

The K/T Boundary Sedimentary Succession in Southeastern Mexico: Outstanding Outcrop Analogs for Calibration of the Main Carbonate Reservoirs in Offshore Campeche

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ABSTRACT

In terms of oil production, the Campeche Bay area is currently the most prolific area of Mexico. Oil production comes from different stratigraphic intervals but the most important is the Cretaceous/Tertiary boundary carbonate breccia succession. For instance, the giant Cantarell field, with originally 35 billion barrels of oil in place, has produced mainly from the Cretaceous/Tertiary boundary carbonate breccia succession. This horizon consists of a graded sedimentary deposit that can be divided, from bottom to top, into four units: Unit 1 is the main reservoir rock and consists of a 150-300 m-thick coarse-grained dolomitized carbonate breccia. Unit 2 is a 10 to 20 m-thick medium to fine-grained dolomitized carbonate breccia mixed with ejecta material. Unit 3 is a 25-30 m-thick very fine-grained interval composed mostly of impact metamorphic constituents and acts as a seal layer. Unit 4 is a calcareous breccia that sometimes occurs within unit 3. In order to document and calibrate the stratigraphic architecture and age of the Cretaceous/Tertiary boundary carbonate breccia succession, intense field work was conducted in southeastern Mexico and the Sierra de Chiapas area. The excellent outcrop analogs allowed to link genetically the main petroleum-producing interval in the Campeche Bay area to the extraordinary Chicxulub impact event that hit northwestern Yucatan at the end of Cretaceous time.