Chemostratigraphic correlations across the Albert Montney Formation

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The Triassic Montney Formation in the Western Canada Sedimentary Basin has been the focus of several regional stratigraphic studies, including several new approaches since 2015. The latest studies have long been overdue and provide new stratigraphic concepts and better age constraints. Here we present a full chemostratigraphic approach to stratigraphic identification of the Montney Formation in Alberta in a study based on 23 core wells. The study reveals marked geochemical differences associated with the dominant stratigraphic units but also highlights some of the more subtle boundaries within the main delineated units. Hence, three main chemostratigraphic units are identified (CS1-CS3) in Alberta. The geochemical proxies of trace elements allow identification of areas with geochemical similarities as well as differences which are proxies for local differences in sediment production, influx and diagenetic variability.

The three main chemostratigraphic units delineated in Alberta have unique signatures that imply marked sediment source changes during the deposition of the Alberta Montney. Statistical evaluation including principal component analysis of the trace and major elements shows that the terrestrial influx in the lower units, dominated by thinly laminated mud/siltstone, was minimal. These deposits have been interpreted as deep-basin turbidite sequences in past depositional models. In contrast, the upper chemostratigraphic unit (CS3) has mud, silt and sandstone deposits with pronounced sediment structures, bioturbation and bed thickness changes and the geochemical signatures infers marked changes in sediment source with both terrestrial and marine sediment origins.

This presentation provides an overview of the chemostratigraphic compositions and correlations across the Alberta Montney Formation and provides new interpretations about correlations and possible depositional environments based on the geochemical signatures of the sediments.