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Reservoir development and distribution in the deepwater offshore West Sabah

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Sabah Shell Petroleum Company (SSPC) holds a strong acreage position offshore NW Sabah, with two deepwater blocks J and G approximately 120 km from the coastline. The area encompassed by the 2 blocks is 6,352 km^2 at a water depth of 150 m to 2,000 m. There have been four discoveries to date in the middle to late Miocene turbidite play associated with thrust cored anticlinal traps — Kinarut-1 (Esso, 1972), Kebabangan-1 (SSPC, 1994), Kamunsu East-1 and Kamunsu East Upthrown-1 (SSPC 1998 and 1999 respectively).

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All of these were gas discoveries but Kebabangan and Kamunsu East Upthrown also discovered an oil rim. All of the discoveries are located in the northeast corner of the acreage and now covered by 3D seismic, the remainder of the blocks are covered by a 2D seismic grid. The understanding of the turbidite system, the distribution and reservoir development is key in ranking our portfolio of prospects and in optimal appraisal/ development.

SSPC initiated a project with Shell Deepwater Services (SDS) to review the deepwater blocks on a regional scale through the consistent interpretation of the 2D seismic, to determine whether we are able to predict (turbidite) sand quality within the identified leads and prospects. A simple scheme was employed to identify and map seismic facies, which had previously been piloted by SSPC during the Lingan Fan study (Mohamad, M., 1997). Four seismic facies based on high and low reflectivity and continuity were identified and mapped. It is believed that this facies scheme can distinguish sand from shale prone intervals and areas. Tying in of wells in the 3D seismic area broadly confirms this facies scheme and is used to predict facies development in areas of no well control. The results of the Kamunsu East Upthrown well and sidetrack with only 300 m separation at the Kamunsu/Kinarut fan interval encountered highly reflective discontinuous seismic, representing sands, yet the variability in sand distribution within a short distance also demonstrates the challenges for field development in turbidite systems.

Regional well data has been compiled and trend curves developed for reservoir geological parameters e.g. porosity/permeability crossplots, to aid in prospect evaluation. In conjunction with the facies scheme the reservoir property trends are used to predict reservoir development and uncertainties across the prospects in the acreage on a consistent basis. It is this facies scheme and reservoir development prediction.that is aiding our prospect analyses and enabling quantification of non-DHI supported leads and prospects.