# The Montney Play of Western Canada: Deposition to Development

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## ABSTRACT

Our growing understanding of unconventional resources demonstrates the need for new or improved models to account for the distribution of rock and fluid properties in these highly heterogeneous and complex source-reservoir systems. This creates new and exciting challenges in geoscience disciplines including stratigraphy and sedimentology, organic geochemistry, geomechanics, geophysics and reservoir engineering. Multidisciplinary analysis of well-documented unconventional plays is key to tackle these challenges and improve our efficiency in exploring and developing these resources. With nearly 60 years of conventional exploration and production, and over 10 years of unconventional development, the Lower Triassic Montney Formation of Western Canada offers a unique opportunity to build an integrated, multidisciplinary reference case study. Furthermore, the Montney Formation is one of the North America's leading unconventional plays in terms of size of potential resource volumes and economics. The Montney formation forms a prograding clastic ramp with conventional reservoirs in shoreface deposits as well as in turbidites. In the distal part of the basin, thick fine-grained offshore and offshore transition deposits are the host of a world-class unconventional resource. These deposits consist of interbedded organic-rich and organic-lean fine-grained sediments. Organic-rich intervals result from both primary organic matter accumulations and solid bitumen associated with the secondary thermal cracking of in-situ and migrated petroleum. Consequently, the distribution of the present-day organic matter measured by the total organic carbon (TOC) content is related to both the depositional architecture and the burial history of the sedimentary basin. Understanding the geological controls on the distribution of initial sedimentary organic matter as well as on subsequent thermal maturation and petroleum expulsion and migration is key to better predict the distribution of fluid and rock properties at basin scale. Following the path of geological time and causality, this presentation will summarize the state of the art of our understanding of the Montney unconventional resource play from deposition to burial history and fluid migrations and relate the geological controls on regional and local heterogeneities to the different play types and their development characteristics.