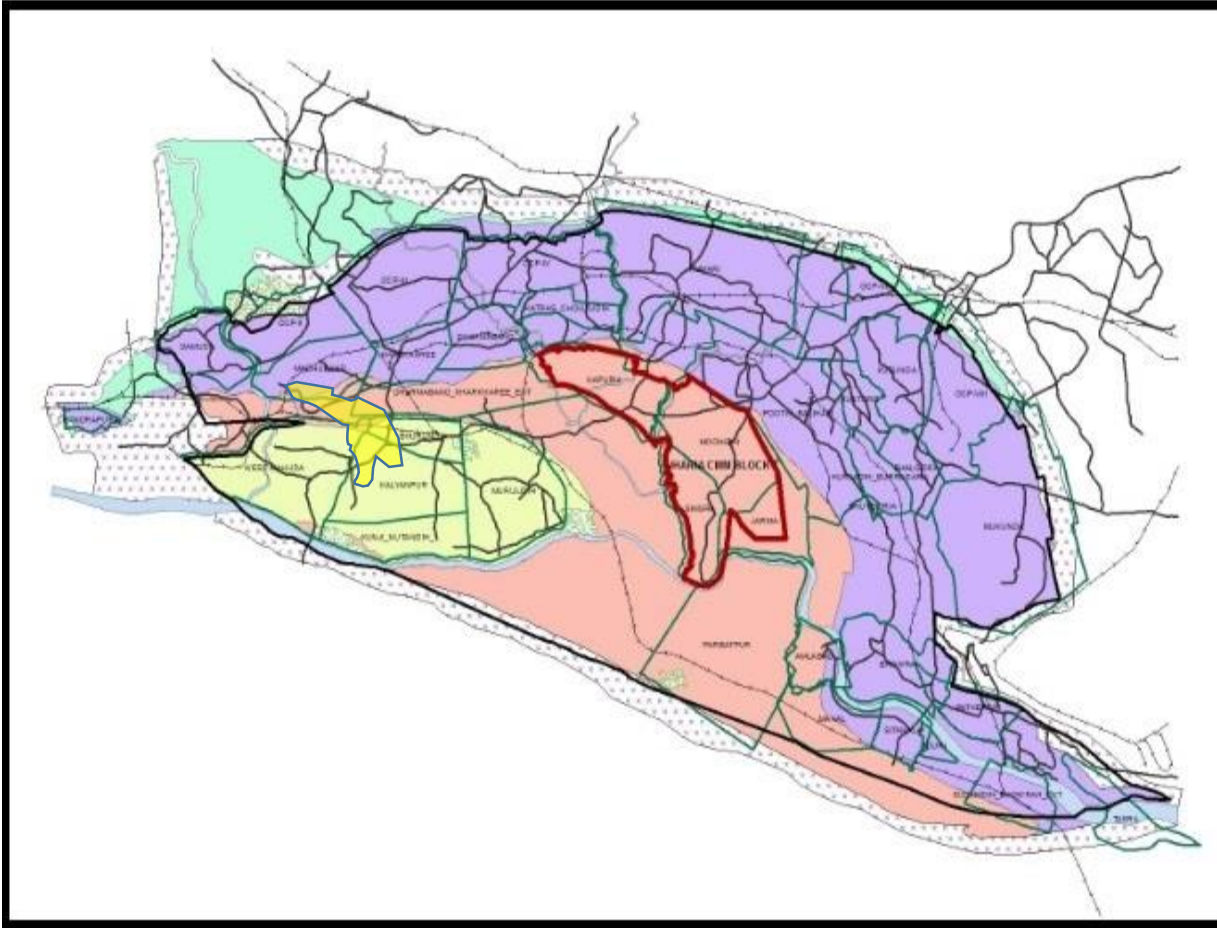




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# **CBM/CMM DEVELOPMENT IN CIL LEASEHOLD AREAS: JHARIA CBM BLOCK**

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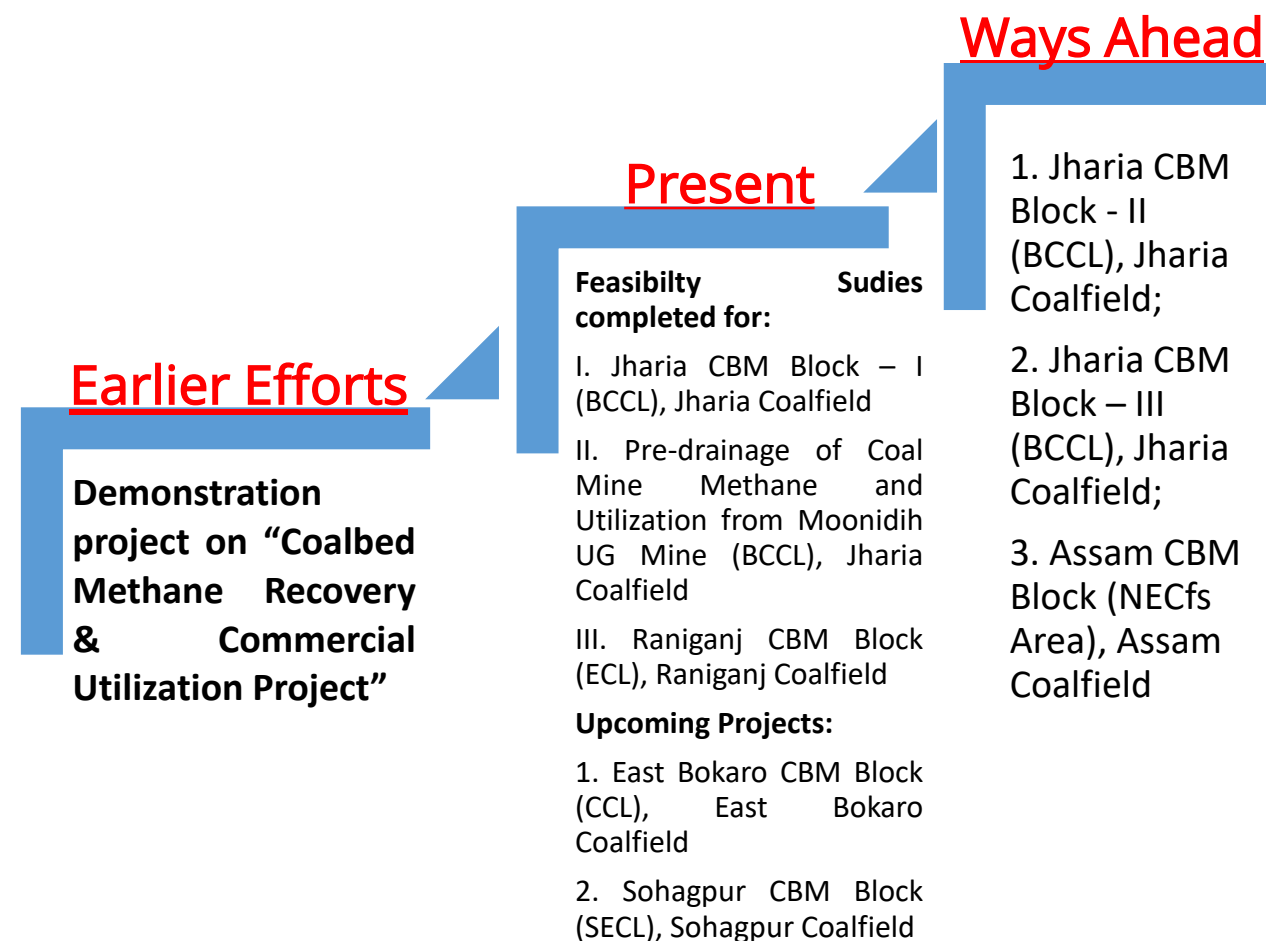


# Government of India's Recent Initiatives

- MoC vide OM dated 29<sup>th</sup> July, 2015 conveyed approval for exploration and exploitation of CBM from areas under mining lease allotted to CIL;
- In November 2015, MoP&NG has issued guidelines for exploration and exploitation of CBM by Coal India Limited (CIL) and its subsidiaries from areas under coal mining lease allotted to CIL.
- The Policy framework for Early Monetization of CBM (April, 2017) provide marketing and pricing freedom to sell the CBM at Arm's Length Price in domestic market; is to govern gas produced from Jharia CBM/CMM block (BCCL);
- MoP&NG issued revised notification on 8<sup>th</sup> May, 2018 on consolidated terms & conditions for grant of exploration and exploitation rights to CIL and its subsidiaries from coal bearing areas for which they possess mining lease for coal in continuation of CBM Policy 1997. Accordingly, Mining lease for coal will also be deemed lease for CBM;
- In April, 2018, CCEA has given its approval for exemption of applicability of the ORD Act and PNG Rules within coal mining leasehold areas, Production and permission to engage experienced technical developers or service contractor from India or abroad as third party for CBM exploitation etc.



- A successful demonstration project on “Coalbed Methane Recovery & Commercial Utilization Project” on behalf of Ministry of Coal, funded by GEF/UNDP-GOI proved the efficacy of the technology for extraction and utilization in Indian geo-mining condition
- Recent initiatives by GoI leads CIL-CMPDI to take up development of CMM/CBM actively.
- Initially Jharia and Raniganj Coalfields have been undertaken for CMM/CBM Development in BCCL command area and ECL command areas.
- More blocks are in other coalfields under CIL leasehold are under delineation





## 1. Pre-drainage of methane at Moonidih mine (BCCL), Jharia Coalfield

- Working Seam XVI has been proposed to recovery methane to enhance production and safety and gainfully utilization of gas.
- A Global Tender for selection of technology/service provider for Pre-drainage of Coal Mine Methane and utilization is to be published very soon

## 2. Jharia CMM/CBM Block (BCCL Area):

- A Project feasibility report for a block of about 24.32Sq. Km for commercial development in the mining leasehold area of BCCL having CBM resource of 25.2 BCM has been prepared and approved by competent authority.
- The CBM block will be developed through MDO route & CMPDI will provide Project Management Consultancy



# Delineation of Jharia CBM/CMM Block

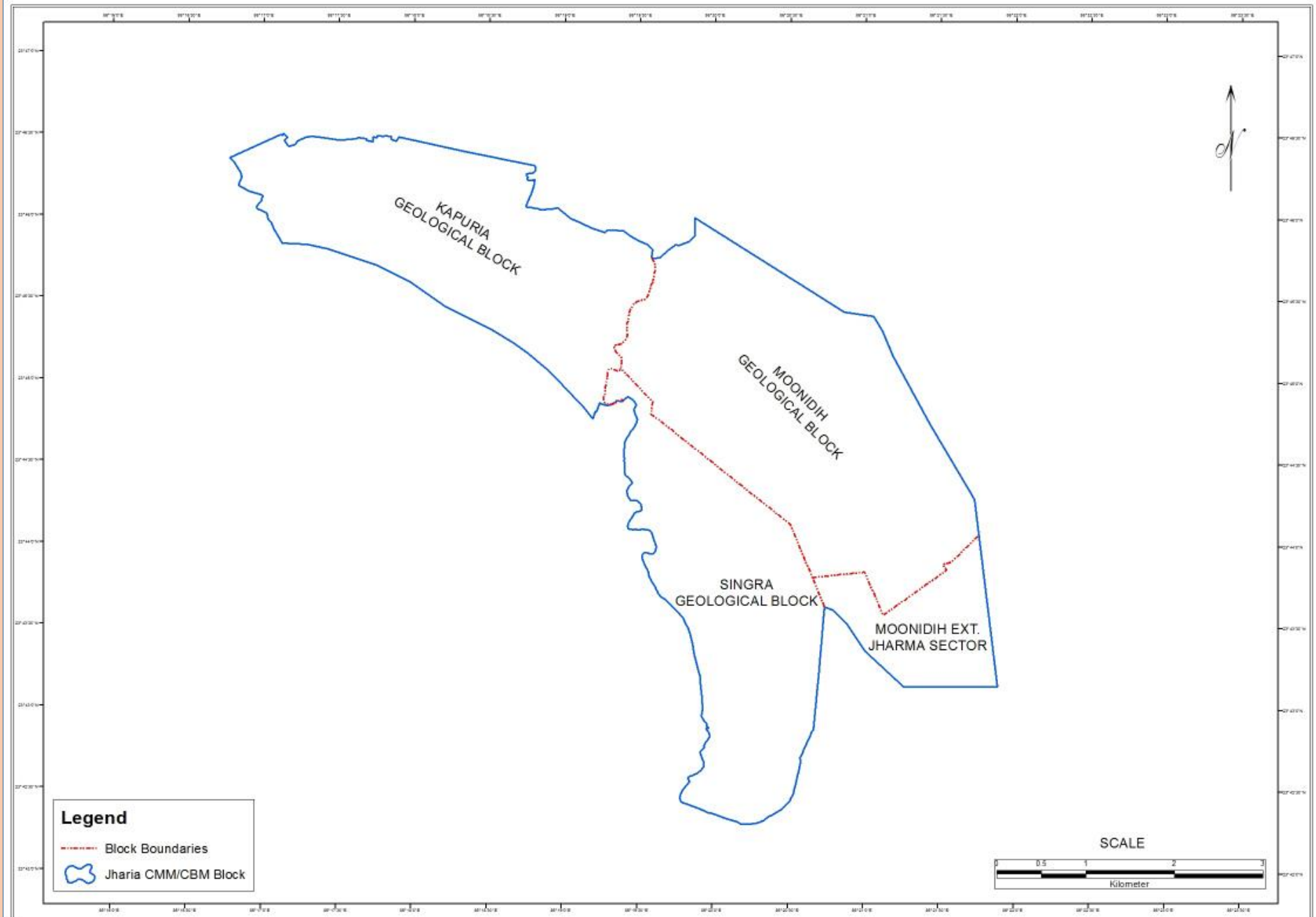
- Degree II & III Gassy mines in Jharia Cf;
- CBM blocks in the Jharia coalfield;

• “Jharia CBM/CMM block” under BCCL mining leasehold area in Jharia coalfield has been delineated with an objective of exploiting Coalbed Methane (CBM);

- Target seam : **XVT and below** ( in the Kapuria, Moonidih and Singra blocks)

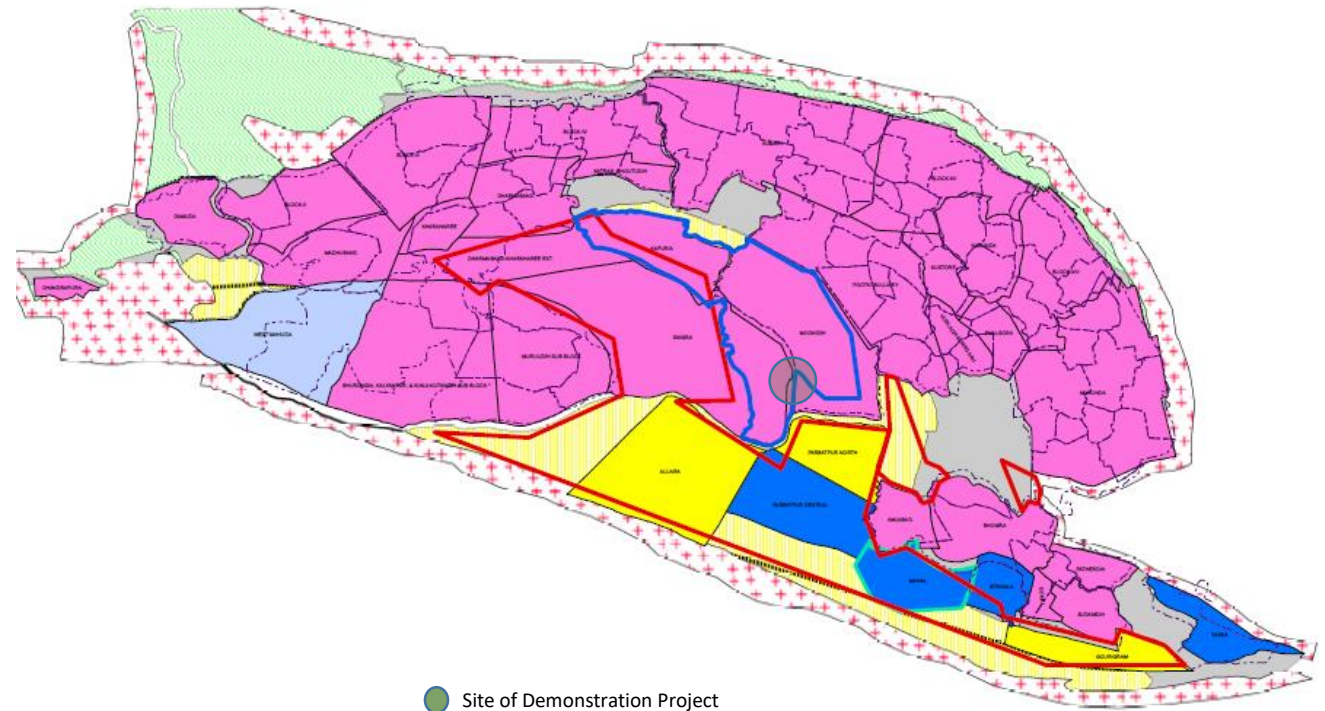


# Jharia CBM/CMM Block (BCCL)



# CBM activities in Jharia Coal Field

- A CMM related demonstration Project has been successfully implemented in Moonidih Mine of BCCL under GoI/GEF/UNDP funding by CMPDI/BCCL.
- Jharia CBM Block (84.55 km<sup>2</sup>) allotted to consortium of CIL-ONGC is being operated by ONGC.



# Scope of WORK



## What is done?

CBM Gas-in-Place is assessed and techno-economics viability is estimated for the project for commercial exploitation of Coal Bed Methane (CBM)











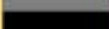




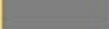


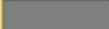


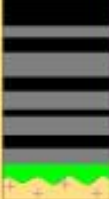
## The Target Areas

Mining leasehold area falling in Kapuria, Moonidih, Singra

## The Seams Targeted

Seam XV T and below

# Standard Seam Sequence of Jharia Basin

SEAM NAME	COLUMN	THICKNESS RANGE (m)	PARTING RANGE (m)
BARREN MEASURES			
XVIII		1.25-6.10	32-60
XVII TOP		Up to 2.65	14-40
XVII BOTTOM		0.25-2.05	96-125
XVI COMBINED		4.15-6.31	87-128
XV COMBINED		5.99-9.25	37-73
XIV		4.25-12.04	3-18
XIII		1.90-8.69	10-25
XII		3.43-5.59	6-24
XI		1.59-6.19	18-60
X		2.44-4.41	2-68
IX		2.51-4.12	62-69
VIIIC		2.56-2.71	4-5
VIIIB		1.85-2.64	8-10
VIIIA		0.71-1.52	18-55
VIII		4.75 - 7.96	8-26
V/VI/VII		32.91- 37.56	2-8
IV		5.66-10.62	9-51
III		5.76-11.82	9-31
II		1.65-7.38	15-20
I		7.63-10.67	
TALCHIR METAMORPHICS			

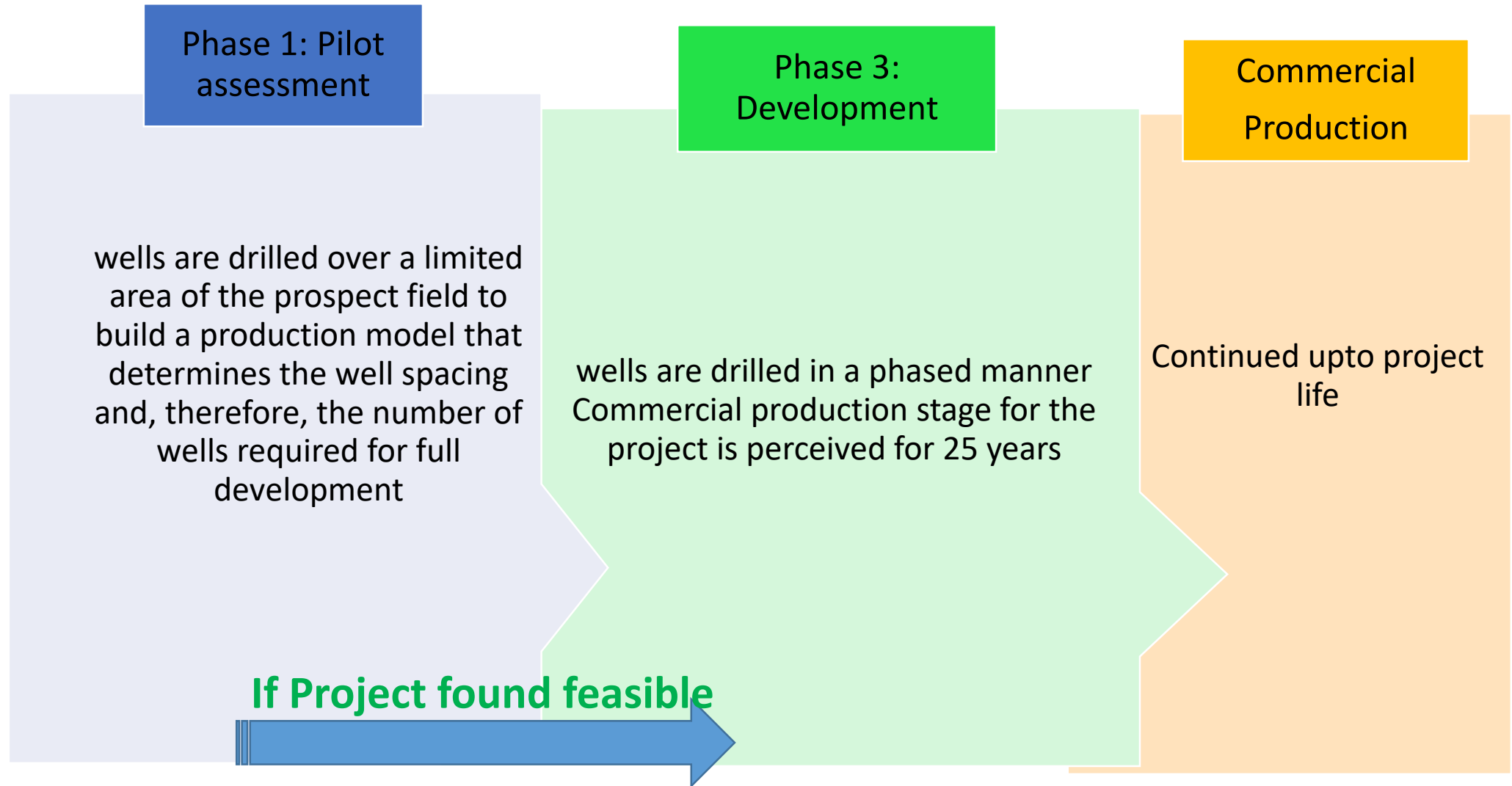
# Estimation of CBM Gas In Place Reserve...

- **Net Coal resource: 1961.85 MMT**
- **Total Gas-In-Place resource: 25.22 BCM**

*This assessment of gas resource of the CBM block is an attempt to have a broad idea of the prospectivity of the block and should be taken as an approximate estimate that will be subject to modification with generation of reservoir data from the block.*

# Project Implementation Concept

CBM production will be a long gestation project with a multi-phase development process, involving following Phases



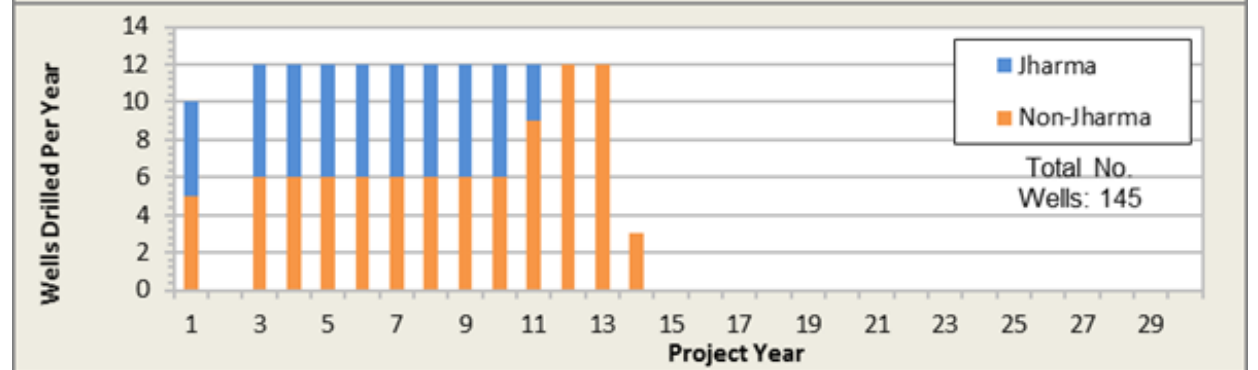
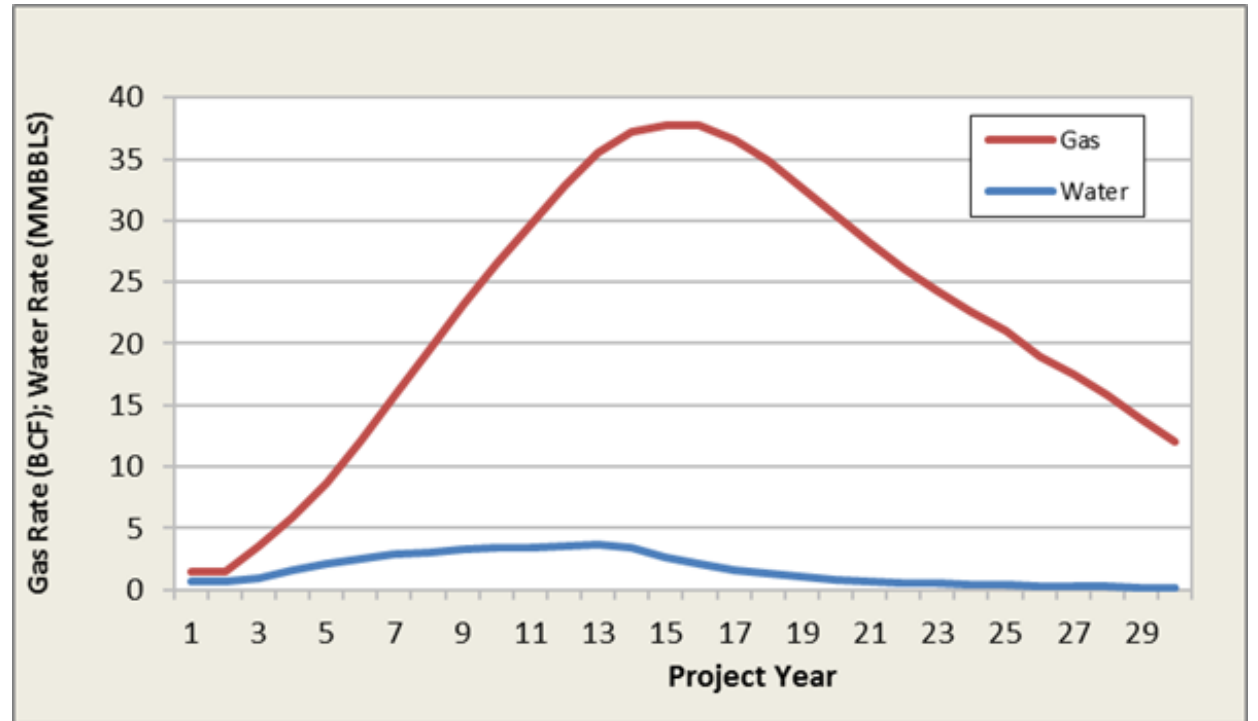
# Field Production Profile

- Total of 145 wells were considered for field development
- The first 10 pilot wells will be drilled in year 1, with an additional 1 well per month drilled beginning in year 3 and beyond.
- Wells are allowed to produce for 25 years using a water production rate of 400 barrels of water per day (BWPD)

# Field Production Profile & Drilling Schedule

Drilling Schedule for Development of Jharia CMM Block

Project Year	Wells Drilled			Cumulative Wells		
	Non-Jhama	Jhama	Total	Non-Jhama	Jhama	Total
1	5	5	10	5	5	10
2	0	0	0	5	5	10
3	6	6	12	11	11	22
4	6	6	12	17	17	34
5	6	6	12	23	23	46
6	6	6	12	29	29	58
7	6	6	12	35	35	70
8	6	6	12	41	41	82
9	6	6	12	47	47	94
10	6	6	12	53	53	106
11	9	3	12	62	56	118
12	12	0	12	74	56	130
13	12	0	12	86	56	142
14	3	0	3	89	56	145



# Economic Results

<b>Total Wells (Vertical)</b>	<b>Wells</b>	<b>145</b>
<b>Total CAPEX</b>	\$ million (INR)	289 (1878 Crore*)
<b>Total OPEX</b>	\$ million (INR)	169 (1098.5 Crore)
<b>Recoverable Volume</b>	BCM	19.9
<b>Average Prod.</b>	MMSCMD	1.3

<b>Gas Price considered</b>	<b>\$/MMBTU</b>	<b>USD 5.70</b>
<b>Gas Price Inflation</b>	%	0%
<b>Cost Inflation</b>	%	0%
<b>IRR</b>	%	<b>52%</b>
<b>NPV-12</b>	\$ million (INR)	470 (3055 Crore*)
<b>BEP (Break Even Price)</b>	\$/MMBTU	1.56

<b>Gas Price considered</b>	<b>\$/MMBTU</b>	<b>USD 8.00</b>
<b>Gas Price Inflation</b>	%	0%
<b>Cost Inflation</b>	%	0%
<b>IRR</b>	%	<b>72%</b>
<b>NPV-12</b>	\$ million (INR)	731 (4751.5Crore*)
<b>BEP (Break Even Price)</b>	\$/MMBTU	1.56

# Marketing prospects of Gas

- The sale of CBM is presently envisioned to be at well head/the field gate to an end-user or to a gas marketer for supply to the end-user in adherence with the natural gas utilization policy of the Government;
- In the present case, the feasibility of several custody transfer points for gas sale to gas marketers, or direct to the end-user can be considered. However, the feasibility of interconnection with regional production hubs i.e; GAIL should also be examined in the future as economics considering requisite permission;
- The Policy framework for Early Monetization of CBM vide notification dated 11<sup>th</sup> April, 2017 provide marketing and pricing freedom to sell the CBM at Arm's Length Price in domestic market; is to govern gas produced from Jharia CBM/CMM block (BCCL);
- Representative Arm's Length Prices currently discovered by CBM commercial producers in the region are currently in the US\$8 to 10 per MMBTu;
- However, market prices for Jharia gas are closer to US\$5.70/MMBTu of ONGC.

# Marketing Prospects of CBM

- GAIL (India) Ltd is laying Jagdishpur -Haldia Pipeline (JHPL) with design capacity of 16.00 MMSCMD including 4.00 MMSCMD as common carrier
- Salient features of the GAIL project:
  - Design Capacity: 16 MMSCMD
  - Pipeline Length: 1836 Km
  - States covered: Jharkhand, West Bengal & Odisha
  - Completion schedule: by March 2019
- Gas Pipeline from Angul to Bokaro (from Dhamra) and Haldia to Durgapur is expected to be commissioned by Dec 2020

धन्यवाद  
Thank You