

**STUDI PEMETAAN BAWAH PERMUKAAN SERTA KONTROL
EVOLUSI STRUKTUR GEOLOGI TERHADAP SISTEM
PENGENDAPAN DAN SISTEM *PETROLEUM* CEKUNGAN
PULL APART SELAT SUNDA**

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Fokus penelitian berada pada salah satu cekungan yang berada di perairan Selat Sunda serta terletak pada batas antara Provinsi Lampung dan Banten. Panjang lintasan daerah penelitian 732 km dengan mencakup luas 10.000 km². Secara tatanan tektonik Cekungan *pull apart* Selat Sunda terletak pada sistem transisi subduksi normal di selatan Jawa dan berubah menjadi subduksi miring di lepas pantai barat Sumatra, berdasarkan tatanan tektonik tersebut kajian secara mendalam mengenai struktural dan stratigrafi cekungan ini sangatlah menarik untuk mengetahui konfigurasi sejarah geologi serta potensi-potensi yang ada di cekungan *pull apart* Selat Sunda.

Evolusi struktur geologi cekungan *pull apart* Selat Sunda dimulai pada pembukaan cekungan pada kala Miosen Awal-Tengah bersamaan dengan proses *orogenesis* Bukit Barisan sehingga membentuk struktur sesar turun lokal berarah utara-selatan (N-S), evolusi ini berlanjut di Miosen Akhir dengan ditandai inisiasi pergerakan Sesar Sumatra dan Ujungkulon yang berarah tenggara-baratlaut (SE-NW) sehingga membuat penebalan lapisan unit 1 bagian atas secara lokal. Kala Pliosen Akhir evolusi struktur geologi di cekungan ini mencapai puncaknya ditandai dengan re-aktivasi sesar-sesar tua berarah utara-selatan (N-S) yang disebabkan oleh pergerakan *transtensional overstepping* Sesar Sumatra dan Ujungkulon yang semakin kuat di fase kompresi Plio-Plistosen sehingga terbentuk geometri *graben* dan *horst* berarah utara-selatan (N-S) pada sebagian besar cekungan ini.

Analisis *palinspastic, flattening* dipadukan dengan analisis ketebalan peta *isochrone* mendapatkan bahwa unit 1 dan unit 2 mempunyai ketebalan relatif sama dengan nilai *extension* konstan sehingga kedua unit ini dikategorikan sebagai unit *pre-transtensional* sedangkan unit 3 yang berumur Pliosen Akhir sampai Plistosen sangat tebal pada *graben* Krakatau 1,832 TWT sedangkan pada tinggian 0,111 TWT serta mempunyai lonjakan nilai *extension* sebesar 6% dengan momen kritis pada akhir pengendapan unit 2 sehingga unit ini dikategorikan *syn-transtensional*. Sistem *petroleum* daerah penelitian terdiri atas *source, reservoir, seal*, sedangkan *trap* yang terbentuk terdiri atas perangkat struktural dan kombinasi struktural-stratigrafi, dan hadirnya indikasi *DHI (direct hydrocarbon indicators)* yaitu *bright spots* pada zona *ridge* Tabuan dan *gas chimney* pada zona *graben* Krakatau.

Kata Kunci: Selat Sunda, evolusi struktur, *transtensional, palinspastic, isochrones*, sistem *petroleum, DHI*.

STUDY OF SUB-SURFACE MAPPING AND CONTROL STRUCTURE GEOLOGY EVOLUTION OF DEPOSITION AND ALSO PETROLEUM SYSTEM OF PULL APART BASIN SUNDA STRAIT

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The focus of the present research is in one basin that is located in the deep waters of the Sunda Strait and is located at the borderline between Lampung and Banten. The path length study area covers 732 km with a total area of 10,000 km². In tectonic order the Sunda Strait pull apart basin lies in the transition system of normal subduction in southern Java and turned into oblique subduction in the west coast of Sumatra, based on that tectonic order, the in depth study of the structure and stratigraphic basin is very interesting to know the configuration of the geological history and potentials in the Sunda Strait pull apart basin.

Evolution of the geological structure of the Sunda Strait pull apart basin began on the opening basin in the first stage Early-Middle Miocene simultaneously with the process orogenesis of Bukit Barisan to form normal local fault structures trending north-south (N-S), this evolution continues in Late Miocene marked by the initiation of the movement of Sumatra and Ujungkulon Fault trending southeast-northwest (NW-SE) making the locally thickening of upper layer of unit 1. Late Pliocene evolution of the geological structure in the basin reached its peak marked with a re-activation of the old faults trending north-south (NS) caused by the transtensional overstepping movement of Sumatra and Ujungkulon Fault which is getting stronger in the Plio-Pleistocene compression phase forming graben geometry and a north-south trending horst (NS) in most of the basin.

Palinspastic, flattening Analysis combined with the analysis of the thickness of isochrone map shows that unit 1 and unit 2 have a thickness which is relatively equal to the value of the constant extension so that both units are categorized as pre-transtensional units while unit 3 aged Late Pliocene until Plistosen is very thick on the Krakatau graben 1.832 TWT while at 0.111 TWT thick it has the increase of extension in value by 6% with critical moment at the end of the deposition in unit 2 so that the unit is categorized as syn-transtensional. Petroleum system of the research area consists of source, reservoir, seal, while the trap formed consists of a structural trap and structural-stratigraphic combination, and the presence of an indication of DHI (direct hydrocarbon indicators), which is bright spots in the Tabuan ridge zone and chimney gas in the Krakatau graben zone.

Keywords: Sunda Strait, structural evolution, transtensional, palinspastic, isochrones, petroleum system, DHI.