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POSTER ABSTRACT

INTEGRATED OUTCROP / SUBCROP MAP - EASTERN VENEZUELA (EV) GREATER TRINIDAD AREA (GTA) BELOW 11.4 Ma EVENT/UNCONFORMITY SHOWING LATERAL RAMPS AND ASSOCIATED FRONTAL THRUSTS

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Paleoanalysis for around two thousand key wells and interpreted –2D and –3D seismic data over the Greater Trinidad Area (GTA), and extensive technical literature research for the Eastern Venezuela Area (EVA) were integrated to generate an 11.4 Ma Outcrop / Sub Crop Map over the entire Area. The Area extends North-South from the Caribbean Plate – Tobago Trough to the South American-Guyana Shield respectively and West-East from the Venezuelan-Guarico Basin to the Present-Day South-American – Continental Slope setting offshore East Coast of the GTA respectively. This exercise was to determine if there were any similar NW/SE trending mid-Miocene tear faults/ Lateral ramps in the GTA as observed in the EVA (e.g. Urica, San Francisco, etc.). It turns out that there could be at least six such lateral ramps in the GTA based on the mapping, Los Bajos being one.

The 11.4 Ma Event was one of nine major events which impacted on the complex tectonostratigraphic evolution of the Eastern Venezuelan Basin (EVB) of which the Greater Trinidad Area forms the easternmost part. The evolution started off with Early to Mid-Jurassic Rifting (~ 190 Ma – 157 Ma) followed by an Upper Jurassic to Late Cretaceous two-cycle protracted Passive margin phase (157 Ma – 65 Ma) and a Tertiary Active Margin Phase (65 Ma to Present-Day) . Active Margin Phase punctuated by five major sub-tectonic events due to various plate interactions involving southward subducting Proto-Caribbean oceanic crust and eastward overriding Caribbean Plate Motions along the northern margin of South America with time during this period.

The 11.4 Ma event marked the culmination of Late Oligocene to Mid-Miocene (~ 30 Ma – 11.4 Ma; episodic to 6.0 Ma) oblique collision of the eastward migrating-overriding Caribbean Plate and associated Accretionary Prism with an established Paleogene

amagmatic forearc/backarc tectonic setting along the eastern part of the northern margin of South America including the GTA. The Paleogene Event (~ 65 Ma – 38 Ma) was as a result of shallow southward amagmatic ProtoCaribbean oceanic crust subduction collision beneath the northern margin of South America along the once sutured oceanic crust / attenuated S.A. continental crust boundary. This impact resulted in a north facing forearc passive / prism setting (formerly Up Kt-Naparima Hill extensional scar material plus Northern Range slope to basin floor deposits) and a south facing backarc trough / south-verging fold and thrust belt/foredeep-foreland setting. The backarc setting occupying most of the GTA possibly as far south to the Present-Day South-Coast of Trinidad such that some of the uplifted areas were exposed to sub-aerial erosion and down-gradient deposition into subaqueous deepwater piggy-back basins during Upper Eocene /Early Oligocene. Continued tectonic loading and Caribbean Plate arrival loading helped to rapidly subside the exposed parts of the F/T Belt and synclinal lows into deeper water conditions.

The culmination of the 11.4 event resulted in upliftment and sub-aerial exposure of the low grade metamorphic Araya/Paria/Northern Range slope deposits (formerly amagmatic forearc passive/prism setting) and continued evolution of the already established amagamatic Paleogene backarc trough / fold-thrust belt / foredeep-foreland setting. At this time, the combined event led to a well established south-east verging fold and thrust belt defined by a wedge top, deformation front and foredeep basin with NW/SE trending lateral ramps and frontal thrusted anticlines. In addition to the Urica and San Francisco lateral systems, six other such systems were mapped in the GTA (Los Bajos being one). The lateral ramps appear to have aligned themselves along lines of transfer faults formed during the Early to Mid-Jurassic Rifting. These ramps appear to have started off as tear faults. The Mid-Miocene Deformation Front had a general WSW to ENE trending zig-zag geometry due to the varying amounts of frontal shortening associated with the displacements along the NW-SE trending lateral ramps lending itself to salients and re-entrants.

Some of the lateral ramps become beheaded, displaced and concealed in the Upper Miocene / Pliocene Gulf of Paria pull-a-part basin acting as extensional collapse faults. In Pleistocene, some of the lateral ramps continued to be active e.g. Los Bajos, etc. due to near normal southward directed contractional deformation associated with the eastward translation of the Caribbean Plate resulting in further displacement , shortening and tightening of frontal thrusted anticlines.