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Tectonic Fabric and Fault Activity Revealed by Syn-sedimentary Deformation in Upper Ordovician Red River Strata, Southeastern Saskatchewan

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Subaqueous laminites and evaporites from Red River strata in southeastern Saskatchewan exhibit sediment deformation features.

Sediment deformation in the Herald Formation is identified as “seismites” because it is ascribed to the effects of earthquake-induced stresses. Seismites potentially act as proxies for individual earthquake events and range from soft-sediment deformation to brittle failure. The Herald Formation is a series of carbonate–evaporite shallowing-upward sequences and is subdivided into the Lake Alma, Coronach and Redvers members. The Lake Alma and Coronach members consist of dolomitic wackestone to packstone overlain by laminated dolomudstone and capped by laminated to enterolithic anhydrite. The area under investigation has an orthogonal structural fabric where faults are oriented NE–SW and NW–SE extending from townships 1 to 15, ranges 1 to 23. Wells cored in the designated interval exhibit a distribution of seismites that helps elucidate the basement tectonic system and gauge the timing of fault activity.

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