

Characterization Of Complex Lateral Heterogeneity Using MWD, XRF And Seismic Inversion

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ABSTRACT

Capturing lateral heterogeneity is challenging, particularly when only Measurement While Drilling (MWD) data are available and gamma ray (GR) character alone does not reflect the variability inherent in the zone of interest. Using Logging While Drilling (LWD) technologies is the preferred method of capturing and characterizing heterogeneity along the length of a lateral, but LWD technologies can be cost prohibitive. This paper presents two separate case studies where X-ray diffraction (XRF) was run on cuttings taken at regular intervals along the lateral length and used to correlate to core-calibrated regional geologic facies models at both the log and seismic scale. The results of these case studies demonstrate the viability of this technique to accurately predict lateral heterogeneity in a complex geologic system using relatively low cost measurements. The laterals presented in both case studies were located near key vertical cored wells where XRF analyses were run at 1' resolution over the entire zone of interest. The full regional calibration dataset consisted of 10 cored vertical wells where this high vertical resolution XRF analysis was conducted.