X-Ray Fluorescence Analysis of the Justiss LA Central IPNH No. 2 Well-Core from LaSalle Parish, Central Louisiana

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ABSTRACT

The Cretaceous-Paleogene Boundary Deposit (KPBD) has undergone intense scientific study and has been determined to have been deposited catastrophically due to the effects of the Chicxulub Impact. The purpose of this study is to examine the Justiss LA central IPNH No. 2 well-core from LaSalle Parish, Louisiana, which contains evidence of the KPBD and determine in detail the geochemistry of the core and how it correlates to the effects of the Chicxulub Impact. The core has four sections based on lithology: (1) a pre-impact chalk with lower hard ground, (2) mass transport deposit (KPBD), (3) upper hard ground/suspected fall back ejecta (KPBD), (4) post-impact Midway Shale, with both the mass transport and fall back ejecta deposited as a result of the impact. This fourfold division is confirmed by performing an X-ray Fluorescence (XRF) analysis on the well-core which determined the elements within the core. Before analysis, 36 representative samples were taken from the core and dissolved in 10% HCl to facilitate detection of the more minor elements in the core which are heavily masked by the dominant presence of calcium carbonate. Elemental analysis using XRF established conclusive evidence of two hard grounds within the core through significant spikes in U that correspond to massive gamma-ray spikes on the well-log. At the top of the KPBD in the upper hard ground lies evidence of the Chicxulub Impact in the elements Ni, Zn, Zr, and Mn which are several hundred ppm higher than anywhere else in the well-core. Therefore, these elements are unnaturally high in abundance which suggests that they were deposited by the process of fall back from an asteroid impact such as Chicxulub Impact event, based on a wide variety of scientific literature. Furthermore, elemental evidence of the Chicxulub Impact exists in Louisiana in the form of fall back ejecta.

Frederick, F., G. L. Kinsland, and M. Rahmatian, 2019, X-ray fluorescence analysis of the Justiss LA Central IPNH No. 2 well-core from LaSalle Parish, central Louisiana: GeoGulf Transactions, v. 69, p. 499.