

496001

NSW OIL & GAS COMPANY N.L.

**APPLICATION FOR GEOPHYSICAL
SUBSIDY**

SAILFISH MARINE SEISMIC SURVEY

OCTOBER 1970

OR_0393

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N.S.W. OIL AND GAS COMPANY N.L.

9th Floor, United Insurance Building,
280 George Street,
SYDNEY. N.S.W. 2000.

October 30, 1970.

The Director
Bureau of Mineral Resources
Petroleum Exploration Branch
P.O. Box 378
CANBERRA CITY. A.C.T. 2601.

Dear Sir:

APPLICATION FOR GEOPHYSICAL SUBSIDY

Subsidy application is hereby made for a marine seismic survey. The relevant information is set out below.

NAME OF PROJECT

Sailfish Marine Seismic Survey

NAME OF APPLICANT

N.S.W. Oil and Gas Company N.L.

REGISTERED ADDRESS OF APPLICANT

9th Floor, United Insurance Building
280 George Street,
SYDNEY. N.S.W. 2000.

NOMINEE

Exploration Manager,
Planet Management and Research Pty. Ltd.,
9th Floor, United Insurance Building,
280 George Street,
SYDNEY. N.S.W. 2000.

LOCATION OF PROJECT

The location is in the East Gippsland Basin about 50 miles northeast of Flinders Island in Exploration Permit T/1P (See Plate 1)

REGIONAL GEOLOGY

The Gippsland Basin has an area of 20,000 square miles and is situated between a northern belt of Palaeozoic sediments and metamorphics near the southeast coast of Australia and a southern granite ridge extending from Wilson's Promontory to the northeast corner of Tasmania. About 70 percent of the basin lies offshore in the Bass Strait area of the Tasman Sea.

Mesozoic and Tertiary sediments exceeding 25,000 feet in composite thickness fill the Gippsland Basin. These sediments overlie Palaeozoic rocks, ranging in age from Carboniferous to Ordovician, that were deposited in the north-south trending Tasman geosyncline prior to the formation of the Gippsland Basin.

The Jurassic-Lower Cretaceous Strzelecki Group of sediments were deposited in the early stages of the Gippsland Basin development. These predominantly alluvial to upper deltaic sediments were derived from uplifted Palaeozoic igneous and sedimentary rocks north and south of the basin. The resulting thick sequence of greywacke and subgreywacke with abundant plant material and thin coal seams exhibits poor porosity in the basin where encountered onshore and is considered economic basement. Over 8,500 feet of Strzelecki has been encountered onshore and the unit probably thickens to 10,000 feet basinward.

The Strzelecki Group of sediments was uplifted and folded at the end of the Lower Cretaceous. The Latrobe Valley Delta Complex unconformably overlies the Strzelecki Group and largely derived its sediments from these rocks.

The Latrobe Valley Delta Complex is comprised of alluvial and upper deltaic sediments ranging in age from upper Cretaceous through Eocene. Several cycles of sediment reworking and resultant local unconformities are represented within these rocks. Two main units have been defined by well control within the Latrobe Valley Delta Complex.

The Upper Cretaceous-Palaeocene unit is referred to as the Childers formation or "Unnamed Unit" and is estimated to attain 6,000 feet in thickness in the Tuna area. The unit consists of interbedded sandstone, siltstone, shale and coal. The sands are typically clean and range from very fine to pebbly. Porosity values of up to 25% and permeabilities up to 300 m.d. are attained in this unit.

The Eocene Latrobe Valley Coal Measures comprise the upper unit of the Delta Complex and attain a thickness of 5,000 feet. Offshore, this formation consists of about 75% clean well-sorted, friable sand. This unit constitutes the major reservoir to date for Gippsland oil and gas; however, substantial oil and gas columns have also been encountered in the Childers formation unit of the Latrobe Complex. Porosity in the L.V.C.M. of 26 to 30% and permeabilities of up to 5 darcies are reported from Esso's Marlin Field.

A hiatus between the Eocene Latrobe Valley Coal Measures and the Oligocene Lakes Entrance formation may have resulted from both subareal erosion prior to the Lakes Entrance marine transgression and submarine canyon type erosion during the early stages of the marine invasion. The Lakes Entrance formation is predominantly a calcareous and glauconitic mudstone offshore and ranges from 200 to 500 feet thick except in places where it has filled submarine canyons with sediment and may attain thicknesses in excess of 2,500 feet. The source for the Gippsland Basin hydrocarbons may be the Lakes Entrance marls and mudstones that unconformably overly the Gippsland Basin primary hydrocarbon reservoir, the Latrobe Valley Delta Complex.

Another hiatus followed Lakes Entrance deposition and some channels were cut in these sediments which were in turn filled by Miocene Gippsland Formation marls. The Gippsland formation, which is similar in lithology to the Lakes Entrance formation, attains a maximum thickness of about 6,000 feet. Pliocene fossiliferous sands and marls overly the Gippsland formation and attain thicknesses up to 1,000 feet in the south-eastern part of the basin.

The structure of the Gippsland Basin has been largely controlled by a Jurassic-Lower Cretaceous east-west trough or graben. Down-to-the-basin faulting in the southern part of the basin has a strong east-west strike component and is probably related to the southern margin of the Mesozoic trough. The eastern flank of the Gippsland Basin has not been defined.

Magellan's seismic survey located a large structural anomaly, called herein the Sailfish Structure, in the west central portion of their T/IP Licence. The quality of seismic data is poor over the crest of this feature but it appears that the northwest-southeast striking structure has one large central area of closure with smaller subsidiary culminations to the north and south. The extension of well datums into the Sailfish area through Esso's and Magellan's seismic lines indicate the presence of up to 3,000 feet of Latrobe Valley Delta Complex sediments overlying basement on the Sailfish structure. The Lakes Entrance marls which were deposited during a major marine transgression are likewise expected to be present.

PREVIOUS GEOPHYSICS

The B.M.R. made an aeromagnetic survey of the onshore Gippsland Basin in 1952, and in 1956 covered an offshore area in a strip about 50 miles wide paralleling the coast from Wilson's Promotory to east of Lakes Entrance. A deep trough was indicated offshore east of Lake Wellington extending beyond the area of the magnetic coverage with 15,000 feet of sediments and shallowing to 2,000 feet south of Wilson's Promotory. The proposed Sailfish survey is situated just south of the B.M.R. aeromagnetic survey.

In 1961 the Bass Strait Encounter Bay Aeromagnetic Survey (B.M.R. Report No. 60) west of the present survey area, showed the Gippsland Basin western margin to extend southeast from Wilson's Promotory to north of Flinders Island. It showed also that the eastern margin of the Otway Basin extended southerly from King Island to the west coast of Tasmania, and that the central part of the Bass Strait area is a large saucer shaped basin elongated northwest to southeast with sediments in excess of 10,000 feet. Basement ridges separate it from the Gippsland Basin on the northeast and the Otway Basin on the west.

The Aeromagnetic Survey, Eastern and Western Bass Strait, January 1968, by Magellan Petroleum (non-subsidised) extended the magnetic coverage to the south, and embraces the area of the proposed Sailfish Marine Seismic Survey. It showed an area of shallow basement (2,000 feet) in the immediate area of the Sailfish Seismic structure, deepening to the east into a deep trough containing 19,000 feet of sediments above magnetic basement. In the northern part of the area there is a magnetic basement anticlinal feature at 4,000 feet where the seismic showed a slight eastward nosing superimposed on the regional east dip. Enclosure 2 shows magnetic basement contours.

Many marine seismic surveys have been conducted in the Gippsland and Bass Basins beginning with analogue reconnaissance surveys in 1962-63 of the Gippsland Basin. Good reflections were obtained from the upper Latrobe Complex. The overlying Lakes Entrance and Gippsland Formation were characterized by lack of reflection continuity. Events below the Latrobe Complex were significantly affected by multiples and reverberations. In general the reconnaissance programmes confirmed the aeromagnetic interpretations and in addition outlined several large simple anticlines and suggested other promising structural leads. In the Bass Basin the reconnaissance programme gave reliable data, confirmed the aeromagnetic interpretation, showed the general lack of anticlinal features but revealed some small reef-like buildings or intrusives, subsequently shown to be pyroclastic in origin where drilled.

The Gippsland Marine Seismic Survey (EH '68) by Esso is located immediately west of the present survey. It substantiated previous seismic work and more clearly outlined the zero edge of the Latrobe in the large stratigraphic play on the southwestern flank of the Gippsland Basin.

The "East Gippsland Basin Area - Marine Seismic Survey" for Magellan June 1969 located the structural leads which give rise to the present proposed survey. It indicated a basement horizon at depths similar to magnetic basement over the southern portion of T/1P and the northern portion of VIC P/4. Southern VIC P/4 and northern T/1P showed magnetic basement considerably deeper than the seismic reflection basement. Seismic basement varies between 4,000 and 10,000 feet deep over the area of the present survey. There is mapped closure at this level on the Sailfish structure and also at Top Latrobe Complex horizon some 1,000 - 2,000 feet higher. Enclosure 3 is a seismic structural interpretation of the Top of the Latrobe Valley Coal Measures by Planet Management and Research Pty. Ltd., showing the proposed programme. Enclosure 4 is a seismic section showing a small anomaly marked "Anomalous Feature" which may be indicative of reefing. The small grid spacing between the proposed seismic lines in this area is designed to trace the outline of this feature.

The closest well velocity control is from Blubone No. 1 (T.D. 1984') and Mullet No. 1 (T.D. 2463') about 45 miles to the west. Both wells encountered Lakes Entrance Formation and Latrobe Valley Coal Measures overlying Devonian granite. At Blubone No. 1 the Latrobe Formation has an interval velocity of about 7,500'/s and the overlying Lakes Entrance Formation is a little over 8,000'/s. Within the overlying Gippsland Formation, velocities generally vary from 6,000'/s near the top, to about 7,500'/s at the base. Basement velocity is 18,500'/s.

OBJECTIVES OF THE SURVEY

The objectives of the survey are to verify the structural closure on the Sailfish anomaly, and to investigate possible reef structures to the north, with a view to maturing a test site.

PLAN OF OPERATION

Objectives are at shallow to intermediate depths in the area of interest. Basement depths are up to 6,000 feet. A short cable (4,800') will be used for the survey, a 24 or 48 fold stack using two 300 cu. in. (baffled) guns and one 40 cu. in. or 120 cu. in. gun. The data will be digitally recorded using Binay Gain Amplifiers and a 2 ms sample rate. Two refraction probes will be shot in an endeavour to better define the Sailfish structure and obtain more velocity control of the formation.

The survey will be in accordance with B.M.R. standards. Progress reports will be submitted bi-monthly. The final report will be submitted within four months of the last day of recording.

There are 300 miles of programmed reflection line, plus two refraction probes. Additional reflection and refraction will be programmed if necessary to further detail any interesting leads. Assuming a production rate of 60 - 70 miles per day, the survey should take about seven days including one days travel time, plus any time taken for additional work.

PETROLEUM TENEMENT

Petroleum Exploration Permit: T/1P
Holder: Magellan Petroleum
Australia Ltd.

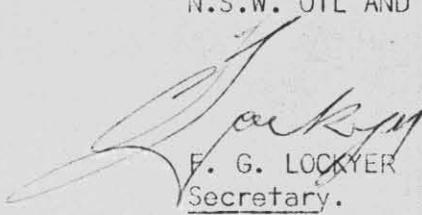
COPY OF CONTRACT

See Attachment No. 1.

ESTIMATE OF COSTS

See Attachment No. 2.

Yours faithfully,
N.S.W. OIL AND GAS COMPANY N.L.



F. G. LOCKYER
Secretary.

Attachment No. 1 - Contract
Attachment No. 2 - Cost Estimate
Plate 1 - Locality Plan
Enclosure No. 1 - Programme Map Showing Water Depths
No. 2 - Programme Map Showing Magnetic Basement
No. 3 - Programme Map Showing Seismic Structural Contours on
the top of the Latrobe Valley Coal Measures
No. 4 - Seismic Section

GEOPHYSICAL SERVICE AGREEMENT

between

PLANET MANAGEMENT & RESEARCH PTY. LIMITED

and

TELEDYNE EXPLORATION COMPANY

THIS AGREEMENT made as of the 21 day of October between TELEDYNE EXPLORATION INTERNATIONAL, INC. (hereinafter called the "CONTRACTOR") having an office and place of business at 5825 Chimney Rock Road, Houston, Texas, and PLANET MANAGEMENT & RESEARCH PTY. LIMITED (hereinafter called the "COMPANY") registered address 280 George Street, Sydney, New South Wales.

WHEREAS the COMPANY desires that certain marine geophysical work be undertaken by the CONTRACTOR by means of a marine seismic survey in Australia, and the CONTRACTOR is ready, willing and able to carry out such work.

NOW, THEREFORE, in consideration of the mutual covenants and agreements of the respective parties, it is agreed as follows:

1.0 NATURE OF THE WORK

CONTRACTOR shall conduct a marine seismic survey in search of subsurface geological structures favourable to the accumulation of oil and gas over Australian offshore areas in such areas as may be from time to time designated by COMPANY, in the manner and subject to the terms and conditions hereinafter set forth. Such work shall be conducted with reasonable expedition, care and diligence with adequate seismic marine instruments, other equipment, and fully experienced and capable personnel, to be furnished pursuant to this Agreement. COMPANY guarantees CONTRACTOR a minimum amount of marine seismic data acquisition, pursuant to the terms of 10.0.

1.1 OBJECTIVE

In general, the objective of the work will be to obtain the best geophysical subsurface data of the best possible accuracy within areas programmed by COMPANY.



- 2) The average recording speed will be 5 knots plus or minus 10%.

B. THE SEISMIC CREW

- 1) The on board geophysical staff is to be composed of experienced personnel qualified in the positions listed. More detailed resume's are attached for the supervisory staff.

1	Supervisor (½ time on board)	F. Don Bowman
1	Party Chief	Ken Parker
2	Senior Observers	Jim Springer Jose Gomez
2	Observers	Max Summers Paul Rosenblum
2	Navigation Operators	Supplied by ONI
1	Deck Technician	M. Rabucki
2	Mechanics - Air Gun Technicians	R. Grey M. Davis

- 2) The Teledyne representative in Newcastle will be the Project Supervisor, F. Don Bowman. The Region Manager, Mr. Don Bealer, will be present at the start of operations.
- 3) The Teledyne Region Manager, Mr. Don Bealer, is resident in Sydney and will provide local administration and supervision.

Managerial, technical and logistical staffs in Teledyne's Houston office will maintain daily contact with the M/V Teledex IV through SSB radio base station KLS in the Teledyne Home Office.

C. THE SEISMIC EQUIPMENT

1. Impulse Unit

- a) Bolt Associates Model 1500 B PAR Air Guns in a three (3) gun array. Each gun has a capacity of 300 cu. in. of air, and a firing pressure of 2,000 p.s.i. Two of the three guns are fitted with Bolt Model 2-D bubble suppressors.

1.2 AUTHORITY

The scope and objectives of the work shall be defined by COMPANY, and COMPANY shall have the right to review work done by CONTRACTOR hereunder for the purpose of ascertaining whether such work is so conducted to obtain data satisfactory to COMPANY. CONTRACTOR will accept reasonable suggestions made by COMPANY to the end that such data may be obtained. The actual conduct and manner of performance of the work to be done by CONTRACTOR hereunder, nevertheless, shall be exclusively under the direction and supervision of CONTRACTOR, it being understood that CONTRACTOR is an independent contractor, not acting as agent of COMPANY; that persons engaged by CONTRACTOR for performance of such work shall be employees of CONTRACTOR; that all persons engaged by COMPANY shall be employees of COMPANY and that neither COMPANY nor CONTRACTOR shall have direction or control of the employees of the other, provided however that all technicians, other personnel and local labour if any supplied by COMPANY shall be under the direction of CONTRACTOR through CONTRACTOR's Party Chief while they are engaged in survey operations.

2.0 EQUIPMENT, PERSONNEL AND SERVICES TO BE PROVIDED BY CONTRACTOR

A. THE VESSEL

1) Name:	M/V Teledex IV
Dimensions:	135' x 28' x 10'
Tonnage:	Gross 198 Net 135
Draft:	9 feet
Crew:	Master, Mate, Engineer, 2 Able Seamen, Cook: Total 6
Range:	(No survey) 3600 N. Mi. port to port.
Power:	Two (2), Caterpillar D-353 580 HP each Gear Red 3:1
Travelling speed:	11 Knots
Radio Facilities:	SSB-RF Communications, Ship to Shore - 2
Radar Equipment:	Kelvin Hughes Mod. 17, 24 mi. range.
Sonar Equipment:	Fathometer: Raytheon 721, Bendix DR 20, 100 fm.

- b) The firing interval capability of the system is ten (10) seconds minimum for 900 cu. in. air gun capacity.
- c) The compressor drives use diesel fuel from the ship's tanks. The endurance at sea is therefore independent of the requirements of the impulse source.

2. 24 Trace System: SDS 1010 24 channel binary gain recorder with:

- 1. 1200 ft. reel handling capacity.
- 2. 9 track recording heads (300 b.p.i.)
- 3. SEG "B" Format recording circuitry.
- 4. 30 Channel input multiplexer.

One Seismic Engineering 4800 foot Streamer with optional length but specifically with 24 groups, 200 feet between centers; utilizing 20 conventional crystal phones per 100 ft. group; up to 10 "Condep" controllers; four (4) depth sensors, with provision to obtain water break data on any four traces; a 400 ft. noise isolation section; and with variable offsets up to 1800 feet. The cable is equipped with a tail buoy which is isolated by polypropylene rope sections from the end of the streamer. The streamer can not be used in water depths less than 35 ft.; recommended depth is 40 ft. for the best data quality.

The on board quality control records will be of two kinds:

- (1) Single trace facsimile recorders made on a Teledyne Exploration Model RF-300 Seismic Profile Facsimile Recorder including interfacing to Signal Programmer PM-700 and Amplifier Junction Box Model AU 220.
- (2) Twenty-four trace monitor records played out on a Dynatronics Model PR-80 dry write camera.

D. MAGNETOMETER EQUIPMENT (optional)

One (1) each Varian Model V-4970 Marine Proton Magnetometer with

- (a) Electronic console

- (b) Analog chart recorder, 5 inch
- (c) Winch to console cable, 100 ft.
- (d) Marine sensor with 500 ft. tow cable.

E. SHORAN RADIO POSITIONING SYSTEM: this is a radar transponder type of radio positioning system. This equipment consists of a signal source, a transmitter, receiver and indicator unit comprising the mobile station and a receiver coupled to a transmitter at each base station (2 each and 1 remote). Three separate frequencies are used in the NHF/UHF part of the spectrum. The range of the system is estimated to be $d = k \cdot (\sqrt{h_1} + \sqrt{h_2})$ where

- d = estimated maximum range in feet
- h_1 = height of mobile station antenna in feet
- h_2 = " " base " " " "
- k = varies between 1.5 and 2.5 under normal conditions, with no obstruction between mobile and base stations.

The instrumental accuracy of the Shoran equipment, when properly used is $\pm 50-75$ feet on a single range. The overall position accuracy is related to the range accuracy by the angle of intersection at the mobile station, between the Shoran range circles.

2.1 BASIC PARTY UNIT

CONTRACTOR shall furnish, maintain and operate in workmanlike manner at its sole cost and expense and in consideration of the payment by COMPANY of contract fees and charges as defined in Section 6.0 hereunder, the M/V Teledex IV, a seismic survey vessel, (hereinafter called "Basic Party") consisting of the personnel, equipment and supplies more particularly defined in clause 2.0. CONTRACTOR shall use his best efforts to begin work on or about October 16, 1970. CONTRACTOR shall furnish all substitute and additional personnel and all repair or spare parts required to keep such Basic Party in working order and shall acquire all expendable supplies in connection herewith. Qualified personnel shall not be changed without permission in writing from the COMPANY which shall not be unreasonably withheld.

2.2 INSURANCES AND INDEMNITIES

(a) Insurances

1. CONTRACTOR agrees to provide and maintain in full force and effect during the term of this Agreement the following insurance coverages with companies and on policy forms satisfactory to COMPANY and to furnish to COMPANY at its address prior to commencement of operations certificates of insurance on forms satisfactory to COMPANY listing all policies required under the terms of this agreement.

A. Workmen's Compensation and Employer's Liability Insurance Policy specifically enumerating States or countries where work will be performed and including the provisions:

1. All States Endorsements
2. Additional Medical Payments, minimum limit \$10,000
3. Coverage B Employer's Liability Limit in an amount of \$2,000,000.
4. Protection to be provided under the United States Longshoremen's and Harbour Worker's

Compensation Act as amended to include protection with respect to the extension of this Act under the "Outer Continental Shelf Lands Act."

5. The location of work places shown in the policy shall include all areas involved in operations covered under this Contract.
6. Maritime endorsement Master or members of crew including Transportation, Wages, Maintenance and Cure.
7. Voluntary Compensation Coverage. All employees for worldwide exposures.
8. Repatriation Coverage, Limit \$2,500.
9. Thirty (30) Day Notice of Cancellation or Change.

B. Combined single limit bodily injury and property damage liability insurance including automobile in an amount of \$2,000,000 for each occurrence. Such insurance must cover operations in all offshore waters covered in this Contract and beyond the territorial limits of the United States and must include coverage for the liability assumed by CONTRACTOR under the indemnity provisions of this Agreement (Contractual Liability.)

1. Completed Operations Liability Insurance to be insured under the Comprehensive General Liability Insurance.
2. Personal Injury Liability Insurance to be insured with standard exclusions (a) and (c) to be deleted.
3. Thirty (30) day Notice of Cancellation or Change.

2. CONTRACTOR, except as otherwise provided herein, hereby agrees to indemnify and to hold and save COMPANY and any or all co-leasees of COMPANY who wholly or partially bear the cost of operations hereunder harmless from each and every claim suit or judgement for damages to or loss of property, including CONTRACTOR's property and equipment or for injury to or death of any person or persons caused by or arising out of or in connection with the operations of CONTRACTOR under this Agreement and shall defend all such suits at its own cost, paying all attorney's fees and other expenses incidental thereto and shall

pay any valid and final judgement, including costs of court, provided, however, that Company agrees to indemnify and hold and save CONTRACTOR harmless from all costs of every nature including final judgement, legal fees and costs in connection with each and every claim, suit or judgement for injury to or death of any officer or employee of COMPANY when not due to negligence of CONTRACTOR.

(b) Indemnities by COMPANY

Except as otherwise provided in this Agreement, and conditionally upon full compliance by CONTRACTOR with its obligations, hereunder, COMPANY shall indemnify, protect, defend and hold CONTRACTOR harmless from and against any and all claims for

- (i) Injury, loss or damage suffered by COMPANY or by its servants, agents or employees not arising from any negligent act or omission of CONTRACTOR's employees in the course of operations hereunder, and
- (ii) Unavoidable damage to property resulting from the conduct of operations in accordance with this Agreement and under the Petroleum (Submerged Lands) Act, 1967.

(c) Indemnities by CONTRACTOR

CONTRACTOR shall indemnify, protect, defend and hold COMPANY harmless from and against any and all loss, cost and expense in connection with any and all claims:

- (i) made by CONTRACTOR's employees or their legal representatives, heirs or assigns.
- (ii) made by any government or governmental agency arising out of any failure by CONTRACTOR to comply with the provision of Paragraph 2.2 (d) and
- (iii) made by any persons based upon alleged infringement by contractor of any patent or similar right.
- (iv) Arising from pollution of the sea or destruction to sea life.

(d) The provisions of this Agreement shall be subject to and all operations hereunder shall be conducted in full compliance with any and all valid and applicable municipal regulations, laws, rules, orders and regulations of the States of New South Wales, Victoria, Tasmania and the Commonwealth of Australia, or in other areas wherein such operations are being conducted.



(e) COMPANY shall designate each area to be surveyed and CONTRACTOR shall enter upon and conduct geophysical work in such lands as are designated by COMPANY or its representative assigned to the work. The permissions necessary for CONTRACTOR to enter upon such designated lands shall be the responsibility of COMPANY; however CONTRACTOR agrees to attempt to secure such permissions for the account of COMPANY, provided CONTRACTOR in the securing of such permissions shall not be deemed negligent or liable for claims which may arise from the invalidity of such permissions if such permissions are procured from the person apparently in possession of the designated property, or from such person or persons to whom the apparent possessor refers the representative of CONTRACTOR.

4.0 TAXES

CONTRACTOR will pay any taxes levied in Australia or elsewhere on income derived by CONTRACTOR under this contract.

5.0 PAYMENTS AND REIMBURSEMENTS

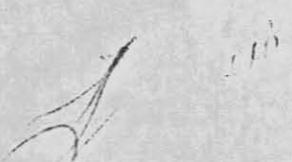
CONTRACTOR shall invoice COMPANY monthly for sums currently due to CONTRACTOR under this Agreement. COMPANY shall promptly after receipt and processing of each invoice pay CONTRACTOR all sums due and payable to CONTRACTOR.

6.0 FEES

As full compensation for CONTRACTOR's performance of its obligations hereunder COMPANY shall guarantee CONTRACTOR a minimum of 21 operational working days at a rate of \$A2856.00 per calendar day. The minimum guaranteed work program of 21 days is to be completed by December 31, 1970 unless waived under other conditions of the contract.

In the event the Government of Australia requests that its representatives sail aboard the CONTRACTOR's vessel, COMPANY shall pay the actual costs of food, lodging and all other fees assessed by the Government for the support of its personnel.

The following items and services are applicable to the survey operations for the account of COMPANY, are proposed to be provided by or reimbursed by COMPANY to CONTRACTOR, any reimbursements to be at a cost to CONTRACTOR plus 10 per cent.



- A. All costs of magnetic tapes.
- B. Costs of personnel and equipment over and above that to be provided by CONTRACTOR under 2.0 if requested by COMPANY at a rate to be mutually agreed.
- C. Radio licenses and fees required in the area of operations.
- D. Extended range Shoran using two (2) base stations and one remote at a rate of \$A17,000.00 basic.
- E. Expenses over and above party operating costs if incurred on special projects at the request of the COMPANY.
- F. All costs of transportation of seismic data, magnetic tapes, maps, cross sections, etc., between the seismic party and interpretation and data processing offices and otherwise as may be directed by COMPANY.
- G. Suitable base maps for the orderly and efficient planning and conduct of the surveys and interpretation and presentation of the data thereof.

7.0 WORK SCHEDULE

CONTRACTOR shall use its best endeavours to work twenty-four hours per day, seven days per week until twenty-one days work period have been undertaken.

Included in the 21 operational working days referred to in Clause 6.0 shall be the time taken by the CONTRACTOR to move the Teledex IV from Newcastle, N.S.W. to P.E.L. 5 off the N.S.W. coast, from P.E.L. 5 back to Newcastle, from Planet's Golden Beach structure to VIC/P4 and T/IP and thence to Eden, N.S.W.

8.0 REPORTS

8.1 CONTRACTOR shall render its reports in a manner satisfactory to COMPANY, and shall keep COMPANY fully informed on the progress of any work. Within three (3) months from completion of work in any area, CONTRACTOR shall furnish COMPANY with a written report on its findings which shall conform with standards set by the Bureau of Mineral Resources of the Commonwealth of

[Handwritten signature] *[Handwritten initials]*

Australia. During the progress of the work in any area, CONTRACTOR shall comply with any and all reasonable requests from COMPANY or its representative for information obtained to that date. Such reports shall include all relevant observations data sheets and maps and shall also include the necessary calculations and results of calculations to date, together with any maps on which those results have been produced.

8.2 All reports shall be the permanent property of COMPANY, but shall be accessible to CONTRACTOR for purpose of COMPANY's work only, at all reasonable times so long as this Agreement shall remain in effect. CONTRACTOR or its agents or sub-contractors or employees shall ensure that parties other than COMPANY or its nominee or nominees do not have access to any maps, data or information of any kind whatsoever furnished by COMPANY or its agents, or developed by CONTRACTOR in connection with the execution of this Agreement, except by written permission of COMPANY. CONTRACTOR, its agents, employees and sub-contractors shall not disclose such maps, data or information to parties other than COMPANY without its written consent.

This covenant shall be a continuing one, notwithstanding the termination or expiration of this Agreement for any cause or reason, and the aforesaid maps, data and information shall be kept strictly confidential and belong exclusively to COMPANY or its nominee or nominees, except that CONTRACTOR shall not be liable for divulging information required from him by Government agencies in accordance with the provisions of any applicable law. CONTRACTOR agrees that it will use reasonable diligence to determine whether the governmental authorities requesting or demanding information have authority to request or demand same, if such request or demand pertains to some confidential aspect of this work other than location or general nature, and that it will promptly notify COMPANY's representative in order to obtain said representative's assistance.

8.3 CONTRACTOR agrees that it will take no advantage of the information obtained from its work under the provisions hereof and that such information shall be for the exclusive use and benefit of COMPANY or its assignees. CONTRACTOR further undertakes that it will use its best endeavours to ensure that its sub-contractors, agents or employees likewise take no such advantage.

[Handwritten signature]

9.0 SUCCESSION

COMPANY is hereby given the right to assign and re-assign this Agreement to other persons, firms or corporations whether now in existence or hereafter to be formed or chartered, for whose benefit this Agreement is made, insofar as and for the time the same may be assigned to each respectively. Provided that COMPANY shall, in the event of such assignment or re-assignment, remain nevertheless primarily liable to CONTRACTOR for all sums payable to CONTRACTOR hereunder, and COMPANY shall look to said other persons, firms and corporations respectively for reimbursement for all sums so paid to CONTRACTOR on account or work performed hereunder for each respectively. The work, duties and obligations to be done or performed hereunder by CONTRACTOR shall not be assigned by CONTRACTOR unless it first has received the written consent of the COMPANY. Any and all obligations of the COMPANY hereunder shall be discharged upon performance thereof by any company or companies associated or affiliated with COMPANY.

10.0 TERM

Operations of the Basic Party (i.e. ship, personnel and equipment) hereunder shall continue until completed to the satisfaction of COMPANY or until terminated by either party on seven days' written notice to the other provided that:

- (a) COMPANY or CONTRACTOR may not terminate until after a minimum of 21 operational working days referred to in clause 6.0 has been completed by CONTRACTOR.
- (b) COMPANY may terminate at any time, without penalty and without prejudice to its other rights and remedies as provided by law, if CONTRACTOR is at default hereunder, notwithstanding sub-clause (a) hereof.

11.0 SUB-CONTRACTORS

CONTRACTOR may engage subcontractors to perform all or any of the matters which would normally be performed by subcontractors under an agreement of the kind contained herein.

12.0 PROPER LAW

This contract shall in all respects be governed by the law of the State of New South Wales and any dispute touching the same (if both parties so agree) be referred to arbitration under the Arbitration Act 1902.



13.0 COMPLIANCE WITH APPLICABLE LAW

CONTRACTOR shall, in the performance of the work hereunder to be performed by it, observe and comply with the provisions of all applicable Statutes, Rules and Regulations of the Commonwealth of Australia and any other State in which such work is being performed.

14.0 NOTICES

All notices required to be given to COMPANY hereunder shall be sent to COMPANY at 280 George Street, Sydney, New South Wales.

All notices required to be given to CONTRACTOR shall be sent to CONTRACTOR at 5825 Chimney Rock Road, Houston, Texas.

All notices given by either party shall be deemed sufficient for all purposes if sent by registered mail and shall be effective from the date of receipt thereof.

CONTRACTOR shall nominate a representative in the field who may receive instructions on its behalf and who may be nominated as "Person in Charge".

15.0 PATENT AND TRADE MARK IDENTITY

CONTRACTOR hereby indemnifies and saves COMPANY harmless against all and any claims and demands which may be made against COMPANY in respect of infringement of patent or trade mark rights arising out of the performance by CONTRACTOR of the terms of this Agreement.

16.0 SUBMISSION TO AUSTRALIAN JURISDICTION

Where a survey is carried out hereunder in any Permit issued pursuant to "The Petroleum (Submerged Lands) Act of 1967" of the Commonwealth of Australia and the equivalent Act of the relevant State of the Commonwealth, CONTRACTOR undertakes that in respect of the whole of its operations in such Permit it will not seek to deny and that it will ensure that none of its

sub-contractors agents or employees will seek to deny the applicability in any part of such Permit of Sections 9, 10 and 13 of the said "The Petroleum (Submerged Lands) Act of 1967" of the Commonwealth of Australia and of the equivalent Sections of the equivalent Act of the relevant State of the Commonwealth and CONTRACTOR further undertakes that it will indemnify and keep indemnified COMPANY and other parties having an interest in the Permit against any liability arising out of denial or attempted denial in breach of this Clause.

17.0 NO ORAL MODIFICATIONS

This Agreement may not be modified or discharged, in whole or in part, except by an instrument in writing signed by both parties.

18.0 FORCE MAJEURE

If due to Force Majeure defined herein as riots, war, insurrection, fire, national emergency or any Act of God or other casualty beyond the control of CONTRACTOR or COMPANY and other than events referred to in Clause 7.0 above, the continuation of the work shall be interrupted, CONTRACTOR shall not be liable for any delay or failure of performance of this agreement insofar as such delay or failure is the result of such cases aforesaid, and COMPANY shall be relieved of its obligations to make payment set out herein above from the date of cessation of operations and until operations can be again resumed by CONTRACTOR.

IN WITNESS WHEREOF this Agreement is executed in duplicate, each copy for all purposes to be deemed on original, as of the day, month and year first above mentioned.

For and on behalf of PLANET MANAGEMENT & RESEARCH PTY. LIMITED

John Smith Director
.....
Jacky Secretary
.....

Witness:

For and on behalf of TELEDYNE EXPLORATION COMPANY

D.R. Smith
.....
E. Stass
.....

Witness:

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PERSONNEL BIOGRAPHIC INFORMATIONTELEDYNE EXPLORATION COMPANY

and

OFFSHORE NAVIGATION INC.Donald R. Bealer

Area Manager - Far East

Mr. Donald Bealer received a Bachelor of Science Degree from the University of Southwestern Louisiana in 1962. One year later, he received a Master of Science Degree from Miami (Ohio) University.

Upon completion of his formal education, Mr. Bealer was employed by Geophysical Service, Incorporated, and received experience in land operations throughout Mississippi, Louisiana, Oklahoma and East Texas. He was transferred to New Orleans, Louisiana in 1964 as a Geophysical Engineer assigned to the processing of initial seismic data acquired on the East Coast of the United States.

In 1965, Mr. Bealer joined Continental Oil Company as a Geophysicist responsible for interpretation in the Lafayette, Louisiana area. Initial programming of digital Vibroseis* correlation was conducted while temporarily assigned to the Ponca City Computer Center.

* Trademark Continental Oil Company

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On rejoining G.S.I., Mr. Bealer was responsible for logistics and processing of the first East Coast Combine and later the West Coast Florida Combine. Investigation and programming of velocity determination techniques were developed at this time.

Mr. Bealer was engaged in the development of the first operation air gun system developed by G.S.I. during phases of the combine work.

Completion of the West Coast Florida Combine operations was followed by a transfer as Operational Supervisor to the Far East. Under his supervision, seismic surveys were conducted in the Australian, New Zealand and Indonesian areas.

Mr. Bealer was transferred to Canada as Manager, Marine Processing and Operations in the summer of 1968. Surveys under his supervision were conducted on the North, East and West Coast of Canada.

In March, 1969, he joined Teledyne Exploration Company as Program Manager of the Far East.

Mr. Bealer is a member of Sigma Gamma Epsilon, Lambda Chi Alpha and the Canadian Society of Exploration Geophysicists.

F. Donald Bowman
Supervisor

Mr. Don Bowman received his formal training and three years of experience in electronics while serving the U.S. Army Signal Corps. Upon discharge in 1962 he joined the Martin Company as an electronic technician, and in April 1964 accepted a position at Rayflex Exploration Company as a marine seismic technician. Mr. Bowman's training in marine seismic operations was under the direction of Mr. Neil A. Moore, who at that time was the Manager of Field Services for Rayflex.

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At the end of six months Mr. Bowman was made a party chief and was assigned to train others in the same line, as well as to manage marine seismic profiling operations.

Mr. Bowman continued to manage projects for Rayflex after the company was acquired by Marine Geophysical Services division of Alpine Associates in April 1965. In August of 1965 he joined the Geotech Division as a field party chief. Later after transfer to Teledyne Exploration, he was promoted to supervisor and assigned to Far Eastern operations.

Mr. Bowman is presently in charge of a marine geophysical crew. His experience extends to all types of marine seismic equipment and his management capabilities have resulted in successful Teledyne programs in many parts of the world.

W.B Springer

Senior Observer

Mr. Springer attended Grenville High School and completed his high school education in 1940. He continued his education at the Rice Institute in Houston, Texas until he was drafted in 1941.

He was enrolled in the US Navy E.12 program and was commissioned as a mid shipman in 1942. Upon completion of his military service, Mr. Springer joined the Independent Exploration Co. in 1946, as an observer trainee and has completed thirteen years of shallow water and land seismic and four years of offshore marine seismic work.

Max Summers

Observer

Mr. Summers completed his formal education at the Hull Marine Technical College where he received his appointment from the Royal Society of Arts.

From 1961 to 1966, Mr. Summers was employed by Airedal, Electric Company as an electrical engineer. From 1966 to 1967 he was employed by the M.N.F.C. Co. Ltd. of York, England, as a micro switch and instrumentation engineer. Mr. Summers was then employed by A.E.I. in London as a test engineer.

Paul Rosenblum

Observer

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Mr. Rosenblum attended the University of New South Wales from 1965 to 1967. From 1968 to 1970 he was assigned as a computer operator for Geophysical Services Inc. and was later transferred to field operations where he conducted quality control and satellite navigation.

Mr. Rosenblum was later employed by United Geophysical as a satellite Doppler operator and has been employed by Teledyne since July 1970.

Jose Gomez

Senior Observer

Mr. Gomez entered the U.S. Air Force in 1954 where he served in communications maintenance. In 1958 he completed his military duties and joined R.C.A. as a maintenance technician in NORAD and Early Bird Defence Systems.

Mr. Gomez completed several courses in advanced electronics and communications while employed by R.C.A.

In 1966 Mr. Gomez joined Teledyne Exploration as an observer trainee and has since served on marine offshore surveys throughout the world.

Ken Parker

Administrator - Party Chief

Mr. Parker attended the University of Florida (Jacksonville) for two years as an accounting major. Upon completion of these two years, Mr. Parker migrated to Australia and was employed by Teledyne Exploration to co-ordinate and administrate the operations of Party 708 on the M/V Teledex IV.

Captain John Lesley

Captain Lesley has an unlimited ticket from the U.S. Coast Guard and has been at sea for the past twenty-five years.

He has worked on seismic survey vessel for the past four years and is thoroughly familiar with the operations and requirements for this type procedures.



Ronald Grey
Chief Engineer

Mr. Grey is an Extra Chief Engineer and has served on major freighters on the Australia to U.K. run for the past fourteen years.

Chief Engineer Grey has been employed by Teledyne since August of this year.

Donald E. Heaverlo - Offshore Navigation Inc.
Party Chief

Mr. Heaverlo attended the U.S. Navy Electronics School and spent sixteen years in the U.S. Navy as an Electronics Technician.

Mr. Heaverlo has been with Offshore Navigation for seven years employed as an Electronic Technician, Mobile Operator on Shoran Systems, Hirex Systems and Raydist Systems.

Ranvil W. Simmons
Mobile Operator

Mr. Simmons received his training in electronics Communications and Navigation in the U.S. Navy. He spent twenty-four years in the U.S. Navy in this department.

Mr. Simmons has been with ONI for two years as a Mobile Operator in Shoran and RAYdist Systems.

John Lee
Mobile Operator

Mr. Lee attended the British Merchant Marine Radio School where he received his training. He spent five years in the British Merchant Marine as a Radio Officer, after which he joined the British Department of Post and Telegraphs as a Communications officer and was employed by them for five years.

Mr. Lee has been with ONI for the past three years employed as a Shoran Mobile Operator.

[Handwritten signature]

Lambertus Koningsveld

Base Station Operator

Mr. Koningsveld obtained his training in the Royal Dutch Army in Mechanics and Radio operations. He spent four years in the Army.

This gentleman spent fifteen years in the mechanics trade and for the past three years has been employed by ONI as Base Station Operator.

Geoffrey A. Rolfe-Smith

Base Station Operator

Mr. Rolfe-Smith spent three years at the Hamilton Technical College, New Zealand studying physics and electricity, following this he studied for one year with the N.Z. Railways and obtained knowledge in communications systems and Westinghouse computers.

Mr. Rolfe-Smith then spent nine years with the N.Z. Railways as a Communications Technician then one year with Shell BP & Todd and Western Geophysical Co. He has been with ONI for four months employed as a Shoran Base Station Operator.

Terence J. Wright

Base Station Operator

Mr. Wright trained with the Electricity Trust of S.A. in maintenance of electrical equipment, and remained with them for three years.

Mr. Wright has been with ONI for five months as a Shoran Base Station Operator.

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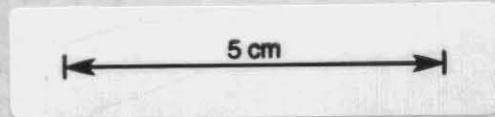
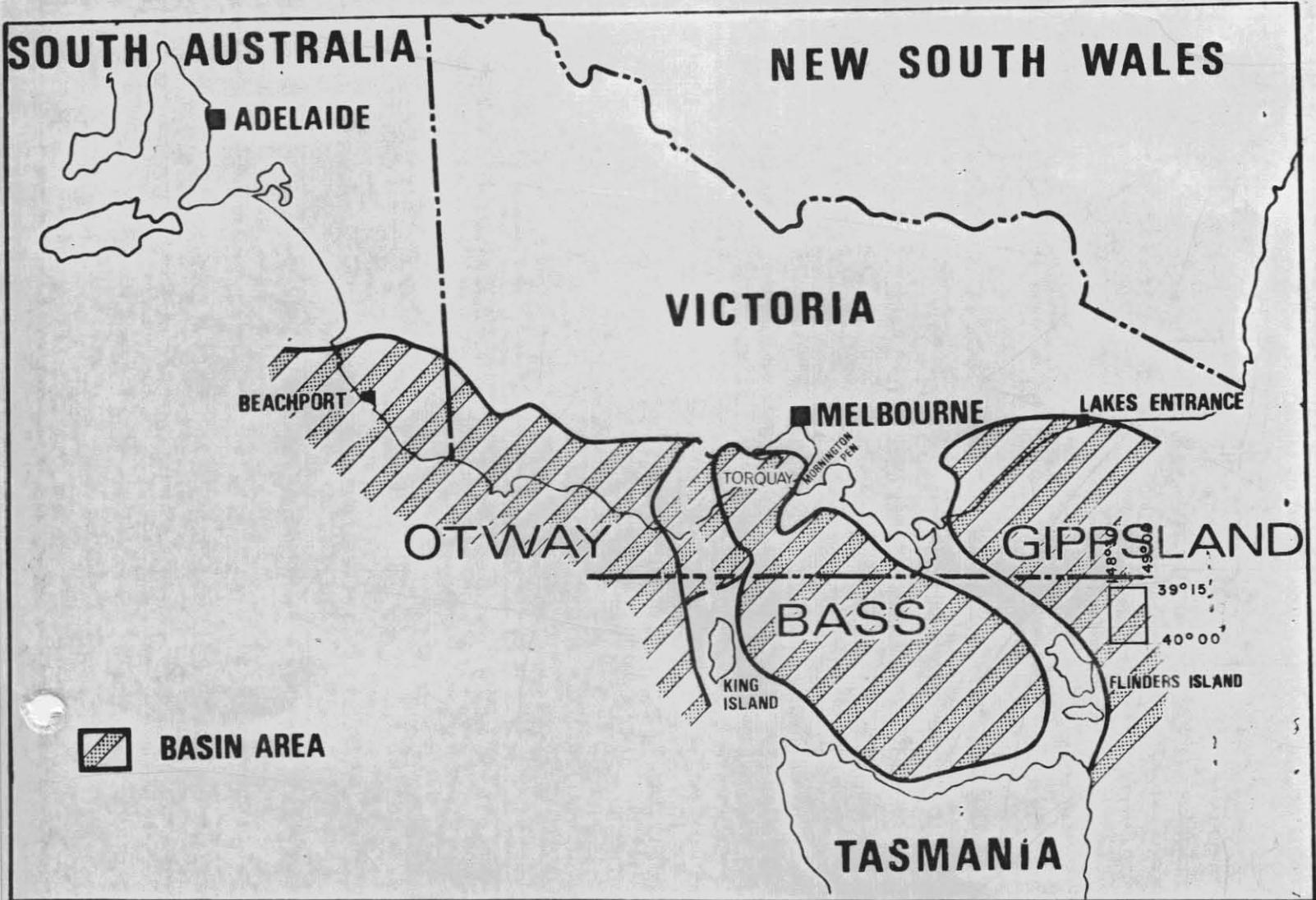
ATTACHMENT 3.

490028

COST ESTIMATE

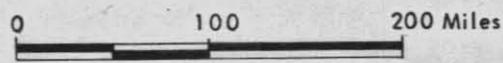
SAILFISH MARINE SEISMIC SURVEY, VIC.

ACC. NO.	DESCRIPTION	A TRAVEL	B PAYROLL	C CONTRACTOR	F SUPPLIES	G FREIGHT	TOTAL	SUBSIDISABLE
1	Supervision		750.00	750.00			1,500.00	1,500.00
6	Travel & Accommodation		300.00	100.00			400.00	400.00
9	Subsidy Expenses		200.00				200.00	
11	Reports		250.00				250.00	250.00
12	Maps & Drafting		100.00				100.00	100.00
14	Activation		150.00				150.00	150.00
19	Communications			150.00			150.00	150.00
20	Reparation							
21	Freight					1,000.00	1,000.00	1,000.00
26	Geophysical Survey Contract - Data Acquisition			24,500.00			24,500.00	24,500.00
	" " " - Shoran			6,000.00			6,000.00	6,000.00
	" " " - Interpretation			4,500.00			4,500.00	4,500.00
48	Other Supplies - Sonobuoys			3,000.00			3,000.00	3,000.00
38	Data Processing			35,500.00			35,500.00	35,500.00
			1,750.00	74,500.00		1,000.00	77,250.00	77,050.00



N.S.W. OIL AND GAS CO. N.L.

SAILFISH MARINE SEISMIC SURVEY LOCALITY PLAN





N.S.W. OIL AND GAS CO. N.L.
**SAILFISH MARINE SEISMIC SURVEY
 PROPOSED PROGRAMME**

LEGEND
 — REFLECTION
 X — REFRACTION
 ~ WATER DEPTH

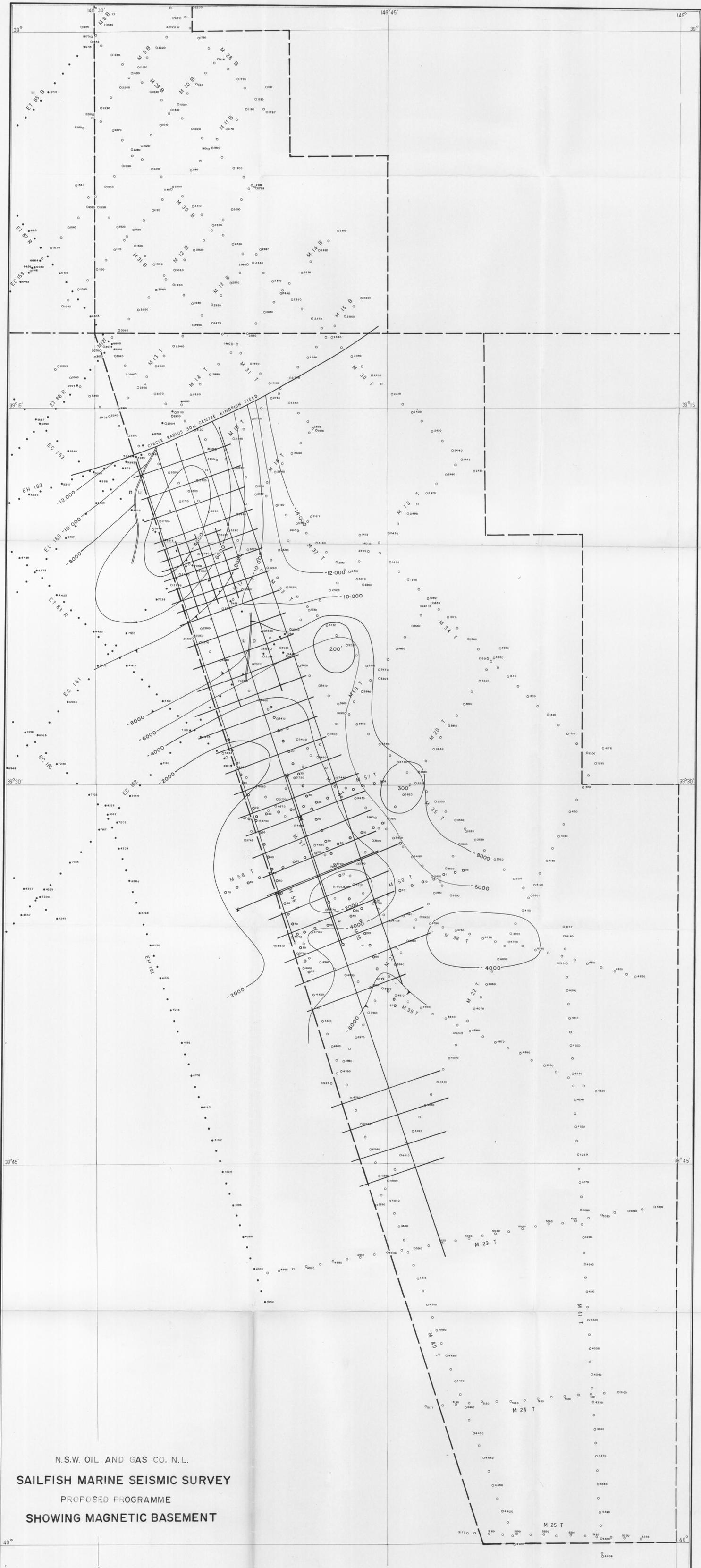
SHOT POINTS
 ○ Magellan Petroleum Southern PTY. LTD.
 ● Esso Exploration & Production Australia Inc.

5 cm
 0 2 4 6 miles
 Scale 1:100,000

EAST GIPPSLAND BASIN AREA

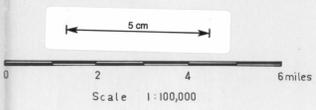
496030

ENCLOSURE 1



N.S.W. OIL AND GAS CO. N.L.
SAILFISH MARINE SEISMIC SURVEY
 PROPOSED PROGRAMME
SHOWING MAGNETIC BASEMENT

SHOT POINTS
 ○ Magellan Petroleum Southern PTY. LTD.
 ● Esso Exploration & Production Australia Inc.



EAST GIPPSLAND BASIN AREA



N.S.W. OIL AND GAS CO. N.L.
SAILFISH MARINE SEISMIC SURVEY
 PROPOSED PROGRAMME
 SHOWING SEISMIC
TOP LATROBE VALLEY COAL MEASURES

SHOT POINTS
 ○ Magellan Petroleum Southern PTY LTD
 ● Esso Exploration & Production Australia Inc.

LEGEND:
 ——— L.V.C.M.
 - - - - - Latrobe SS. Sub Crop
496032



Scale 1:100,000

EAST GIPPSLAND BASIN AREA

496033

231'

252'

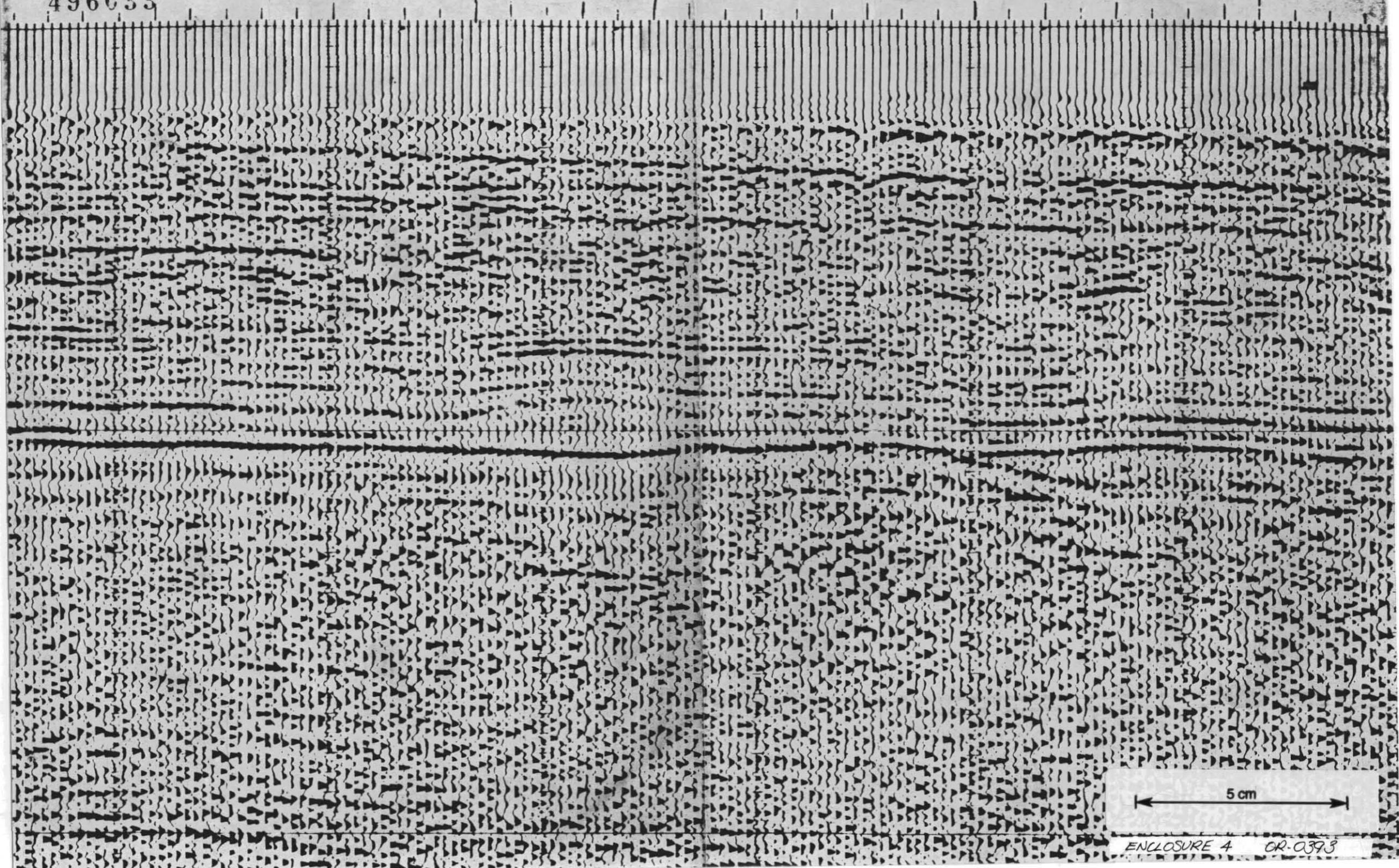
268'

280'

395'

307'

320'



5 cm

ENCLOSURE 4 OR-0393