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Petro Quest Pty. Ltd.,
151-155 Dorcas Street,
South Melbourne,
Victoria. 3205

REPORT PET 703/3

MICROFILMED
FICHE No.014498-

TASMANIAN OIL-SHALE PROSPECTS

QUARTERLY INTERIM REPORT

for

PETRO QUEST PTY. LTD.

by

GENERAL GEOLOGICAL SERVICES

OPEN FILE

Work Order PET 703

MAY, 1980

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TASMANIAN OIL-SHALE PROSPECTSQUARTERLY INTERIM REPORT1. INTRODUCTION

This report presents the operations carried out by General Geological Services for Petro Quest Pty. Ltd. in connection with oil shale search throughout four exploration licence areas in central-north Tasmania for the period of 10th January to 31st March, 1980. It also outlines plans for operations during the next quarter.

Petro Quest Pty. Ltd. applied to the Tasmanian Department of Mines in July 1979 for approval to undertake exploration for "coal (including peat and shale)" as set out in Section 15B of The Mining Act, 1929, in four prospective areas covering approximately 3,500 square kilometres as shown in Figure 1. These areas include not only already known oil-shale localities but also geological formations possessing a potential for oil-shale occurrence.

A summary of the licence areas is given below. Specific data on the location and extent of each of these areas appears in Figures 2 to 6, and in their respective Schedules (Appendix 1).

<u>Petro Quest Survey Areas</u>		<u>Tasmanian Mines Department Exploration Licence Areas</u>			
<u>No.</u>	<u>Name</u>	<u>No.</u>	<u>Land District</u>	<u>Vicinity</u>	<u>Area (Km²)</u>
1	Hellyer	17/79	Wellington	Yolla	895
2	Latrobe	18/79	Devon	Railton	592
				Area 1	352
				Area 2	177
3A	Golden Valley)	19/79	Devon, Westmoreland and Somerset	Great	1,272
3B	Bracknell)			Western Tiers	
4	Beaconsfield	21/79	Devon & Dorset	Beacons- field	741

The framework of the exploration programme as initially proposed (General Geological Services, October 1979 and December 1979) is as follows:

<u>Stage</u>	<u>Work Programme</u>	<u>Timing</u>
		<u>Year One</u>
1.	Region geological appraisal	12 months
	A. Preliminary reconnaissance	2 months
	B. Detailed geological mapping and sampling	4 months
	C. Geophysical and scout-drilling programmes	6 months
2.	Engineering and reverse economic studies	6 months (With Stage 1C)
		<u>Year Two</u>
3.	Detailed evaluation of oil-shale	8 months
4.	Feasibility studies	4 months

The geological appraisal to date embraces Stages 1A and 1B; it has included a literature search and a field survey which covers both the region as a whole and the specific exploration licence areas. The work programme for Stages 1A and 1B in the next quarter will involve a literature review, analysis of survey data, and preparation of a report.

Monthly reports have been prepared for each of the four exploration licence areas for the month ending 31st May, 1980. This interim report should be read in conjunction with the monthly reports.

2. OPERATIONS PERFORMED

2.1 Establishment

Petro Quest Pty. Ltd. is meeting its exploration responsibilities in Tasmania through the activity and advice of General Geological Services who are retained as both administrative and technical managers and consultants for the current oil-shale programme.

The address of Petro Quest Pty. Ltd. is:

151 - 155 Dorcas Street,

South Melbourne,

Victoria. 3205

Telephone - (03) 690 5317, (03) 690 5900

2.11 Administrative Management

All administrative matters concerning the programme are under the control of Mr. Colin Glazebrook who is Managing Director of General Geological Services (155 Dorcas Street, South Melbourne, Victoria, 3205); he also acts as Exploration Manager for Petro Quest Pty. Ltd.

2.12 Technical Management

General Geological Services has engaged senior consultants for the duration of the programme. Project Manager is Dr. A.G. Link who is responsible for supervising the field work and the detailed reporting of the Stage 1A and 1B programmes. He is supported by Mr. R.C. Glenie and several geological assistants. These consultants will be supplemented by additional personnel and service company representatives depending on the development of the exploration programme.

A field office was established at Beauty Point - 45 km NW of Launceston. This location permitted relatively efficient access for field parties to Petro Quest Areas 2 (Latrobe), 3A (Golden Valley), 3B (Bracknell) and 4 (Beaconsfield). Area 1 (Hellyer) was surveyed from field camps set up at various locations.

2.2 Data Collection

The history of oil-shale exploration and associated hydrocarbon production in Tasmania goes back to at least 1910 when the first small retorts were erected in the Latrobe area. Intermittent development of these oil-shale resources by various companies through the following 25 years until 1932, experimental projects by governmental organizations from 1936 to 1941, and investigations by Endeavour Oil Company N.L. (now Endeavour Resources Ltd.) from 1974 to the present, together with many related studies by the Tasmanian Geological Survey, provide relatively numerous though scattered data sources.

2.21 Literature Search

An initial collection and review of the most important literature was made prior to application for exploration licences. This information was augmented during and following the field programme from a systematic search for relevant literature made at

- (i) technical libraries in Melbourne, and particularly at
- (ii) the Tasmanian Department of Mines in Hobart where early records, documents, and open-file material were available.

The main categories of data compiled from these

sources can be listed as follows:

- * Regional geological and geophysical data in the form of published papers and maps dealing with basin-wide Permo-Triassic rock units, major structural elements, hydrogeology, bio-stratigraphy, and palaeo-environmental interpretations.
- * Specific information on the geology and mining of the oil-shale deposits as recorded in the form of technical papers, unpublished reports and plans, and related documents.
- * Topographic maps.
- * Land ownership plans.
- * Environmental and conservation data.

2.22 Photographic and Imagery Cover

In order to supplement existing geological maps and to extend oil-shale units into unmapped areas during the field survey, the following aerial photographs were obtained from the Tasmanian Department of Lands:

- * Complete stereo-aerial photographic coverage of all exploration licence areas selected from the best quality available, regardless of scale.

As a regional overview of the geological framework of the whole of northern Tasmania, appropriate satellite imagery was ordered from the Australian Department of National Development:

- * Ert's band 7 imagery in two sheets across NW and NE Tasmania.

2.3 Geological Reconnaissance

A preliminary drive-through reconnaissance of all four licence areas was made by the Exploration Manager of Petro Quest Pty. Ltd. during the setting out of lease datum notices.

Following establishment of the field station, the field personnel first examined type and reference sections of the major Permian and Triassic litho-stratigraphic units in northern Tasmania, in particular at Poatina, in Quamby Brook, and along the Mersey River cliffs between Latrobe and Railton.

Orientation surveys were carried out by the field team split into two parties led by the Project Manager and the Senior Consultant through Petro Quest Areas 2 (E.L. 18/79), 3A and 3B (E.L. 19/79) and Areas 1 (E.L. 17/79), 4 (E.L. 21/79) respectively. Following initial assessment of area potential, prospective localities were examined in detail either by combined or by interchanged survey parties in order to test opinions and to obtain accurate and correlateable field evaluations.

A generalised model for the depositional environment of the oil-shale (tasmanite) in the Early Permian basin was constructed at the commencement of the field programme. This model greatly assisted in the re-interpretation of stratigraphic units, particularly those units in areas where the earlier available mapping by others is accompanied by little geological description and coarse stratigraphic sub-division.

The prevailing view that the occurrence of tasmanite is confined to a particular position in the Lower Permian Parmeener Super-Group (representing a single event or related series of events in the early stages of the first major marine transgression in the Early Permian) was in general confirmed. This conclusion enabled

certain areas originally believed to be prospective to be discarded and other areas to be considered worthy of further investigation.

A critically limiting factor in the field exploration programme was the overall paucity of outcrop of the prospective stratigraphic units.

The field parties were continuously active in northern Tasmania for six weeks during January and February. Several additional surveys were made to areas of interest during March.

Samples were taken from tasmanite oil-shales found in outcrop in Petro Quest Area 1 (E.L. 17/79), Area 2 (E.L. 18/79), Area 3A (E.L. 19/79) and Area 4 (E.L. 21/79). In addition, a non-marine torbanite oil-shale was sampled in Area 1.

2.4 Previous Mining and Environmental Factor Evaluation

Information on past oil-shale mining and processing has been assembled; the sites of these operations were visited during the field programme. The majority of these old workings are located adjacent to Petro Quest Area 2 (E.L. 18/79) in the Endeavour Resources Ltd. licence area (E.L. 4/74) along the Mersey River between Latrobe, Railton, and Kimberley. A number of the adits are still partly open and the remains of associated retorting plants are identifiable.

Other localities indicating past small extraction attempts and testing operations occur in Petro Quest Area 1 (E.L. 17/79) south of Preolenna, Area 3A (E.L. 19/79) southwest and southeast of Deloraine, and Area 4 (E.L. 21/79) near Lilydale.

The areas of past mining operations have been examined from the viewpoint of their short and long period impact on aspects of the local environment (including soil and vegetation disturbance, deforestation, spring and seepage interference, run-off and drainage change, stream sedimentation and pollution, landslide and subsidence). The more direct effects on land ownership and utilization, grazing and agricultural capacity, water rights, forest management, etc. caused by tailing dumps and settling ponds, adits and shafts, drillholes, processing plants, roads and railways, etc. have also been assessed.

Consideration has also been given to possible sensitive environmental issues which might be raised by rural communities, conservation groups, and forest-product industries.

3. EXPENDITURE

GENERAL GEOLOGICAL SERVICESEXPENDITURE REPORTQUARTER ENDING 31ST MARCH, 1980

COMPANY PETRO QUEST PTY. LTD.
WORK ORDER PET 703
PROSPECT NAME Petro Quest Area 1 - HELLYER, Area 2 - LATROBE,
Area 3 - GOLDEN VALLEY AND BRACKNELL,
Area 4 - BEACONSFIELD
LOCATION AND PERMIT NO. YOLLA E.L. 17/79, RAILTON E.L. 18/79, GREAT
WESTERN TIERS E.L. 19/79, BEACONSFIELD E.L. 21/79

EXPENDITURE DETAILS

	<u>E.L.</u> <u>17/79</u> \$	<u>E.L.</u> <u>18/79</u> \$	<u>E.L.</u> <u>19/79</u> \$	<u>E.L.</u> <u>21/79</u> \$	<u>Total</u> \$
<u>ADMINISTRATION COSTS</u>	602	415	402	422	1,841
<u>OFFICE STUDIES</u>	1,217	1,184	1,002	725	4,128
<u>FIELD STUDIES</u>					
Geological	6,070	3,748	9,531	4,753	24,102
Geophysical					
Drilling					
<u>RENTAL EQUIPMENT ETC.</u>	<u>1,593</u>	<u>374</u>	<u>1,967</u>	<u>898</u>	<u>4,832</u>
TOTALS	\$9,482	\$5,721	\$12,902	\$6,798	\$34,903
	=====	=====	=====	=====	=====

ACCOUNTING OFFICE
MAKING REPORT

PETRO QUEST PTY. LTD.

DATE

30TH MAY, 1980.

4. OPERATIONS PLANNED

4.1 Objective

The ultimate objective of the regional appraisal (i.e. Stages 1A, 1B and 1C) is to provide assessments of the following:

- (i) Likely maximum and minimum in-situ tonnages (inferred reserves).
- (ii) Likely oil-shale quality and its variation (shale grade and oil yield).
- (iii) Broad variations expected in seam thickness.
- (iv) Structure in terms of maximum, minimum, and average dips, and degree of faulting.
- (v) Range of depths at which oil shale may occur (overburden) and some broad idea as to the proportions of oil-shale tonnage which is mineable by open-cut and underground methods.

Although part of these objectives can be reached at the present stage, some cannot be achieved until completion of the geophysical and scout-drilling programmes (Stage 1C). Thus data concerning inferred oil-shale reserves, grade and yield, seam thickness and overburden, structural situation, mining method viability, environmental constraints, etc., will be provisional estimates.

4.2 Interpretation

The next quarter will be devoted to an integrated geological interpretation of all data obtained from the review of relevant literature on Tasmanian oil-shale deposits, and from the results of the field survey in the Petro Quest exploration licence areas.

This interpretation will provide a basis for the preliminary assessment of the oil-shale potential which

will complete Stages 1A and 1B of the exploration programme.

4.3 Maps

A series of maps will be prepared showing the results of the field geological survey and economic assessment on base maps at scales of 1:50,000 and 1:100,000.

Base sheets already prepared at 1:10,000 scale are too detailed for presenting data compiled at this stage, but will probably be incorporated into later stages of the programme.

The maps will contain the following information:

- . Location of exploration licence area boundaries.
- . Past mining areas including processing and testing sites.
- . Geological data including significant rock units and structural elements.
- . Oil-shale potential assessment including preliminary estimates of inferred reserves, and overburden ratios.
- . Drillhole sites and geophysical traverse lines for next stage.
- . Land ownership and utilization.
- . Economic factors including power and water supply, road and rail transport, etc.
- . Areas recommended for relinquishment and/or progress to Stage 1C.

4.4 Assays

Selected samples of oil shale and associated rocks will be submitted for chemical analysis and prepared for petrographic examination.

The oil-shale analyses will generally include a proximate

APPENDIX 1 - EXPLORATION LICENCE AREA SCHEDULESE.L. 17/79 - PETRO QUEST AREA 1 (HELLYER)

Commencing at the Posted Notice situate at a north west angle of the area whose grid co-ordinates are 380,000 metres E., 5,459,000 metres N., thence grid east to low-water-mark on Bass Strait by that low-water-mark in a general south-easterly direction to its intersection with grid 400,000 metres E., grid south to 5,430,000 metres N., grid west to 390,000 metres E., again grid south to 5,420,000 metres N., again grid west to 370,000 metres E., grid north to 5,436,160 metres N., again grid east to 370,410 metres E., again grid north to 5,438,925 metres N., again grid east to 372,210 metres E., again grid north to 5,440,795 metres N., again grid east to 375,845 metres E., again grid north to 5,441,730 metres N., again grid east to 377,665 metres E., again grid north to 5,443,580 metres N., again grid east to 379,470 metres E., again grid north to 5,449,060 metres N., again grid west to 377,580 metres E., again grid north to 5,450,000 metres N., again grid east to 380,000 metres E. aforesaid thence again grid north to the point of commencement.

E.L. 18/79 - PETRO QUEST AREA 2 (LATROBE)

Commencing at the Posted Notice situate at the north-west angle of the area whose grid co-ordinates are 440,000 metres E., 5,440,000 metres N., thence grid east to 470,000 metres east, grid south to 5,410,000 metres N., grid west to 465,000 metres E., grid north to 5,424,000 metres N.; again grid west to 458,000 metres E., again grid north to 5,435,000 metres N., again grid west to 440,000 metres E. aforesaid thence again grid north to the point of commencement.

analysis (moisture, ash, volatile matter, fixed carbon), sulphur, and specific gravity.

4.5 Report

A final report for Stages 1A and 1B of the regional appraisal will be submitted at the end of the next quarter. It will contain conclusions and recommendations on the programme carried out to date.

Commencing at a north-west angle of the area whose grid co-ordinates are 440,000 metres E., 5,420,000 metres N., thence grid east to 457,620 metres E., grid south to 5,410,000 metres N., grid west to 440,000 metres E. aforesaid thence grid north to the point of commencement.

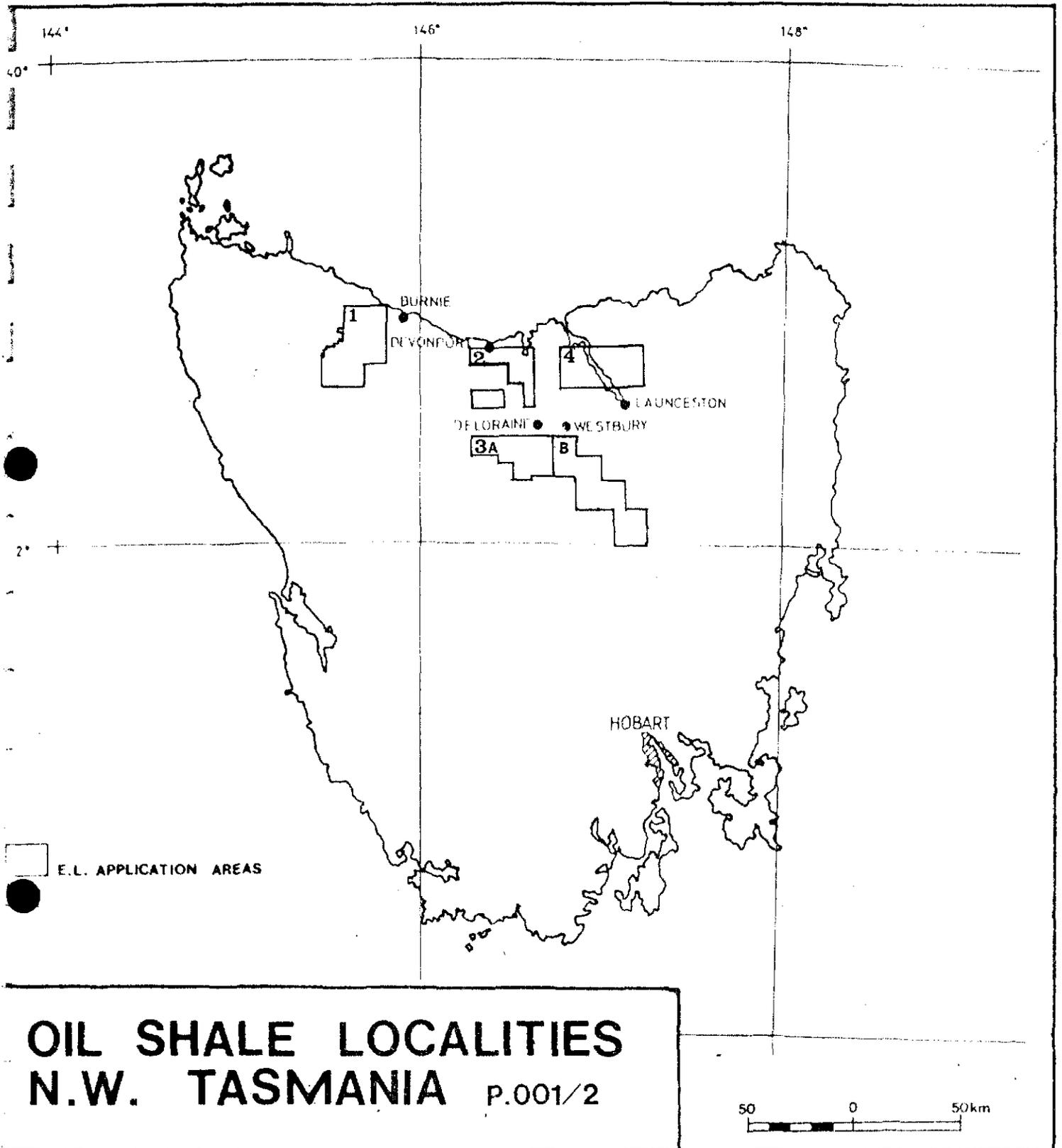
E.L. 19/79 - PETRO QUEST AREAS 3A (GOLDEN VALLEY) AND 3B (BRACKNELL)

Commencing at the north-west angle of the area applied for whose grid co-ordinates are 440,000 metres E., 5,400,000 metres N., thence grid east to 490,000 metres E., grid south to 5,390,000 metres N., again grid east to 500,000 metres E., again grid south to 5,380,000 metres N., again grid east to 510,000 metres E., again grid south to 5,370,000 metres N., again grid east to 520,000 metres E., again grid south to 5,350,000 metres N., grid west to 504,000 metres E., grid north to 5,370,000 metres N. aforesaid again grid west to 490,000 metres E. aforesaid again grid north to 5,384,000 metres N., again grid west to 473,000 metres E., again grid south to 5,380,000 metres N. aforesaid, again grid west to 464,000 metres E., again grid north to 5,390,000 metres N. aforesaid, again grid west to 450,000 metres E., again grid north to 5,394,000 metres N., again grid west to 440,000 metres E. aforesaid thence again grid north to the point of commencement.

E.L. 21/79 - PETRO QUEST AREA 4 (BEACONSFIELD)

Commencing at the Posted Notice situate at the south-west angle of the area whose grid co-ordinates are 481,000 metres E., 5,421,000 metres N., thence grid north to 5,440,000 metres N., grid east to 520,000 metres E., grid south to 5,421,000 metres N. aforesaid thence grid west to the point of commencement.

APPENDIX 2

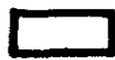


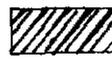
OIL SHALE LOCALITIES
N.W. TASMANIA P.001/2

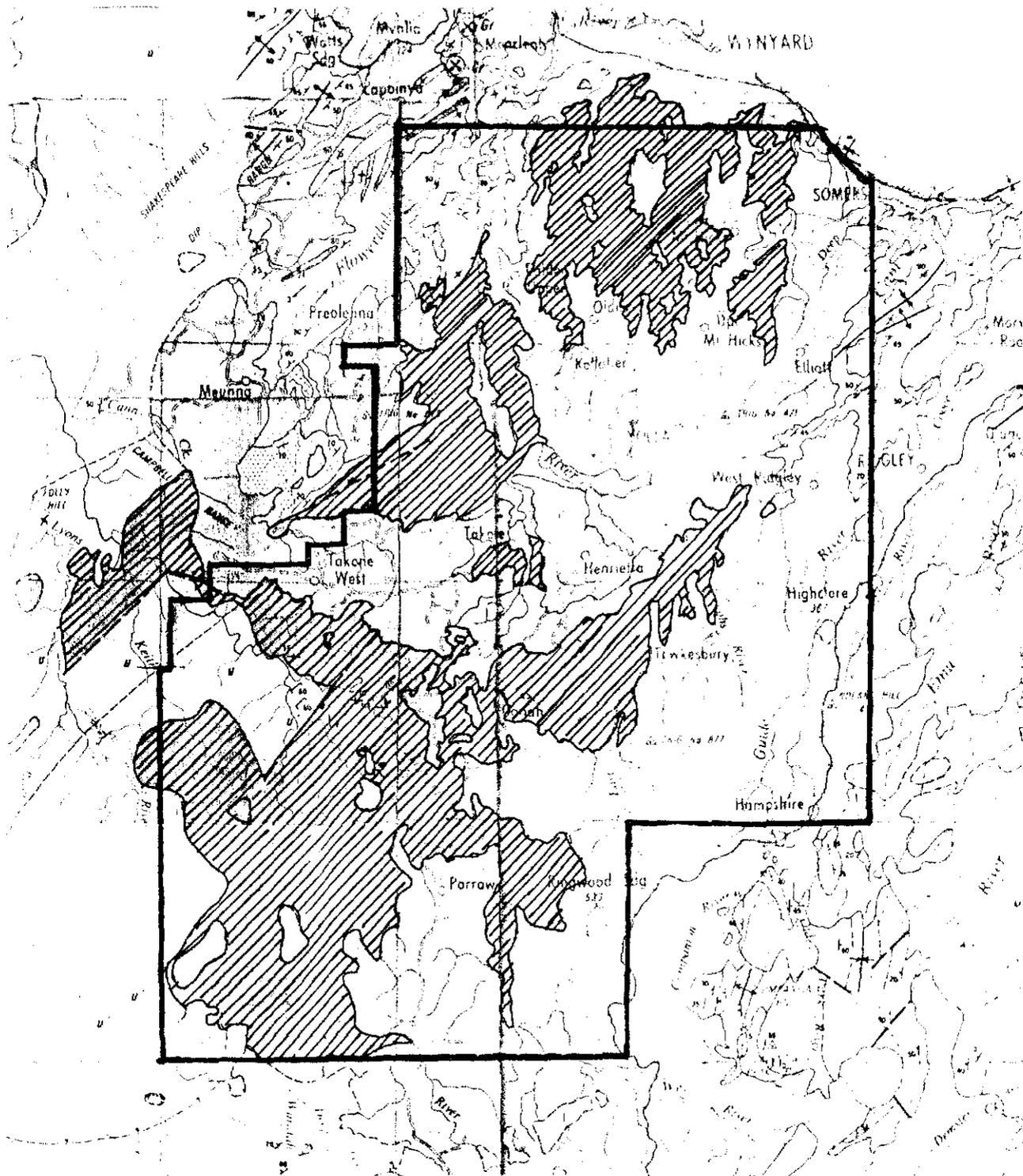
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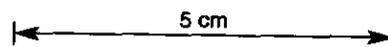
 E.L. AREA

 TASMANITE OIL SHALE PROSPECTIVE FORMATION.

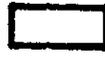


LOCATION PLAN. E.L. AREA 1.
HELLYER TASMANIA

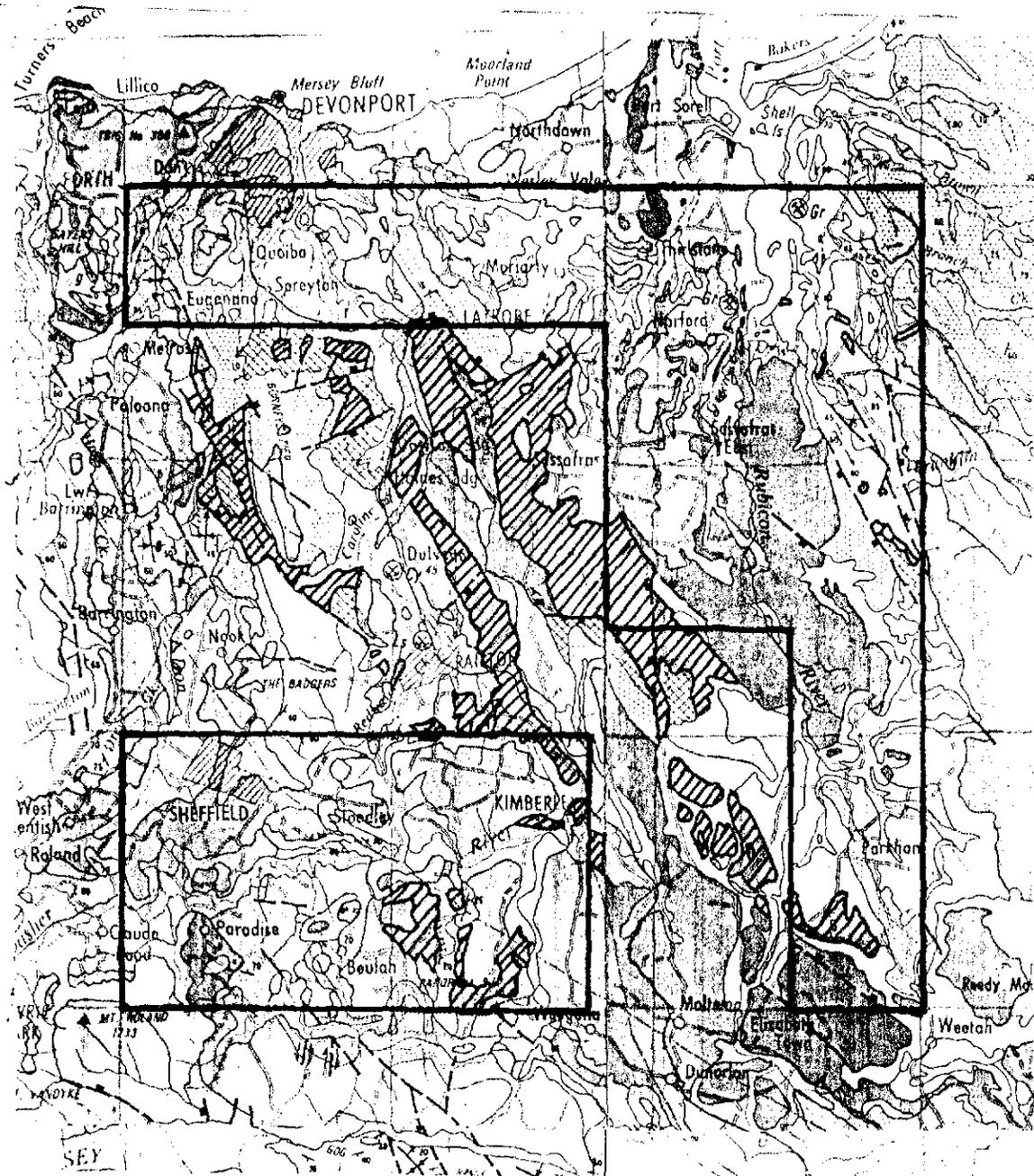
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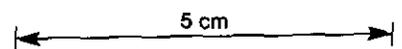
 E.L. AREA

 TASMANITE OIL SHALE
PROSPECTIVE FORMATION



LOCATION PLAN. E.L. AREA 2.
LATROBE TASMANIA

SCALE 1:250000



PETRO QUEST PTY LTD.
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LEGEND

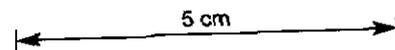
 E.L. AREA

 TASMANITE OIL SHALE
PROSPECTIVE FORMATION



LOCATION PLAN. E.L. AREA 3A
GOLDEN VALLEY TASMANIA

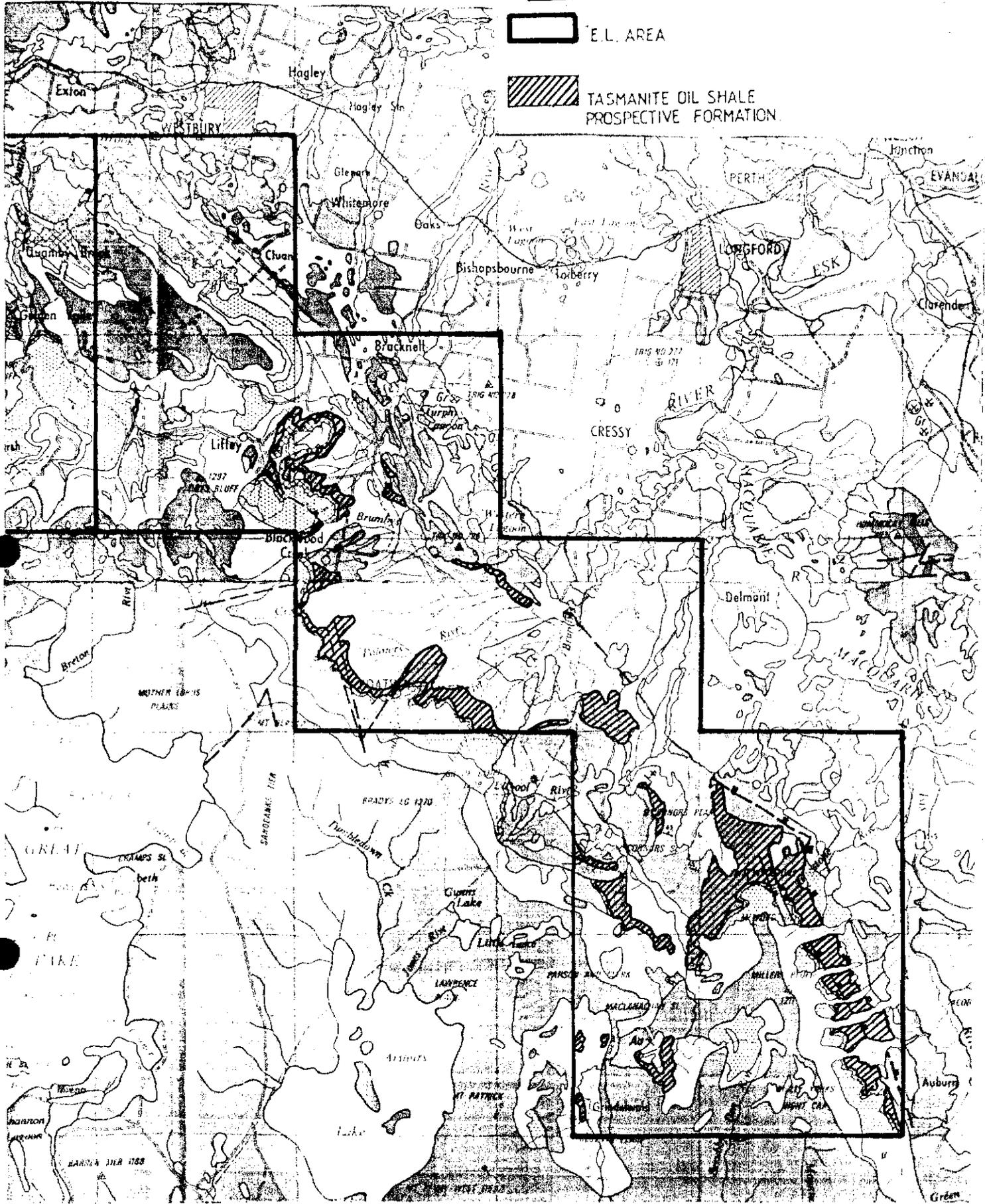
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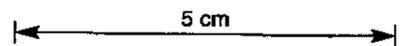
E.L. AREA

TASMANITE OIL SHALE PROSPECTIVE FORMATION



LOCATION PLAN. E.L. AREA 3B
BRACKNELL TASMANIA

SCALE 1:250 000

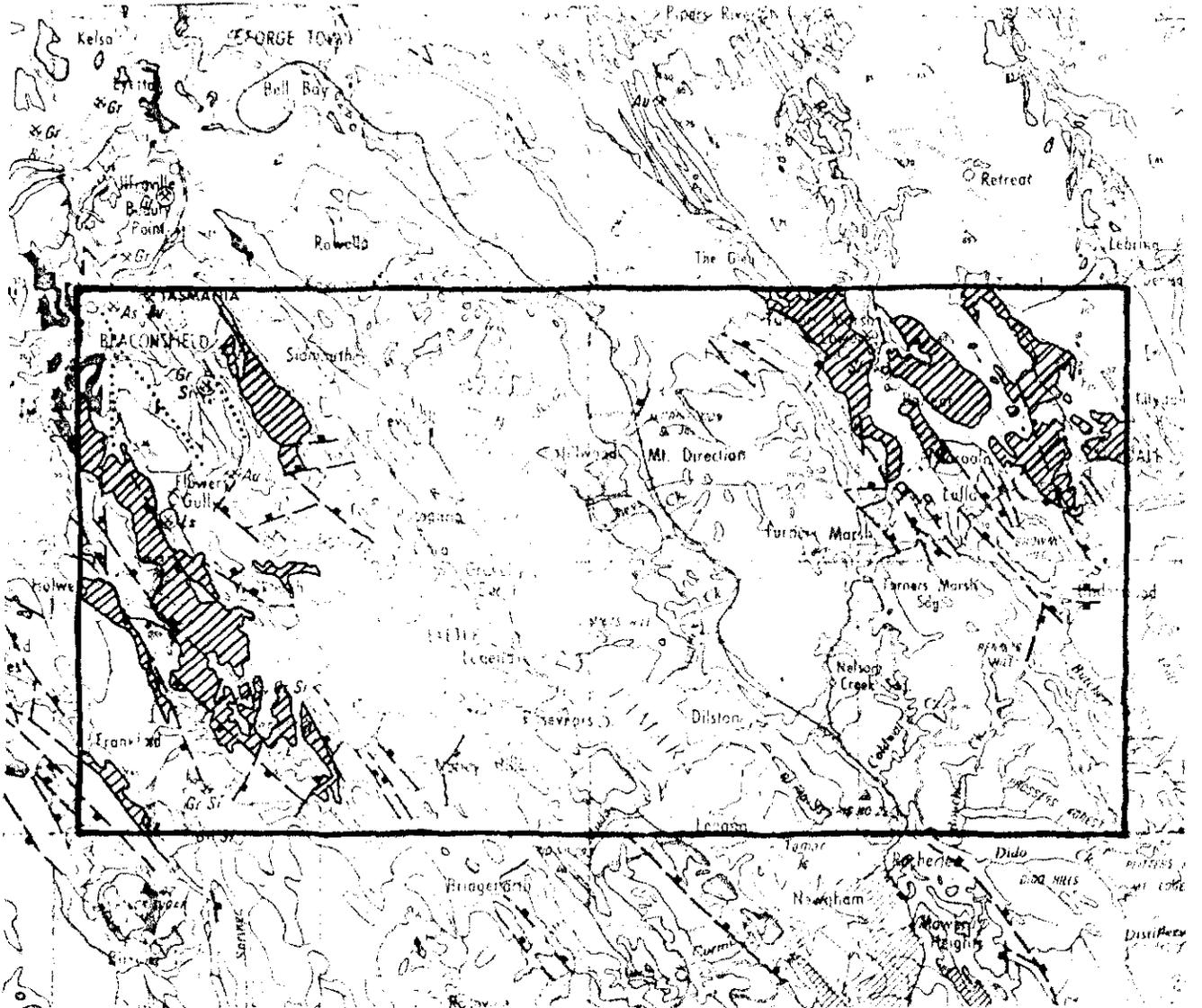


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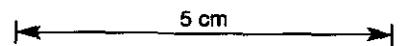
 E.L. AREA

 TASMANITE OIL SHALE
PROSPECTIVE FORMATION



LOCATION PLAN. E.L. AREA 4
BEACONSFIELD TASMANIA

SCALE 1:250000



APPENDIX 3 - CONSULTING SERVICES AND PERSONNELGENERAL GEOLOGICAL SERVICES

General Geological Services is a professional and technical consulting group of qualified Geologists and allied earth scientists with a range of skilled field and research experience in the exploration and development of petroleum and mineral resources in the Australasian, South Pacific, and South-East Asian regions.

The consultants collectively have a background in hard and soft rock geology throughout inland and coastal Australia and in the adjacent archipelagos and oceanic islands. They have conducted large and small exploration programmes for oil, coal, and minerals from initial inspection through to final evaluation. The consultants have, in particular, established an expertise in the study of stratigraphic entrapments for oil and gas in Australia by the use of depositional environment studies, seismic stratigraphy, and structure analysis.

The Principal Consultant is Mr. Colin Glazebrook whose qualifications and experience are listed below.

C. GLAZEBROOK, B.Sc. (Melb), A.A.I.M.M., Member of Geological Society of Australia - Exploration Manager, Petroleum Geologist and Geophysicist

Mr. Glazebrook acts as Exploration Manager and Chief Petroleum Geologist for the Zan Quest Energy Resources Group of associated companies. He obtained his B.Sc. (Geology and Geophysics) at Melbourne University in 1963, and since that time has worked continuously as a geologist in both the petroleum and mining industries. Between 1963 and 1970 he was employed by Core Laboratories Incorporated, initially as a Geological Engineer and subsequently as a Consulting Petroleum Geologist. His initial employment was within Australia and New Zealand and included work in Queensland (Surat, Adavale, and Gallilee Basins), Victoria (Gippsland Basin), Northern Territory (Amadeus Basin), and Western

Australia (Carnarvon and Canning Basins), where he specialised in well-site geology, basin studies, petroleum engineering, and core analysis. In 1966 he was transferred by Core to their North Sea operations and carried out assignments in West Africa and the Persian Gulf.

On returning to Australia, he was engaged as Senior Geologist in Australia for Austin-Anderson (Aust) Pty. Ltd. In 1973 he established his own consulting business, General Geological Services, specialising in stratigraphic, structural and sedimentary studies for minerals, coal, and petroleum and has carried out investigations for clients throughout Australia and the South Pacific. Since 1978 he has been acting as Chief Petroleum Geologist and Exploration Manager for the Zan Quest Energy Resource Group.

Other consultants engaged by General Geological Services and available to the Zan Quest Group include the following:

DR. A.G. LINK, M.Sc. (Melb), Ph.D (A.N.U.), M.A.A.P.G., M.A.I.M.M. -
Petroleum Geologist, Seismic Stratigrapher, and Depositional Analyst

Dr. Link graduated with M.Sc. in 1965, and specialising in sedimentology, took out a Ph.D. in 1970. Since that time he has specialised in Depositional Systems Analysis.

As seismic interpretation provides such a useful insight into sedimentary disposition in sedimentary basins, Dr. Link has concentrated on interpretation techniques and methods with particular emphasis on the Gippsland, Bass and Otway Basins of Victoria.

Dr. Link has consented to work for General Geological Services in a consulting capacity in stratigraphic evaluation and structural analysis.

R. GLENIE, A.R.M.T.C. Geology (Melb), F.R.M.I.T. Geology by Research (Melb), Member of Geological Society of Australia, Member of P.E.S.A.-Stratigrapher, Sedimentologist, and Energy Resource Analyst

Mr. Glenie has acquired a wide experience in sedimentary basin studies over many years since initial graduation in 1956. He commenced with the Victorian Department of Minerals and Energy, with which he worked from 1957 to 1970 carrying out geological surveys, supervising drilling projects, and contributing technical reports and maps.

During 1968 Mr. Glenie was engaged by the United Nations Organization as Hydrogeological Adviser to the Indonesian Government. From 1970 - 1971, as a Senior Geologist for Austin-Anderson (Aust) Pty. Ltd., Mr. Glenie carried out mineral exploration throughout Australia and the South-west Pacific. From 1971 - 1973, as a Senior Consultant with Australian Groundwater Consultants Pty. Ltd., he was involved with groundwater investigations and sedimentary basin studies both in Australia and Indonesia. Since 1973 Mr. Glenie has conducted his own consulting geological practice specialising in stratigraphic analyses and sedimentary studies for groundwater, coal, and hydrocarbons. During this time he has carried out investigations for clients throughout Australia and also in Southern Africa and the Middle East.