

Understanding the Origin of the Sub-Unconformity Diagenetic Caprock, in the Mississippian of the Williston Basin, Southeast Saskatchewan

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Abstract/Excerpt

Diagenetic alteration of Mississippian carbonates overlain by Lower Watrous clastics has obliterated all porosity and permeability within an altered zone. This makes it a regionally important caprock for hydrocarbon reservoirs within the area, and also a suitable site for long-term geological storage of carbon dioxide (Whittaker, 2004).

Locally, the caprock is absent where alteration did not occur or less commonly, dissolution of porosity-filling anhydrite took place. This has allowed continued upward migration of oil into overlying Lower Watrous clastics where reservoirs are widespread sandstones capped by argillaceous mudstones.

An understanding of how one of the major caprocks in the Williston Basin has formed should allow better predictions to be made about the presence and thickness of the alteration zone, and how that relates to oil occurrence. This is especially important where the alteration zone changes thickness laterally and production employs horizontal drilling.