

AN ANALYSIS OF TARANAKI BASIN HYDROCARBON MIGRATION SYSTEMS

T Haskell
Haskell Exploration Services Ltd
Wellington

Abstract

An analysis of hydrocarbon-bearing structures in the Taranaki Basin shows that they are Miocene or younger in age. The Maui Field and adjacent Moki and Maui-4 structures are Latest Miocene-Early Pliocene in age. Structures along the Manaia Fault, including the Kapuni Field, are Late Miocene, as is the adjacent Stratford Field. Those in the Tarata Thrust System are Mid Miocene and the Kaimiro Field is Pleistocene. The reservoir contents and gas/oil and hydrocarbon/water contact relationships indicate that accumulation of hydrocarbons in the fields is an ongoing process. The age of the accumulations is therefore much younger than the structures. Present day regional structural patterns are adopted as the basis for determining hydrocarbon migration paths. Using this thesis, the source of hydrocarbons in the Maui Field can be traced to the southern North Taranaki Graben and western Manganui Graben, in contrast to the adjacent structures which are sourced from the South Taranaki Graben. In both cases the ultimate source is 20-40 kilometres distant. The structures in the Manganui Graben are sourced by combinations of vertical migration and, principally, migration vectored up-dip from the graben deep adjacent to the Taranaki Fault along the eastern margin of the graben. The Tarata Thrust system is sourced by a combination of westwardly vectored migration from the regionally deeper eastern flank of the Manganui Graben and vertical migration. The Stratford and Kaimiro fields are sourced by vertical migration vectored radially up-dip into the culminations by the structural flanks.

Author

TOM HASKELL has an M.Sc. from Victoria University of Wellington, and a Ph.D. from the University of Queensland. From 1969 to 1971 he worked for Planet Oil in Sydney as a Petroleum Geologist on a number of eastern Australian basins, from Bass Strait to the Gulf of Papua. After work in Australia and North America Tom joined Shell, BP and Todd Oil Services Limited in 1974 based at New Plymouth as Production Geologist.

In January 1980 Dr Haskell joined the Petroleum Corporation of New Zealand (Exploration) Limited as Chief Geologist, shortly afterwards becoming Exploration Manager, and then General Manager in 1981. In May 1984, Dr Haskell resigned from Petrocorp (Exploration) and established Haskell Exploration Services Limited.