Depositional and Diagenetic Models of Miocene Parigi and Pre-Parigi Carbonates Offshore Northwest Java, Indonesia

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An integrated approach to understanding the deposition and diagenesis of the Parigi carbonates in KL area and the Pre Parigi carbonates in APN area has been developed using petrographic, well logs and seismic analysis. The petrographic analysis which was performed on 153 thin sections from the Parigi carbonate in the KL area allows the identification of 5 major facies based on variation in major grain types. They are planktonic benthic foraminiferal, upper benthic foraminiferal, red algal, middle benthic foraminiferal and lower benthic foraminiferal facies. They were deposited during Middle to Late Miocene in a low to moderate energy and relatively deeper water shelf environment. The sea level clearly oscillated during the period of carbonate deposition which exposed the carbonates during sea level falls. Consequently, the carbonates were subjected to marine and meteoric diagenesis. The meteoric diagenesis has significantly enhanced the primary porosity of the carbonates by creating mouldic, vugular and intecrystalline porosity. In the other hand, the meteoric diagenesis also created low porosity zones due to extensive fresh water cementation which was formed in fresh water phreatic environment. The low porosity intervals are relatively thin compared to the porous carbonate intervals. However, they may form permeability barriers which are important in the development strategy for gas recovery within the carbonate. The present preserved porosity is excellent ranging from 20 to 40 % with permeability up to 1.1 Darcy.

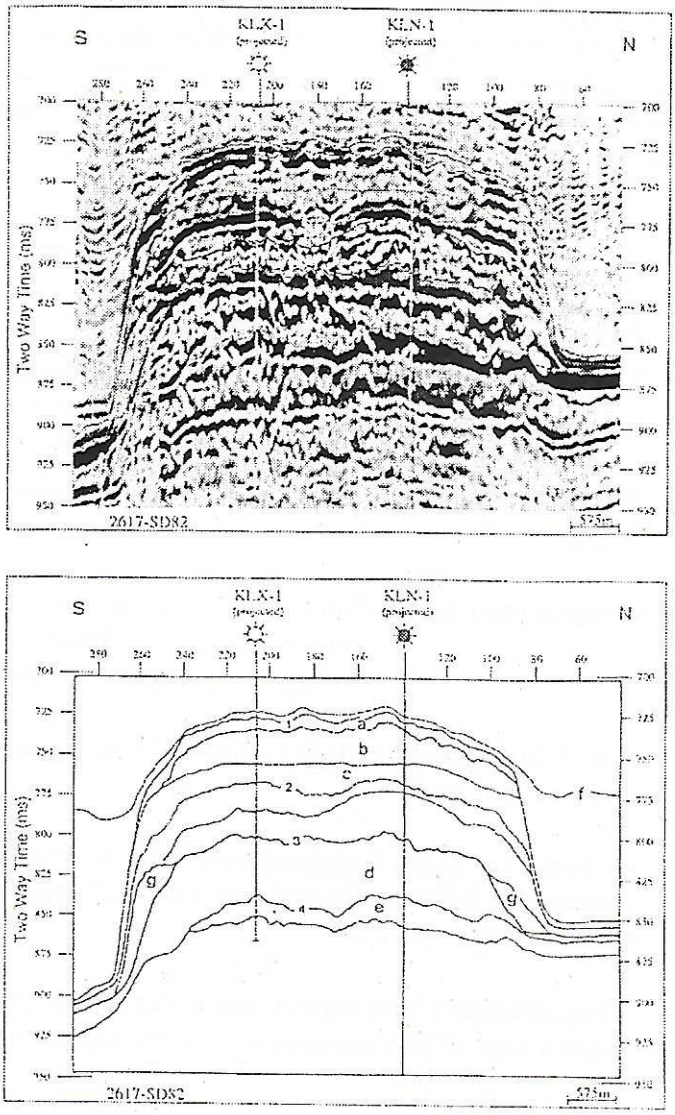


Fig 1. Parigi carbonates banks NS seismic section (A) and its interpretation (B) showing four growthphases bounded by unconfirmity surfaces (1-4) and seven carbonate facies (a-g).

Seismic data shows that the Parigi carbonates in the KL area were deposited as banks in four growth phases bounded by unconformity surfaces (Fig. 1). Each growth phase occurred during highstand, while during lowstand periods, the banks were exposed and subjected to fresh water diagenesis. Furhtermore, the seismic analysis integrated with petrographic analysis allows the reconstructin of relative change of sea level curve.

Petrographic analysis on the Pre Parigi carbonates in the APN area shows that the carbonates are formed by benthic foraminiferal wackestone, packstone and grainstone. The fresh wa-

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ter cement and dissolution texture observed in the carbonates indicate that the carbonates have been exposed and subjected to meteoric diagenesis. Sidewall core analyses show that the carbonates have very good porosity ranging from 20 to 30%. Seismic data shows that the carbonates were deposited as inter-reef carbonates, while the carbonate build-ups or banks are poorly known, because only one thin section is available from these banks. Sidewall core analyses from one of the banks show an average porosity of 32% with permeability between 57 to 240 mD.

Both carbonate banks and inter-reef carbonates of the Parigi and Pre-Parigi in the KL and APN areas show very good porosity and permeability. This means that all the Parigi and Pre Parigi carbonates in Offshore Northwest Java (ONWJ) have potential as reservoir rocks. The carbonates are overlain by the Cisubuh shale, which provides a good seal. As reservoirs and seals are available and gas is known to have been generated, the main problem in finding gas accumulation within the carbonate is understanding the migration mechanism which should be the subject of future studies.

Announcement Erratum
Tectonics and Sedimentation of Indonesia
Bandung 15-20 March 1999.

There are some changes on the 2nd announcement of the Tectonic and Sedimentation of Indonesia seminar.

- **Registration fee:** Professionals early registration (Before March 1, 1999)= Rp. 500.000
  Professionals late registration (March 1-20, 1999)= Rp. 700.000
  Student and civil services = Rp 125.000 (limited)

Note: 5 free student tickets are available for each university in Indonesia. Department heads should proposed their students.

- **Course**: Dr. Henry Posamentier and Prof. Soejono Martodjojo are going to give a 1 day course / workshop on Sequence Stratigraphy, on 17 March 1999. Course fee will be Rp.300.000/person. Maximum participant: 30

- **Registration:** Please register yourself as soon as possible due to limited seminar participants. Attached a copy of your payment order to the registration form and submit to:

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