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

80-1449

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REPORT PET 703/3

MICROFILMED

TASMANIAN OIL-SHALE PROSPECTS

FINAL

for

PETRO QUEST PTY. LTD.

by

GENERAL GEOLOGICAL SERVICES

OPEN FILE

Work Order PET 703

JULY, 1980

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TASMANIAN OIL-SHALE PROSPECTSFINAL REPORT1. INTRODUCTION

This report presents the results of field investigations and desk studies carried out by General Geological Services for Petro Quest Proprietary Limited (Petro Quest) in connection with oil shale search through four exploration licence areas in central-north Tasmania for the period of 10th January to 30th June 1980. It also outlines a forward programme centred around scout-drilling and geophysical operations during the next six months.

Petro Quest applied to the Tasmanian Department of Mines in October 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 several known oil-shale localities and widespread occurrences of geological formations possessing favourable potential.

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.

Petro Quest Survey Areas		Tasmanian Mines Department Exploration Licence Areas			
No.	Name	No.	Land District	Vicinity	Area (Km ²)
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 Western Tiers	1,272
3B	Bracknell)				
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:

Stage	Work Programme	Timing
		Year One
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 IC)
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 has involved a literature review, an extensive field investigation and survey, and analysis of field data; it is the subject of this report.

Monthly reports have been previously prepared for each of the four exploration licence areas for the months ending 31st May and 30th June, and a quarterly interim report summarizes work completed to the end of May, 1980.

Petro Quest 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 search and evaluation programme.

The address of Petro Quest Proprietary Limited is:

151 - 155 Dorcas Street,

South Melbourne,

Victoria. 3205

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

(1) 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.

(2) 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 during the regional geological appraisal 2 (Stages 1A and 1B) 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. GEOLOGICAL SEARCH AND SURVEY PROGRAMME

2.1 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.

2.1 1. 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 rock units of Permo-Triassic age, major structural elements, hydrogeology, bio-stratigraphy, and palaeo-environmental interpretations.

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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 through 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.

- * 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.

2.1 2. 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.

2.2 Geological Reconnaissance

A preliminary drive-through reconnaissance of all four licence areas was made by the Exploration Manager of Petro Quest 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 from the road section exposures at Poatina, in the stream banks at Quamby Brook, and along the Mersey River cliffs between Latrobe and Railton.

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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.

2.3 Previous Mining and Environmental Factor Evaluation

Information on past oil-shale mining and processing has been assembled; the sites of these operation 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. EXPLORATION RESULTS AND ASSESSMENTS

3.1 Interpretations

Integrated geological interpretations are progressively being assembled from 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.

These interpretations provide a basis for the preliminary assessment of the oil-shale potential which completes Stages 1A and 1B of the exploration programme and are used in designing the follow-on Stage 1C field exploration programme.

The major areas of interest deriving from the geological study and preliminary interpretation are as follows:

1. Oonah Area (ref. Map - Area 1)

Field examination indicated that rock units favourable to the occurrence of tasmanite oil shale are exposed in a relatively extensive area near Oonah. Several oil-shale beds outcropping in the face of an old test pit were channel sampled. The oil shale occurs in the Inglis Siltstone of Early Permian age.

2. Preolenna Area (ref. Map - Area 1)

A layer of tasmanite shale discovered on the northern valley slope of the Jessie River was sampled and indicates a more widespread occurrence than previously known.

A torbanite oil shale in the Preolenna Coal Measures of Middle Permian age was sampled from an old adit in the same area.

3. Latrobe-Railton (ref. Map - Area 2)

Spot samples were collected from outcrop and old mine workings along the eastern side of the Mersey River in order to provide comparative analytical data.

4. Quamby Brook (ref. Map - Area 3)

Channel sampling of marine oil shale in the Early Permian Quamby Mudstone was carried out in the bank of the Quamby Brook near Golden Valley.

3.2 Maps

A series of maps have been initiated showing results of the field geological survey and related economic assessment on base maps at scales of 1:50,000 and 1:100,000. Additional 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 exploration licence area boundaries (i).
- . Past mining areas including processing and testing sites (iii).
- . Geological data including significant rock units and structural elements (i).
- . Oil-shale potential assessment including preliminary estimates of inferred reserves, and overburden ratios (iii).
- . Drillhole sites and geophysical traverse lines for next stage (iii).
- . Land ownership and utilization (ii).
- . Economic factors including power and water supply, road and rail transport, etc. (ii).

- (i) Completed
- (ii) Collated in part
- (iii) In preparation

The maps show the prospective exploration areas divided into two categories as follows:

- (1) Areas initially believed to possess prospective potential for marine oil shale: these areas were delineated from the Tasmanian Geological Survey's 1:250,000 map sheets, and include Early Permian stratigraphic units that embrace the tasmanite oil shale beds. Some inconsistencies were later found to exist in the mapped units, owing presumably to the different years of production of the source 1:63,360 geological sheets and to the changes in definition of rock units within the relevant Permian sequence.
- (2) Areas containing inferred oil-shale reserves: these areas were delineated during the Petro Quest field programme and are the subject of present study and the focus of forward geophysical survey and scout-drilling.

It is anticipated that the remaining data will be added to the map sheets within the next month prior to a drilling decision.

3.3 Assays

Nineteen selected samples of oil shale and associated rocks have been submitted for chemical analysis and prepared for petrographic examination by the Australian Mineral Development Laboratories (AMDEL). The oil-shale testing includes proximate analysis (moisture, ash, volatile matter, and fixed carbon), sulphur, specific gravity, and base metal determinations.

At this stage, only the results of bulk density testing have been received, and these are presented in Appendix 1.

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4. FORWARD PROGRAMME

4.1 Objectives

The ultimate objectives of the regional appraisal (i.e. Stages 1A, 1B and 1C) are 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 variation expected in seam thickness.
- (iv) Structure in terms of maximum, minimum and average dips, and degree of faulting.
- (v) Range of depths (overburden) at which oil shale may occur 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 have been attained following completion of the geological survey (Stages 1A and 1B), 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.

Stage 1 work is underway at the present time with the Preliminary Reconnaissance completed and the following stage nearing completion. This will be completed in the next period.

4.1 Detailed Geological Mapping and Sampling

Stage 1B:

Estimated time for completion is 4 months.

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Following construction of the preliminary geological maps of the areas, field teams will be sent in to carry out detailed investigations and complete a thorough basin study of the region, using geological mapping followed by a combination of seismic, gravity, and magnetic surveys to accurately delineate the limits of the oil-shale horizons.

The following activities will be undertaken during the course of this investigation.

- * Examination of topography and its relationship to geologic conditions.
- * Identification of lithologies and measurement of rock structural parameters.
- * Verification of faulted and fractured zones observed in photo-geology.
- * Observation of erosion characteristics and valley sediments.
- * Observation and field testing of major springs and seepage areas.

4.2 Geophysical Surveys and Scout-Drilling Operations

Stage 1C:

Estimated time for completion is six months.

As mentioned previously, one of the major concerns of basin study work is to delineate the margins of the oil shale areas.

The second major task of the basin study is to determine the time-stratigraphy of the basin and the lithofacies distribution within the interesting formations.

In many cases this information can be built up from published geological data and the records of previous oil and water bores. In certain circumstances, however, where there is no previous subsurface information, it may

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be necessary to undertake a limited programme of stratigraphic drilling to complement field mapping and air photo-interpretation. Any such stratigraphic drillholes will be carefully sited by the field mapping party and the programme will have the objective of intersecting as complete a succession as possible. This implies the siting of the holes to allow for a recognisable overlap in stratigraphy. The results will be carefully correlated between drillholes and against field data using lithology and palaeontology. Relative ages will be obtained by micropalaeontology and palynology, and samples for such studies will be taken at regular intervals in drillholes in order to accurately determine the presence of any disconformities or major breaks in the sequence. Coupled with this programme, consideration will be given to the use of a combination of gravity, magnetic, and shallow seismic reflection techniques to augment and reduce the initial number of stratigraphic drillholes and detailed oil-shale evaluation drillholes in the Stage 3 programme.

A test programme is envisaged during the preliminary reconnaissance stage to see which methods are suitable for the investigation areas. More details of this programme will be presented during application for licence renewal. Samples of drillholes will be carried out and selected assaying done on the oil-shale cores.

4.3 Engineering and Reverse Economic Studies

Stage 2:

Estimated time 6 months to be carried out simultaneously during the latter part of the Stage 1 programme.

From the Regional Geological Appraisal Programme, a preliminary assessment can be made of the potential viability of any oil-shale deposit in the area.

Capital, environmental impact, operating costs, and infra-structure costs will be estimated and set against the likely realisation to give some idea of the size and quality of the target that needs to be found in order to establish an economic operation. A further geological study can then reassess the situation based on this preliminary economic study and decide whether the chances of finding the required target merit continued exploration.

This assessment is vital as the next stage calls for a detailed evaluation of the oil-shale deposits by an intensive drilling programme. If insufficient target zones are found an area will be surrendered at this time. Good prospects will be reapplied for and a detailed evaluation programme of drilling, sampling, and assaying will be prepared.

4.4 Estimated Costs for Forward Programme

	EL 17/79	EL 18/79	EL 19/79	EL 21/79
Stage 1/2 (Completion)	2,000	2,000	4,000	2,000
Stage 1/3	12,000	9,000	15,000	9,000
Stage 2 (Commencement)	<u>5,000</u>	<u>3,000</u>	<u>6,000</u>	<u>3,000</u>
Total Estimated Expenditure.	<u>\$17,000</u>	<u>\$14,000</u>	<u>\$25,000</u>	<u>\$14,000</u>

These costs are the estimated minimum, in keeping with the original submission for the licences.

Separated reports on the work done to date on the licences are being forwarded under separate cover.

Yours faithfully,

COLIN GLAZEBROOK
Exploration Manager



The Australian
Mineral Development
Laboratories

amdel

Flemington Street, Frewville,
South Australia 5063
Phone Adelaide 79 1662
Telex AA 82520

4 July 1980

Please address all
correspondence to
P.O. Box 114 Eastwood
SA 5063

In reply quote:

MD 3/0/0

5976/80

General Geological Services
P.O. Box 326
SOUTH MELBOURNE Vic 3205

Attention: Mr G. Glenie

REPORT MD 5976/80

YOUR REFERENCE:	Application for Service Work dated 18 June 1980.
MATERIAL:	Nineteen Samples.
DATE RECEIVED:	20 June 1980.
INFORMATION REQUIRED:	Bulk Density.

Investigation and Report by: Lyn J. Day.

Manager, Materials Division: Dr William G. Spencer.

B. G. Jackson

for Norton Jackson
Managing Director

Pilot Plant: Osman Place
Thebarton S.A.
Telephone 43 8053
Branch Laboratory: Perth

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1. INTRODUCTION

Nineteen samples were submitted for bulk density determinations. The samples varied considerably in nature and consisted of oil shale, oil shale and associated sediment, carbonaceous clay and coal.

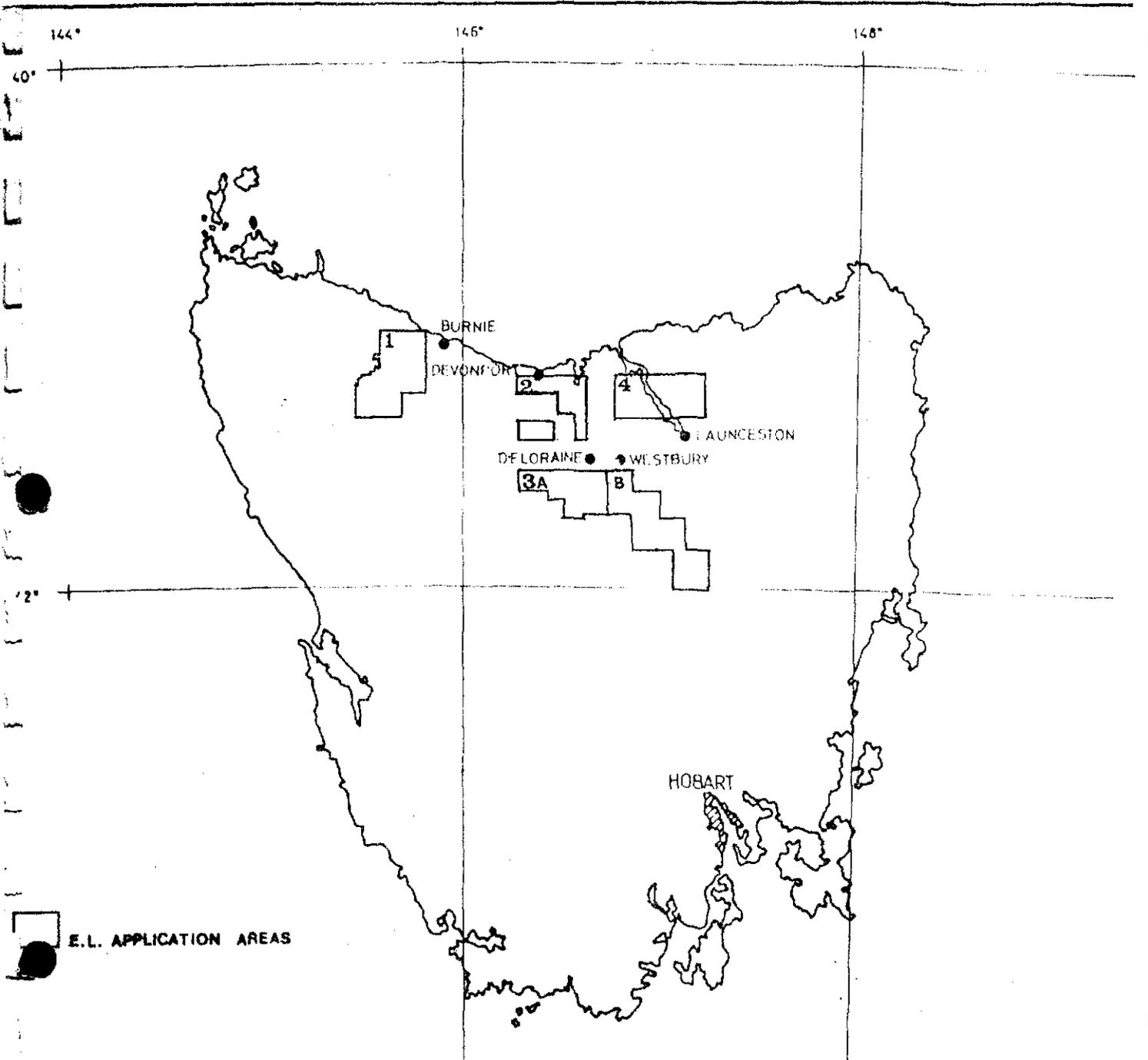
2. PROCEDURE

Due to the varied nature of the samples two methods were used. The first method used to determine the bulk densities was to weigh the samples, immerse them in water for twenty four hours and then reweigh them suspended in water and also with surface water removed. Samples tested in this manner are marked *. However, the majority of the samples appeared likely to partially or wholly disintegrate on immersion in water and consequently were coated with wax before having their bulk densities determined in a manner similar to that described above. All bulk densities were determined on an as received basis, i.e. they were not dried before testing.

3. RESULTS

Sample	Bulk Density <u>g/cm³</u>
1-1-1	2.11
1-1-2	1.92
1-1-3	2.01
1-1-4	2.12
1-1-5	1.90
1-1-6	1.93
1-4-4	1.55
1-5-2	1.32*
1-5-4	2.29*
2-1-4	1.85
2-3-2	1.38
3-1-1	2.17
3-1-2	2.19*
3-1-3	2.06
3-1-4	2.09*
3-1-5	2.14
3-1-6	2.31*
3-1-7	2.41*
3-1-8	2.36*

dt.



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

50 0 50km

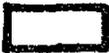
5 cm

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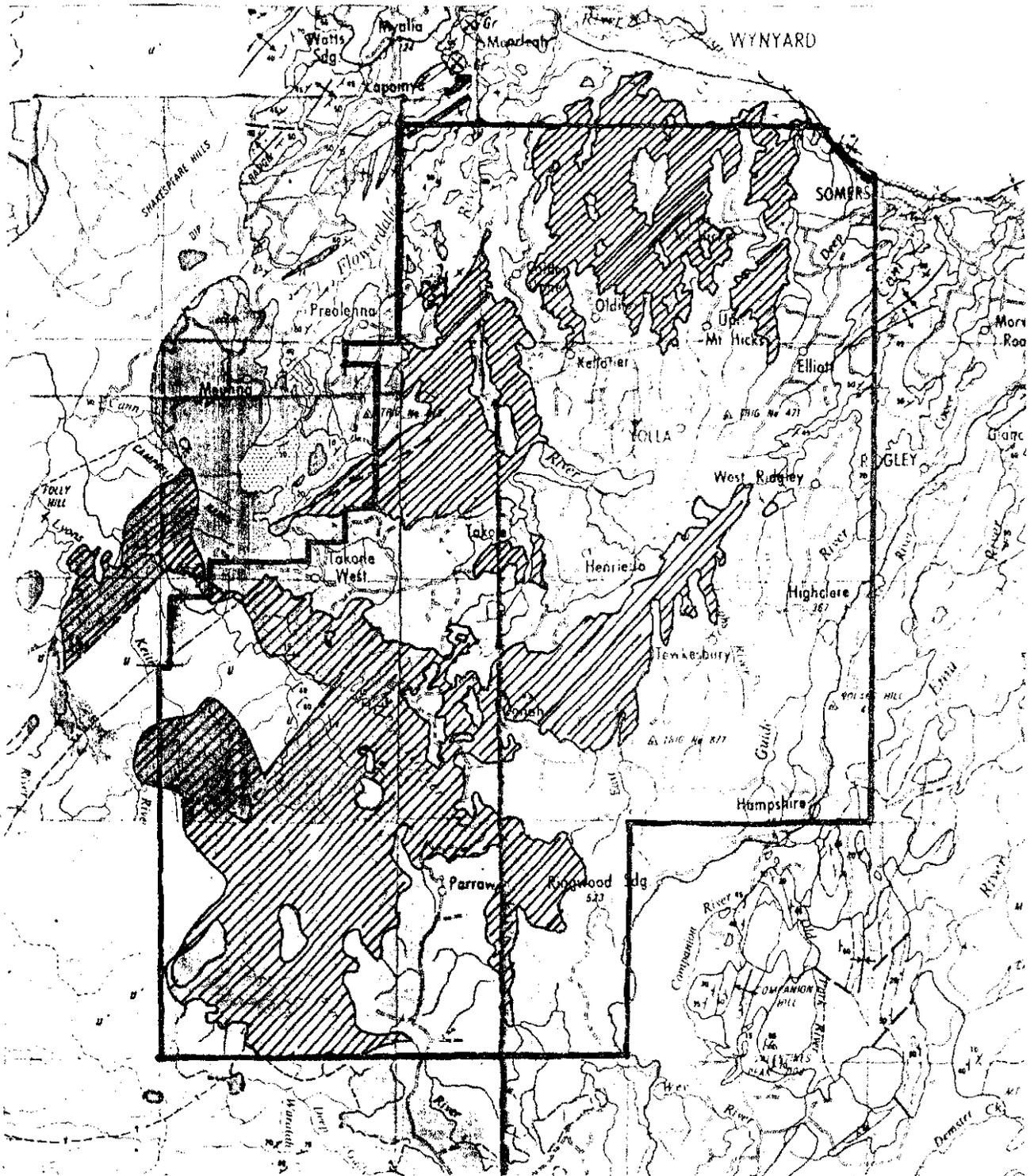
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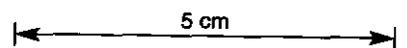
 E.L. AREA

 TASMANITE OIL SHALE PROSPECTIVE FORMATION



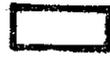
LOCATION PLAN. E.L. AREA 1.
HELLYER TASMANIA

SCALE 1:250000

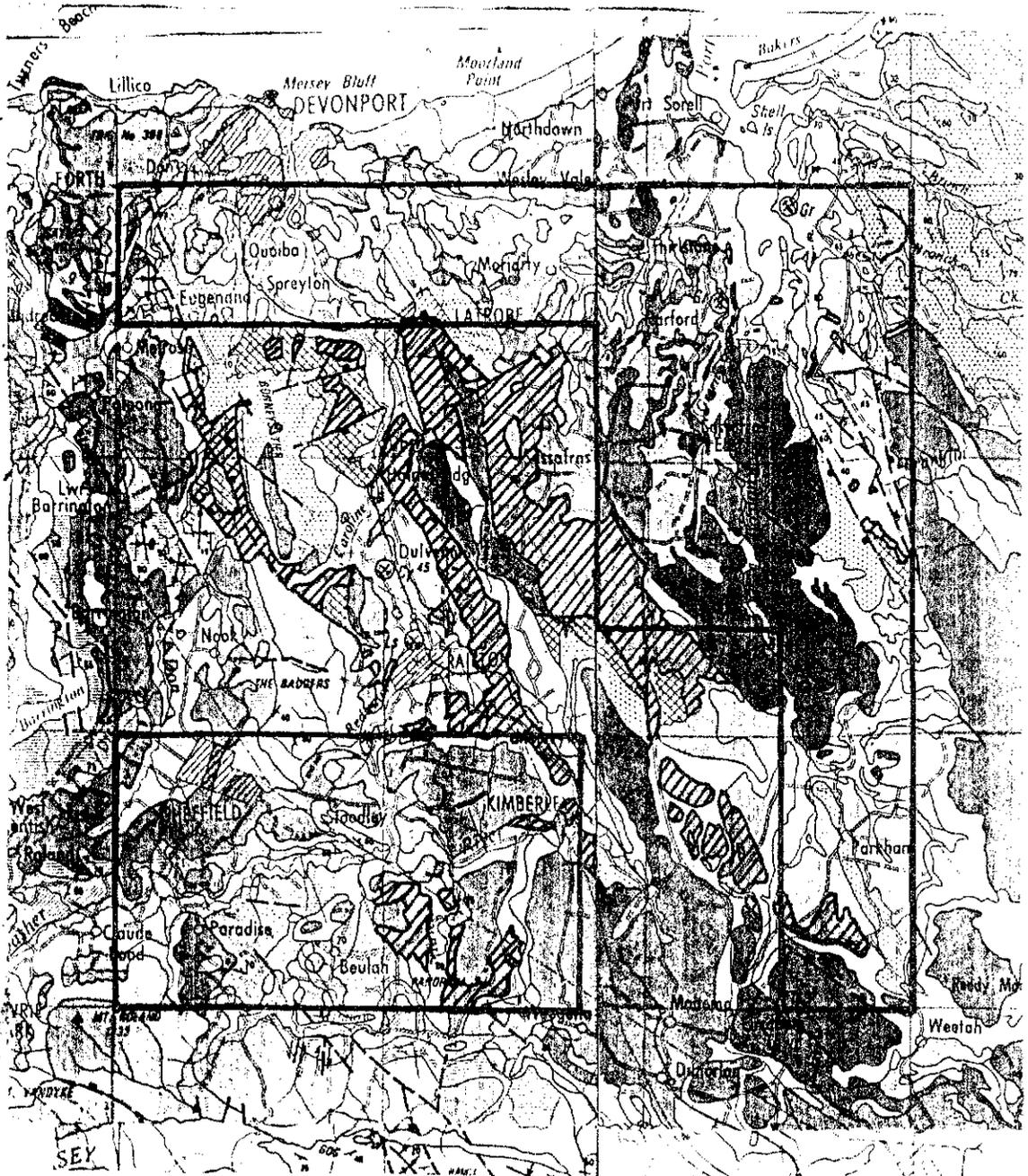


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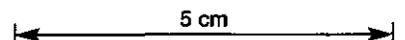
 E.L. AREA

 TASMANITE OIL SHALE PROSPECTIVE FORMATION



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

SCALE 1:250000



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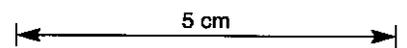
 E.L. AREA

 TASMANITE OIL SHALE PROSPECTIVE FORMATION



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

SCALE 1:250000



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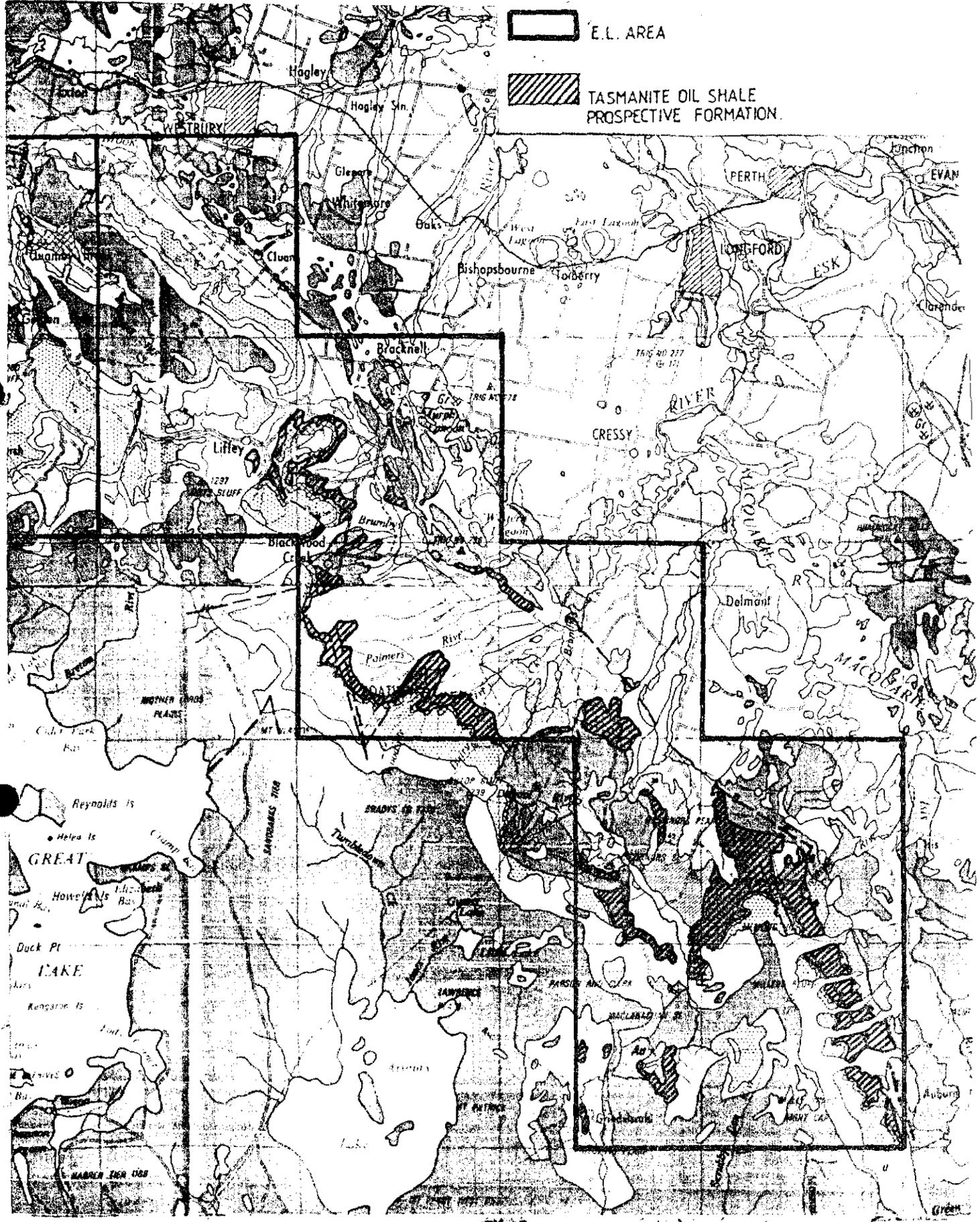
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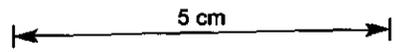
E.L. AREA

TASMANITE OIL SHALE PROSPECTIVE FORMATION.



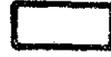
LOCATION PLAN. E.L. AREA 3B
BRACKNELL TASMANIA

SCALE 1:250000

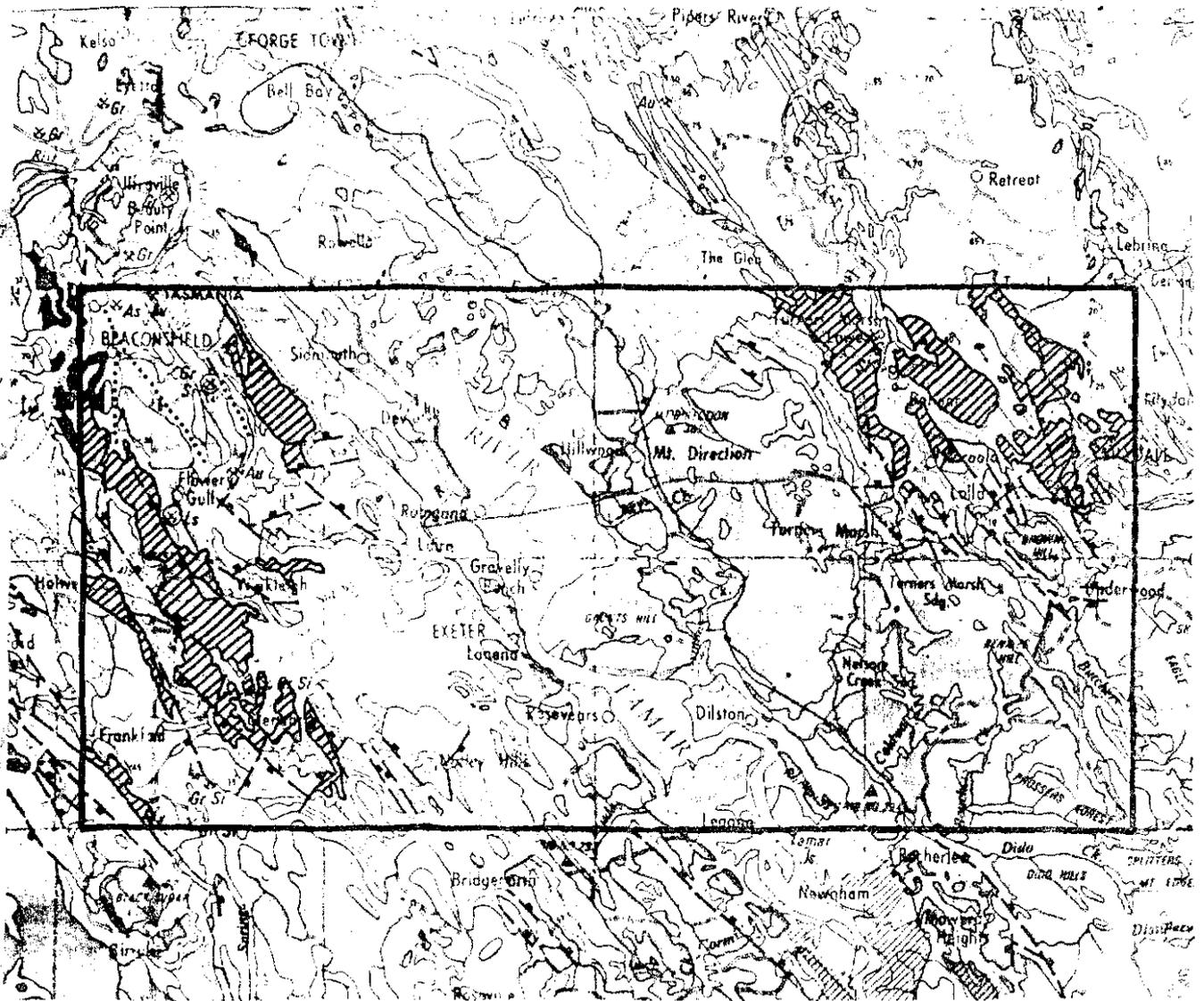


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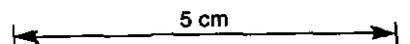
 E.L. AREA

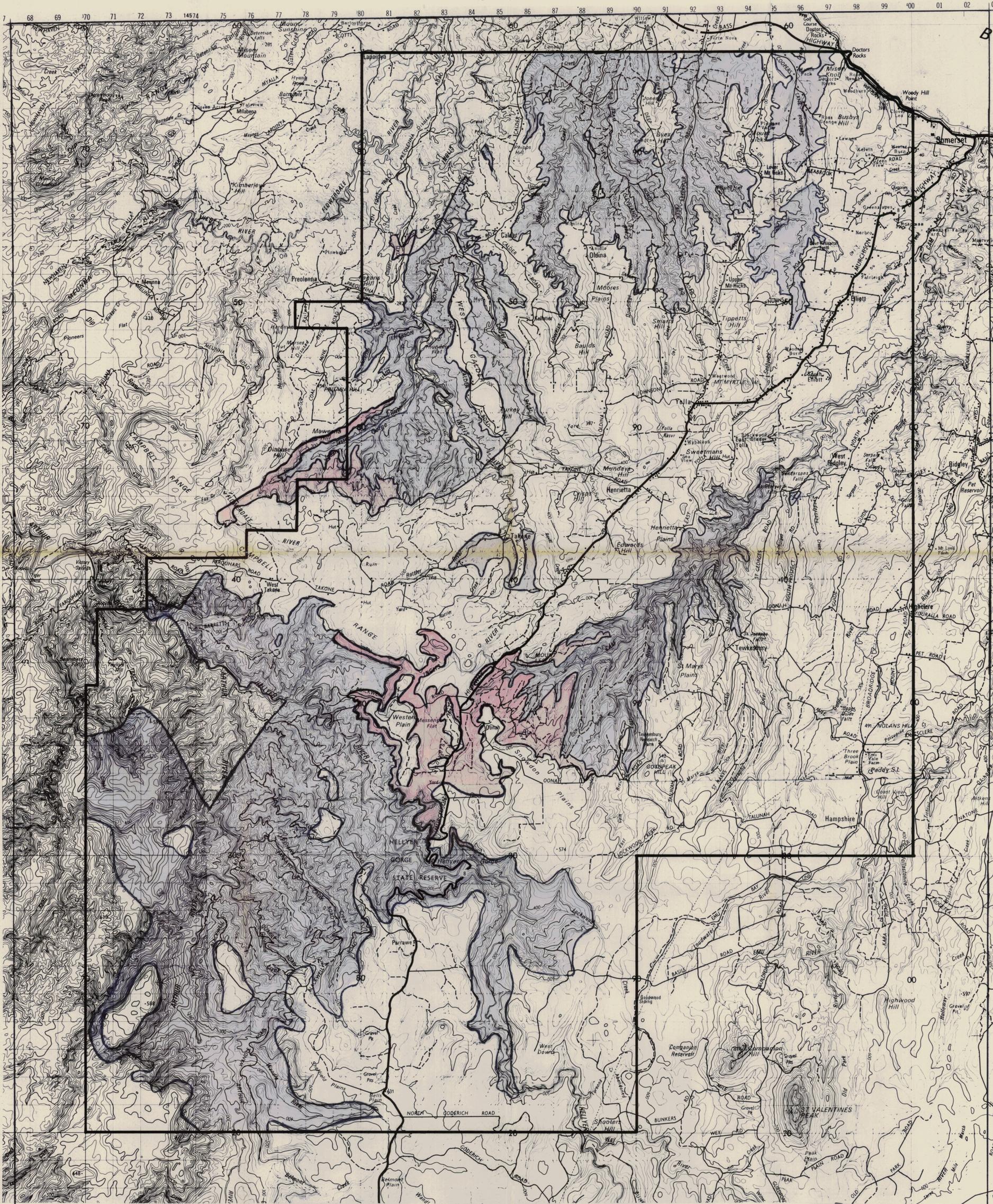
 TASMANITE OIL SHALE PROSPECTIVE FORMATION



LOCATION PLAN. E.L. AREA 4
BEACONSFIELD TASMANIA

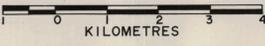
SCALE 1:250000





TASMANIAN E.L. AREA 17/79
BASE MAP

Scale 1 : 50,000



HORIZONTAL DATUM : AUSTRALIAN GEODETIC DATUM 1966
VERTICAL DATUM : AUSTRALIAN HEIGHT DATUM
PROJECTION : TRANSVERSE MERCATOR

Company. PETRO QUEST	
Area. 1	3255
Work No. 703	Author.
Date.	Drawn.

TOPOGRAPHIC DATA

- Highway
- Road
- - - Track
- Contour Interval 20metres
- ~ Waterway
- + + + Railway

GEOLOGICAL DATA

- Geophysical Boundaries
- Bedding & Dip
- + Anticline Folding
- + Syncline Folding
- Faults
- Bore showing S.L. No., Depth (m)
- D.D.H. showing S.L. No., Depth (m)

MINING & DEVELOPMENT

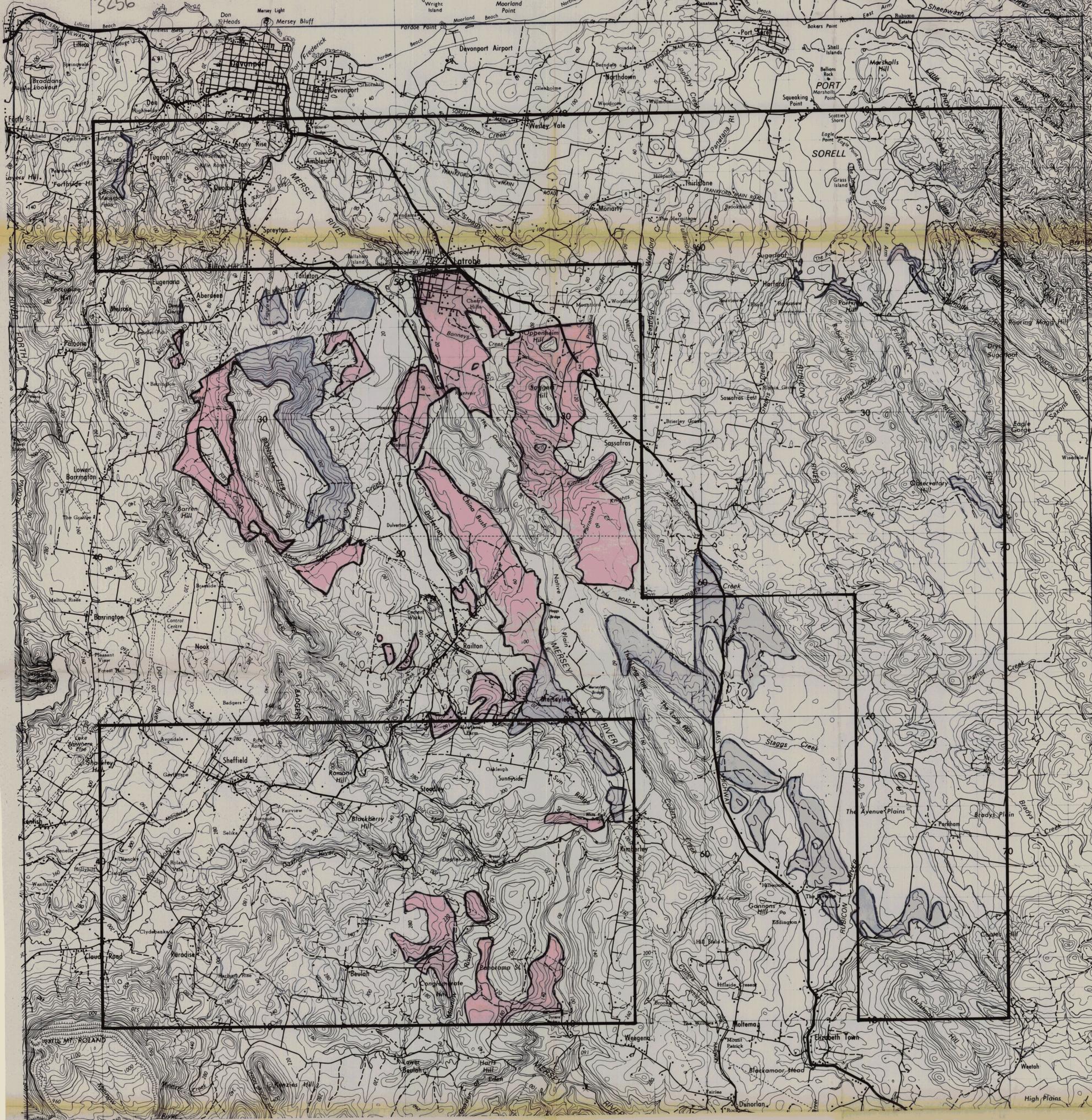
- Units Prospected
- Units with Inferred Reserves
- Underground Mining Areas
- Open Cut Areas

EXPLORATION DATA

- Shaft showing S.L. No., Depth in metres
- Adit
- Costean, Depth in metres
- Open Cut Existing
- 200°-280°E-15°. Suggested drill holes, Depth, Direction & Inclination
- Suggested Costeans
- Geophysical Survey Line, Gravity (G), Seismic (S), Magnetic (M)
- Anomaly & Depth to Top
- Sample Location

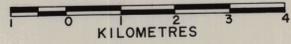
NOTE. TOPOGRAPHIC BASE COMPILED FROM TASMANIAN LANDS DEPARTMENT 1 : 50,000 SHEETS.
GEOLOGICAL DATA DERIVED FROM TASMANIAN MINES DEPARTMENT 1 : 63,360 SHEETS.

3256



TASMANIAN E.L. AREA 18/79
BASE MAP

Scale 1 : 50,000



HORIZONTAL DATUM : AUSTRALIAN GEODETIC DATUM 1966
VERTICAL DATUM : AUSTRALIAN HEIGHT DATUM
PROJECTION : TRANSVERSE MERCATOR

Company. PETRO QUEST	
Area. 2	3256
Work N° 703	Author.
Date.	Drawn.

TOPOGRAPHIC DATA

- Highway
- Road
- - - Track
- ~ Contour Interval 20metres
- ~ Waterway
- ++++ Railway

GEOLOGICAL DATA

- Geophysical Boundaries
- Bedding & Dip
- Anticline Folding
- Syncline Folding
- Faults
- 120 10 Bore showing S.L. N°, Depth (m)
- D.D.H. showing S.L. N°, Depth (m)

MINING & DEVELOPMENT

- Units Prospected
- Units with Inferred Reserves
- Underground Mining Areas
- Open Cut Areas

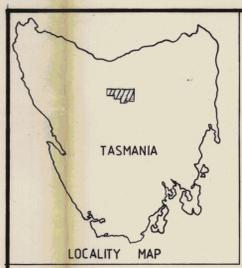
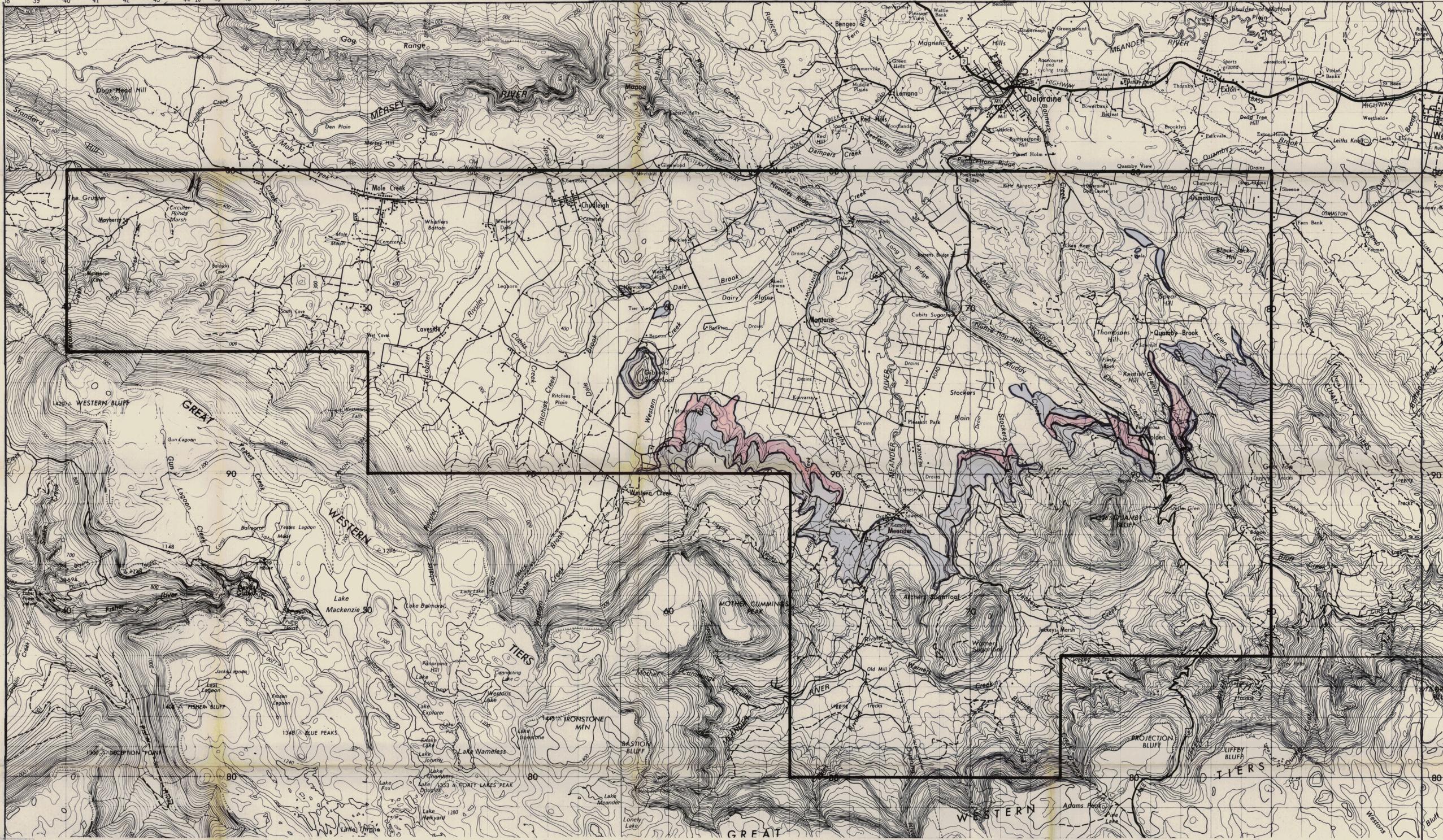
EXPLORATION DATA

- 100 20 Shaft showing S.L. N°, Depth in metres
- Adit
- Costean, Depth in metres
- Open Cut Existing
- 200 280°E ~ 15°, Suggested drill holes, Depth, Direction & Inclination
- Suggested Costeans
- Geophysical Survey Line, Gravity (G), Seismic (S), Magnetic (M)
- Anomaly & Depth to Top
- ② Sample Location

NOTE. TOPOGRAPHIC BASE COMPILED FROM TASMANIAN LANDS DEPARTMENT 1:50,000 SHEETS
GEOLOGICAL DATA DERIVED FROM TASMANIAN MINES DEPARTMENT 1:63,360 SHEETS.

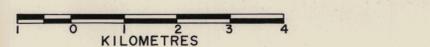
074027

30-1449



TASMANIAN E.L. AREA 19/79

BASE MAP
Scale 1 : 50,000



HORIZONTAL DATUM : AUSTRALIAN GEODETIC DATUM 1966
VERTICAL DATUM : AUSTRALIAN HEIGHT DATUM
PROJECTION : TRANSVERSE MERCATOR

074028

80-1449

Company. PETRO QUEST	
Area. 3A.	3257
Work N ^o . 703	Author.
Date.	Drawn.

3257

TOPOGRAPHIC DATA

- Highway
- Road
- Track
- Contour Interval 20metres
- Waterway
- Railway

GEOLOGICAL DATA

- Geophysical Boundaries
- Bedding & Dip
- Anticline Folding
- Syncline Folding
- Faults
- Bore showing S.L. N^o, Depth (m)
- D.D.H. showing S.L. N^o, Depth(m)

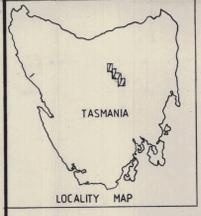
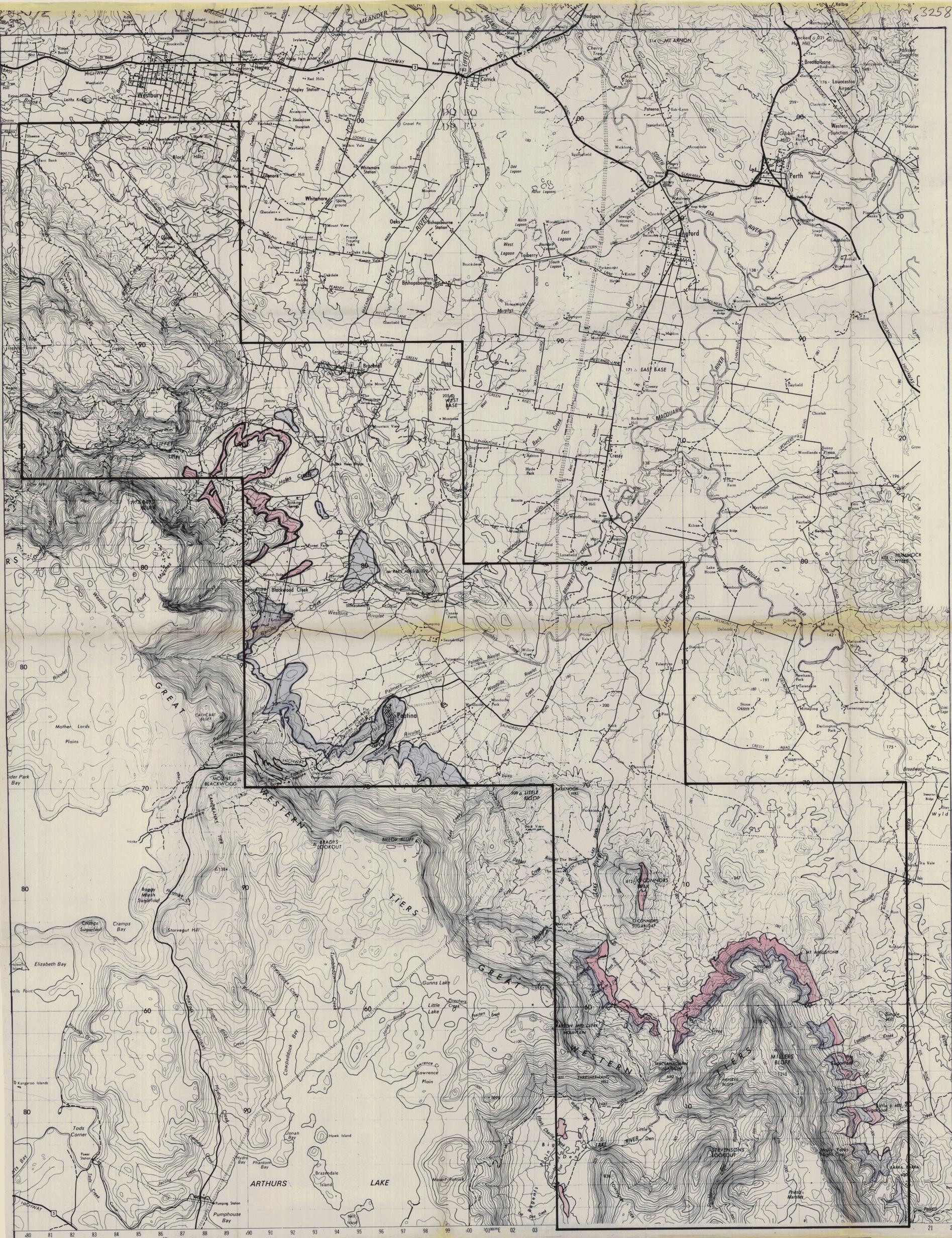
MINING & DEVELOPMENT

- Units Prospected
- Units with Inferred Reserves
- Underground Mining Areas
- Open Cut Areas

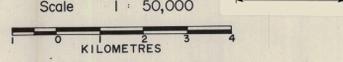
EXPLORATION DATA

- Shaft showing S.L. N^o, Depth in metres
- Adit
- Costean, Depth in metres
- Open Cut Existing
- 200^o 280^o E~15^o, Suggested drill holes, Depth, Direction & Inclination
- Suggested Costeans
- Geophysical Survey Line, Gravity(G), Seismic(S), Magnetic (M)
- Anomaly & Depth to Top
- Sample Location

NOTE. TOPOGRAPHIC BASE COMPILED FROM TASMANIAN LANDS DEPARTMENT 1 : 50,000 SHEETS. GEOLOGICAL DATA DERIVED FROM TASMANIAN MINES DEPARTMENT 1 : 63,360 SHEETS.



TASMANIAN E.L. AREA 19/79
BASE MAP
 Scale 1 : 50,000

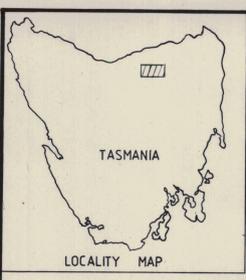


HORIZONTAL DATUM: AUSTRALIAN GEODETIC DATUM 1986
 VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
 PROJECTION: TRANSVERSE MERCATOR

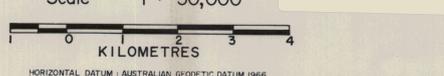
074029	
Company: PETRO QUEST	
Area: 3B	3258
Work No: 703	Author:
Date:	Drawn:

TOPOGRAPHIC DATA	GEOLOGICAL DATA	MINING & DEVELOPMENT	EXPLORATION DATA
<ul style="list-style-type: none"> Highway Road Track Contour Interval 20metres Waterway Railway 	<ul style="list-style-type: none"> Geophysical Boundaries Bedding & Dip Anticline Folding Syncline Folding Faults Bore showing S.L. No., Depth (m) D.D.H. showing S.L. No., Depth (m) 	<ul style="list-style-type: none"> Units Prospected Units with Inferred Reserves Underground Mining Areas Open Cut Areas 	<ul style="list-style-type: none"> Shaft showing S.L. No., Depth in metres Adit Costean, Depth in metres Open Cut Existing 200°-280°E ~ 45° Suggested drill holes, Depth, Direction & Inclination Suggested Costeans Geophysical Survey Line, Gravity(G), Seismic(S), Magnetic(M) Anomaly & Depth to Top Sample Location

NOTE: TOPOGRAPHIC BASE COMPILED FROM TASMANIAN LANDS DEPARTMENT 1:50,000 SHEETS
 GEOLOGICAL DATA DERIVED FROM TASMANIAN MINES DEPARTMENT 1:63,560 SHEETS



TASMANIAN E.L. AREA 21/79
 BASE MAP
 Scale 1 : 50,000



HORIZONTAL DATUM : AUSTRALIAN GEODETIC DATUM 1966
 VERTICAL DATUM : AUSTRALIAN HEIGHT DATUM
 PROJECTION : TRANSVERSE MERCATOR

074030

Company. PETRO QUEST	
Area. 4	3259
Work No. 703	Author.
Date.	Drawn.

TOPOGRAPHIC DATA

- Highway
- Road
- - - Track
- Contour Interval 20metres
- ~ Waterway
- + + + Railway

GEOLOGICAL DATA

- Geophysical Boundaries
- Bedding & Dip
- ↑ Anticline Folding
- ↓ Syncline Folding
- Faults
- Bore showing S.L. No., Depth (m)
- D.D.H. showing S.L. No., Depth (m)

MINING & DEVELOPMENT

- Units Prospected
- Units with Inferred Reserves
- Underground Mining Areas
- Open Cut Areas

EXPLORATION DATA

- Shaft showing S.L. No., Depth in metres
- Adit
- Costean, Depth in metres
- Open Cut Existing
- 200° 280° E ~ 45° Suggested drill holes, Depth, Direction & Inclination
- Suggested Costeans
- Geophysical Survey Line, Gravity (G), Seismic (S), Magnetic (M)
- Anomaly & Depth to Top
- Sample Location

NOTE. TOPOGRAPHIC BASE COMPILED FROM TASMANIAN LANDS DEPARTMENT 1 : 50,000 SHEETS.
 GEOLOGICAL DATA DERIVED FROM TASMANIAN MINES DEPARTMENT 1 : 63,360 SHEETS.