

Regional Paleocurrent Patterns of the Mississippian Mattson Formation from the La Biche, Kotaneelee, and Liard Ranges, Yukon and Northwest Territories

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The upper Visean to Serpukhovian Mattson Formation is a sandstone dominated unit comprising deltaic deposits preserved in the foothills of the northern Cordillera and subsurface of the adjacent plains. This formation, which conformably overlies the shale-dominant Golata and Besa River formations, is unconformably overlain by Permian and Cretaceous strata. Prior to this study, detailed examination of the Mattson by GSC geologists was limited to five outcrop sections near its northern outcrop edge. The formation, up to 1500 m thick, has been subdivided into three informal members on the basis of variations in sandstone content and bedding style. Previously documented paleocurrent data come from fluvial channel fills in the middle member of the Mattson at its type section along Jackfish Gap.

More detailed mapping in the Fort Liard (NTS 95B) and La Biche River (NTS 95C) map areas by the Central Foreland NATMAP Project has facilitated the collection of paleocurrent data from the Mattson over a wide geographic region, south of the type section. The new results show dominantly S to SW paleocurrents in the lower and middle members, in agreement with previously documented fluvial data from Jackfish Gap. These results also agree with the general lithofacies patterns within the Mattson, specifically that delta-plain facies with numerous fluvial channel fills dominate in the NE, whereas delta-front, delta-slope and carbonate marine facies predominate in the SW. In contrast, southwestern occurrences of the upper Mattson include tidal-channel fills, tidal-inlet deposits and coastal dunes that record paleocurrents characterized by an E to SE trend.