



Reservoir Delineation and Amplitude Attribute Analysis Utilizing Visualization and Sgy Processing Software (or How to Find the Exact Reservoir to Drill in an Anastomosing Channel Sand System)

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ABSTRACT

The objective of the InsightEarth computer-aided analysis is to lower risk associated with selecting well locations for optimal reservoir stratigraphic, structural and production constraints. The software provides for visualization, volume processing, accurate attribute representation, and interpretation of 3D volumes. The advanced algorithms confirm structural and stratigraphic anomalies in SGY seismic amplitude data.

The stratal domain process was utilized to delineate and map an anastomosing productive sand channel system for a 350 square kilometer eastern European 3D seismic volume provided by Gustavson Associates, LLC of Boulder, CO. The complex structure and anastomosing channel system stratigraphy of the area concealed the continuity of the reservoir and may have contributed to the drilling of several non-productive wells. The stratal domain transform process was used to convert the time/depth domain volume into a paleo-surface volume. The objective was to obtain a structurally accurate interpretation where the stratal domain volume has horizontal events because non-horizontal events indicate inaccurate structure interpretation. Structural relationships were corrected in the structural time/depth domain volume and a new stratal domain volume was generated. The additional stratal domain volume iterations yielded a volume of horizontal events and stratal slices that imaged all depositional systems to represent the true paleo-depositional environment of the reservoir.

Advanced algorithms calculated attributes in three (3) dimensions to show the potential reservoir with amplitude anomalies that will be targeted in the Client's drilling program. The stratal domain volume results and the structural analysis indicate that the reservoir and associated complex faulted structure of a previously selected well location were not ideal. The new

reservoir interpretation successfully provided the required risk analysis to recommend the selection of an alternate well location. By utilizing the visualization and processing results, the recognizable morphologies (anastomosing systems) can be mapped providing the client with accurate well selection for future project development.