

Stratigraphic Framework and Biostratigraphy of the Pennsylvanian-Permian Belloy Formation, northeastern British Columbia

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Stratigraphic correlation is the central geologic problem with the underexplored, mixed carbonate-siliciclastic, Belloy Formation in northeastern British Columbia. Integration of conodont biostratigraphy, sedimentology, and wireline logs from this research illustrates six central points. 1. Five major unconformity bounded sequences exist within the Belloy Formation. They are dated as Bashkirian, Moscovian, Kasimovian-Gzhelian, Artinskian-Kungurian, and Roadian-Wordian. Thin, vertically juxtaposed, condensed intervals and conglomerate within the Permian suggest that there may be more sequences than can be conclusively identified in this study. 2. The Beatton High and Hudson Hope "Low" formed an extensive uplifted region between late Moscovian and early Artinskian. This tectonic event forming an Intra-Pennsylvanian Unconformity is coincident with the depocentre, centred in the study area during the Pennsylvanian, shifting eastward into Alberta, during the Permian. 3. Lithofacies are variable ranging from dolostone, mixed clastic carbonate to quartzose sandstone, siltstone, conglomerate or breccia, and rare shale. From these data, deposition is interpreted within intertidal to shallow subtidal environments. 4. Contrary to previous interpretations, the stratigraphic model presented here, suggests that tectonics is a major factor controlling Belloy Formation sedimentation and preservation. This model illustrates that many geologic structures are variably active and inactive (e.g. Ft. St. John Graben) as well as structural inversion occurrences (e.g. Hudson Hope Low) during Belloy deposition. 5. Bashkirian and Moscovian age sequences are the primary reservoir unit within the Belloy in this area. 6. Conodont biostratigraphy integrated with wireline logs and core data has proven essential for correlating these units and constructing the stratigraphic framework model.