three galleries on one side of the panel is proposed to be used as intake airways and the remaining two to be used as return airways. Ventilating air current shall be coursed by brick stoppings suitably plastered to minimize leakages. The stoppings are to be maintained within a maximum of 2 pillars of the tail-end of gate-belt. Leakage through the last connection is to be controlled by temporary</p>
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		<p>stopping like brattice cloth. [<i>Transparent/ translucent brattice is preferable such that the plying shuttle cars and other mobile machinery can be viewed from the other side of the brattice. This will prevent any accident with the mobile machinery.</i>] Airflow at the rate of 25 to 30 m<sup>3</sup>/sec is generally required in the LVC of the continuous miner panel for diluting the inflammable gas and airborne respirable dust generated due to the cutting action of the machine.</p> <p>Ventilation of each blind end is achieved by the dust scrubber system integrated with the continuous miner and forced auxiliary ventilation. Two auxiliary fans with duty of 12 m<sup>3</sup>/sec or other suitable capacity are proposed to be installed. Reinforced flexible ducting of suitable diameter (600/800/1000mm) between the face and the fans shall be hanged from the roof bolts on steel ring wires. The ducting has to be kept extended behind CM to properly ventilate the face. The dust scrubber system (Wet Type), an integral part of the continuous miner, sucks in dust-laden air from the working face and washes out dust from air and ejects clean dry air back to the mine atmosphere. This helps in reducing the dust concentration at the working face thereby controlling the hazards associated with coal dust as well as helps in improving ventilation condition due to suction effect.</p> <p>Considering , the air quantity of 30 m<sup>3</sup>/s at the LVC of CM district may be considered. As two district / levels will run in the Upper Bachra Seam at a time for achieving output of around 1200 (tpd), the total air quantity will be required at the LVC 50 m<sup>3</sup>/sec. Besides the above, pumping stations/sumps and/or UG sub-station are required to be ventilated. For this lump sum provision of about 15m<sup>3</sup>/s will be made for each seam. Total actual requirement would be about 95 m<sup>3</sup>/s. Considering the above, the estimated air discharge required through the two main fans at proposed air shafts, assuming VEQ of 60%, will be about 160 m<sup>3</sup>/s. i.e. 9600 m<sup>3</sup>/min</p> <p>The specifications of the existing main mine fan is PV 200, 35-85 m<sup>3</sup>/sec, 120 kW, 3.3 kV, which is not sufficient to ventilate the mine and hence,</p>
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the new main mechanical ventilator , VF 3000 , 9600 m<sup>3</sup>/min , 260 KW , 3.3 KV is proposed.

Ventilation study is proposed for assessment of air requirement as well as fan requirement for the same. Provisions of the study should be strictly complied for effective ventilation within the district / mine.

**Pumping arrangement:**

The existing main pumps and face pump along with their locations are given in the table below:

Sl. No	Location	Head in Mtr.	Capacity in GPM	Motor voltage/ KW
1	17 LW/ 6MD	180	500	550V/110KW
2	37LW/1MD Benti Block	160	1000	3.3KV/175KW
3	48LW/20D	160	1000	3.3KV/175KW
4	36LW/17D	160	1000	3.3KV/225KW
5	7LE/ 6MD	30	150	550V/10KW

Apart from the above main pumps, one pump of 500 GPM, 180m head and 110 kW is proposed to be installed at the end of trunk road BT-2 of to pump out the water from the Benti block side of mine.

The proposed pumping system for the main sumps Main Sumps - 1 for Upper Bachra seam is proposed near the trunk-1 and panel S-12, which receive the water from nearly all of the working area of Upper Bachra seam. Details of pumps and their specifications along with requirement are given below:

Sl. No	Particulars	Units	UB Seam	LB Seam
1.	Centrifugal Pump , 76 lps, 100m head , 150 KW , 3.3 KV	No's	1	1
2.	Centrifugal Pump , 38 lps, 60m head , 75 KW , 3.3 KV	No's	1	1

3.1.3	Coal production capacity proposed "Mtpa"	Production capacity of 1.0 Mty
3.1.4	Justification for optimization of Coal production capacity	<p><b><u>Churi- Benti UG Mine:</u></b></p> <p>The area annexed for CM deployment is mostly virgin. The development of this virgin area is restricted by bolting rate during development. Considering the bolting rate 15 bolts per hour per machine, number of hours working in a shift for bolting as 5 hours, three shift operation in a day. The expected number of bolts to be installed comes around 225 bolts in a day. Assuming four number of bolts in a row, around 45 rows of bolts will be installed. Considering spacing between rows as 1.5m, the expected progress in a day comes around 54. Accordingly, expected production during development in virgin area comes around 1880Te (Considering average thickness of 4.0m, gallery width 6.0m and specific gravity as 1.45.). Annual production comes around 0.62 Mty Accordingly, annual production during development has been considered as 0.60 Mty. However Actual production capacity may vary according to the seam thickness, availability of machine, caving characteristic of roof strata etc. It has also been experienced in CIL mines, even in Churi UG mine, that the production with Standard height continuous miner is around 0.60 Mty during depillaring of developed panels.</p> <p>With Load Haul Dumper (LHD), it has been experienced in CIL mines that the production rate ranges from around 200 tpd influenced by the height of mining. Considering the average rate of 200 tpd per LHD for the proposed pillar sizes, the average annual production from 6 set of Load Haul Dumper (LHD) shall be around 0.4 Mt.</p> <p>Hence total production capacity of mine comes to 0.6 Mty + 0.4 Mty = 1.0 Mty.</p>
3.1.5	Calendar year from which the	2026-27

	production will start																									
3.1.6	Year of achieving rated production	2026-27 (1 <sup>st</sup> year of operation)																								
3.1.7	<b>Tentative Coal Production Plan “MT”</b>																									
		<table border="1"> <thead> <tr> <th>Year</th> <th>Churi Benti UG Mine</th> </tr> </thead> <tbody> <tr> <td>Y1</td> <td>1.0</td> </tr> <tr> <td>Y2</td> <td>1.0</td> </tr> <tr> <td>Y3</td> <td>1.0</td> </tr> <tr> <td>Y4</td> <td>1.0</td> </tr> <tr> <td>Y5</td> <td>0.60</td> </tr> <tr> <td>Y6</td> <td>0.60</td> </tr> <tr> <td>Y7</td> <td>0.60</td> </tr> <tr> <td>Y8</td> <td>0.60</td> </tr> <tr> <td>Y9</td> <td>0.60</td> </tr> <tr> <td>Y10</td> <td>0.30</td> </tr> <tr> <td>Total</td> <td>7.30 Mt</td> </tr> </tbody> </table>	Year	Churi Benti UG Mine	Y1	1.0	Y2	1.0	Y3	1.0	Y4	1.0	Y5	0.60	Y6	0.60	Y7	0.60	Y8	0.60	Y9	0.60	Y10	0.30	Total	7.30 Mt
Year	Churi Benti UG Mine																									
Y1	1.0																									
Y2	1.0																									
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Y8	0.60																									
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3.1.8	Rated Capacity “Mtpa”	1.0																								
	- By OC	-																								
	- By UG	1.0																								
	- Overall	1.0																								
3.1.9	Life of the mine: “Years”	10 years																								
	- By OC	-																								
	- By UG	10 years																								
	- Overall	10 years																								
3.1.10	Whether the proposed external OB	Not Applicable																								

	<p>dump site is coal bearing: If so, whether coal/ lignite below waste disposal area is extractable.</p>	
3.1.11	<p>Whether negative proving for coal/ lignite in the proposed site for OB dump/ infrastructure has been done.</p>	<p>Not Applicable</p>
3.1.12	<p>Results of any investigation carried out for scientific mining, conservation of minerals and protection of environment; future proposals .</p>	<p><b><u>Future proposal for scientific study</u></b></p> <ol style="list-style-type: none"> <li>1. Strata Control and Monitoring Plan (SCAMP) would require to be formulated for all mining units with the help of scientific/ academic institution and approved by DGMS.</li> <li>2. Ventilation Simulation Study will be required before start of working in additional area.</li> <li>3. Cavability study may also be required for the same.</li> <li>4. Physico-mechanical properties of strata may be required.</li> <li>5. A scientific study to assess the stability of parting between Lower Bachra and Upper Bachra seam in contiguous zone.</li> <li>6. Thermo- Compositional study.</li> </ol>

3.1.13	Type of Equipment/ HEMM proposed	Sl. No.	Particulars	Qty.
		<b>A.</b>	<b>UG MINING EQUIPMENT</b>	
		<b>A.I</b>	<b>Equipment for CM Panel</b>	
		1	<b>Continuous Miner Equipment Set consisting of:</b>	1
			Standard Height Continuous Miner - 1 No.	1
			Electric / battery Shuttle Car - 2 Nos.	2
			Twin-Boom mobile roof bolter - 2 Nos.	2
			Feeder-Breaker - 1 No.	1
			Electricals for CM Package - 1 No.	1 set
			Initial spares for CM	1 set
			LHD (As utility vehicle for CM district) (Std. Height 1.5 m3)	1
		2	Auxiliary Ventilation Fan with flexible ducting	2
		3	Face Pump	2
		<b>A II</b>	<b>LHD District</b>	
			Load Haul Dumper (LHD) with 1.5 m3 capacity	6
			Universal drilling machine (UDM)	3
		<b>B.</b>	<b>EQUIPMENT FOR UNDERGROUND TRANSPORT</b>	
		1	Surface Belt (SB-1), width 1000mm, Length 120m, Lift 20m, 1x75 kW, NFLP (existing)	1
		2	Incline Belt (TB-1), width 1000mm, Length 500m, Lift 111m, 2x150 kW, NFLP (existing)	1
		3	Trunk Belt (TB-2), width 1000mm, Length 1000m, Lift 10m, 2x110 kW, FLP (existing)	1
		4	Trunk Belt (TB-3), width 1000mm, Length 1000m, Lift 0m, 2x75 kW, FLP (existing)	1

		4	Trunk Belt (TB-4), width 1000mm, Length 620m, Lift 5m, 1x110 kW, FLP (existing)	1
		6	Trunk Belt (TB-5), width 1000mm, Length 500m, Lift 15m, 1x110 kW, FLP (existing)	1
		7	Trunk Belt (TB-6), width 1000mm, Length 1000m, Lift 30m, 2x110 kW, FLP (existing)	1
		8	Trunk Belt (TB-7), width 1000mm, Length 800m, Lift 30m, 2x110 kW, FLP (existing)	1
		9	Gate Belt (TB-8), width 1000mm, Length 1000m, Lift 10m, 2x110 kW, FLP (existing)	1
		10	Gate Belt (GB-1), width 1000mm, Length 600m, 1x75 kW, FLP (New)	1
		11	Gate Belt (GB-2/3), width 1000mm, Length 400m, 1x55 kW, FLP (New)	2
		12	Trunk Belt (TB -1 UB), width 1000mm, Length 550m, 1x90 kW, FLP (New)	1
		13	Drift Belt (DB), width 1000mm, Length 300m, 1x55 kW, FLP (New)	1
		14	Connecting Belt (CB-1/2), width 1000mm, Length 550m, 1x75 kW, FLP (New)	2
		15	Link Belt (LB-1/2/3), width 1000mm, Length 200m, 1x37 kW, FLP (New)	3
		16	Belting 1000mm, PVC	As required
		17	Transfer chutes with liners for conveyors etc.	As required
		18	Endless Haulage, 1200m length, 55kW at BT-1	1
		19	Direct Haulage, 800m length, 37kW at BT-2	1
		<b>C.</b>	<b>VENTILATION EQUIPMENT</b>	
			<b>Main Mine Ventilation Equipment</b>	
		1	Main Mechanical Ventilator, VF 3000, capacity : 160 m <sup>3</sup> /sec 3.3 kV, 260 kW Motor (incl. electrical)	1

**Note:** The specifications of the proposed equipment may suitably be changed by the Mine management after detailed engineering.

## CHAPTER 4

### SAFETY MANAGEMENT

	<i>Parameters</i>	<i>Details</i>
<b>4.1</b>	<b>Safety Management</b>	
4.1.1	Important safety aspects :	<p><b>Damodar River:</b></p> <p>Damodar river passes through the middle of Churi Benti UG Mine. Sufficient parting (measured w.r.t angle of draw) has to be left from HFL of Damodar river before starting depillaring of panels. Depillaring shall not be done in any pillars lying within River and below the HFL Zone of Damodar River and within protective barrier area @ 32-degree angle of draw. All the boreholes should be plugged in properly and has to be checked during monsoon season to avoid any sudden inrush of water. Filling of low lying area may be required during the depillaring of panels of considered Churi-Benti UG mining area. Assessment of requirement of embankments along Damodar river are proposed.</p> <p><b>Filling of Low Lying Area:</b></p> <p>An Area of within the diverted forest land lying on the churi side inside the project boundary is below the HFL. The said land is to be heightened to at least 3m above the HFL in accordance to the CMR 2017. Depillaring beneath this area (i.e Panel W-7, W-8 , W-9 , W-10) can only started after filling and Statutory approval.</p> <p><b>Mine Safety</b></p> <p>Underground Coal mining is a hazardous operation as it offsets the equilibrium of natural deposition environment viz., in-situ stress field, ground water, surface drainage system and other ambient conditions. Hence, all relevant statutory safety provisions and DGMS Guidelines should be strictly adhered to eliminate or minimize the likely hazards during the project implementation. As the mine concerned is a very old mine with old abandoned</p>

	<b>Parameters</b>	<b>Details</b>
		<p>workings in, over and around it, safety becomes even more important an issue and the mine operator needs to remain vigil constantly for every activity taking place in the mine. Although, necessary resource provisions have been made in this report, additional resources, if required, during implementation must be provided to maintain safe working conditions in the mine.</p> <p>All precautions stipulated under CMR, 2017 and circulars issued by DGMS from time to time shall be strictly complied with for the maintenance of safe working conditions in the mine. Some of the major sources of danger for this mine and their preventive measures have been briefly described below.</p> <p><b>Degree of Gassiness</b></p> <p>All precautions in this regard as per CMR and DGMS Circulars must be taken by the mine operator.</p> <p>Before reopening of the Sectionalized districts / panels, all parts of the district must be inspected and examined for presence of inflammable gases in the mine air and specifically outside the isolation stoppings of sealed goaves, galleries near faults/ dykes, etc. During re-opening of "sealed off "developed panels, the procedures stated in Coal Mines Regulation'2017 and DGMS circulars should be strictly followed.</p> <p>In view of the prevailing degree of gassiness, sufficient quantity of fresh air should be circulated through the workings with the main mechanical ventilator as well as auxiliary ventilators to dilute the inflammable and noxious gases below the permissible limits to render the workers and mine safe. All ventilation devices should be so maintained as to provide sufficient quantity of fresh air at all working places.</p> <p>Under the circumstances, monitoring of inflammable and noxious gases by competent persons becomes very important. A</p>

	<b>Parameters</b>	<b>Details</b>
		<p>continuous mine environment monitoring system particularly is rather recommended. In addition, gas detectors (methanometers, CO-detectors, multi-gas detectors, etc.), self-rescuers in adequate numbers should always be maintained in the mine. Escape route into the mine should be properly marked with fluorescent arrows and the same should also be marked on the mine plan. Whenever inflammable gas percentage in the mine air exceeds the statutory limit, necessary precautionary measures as per CMR should immediately be taken.</p> <p><b>Mine Dust</b></p> <p>In Churi – Benti UG Mine, mechanical cutting of coal has been proposed which would result in generation of coal dust. The airborne respirable coal dust is potentially hazardous for occupational health of workers. Necessary precautions and technical measures should be adopted to keep the concentration of respirable coal dust below permissible exposure limit. Water sprays on all coal cutting machine should always be kept electro-mechanically interlocked and this interlocking arrangement should not be fiddled with. Continuous miner should preferably be used with dust scrubber to control dust near the point of generation.</p> <p>Also, the coal dust is hazardous from the point of view of coal dust explosion. All loose coal and accumulated coal dust on various structures, machinery, etc. has to be cleaned regularly. Use of water and incombustible dust must be resorted to prevent dangers of coal dust explosion. Surface temperature of electrical apparatus should be also be monitored. In this regard, all provisions made under CMR and any order of DGMS or conditions with DGMS permission must be complied with.</p>

	<b>Parameters</b>	<b>Details</b>
		<p><b>Inundation</b></p> <p>Proper surface and underground precautions as per the provisions made under the CMR and DGMS Circulars shall be taken during mining and particularly during monsoon season. All precautions must be taken to prevent danger from surface water into all proposed mining units.. In addition, all exploratory boreholes drilled in mining area should be plugged so that water from surface should not find its way to the underground workings through these boreholes. Though pumps and sumps for all the mining units of the allocated Churi – Benti UG mine, the actual make of water can be assessed by a careful hydro-geological studies.</p> <p><b>Fire And Spontaneous Heating</b></p> <p>All precautions shall be taken against spontaneous heating and outbreak of fire as per the provisions made under prevailing statutes. Any condition given in DGMS permission in this regard must be complied with. Panel system of working has also been proposed. Each panel will be isolated by barriers with minimum number of openings required therein for ventilation and transport.</p> <p>Additional precautions are to be taken along the belt conveyor route to check for smooth rolling of idlers. Jammed and broken idlers are to be immediately replaced. Fire-fighting equipment are to be provided in adequate numbers at suitable locations to meet any eventuality in case of outbreak of fire. Adequate provision for fire detection and alarm system shall be made and the mine management will need to remain vigilant with regard to spontaneous combustion during mining and even after sealing the panels. All other provisions of CMR with regard to prevention of dangers due to fire and spontaneous combustion will be strictly adhered to.</p>

	<b>Parameters</b>	<b>Details</b>
		<p><b>Roof / Strata Control</b></p> <p>Before reopening of the proposed mining districts, all developed workings and roadways through which workmen are supposed to pass through and all trunk roadways which are proposed to be used during the remaining life of the mine units, must be properly supported. Existing supports in all the mining units must be examined and tested and additional supports, if required, must be erected/ installed.</p> <p>Strata Control and Monitoring Plan (SCAMP) would require to be formulated for all mining units with the help of scientific/ academic institution and approved by DGMS. The approved SCAMP will have to be implemented by a dedicated strata control team to be formed by the mine operator. Proper equipment and instruments should be maintained and use for monitoring strata movement such that necessary preventive measures may be adopted in time.</p> <p><b>Other Safety Measures</b></p> <p>To promote safety in mine, following additional provisions should also be considered:</p> <ul style="list-style-type: none"> <li>• All equipment to be used in the mines should be of type approved by DGMS;</li> <li>• All electrical apparatus to be used in the mines for the purpose transmission, transformation, storage and use should be flameproof and all cables including trailing cable should be of adequate current rating capacity;</li> <li>• Means of transmitting signalling and communications should be intrinsically safe;</li> <li>• All places where the persons have to work or pass through should be provided with sufficient general illumination as per statutory requirement;</li> </ul>

	<b>Parameters</b>	<b>Details</b>
		<ul style="list-style-type: none"> <li>• In active mining areas in CM district where mobile machinery ply frequently, all work persons should be provided with fluorescent jacket and also translucent sheets should be erected as temporary stopping in CM district to avoid hazards due to pinning or running over by shuttle cars;</li> <li>• Continuous miner with proximity warning system should preferably be used where proposed;</li> <li>• Suitable tools and tackles should be provided in the mines to prevent musculo-skeletal injuries to work persons;</li> <li>• Arrangement for periodic refresher training program and general safety awareness program for mine workers and supervisors should be made by the mine operator;</li> <li>• Adequate number of safety devices should always be maintained for the proposed mines;</li> <li>• The proposed rescue rooms and first aid room should have required facilities and apparatus as per the prevailing statutes;</li> <li>• Necessary arrangements shall be made to keep the noise level within permissible limit by using silencers, dampeners, etc.;</li> <li>• The mine entries, surface installations (including plant &amp; machineries) and the coal stock area should be adequately guarded to prevent intrusion of outsider and any other nuisance element within the mine; etc.</li> </ul> <p>All mining operations in the proposed mining units shall be carried out by the mine operator as per the provisions made under Act, Rules, Regulations and Orders made thereunder. Terms and conditions of all permissions from regulatory authorities should be strictly complied with.</p>

	<b>Parameters</b>	<b>Details</b>
4.1.2	A Commitment from the Company Board that entire mining operation will be carried out as per the provision given under Mines Act 1952, Coal Mines regulation 2017 and wherever specific permission will be required the company will approach the concerned authorities.	<p><b>A Commitment from the Company Board</b></p> <p>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 be approach the concerned authorities. (Refer Annexure-III)</p>

  
 Project Officer  
 Churi Benti UG Project  
 N.K. Area, CCL

## CHAPTER 5

### INFRASTRUCTURE FACILITIES

	<b>Parameters</b>	<b>Details</b>
5.1	Mine infrastructure required e.g . Equipment maintenance planning, Office buildings, Workshop, Power Supply arrangement, Water supply, etc.	<p>As Churi-Benti mine is already in operation, all important infrastructure like Office buildings, Workshop, Power supply arrangement, Water supply, etc. are in place. Hence, all existing infrastructure shall be used further.</p> <p>The Details of existing service buildings:</p> <ul style="list-style-type: none"> <li>• Project Office</li> <li>• Workshop</li> <li>• Store</li> <li>• Pit Office</li> <li>• Substation (2 Nos)</li> <li>• MTK Room</li> <li>• Haulage Room</li> <li>• Filter Plant</li> <li>• Fan House</li> <li>• Weighbridge (2 Nos)</li> <li>• Canteen</li> <li>• Magazine Room</li> <li>• Bank</li> <li>• Post Office</li> <li>• Pump House (3 Nos)</li> </ul>
5.2	Power supply & illumination	<p><b>Power Supply</b></p> <p>At present, power is being supplied to the Churi-Benti UG mine from the Piparwar source substation through two 33 kV overhead transmission line (OHTL) feeders. These feeders provide power to the existing surface substation of the mine.</p> <p>The existing surface substation for the Churi-Benti UG mine is equipped with two transformers, each with a capacity of 5.0 MVA, 33 kV/3.3 kV, along with one transformer of 25 kVA, 3.3 kV/230 V. These transformers are sufficient to meet the current load requirements of the mine, including the additional load from the LHD district, belt conveyor, haulage drive, pump drive and the proposed chairlift man-riding system.</p> <p>Therefore, the existing surface substation will continue to supply power to all the load requirements of the mine, both existing and additional.</p> <p><b>Surface Power Distribution Board for Power Supply to Churi-Benti UG Mine</b></p> <p>A 3.3 kV, VCB, NFLP 11 panel power distribution board complete with vacuum circuit breakers has been installed for power distribution. These</p>

	<b>Parameters</b>	<b>Details</b>
		<p>panels receive power from 2x5.0 MVA, 33/3.3 kV transformers. The power distribution panels with all protections &amp; metering is provided in the sub-station for controlling the power supply to the mine. Additionally, a 3.3 kV, VCB, NFLP 6 panel power distribution board proposed to be installed for supplying power to additional UG cable feeder for LHD districts. The boundary/ area of the existing substation should also be extended to accommodate additional 3.3 kV switchgear panels to meet increased power demand.</p> <p><b>Underground Power Supply to the Mine</b></p> <p>The power is transmitted into the mine through 3.3 kV, PVCDWA cable feeders. The cable feeders enter into the mine through incline and borehole. One cable feeder of 3.3 kV, PVCDWA, 3 x 120 mm<sup>2</sup> and other 3.3 kV, PVCDWA, 3 x 95 mm<sup>2</sup> enters into the mine through borehole. Additionally, a cable feeder of 3.3 kV, PVCDWA, 3 x 70 mm<sup>2</sup> enters into the mine through incline.</p> <p>These cable feeders are supplying power to the UG loads of the mine through HT distribution board, Transwitch unit and LD distribution board. 3.3 kV, VCB are provided for supplying power to HT load and for supplying power to LT loads Transwitch unit and 550 kV ACB are provided in the mine.</p> <p>In the future, as the mine expands, addition cable feeders will be provided to supply power to the new areas. Additional 3.3 kV VCBs, 550 V ACBs, and Transwitch units will also be installed as required to meet the increasing power demands.</p> <p><b>ILLUMINATION</b></p> <p>❖ <b>Surface Illumination</b></p> <p>The mine site surface area with office buildings, security posts, stores, coal handling system, workshop, stock yards etc. will be sufficiently illuminated by LED lights.</p> <p>❖ <b>Underground Illumination</b></p> <ul style="list-style-type: none"> <li>• Underground illumination is to be provided for face and mine roadways etc.</li> <li>• Different loading points, pumps etc. would be illuminated by LED lamps with FLP/mining type fittings, weather-proof, suitable for accommodating single or twin 12 W LED lamps at 110 V supply and provided with wire guard protection.</li> <li>• Coal faces would be illuminated by LED Lamp with FLP/mining type fittings (well-glass), suitable for accommodating 1x12 W LED lamp,</li> </ul>

	<b>Parameters</b>	<b>Details</b>																																													
		<p>threaded type confirming to IS/IEC: 60079 latest and IS: 13346 latest at 110V supply. The fittings shall be provided with reflectors, hemispherical type with strong glass lamps and wire-guard protection.</p> <ul style="list-style-type: none"> <li>Adequate number of FLP lighting and signaling transformers of rated 5 kVA, 550V/110V will be provided for this purpose.</li> </ul>																																													
5.3	Drainage & Pumping : Assessment of volume of water for Pumping, Pumping Capacity	<p><b><u>Pumping Arrangement:</u></b></p> <p>The existing main pumps and face pump along with their locations are given in the table below:</p> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Location</th> <th>Head in Mtr.</th> <th>Capacity in GPM</th> <th>Motor voltage/ KW</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>17 LW/ 6MD</td> <td>180</td> <td>500</td> <td>550V/110KW</td> </tr> <tr> <td>2</td> <td>37LW/1MD Benti Block</td> <td>160</td> <td>1000</td> <td>3.3KV/175KW</td> </tr> <tr> <td>3</td> <td>48LW/20D</td> <td>160</td> <td>1000</td> <td>3.3KV/175KW</td> </tr> <tr> <td>4</td> <td>36LW / 17D</td> <td>160</td> <td>1000</td> <td>3.3KV/225KW</td> </tr> <tr> <td>5</td> <td>7LE/ 6MD</td> <td>30</td> <td>150</td> <td>550V/10KW</td> </tr> </tbody> </table> <p>Apart from the above main pumps, one pump of 500 GPM, 180m head and 110 kW is proposed to be installed at the end of trunk road BT-2 of to pump out the water from the Benti block side of mine.</p> <p>The proposed pumping system for the main sumps Main Sumps - 1 for Upper Bachra seam is proposed near the trunk-1 and panel S-12, which receive the water from nearly all of the working area of Upper Bachra seam. Details of pumps and their specifications along with requirement are given below:</p> <table border="1"> <thead> <tr> <th>SI. No</th> <th>Particulars</th> <th>Units</th> <th>UB Seam</th> <th>LB Seam</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Centrifugal Pump , 76 lps, 100m head , 150 KW , 3.3 KV</td> <td>No's</td> <td>1</td> <td>1</td> </tr> <tr> <td>2.</td> <td>Centrifugal Pump , 38 lps, 60m head , 75 KW , 3.3 KV</td> <td>No's</td> <td>1</td> <td>1</td> </tr> </tbody> </table> <p><b>Note:</b> Specifications of pumps given in the above table may suitably be changed by the Mine management as per the actual pumping requirement during mine operation.</p>	Sl. No.	Location	Head in Mtr.	Capacity in GPM	Motor voltage/ KW	1	17 LW/ 6MD	180	500	550V/110KW	2	37LW/1MD Benti Block	160	1000	3.3KV/175KW	3	48LW/20D	160	1000	3.3KV/175KW	4	36LW / 17D	160	1000	3.3KV/225KW	5	7LE/ 6MD	30	150	550V/10KW	SI. No	Particulars	Units	UB Seam	LB Seam	1.	Centrifugal Pump , 76 lps, 100m head , 150 KW , 3.3 KV	No's	1	1	2.	Centrifugal Pump , 38 lps, 60m head , 75 KW , 3.3 KV	No's	1	1
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	<b>Parameters</b>	<b>Details</b>
5.4	Coal Handling Arrangement: Brief detail of CHP/ Mode of Dispatch, Coal quality and coal staking and handling arrangement	<p><b>Churi-Benti Mine</b></p> <p>The existing surface bunker of 5x135 Te will be used for storing the coal extracted from Churi-Benti underground mine. All five pockets of the surface bunkers will be filled with the help of surface belt SB-1.</p> <p>Mode of dispatch from surface bunker to railway siding will be by covered truck transport.</p> <p>Estimated weighted average coal quality for the seam/ sections are G7.</p> <p>There is temporary coal stock arrangement at Pit top of the project exists which shall be utilized.</p> <p>Regular coal sampling and assessment of coal quality is proposed.</p>
5.5	Coal washing and the proposed handling/ disposal of rejects.	Beneficiation / washing is not proposed for the coal produced from this mine.

  
 Project Officer  
 Churi Benti UG Project  
 N.K. Area, CCL

## CHAPTER 6 LAND REQUIREMENT

	Parameters	Details																																																										
<b>6.1</b>	<b>LAND REQUIREMENT</b>																																																											
6.1.1	Total Land requirement for the mine in "Ha"	<p>The estimated total land required for the mine is 765.13 Ha. The break-up of Premining land use land use given at table.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="width: 30%;">Land Type</th> <th style="width: 40%;">Area (Ha)</th> </tr> </thead> <tbody> <tr> <td rowspan="7" style="text-align: center; vertical-align: middle;">Tenancy</td> <td>Agricultural</td> <td style="text-align: right;">66.45</td> </tr> <tr> <td>Township/settlement</td> <td style="text-align: right;">29.54</td> </tr> <tr> <td>Grazing</td> <td></td> </tr> <tr> <td>Barren</td> <td></td> </tr> <tr> <td>Water Bodies</td> <td style="text-align: right;">21.8</td> </tr> <tr> <td>Road</td> <td style="text-align: right;">8.61</td> </tr> <tr> <td>Community/other use</td> <td></td> </tr> <tr> <td rowspan="7" style="text-align: center; vertical-align: middle;">Govt Non Forest</td> <td>Agricultural</td> <td></td> </tr> <tr> <td>Township/settlement</td> <td style="text-align: right;">0.5</td> </tr> <tr> <td>Grazing</td> <td></td> </tr> <tr> <td>Barren</td> <td style="text-align: right;">15.07</td> </tr> <tr> <td>Water Bodies</td> <td style="text-align: right;">7.43</td> </tr> <tr> <td>Road</td> <td style="text-align: right;">5.8</td> </tr> <tr> <td>Community/other use</td> <td style="text-align: right;">16.00</td> </tr> <tr> <td colspan="2">Total Non-Forest Land</td> <td style="text-align: right;">171.20</td> </tr> <tr> <td rowspan="3" style="text-align: center; vertical-align: middle;">Forest</td> <td>Reserve</td> <td></td> </tr> <tr> <td>Protected / Notified</td> <td style="text-align: right;">494.32</td> </tr> <tr> <td>GMJJ / Revenue</td> <td style="text-align: right;">99.61</td> </tr> <tr> <td>Freehold</td> <td></td> <td></td> </tr> <tr> <td colspan="2">Total (Project Area)</td> <td style="text-align: right;">765.13</td> </tr> <tr> <td colspan="2">Outside project area</td> <td style="text-align: right;">0.00</td> </tr> <tr> <td colspan="2">Total Area</td> <td style="text-align: right;">765.13</td> </tr> <tr> <td colspan="3">Source : Project officials Churi and mine management</td> </tr> </tbody> </table>		Land Type	Area (Ha)	Tenancy	Agricultural	66.45	Township/settlement	29.54	Grazing		Barren		Water Bodies	21.8	Road	8.61	Community/other use		Govt Non Forest	Agricultural		Township/settlement	0.5	Grazing		Barren	15.07	Water Bodies	7.43	Road	5.8	Community/other use	16.00	Total Non-Forest Land		171.20	Forest	Reserve		Protected / Notified	494.32	GMJJ / Revenue	99.61	Freehold			Total (Project Area)		765.13	Outside project area		0.00	Total Area		765.13	Source : Project officials Churi and mine management		
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6.1.1 (d)	Forest land to be released 281.17 Ha.	<p align="center"><b>Component wise breakup of land involved in the forest diversion proposal under process:</b></p> <table border="1"> <thead> <tr> <th>S No.</th> <th>Component</th> <th>Forest Land (Ha)</th> <th>Non-Forest Land (Ha)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Depillaring with caving/stowing /extraction of coal</td> <td>235.61</td> <td>166.53</td> <td>Underground use</td> </tr> <tr> <td>2</td> <td>Filling of low-lying area with the help of trucks</td> <td>2.65</td> <td>0</td> <td>Surface use</td> </tr> <tr> <td>3</td> <td>Stowing plant with water reservoir and allied infrastructure</td> <td>1.23</td> <td>0</td> <td>Surface use</td> </tr> <tr> <td>4</td> <td>Regularization of DVC sub-station, filter plant</td> <td>14.10</td> <td>0</td> <td>Surface use</td> </tr> <tr> <td>5</td> <td>Regularization of residential buildings, surface buildings</td> <td>22.7</td> <td>4.67</td> <td>Surface use</td> </tr> <tr> <td>6</td> <td>Safety zone</td> <td>4.88</td> <td>0</td> <td>Surface use</td> </tr> <tr> <td></td> <td align="right">Total</td> <td>281.17</td> <td>171.20</td> <td></td> </tr> </tbody> </table>	S No.	Component	Forest Land (Ha)	Non-Forest Land (Ha)	Remarks	1	Depillaring with caving/stowing /extraction of coal	235.61	166.53	Underground use	2	Filling of low-lying area with the help of trucks	2.65	0	Surface use	3	Stowing plant with water reservoir and allied infrastructure	1.23	0	Surface use	4	Regularization of DVC sub-station, filter plant	14.10	0	Surface use	5	Regularization of residential buildings, surface buildings	22.7	4.67	Surface use	6	Safety zone	4.88	0	Surface use		Total	281.17	171.20	
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Parameters	Details								
	Type	Land use (Proposed)	Land Use (End of Life)	Land Use (Post Closure)					
			Agri-cultural land	Planta-tion	Water Body	Public /Comp Any use	Forest Land (Returned)	Undisturbed	
6.1.2	Land use of total leasehold Area during mining								
	Excavation Area	--	--	--	--	--	--	--	--
	Backfilled Area	--	--	--	--	--	--	--	--
	Excavated Void	--	--	--	--	--	--	--	--
	Without plantation	--	--	--	--	--	--	--	--
	Top Soil Dump	--	--	--	--	--	--	--	--
	External Dump	--	--	--	--	--	--	--	--
	Safety Zone	4.88	4.88	--	--	--	4.88	--	4.88
	Haul Road between quarries	--	--	--	--	--	--	--	--
	Road diversion	--	--	--	--	--	--	--	--
	Below River (a)	29.23	29.23	--	--	29.23	--	--	29.23
	Undisturbed/ Mining right for UG (b)	675.41	675.41	66.45	--	--	608.96	0	675.41
	Total Area for mining including area below river (a+b)	675.41+29.23 = 704.64							0
	Settling pond	--	--	--	--	--	--	--	--
	Road & Infrastructure Area (c)	50.61	50.61	--	19.79	--	30.82	--	50.61
	UG entry (d)	5	5	--	--	--	5	0	5
	Total Area including Road, Infrastructure, incline mouth etc. (c+d)	55.61	-					-	-

Parameters		Details								
	Water harvesting (included in the infrastructure area)	--	--	--	--	--	--	--	--	--
	Garland Drain	--	--	--	--	--	--	--	--	--
	Green Belt	--	--	--	--	--	--	--	--	--
	Rationalization area	-	--	--	--	--	--	--	--	--
	Embankment	--	--	--	--	--	--	--	--	--
	Water Reservoir near pit	--	--	--	--	--	--	--	--	--
	Resettlement	--	--	--	--	--	--	--	--	--
	Pit head power plant	--	--	--	--	--	--	--	--	--
	Agricultural land	--	--	--	--	--	--	--	--	--
		<b>765.13</b>	<b>765.13</b>	<b>66.45</b>	<b>19.79</b>	<b>29.23</b>	<b>30.82</b>	<b>618.84</b>	<b>0</b>	<b>765.13</b>
6.1.3	Surface features over the block area	Coal mine infrastructure, roads, Damodar River, ponds and villages, rehabilitation centre of Piparwar Opencast. 33 KV OHL exists over the mining area.  There is no distinct surface feature which will affect the UG working. The surface covers 21.17 Ha of infrastructure including Piparwar rehab site, some part of village and incline and related structure, managers and project office, Bunker, transfer point, stock yard, substation, lamp room, store, workshop, weigh bridge, canteen, Haulage room, filter plant etc. River Damodar is passing over the mine plan area covering 17.15 Ha.								
6.1.4	No. of villages/ Houses to be shifted	02 revenue Village (data provided by mine management)								
6.1.5	Population to be affected by the project	801 Family (data provided by mine management)								
<b>6.2</b>	<b>Details of Lease</b>									
6.2.1	Status of lease	Lease available with CCL  1. Nationalization 2. Notification vide SO No.4774 dtd. 25.09.1985, and								

	Parameters	Details																
		<p>3. Notification vide SO No.761 dtd. 17.02.1982</p> <p>4. LA Act Vide LA case No 5/87-88.</p> <p>Total land acquired of by above 3 notifications is 765.13 Ha (Existing Leasehold area). The area of present Mine plan of 765.13 ha is part of above acquisition is under –</p> <table border="1"> <thead> <tr> <th>Block</th> <th>Forest land</th> <th>Non Forest land</th> <th>Total (Ha)</th> </tr> </thead> <tbody> <tr> <td>Churi</td> <td>528.09</td> <td>60.77</td> <td>588.86</td> </tr> <tr> <td>Benti</td> <td>65.84</td> <td>110.43</td> <td>176.27</td> </tr> <tr> <td>Total</td> <td>593.93</td> <td>171.20</td> <td>765.13</td> </tr> </tbody> </table> <p>** Data provided by Project Officer, Churi – Benti UG Project vide Letter No: PO/Churi/letter/205-26/2099 dated 19.11.2025</p>	Block	Forest land	Non Forest land	Total (Ha)	Churi	528.09	60.77	588.86	Benti	65.84	110.43	176.27	Total	593.93	171.20	765.13
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Churi	528.09	60.77	588.86															
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Total	593.93	171.20	765.13															
6.2.2	Existing Lease Area "Ha"	765.13																
6.2.3	Period for which Mining Lease has been granted/ is to be renewed/ is to be applied for	Life of the mine																
6.2.4	Date of expiry of earlier Mining Lease, if any	Acquisition under – Nationalization, Notification vide SO No.4774 dtd. 25.09.1985, Notification vide SO No.761 dtd. 17.02.1982 , LA Act Vide LA case No 5/87-88.																
6.2.5	Whether the lease boundary/ required boundary is same as mentioned in the allotment order	Yes																
6.2.6	Lease Area (applied/required)	765.13 Ha (Part of already acquired land with acquisition under – Nationalization, Notification vide SO No.4774 dtd. 25.09.1985, Notification vide SO No.761 dtd. 17.02.1982), LA Act Vide LA Case No . 5 /87																

	Parameters	Details
	as per the Mining Plan under consideration (Ha)	
6.2.7	Whether the applied lease area falls within the allotted block	Yes
6.2.8	Area (Ha) of lease which falls outside the delineated block boundary /Existing Mining Lease	Nil
6.2.9	<b>Details of outside area:</b>	
	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

	<b>Parameters</b>	<b>Details</b>
6.2.10	<b>Whether some part(s) of the allotted block has not been applied for mining lease.</b>	
	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

  
**Project Officer**  
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## CHAPTER 7

## ENVIRONMENTAL MANAGEMENT

	<i>Parameters</i>	<i>Details</i>
7	<b>ENVIRONMENTAL MANANGEMENT:</b>	
	<p>Environment management is to be done based on the provisions laid down in Guidelines for Preparation of Mining Plan &amp; Mine Closure Plan, 2025 issued by Ministry of Coal, GoI. The main objective is:</p> <p>(a) Ensuring sustainable practices that minimize waste generation and maximize efficiency.</p> <p>(b) To promote responsible mining practices that support both the coal industry and the broader ecosystem. Mandatory incorporation of restoration, remediation, and regeneration measures into mining plans to ensure the responsible and sustainable management of natural resources.</p> <p>(c) To minimize environmental footprint, mitigate adverse impacts on local communities and ecosystems, and contribute to the overall conservation and preservation of natural habitats.</p> <p>(d) To prioritize environmental conservation by monitoring soil, groundwater, and vegetation and implementing measures to improve water quality.</p>	
7.1	The project proponent shall submit an undertaking that the mine shall be operated as per the Environment Clearance (EC) and Forestry Clearance (FC) for the project.	In order to carry out the proposed mining activity in an environmentally sustainable manner, suitable environmental protection measures shall be taken up at different stages of project operation and post closure. A certificate of commitment from Project Proponent that the project will comply with the conditions stipulated in the Environmental Clearance and Forest Clearance is given in Annexure-VIII.

  
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## CHAPTER 8

## PROGRESSIVE &amp; FINAL MINE CLOSURE PLAN

Parameters		Details							
8.1	<b>Land Degradation and restoration Schedule</b>								
8.1.1	Churi Benti UG Mine being underground mine there is minimal land degradation. The land near incline mouth. project office, CHP, haulage room, Pit office, Rehabilitation site of Piparwar has already been constructed over land. Tentative LandDegradation is indicated in following table Tentative Land Degradation and Technical Reclamation (Commutative Area "Ha")								
		Land Degraded Area in Ha				Technically Reclaimed Area			
Stage/Year		Excav	Dump (Ext. + Top soil)	Infra/ others	Total	Backfill	Dump (Ext. + Top soil)	Others	Total
Up to Base year									
Y-1	2025-26			50.61	50.61				
Y-3	2027-28			50.61	50.61				
Y-5	2029-30			50.61	50.61				
Y-8	2034-35			50.61	50.61				
Post Mining Closure									
Y-11	2037-38			50.61	50.61			0	0
<b>Note:</b>									
8.1.2	Tentative Biological Reclamation (Cumulative in "Ha")								
Year/Stage		Biologically Reclaimed Area in Ha.				Forest land (Return) in Ha	UnDist- urbed / To be left for Public / company Use	Total	Total
(Life of the mine plus post closure period)		Agric ulture	Plantati on	Water Body	Public / Comp any Use				
Up to Base year									
Y-1	2025-26	66.45	3.31	29.23		0	30.82	-	
Y-3	2027-28	66.45	3.31	29.23		0	30.82	-	
Y-5	2029-30	66.45	3.31	29.23		0	30.82	-	
Y-10	2034-35	66.45	19.79	29.23			30.82	-	
Post Mining closure									
Y-11	2037-38	66.45	19.79	29.23		618.84	30.82	765.13	

	Parameters	Details
		Note : : Stages of reclamation and restoration of land given for 1 <sup>st</sup> , 3 <sup>rd</sup> , 5 <sup>th</sup> , 10 <sup>th</sup> and for the entire life of the project and for 3 years post mining closure .
		Details will be given in FMCP, which will be prepared in 3 <sup>rd</sup> year, before 8 years from end of life of mine.
8.2	<p><b>Post Closure Water Quality management:</b></p>	<p>The details of water bodies available in the lease hold area is given in the post closure land used plan. Measures to be taken for protection of the same including control of erosion, will be given in Final Mine closure Plan (FMCP). FMCP will be prepared 8 years before the closure of mine. (as per MP &amp; MCP guideline 2020- details given at para 18.10.4)</p> <p>Water quality management being undertaken during progressive MCP to continue after post closure. Time Scheduling for post mining closure period is to be taken as 3 (three) years. If any deviation from the prescribed water quality standard is detected, the appropriate remedial actions shall immediately be enforced, and frequency of sampling shall be increased till the water quality becomes normal. The test results would be compared with the standards prescribed by the MoEF&amp;CC and if any deviation is detected, remedial actions would be immediately taken to bring the water Quality standard within the prescribed limits. 4-5 nos. of water monitoring station covering effluent water, surface water and drinking water category are proposed for post closure water quality management. However, monitoring station and frequency of sampling to be fixed in consultation with JSPCB, Ranchi or its regional office at Ranchi.</p> <p><b>Measures to be taken for protection of the Water Quality</b></p> <ul style="list-style-type: none"> <li>• The mine discharge water is proposed to be recycled mainly for sand stowing as mining with stowing is proposed in the all the mine units. Additional water will be used for cooling of plant and machinery, dust suppression, etc.</li> <li>• The treatment facilities such as sedimentation will be provided for mine discharge where required.</li> <li>• The water during rainy season is being diverted through the surface drains to the closed nallahs. Jharkhand State Pollution Control Board is collecting regular water samples from different sample points and any discrepancy observed/pointed out by them is being dealt with promptly.</li> <li>• Apart from the above, CCL is also monitoring the water quality, in every quarter</li> </ul>

	Parameters	Details
		<p>of the year. Percentage of BOD, COD and SS are under permissible limits. The process of water quality monitoring is proposed to be continued.</p> <ul style="list-style-type: none"> <li>• The effluents from the service buildings are proposed to be collected by a sewerage system and shall be treated at the proposed sewerage treatment plant. There will not be any impact as the treated sewage will be discharged after treatment.</li> <li>• The excess mine water, which is discharged into nearby natural drainage channel can be used by local villagers for agriculture and other purposes. This will also augment recharge of the ground water regime.</li> <li>• Post-project water quality monitoring will be carried out by outside agency as per the frequency stipulated by MoEF&amp;CC for the coal mining industry. Monitoring locations in and around the project will be placed in consultation with the State Pollution Control Board.</li> <li>• The Post Closure water quality monitoring is proposed for 3 years duration.</li> </ul>
8.3	<b>Post Closure Air Quality management</b>	<p>Air quality management being undertaken during progressive MCP may continue after post closure. Time Scheduling for post mining closure period is to be taken as 3 (three) years as being underground mine. The test results would be compared with the standards prescribed by the MoEF&amp;CC and if any deviation is detected, remedial actions would be immediately taken to bring the AAQ standard within the prescribed limits. 4 nos. of air monitoring stations are proposed for post closure air quality management. However, monitoring station and frequency of sampling to be fixed in consultation with JSPCB, Ranchi or its regional office at Ranchi.</p> <p>The following additional measures may be taken to maintain air quality:</p> <ul style="list-style-type: none"> <li>• All service roads/ permanent roads shall be surfaced with asphalt and shall be kept free of ruts and potholes;</li> <li>• Regular maintenance of tipping trucks and other vehicles to limit emission of harmful exhaust fumes;</li> <li>• Frequent water spraying on truck loading points, conveyor unloading points, etc.;</li> <li>• Proper loading of trucks to prevent spillage during transportation;</li> </ul>

	Parameters	Details																																																						
		<ul style="list-style-type: none"> <li>Physical removal of dust from the roads;</li> <li>Greenbelts around service building areas and residential colonies besides avenue plantations along roads; etc.</li> <li>To monitor the air quality, the mine has been drawing quarterly air samples for analysis. This practice of air quality monitoring shall be kept continued.</li> </ul>																																																						
<p><b>8.4</b></p>	<p><b>Waste Management</b> (Figures in Mm<sup>3</sup>) (Tentative)</p> <p>The Churi underground mine project, as such there no waste generated or a minimal amount is generated. There is no OB dump, external dump, internal dump. No embankment is planned on the surface, though a river is passing through the property. Suitable barriers as per CMR-2017 &amp; DGMS guidelines are being left in underground so that UG working does not affects the river over the surface.</p> <table border="1" data-bbox="244 837 1463 1655"> <thead> <tr> <th data-bbox="244 837 379 911">Year/ Stage</th> <th colspan="3" data-bbox="379 837 791 911">OB Removal in Mm3</th> <th colspan="2" data-bbox="791 837 1010 911">External Dump</th> <th colspan="2" data-bbox="1010 837 1272 911">Internal Backfilling</th> <th colspan="2" data-bbox="1272 837 1463 911">Embankment</th> </tr> <tr> <td data-bbox="244 911 379 1095">(Life of the mine plus post closure period)</td> <td colspan="3" data-bbox="379 911 791 1095">(Cumulative)</td> <td colspan="2" data-bbox="791 911 1010 1095">(Cumulative)</td> <td colspan="2" data-bbox="1010 911 1272 1095">(Cumulative)</td> <td colspan="2" data-bbox="1272 911 1463 1095">(Cumulative)</td> </tr> <tr> <td data-bbox="244 1095 379 1169"></td> <td data-bbox="379 1095 496 1169">Top Soil</td> <td data-bbox="496 1095 652 1169">OB</td> <td data-bbox="652 1095 791 1169">Total</td> <td data-bbox="791 1095 882 1169">Top Soil</td> <td data-bbox="882 1095 1010 1169">OB</td> <td data-bbox="1010 1095 1134 1169">Top Soil</td> <td data-bbox="1134 1095 1272 1169">OB</td> <td data-bbox="1272 1095 1396 1169">Top Soil</td> <td data-bbox="1396 1095 1463 1169">OB</td> </tr> <tr> <td data-bbox="244 1169 379 1397">Up to Base year</td> <td colspan="9" data-bbox="379 1169 1463 1655" rowspan="5">Not applicable as it is an underground mine</td> </tr> <tr> <td data-bbox="244 1243 379 1285">Y-1</td> </tr> <tr> <td data-bbox="244 1285 379 1328">Y-3</td> </tr> <tr> <td data-bbox="244 1328 379 1370">Y-5</td> </tr> <tr> <td data-bbox="244 1370 379 1413">Y-8</td> </tr> <tr> <td data-bbox="244 1413 379 1655">Post Closure</td> </tr> </thead></table>											Year/ Stage	OB Removal in Mm3			External Dump		Internal Backfilling		Embankment		(Life of the mine plus post closure period)	(Cumulative)			(Cumulative)		(Cumulative)		(Cumulative)			Top Soil	OB	Total	Top Soil	OB	Top Soil	OB	Top Soil	OB	Up to Base year	Not applicable as it is an underground mine									Y-1	Y-3	Y-5	Y-8	Post Closure
Year/ Stage	OB Removal in Mm3			External Dump		Internal Backfilling		Embankment																																																
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Y-8																																																								
Post Closure																																																								
<p><b>8.5</b></p>	<p><b>Top Soil Management – (Including Action plan for Top Soil management) (Tentative)</b></p> <p>(All Figures are Cumulative and in Mm<sup>3</sup>)</p> <p>This is an underground mine as such there is no top soil removal. However, top soil from nearby places will be spread over after filling the low lying area of about 0.65 Ha to avoid water seepage into the underground mine.</p>																																																							

Parameters		Details						
	Year/Stage	Top Soil Used						
	(Life of the mine plus post closure period)	Top Soil Removal Plan	Spreading Over Embankment	Spreading over Backfill area	Spreading over External OB Dump area	Used in Green Belt area & Safety Zone	Used in land Dismantled	Total Utilised
	Up to Base year	Not applicable as it is an underground mine						
	Y-1							
	Y-3							
	Y-5							
	Y-10							
	Post Closure							
<b>8.6</b>	<b>Management of Coal Rejects .</b>	As coal beneficiation is not proposed, handling and disposal of rejects is not needed in this mining plan. There is no provision of washery, as such managements of coal rejects are not required.						
<b>8.7</b>	<b>Restoration of Land used for Infrastructure</b>	The list of infrastructure to be retained and to be dismantled will be given in subsequent progressive MCP. However as far as possible, industrial structures like service buildings (workshop, stores, office building, etc.) and other infrastructure (sub-stations, transformers, community services, pump-houses, water-treatment/ filtration plants, waterlines, power lines, roads etc.) will be utilized by the other mines of CCL. The equipment will be removed and used somewhere else. Every effort will be made to restore the area to economic utilization value in line with mine closure plan. Possibilities shall be explored for handing over the buildings and other infrastructures including the reclaimed land to the State Government for the benefit of local villagers and strengthening the area infrastructures. The end use of these facilities shall be decided by the State Government with the help of District Authorities and Village Panchayat. Details will furnished in subsequent progressive MCP.						
<b>8.8</b>	<b>Disposal of Mining Machinery</b>	Disposal of mining machinery will start from last phase of FMCP. However the machines deployed by Contractor will be taken away by Contractor. All the Departmental machineries which will have residual life will be shifted to the other						

	Parameters	Details				
		projects of the company i.e. CCL. All surface assets (Plant & Machinery) will be transferred to other new/ working mines of the company. This will ensure that the assets perform during their economic life.				
8.9	Safety & Security	<p>The following safety and security measures may be adopted during the final mine closure of the underground mine units Churi mine:</p> <ul style="list-style-type: none"> <li>All surface openings to underground work sites will be filled and levelled to blend in with the surrounding topography, or will be concrete-capped.</li> <li>All the boreholes, exploration holes will be properly capped and sealed to prevent ingress of air into the underground workings to prevent fire due to left out coal.</li> <li>Only authorized personnel will be allowed to carry out abandonment and post-project monitoring activities.</li> <li>No coal or other combustible materials shall be left on the ground to prevent accidental fire.</li> <li>All electrical and mechanical equipment such as in shaft, incline, conveyor belt, etc. shall be decommissioned suitably so as to prevent any accident.</li> <li>The structures or buildings that are to be retained shall be properly guarded to prevent their misuse by miscreants.</li> </ul> <p>Monitoring facilities have been established for monitoring the soil/ air/ water quality, effectiveness of reclamation measures etc. and the same shall be used during post-mining monitoring.</p> <p>Details will be provided in the final mine closure plan.</p>				
8.10	Abandonment Cost and Financial Assurance					
8.10.1	Abandonment Cost:					
	<b>Financial Provisions for Churi Benti UG Mine</b>					
		<b>Details (approx.)</b>				
	<b>Head</b>	<b>Parameters</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate Rs/unit</b>	<b>Amount (Rs. crore)</b>
	<b>A. Prog-ressive</b>	Barbed wire fencing around the mine (Pit & Dump)	m	2000	1120	0.224

Parameters		Details				
Mine Closure	Waste Management	LS	--	--	1.0	
	Filing of Void - Rehandling of Dump (Not carried out as part of regular mining operation)		NA	NA	--	
	Top soil Management		NA	NA	--	
	Technical and Biological Reclamation of mined out land and OB Dump.	Ha	3.07	200000	0.614	
	Plantation over virgin area including green belt	Ha	19.79	672325	1.33	
	Manpower Cost and supervision	LS	--	--	2.5	
	Toe wall around the dump		NA	NA	--	
	Garland drain	m	5000	1000	.050	
	Stowing or any other activity		--	--	--	
	Subsidence Monitoring and Management	LS	--	--	1.0	
	Isolation Stoppings	LS	--	--	1.0	
	Any other Activity	Development of Eco Park, Miawaki forest, other repurposing including Solar etc. activities .	LS	--	--	1.5
		Water quality management	LS	--	--	0.3
		Air quality management	LS	--	--	0.3
		Gap Plantation	LS	--	--	.12
Sealing of any UG entry over the surface		LS	--	--	0.0	
Other activities	LS	--	--	1.0		
<b>Sub Total (A)</b>					<b>10.888</b>	
<b>B. Post Closure Activities</b>						
B.1 Dismantling of Infrastructure & Disposal/ Rehabilitation of Mining Machinery	Dismantling of workshop	LS	--	--	0.12	
	Dismantling of CHP	LS	--	--	0	
	Dismantling of mine structures	LS	--	--	0.12	
	Dismantling of Civil structures	LS	--	--	0.15	
	Rehabilitation of the dismantled Facilities	LS	--	--	0.25	
	Dismantling of pumps and Pipes/ other facilities	LS	--	--	0.25	
	Dismantling of stowing bunkers, provisioning of pumps for bore well pumping arrangement	LS	--	--	0	
	Dismantling of UG equipment	LS	--	--	0.18	
	Rearranging water pipeline to dump top park/ Agricultural land	LS	--	--	0.2	
	Dismantling of Power lines	LS	--	--	0.2	
	<b>Sub total (B1)</b>					<b>1.47</b>
B.2 : Safety	Barbed wire fencing around mine (Pit & dumps)	m	3500	1120	0.39	

	Parameters	Details			
and security	Concrete wall with masonry / concrete pillars around the pit	LS	--	--	0.06
	Securing entries (shaft/inclines)	LS	--	--	0.06
	Securing of Inclines & Others	LS	--	--	0.06
	Appropriate fencing around the water body (incl fencing and boundary wall etc)		NA	NA	--
	Installation of bore well pump	LS	--	--	0.14
	Stabilisation (viz benching, pitching etc) of side walls of the water body		NA	NA	--
	Toe Wall around the dump		NA	NA	--
	Garland drain	LS	--	--	0.20
	Drainage Channel from main OB Dump		NA	NA	--
	Misc. safety works	LS	--	--	0.26
	Flags/Boards with warning signals at vulnerable places	LS	--	--	0.035
	<b>Sub total (B.2)</b>				
B.3 : Technical and Biological Reclamation of Mined out of land and OB Dump	Filling of void (developed by cracks on surface if any)	LS	--	--	0.25
	OB Rehandling for backfilling		NA	NA	--
	Terracing, blanketing with soil and vegetation over surface if applicable including gap plantation and other activities.	Ha	5	516250	0.25
	Peripheral road, gates, view point, cemented steps on bank		NA	NA	--
	Expenditure on development of Agricultural land	LS	--	--	0.26
	Landscaping Plantation	Ha	10	1032500	1.03
<b>Sub total (B.3)</b>					<b>1.79</b>
B.4 : Post Closure monitoring and supervision	Power Cost	LS	--	--	0.57
	Post Mining Water quality management	LS	--	--	0.34
	Post Mining Air quality management	LS	--	--	0.27
	Subsidence monitoring for 5 years	man-year	15	750000	1.12
	Manpower Cost and supervision	man-year	12	750000	0.9
	Waste Management	LS	--	--	0.14
	DGPS survey of Extent of mining operation	LS	--	--	0.05
<b>Sub total (B.4)</b>					<b>3.39</b>
B.5 : Sustainability	Skill Development and Trainings (Alternative Source of livelihood) (Entrepreneurship development incl vocational training etc.)	LS	--	--	0.11

Parameters		Details			
	Fruit bearing, medicinal & local species plantation / Afforestation (incl. of other repurposing activities etc.)	LS	--	--	0.11
	Agriculture and other Allied Activities	LS	--	--	0.07
	Eco-Tourism Development (incl. recreational activities and other repurposing activities etc.)	LS	--	--	0.12
	Flora and fauna Conservation/Wildlife conservation (incl. Eco park development and other repurposing activities etc.)	LS	--	--	0.07
	Water Resource Management/Conservation (incl pisciculture, recreational etc.)	LS	--	--	0.05
	Clean Energy Projects	LS	--	--	0.05
	Art and Culture	LS	--	--	0.05
	Women Empowerment	LS	--	--	0.17
	Welfare of aged and disabled people (incl. Medical camps etc.)	LS	--	--	0.06
	Sustainable Living (incl improving the Socio- Economic Standards of Local Communities and other activities etc.)	LS	--	--	0.05
	Sanitation	LS	--	--	0.05
	Any other activity	LS	--	--	0.025
	<b>Sub Total (B.5)</b>				<b>0.985</b>
	<b>Total (B)</b>				<b>8.84</b>
	<b>Grand Total (A+B)</b>				<b>19.728</b>
	Provisioning for Just Transformation (as per para 3.5.5(iv) of MPG-25).	10%			1.9728
	(90% of mine closure cost calculated at para 8.10.2) Available for final reimbursement after FMCP	90%			17.7552
	<b>Mine Closure cost for entire life (total development and production years as given in the calendar plan from the zeroth year to the post-mining closure period and including post-closure monitoring period) (Progressive + Final mine closure) [Mine closure cost calculated at para 8.10.2]</b>	<b>100%</b>			<b>19.728</b>
	<b>Note :</b> 1. The amount shown above includes GST. 2. As per para 3.5 (iv) of MPG-25, A corpus from 10 percent of the balance deposited amount from final mine closure cost is to be created towards Just Transformation. This amount may be utilized by project proponents for socio-transition after the closure of the mine in consultation with district administration, local authority and stakeholders for skill development, sustained livelihood and employment generation etc. The detailed modalities for usage of fund will be issued separately. The proponent to prepare a plan for just transformation after the mine closure for utilizing 10% of just transformation fund and engage agency to implement the plan before the reimbursement of 90 % of the balance amount.				

	Parameters	Details
		<p>3. The allocation of fund towards different heads under sustainability and CDLP is tentative and to be elaborated as per need based study to be undertaken during implementation of project.</p>
8.10.2		<p>Financial Assurance: Amount to be deposited in Escrow account as a security against the mine activities to be carried out for the closure of the mine</p> <p>Central Coalfield Limited (CCL) shall strictly adhere to the following:</p> <ul style="list-style-type: none"> <li>• For financial assurance Central Coalfield Limited (CCL) shall cause payment to be deposited in the existing Escrow Account of Churi UG at the rate computed as indicated in above Table . The amount being deposited will be reviewed with such periodicity as deemed fit by the CoalController.</li> <li>• Mining is to be carried out in a phased manner (as per para 2.1 of MP guideline 2020) initiating afforestation/ reclamation work in the mined out area of the first phase while commencing the mining in the second phase i.e. continuation of themining activity from one phase to other indicating the sequence of operations depending on the geo-mining condition of the mine. As per para 2.12, up to 50% of the total deposited amount including interest accrued in the Escrow Account may be released after every five years in the line with the periodic examination of the closure plan as per clause 2.6 of the guideline. The amount released should be equal to the expenditure incurred on the progressive mine closure in past five year or 50% whichever is less. The balance amount at the end of the final mine closure will be released to CCL (as per para 2.15 of guidelines) on compliance of all provision of closure plan duly signed by CCL to the effect that said closure of the mine complies all statutory rules, regulations, order made by the central/ or state government, statutory organizations, courts etc. The compliance submitted by CCL is to be duly certified by the coal controller.</li> <li>• An agreement, outlining detailed terms and conditions of operating the Escrow Account (as per para 2.7 &amp; 2.15 of guidelines), shall be executed among Central Coalfield Limited (CCL), the Coal Controller and the concerned bank in order to give effect to this. The agreement shall be executed before the grant of the permission by the Coal Controller to open the mine.</li> <li>• Financial assurance is the amount to be deposited in Escrow account as a security against the mine activities to be carried out for closure of the mine.</li> <li>• A mine closure report for Churi Benti UGP with a project area of 765.13 Ha was prepared by CCL and was</li> </ul>

Parameters	Details		
	<p>approved by CCL board in its 385<sup>th</sup> (no. 2 of 2012) meeting held on 24.02.2012. An Escrow account no. 59101073623 was opened on 5<sup>th</sup> Aug 2013 and <b>present Escrow Account no: 0059207600000074</b>. Until by 2023-24 an amount of Rs. 1233.92 Lakhs has been deposited by CCL. The estimated life under the approved mine closure plan was 15 years (10+3+2).</p> <ul style="list-style-type: none"> <li>The present mining plan, envisaged within the area of existing mine closure plan will result in increase of life of the mine by 10 years. Hence, further deposition of escrow fund subsequent to implementation of the envisaged mine plan will be as per the calculation shown below:</li> </ul>		
<b>Amount to be deposited into Escrow Account annually ("Rs. in Crs")</b>			
WPI as on	AUG-2025	(A)	155.2
WPI as on base data	MAY-2024	B	153.5
Escalation rate of Closure cost		$C = A/B$	1.01107
Base Rate of Closure Cost "Rs. Crs/ha"		D	0.02
Closure Cost "Rs. Crs/ha" *		$E = C * D$	0.020221
Area "ha"		F	765.13
Amount to be deposited into Escrow Account "Rs. in Crs"		$G = E * F$	15.472075
Amount already deposited into Escrow Account "Rs. in Crs"		H	12.3392
Net Amount to be deposited into Escrow Account "Rs. in Crs"		$I = G - H$	3.132875
Rate of compounding of Annual Closure Cost		J	5.00%
Balance Life of the project "in Yrs"		K	10
Annual Closure Cost "Rs. in Crs"		$L = I / K$	0.313288
Amount to be deposited into Escrow Account after compounding @ of 5% "Rs. in Crs"		M	3.9405
Amount to be considered for populating Financial Provisions for different activities		$N = H + M$	16.2797
25% FOR Sustainability (Community development & Livelihood related activities)"Rs in Cr		$O = M * .25$	0.985124
	Amount to be deposited into Escrow Account annually (Rs. in Crore)		
		<b>Year</b>	<b>Amount to be deposited</b>

	Parameters	Details	
		1	0.31328
		2	0.32895
		3	0.34539
		4	0.36266
		5	0.38080
		6	0.39984
		7	0.41983
		8	0.44082
		9	0.46286
		10	0.48601
		<b>Total</b>	<b>3.9405</b>

The above calculation of the annual mine closure cost is based on the WPI of Aug 2025. However, the above calculated annual mine closure cost may need to be updated at the time of actual start of work on updated WPI. The amount shown in the table above or the updated amount, as the case may be, shall be deposited year-wise in the said Escrow Account for Churi Benti UG mine, CCL as Financial Assurance.

Reimbursements from Escrow Account (for progressive and final closure), preparation of final mine closure plan, final closure activities, post closure monitoring, etc. shall be done as per the provisions under the Guidelines for Preparation of Mining Plan and Mine Closure Plan, January 2025 issued by MoC.

  
**Project Officer**  
**Churi Benti UG Project**  
**N.K. Area, CCL**

**ANNEXURE - I**

**COPY OF ALLOTMENT ORDER / VESTING ORDER**

  
**Project Officer**  
**Churi Benti UG Project**  
**N.K. Area, CCL**

**ANNEXURE-II**

**CERTIFICATE BY MPPA**

It is to certify that the Mining Plan/Project area of Churi-Benti Coal Mine is confined within the cardinal point coordinates of the 765.13 Ha. area furnished by the Project Proponent/CCL.

**Mining Plan Preparing Agency  
Central Mine Planning & Design Institute Limited**

  
**Project Officer  
Churi Benti UG Project  
N.K. Area, CCL**

**ANNEXURE-III****APPROVAL OF THE COMPANY BOARD**

Mining Plan and Mine Closure Plan for the Churi- Benti UG Mine is prepared by CMPDI, Ranchi, an Accredited Mining Plan Preparing Agency. All the activities related to the same will be complied with by Churi-Benti UG mine management on behalf of CCL.

Therefore, the Board of Directors of Central Coalfields Limited is hereby the following undertaking for compliance of Mining Plan and Mine closure plan submitted.

1. It is undertaken by the Central Coalfields Limited that the mine will be developed as per the Approved Mining Plan and Mine Closure Plan and all other approvals, as required will be obtained from relevant authorities.
2. It is committed that the entire mining operation will be carried out as per the statutory provision given under Mines Act 1952, Coal Mines Regulation 2017, EP Act 1986 and FC Act 1980 and wherever specific permission will be required. the company will approach the concerned authorities.
3. Financial assurance for implementation of Mining Plan & Mine Closure Plan is also given.
4. Board confirms that entire Progressive and Final activities shall be implemented as per the Approved Mining Plan and Mine Closure Plan by the concerned authorities.
5. It is undertaken that the reclamation & rehabilitation work shall be carried out in accordance with the approved Mine Closure Plan and any modification/amendments which may be made in the mine closure plan by the Board of Central Coalfields Limited from time to time.
6. It is also undertaken that the protective measures contained in the Mine closure plan including reclamation and rehabilitation works will be carried out in

accordance with the approved Mine Closure Plan and final Mine Closure Plan and undertake to submit a yearly report before 1st July of every year to the Coal Controller setting forth the extent of protective and rehabilitative works carried out as envisaged in the approved Mine Closure Plan (Progressive and Final Closure)

7. Company gives undertaking that they will obtain a mine closure certificate from Coal Controller to the effect that the protective, reclamation and rehabilitation works have been carried out in accordance with the approved Mine Closure Plan I final Closure Plan and will surrender the reclaimed land to the State Government concerned.

**Director**  
**Central Coalfields Limited**

  
Project Officer  
Churi Benti UG Project  
N.K. Area, CCL

**ANNEXURE -IV**

Copy of earlier approval of mining plan - Not Applicable

  
Project Officer  
Churi Benti UG Project  
N.K. Area, CCL

**IMPLEMENTATION SCHEDULE FOR MINE CLOSURE ACTIVITIES IN CHURI BENTI UG (LIFE OF THE UG MINE: 10 YEARS)**

Sl.No	Activity	1st Phase					Last Phase					Post Closure Monitoring Phase		
		1	2	3	4	5	6	7	8	9	10	PC1	PC2	PC3
A. Progressive Mine Closure	Water quality management	█	█	█	█	█	█	█	█	█	█			
	Air quality management	█	█	█	█	█	█	█	█	█	█			
	Barbed wire fencing around the mine (Pit )				█	█	█	█	█	█	█			
	Waste Management					█	█	█	█	█	█			
	Plantation over virgin area including green belt	█	█	█	█	█	█	█	█	█	█			
	Gap Plantation													
	Manpower Cost and supervision	█	█	█	█	█	█	█	█	█	█			
	Stowing, subsidence monitoring, its management	█	█	█	█	█	█	█	█	█	█			
	Isolation Stoppings	█	█	█	█	█	█	█	█	█	█			
	Development of Eco Park, other repurposing activity like solar etc.								█	█	█			
	Garland drain								█	█	█			
	Plugging of Borehole		█	█	█	█	█	█	█	█	█			
	Any other Activity	█	█	█	█	█	█	█	█	█	█			

  
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**IMPLEMENTATION SCHEDULE FOR MINE CLOSURE ACTIVITIES IN CHURI BENTI UG (LIFE OF THE UG MINE: 10 YEARS)**

Sl.No	Activity	1 <sup>st</sup> Phase					Last Phase					Post Closure Monitoring Phase		
		1	2	3	4	5	6	7	8	9	10	PC1	PC2	PC3
B1. Dismantling of Infrastructure, disposal of mining machinery	Dismantling of workshop													
	Dismantling of CHP													
	Dismantling of mine structures													
	Dismantling of Civil structures													
	Rehabilitation of the dismantled Facilities													
	Provisioning of pumps for bore well pumping arrangement and Dismantling of UG equipment													
	Dismantling of pumps and Pipes/ other facilities													
	Rearranging water pipeline to dump top park/ Agricultural land													
	Dismantling of Power lines													
Sl.No	Activity	1 <sup>st</sup> Phase					Last Phase					Post Closure Monitoring Phase		
		1	2	3	4	5	6					PC1	PC2	PC3
B2. Safety and security	Barbed wire fencing around mine Pit													
	Concrete wall with masonry / concrete pillars around the pit													
	Appropriate fencing around the water body													
	installation of bore well pump													
	Stabilisation (viz benching, pitching etc) of side walls of the water body													
	Flags/Boards with warning signals at vulnerable places													
Sl.No	Activity	1 <sup>st</sup> Phase					Last Phase					Post Closure Monitoring Phase		
		1	2	3	4	5	6	7	8			PC1	PC2	PC3
B3. Technical and Biological reclamation of mined out land and OB dump	Filling of void (developed by cracks on surface if any													
	Gap Plantation													
	Peripheral road, gates, view point, cemented steps on bank,													
	Expenditure on development of Agricultural land													
	Plugging of boreholes and plantation													
	Land Scaping & Plantation													
Sl.No	Activity	1 <sup>st</sup> Phase					Last Phase					Post Closure Monitoring Phase		
		1	2	3	4	5	6	7	8	9	10	PC1	PC2	PC3
B4. Post Closure management and supervision	Power Cost													
	Post Mining Water quality management													
	Post Mining Air quality management													
	DGPS survey of Extent of mining operation													
	Waste Management													
	Manpower Cost and supervision													
	Subsidence monitoring													

Sl.No	Activity	1st Phase					Last Phase			Post Closure Monitoring Phase				
		1	2	3	4	5	6	7	8	9	10	PC1	PC2	PC3
B5. Others (Sustainability)	Entrepreneurship development vocational/ skill development training for sustainable income of affected people													
	Golden Handshake/ Retrenchment benefits to 200 employees of UG													
	Onetime financial grant to societies/institutions/ organisations which is dependent upon the project;													
	Provide jobs in other mines of the company													
	Repurposing activities such as agriculture, pisciculture, eco-park, recreational, landscaping, waterbody conservation, irrigation, Solar etc. wherever it is applicable													
	%age of PAP for whom alternate arrangements made for sustained livelihood (Indirect employment/ Created source of income other than direct employment)													
	Continuation of other services like running of schools etc.													
	Third-party audit & Report preparation													
	Records keeping & monitoring													
	Entrepreneurship Development (vocational/ skill development training for sustainable income of affected people for 5 years.													
	Any Other Steps for improving the Socio- Economic Standards of Local Communities													
	Medical camps/health checkup camps in and around 5 km for 5 years													
PC1 → Final Mine Closure Activity Phase Year 1 ; PC2 → Final Mine Closure Activity Phase Year 2; PC3 → Final Mine Closure Activity Phase Year 3														

*A. J.*  
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 N.K. Area, CCL

**ANNEXURE -VI**

Non-Refundable Application Fees - Not Applicable

  
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**ANNEXURE –VII**

Expert-Review Report - Not Applicable

  
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**ANNEXURE –VIII**

Mining Plan and Mine Closure Plan for the Churi- Benti UG Mine is prepared by CMPDI, Ranchi, an Accredited Mining Plan Preparing Agency. following the guidelines issued by the ministry of coal, Govt of India vide F.No. CPAM-34011/28/2019-CPAM dated 31.01.2025.

Certified that the terms and conditions stipulated in the Environmental Clearance and forest clearance will be complied with,

**Director**  
**Central Coalfields Limited**

  
**Project Officer**  
**Churi Benti UG Project**  
**N.K. Area, CCL**

## Disclaimer

The mining plan has been prepared based on information and data provided by Churi-Benti Mine Management (Central Coalfields Limited).

CMPDI Shall have no liability to Churi-Benti Mine Management (Central Coalfields Limited) and any other persons under any law, statute, rules or regulations for any loss, damages, cost and expenses which may arrive from or be incurred or suffered on account of anything contained in this report including accuracy, adequacy, correctness or liability.

The submitted mining plan has been prepared as per approved Guidelines issued by the ministry of coal, Govt of India vide F.No. CPAM-34011/28/2019-CPAM dated 31.01.2025.

  
Project Officer  
Churi Benti UG Project  
N.K. Area, CCL