The Zama Discovery in Salina del Istmo Basin, Offshore Tabasco: "New Dawn" for Offshore Mexico Exploration

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ABSTRACT

The Talos Energy Zama #1, the first private-sector exploration well operated in Mexico in 78 years, was drilled in May-July of 2017 in Block 7, offshore Tabasco in 166m water. The Zama structure was identified prior to the leasing round using 3D narrow-azimuth seismic data, and consists of an upthrown fault block with three-way closure on the flank of a salt structure in the eastern Salina del Istmo basin. A gross sandstone reservoir interval of 344 meters was penetrated, containing 29.6º API oil. The estimated reserves make Zama one of the most significant offshore discoveries globally in several years.

An array of tools and techniques was used to define, drill, and evaluate the Zama prospect. These include: 1) pre-drill AVO analysis calibrated to seismic data using existing well control, 2) structural and stratigraphic analysis to frame the prospect in proper context, 3) petrophysical analysis using XRD mineralogy and image logs, 4) forward modeling for pre-drill stratigraphic control and reservoir thickness, 5) a full suite of LWD and wire line logs (including elemental spectroscopy, formation pressure testing, and fluid sampling), 6) combined biostratigraphic and petrologic (XRD and XRF) analyses performed on cuttings while drilling, and PVT analysis.

The reservoir section is dominated by amalgamated, very fine-grained to fine-grained, highly feldspathic, consolidated sandstones with low clay and carbonate contents. Structural mapping and biostratigraphy suggest sediment may have been fed into an evolving Late Miocene mini-basin from a focused entry point, and deposited as a confined slope-fan complex. The base of the reservoir section coincides with a significant unconformity related to salt tectonics. XRF elemental chemostratigraphy recognized 20 zones within the overall Oligocene-Pleistocene section, largely driven by changes in heavy mineral and clay composition. Distinctive elemental changes occur across the base-of-reservoir unconformity, while more subtle variations appear useful for intra-reservoir subdivision. After pressure-gradient data confirmed only one hydrostatic system in the reservoir, a fluid sample was acquired. Wellbore conditions precluded acquisition of cores, so there is still much to learn about the details of the Zama reservoir.

With the success of this integrated approach, the Zama #1 discovery has thus far lived up to its Mayan namesake, "City of Dawn", and hopefully signals a new era for exploration in Mexico.

BIOGRAPHY

David has 35 years of exploration and development experience in various basins in the Gulf Coast of North America and seven countries around the world. His efforts have produced numerous discoveries in both clastic and carbonate environments. His primary efforts have been historically focused on prospect generation and development utilizing the full integration of geological and geophysical data. He has a Bachelor of Science in Geology from Memphis University.