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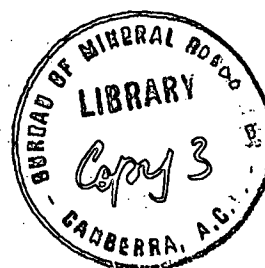
DEPARTMENT OF  
MINERALS AND ENERGY



BUREAU OF MINERAL RESOURCES,  
GEOLOGY AND GEOPHYSICS

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Record 1973/192



PETROLEUM EXPLORATION BRANCH  
SUMMARY OF ACTIVITIES

(PERIOD FROM 1.11.72 TO 31.10.73)

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CONTENTS

	<u>Page</u>
SEDIMENTARY BASINS STUDY SECTION	1
SUBSIDY SECTION	3

## SEDIMENTARY BASINS STUDY SECTION

All but one or two positions out of 20 were actually filled throughout most of the year. A reorganization of the Core and Cuttings Laboratory was approved and as a result two new technical positions were created. The new staff will be used to overcome the backlog and an additional workload brought on by the requirements of the Petroleum (Submerged Lands) Act. A critical shortage of space at the Laboratory will be relieved when the extension is completed in 1974.

The Section continued to review the results of petroleum exploration in and the petroleum prospectiveness of the sedimentary basins of Australia and Papua New Guinea. Most of the available basic data in the Canning Basin were interpreted as part of a detailed basin analysis.

### Sydney Basin

A bibliography was published. The Sydney Basin review was issued as a record which was edited for publication and galley proofs were corrected.

### Canning Basin

Interval boundaries were picked on most of the onshore and offshore seismic sections and velocity analysis has commenced. The boundaries of all intervals were identified on well logs and on measured sections and recorded on cards. Thickness and lithofacies data for Mesozoic and Cainozoic intervals were recorded on cards and preliminary objective isopach and lithofacies maps with sections have been prepared or are in preparation. Environmental analysis is proceeding concurrently. Draft report writing has commenced.

### Australia and Papua New Guinea

A summary of current knowledge of sedimentary basins was partly completed and issued as a restricted record. Draft contributions have been completed for most of the remaining basins and await resumption of the project.

A set of maps showing past and current drilling operations was maintained, together with an index based on the 1:250 000 sheet areas. Subsidised and unsubsidised wells are distinguished and the current status of each well indicated.

A base map, showing all wells and measured sections in the Carnarvon Basin, and a cross index sheet were completed.

Summaries of oil search activities for 1970 and 1971 were issued as Records. A summary for 1972 has been drafted.

Card indexing of drilling and geophysical operations continued. Card index systems containing recent references on sedimentary basins and references with special relevance to basin study work were kept up.

### Core and Cuttings Laboratory

Bureau personnel made 262 visits and representatives of 57 companies made 209 visits to the Laboratory. The facilities offered in the Laboratory were used for a total of 1574 man days; a 326 percent increase over the previous year.

Core boxes, sample submission forms, core bags, and pre-labelled cuttings bags were forwarded to nine BMR field parties. All subsidised and offshore drilling operations were supplied with sample submission forms. A total of 80 270 pre-addressed cuttings bags were supplied on request, an increase of 66 percent over the previous year.

14 500 core samples, 102 630 cuttings samples, and 88 samples from drill stem tests and formation interval tests were received from 357 drilling operations. The total number of samples received increased by 388 percent compared to the previous year.

52 300 samples were checked and semi-registered and 69 155 samples were fully registered. The store now contains 836 301 fully registered samples.

An extension to the store is to be completed in 1974 and should relieve the present critical storage problem. Approximately 534 000 unregistered samples are stored outside of the Laboratory.

435 thin sections were prepared and 2094 cuttings samples were washed.

### Publications 1972/73

FORMAN, D.J., and SHAW, R.D., 1973 - Deformation of the crust and mantle in central Australia. Bur.Miner.Resour.Aust.Bull. 144

MAYNE, S.J., and RAINE, M.J., 1972 - Bibliography of the Sydney Basin (to 31 December 1969). Bur.Miner. Resour. Aust. Rep. 158

REYNOLDS, M.A., 1971 - A review of the Otway Basin. Bur. Miner. Resour. Aust. Rep. 134

### Publications in press

MAYNE, S.J., NICHOLAS, E.N., BIGG-WITHER, A.L., RASIDI, J., and RAINE, M.J., - Geology of the Sydney Basin: a review. Bur. Miner. Resour. Aust. Bull. 149

### Records (unpublished)

FORMAN, D.J., WYBORN, L., KURYLOWICZ, L.E., PASSMORE, V.L., and MAYNE, S.J., 1973 - Summary of sedimentary basins in Australia and Papua New Guinea, 1973. Bur. Miner. Resour. Aust. Rec. 1973/98 (restricted).

NICHOLAS, EVELYN, 1971 - Summary of oil search activities in Australia and Papua New Guinea during 1970. Bur. Miner. Resour. Aust. Rec. 1971/46

NICHOLAS, EVELYN, 1973 - Summary of oil search activities in Australia and Papua New Guinea during 1971. Bur. Miner. Resour. Aust. Rec. 1973/27

WILLIAMS, L.W., FORMAN, D.J., and HAWKINS, P.J., 1973 - Sedimentary basins of the Sahul Shelf. Bur. Miner. Resour. Aust. Rec. 1973/74

Records (in prep.)

NICHOLAS, EVELYN, - Summary of oil search activities in Australia and Papua New Guinea during 1972. Bur. Miner. Resour. Aust. Rec.

KRAITSOWITS, I.K., - Semantic data processing. Record for internal distribution only.

SUBSIDY SECTION

Petroleum Search Subsidy Act

The processing of applications and the examination and assessment of final reports and cost statements on subsidised operations continued.

Applications

During the year 1 November 1972 to 31 October 1973, the Subsidy Section received 93 applications for approval of operations under the Petroleum Search Subsidy Act 1959-1969. These consisted of 48 for exploration drilling operations, 42 for seismic surveys (including 2 for seismic and gravity surveys and 2 for seismic and magnetic surveys) and 3 for gravity surveys.

Eighteen applications were also received for approval of extensions to operations; 8 of these were for extensions to the target depths of wells and 4 were for production testing, and 6 were for extensions to the programmes of seismic and gravity surveys.

Approvals

Ninety-one applications were approved under the Petroleum Search Subsidy Act 1959-1969 during the year ended 31 October 1973. Forty-eight of these were for exploration drilling operations and 43 were for geophysical surveys (see Plates 1 and 2). Three applications for approval of drilling operations were refused, and the Minister had not given a decision on 4 applications. Five geophysical applications for approval were pending at 31.10.73. In addition, 21 extensions to programmes were approved, 14 to drilling operations (including 4 for production testing), and 7 to geophysical surveys. As a result of these approvals the amount of \$10,859,572 was committed by way of subsidies under the Petroleum Search Subsidy Act during the 12 months ended 31 October 1973.

The approved geophysical operations consisted of 39 seismic surveys (including 2 seismic and gravity surveys, 2 seismic and magnetic surveys, and 12 marine surveys), and 4 gravity surveys. Eighteen of the approved drilling operations were for offshore wells.

Expenditure

In the 12 months to 31 October 1973, a total of \$9,549,216 was paid by the Commonwealth in subsidies to petroleum exploration companies under the Petroleum Search Subsidy Act 1959-1969. A breakdown of this expenditure by States and type of operation is given in Table I.

TABLE I

Expenditure under the Petroleum Search Subsidy Act  
1959-1969

1 November 1972 - 31 October 1973

	Drilling Operations		Geophysical Operations		Total
	Onshore	Offshore	Onshore	Offshore	
Queensland	258,496	-	456,685	-	715,181
New South Wales	15,488	-	-	6,095	21,583
Victoria	18,749	248,066	372,371	14,528	653,714
Tasmania	-	44,022	-	14,528	58,550
South Australia	290,465	-	128,692	4,750	423,907
Western Australia	2,002,212	1,228,867	1,390,935	185,690	4,807,704
Northern Territory	-	-	406,602	16,272	422,874
Papua New Guinea	579,902	240,390	1,571,972	53,439	2,445,703
<b>TOTAL</b>	<b>3,165,312</b>	<b>1,761,345</b>	<b>4,327,257</b>	<b>295,302</b>	<b>9,549,216.</b>

The expenditure under the Petroleum Search Subsidy Act during the financial year ended 30 June 1973 was \$8,084,257. Of this amount, \$6,314,406 was paid for onshore operations and \$1,769,851 for offshore operations.

At 31 October 1973, the total expenditure by the Commonwealth in petroleum search subsidies was \$127,480,639, and the total commitment was \$136,105,872 on 640 drilling operations and 953 geophysical operations.

Visits to subsidised operations

During the year ended 31 October 1973, officers of the Subsidy Section inspected 26 drilling operations, including 9 offshore wells, and 12 geophysical operations.

Features of subsidised exploration

During the period under review, the number of drilling operations approved for subsidy showed a marked increase on the previous year (48 compared with 39); the number of onshore operations increased from 26 to 30, and offshore operations increased from 13 to 18. Seventeen of the approved drilling operations were in Western Australia,

13 in Queensland, 4 each in Victoria and South Australia, 3 in New South Wales, 1 in Tasmania, and 6 in Papua New Guinea. Offshore drilling operations were in waters adjacent to Western Australia (11), Victoria (4), Tasmania (1), and Papua New Guinea (2).

Significant shows of hydrocarbons were recorded from 4 onshore wells and 5 offshore wells approved for subsidy during the year ended 31.10.73. Kanowana No. 1, drilled in the northern Cooper Basin, South Australia, by Vamgas N.L., flowed gas on production test of the interval 9077-9083 ft (Patchawarra Formation) at a rate of 5.8 MMcf/d, with 24 bbl condensate and 6 bbl water per MMcf/gas. Durham Downs No. 1, drilled by Delhi International Oil Corporation in the eastern-central Cooper Basin, Queensland, tested gas at rates up to 2.94 MMcf/d from the interval 8313-8444 ft (Patchawarra Formation). In the southeastern Cooper Basin, Queensland, Wolgolla No. 1, drilled by Delhi, also tested gas from the Patchawarra Formation over the interval 6600-6694 ft at a rate of 1.9 MMcf/d. Lake Murray No. 1 drilled by Continental Oil Company of Australia Ltd in the western Papuan Basin, PNG, recorded a gas flow on test of the interval 5474-5650 ft at a rate of 284 Mcf/d.

Production testing of Barrow Deep No. 1 (drilling operation approved 20.9.72; extension to cover production testing approved 18.9.73) commenced on 28.7.73, and the well was suspended on 26.9.73 (T.D. 15,256 ft). Three zones (Jurassic) were tested and gas flows accompanied by condensate and water at the following rates were recorded:

Perf. Interval (feet)	Gas MMcf/d	Condensate bbl/day	Water bbl/day
11,258 - 11,268	Up to 22	Approx. 110	Approx. 44
10,932 - 10,942	Up to 6	Approx. 180	Approx. 114
10,652 - 10,662	Up to 10.3	Approx. 231	Approx. 28

Hydrocarbons were recovered on tests of Palaeocene sections in two wells drilled by Esso Exploration and Production Australia, Inc., in the offshore Gippsland Basin. Marlin A-24, drilled from the Marlin A platform, produced oil from thin sands between 10438-10612 ft (M.D.) and gas from nine separate sands in a shale/sand sequence between 8742-10425 ft (M.D.). Marlin-4, drilled by Glomar Conception and located about 2 $\frac{3}{4}$  miles east of the Marlin A platform, reported gas and minor condensate from thin sands between 7460 and 7836 ft. The other three offshore wells are located on the Northwest Shelf of Western Australia. Eaglehawk No. 1 and Egret No. 1 were drilled by B.O.C. of Australia Ltd, in the Dampier Sub-basin. Eaglehawk No. 1 well, some 7-12 miles northeast of the North Rankin gas/condensate field on the Rankin Trend, tested 29.3° API gravity oil at rates up to 1645 bbl/day from Upper Triassic sands. Egret No. 1 well, about 4 $\frac{1}{2}$  miles east of Eaglehawk No. 1, tested 39° API gravity oil at rates up to 2729 bbl./day from Upper Jurassic section. West Tryal Rocks No. 1, drilled by West Australian Petroleum Pty Limited in the Barrow Sub-basin approximately 40 miles northwest of Barrow Island, was suspended due to mechanical difficulties. Testing will be carried out at a future date. Several of the subsidised wells made significant contributions to our knowledge of Australian stratigraphy.



During the year ended 31 October 1973, there was a considerable decrease in the number of subsidised seismic surveys, both onshore and offshore (39 approved compared with 50 in the previous 12 months). Twenty-seven of these approvals were for land surveys and 12 were for marine operations (35 and 15 respectively in the previous year). Most of the geophysical activity was in the Canning Basin (onshore and offshore), the onshore Perth Basin, and in Papua New Guinea. The largest marine seismic surveys completed during the year were B.O.C.'s Mermaid-Cartier survey of 3020 miles in the Browse and Canning Basins, and the Steamboat-Spit survey of 1623 miles in the Dampier and Beagle Sub-basins.

Four gravity surveys were approved during the year ended 31.10.73, compared with 1 in the previous year. No applications for aeromagnetic surveys were received during the period under review.

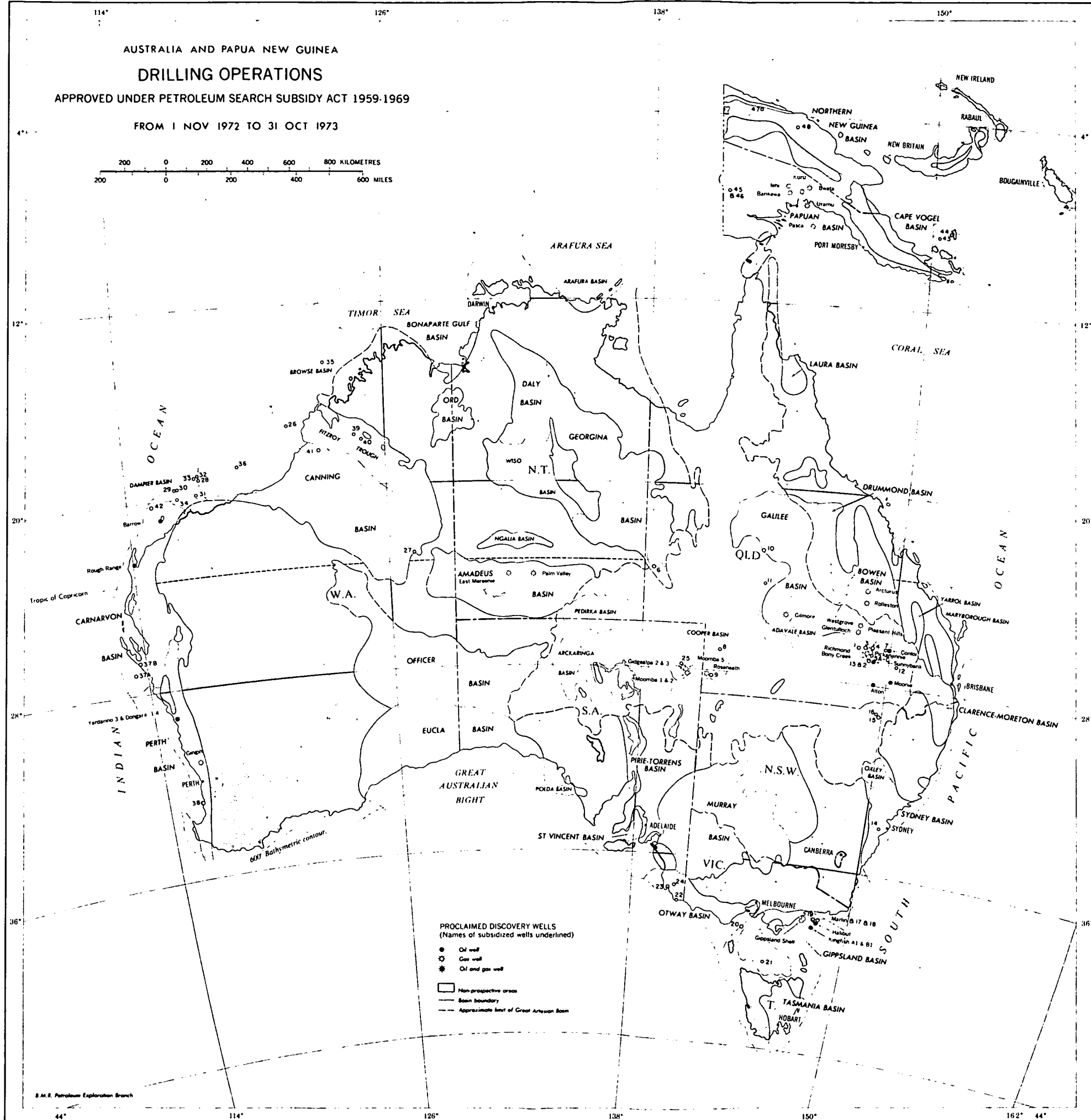
While there were no significant changes in geophysical techniques employed during the year, the introduction of portable digital processing systems for seismic data is worthy of note. Two such systems were introduced into Australia by different geophysical contractors. The new portable processing systems can be set up on the field crew or in a nearby town where they can provide the field geophysicist with rapid analysis, processing and display of the seismic data while the crew is still operating.

#### Petroleum (Submerged Lands) Act

During the year, the Subsidy Section assumed responsibility for the receipt, examination, indexing and storage of data and reports received under the Act. Inspections were made by officers of the Section of drilling operations in offshore areas of Northern Territory and Papua New Guinea.

#### Assessment of Prospects

The Section has received requests for advice on the petroleum potential of areas and prospects, and significance of new discoveries. The reinterpretation of structural maps of prospective areas and the assessment of all data received from these areas are continuing projects.

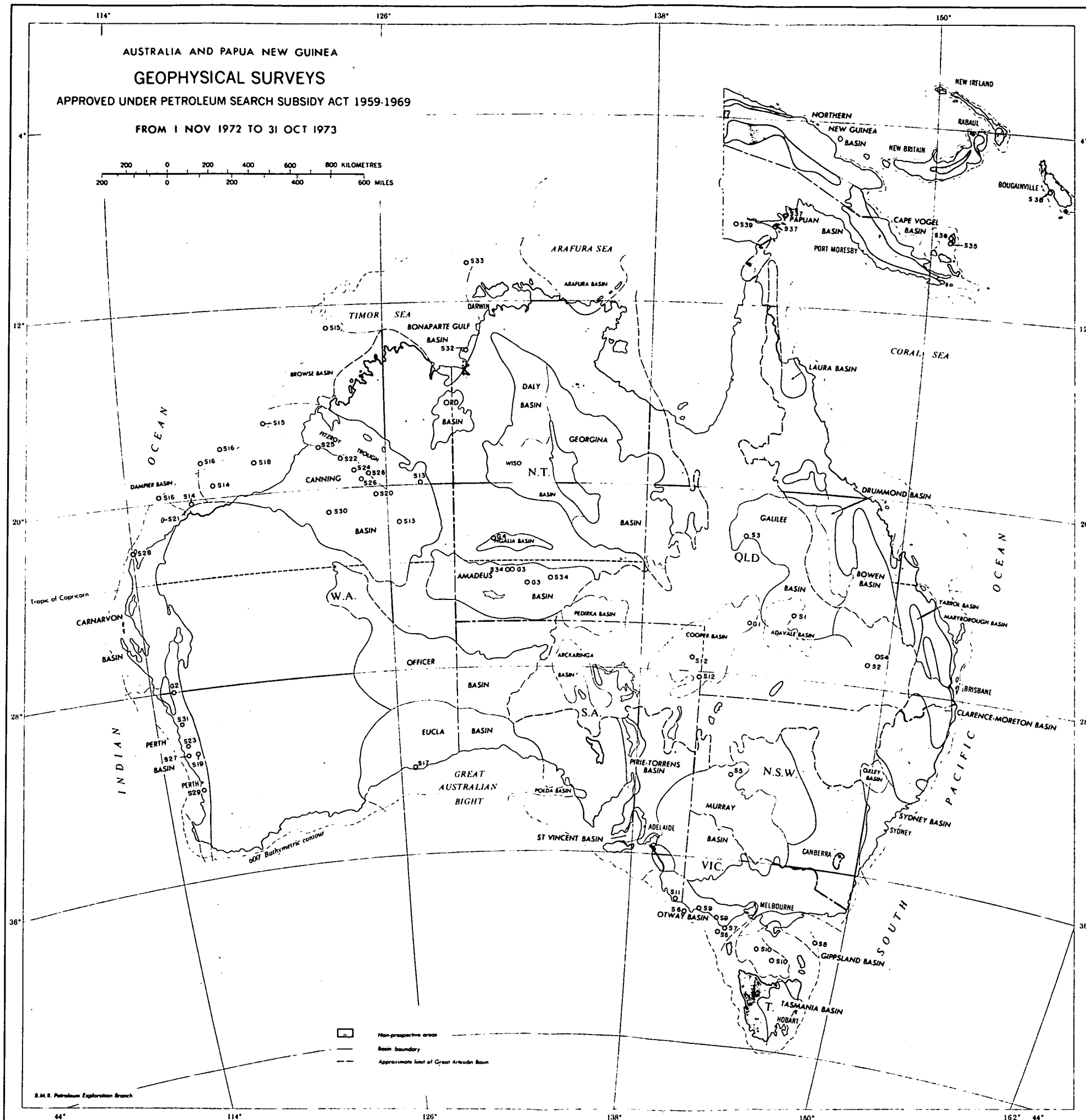


# EXPLORATION WELLS

Unless otherwise stated, well location refers to No. 1 Well

1	Bindango, Qld	(A.A.O.)
2	Fairfield West, Qld	(A.A.O.)
3	Minmi, Qld	(A.A.O.)
4	Pleasant Hills No. 17, Qld	(A.A.O.)
5	S.E. Roma Basement Valley Project, Qld	(A.A.R.)
	A - Blue Hills	
	B - Paddy Ward	
	C - Six Mile	
6	Ethabuka, Qld	(Alliance)
7	Cypress Downs, Qld	(Damsen)
8	Durham Downs, Qld	(Delhi)
9	Wolgalla, Qld	(Delhi)
10	Clyde, Qld	(Hematite)
11	Ban Ban, Qld	(Kelsey)
12	Rockwood North, Qld	(LSG Aust.)
13	Banoona South, Qld	(S. Union)
14	Bringelly Project, N.S.W.	(Bridge)
15	Moree No. 1, N.S.W.	(Mayfair)
16	Moree No. 2, N.S.W.	(Mayfair)
17*	Marlin A-24, Vic.	(Esso)
18*	Marlin - 4, Vic.	(Esso)
19*	Morwong, Vic.	(Esso)
20*	Snail, Vic.	(Hematite)
21*	Narimba, Tas.	(Esso)
22	Douglas Point, S.A.	(Gen. Ex.)
23	Beachport East, S.A.	(J.H.R.)
24	Diamond Swamp, S.A.	(J.H.R.)
25	Kanowana, S.A.	(Vamgas)
26*	Wamac, W.A.	(Amox)
27	Contention Heights, W.A.	(Aquitaine)
28*	Cossigny, W.A.	(B.O.C.)
29*	Eaglehawk, W.A.	(B.O.C.)
30*	Egret, W.A.	(B.O.C.)
31*	Hauy, W.A.	(B.O.C.)
32*	Jarman, W.A.	(B.O.C.)
33*	Ronsard, W.A.	(B.O.C.)
34*	Rosemary, W.A.	(B.O.C.)
35*	Yampi, W.A.	(B.O.C.)
36*	Keraudren, W.A.	(Hematite)
37A	Kalbarri, W.A.	(Oceania)
37B	Tamala, W.A.	(Oceania)
38	Lake Preston, W.A.	(WAPET)
39	Mimosa, W.A.	(WAPET)
40	Mt Hardman, W.A.	(WAPET)
41	Thangoo No. 2, W.A.	(WAPET)
42*	West Tryal Rocks, W.A.	(WAPET)
43*	Goodenough, PNG	(Amoco)
44*	Nubiam, PNG	(Amoco)
45	Lake Murray No. 1, PNG	(Continental)
46	Lake Murray No. 2, PNG	(Continental)
47	Bongos, PNG	(Gen. Crude)
48	Keram, PNG	(Gen. Crude)

\* Offshore Operation



SEISMIC SURVEYS

S1	Mount Edinburgh, Qld	(Hartogen)
S2	Yambugle, Qld	(Hartogen)
S3	Wokingham Creek, Qld	(Hematite)
S4	Yuleba Creek, Qld	(Tricentrol)
S5	Menindee, N.S.W.	(Beaver)
S6*	Cape Nelson - Cape Otway, Vic. & Tas.	(Hematite)
S7*	Cape Otway, Vic. (& Magnetic)	(Interstate)
S8*	North East Furneaux, Vic. & Tas.	(Magellan)
S9	Otway Coastal Strip, Vic.	(Shell)
S10*	Flinders, Tas.	(Hematite)
S11	Tartwaup, S.A.	(Alliance)
S12	Mudlankie, S.A. & Qld	(Delhi)
S13	Thornton, W.A.	(A.A.O.)
S14*	De Grey Nose, W.A.	(B.O.C.)
S15*	Mermaid - Cartier, W.A. & N.T.	(B.O.C.)
S16*	Steamboat - Spit, W.A.	(B.O.C.)
S17	Scorpion Bight, W.A. (& Gravity)	(Coastal)
S18*	Jaubert, W.A. (& Magnetic)	(Hematite)
S19	Barberton, W.A.	(WAPET)
S20	Barbwire 2, W.A.	(WAPET)
S21	Barrow 3, W.A.	(WAPET)
S22	Collins II, W.A.	(WAPET)
S23	Coomallo 2, W.A.	(WAPET)
S24	Crossland III, W.A.	(WAPET)
S25	Doran, W.A.	(WAPET)
S26	Jones Range - Hall Range, W.A.	(WAPET)
S27	Mullering, W.A.	(WAPET)
S28	Murat, W.A.	(WAPET)
S29	Rockingham, W.A.	(WAPET)
S30	Sahara II, W.A.	(WAPET)
S31	Warradong II, W.A.	(WAPET)
S32	Quins, N.T. (& Gravity)	(Aquitaine)
S33*	Calder - Evans, N.T.	(B.O.C.)
S34	Central Amadeus, N.T.	(Magellan)
S35*	Kiriwina, PNG	(Amoco)
S36*	Trobriand Islands Detail, PNG	(Amoco)
S37	Kiwai, PNG	(Endeavour)
S38*	Bougainville D-1, PNG	(Shell)
S39	Morehead, PNG	(Texaco)

\* Offshore Operation

GRAVITY SURVEYS

G1	Windorah East, Qld	(XLX)
G2	Coolcalalaya, W.A.	(Sunningdale)
G3	Gardiner Range, N.T.	(Magellan)
G4	Mount Gurner, N.T.	(Magellan)