

Delineation of a sand reservoir at Manitou Lake Saskatchewan: Interpretation of 3D-3C seismic data

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ABSTRACT

Lower Cretaceous fluvial sands channels with high porosity and permeability in the Manitou Lake area of Saskatchewan can contain important oil and gas reserves. Well logs and synthetic seismograms are used to correlate the PP and PS seismic sections from a 3C-3D seismic survey to better delineate the Colony and Sparky reservoir sands. Mode-converted (PS) seismic amplitudes can complement traditional PP channel interpretation. Amplitude maps at the Colony sands show different aspects of the channel interpretation. The oil and gas saturated sand channels give low V_p/V_s values, a P impedance decrease and an S impedance increase. Lithology and fluid discrimination based on V_p/V_s values can be derived from the inverted PP and PS (registered in PP time) sections. Detailed registration of multicomponent seismic data aims to reduce the uncertainty and improve well targeting.