

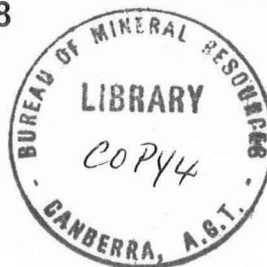
COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

053541

Record No. 1970 / 108



**Petroleum Exploration Branch
Summary of Activities
1970**

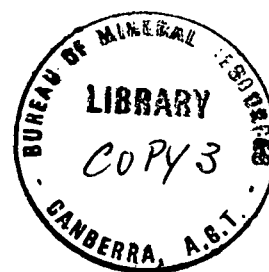
(Period from 1 November 1969 to 31 October 1970)

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Record No. 1970 / 108



Petroleum Exploration Branch Summary of Activities 1970

(Period from 1 November 1969 to 31 October 1970)

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PETROLEUM EXPLORATION BRANCH

SUMMARY OF ACTIVITIES

1970

(Period from 1.11.69 to 31.10.70)

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SUBSURFACE SECTION

SEDIMENTARY BASINS STUDY SECTION

The Sedimentary Basins Study Section continued its review of the Sydney Basin and began collecting and compiling basic data on the Canning Basin. Bibliographies were completed for six sedimentary basins. Editing of Report No. 134 - "Review of the Otway Basin" continued. The mechanics and objectives of basin studies were examined and a manual for compiling basin study reports was written. An assessment of oil search activities in Australia and Papua-New Guinea was maintained.

Sydney Basin

Three wells, B.M.R. Wollongong Nos. 1, 2, and 2A, were drilled near Nowra in March and April of 1970 to resolve stratigraphic correlation problems in the area. The drilling demonstrated that the Nowra Sandstone has been wrongly correlated by earlier workers.

Basin-wide geological correlations have been established. All subsidised onshore seismic records have been reduced and spliced to give long sections across the Sydney Basin and the geological correlation has been checked with the seismic correlation. Preparation of isopach, litho-facies, and structural contour maps has commenced.

A three plate aeromagnetic map (total intensity and interpretation) and a partially complete Bouguer anomaly contour map have been drafted.

Canning Basin

Columnar sections of wells and measured sections in the Canning Basin have been drawn and an attempt is being made to correlate the Carboniferous, Devonian and Ordovician rocks.

Specifications for the contract reduction of seismic, gravity, and aeromagnetic maps and seismic sections are being drawn up.

A seismic locality map is being prepared.

A preliminary petrological study of the Devonian in Frome Rocks No. 2 and in Meda No. 2 commenced.

Petroleum exploration in Australia and Papua-New Guinea

A card index of drilling and geophysical operations was kept. Progress maps were maintained of the Dongara-Yardarino-Mondarra oil and gas fields in Western Australia, the Pleasant Hills-Grafton Range-Mooga gas fields in Queensland, and the Gidgealpa-Moomba gas fields in South Australia. A progress map of petroleum exploration and development wells drilled in 1969 and 1970 was maintained.

Draft summaries of oil search activities for 1968 and 1969 were prepared.

Unpublished records and compilations

Bibliography of the Perth Basin, Western Australia. Record 1970/8.	Distributed
Bibliography of the Canning Basin, Western Australia. Record 1970/9.	Distributed
Bibliography of the Sydney Basin, New South Wales, Record 1970/19.	Typed onto duplimats
Bibliography of the Carnarvon Basin, Western Australia. Record 1970/71.	With typists
Bibliography of the Bonaparte Gulf Basin, W.A. and N.T. Record 1970/17.	Distributed
Bibliography of the Clarence-Moreton Basin of New South Wales and Queensland. Record 1970/58.	Ready for distribution
Dawsonite in Sydney Basin Wells. Record 1970/7	Distributed
A history of the torbanite industry and of the search for hydrocarbons in the Sydney Basin of N.S.W. Record 1970/36.	Distributed
Summary of oil search activities in Australia and Papua-New Guinea during 1968.	Draft
Summary of Oil search activities in Australia and Papua-New Guinea during 1969.	Draft
Part of the petroleum chapter in the Australian Mineral Industry 1969 Review.	Draft
Manual for compiling basin study reports in the Petroleum Exploration Branch	Typed onto duplimats
Well completion report, B.M.R. Wollongong Nos. 2 and 2A, Sydney Basin, N.S.W.	Draft

CORE AND CUTTINGS LABORATORYVisitors

235 B.M.R. personnel and 128 company personnel representing 76 outside organisations visited the Laboratory. The full facilities offered in the Laboratory for the petrological examination and chemical testing of the stored subsurface samples were used by B.M.R. personnel for a total of 312 working days and by Company personnel for 159 working days.

Major works carried out in the laboratory

1005 wells/bores were plotted on wall maps and were documented in the Laboratory's well data storage and retrieval system. This number

includes all subsidised wells, every offshore well, and all B.M.R. scout bores drilled during the period. The total number of wells documented in the Laboratory is 5230.

Significant steps have been made towards the establishment of an Australia-wide system of documenting oil wells and bores which are relevant to oil search and from which materials are stored in the Laboratory. Pilot studies in geological data processing were undertaken, coding forms were made and computer programmes were written for the processing of general well data and information, associated sample data, borrowings and results of tests, frequency calculations, conversions of grid references and sample depth intervals to metric equivalents etc. The trials were run on the C.S.I.R.O. 3600 CDC Computer - all were successful. As a consequence of these trials, a computerised data processing system was proposed, and this is now being examined by the Organisation and Methods Section of the Department of National Development.

The system developed in the Laboratory for allocating unique numbers to oil wells and B.M.R. bores in particular grid areas has now been adopted by Esso Standard Oil (Australia) Limited. A scheme for the exchange of non-confidential information between the Core and Cuttings Laboratory and Esso has been agreed upon.

The Laboratory's computerised technique for interpretation of Differential Thermal Analysis results was further advanced. A technique has been evolved for the digitisation of D.T.A. curves and programmes have been written for the computerised comparison procedures between unknowns and references (1773 reference minerals and mineral assemblages). However, the four channel "Deltatherm" D.T.A. apparatus has been idle for the last six months due to staff shortages and lack of requests for analysis.

184,434 feet of cuttings were tested for phosphate, from 5390 feet of drilled interval for evaporites (bromide analysis by Mines Exploration Pty. Ltd.), and 132 samples for carbonates (Sedimentary Basins Study Section).

Experiments were carried out with several heating processes to reducing the setting time for resins when preparing "buttons" (reference materials embedded in clear resins). The best results were achieved with the use of dielectric currents; setting times were reduced from 24 hours to one hour without any loss in transparency.

The covering technique developed in the Laboratory to give an "as polished" appearance to "buttons" so that they can be examined under the microscope has been extended to cover cores or flat surfaces on rock. The Laboratory prepared "as polished" 138 type rocks from the main metalliferous provinces to be exhibited in Australian Embassies overseas.

268 thin sections were prepared. Total number of thin sections in store is 4321.

A list was prepared and distributed of all seismic surveys for which reports, sections or maps are stored in the Laboratory.

Experiments were carried out with new etching and staining techniques for the preparation of acetate peels of carbonate rocks.

A catalogue of all B.M.R. drilling was kept and the currently available numbers in the relevant grid areas were distributed to B.M.R. party leaders. In the current field season, seven outgoing Field Parties were equipped with materials required for the packaging and transportation of subsurface samples (core boxes, cartons, labelled polythene bags for cuttings, lay-flat poly-tubing for cores, staplers, marking pens, etc.) a Study is now being undertaken to see whether the packaging of cores can be simplified.

Pads of Sample Submission Forms were distributed to all companies submitting materials to the Laboratory (133 company operations and 48 Bureau drilling operations during the period). Details of core and cuttings received were forwarded to the Subsidy Section.

53,590 pre-labelled polythene cuttings bags were sent to 81 well-sites. The demand from industry for the bags increased more than three times over the previous period.

Store

The Laboratory continued to receive, label, catalogue, index and store subsurface samples from subsidised drilling and geophysical operations (Petroleum Search Subsidy Act), from off-shore drilling (Petroleum (Submerged Lands) Act), from B.M.R., and State Mines Departments drilling operations and from private company drilling operations (donations).

Materials received

Subsurface materials were received from 133 oil wells and 48 B.M.R. scout bores.

Subsidised operations - Cores.

7332 samples were received, representing approximately 5750 feet of cored interval.

Subsidised operations - Cuttings.

25,686 samples, representing 286,728 feet of drilled interval.

Subsidised operations - Seismic Shothole Samples.

2329 samples, representing approximately 140,000 feet of drilled interval.

Subsidised operations - Drill-stem tests.

17 fluid samples.

Offshore operations - Cores.

1886 samples, representing approximately 640 feet of cored interval.

Offshore operations - Cuttings.

4946 samples, representing 79,126 feet of drilled interval.

B.M.R. operations - Cores.

7800 samples, representing approximately 3250 feet of cored interval.

B.M.R. operations - Cuttings.

1790 samples, representing 87,631 feet of drilled interval.

Donations - Sidewall Cores.

38 samples.

Donations from Queensland and South Australia State Mines Departments - Cores.

5825 samples, representing approximately 300,000 feet of cored interval.

Donations from Queensland and South Australian State Mines Departments - Cuttings.

1225 samples, representing 19,717 feet of drilled interval.

Registration

During the year 53,012 samples were registered (received, marked with depth intervals, repacked into standard containers, documented and put into permanent storage).

Store Totals

Grand total of samples stored in the Laboratory:

Cuttings:	383,557 (representing over four million feet of drilled interval).
Cores:	84,943 (approximately seven miles of actual core material if samples are laid end to end).
Sidewall Cores:	2419

Estimated number of unregistered samples (stored within and outside of the Laboratory, awaiting registration): 500,000.

Major works carried out in the Store

A 10,000 sq. ft. extension to the Laboratory which was planned for 1970-71 has been deferred to 1971-72. An acute shortage of storage space developed late in 1969 and, as a result, the store part of the Laboratory was reorganized in the first half of 1970. 648 man hours were spent repacking all stored materials in a more condensed form: 3500 extra shelves were placed in the existing storage cabinets. At the same time the collection was re-arranged in the order of the index numbers, making retrieval of materials easier. Approximately 250,000 unregistered samples are still stored outside of the Laboratory awaiting completion of the extensions.

2449 core samples were halved and three quartered: three-quarters of each sample were returned to the N.S.W. Department of Mines and one-quarter of each sample was retained in the collection in accordance with existing exchange arrangements with the N.S.W. State Mines Department.

Two slabbing saws were modified for dry or semi-dry slabbing of cores as wet slabbing may disintegrate friable and soluble cores.

The extensions to the Laboratory built in 1969 for storage purposes have all been filled and put into use.

Slabbing room (218.5 sq. ft)

- Clipper slabbing saw, cuttings washing and drying machine, sieve shaker installed.

Records rooms (352 sq. ft)

- Filled with documentary material received in accordance with the Petroleum Search Subsidy Act.

Thin section storage room (175 sq. ft)

- Equipped with petrological microscope, storage cabinets for thin sections and associated description cards.

Glassware storage room (64 sq. ft)

- Fitted with wooden storage racks for glassware.

Acid storage room (36 sq. ft.)

- Acid resistant coating on all surfaces, special fittings for light and ventilation. Stores all corrosive and toxic materials.

Display room (337 sq. ft)

- Fitted with benches for display and for drying of samples.

SUBSIDY SECTION

Applications

During the 12 months from 1st November, 1969 to 31st October, 1970 the Subsidy Section received 114 applications for approval of operations under the Petroleum Search Subsidy Act 1959-1969. These consisted of 40 exploration drilling applications and 74 geophysical applications. Of these applications, 95 had been approved at 31st October, one drilling operation was refused, 2 drilling operations were withdrawn, and the Minister had not yet given a decision on 16 applications.

The geophysical operations were made up of 64 seismic surveys, of which 7 included gravity readings and 12 were marine surveys, 8 gravity surveys and 2 aeromagnetic surveys. 7 of the drilling applications were for wells to be drilled offshore.

In addition to the above applications, 35 applications were also received for approval of additional work on approved operations, i.e. for approval of an extension to the approved programme of an operation. Of these, 16 were for extensions to the approved target depth of wells or for production testing, 18 were for extensions to the approved programme of seismic surveys, and 1 was for an extension to the programme of a gravity survey.

The applications received for exploration drilling operations and geophysical operations are listed in Tables 2 and 3 respectively and their location is shown on the accompanying maps, Plates 1 and 2, respectively.

Approvals

During the same period, the Minister approved 118 operations under the Petroleum Search Subsidy Act 1959-1969. 36 of these were exploration drilling operations and 82 were geophysical operations. In addition, 43 extensions to approved programmes were approved, 22 to drilling operations and 21 to geophysical operations. The estimated financial commitment to the Commonwealth by way of subsidies as a result of these approvals was \$7,310,236.

Expenditure:

In the 12 months to 31st October, 1970, \$10,262,118 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 also into drilling and geophysical expenditure and onshore and offshore expenditure is given in Table 1.

TABLE I
Petroleum Search Subsidy Expenditure

1st November, 1969 - 31st October, 1970

State	Drilling Operations		Geophysical Operations		Total
	Onshore	Offshore	Onshore	Offshore	
Queensland	797,874	249,579	429,108	152,320	1,628,881
New South Wales	206,992	-	175,788	73,864	456,644
Victoria	137,228	312,914	123,102	49,852	623,096
Tasmania	-	364,434	-	30,610	395,044
South Australia	439,031	-	263,135	95,208	797,374
Western Australia	510,076	1,954,704	482,075	917,760	3,864,615
Northern Territory	518,260	235,665	57,511	255,831	1,067,267
Papua & New Guinea	574,960	7,441	805,625	41,171	1,429,197
	3,184,421	3,124,737	2,336,344	1,616,616	10,262,118

The expenditure under the Petroleum Search Subsidy Act 1959-1969 during the financial year ending 30th June, 1970 was \$14,298,033. This amount was the highest annual expenditure in any financial year since the beginning of subsidy in 1957/58, exceeding the previous highest amount by 1.8 million dollars.

At 31st October, 1970 the total expenditure by the Commonwealth in petroleum search subsidies was \$100,806,593 and the total commitment was \$106,846,930.

Areas Excluded from Subsidy

During the period under review, the Minister excluded additional areas in Queensland from subsidy. These were:

- (1) An area within a 20 miles radius of Roseneath No. 1;
- (2) An area within a 40 miles radius in each case of Grafton Range Nos. 10, 14, 13 and 4, these wells defining the present limits of the Grafton Range gas field.

Features of Subsidised Exploration

The subsidised exploration during the 12 months to 31st October, 1970 was scattered widely throughout Australia and Papua and New Guinea; however there were some significant areas in which little exploration was done. There was no subsidised exploration carried out in the Amadeus Basin or the Adavale Basin, while only 1 gravity survey was carried out in the onshore Carnarvon Basin.

On the other hand some of the less prospective areas received some renewed attention. In the Laura Basin, a 2 well programme was completed, which followed a seismic survey done there the previous year. A gravity survey was undertaken in the eastern Officer Basin and some renewed interest was shown in the Toko Syncline area of the Georgina Basin where a 3 month seismic programme was conducted. An area to the south-west of Oodnadatta, which has been called the Arckaringa Basin and which had previously received little attention, was the subject of 2 seismic and gravity surveys and one well. An extensive seismic programme is also being carried out in the Lake Frome Embayment.

The only subsidised offshore drilling to be carried out during the period under review was off the north-west coast of Australia. Subsidised offshore geophysical work was carried out in waters adjacent to New South Wales, South Australia, Western Australia and Northern Territory.

The most active areas for subsidised exploration were the Cooper Basin, onshore Canning Basin, North-west Shelf and Papua and New Guinea. These areas are discussed in more detail below.

The only significant petroleum discoveries in subsidised wells were both in the Cooper Basin. Roseneath No. 1, in Queensland, produced gas at a rate of 8 MMcf/d from the Permian Gidgealpa Formation

and has been completed as a gas producer. Packsaddle No. 1, in South Australia, also produced gas at a rate of 2.6 MMcf/d on drill stem test and production testing is in progress.

Petrel No. 1 well, which blew out on August 6th, 1969 after encountering a strong gas flow, has still not been controlled completely. A relief well, No. 1A, was directionally drilled to intersect the gas reservoir within about 50 feet of the original well, and large quantities of salt water followed by cement and mud were pumped in an attempt to communicate with and then seal off the flowing well. This has been partially successful and it is estimated that the flow is now only about 20% of its original size. The company is now considering the next steps to be taken to complete the killing of the well.

Cooper Basin

Due to the farmouts granted by the original leaseholders (Delhi International Oil Ltd. and Santos Ltd.) around the Gidgealpa and Moomba gas fields and to the lure of the Sydney gas market, the Cooper Basin has become one of the most active exploration areas in Australia. During the 12 months to 31st October, 1970, 7 subsidised seismic surveys were completed and one was still in progress at this date; about 1100 miles of coverage was obtained by these surveys and in addition gravity readings were made along the seismic traverses on 4 of the surveys.

In the same period 10 subsidised wells were completed for a total footage of 80,574 feet and one further well was in progress at 31st October, 1970. The wells to the north-east of the Gidgealpa-Moomba gas fields averaged about 10,600 feet in depth, whereas those to the south averaged only about 5000 feet. In all cases the main objective was to test the Permian Gidgealpa Formation, but several of the wells were continued deeper to evaluate the Pre-Permian, and in one case, Coongie No. 1, also tested a possible structure in the Cambrian. Coongie No. 1 was the deepest test, being drilled to 11,941 feet.

As already recorded above, the Roseneath No. 1 and Packsaddle No. 1 wells in this area discovered large flows of gas.

There was a considerable amount of additional seismic and drilling activity in the Cooper Basin which fell within the areas excluded from subsidy around the Gidgealpa and Moomba gas fields, and a number of large gas flows and a significant oil flow have been discovered within these areas during 1970.

North-west Shelf

Exploration continued on the North-west Shelf during the period under consideration at a fairly active level. About 5250 miles of subsidised seismic coverage was surveyed with the main objective of detailing structural leads which had been revealed by the reconnaissance work carried out in previous years. A drilling programme has proceeded continuously throughout the year using the "Glomar Tasman" drilling vessel and 4 wells were completed.

The results of these wells have been disappointing as all have been dry. Sahul Shoals No. 1 situated about 120 miles north-east of Ashmore Reef No. 1 was drilled to 12,475 feet and was the deepest

subsidised well drilled this year. It encountered about 5450 feet of Tertiary sediments and 435 feet of Upper Cretaceous resting with angular unconformity on a predominantly marine Triassic section about 6415 feet thick, and bottomed in a re-crystallised limestone of late Permian age. The Legendre No. 2 well was drilling at 31st October, 1970. It is 5 miles north-east of Legendre No. 1, which produced oil at about 1000 b.p.d., and is on the same structural trend.

Canning Basin (Onshore)

Exploration in the onshore Canning Basin received a big boost this year when West Australian Petroleum Pty. Ltd. embarked on a large seismic programme employing 2 crews continuously from May onwards. This programme was continuing at 31st October. A large part of the programme consists of long reconnaissance lines through the Great Sandy Desert. Together with work by other operators, about 1250 miles of seismic coverage was completed in the period. 5 wells were also completed, 3 of them on the Lennard Shelf, where a thicker Palaeozoic section has been encountered than had been expected.

Papua and New Guinea

In terms of coverage obtained, geophysical activity in Papua and New Guinea cannot be said to be high, but in terms of expenditure it is quite considerable. During the 12 months, 5 seismic surveys were completed, 2 were in progress at 31st October, 1970, and 2 gravity surveys and 1 aeromagnetic survey were completed. The total estimated expenditure on these surveys was 3.7 million dollars. The cost of some of the seismic work is running as high as \$10,000 per mile, a testimony to the severe operational and logistical problems encountered in the area. One subsidised well, Ipigo No. 1, was drilled to a depth of 9252 feet.

Publications

Two reports of subsidised operations were published during the year:

- No. 84 - Permit No. 39, Papua, Marine Seismic Survey 1966, by Phillips Australian Oil Company,
- No. 88 - Summary of Data and Results, Otway Basin, Victoria, Pecten No. 1-1A and Nerita No. 1, by Shell Development (Aust.) Pty. Ltd.

Ten more reports were prepared for publication during the year.

TABLE 2Applications for Approval of Exploration Drilling Operations1 November 1969-31 October 1970

1.	Mowla No. 1	W.A.	(Total)
2.	Mt Emu No. 1	N.S.W.	N.S.W. O. & G.
3.	Gilpeppie No. 1	Qld.	(Alliance)
4.	Sahul Shoals No. 1	N.T.	(B.O.C.) -0
5.	Muttaborra No. 1	Qld.	(Pursuit)
6.	Cherri No. 1	S.A.	(Pexa)
7.	Coongie No. 1	S.A.	(Flinders)
8.	Howes Swamp No. 1	N.S.W.	(Esso)
9.	Coreena No. 1	Qld.	(Beaver)
10.	Weedina No. 1	S.A.	(Pexa)
11.	Sunset No. 1	Vic.	(A.A.O.)
12.	Morkalla No. 1	Vic.	(A.A.O.)
13.	Nadda No. 1	S.A.	(A.A.O.)
14.	Valetta No. 1	Qld	(Beaver)
15.	Packsaddle No. 1	S.A.	(Alliance)
16.	Ipigo No. 1	Papua	(A.P.C.)
17.	Gurra No. 1	S.A.	(Pexa)
18.	Kumbarie No. 1	S.A.	(Pexa)
19.	Lacepede No. 1	W.A.	(B.O.C.) -0
20.	Koburra No. 1	Qld.	(Flinders)
21.	Weena No. 1	S.A.	(Pexa)
22.	Belmore No. 1	Qld.	(Longreach)
23.	Napier No. 4	W.A.	(Lennard)
24.	Tallalia No. 1	Qld	(Flinders)
25(a)	Breeza Plains No. 1	Qld.	(Crusader)
25(b)	Lakefield No. 1	Qld.	(Crusader)
26.	Leveque No. 1	W.A.	(B.O.C.) -0
27.	Rosella Creek No. 1	Qld.	(Target)
28.	Enderby No. 1	W.A.	(B.O.C.) -0
29.	Napier No. 5	W.A.	(Lennard)
30.	Charlotte No. 1	W.A.	(WAPET) -0
31.	Legendre No. 2	W.A.	(B.O.C.) -0
32.	Magobu Island No. 1	Papua	(Endeavour)
33.	Yanpurra No. 1	S.A.	(Flinders)
34.	Allandale No. 1	Qld.	(Beaver)
35.	Warnbro No. 1	W.A.	(WAPET) -0

36. Horrane No. 1	Qld.	(Amalgamated)
37. Tinganoo Bay No. 1	N.T.	(Flinders)

0 - Offshore

AUSTRALIA AND NEW GUINEA

PETROLEUM SEARCH SUBSIDY ACT 1959-1969

APPLICATIONS FOR APPROVAL OF EXPLORATION DRILLING OPERATIONS

1 November 1969 — 31 October 1970

200 0 200 400 600 800 Kilometres
200 0 200 400 Miles

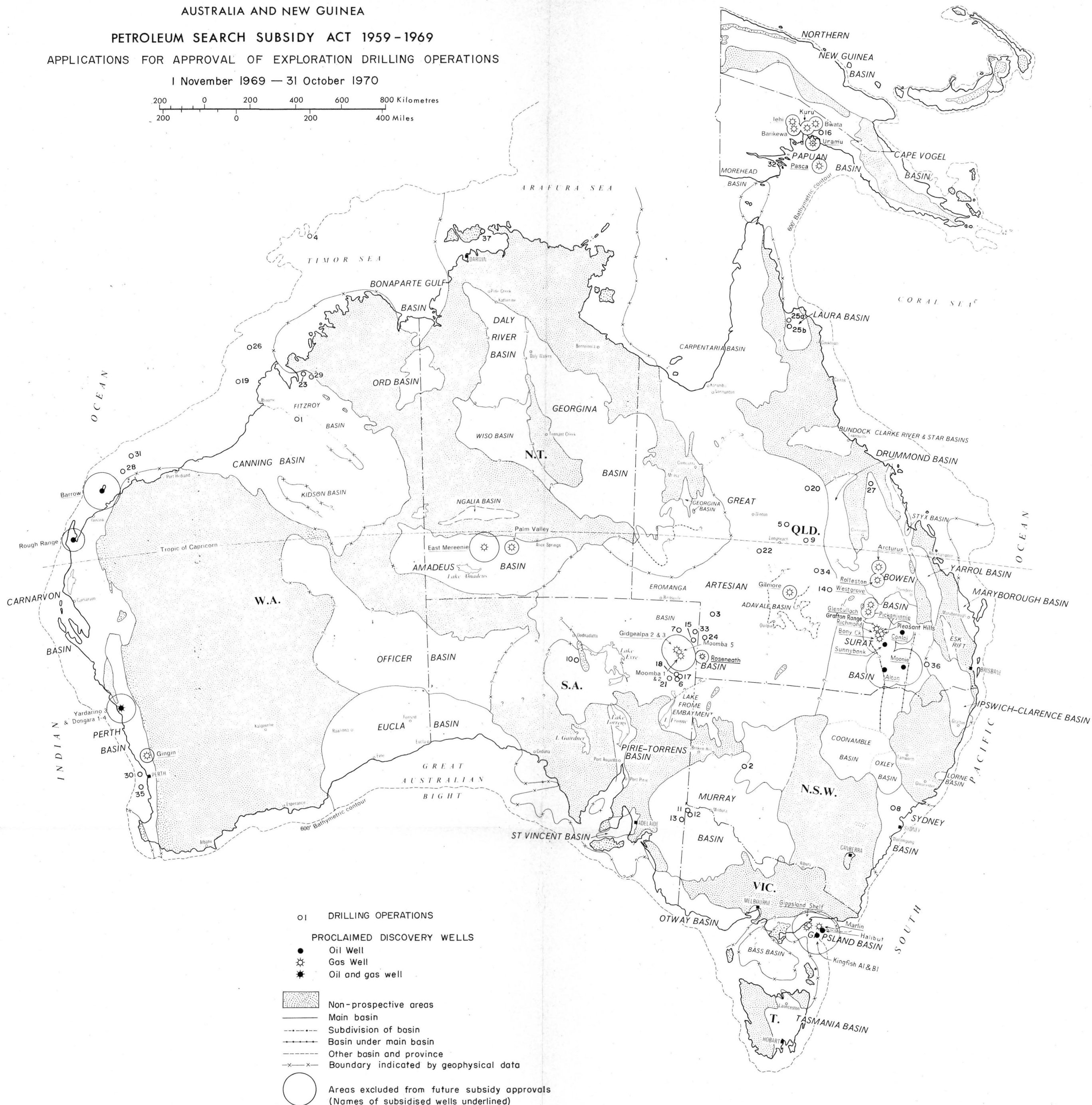


TABLE 3

Applications for Approval of Geophysical Operations1 November 1969-31 October 1970Seismic (Land)

S1. Packsaddle-Innaminka,	S.A.	(Alliance Petroleum)
S2. Macarthur-Portland,	Vic.	(Shell)
S3. Munro R-1,	W.A.	(Wapet)
S4. Winnathee,	N.S.W.	(N.S.W. O.M.)
S5. Koburra,	Qld.	(Flinders)
S6. Hamilton Gate,	N.S.W. & Qld.	(N.S.W. O.G.)
S7. Warrinilla West,	Qld.	(Planet)
S8. Mubi,	Papua	(BP)
S9. Dandaragan West,	W.A.	(Wapet)
S10. Tarwin,	Vic.	(A.P.M.)
S11. Moore River-Lancelin,	W.A.	(Wapet)
S12. Mount Emu,	N.S.W.	(N.S.W. O.G.)
S13. Gambier Trough,	S.A.	(Alliance)
S14. Jerilderie North,	N.S.W.	(N.S.W. O.G.)
S15. Narweena,	N.S.W.	(Pexa)
S16. Toko Range,	Qld.	(Alliance)
S17. Mt. Ross,	S.A.	(Vamgas)
S18. Parkes,	N.S.W.	(N.S.W. O.G.)
S19. Tabletop,	W.A.	(Wapet)
S20. Horrane,	Qld.	(Amalgamated)
S21. Wannon,	Vic.	(Alliance)
S22. Alexander II,	W.A.	(Lennard)
S23. East Lynne,	Qld.	(Beaver)
S24. Stockton,	N.S.W.	(N.S.W. O.G.)
S25. Mai Mai,	New Guinea	(Aquitaine)
S26. Bundulla,	N.S.W.	(Alliance Petroleum)
S27. Patchawarra Central 2,	S.A.	(Bridge)
S28. Helena,	W.A.	(Wapet)
S29. Shotover,	Qld.	(U.P.R.)
S30. Burt Range,	N.T.	(Lennard)
S31. Lake Betty,	W.A.	(Wapet)

S32. Coopers Creek Central,	S.A. & Qld.	(Flinders)
S33. Pincombe Range,	W.A.	(Alliance)
S34. Libano,	Papua	(A.P.C.)
S35. Crossland,	W.A.	(Wapet)
S36. Balimo,	Papua	(Texaco)
S37. Walyering Detail,	W.A.	(Wapet)
S38. Gogo Trig,	W.A.	(Wapet)
S39. Laurel,	W.A.	(Wapet)
S40. Oscar,	W.A.	(Wapet)
S41. Bemm River,	Vic.	(W.Y.P.)
S42. P.E.L. 179,	N.S.W.	(Calcana)
S43. Broome-Samphire,	W.A.	(Wapet)
S44. Preston Detail,	W.A.	(Wapet)
S45. Perder,	W.A.	(Wapet)

Seismic and Gravity (Land)

SG1. Innamincka,	Qld. & S.A.	(Flinders)
SG2. Thallon,	Qld.	(Pexa)
SG3. Lake Conway,	S.A.	(Pexa)
SG4. Accalana,	S.A.	(Pexa)
SG5. Cecilia,	Papua	(Texaco)
SG6. Peake Creek,	S.A.	(Pexa)
SG7. Stretch Range,	W.A.	(Aquitaine)

Seismic (Marine)

SM1. Perth Waters,	W.A.	(Wapet)
SM2. Barrow Waters,	W.A.	(Wapet)
SM3. Canning,	W.A.	(Wapet)
SM4. Poldia Basin,	S.A.	(Bridge)
SM5. Baudin,	S.A.	(Hematite)
SM6. King Sound,	W.A.	(Wapet)
SM7. Geelvink Channel,	W.A.	(BP)
SM8. Tryal-Evans,	W.A. & N.T.	(B.O.C.)
SM9. Twilight Cove,	W.A.	(Genoa)
SM10. South Sydney Basin,	N.S.W.	(Magellan)
SM11. South Broken Bay,	N.S.W.	(Longreach)
SM12. Charlotte Head,	N.S.W.	(N.S.W. O.G.)

Aeromagnetic

- A1. Lake Murray-Aramia,
A2. Portland-Geelong,

Papua (Continental)
Vic. (Shell)

Gravity

- G1. Jerilderie,
G2. Madang,
G3. Casterton,
G4. Eastern Officer Basin,
G5. Murchison-Gascoyne,
G6. Mt. Daer,
G7. Ngalia Basin 2,
G8. Kanau,

N.S.W. (N.S.W. O.G.)
New Guinea (Continental)
Vic. (Planet)
S.A. (Murumba)
W.A. (Barewa)
N.T. (Beach)
N.T. (Magellan)
Papua (A.P.C.)

AUSTRALIA AND NEW GUINEA

PETROLEUM SEARCH SUBSIDY ACT 1959-1969

APPLICATIONS FOR APPROVAL OF GEOPHYSICAL OPERATIONS

1 November 1969 — 31 October 1970

200 0 200 400 600 800 Kilometres
200 0 200 400 Miles

