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# Unlocking HC potentials of the Tertiary Basin South East of Oman

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## ABSTRACT

New 2D seismic data acquired in 2016 revealed an extensional geometry of what is known as the Tertiary Basin mapped in the vicinity of block 55 located in the South East part of Oman (i.e. Ras Madrakah). The Masirah Graben (i.e. Tertiary Basin) is part of a Mesozoic rift system evolved at Tertiary time in response to Indian/Afghan plate tectonics at Late Cretaceous applying deformation effects. The Basin center with maximum depth of 6km was initially outlined as a result of the Full Tensor Gradiometry data (FTG) where it measures a 3D depiction of the Gravity field anomaly as sourced by sub-surface density contrasts.

The Masirah Graben is covered by allochthonous sediments sequence (deep marine rocks) which is complexly folded and deformed due to thrusting and faults. Ophiolites are pillow basalts associated with deep marine rocks were obducted during Late Cretaceous Mastrichtian (i.e. 70 Ma) to Early Tertiary (i.e. 55 Ma) appears in seismic as chaotic undisturbed napes of complex folding and thrusts. At later time younger sedimentary sequence were overlain with low energy deposited forming very thick strata and constantly subsiding overburden with depth causing more stress in the vicinity and sparking deep seated faults to reactivate and create humps of possible potential HC accumulation.

The technical work started after acquired all necessary data required for optimum case to drill the first exploratory well targeting relatively deep potentials firstly Lower Aruma sands (Late Cretaceous), secondly Wasia, Kahma (Lower Cretaceous), & Nafun (Pre Cambrian) potentials. There are few leads that have been mapped over the anticipated Tertiary Basin within block 55 and only few were progressed for drilling over extensive maturation assurances steps.

One well was spudded in May 2017 aiming to unlock possible HC potentials in the Tertiary Basin within block 55 in Oman multi targets together with the necessary data to be acquired will shed the light of new play and possibly deeper conventional tight plays. The first target is sands channel of the Lower Aruma of the Aruma Group, Late Cretaceous in age. The HC source is believed to be originated from Infracambrian Huqf Group and thought to be migrated vertically and laterally through deep seated faults. Since there are no published literatures discussing the hydrocarbon potentials and prospectivities in the Tertiary Basin except for one by Beauchmp et al, 1995 as there was no drilling activities and seismic acquisition for long time? Only recently some operators started acquiring data and drilling new wells revealed the discovery of new play of Lower Aruma sands within the Tertiary Basin. This single discovery was the main drive to continue the exploration activities in the vicinity in different blocks within the same basin to further assess the HC potentials of the Tertiary Basin and prove commerciality. Challenges in finding such reservoir sand channels are difficult especially with limited data coverage. However in case of success it will open up a new play in Oman and few other prospects and leads are expected to be progressed for drilling to map the size of the prize of this play to support future exploration and development activities.