

## Seismic Reservoir Characterization of the Morrow “A” Sandstone, Postle Field, Oklahoma

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Three multicomponent (9-C) seismic surveys were conducted at Postle Field, Oklahoma. Interpretation of the surveys illustrates that the Morrow “A” sandstone can be detected. The sandstone was previously considered acoustically invisible, yet the combination of multicomponent and time-lapse seismic data has enabled us to detect the reservoir, with average thickness OF 38 ft (8.5 m) buried beneath a complex overburden at 6100 ft (1850m) depth.

Even though the sandstone is thin, it has a greater elastic impedance contrast than acoustic impedance contrast. We have found that shear wave data enables reservoir mapping of at least half the minimum thickness seen on P-wave data. This is because the shear wave reflectivity contrast between the sandstone and adjacent shale is three times that of P-wave, thus enabling higher definition of the thin sandstone reservoir with shear wave data. Dynamic changes introduced by water and carbon dioxide flooding enables further delineation of the sandstones in the shale-dominated interval.