# CHAPTER I

# INTRODUCTION

Many different strategies may be deployed in the recovery of hydrocarbons from petroleum reservoirs. The strategy varies from field to field as well as well to well. There are a lot of factors that come into play. However, this study focuses on performance of different perforation strategies for multi-layer reservoirs containing different kinds of fluid in order to maximize the recovery of hydrocarbons and at the same time minimize the water production.

The reservoirs of interest are in the A field, which is located in the Gulf of Thailand. In this field, there are many fault blocks each covering over 5 km in the strike direction. In the dip direction, fault block width can vary from 2 km. to 100 m. The deposition of the reservoir sands occurred in early to late Miocene period in alluvial plain. Fluvial, fluvial-deltaic and deltaic environments are found on the lower coastal plain. Minor marine transgression has also been observed in the A field. Clastic deposition is dominant with amalgamated channels and point bars, forming reservoir sands. The reservoir section is found between 3500' to 9500' below the sea level. A typical well encounter about 40 sands, about 3-20 will contain hydrocarbon. The A Field reservoirs average 20' thick but range between 3' – 100' thick. Porosity generally decreases with depth, with an average of 25%. Permeability generally varies with porosity, ranging from as high as 8 darcies to less than 1 md. In certain parts of the reservoirs, permeability may be quite low (0.01-10 md). There are 6 platforms in the A field, and the one that we selected to study is "C Platform".

There are 21 wellheads located on the C platform. Some wells are still producing, some start to decline, and some already depleted. Regarding completion type, there are 7 conventional and 14 mono-bore wells. The well location of the C platform is shown in Figure 1.1.

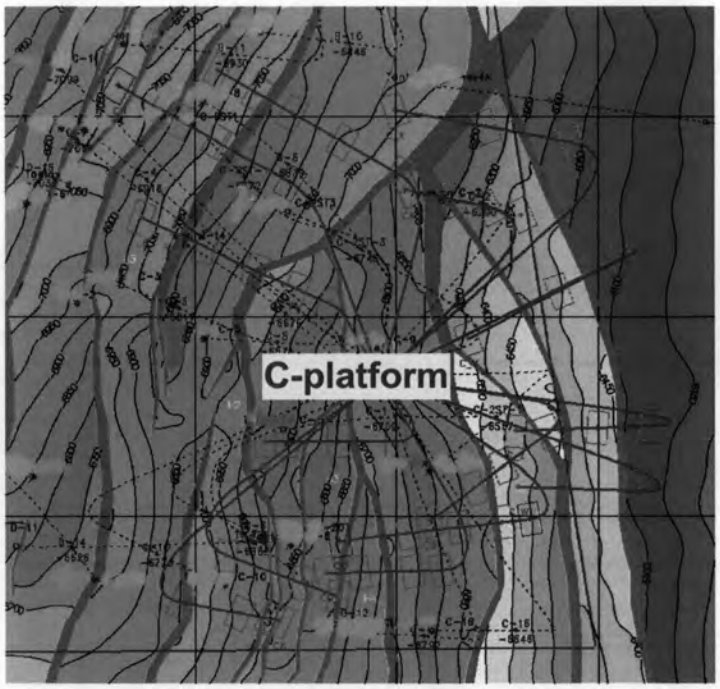


**Figure 1.1: Well location of the C-platform**

In this study, we first performed history match of the wells on the C platform using the Integrate Production Model (IPM) software. The model obtained from the history match was then used in the evaluation of different perforation strategies. Finally, we present some of the results.

The Main work to be done under this study is using all available information to predict reservoir performance using integrate production model. Therefore, it is expected that this work can be used as a guideline for optical completion and production strategy. The study of the depletion strategy will provide the optimum hydrocarbon production from the reservoir.