Thesis Title Facies Analysis of Tertiary Rocks in Mae Soon and Nong Yao Oilfields Fang Basin Northern Thailand

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Abstract

Clastic sediments in the Mae Soon and Nong Yao Oilfields were classified into 3 Formations. Gravel, Sand and top soil of the Recent Sediments Formation overlies conformably on gravel, sand and clay of the Mae Fang formation which, in turn, overlies unconformably on the most widely distributed shale and mudstone of the Mae Sod Formation, below which lies the Pre-Tertiary bedrocks. Crude oil has been discovered and produced mainly from the gray, fine-grained lithic graywacke sandstone and brown siltstone interbeds in the Mae Sod Formation in which organic mudstone and shale behave both as source rocks and seals. Oil shows were also found in conglomerate and conglomeratic sandstone.

The early depositional environment characterizes large lake with minor channel inlets which, during flood season, carried coarse sediments into the lake, otherwise fine-grained organic-rich clay and mud of the Mae Sod formation. Sub-angular to sub-rounded quartz and rock fragments indicate short transportation from parent rocks. The palynological assemblage suggests the Mae Sod Formation was deposited in the

temperate climate. Later, as the lake was filled up, the depositional environment evolved from lacustrine into floodplain and channels, characterized mainly by sand and gravel deposits of the Mae Fang Formation. The main river flowed southeasterly from Nong Yao to Mae Soon oilfields. Finally, the tectonic uplift took place in the south of the study area causing erosion and change in flow direction of the river from southeasterly to northerly as evidence by the flow direction of the current Nam Mae Fang river. Fluvial deposits characterize this Recent Sediments Formation.

Gray to dark gray shale and mudstone of the Mae Sod Formation, especially in Nong Yao oilfield, are rich in organic matters. Lamaginite and alginite A (*Botryococcus sp.*) are the dominant organic matter types found in the study area. Both are good oil sources. The main reservoir rocks are gray and brown, fine-grained sandstone and siltstone whose average porosity varies from 26% in Mae Soon to 19% in Nong Yao oilfield and average permeability varies from 1803 millidarcys at Mae Soon to 126 millidarcys in Nong Yao oilfield.