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2D-Imaging of Mesozoic Sediments along Umapur – Brahmanawada (W-E) Profile, Central India using Refraction Data.

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Summary

Delineation of the velocity-depth modelling of first arrivals has been used to produced P-wave velocity models of the shallow surface structure along the profile "Umapur – Brahmanawada" (155 km) in west-east direction in central India, using seismic refraction. The refraction are recorded using RF -telemetry and Taurus recording systems from SP17 to SP32 in west to east. The shot points lies on Deccan Trap formation from SP17 to SP21 in the west and SP31, SP32 in the east and has alluvium exposures between SP21 up to SP30 in the east. First arrival travel-time refraction data were picked from shot gather of various shot points and converted into velocity depth model by travel-time inversion (Zelt and Smith 1992). Travel-time skip in the first arrival refraction data observed in some of the record sections and reflection phase identified immediately after the refraction phase from top and bottom of the Mesozoic layer with low velocity. The velocity model constrained to a basement depth of 1.4 to 1.6 Km show three layers above the basement.Thickness of the first layer 0.40 Km between SP17 to SP32 with velocity 1.8 Km/s at depth 0.40 Km represent the alluvium. The second layer with an average P-wave velocity 4.80 Km/s at depth 0.45 Km may represent Deccan-Traps. The Trap thickness is about 0.45 Km up to SP17 to SP21 after decreases SP22 to SP32 order of range 0.10 Km in the east. The third layer beneath the Trap with a velocity of 3.6 Km/s is a low velocity layer with a thickness ranging from 0.30-0.35 Km at depth 0.85 Km and may correspond to Mesozoic sediments. The basement velocity 6.10 Km/s lies at a depth 1.45 Km near Umapur in the west and decreases to a depth of 1.10 Km near Brahmanawada in the east. The present results show a significant variability in thickness of various sedimentary layers and particularly usefull in planning future hydrocarbon exploration programs.

Key words: *Seismic refraction, Travel-time inversion, Mesozoic sediments.*

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