Seismic Stratigraphy of the Montney Fm in the Groundbirch-Saturn Region, Peace River Arch Block, BC

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As part of a regional Montney sequence stratigraphic study, a series of regional cross-sections based on over 1,900 wells and 50 cores over the greater Peace River Block was constructed. A sequence stratigraphic approach was used in the correlation. Two regional cross-sections (one north-south trending, the other east-west) were then converted into synthetic seismogram cross-sections (i.e. seismic models). The synthetic cross-sections were compared to two similarly-oriented arbitrary lines created from a suite of seven closely-spaced 3D seismic surveys (provided by ARCIS/Olympic).

Comparison of the model with the arbitrary 3D seismic lines shows the Middle Montney to be the most consistent and readily mappable reflector in the whole Doig-Montney interval. On a regional scale, the east-west arbitrary line clearly shows the Middle Montney reflector monotonically dipping westward toward Sunset Prairie where a slope break occurs; the reflector eventually flattens out at Groundbirch. Locally, a westward-dissipating internal Lower Montney reflector (seismically approximate to a 3rd order sequence boundary) can be mapped over the Sunrise-Sunset Prairie area. The overlying Lower Doig siltstone sequence (or uppermost Montney in industry terminology) is demarcated by several westward prograding and downlapping basin-filling reflectors, which can be mapped intermittently (internal Markers A and B) over the regional lines.

Where additional 3D seismic data were available, localized abrupt changes of relief on the Middle Montney reflector, in the order of 15ms, can be mapped. Adjoining well control corroborates that these abrupt relief changes are real and not seismic artifacts. Infilling and onlapping these lows on the Middle Montney reflector are northeasterly dipping Upper Montney clinoforms.