

CHAPTER 1

INTRODUCTION



1.1 General Overview

In 1969, Thailand announced the first delineation of 19 blocks covering the whole Gulf of Thailand bounded by the tentative maritime boundary. Six foreign oil companies were awarded special concession licenses under the Mineral Act. B.E. 2510. Later on in 1971 when the first Petroleum Act. B.E. 2514 was promulgated all such special concessions as well as new one were converted and awarded as petroleum concessions.

In 1971, 1972, and 1973 Vietnam, Cambodia and Thailand each announced their continental shelf boundary in the Gulf of Thailand, respectively, causing an overlapping area of approximately 32,000 km². Since April 1975, the Thai government instructed the concessionaires to refrain from any petroleum activities in the overlapping area until the Thai Government and neighboring countries could agree on the disputed boundaries. In 1991, the government assigned the Ministry of Foreign Affairs and the Ministry of Industry to solve the boundary disputes, together with finding a proper solution for developing non-living resources in the disputed area as soon as possible.

At present, four companies still hold concessions awarded before 1971 in the overlapping area. These companies are Amoco in blocks B5 and B6, British Gas in blocks B7, B8 and B9, Unocal in blocks B10 and B11 and parts of blocks B12 and B13, and Petroleum Authority of Thailand Exploration and Production Public Company Limited (PTTEP) in blocks B14, B15 and B16, exclusive of the Malaysia-Thailand Joint Developing Area [JDA] (Figure 1.1).

Regardless of Thailand's economic crisis in 1997 and 1998, it is anticipated that petroleum demand may be as high as 1,180 KBDE by 2006. Trisan¹ reported that nowadays Thailand imported oil values are over 130 billion baht annually. Seventy percent of crude imported is from the Middle East and 30 percent from the Far East while 70 percent of oil products are imported from Singapore. The energy structure of Thailand now consists of 63 percent oil, 22 percent natural gas, 13 percent coal and lignite, and 2 percent hydro-power. Since the combine cycle gas-fired power generation has been proven the most efficiency, cheaper and cleaner technology. The market for gas can be roughly quantified by looking at current and projected power generation capacity in the region and assuming that in most cases existing and future stations would be gas fired if gas were to be made available.

Due to the fact that natural gas has significantly reduced Thailand's dependence on import oil, and has saved much foreign exchange, and provided lower-cost energy, therefore, it is very important to look for petroleum fields that can be conveniently developed and that are not far from the existing petroleum production wells, such as in the Thai-Vietnam overlapping area.

The Thai-Vietnam overlapping area , located in the Pattani Basin and the northern part of the Malay Basin and covers 8,470 km² , declared in February 1997, (Figure 1.2), has very high petroleum potential, as evidenced by an attempt of Unocal oil company in recent years to complete feasibility study for the area, which is near to its Erawan, Pailin, Satun, and Jakrawan fields.

1.2 Location of the study area

The study area, the Thai-Vietnam overlapping area, encompasses southeastern part of the Pattani Basin and northwestern part of the Malay Basin in the Gulf of Thailand between latitudes 7°35' N and 8°05' N , and longitudes 101°55' E and 103°20' E (Figure 1.2 and Table 1.1). This area is chosen for study in order to enhance the knowledge of the geological evolution and hydrocarbon potential of economically important Tertiary strata in the Gulf of Thailand. The Pattani Basin and the northern Malay Basin are the most prolific basins in Thailand, accounting for more than 80% of present-day hydrocarbon production in the country.

1.3 Data Sources

Data and samples used in this study are provided by Mineral Fuels Division, Department of Mineral Resources, Thailand. The data include wireline logs, drilling data, palaeontological reports, and other general geological and petroleum engineering information. Data used in the assessment were collected from the north²⁻³¹, the west³²⁻⁴⁰, and the south⁴¹ of study area.

Table 1.1 Location of the Thai-Vietnam overlapping area.

Point No.	Latitude			Longitude			UTM-E	UTM-N	AREA
	DEG.	MIN.	SEC.	DEG.	MIN.	SEC.	M.	M.	SQ.KM.
1	8	50	6	102	15	15	197,989.03	977,645.59	8,469.65
2	8	40	50	102	20	5	206,734.33	960,490.13	
3	8	40	30	102	25	10	216,058.46	959,810.89	
4	8	30	5	102	50	10	261,768.14	931,100.66	
5	7	35	25	103	20	15	316,577.96	839,458.65	
6	7	40	25	102	55	5	270,330.18	839,488.34	
7	8	30	25	101	54	50	820,788.70	941,475.56	
8							197,989.03	977,645.59	

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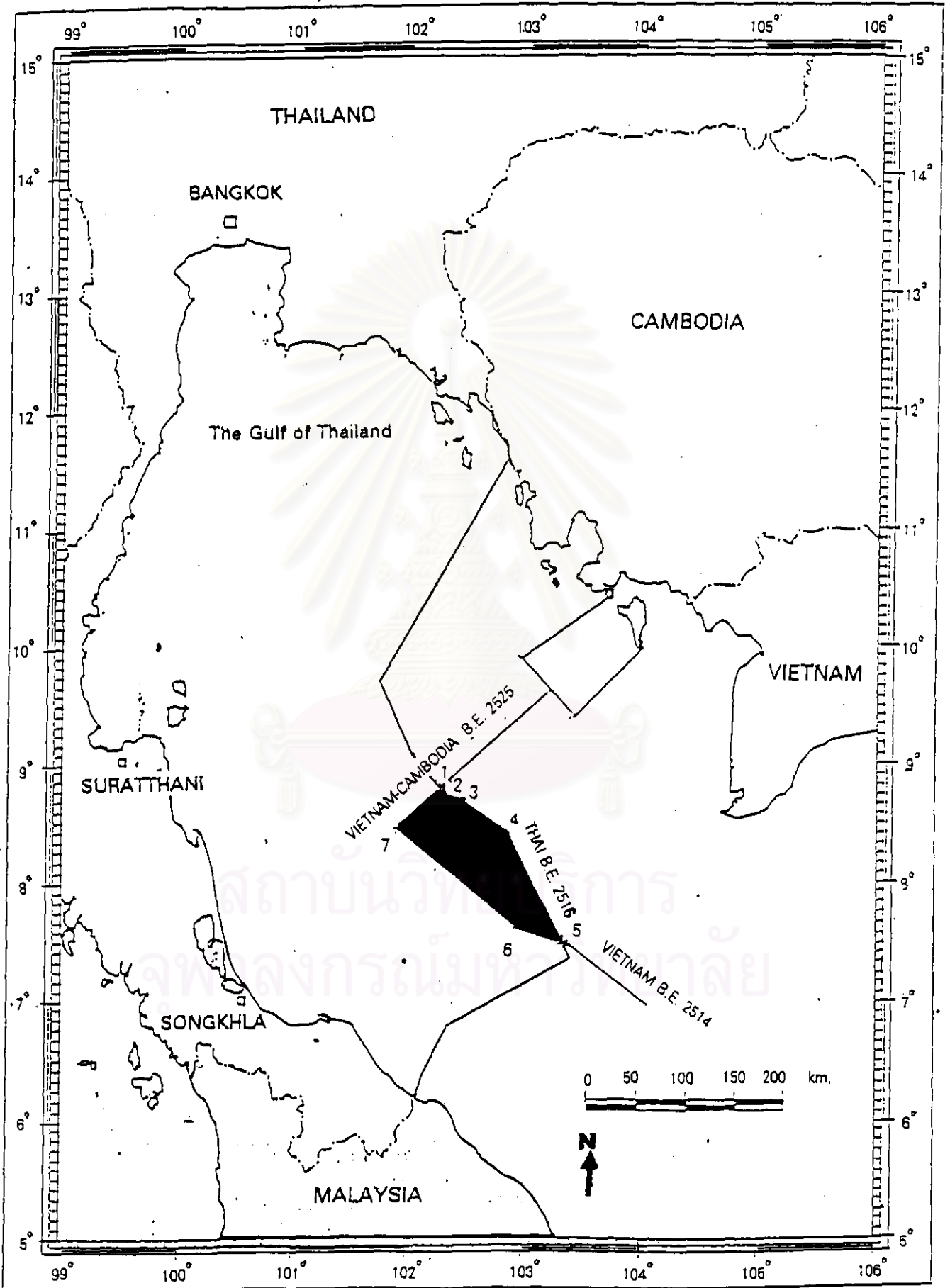


Figure 1.2 Location of the Thai-Vietnam overlapping area (After DMR, 1997)

Well data from the north are from 8 wells of Jakrawan field;

1. Jakrawan -13
2. Jakrawan-15
3. Jakrawan-6
4. Jakrawan-B-1
5. Jakrawan-B-3
6. Jakrawan-B-7
7. Jakrawan-D-4
8. Jakrawan-D-9

6 wells from Funan field;

1. Funan-1
2. Funan A2
3. Funan A11
4. Funan-17
5. Funan-18
6. Funan F8

3 wells from Gomin field;

1. Gomin-3
2. Gomin-4
3. Gomin-5

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2 wells from Kaphong field;

1. Kaphong-1
2. Kaphong-3

5 wells from Platong and South Platong field;

1. Platong-1
2. Platong-5
3. Platong-8
4. S. Platong-1
5. S. Platong-2

5 wells from Pladang and North Pladang field;

1. Pladang-2
2. Pladang-3
3. North Pladang
4. North Pladang-1
5. North Pladang-2

6 wells from Erawan field;

1. Erawan 12-1
2. Erawan 12-6
3. Erawan 12-7
4. Erawan 12-9
5. Erawan 13-4

6. Erawan K-1,

3 wells from Baanpot field;

1. Baanpot 1
2. Baanpot B1
3. Baanpot-4

2 wells from Satun field;

1. Satun-2
2. Satun-3

Other wells from the north of study area are Yala-2, Surat-1, Ranong-1, Kung-1, Pakarang-1, Insea-1, Trat-1, Dara-1 and Krut-1.

Well data from the west of study are 6 wells from Bongkot field;

1. 15-B-4X
2. 15-B-13X
3. Tonkoon-1X
4. Tonsak-2
5. Tonsak-4
6. Tonnokyoong-1X

Well data from the south of study are 2 wells from Joint Developing Area (JDA);

1. Pilong
2. 17-B-1

Location of well in this study are shown in Figure 1.3.

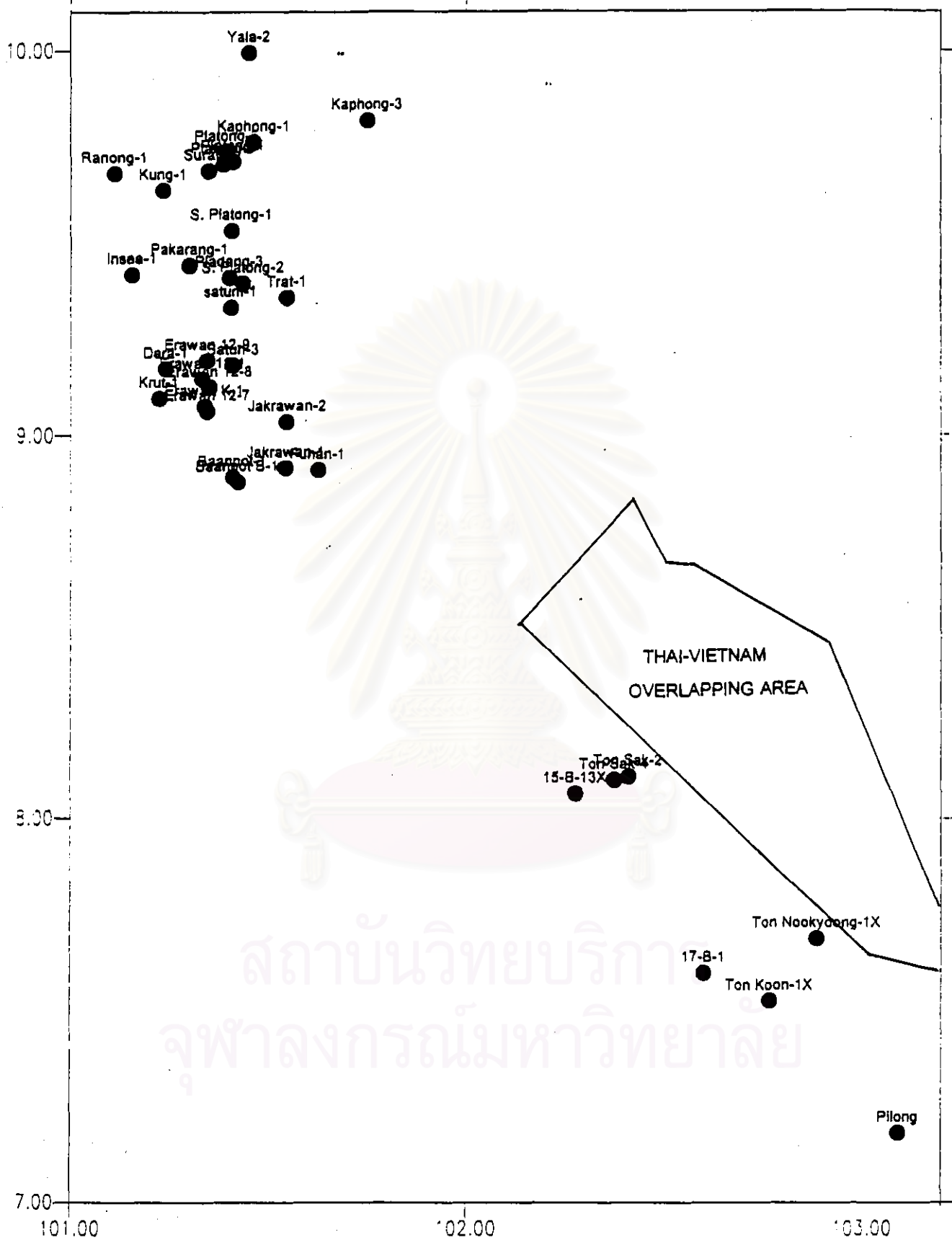


Figure 1.3 Location of wells used in the study.

1.4 Exploration history in the Gulf of Thailand and the adjacent areas of the study area.

In 1971 Conoco drilled the first offshore well (Surat1) in the Gulf of Thailand but the company did not encounter commercial hydrocarbons. January 1973, the first commercial discovery in the Gulf of Thailand was made by Union Oil at the 12-1 well in its concession in the Pattani Basin, and the field was later named Earwan. Since then, additional drilling and exploration have been carried out. Another important well is the 15-B-1X well of Tennoco, which encountered oil and gas in block B15 in the Malay Basin in May 1973.

The area near by the study area, named the Bongkot field, was found the gas accumulation and is currently operated by TOTAL and PTTEP. To the south of the study area , the Joint Development Area of the Thai and Malaysian governments [JDA] is a successful exploration and production area for PTTEP and its partners.

1.5 Purpose of study

The two main purposes of this investigations are: to identify, and to assess the potential of petroleum resources in the Thai-Vietnam overlapping area, and to evaluate economics of the petroleum resources of the Thai-Vietnam overlapping area. In order to achieve these goals, this thesis is divided into four main parts. The first part describes the general geology, such as, the stratigraphy and sedimentation evolution of this overlapping area. The second part concerns and describes the

petroleum geology and petroleum engineering system of this overlapping area. The third part describes and assesses the potential of the undiscovered petroleum in the overlapping area. A computer program, FASPU, based on statistical and geological theories, is applied to calculate the potential of the undiscovered petroleum of this overlapping area. The fourth part deals with economic theories and strategies to develop this overlapping area.

Results from this integrated study may improve the understanding of the petroleum geology and establish the petroleum reserve potential of the overlapping area for future exploration plan.



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