

Mud-Mounds: The Key to Increasing Oil and Gas Production in the Carboniferous?

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Abstract

Throughout geological time, mud-mounds have been important players in the biotic makeup of the oceans of Earth. Mud-mounds are valuable to the petroleum industry because they are similar to reef plays. Like reefs, mud-mounds can provide porous, structural highs that are traps for hydrocarbons. Examples of producing mud-mounds in North America are the Waulsortian mud-mounds in North Dakota, the Waulsortian mud-mounds in the Seal area of Alberta and the mud-mounds of the Paradox Basin, Utah.

The time period on Earth where mud-mounds were most abundant was the Carboniferous. During this time, mud-mounds out-populated reefs as the main build-up types in the oceans. As a result, one would expect a large amount of petroleum production from the Carboniferous, but the opposite is true. World wide, the Carboniferous is an under-producing, over-looked time period, and mud-mounds may be the key to increase production.

In order to understand factors that contribute to a producing mud-mound, one can study other mud-mounds that contain oil and gas, and the Pekisko Formation Waulsortian mud-mounds in Alberta can provide a good model. Porosity is one factor that contributes to production, and in these mud-mounds it is controlled by bryozoa sheltering primary pore spaces, and from the preferential dissolution of early marine cements surrounding bryozoa. Permeability, another important factor in oil and gas production, is controlled by late stage fracturing that begins and terminates at stylolites. These, and other qualities of the Waulsortian mud-mounds, can be used to assess whether mud-mounds in other areas are economically viable.