

## **EVIDENCE OF METEORITIC IMPACT AND CRATER-FILLING STRATIGRAPHY, WETUMPKA CRATER, ALABAMA, USA**

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Wetumpka impact crater in Alabama, USA, is an exposed, semi-circular structure, at least 6.5 km in diameter, which is located today at the juncture between Alabama's Coastal Plain and Appalachian piedmont regions. Wetumpka crater was formed on Alabama's Late Cretaceous continental shelf where target stratigraphy included 120 m of unconsolidated sediment and underlying crystalline piedmont basement rock. Evidence of meteoritic impact at Wetumpka comes from multiple sources. Most importantly, impact-breccia matrix contains moderately abundant, fine-sand sized shocked-quartz grains which display two intersecting sets of PDFs. Also, plagioclase and mica show impact-related microstructures. Gamma-gamma coincidence spectrometry of breccia matrix shows iridium content as high as 0.21 ppb, suggesting a meteoritic component of approximately 0.04%. A high-resolution gravity profile across Wetumpka impact crater reveals a 10 mGal total anomaly (+2 mGal at rim; -8 mGal at center) consistent with impact cratering. Surficial investigations and core data from two centrally located drill holes indicate that Wetumpka's crater-filling unit is apparently composed of two stratigraphic zones: (1) a well-exposed upper veneer of disturbed (i.e., folded, faulted, overturned, and clastic-dike injected) target strata up to approximately 65 m thick and (2) an underlying impactoclastic unit over 135 m thick. Wetumpka's impactoclastic unit consists of intercalated impactite sands and monomict and polymict impact breccias with an admixture of 1 to 5-m blocks of crystalline rock and semi-consolidated target strata. Except for a small area of a few thousand square meters at crater center, the impactoclastic unit is not exposed on the crater floor.