Depositional Facies Control on Reservoir Characteristics in the Middle and Lower Abu Roash "G" Sandstones, Western Desert, Egypt*

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Abstract

Wireline log data from 70 wells along the Asala Ridge in the Egyptian Western Desert were evaluated to form depositional facies models for sandstone intervals within the middle and lower "G" Member of the Abu Roash Formation. Core descriptions and data from nine wells were tied to the log analysis to provide a relationship between log response, lithology, depositional facies, and reservoir characteristics.

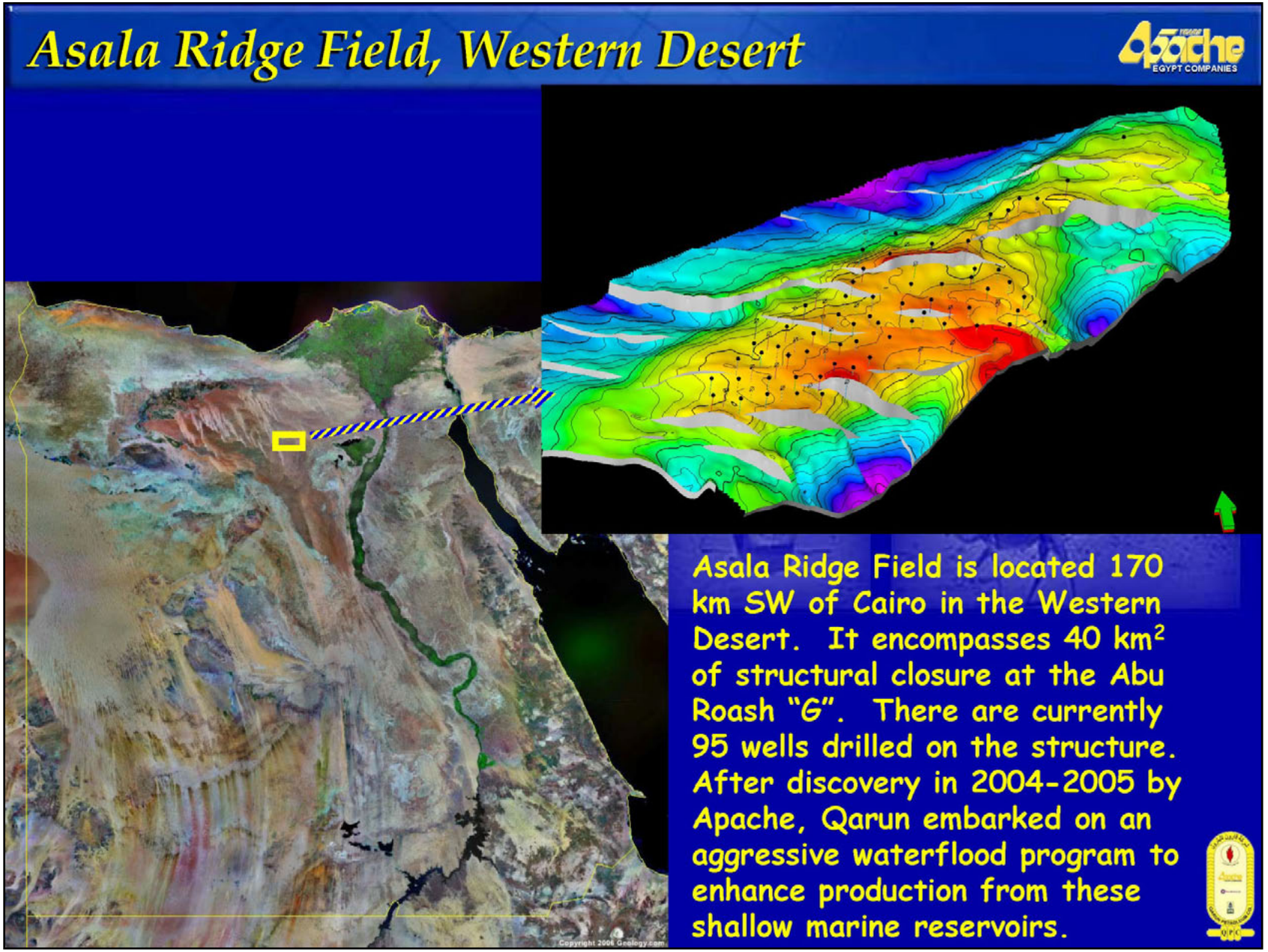
The middle "G" sands exhibit all of the characteristics of a delta distributary system that prograded into the Abu Gharadig Basin during Cenomanian time. Distributary mouth bar, inter-distributary bay fill, organic-rich marsh, and distributary channel facies are readily identifiable on the wireline logs and in the core. A typical middle "G" succession contains prodelta muds at the base with increasing silt laminae upwards which is often capped by cross-bedded fine-grained sand. The cross-bedded sand facies represents deposition in distributary mouth bars and is some of the better reservoir in the interval. The best reservoir rock in the middle "G" was deposited as distributary channel fill that truncates the underlying strata.

In contrast to the younger Abu Roash "G" sands, the lower "G" was deposited entirely in shallow marine environments where the sands exhibit strong linear trends. These sands were apparently deposited in sub-tidal bars within a marine embayment. This interval

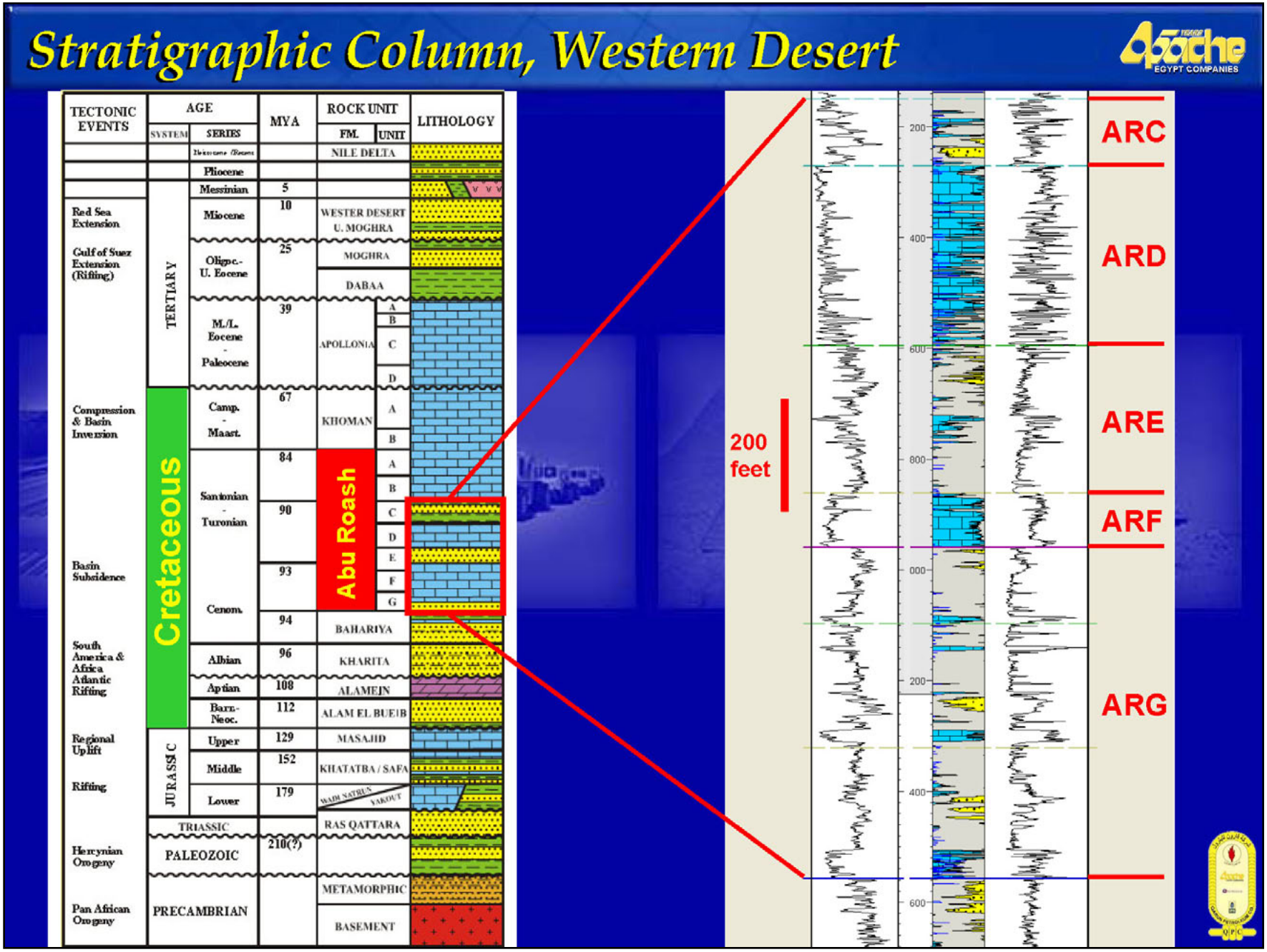
contains no evidence of incision at the base of the sands and the best sand facies exhibit current ripple cross-bedding, presumably from tidal currents.

Results of this study have shown that Abu Roash “G” reservoirs possess considerable vertical and lateral heterogeneity. The depositional facies model and its associated reservoir quality implications have helped the planning and execution of the aggressive waterflood program in these reservoirs at the Asala Ridge Field.

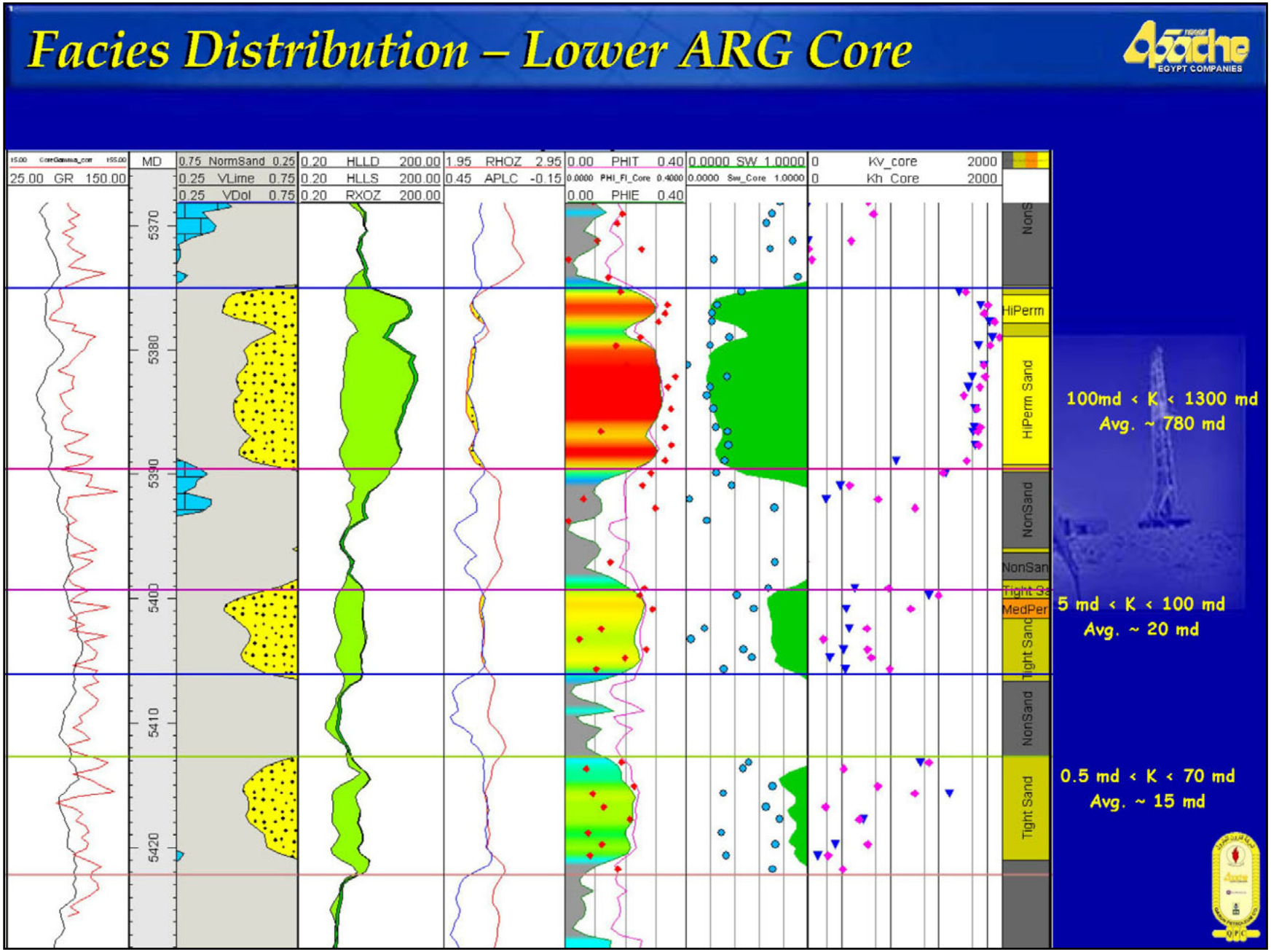
Selected Figures



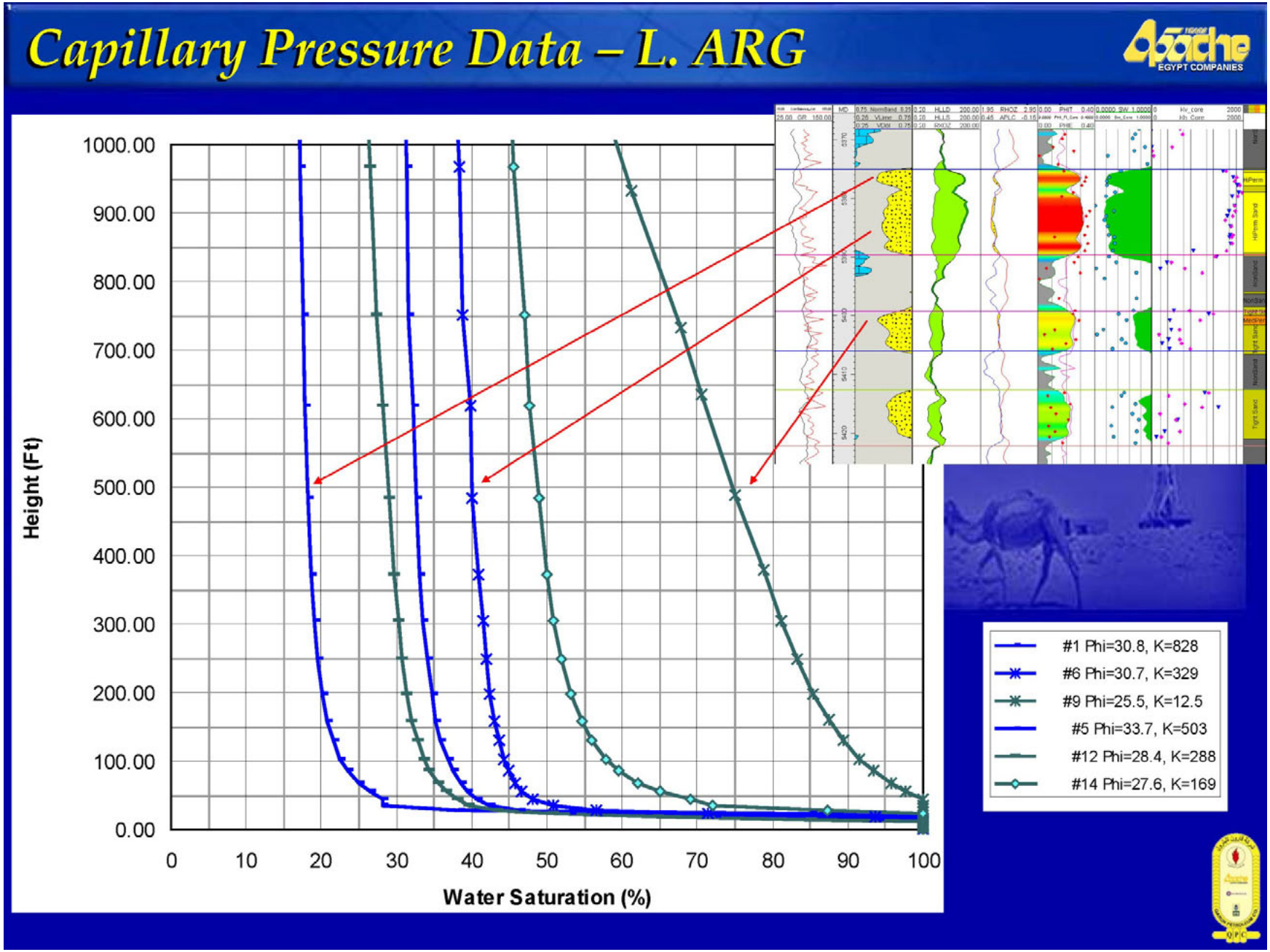
Slide 3. Location map of study area, Asala Ridge Field, Western Desert.



Slide 4. Stratigraphic Column in study area, Western Desert.



Slide 17. Facies Distribution – Lower ARG Core.



Slide 22. Capillary Pressure Data – L. ARG.

References

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