PS The New Stratigraphic Play of Ciputat Sub-Basin, Indonesia: The Integrated Seismic Sequence Stratigraphic Analysis*

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Abstract

Ciputat Sub-Basin is one of the basins that has been proven to produce hydrocarbons. The research focus on this study is the Talang Akar Formation in the Pondok Makmur Field area of the Ciputat Sub-Basin. The discovery of the Pondok Makmur Field was preceded by the successful drilling of the PDM-1 which was initiated on November 27, 2007 with an objective of sandstone to conglomerate interbedded sandstone reservoirs of Bottom Talang Akar Formation. So far, lateral mapping of sandstone reservoirs only uses seismic attributes and has not been detailed down to the sandstone layers, so the study team performed a study for each parasequence of the Talang Akar Formation in the study area. Research methods used stratigraphic sequence analysis with data source in the form of core data, cuttings, well log, mud log, biostratigraphy data, and 3D Seismic data to find potential stratigraphic-structural traps.

The purpose of this study analysis is to apply the sequence time correlation for exploration activity of stratigraphic trap in the Talang Akar Formation in the Ciputat Sub-Basin which aims to determine facies variations and deposition environment, the sequence boundary, developing system tract, thickness and dispersion from each identified stratigraphic unit, position of the structural-stratigraphic trap, finding hydrocarbon potential and making speculative resources calculations on the structural-stratigraphic traps in undrilled areas. In this study, a core description and cuttings can be used to control the well logs that will be used in the interpretation of depositional facies which will be integrated with the depositional age as a result of biostratigraphic analysis into the seismic to obtain the facies boundaries. Once integrated into the seismic, we will conduct a facies analysis with ABC method. The result is that the deposition environment that developed in Ciputat Sub-Basin from old to young is intertidal mud sand flat, intertidal sand flat, subtidal, swamp, intertidal mud flat-intertidal mud sand flats, intertidal sand flats, supratidal, then lagoon. The study area has four sedimentation cycles composed from old to young; SB 0-34 ma – MFS 0-33 ma, SB 1 – 32 ma, MFS 1 – 30.5 ma, SB 2 – 28 ma, MFS 2 – 26 ma, SB 3 – 23 ma, MFS 3 – 22.3 ma, and SB 4 – 21.5 ma. The seismic facies configuration results determined a north-south direction of a subtidal sand bar.

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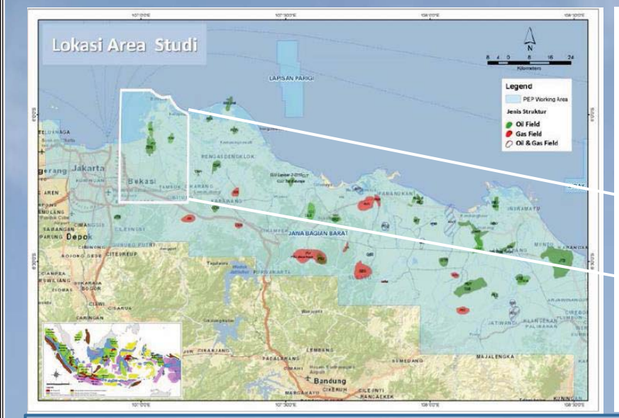
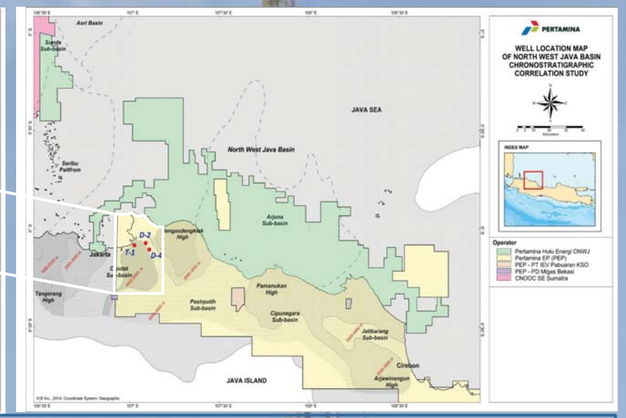
PRELIMINARY

The sequence stratigraphy study aims to increase the success rate of exploration activities in Pertamina and its subsidiaries such as PEP Asset 3 and PHE ONWJ. The sequence stratigraphy study is one of the exploration methods that can find structural and stratigraphic traps and potentially find hydrocarbon resources within the Ciputat Sub-Basin, especially the Talang Akar Formation. This study was conducted in "D" Field, the discovery of "D" Field begins with the success of drilling D-1 which was invited on November 27, 2007 with objective of sandstone reservoir to conglomerate interbedded sandstone of Bottom Talang Akar Formation.

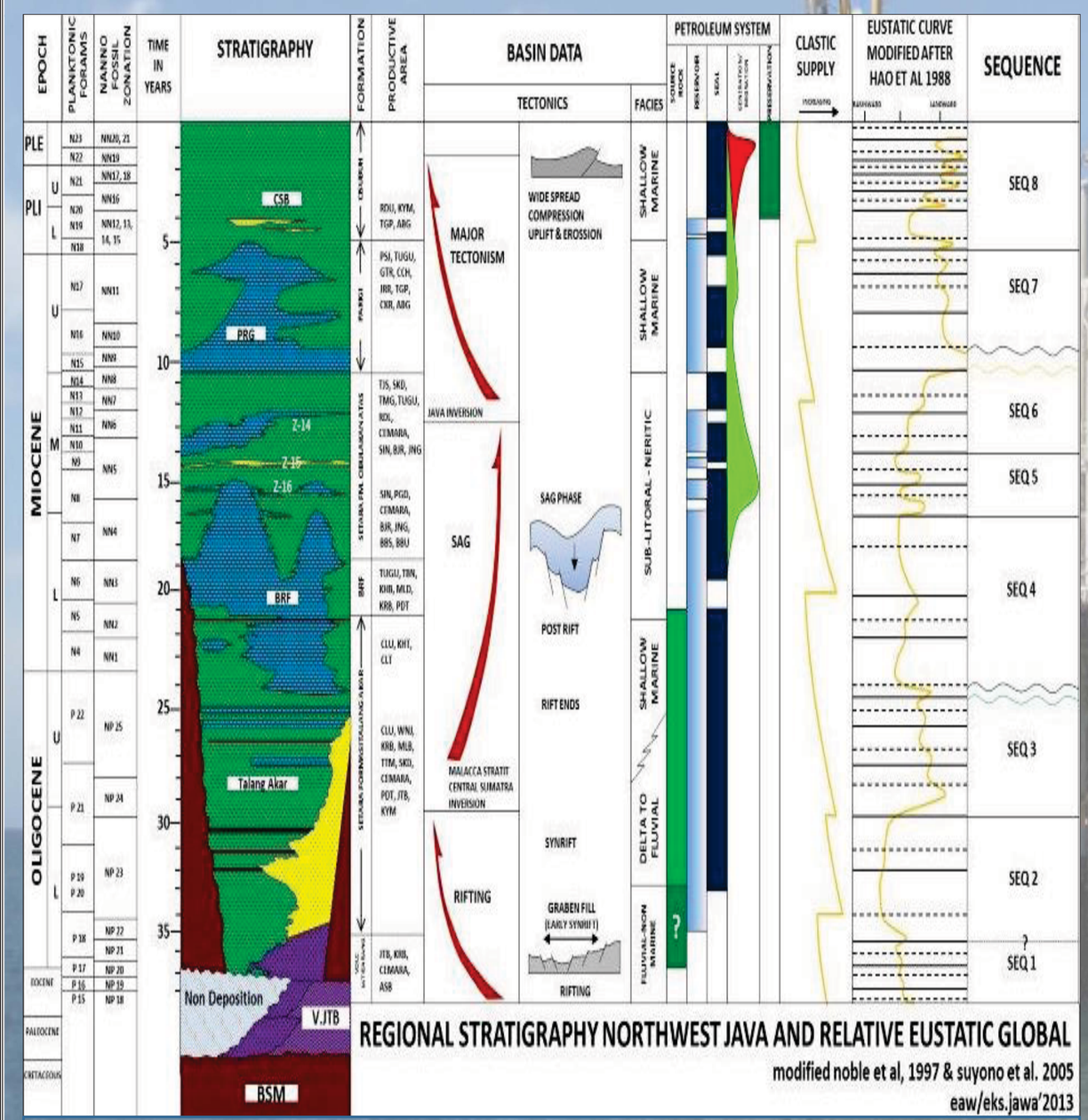
RESEARCH LOCATION





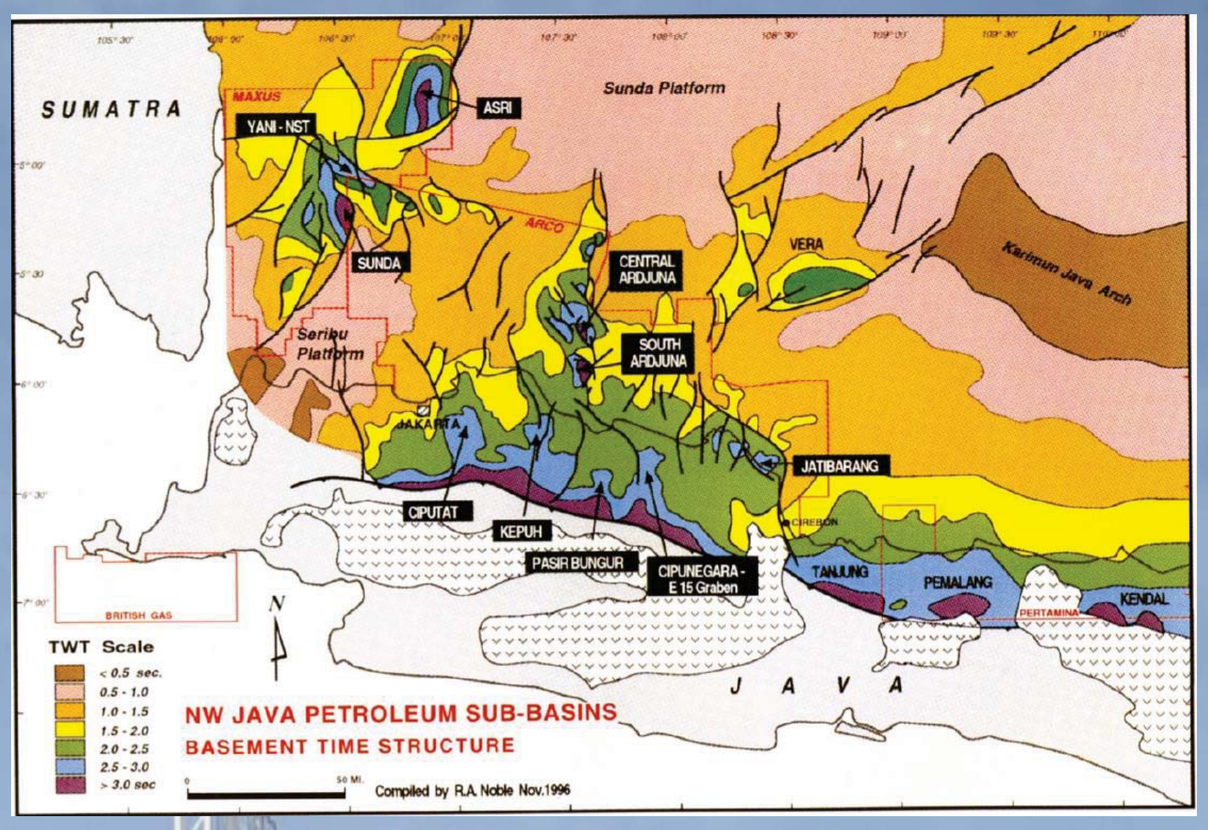
The Research Study is located in Central Arjuna Sub Basin, Northwest Java Basin, Indonesia

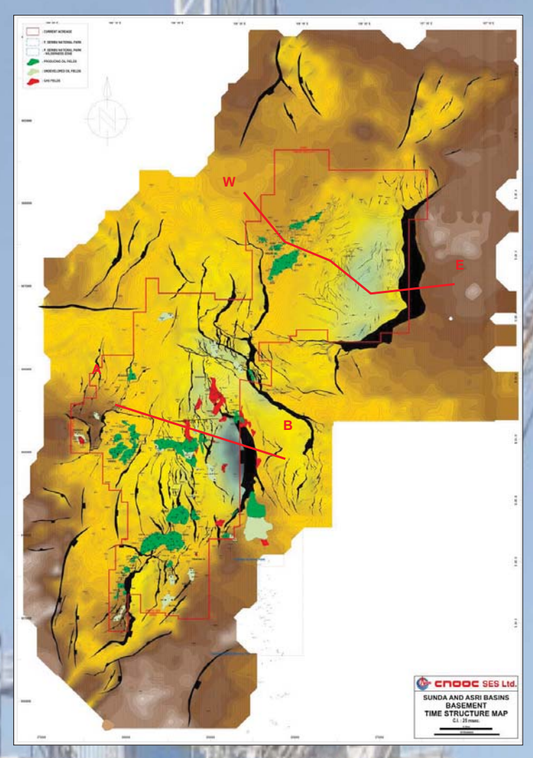
REGIONAL GEOLOGY

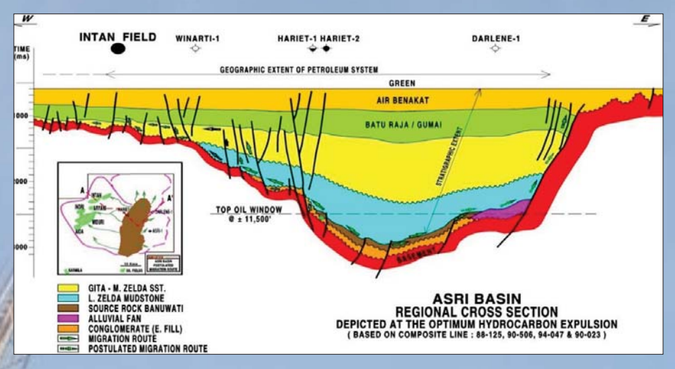


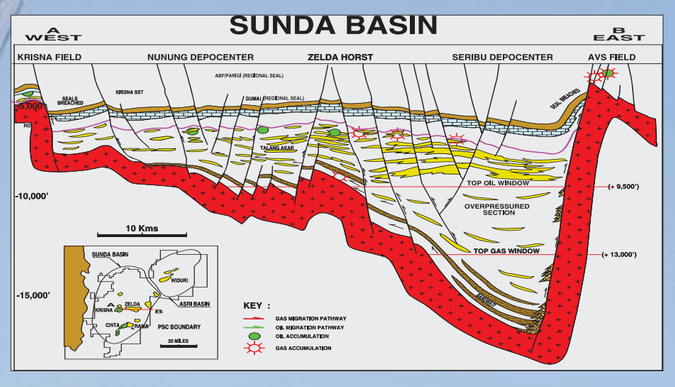
Regional Stratigraphy Northwest Java and Relative Eustatic Global
(Modified noble et al, 1997 & Suyono et al. 2005)

REGIONAL GEOLOGY









DATA AVAILABILITY

TYPE OF DATA	WELL NAME				
	T-1	D-1	D-2	D-3	D-4
	Oil Well Discovery	*Oil & Gas Well Discovery*	*Oil & Gas Well Discovery*		*Oil Well Discovery*
Final Well Report	√	x	√	x	x
Mudlog/Master log	x	√	√	√	√
DST Resume	√	√	√	x	x
Core Description	x	x	√	x	x
Routine Core Analysis	x	x	x	x	√
Side Wall Core Analysis	x	√	√	√	√
Geochemistry Analysis	x	√	√	√	x
Biostratigraphy Report	√	√	√	√	√
Biostratigraphy Chart	√	√	√	x	√
Analysis Resume FVF	x	x	√	x	x
Log LAS	√	√	√	√	√
Deviation Survey	√	x	√	√	√
Checkshot	√	√	√	√	√
Line 3D Seismic	3D Cube seismik				

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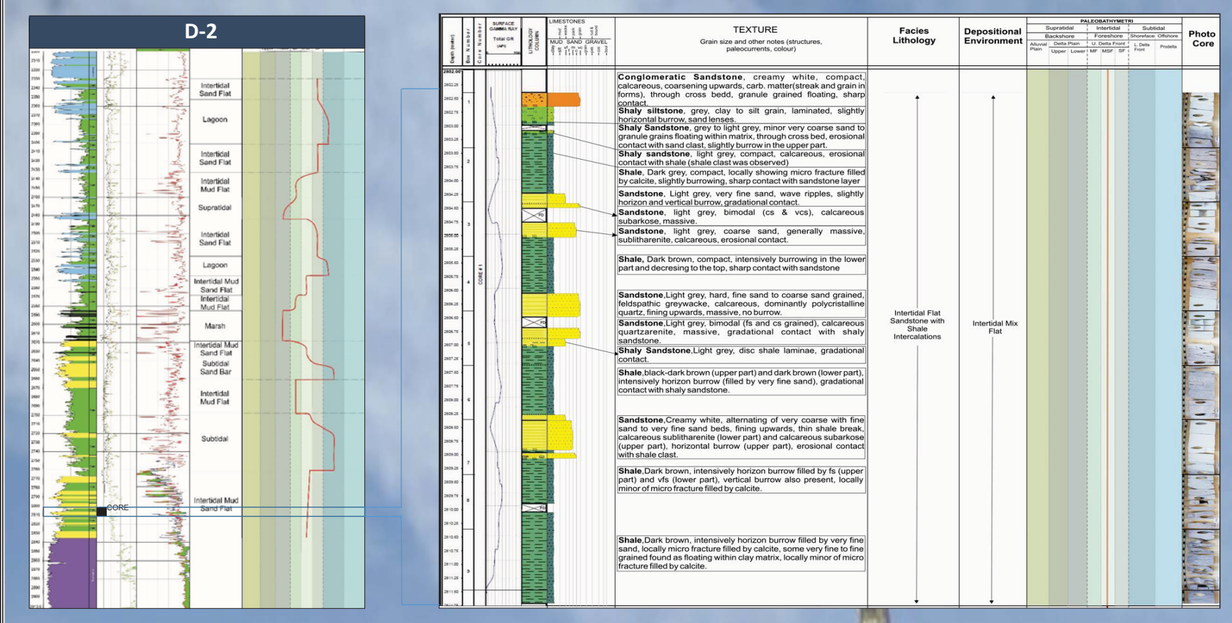
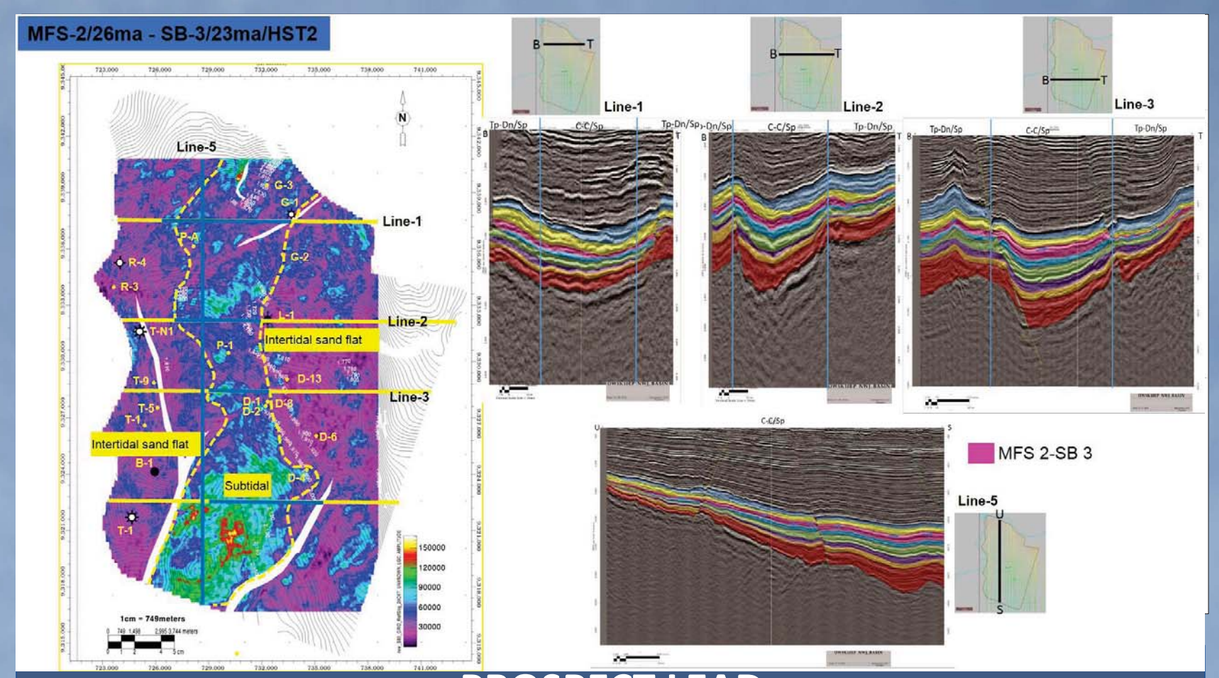
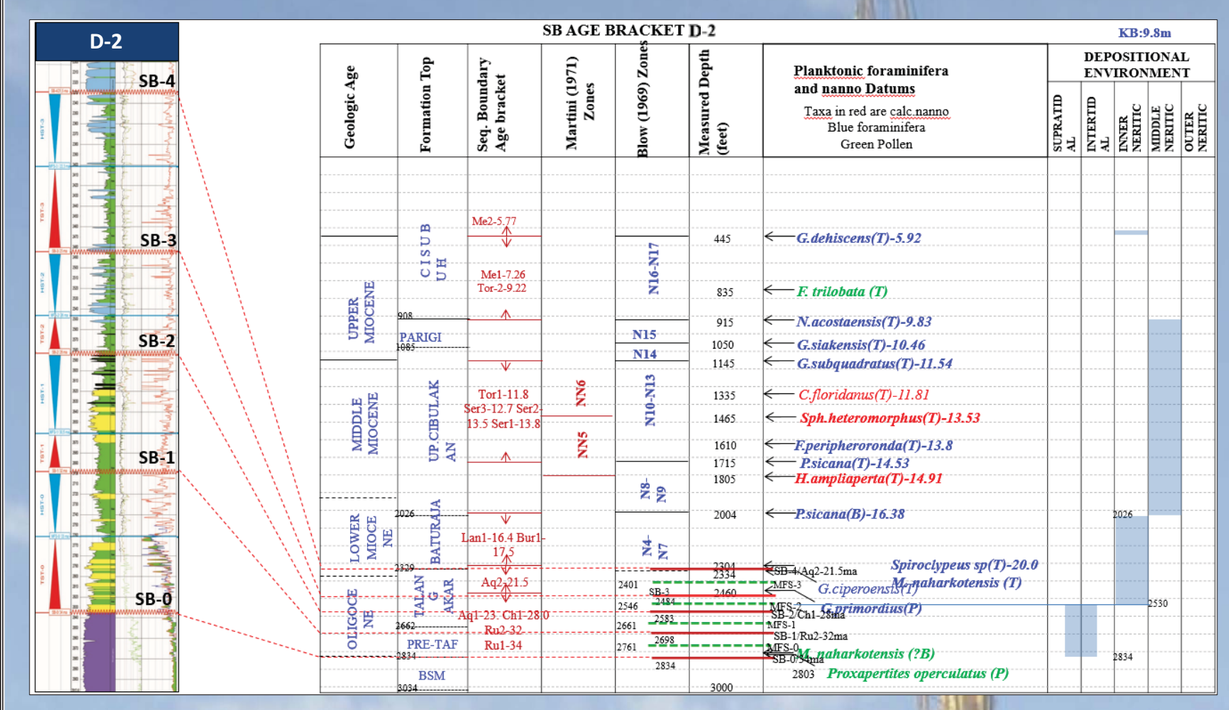
CORE DESCRIPTION



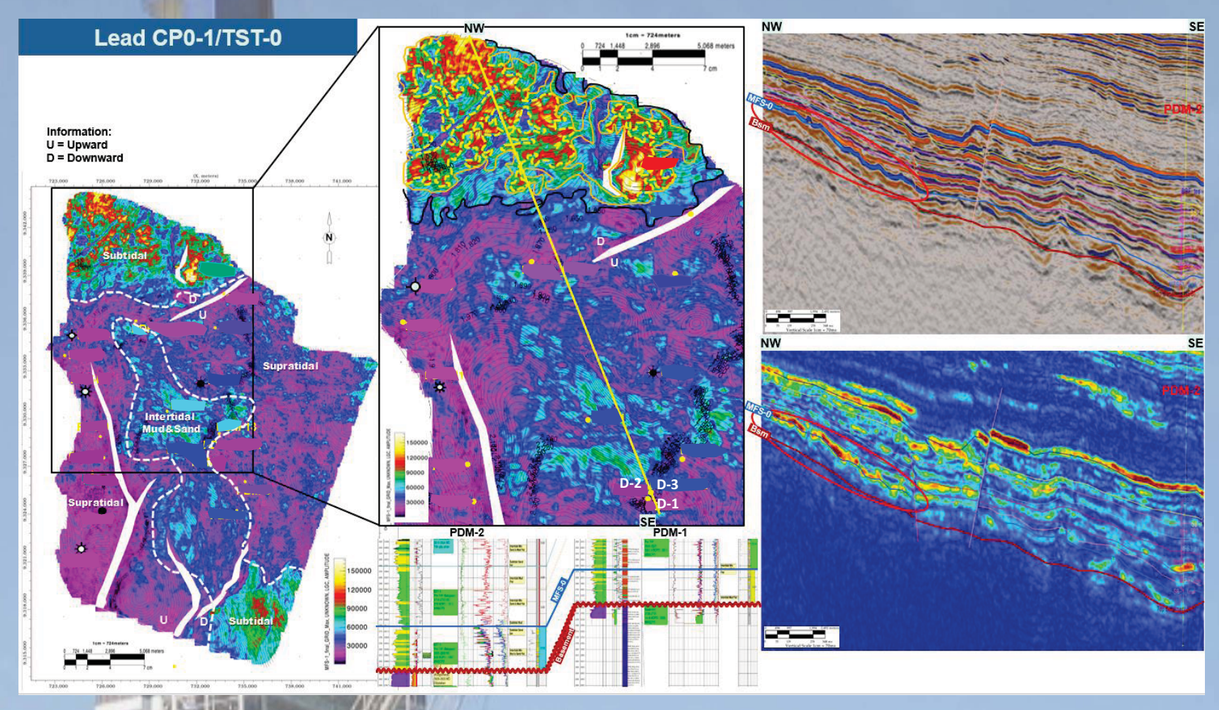
FACIES CLASSIFICATION BASED ON SEISMIC ABC METHOD



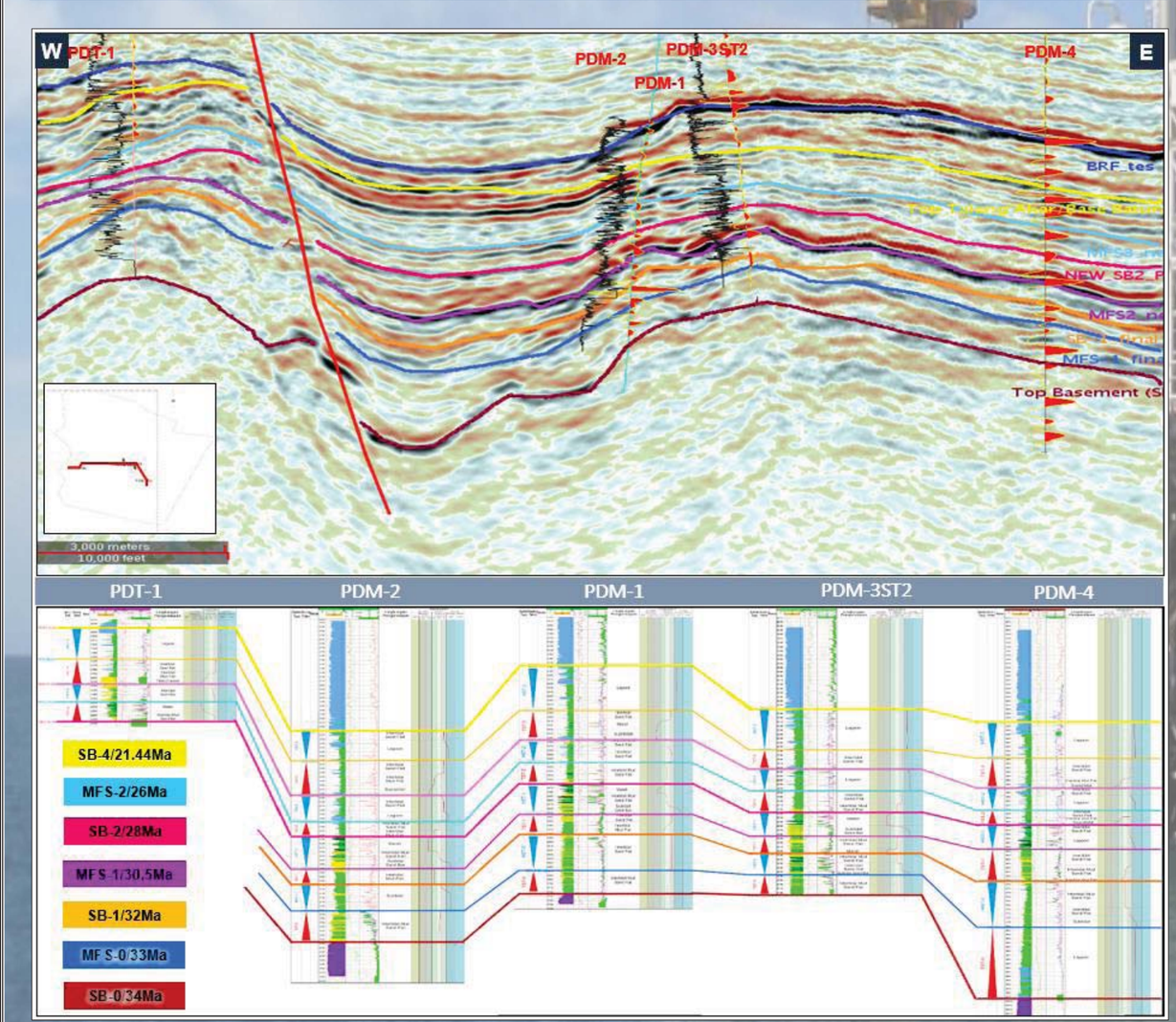
BIOSTRATIGRAPHY ANALYSIS



PROSPECT LEAD



WELL CORRELATION



CONCLUSION

- Deposition environment that develops in the Ciputat sub-basin from old to young is Intertidal Mud Sand Flats, Intertidal Sand Flats, Subtidal, Swamps, Intertidal Mudflat-Intertidal Mud sand Flats, Intertidal sandflats, Supratidal and Lagoon. In Ciputat Sub-basin, deepest environment is subtidal.
- Ciputat sub-basin study area has four sedimentary cycles composed from old to young as follows: SB 0-34ma - MFS 0-33 ma, SB 1 - 32ma, MFS 1 - 30.5 ma, SB 2 - 28ma, MFS 2 - 26ma, SB 3 - 23ma, MFS 3 - 22.3 ma and SB 4 - 21.5ma.
- Seismic facies analysis shows that the direction of deposition is North - South with the sand prone area is the facies of the sand bar.
- RMS map anomalies show potential leads is between SB 0 (34ma) - MFS 0 (33 ma) with extending direction from Northwest to Southeast, MFS 0 (33 ma) - SB 1 (32 ma) in the South and North extends from West to East, SB 1 (32ma) - MFS 1 (30.5 ma) in the Southern section extends from West to East.
- Total speculative unrisk resources is 1.245 MMBO and speculative Unrisk recoverable prospective resources is 306.82 MMBO; 859.3 BCF for a total of 450 MMBOE.

REFERENCE

Pertamina UTC. 2017. G & G Studies Final Report of Sequence Stratigraphic Study of Talang Akar Formation and Potential Stratigraphic-Structure Trap