

A High Resolution VSP In The Oil Sands For Improved Reservoir Characterization

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Abstract

This is a case study that looks at the acquisition and application of a high resolution multi-component walkaway Vertical Seismic Profile (VSP) recorded in 2010 in the Athabasca oil sands region. This is an area with complex reservoirs, complex fluid distributions and unconventional rock property behavior. The target in the oil sands is typically less than 400m deep; in this study, the top of the zone of interest is at approximately 200m. In addition to the complexities mentioned above, shallow targets complicate conventional seismic methods (both surface and downhole) and they can be difficult to image due to variable near surface conditions. High quality, densely sampled 3D multi-component seismic data were acquired and processed with this in mind. The VSP also needed to be high quality and densely sampled to be useful in the reservoir characterization process.