

Reconstruction of the Depositional History of the Elk Point Basin in Saskatchewan During Middle Devonian Time: A Transition from a Normal Marine to Evaporitic Sequence

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The Middle Devonian Elk Point Basin extending from the southern Northwest Territories to northwestern North Dakota and from western Alberta east beyond the present eastern erosional edge in southern Manitoba, is divided into 3 sub-basins, the Saskatchewan Sub-basin, Central Alberta Sub-basin and Northern Alberta Sub-basin. A thick carbonate and evaporite succession was deposited in the Saskatchewan Sub-basin.

Many important aspects of evaporite formation and diagenesis are still poorly understood because of the lack of modern analogs of large evaporite deposits and their susceptibility to post-depositional diagenesis. Isopach maps of different lithologic units based on core descriptions, and the regional correlation of well log signatures of the Middle Devonian carbonate-evaporite from the top of the Ashern Formation to the top of the Prairie Evaporite Formation have been constructed to examine the spatial and temporal relationships between the carbonate and evaporite deposits inside the Saskatchewan Sub-Basin. From this stratigraphic framework, and the spatial relationships recorded on the maps, the transition of the intracratonic Saskatchewan Sub-basin from fully marine to desiccation is documented.