

**PROPOSAL FOR PRELIMINARY  
EXPLORATION (G-3 STAGE) FOR COAL**

**WEST OF URDHAN JAMUNIA**

**NMET FUNDED PROJECT**

**PENCH KANHAN TAWA VALLEY COALFIELD**

**DISTRICT– CHHINDWARA, MADHYA PRADESH**



*cmpdi*  
*A Mini Ratna Company*

सेन्ट्रल माईन प्लानिंग एण्ड डिजाइन इन्स्टीच्यूट लिमिटेड  
(कोयला इण्डिया लिमिटेड की अनुषंगी कम्पनी / भारत सरकार का एक लोक उपक्रम)  
गोन्दवाना प्लेस, कान्के रोड, राँची - 834 031, 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 - 834 031, Jharkhand (INDIA)  
**CORPORATE IDENTITY NUMBER - U14292.JH1975GOI001223**

**PROPOSAL FOR PRELIMINARY EXPLORATION FOR COAL (G-3 STAGE)  
IN WEST OF URDHAN JAMUNIA BLOCK, PKT VALLEY COALFIELD  
DISTRICT-CHHINDWARA, MADHYA PRADESH**

**1.0 INTRODUCTION**

- 1.1 Pench Kanhan Tawa Valley Coalfield occupies southern limb of Satpura Gondwana basin and is covered in parts of Survey of India Toposheet Nos. 55 J/3, J/4, J/7, J/8, J/11, J/12, J/15, J/16, F/15 & F/16. It extends from Banabehra Block in the west to Sonpur Block in the East, over a distance of 200 kms.
- 1.2 The occurrence of coal in Pench Kanhan Tawa Valley coalfield was first reported in the year 1852 and subsequently exploitation has commenced from this coalfield.
- 1.3 West of Urdhan Jamunia block lies in the North Eastern part of this coalfield. It lies to the West of Urdhan Jamunia Block.
- 1.4 Regional & Detailed exploration in the adjacent Urdhan Jamunia (Dip Side) & Pathakuri-Pipariya block was carried out by GSI, MECL and CMPDI respectively, After completion of regional exploration by GSI in and around the proposed block it was identified to have underground resources of coal. CMPDI drilled 62 BHs involving a total meterage of 31730.58 m in Pathakhuri-Pipariya Block and 101 BHs involving a total meterage of 36940.22 m in Urdhan Jamunia Block (Dip Side). Two Geological Report on detailed Exploration for Coal in Pathakuri-Pipariya and Urdhan Jamunia (Dip Side Area) Block, PKT valley Coalfield, District Chhindwara, Madhya Pradesh, was prepared in Feb-2020 & Nov-2020 respectively. One Borehole (PKK6A) of Kahua Khireti Sector Drilled by GSI is located inside the Block. West of Urdhan Jamunia Block is the western extension of Urdhan Jamunia (Dip Side) Block.
- 1.6 West of Urdhan Jamunia Block is located in the north eastern part of PKT valley CF District Chhindwara. The area is covered in the toposheet **55 J/15**. The area falls in the Chhindwara district of Madhya Pradesh state.
- 1.7 CMPDI has drawn proposal for G-3 stage exploration for coal in West of Urdhan Jamunia Block, involving **4700 m** of drilling in **8** boreholes.

**2.0 OBJECTIVES**

- 2.1 The G3 stage of Exploration in the block is proposed to fulfill following objectives-
1. To establish the existence and continuity of coal seams occurring in the block as significant coal resources are present in adjoining block such as Urdhan Jamunia.
  2. To establish the lay, disposition and potentiality of coal seams.
  3. To assess the coal resource by G3 stage of exploration in the block.

### 3.0 LOCATION, COMMUNICATION AND ACCESSIBILITY

3.1 The Block falls in Chhindwara district in Madhya Pradesh, which is a district town on Chhindwara - Narsingpur State Highway, i.e. is around 45 km from Jamunia village. It is situated about 210 km NNW of Nagpur, connected through NH-69 (from Nagpur to Saoner), followed by Maharashtra SH-25 (from Saoner to Kelwad) and SH-19 (from Kelwad to Parasia).

Chhindwara, the district town is situated around 27 km south-east of Parasia. The Madhya Pradesh State Highway -19 connects Parasia with Chhindwara, which is connected to Amla (120km) through broad-gauge line of Central Railway. The block can be approached through all-weather road from Khirsadoh (near Parasia) up to Urdhan via Shivpuri & Thesgora mines.

3.2 A number of Tar roads are available in and around the block for transport. The interior parts of the area can be approached by a number of unmetalled roads, many of which become inaccessible during monsoons.

3.3 West of Urdhan Jamunia Block is located in the north eastern part of PKT valley CF District chhindwara. The area is covered in the toposheet 55 J/15. The geographical co-ordinates of the block defined are as follows:

(Co-ordinates based on WGS-84 System The block boundary is provisional and the bounding coordinates are approximate.)

Latitude : N – 22° 16' 40.528" N to 22° 19' 58.469" N  
Longitude : E – 78° 50' 49.783" E to 78° 56' 46.111" E

The cardinal points of block boundary of West of Urdhan Jamunia Block is presented in Table-I

**Table-I**

<b>CARDINAL POINT OF WEST OF URDHAN JAMUNIA BLOCK, PKT VALLEY COALFIELD, CHHINDWARA DISTRICT, MADHYA PRADESH IN WGS84</b>			
<b>Sl. No.</b>	<b>CARDINAL POINT No.</b>	<b>Longitude</b>	<b>Latitude</b>
1	A	78° 50' 50.027" E	22° 19' 58.469" N
2	B	78° 51' 46.749" E	22° 19' 58.313" N
3	C	78° 52' 2.488" E	22° 18' 36.686" N
4	D	78° 56' 46.111" E	22° 18' 31.201" N
5	E	78° 56' 42.850" E	22° 17' 42.409" N
6	F	78° 55' 45.960" E	22° 17' 20.940" N
7	G	78° 51' 42.406" E	22° 16' 43.252" N
8	H	78° 50' 49.783" E	22° 16' 40.528" N

#### **4.0 PHYSIOGRAPHY, DRAINAGE**

4.1 The area exhibits a rugged topography with undulating terrain. The North western part of the block is mostly hilly. The approximate maximum ground elevation, above mean sea level (MSL) is 950 m is in the North western boundary of the block. The approximate minimum ground elevation is 760 m is in the eastern corner of the block.

#### **5.0 CLIMATE AND VEGETATION**

5.1 The area exhibits typical tropical climate, with hot summer and a cool winter. The maximum temperature recorded in summer is 47° C during May and the minimum temperature in winter is around 4° C during December. The summer season is from mid February to mid June and winter season from October to January. The bulk of rain is during June to September. The average annual rainfall is generally around 1150 mm. for Chhindwara district. The climate is generally dry with moderate rainfall.

5.2 The area under study is generally forested however occurrence of Thick forests and dense Jungles are found in the area. Out of the Total area 24.27 Sq km under exploration approx. 50% is green cover area and other. 50%. is non forest Area. Teak, Sal, Mahua, Amla, Tendu, Palash, Chhind and Bamboo trees are commonly found in this area. Some parts of the block is covered by cultivated fields of crops like wheat, corns, grams & pulses.

#### **6.0 BROAD GEOLOGICAL SET UP**

##### **6.1 Stratigraphic Sequence**

The geological succession in this basin as per published report of GSI, CMPDI and MECL in the study area are as given below.

TABLE-II  
STRATIGRAPHIC SUCCESSION OF THE BLOCK

Age	Formation	Lithology
Recent/Sub-Recent	Soil/Detrital Mantle	Brownish grey sandy clay and black cotton soil
Upper Cretaceous to Eocene	Deccan Trap/ Intertrappeans	Basalts Massive and vesicular with vugs of quartz, zeolites and intertrappeans.
Upper Cretaceous	Lameta	Conglomerate, limestone and clays.
Lower Cretaceous	Jabalpur	Massive sandstones with Jasper, conglomerates, white clays, red clays, carbonaceous shales and coal lenses (50m to 100m.)
-----UNCONFORMITY-----		
Rhaetic (?)	Bagra	Predominantly coarse conglomerates with bands of calcareous sandstones, variegated clays, limestone and dolomite. (180m to 210m).
Upper part of lower Triassic to Middle Triassic	Denwa	Soft variegated clays interbedded with sandstone bands, conglomeratic at places. (about 850m).
Lower Triassic	Pachmari	White coarse grained cross bedded sandstones with lenses of sub angular quartz pebbles. (about 750m).
Upper Permian	Bijori	Micaceous, flaggy sandstones and shales. (180m to 250m).
Middle Permian	Motur	Medium to fine grained variegated sandstones, variegated clays and shales.
Lower Permian	Barakar	Light grey to whitish sandstones with grey shale, sandy shale, alternate bands of shale and sandstone and coal seams.
Upper Carboniferous to Lower Permian	Talchir	Greenish to grey sandstones, siltstone and shale.
-----UNCONFORMITY-----		
Archaeans	Metamorphics	Quartzites, granites, gneisses and schist etc.

## 7.0 Geology of the block

7.1 On the basis of Surface and Subsurface data of exploratory boreholes drilled by GSI/MECL/CMPDI in and around the Urdhan Jamunia (Dip Side) Block the generalized sequence of the different formations in the area under study is given below in Table III

**TABLE-III**  
**STRATIGRAPHIC SUCCESSION OF THE BLOCK**

Age	Formation	Lithology	Thickness range (in meters)
Recent/Sub-Recent	Soil/Detrital Mantle	Black cotton soil/sandy soil	0.50-24.10
Upper Cretaceous	Deccan Trap	Basalt/ Dolerite Dyke	68.75-144.70
Lower Cretaceous	Jabalpur	Gritty sandstone and clay with jasper pebbles.	NIL-29.70
-----UNCONFORMITY----- -----			
Middle Permian	Motur	Medium to fine grained variegated sandstones, variegated clays and shales.	99.05-263.10
Lower Permian	Barakar	Light grey to whitish sandstones with grey shale, sandy shale, alternate bands of shale and sandstone and coal seams.	59.85-102.70
Upper Carboniferous to Lower Permian	Talchir	Greenish to grey sandstones, siltstone and shale.	2.11-6.00
-----UNCONFORMITY----- -----			
Archaeans	Metamorphics	Quartzites, granites, gneisses and schist etc.	0.50

## 8.0 Regional Structure

- 8.1 The general attitude of the bedding in the West of Urdhan Jamunia Block is NNE-SSW to E-W with North Westerly to Northerly dip, however the amount of dip and change in direction cannot be ruled out due to occurrence of large faults in the block.
- 8.2 The interpretation of geological structure in West of Urdhan Jamunia Block is based on the sub-surface data obtained from the boreholes drilled in the Urdhan Jamunia (Dip Side), Pathakuri-Pipariya block coupled with GSI BH data and regional structure.
- 8.3 Based on the data obtained from boreholes drilled in and the surrounding block by GSI, MECL and CMPDI and regional structure in Blocks, tentative floor contour plans have been attempted to decipher the geological structure West of Urdhan Jamunia Block.
- 8.4 It is observed from the floor contour plans that the general strike of the beds NNE-SSW to E-W with a north-westerly to northerly dip.

8.5 The geological structure deciphered in the block is highly tentative in nature and occurrence of Faults in the area under investigation cannot be ruled out completely which may increase or decrease the depths of the boreholes.

**9.0 Sequence and quality of coal seams:**

9.1 In the adjacent easterly situated Urdhan Jamunia (Dip Side) Block, Barakar Formation is the only depository of coal having economics significance. Regional exploration in this area has revealed that the coal seams occur in Barakar Formation.

9.2 Urdhan-Jamunia Block (Dip Side Area) contains five regionally co-relatable consistent coal seams within Barakar Formation with even its splits occurring as individual coal seams. Depending upon their thickness, stratigraphic positions, quality and consistency in occurrence over considerable part of the block under report, a total number of 11 co-relatable coal seams, viz., Seam I, Seam II Top, Seam II Middle, Seam II Bottom, Seam Local, Seam III, Seam IV Top, Seam IV Middle, Seam IV Bottom, Seam V top & Seam V Bottom in descending order are identified. Among these, Seam II Middle, Seam III and Seam IV Middle are found to be major coal seams.

9.3 The sequence of coal seams likely to occur in the proposed block on the basis of boreholes drilled in adjoining block mainly comprises 11 independent seams. The details of coal seam encountered in the surrounding blocks are described below.

SEAM ZONE NO	ROOF DEPTH OF OCCURANCE (m)		THICKNESS (m)	OVERALL QUALITY OF THE SEAM
	FROM	TO		
I	486.39	544.75	0.69-1.22	G7-G12
II(Split)	356.55	932.00	1.50-8.15	G05-G9
III(Split)	377.00	574.00	3.00-4.08	G3-G11
IV-(Split)	384.40	589.25	5.00-7.20	G5-G7
V+(Split)	480-		0.72-0.80	G3-G4

*Quality: GSI Report Kahua Khireti Sector, Pench valley Coal Field*

The overall grade in the proposed block varies from G3-G11..

**10.0 EXPLORATION SCHEME**

**10.1 Drilling:**

Drilling of approximately **4700 m** in 8 boreholes has been proposed in 1600x16000m grid for the West of Urdhan Jamunia Block. The depth of intersection for seam V-B has been proposed from 500m to 950 m at minimum to maximum range.

TABLE-IV  
**Depth of Proposed Boreholes in West of Urdhan Jamunia Block, PKT valley Coalfield**

S. NO.	P. POINT NO	APPROXIMATE DEPTH
1	P-01	650.00
2	P-02	650.00
3	P-03	600.00
4	P04	750.00
5	P05	550.00
6	P06	650.00
7	P07	450.00
8	P08	400.00
<b>Grand Total= 4700m</b>		

Some boreholes may be extended beyond proposed expected depth due to structural complexities like faulting/ to encounter the Talchir formation & for establishing the complete strati-graphical sequence in the region. The project will be executed in two phases on the basis of review of available exploration data.

In view of soft and friable nature of Motur clays and sandstone which causes problem in the drilling appropriate technology, combination of drilling method be adopted to complete the project in the time schedule.

#### 10.2 Geophysical Investigation:

All the boreholes will be geophysical logged. The parameters involved are Sonic, Dual density, Natural Gamma, caliper, SPR, deviation, Resistivity etc.

#### 10.3 Laboratory Studies : Band by Band Analysis, overall analysis, special tests, & Geotechnical studies will be carried out on coal samples.

#### 10.4 Quantum of Work Proposed: Details of proposed work for detailed exploration for coal in West of Urdhan Jamunia block is given below in Table-

TABLE-V  
**QUANTUM OF WORK**

S.No.	Activity	Quantity
1.	Geological Mapping	24.27 Sq km
2.	<u>Drilling:</u>	
	i) Boreholes	8 BHs.
	ii) Meterage	4700 m
3.	i) Levelling and Triangulation	As per requirement
	ii) RL and Co-ordinates	8 BHs.
4.	Drill Core Logging	4700m

5.	Geophysical Logging	8 boreholes 4700.00m
6	<u>Chemical Analysis:</u>	
	i) Band by Band (ash, moisture, volatile matter)	450Samples
	i) Overall ii) Proximate Analysis at 40°C and 60% RH (for I100,I30,BCS)	130Samples
	Gross Calorific Value	130Samples
8	Special Tests (Ultimate analysis, Sulphur, phosphorous content, coking properties tests), petrography test	1 BOREHOLE

*(Note: 3 samples per 1 m of coal has been assumed for band by band analysis)*

## **11.0 LIMITATIONS**

- 11.1 Out of the Total area 24.27 Sq km(approx.) under exploration 50% is green cover area and rest is Non Forest Area. Teak, sal pipal, Kendu and bamboo are the dominant plants in the Forest.
- 11.2 Some of the boreholes may require shifting due to non-approachability due to hills / gullies / villages/ forest cover, geological structure etc.
- 11.3 As the proposed meterage is based on the tentative structure as per Regional reports and data of adjoining blocks, actual meterage may vary during course of exploration.
- 11.4 The tentative R.L. of every proposed borehole point was taken from Google earth i.e. tentative and may change at the time of actual survey.

## **12.0 LIST OF PLATES**

- 12.1 Following plates are enclosed with the proposal:
- I. Borehole Location Plan & Floor contour plan (tentative).
  - II. Location Plan on RF 1:10,000
  - III. Geological Plan.
  - IV. Graphic logs of boreholes drilled by CMPDI/GSI

**Summary of proposal for Preliminary Exploration (G-3) for coal in in  
“West of Urdhan Jamunia Block, PENCH Kanhan Tawa Valley CF, District  
Chindwara , Madhya Pradesh**

West of Urdhan Jamunia block measuring about 24.27 sq.km is located in PENCH Kanhan Tawa Valley CF, District Chindwara , District Chindwara , Madhya Pradesh . The block falls in Survey of India Toposheet no 55 J/15.

The bounding geographical co-ordinates of the block defined are as follows:

Latitude : N – 22° 16' 40.528" N to 22° 19' 58.469" N  
Longitude : E – 78° 50' 49.783" E to 78° 56' 46.111" E

Generalised Geological Sequence in West of Urdhan Jamunia block is as follow-

Age	Formation	Lithology
Recent/Sub-Recent	Soil/Detrital Mantle	Brownish grey sandy clay and black cotton soil
Upper Cretaceous to Eocene	Deccan Trap/ Intertrappeans	Basalts Massive and vesicular with vugs of quartz, zeolites and intertrappeans.
Upper Cretaceous	Lameta	Conglomerate, limestone and clays.
Lower Cretaceous	Jabalpur	Massive sandstones with Jasper, conglomerates, white clays, red clays, carbonaceous shales and coal lenses (50m to 100m.)
-----UNCONFORMITY-----		
Rhaetic (?)	Bagra	Predominantly coarse conglomerates with bands of calcareous sandstones, variegated clays, limestone and dolomite. (180m to 210m).
Upper part of lower Triassic to Middle Triassic	Denwa	Soft variegated clays interbedded with sandstone bands, conglomeratic at places. (about 850m).
Lower Triassic	Pachmari	White coarse grained cross bedded sandstones with lenses of sub angular quartz pebbles. (about 750m).
Upper Permian	Bijori	Micaceous, flaggy sandstones and shales. (180m to 250m).
Middle Permian	Motur	Medium to fine grained variegated sandstones, variegated clays and shales.
Lower Permian	Barakar	Light grey to whitish sandstones with grey shale, sandy shale, alternate bands of shale and sandstone and coal seams.
Upper Carboniferous to Lower Permian	Talchir	Greenish to grey sandstones, siltstone and shale.
-----UNCONFORMITY-----		
Archaeans	Metamorphics	Quartzites, granites, gneisses and schist etc.

The general attitude of the bedding in the West of Urdhan Jamunia Block is NNE-SSW to E-W with North Westerly to Northerly dip, however the amount of dip and change in direction cannot be ruled out due to occurrence of large faults in the block.

Urdhan-Jamunia Block (Dip Side Area) contains five regionally co-relatable consistent coal seams within Barakar Formation with even its splits occurring as individual coal seams. Depending upon their thickness, stratigraphic positions, quality and consistency in occurrence over considerable part of the block under report, a total number of 11 co-relatable coal seams, viz., Seam I, Seam II Top, Seam II Middle, Seam II Bottom, Seam Local, Seam III, Seam IV Top, Seam IV Middle, Seam IV Bottom, Seam V top & Seam V Bottom in descending order are identified. Among these, Seam II Middle, Seam III and Seam IV Middle are found to be major coal seams

The sequence of coal seams likely to occur in the proposed block on the basis of boreholes drilled in adjoining block mainly comprises 11 independent seams. The details of coal seam encountered in the surrounding blocks are described below.

SEAM ZONE NO	ROOF DEPTH OF OCCURANCE (m)		THICKNESS (m)	OVERALL QUALITY OF THE SEAM
	FROM	TO		
<b>I</b>	486.39	544.75	0.69-1.22	G7-G12
<b>II(Split)</b>	356.55	932.00	1.50-8.15	G05-G9
<b>III(Split)</b>	377.00	574.00	3.00-4.08	G3-G11
<b>IV-(Split)</b>	384.40	589.25	5.00-7.20	G5-G7
<b>V+(Split)</b>	480-		0.72-0.80	G3-G4

*Quality: GSI Report Kahua Khireti Sector, Pench valley Coal Field*

The overall grade in the proposed block varies from G3-G11..

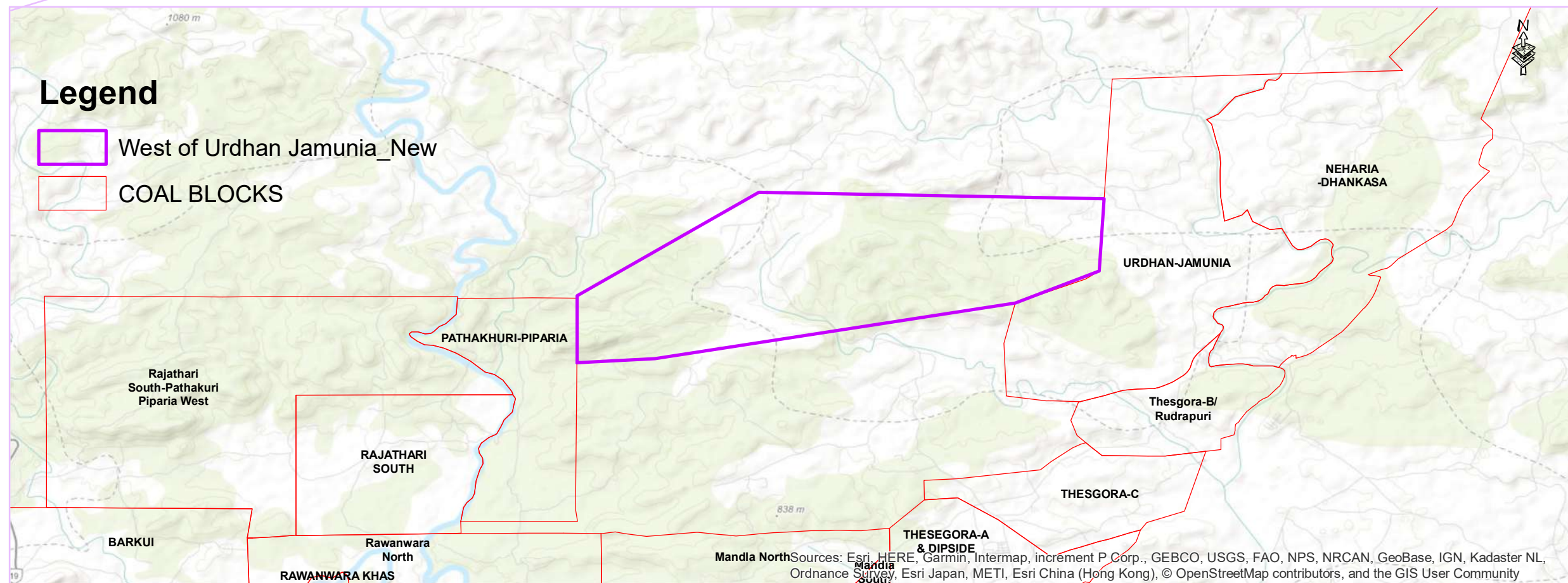
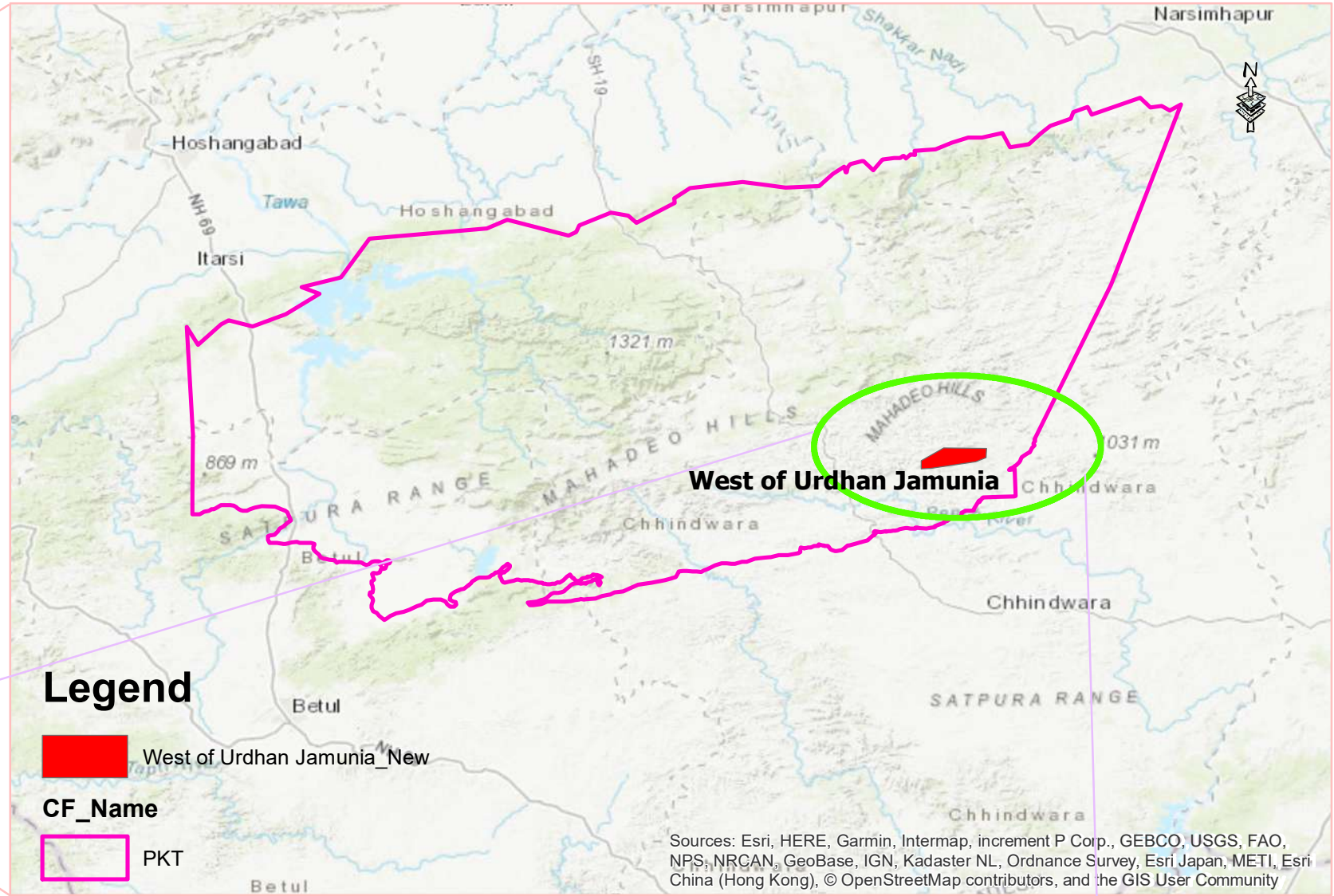
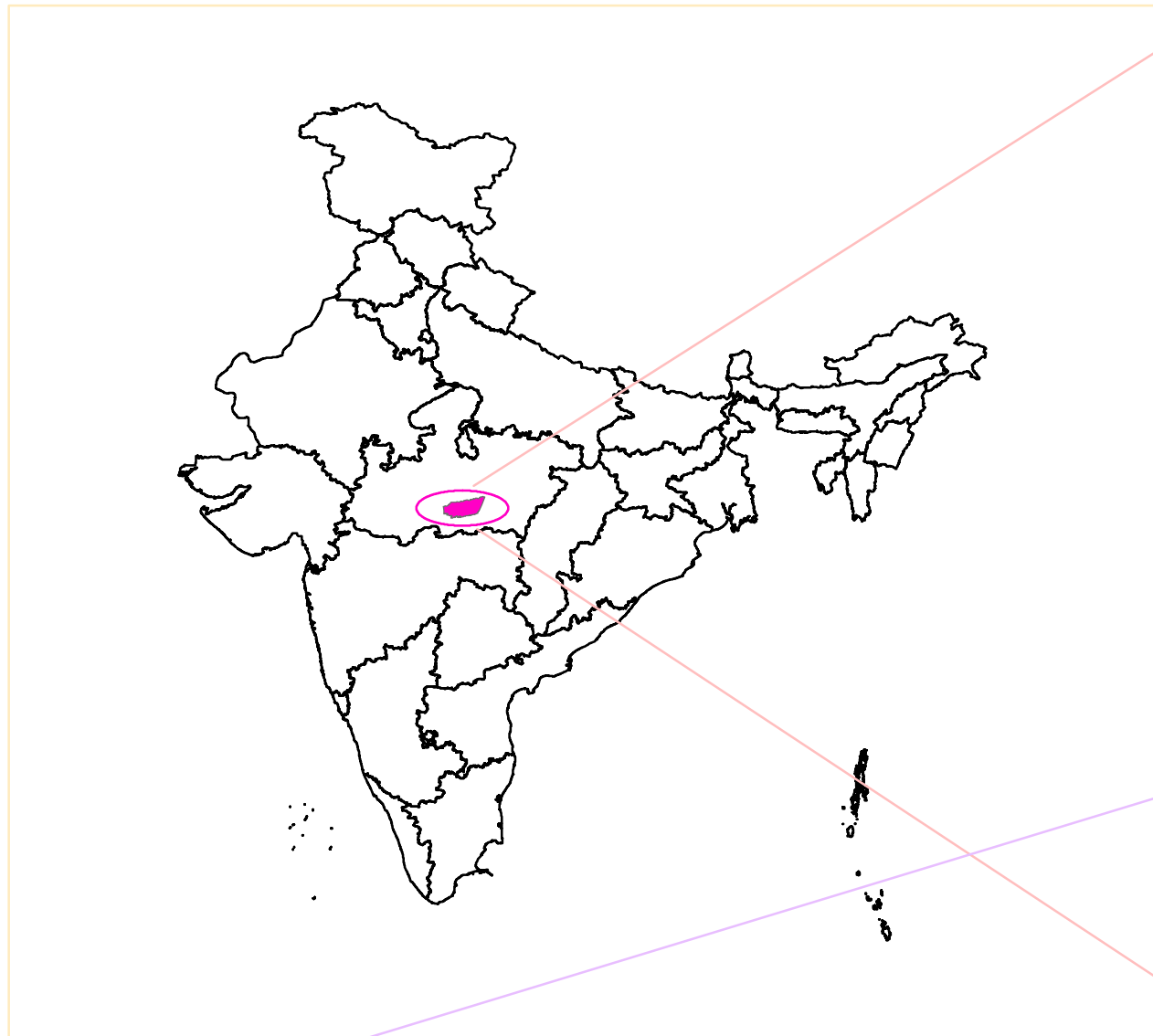
The exploration is proposed for G3 stage as per ISP 2022 in the block for assessing the resource, grade and to establish the structure/behavior of coal seams for mining potential. The quantum of work proposed for G3 stage of exploration is as follow-

#### Quantum of Work

S.No.	Activity	Quantity
1.	Geological Mapping	24.27 Sq km
2.	<u>Drilling:</u>	
	i) Boreholes	8 BHs.
	ii) Meterage	4700 m
3.	i) Levelling and Triangulation	As per requirement
	ii) RL and Co-ordinates	8 BHs.
4.	Drill Core Logging	4700m
5.	Geophysical Logging	8 boreholes 4700.00m
6	<u>Chemical Analysis:</u>	
	i) Band by Band (ash, moisture, volatile matter)	360Samples

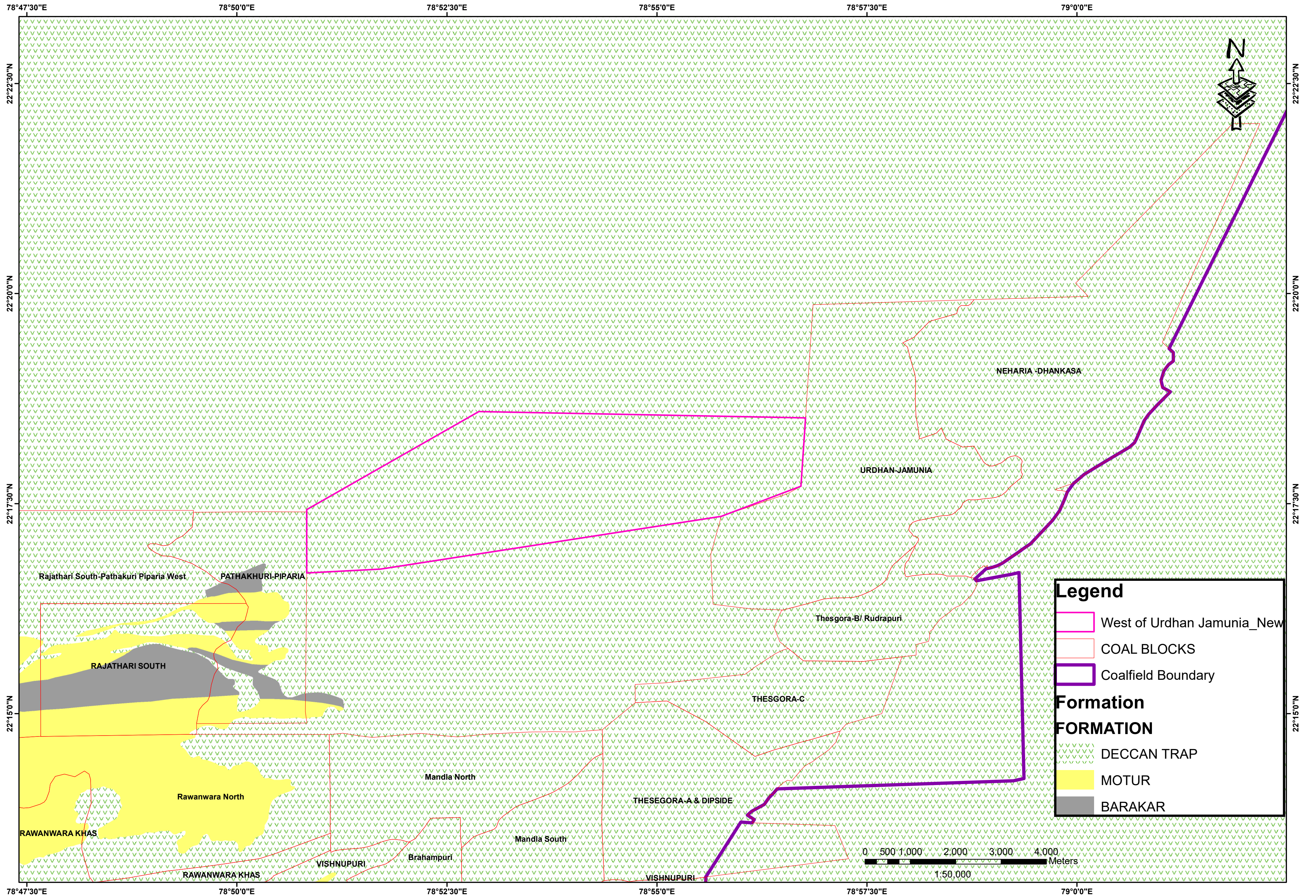
	i) Overall ii) Proximate Analysis at 40°C and 60% RH (for I100,I30,BCS)	130Samples
	<b>Gross Calorific Value</b>	130Samples
8	Special Tests (Ultimate analysis, Sulphur, phosphorous content, coking properties tests), petrography test	1 BOREHOLE

# LOCATION MAP WEST OF URDHAN JAMUNIA COAL BLOCK, PKT COALFILED, MADHYA PRADESH



ALL MAPS NOT TO SCALE

# Geological Map of A Part of PENCH-KANHAN-TAWA COALFIELD, Madhya Pradesh





GOVERNMENT OF INDIA  
GEOLOGICAL SURVEY OF INDIA



LITHOLOGICAL LOG OF BOREHOLES DRILLED IN KAHUA-KHIRETI SECTOR, PENCH VALLEY COALFIELD CHHINDWARA DISTRICT, MADHYA PRADESH

Vertical scale: 1:1000  
1cm = 10m

