

## **Regional Oil-Economical Implications of the Chicxulub Impact: the K/T Boundary Calcareous Breccia and the Seal Ejecta Layer in SE Mexico**

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The K/T boundary sedimentary succession linked to the Chicxulub impact event in southeastern Mexico, offshore Campeche and the Caribbean Region is dominated by carbonate breccia. From outcrops and subsurface information the thickness of the carbonate breccia ranges from 50 to 300 m in Mexico and up to 700 m in Cuba. Its wide distribution around the Chicxulub structure, internal architecture, and stratigraphic relationships indicates that deposition of this sequence took place at different environments, from exposed rocks and shallow-water settings to deep-water marine conditions. The deep-water succession shows a graded fining-upward trend composed of (1) a basal very coarse-grained carbonate breccia followed by (2) a fine-grained carbonate breccia and calcareous sandstone that grades to (3) an ejecta and clay layer (seal) with abundant impact minerals. In outcrops, a thin shaly layer with an Iridium anomaly tops the sequence. In contrast, the sequence deposited on exposed, karstic shallow-water carbonates shows an inverted succession from fine-grained ejecta material at the base topped by blocks of shallow-water limestone. Detailed foraminiferal biostratigraphic analyses clearly indicate a K/T boundary age for the sedimentary succession. The observed stratigraphic characteristics of the sequences support a single K/T impact event. The deep-water breccia has been affected by deep-burial dolomitization and dissolution followed by tectonic fracturing resulting in an important naturally fractured-vuggy oil reservoir. The main reservoir rock and the seal ejecta layer are regionally distributed around the Chicxulub structure. The sedimentary model developed suggests that additional fields might be found northward the current oil fields provided traps and mature source rocks are present.

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