Regional Stratigraphy and Reservoir Units of the Grosmont Formation, Saleski and Burnt Lakes, Alberta

John C. Hopkins [1], Ken Wilde [2], Shawna Christensen [3], and Kent R. Barrett [2]
[1]University of Calgary, Calgary, AB, Canada.
[2]Laricina Energy Ltd., Calgary, AB, Canada. (3) Throndson Energy Ltd., Calgary, AB, Canada.

INTRODUCTION

The Grosmont Formation is comprised of shallow-water carbonates deposited in a platform to ramp succession during the Late Devonian. Early dolomitization pervasively replaced the limestone. Erosion and truncation of the Grosmont along its subcrop edge established a karst regime that resulted in leaching of the dolostones by meteoric waters, fracturing, and local clay infiltration. An extensive seal above the subcrop was provided by Lower Cretaceous shale. In the Early Tertiary, the Grosmont was tilted to the west prior to bitumen charge.

Dolomitization and karst processes have significantly altered the fabric of Grosmont carbonates and several studies of reservoir properties emphasize reservoir heterogeneity. In this presentation we emphasize a regional stratigraphic framework to compare and contrast reservoir properties of two lease areas 105km apart: Saleski Tp85 Rg19W4 and Burnt Lakes Tp95 Rg24W4 105km to the northwest.

REGIONAL STRATIGRAPHY AND RESERVOIR UNITS

The Grosmont is divided into four members separated by three regionally distributed argillaceous carbonate horizons, variously referred to as shale or marl markers. The members have been interpreted as chronostratigraphic units by Cutler (1983) and are identified, from base to top, as the A,B,C and D in contemporary terminologies.

Reservoir units are correlated from log properties and comprise one or more dolostone lithologies that have similar petrophysical characteristics. Eight reservoir units in Members C and D have been correlated throughout 20 wells in Tp 85 Rg19W4 at Saleski. 1AA/07-26-085-19W4 is a key well from Saleski and the core from 1AA/06-17-095-24W4 is from the Burnt Lakes 105km to the northwest. HMI logs were used in 1AA/06-17-095-24W4 in conjunction with core to assess lost core intervals as well as sections that were not cored. The description for units 1,2 and 3 is from core in 1AA/12-15-095-25W4.

CONCLUSIONS

Regional stratigraphy of the Grosmont along a section parallel to its eastern subcrop indicates deposition of carbonate platform to ramp successions with local subsidence and thickening.

Correlation of reservoir units within Members C and D at Saleski and Burnt Lakes, 105km apart, underscores a basic sedimentary theme of marine to peritidal carbonates with subtle differences in the importance and distribution of facies.