

Preparing and Using Quality Log Data to Improve Geophysical Interpretations

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ABSTRACT

This paper discusses methods to assess and improve the quality of wireline log data for use in geophysical applications. Properly edited and interpreted well log data provide geophysicists with critical information for understanding the seismic response to subsurface geology.

Use of log data in geophysics is often limited to the sonic (Dt) and bulk density (Rho_b) curves for generating and tying synthetics to seismic data. Depending upon the quality of the welltie, it is not uncommon for the log data to be largely ignored. Worse, poor quality log data can be carried forward into AVO and rock properties analyses, giving misleading results. Log data must be evaluated for accuracy prior to use in geophysical modeling. Petrophysicists provide essential insight into the integrity, limitations, and uncertainties of log data measurements. A high-quality curve dataset, along with detailed formation evaluation, can have a significant impact on the success of geophysical analyses.

Some practical techniques (and common pitfalls) for improving geophysical curve data through log editing and shear estimation will be examined. Examples illustrate the impact this can have on seismic interpretation. This presentation will also discuss the importance of formation evaluation for advanced geophysical interpretations such as calibrating seismic (elastic) rock properties to reservoir properties. Ultimately, it is the combined efforts of petrophysicists, geologists, and geophysicists that lead us to a better understanding of the subsurface reservoir and reduce drilling risk.