

## **Mapping Almond Reservoir Rocks at Stagecoach Draw Field, Southwestern Wyoming: Application of Spectral Decomposition Technique**

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The application of seismic spectral decomposition delineates thin beds of the upper Almond sandstones at the Stage Coach Draw Field in the Green River Basin Wyoming, and highlights areas for new exploration opportunities. The principal gas production at Stagecoach Draw comes from the upper Almond sandstone, a marginal marine sandstone that thins and changes to nonmarine deposits west of the field. Current field development, consisting of over 30 wells, has proven that both structural and stratigraphic hydrocarbon trapping occur at approximately 8,000 ft depth along the crest of the southeasterly plunging Sandy Bend Arch. A 3-D seismic survey with approximately 72-mi<sup>2</sup> of subsurface coverage was acquired in 1996 to facilitate field exploitation.

This report presents both structural and stratigraphic interpretations of the seismic data set after it was reprocessed using time-frequency analysis of seismic reflection signals. The extent of the Almond pay sandstones has been mapped in more detail utilizing spectral decomposition (SD) techniques. Reservoir and non-reservoir facies were differentiated by comprehensive, integrated seismic attribute analysis. The integrated work combined seismic with lithology and structural geology. The data comprised gamma-ray logs from 36 wells and 3-D seismic. A strong correlation between seismic frequency content and thickness gradient is shown. The SD method was a valuable aid in enhancing the ability to map thin beds with seismic data acquired in the tight gas sandstone environments of the Rocky Mountain region. Results from this study are important for the reservoir modeling and site characterization phases of Stagecoach Draw Field development. Importantly, it is shown that seismic time-frequency analyses significantly assist in delineating gas saturated reservoir rocks. Lastly, this study identifies a large area southeast of Stage Coach Draw that demonstrates similar seismic attributes with reservoir rocks at the Stage Coach Draw Field.