Bureau of Mineral Resources, Geology & Geophysics

R E C O R D

BMR Record 1990/74

Joint Geochemical Research: An Agreement between the Commonwealth of Australia and Transglobal Exploration and Geoscience (USA)

by

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Project 121.20

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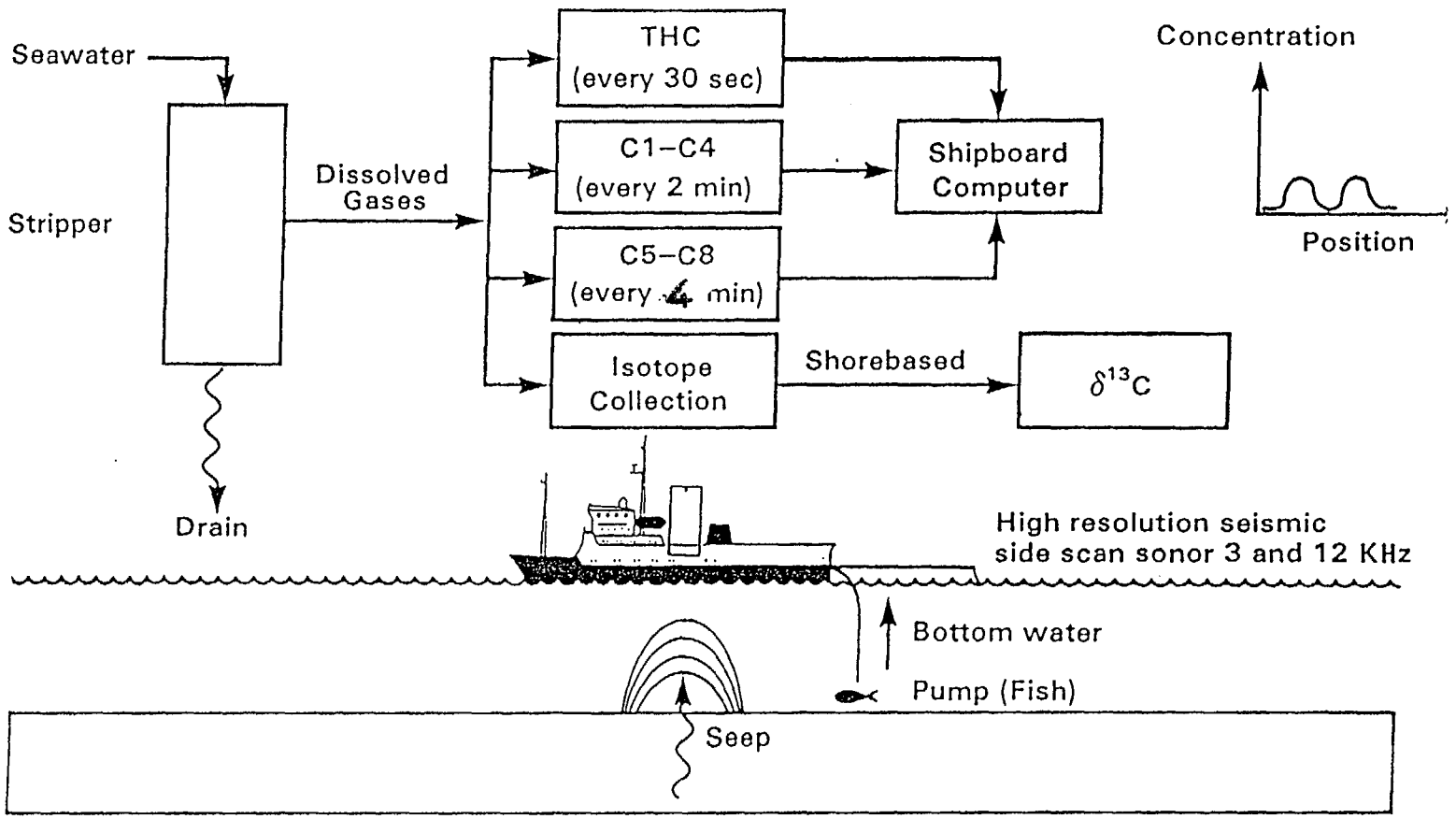
Executive Summary

This record describes an Agreement between the Commonwealth of Australia represented by the Bureau of Mineral Resources and Transglobal Exploration and Geoscience (TEG), a United States Corporation based in Leucadia, California. The Division of Petroleum Geology and Marine Geosciences of BMR, as part of the Continental Margins Program (CMP), had begun a research program to investigate the potential for surface geochemistry -the search for hydrocarbon vents and seeps from sub-seafloor hydrocarbon accumulations into surface sediments and overlying seawater - to contribute to the search for hydrocarbon reservoirs on the Australian continental margin. One part of this Agreement includes the installation on Rig Seismic of geochemical equipment to continuously measure light hydrocarbons in seawater while the ship is underway. A schematic of that equipment is shown overleaf. The acquisition and installation of this equipment on Rig Seismic complements the existing sediment geochemistry methods. A three year research program has begun with TEG, the objectives of which are to investigate:
i. methods for the direct detection of hydrocarbon gases in seawater,
ii methods for the discrimination of thermogenic gases from biogenic gases,
iii. the relationships between the chemical compositions (molecular and isotopic) of seeps and the hydrocarbon reservoir 'source' (liquids, condensate and gas).,
iv. the sea-floor and sub-seafloor expressions of thermogenic gas seeps,
v. the relationship between hydrocarbon gases present in seawater and those present in sediments,
vi. diagenetic processes affecting thermogenic gas seeps,
vii. oceanographic and biological dispersal processes affecting the compositions, locations and distributions of gas seeps.

Geochemical projects will be conducted as part of the CMP and include:(1) surveys in 'frontier' sedimentary basins where any evidence of hydrocarbon seeps provides important clues to the generation and presence of thermogenic hydrocarbons, (2) surveys in known petroleum provinces to conduct 'calibrations' over both barren and known hydrocarbon 'sources' (liquids, condensate, gas) reservoirs, (3) surveys in petroleum provinces to test the application of geochemical techniques to prospect evaluation.

OFFSHORE GEOCHEMICAL EXPLORATION



AGREEMENT

between

The Commonwealth of Australia as represented by

Bureau of Mineral Resources (BMR)
in Canberra, ACT, Australia

and

Transglobal Exploration and Geoscience (TEG)
1159 Hermes Avenue, Leucadia, California, United States of America

The Commonwealth of Australia, as represented by, The Bureau of Mineral Resources (BMR) and TransGlobal Exploration and Geoscience (TEG) incorporated under the laws of the State of California and having its registered office and place of business at 1159 Hermes Avenue, Leucadia, California, USA, hereby agree to establish a program of cooperative research for a period of three years into methods of direct detection of hydrocarbon gases in seawater and techniques for interpreting gas anomalies in terms of subsurface petroleum accumulations.

1. Aims and Scope of the Program

The research program will investigate methods for the direct detection of hydrocarbon and related gases present in seawater; the determination of subsurface seepage pathways; the discrimination of thermogenic from biogenic hydrocarbon gases; the seabed and sub-seabed expression of thermogenic gas seeps; the relationship between hydrocarbon gases present in seawater and those present in seabed sediments; oceanographic and biological dispersal mechanisms and diagenetic processes affecting thermogenic gases.

The program will also involve investigation of techniques for the processing, manipulation and display of thermogenic hydrocarbon gas anomalies detected in seawater and seabed sediments as well as methods for interpreting such displays in terms of possible subseabed accumulations of hydrocarbons.

2. Initial Obligations

BMR has provided shipboard facilities for a period of 16 days to TEG between 1 February 1989 and 2 March 1989 to allow a program of geochemical data acquisition in the Bass Basin and St Vincent's Gulf of southeastern Australia. A period of approximately three days was allowed at either end of

the program alongside suitable wharf facilities for commissioning and decommissioning of equipment. BMR further followed an agreed track and provided on-line navigational information.

TEG agreed to provide all geochemical equipment, both over-the-side and on-board, as necessary to carry out the above program as well as the technical staff and meet the costs needed to operate and maintain that equipment for the duration of that program, including 14 days of BMR operations in the Gippsland and Otway Basins. Subject to paragraph 5, TEG agreed to make available to BMR a copy of all geochemical data collected. TEG further agreed to allow BMR free access to all systems and technology on a "Commercial-in- Confidence" basis.

It was further agreed that BMR would bear the costs of the installation and removal of the equipment from RIG SEISMIC. Freight and other costs associated with transportation of the equipment from and to the USA were borne by TEG.

3. Subsequent Obligations

TEG and BMR agree to undertake the cooperative research program outlined in Item 1 above for a period of three years from 1 August 1989.

In consideration of the obligations of BMR under this agreement, TEG agrees to transfer, absolutely, ownership to the Commonwealth of Australia, through BMR Division of Marine Geosciences and Petroleum Geology (Appendix 1), the essential components, as detailed in Appendix 2, of an operating seawater hydrocarbon sampler and detector system. The system will be transferred from TEG to the BMR, Canberra, Australia on or before 1 August 1989. Any variation in this date must be agreed upon by both parties. Delivery of the system to Australia will be at the cost of TEG while the cost of delivery to BMR Canberra and installation on board RIG SEISMIC will be paid for by BMR. TEG warrants that the equipment, at the time of transfer, is free from all charges, liens or encumbrances of any kind.

BMR agrees to augment the system provided by TEG with a suitable winch, an A-frame as appropriate, and personal computers in order to complete and assemble a fully operational seawater sampling and shipboard analytical unit.

BMR agrees to supply two staff to receive the equipment from TEG and also for training purposes during a program conducted by TEG between 28 June and 30 July from Perth to Port Hedland. In return, TEG agrees to provide personnel, waiving salary costs, to install and commission the system on RIG SEISMIC at a mutually agreed time. If TEG personnel come from the US solely to install the equipment on Rig Seismic, economy airfares to Australia, accommodation and incidental expenses will be paid at standard Australian Government Public Service (non Senior Executive Service) rates. If TEG personnel are in Australia as part of a TEG program at the approximate time of commissioning of the equipment on Rig Seismic, no overseas airfares or part thereof will be provided by BMR. TEG will provide personal liability coverage for TEG personnel at all times and TEG is responsible at all times for any claims made by TEG personnel while working on Rig Seismic.

BMR will maintain the sampling, data acquisition and analytical units in good working order. To this end, TEG will provide a maintenance service for a management fee of $US1 000 annually in order to provide over the period of the agreement, spares and replacement parts to maintain the equipment in good working order. The cost of any such parts, including freight and a service fee of 10%, shall be paid by BMR on production of invoices and supporting documentation. The management fee will be due on 1 October 1989 and on the same date in subsequent years.

BMR will operate the unit during the period of the agreement for the purpose of identifying petroleum resource potential and encouraging exploration, in accordance with the objectives of BMR's Continental Margins Program and the terms of Appendix 3. All data so obtained remains the property of BMR, but will be made available to TEG for promotional purposes only, in accordance with clause 5.

4. Lease-Back Arrangements

The analytical and data acquisition units (Appendix 2) will be made available to TEG during the three year term of this agreement through a lease-back arrangement for not less than 90 days per annum for periods of not less than 30 days at a time for commercial purposes. The lease-back of the deck hardware (faired cable and submersible fish) will be optional and provided subject to limitations of use on Rig Seismic. The deck hardware if leased back will be provided in an 'as used' condition.

The lease back option period begins 1 August 1989. The timing and transfer of the equipment, beyond 1 August 1989, between BMR and TEG will be mutually agreed upon subject to constraints of both the BMR and TEG programs.

Costs of decommissioning, transportation and recommissioning on subsequent programs will be met by TEG and the unit will be returned in fully operational condition. If the equipment is used by TEG outside of Australia all customs clearance duties and associated matters will be dealt with and paid for by TEG.

The lease-back charge will be on a basis of $25 per kilometre travelled for each client of TEG, i.e. company or joint venture or study group. The charge will be payable by TEG within 30 days of completion of the survey to the BMR Trust Account (Offshore Sedimentary Basins Research Program) one component of which is for marine geochemical research.

TEG will commercially insure the complete system when leased from the BMR at all times to guarantee provision of a full replacement system to BMR should loss occur by any means. The TEG insurance should include property insurance to cover damage and loss when in storage or in transit and 'over-the-side' cover when used at sea. TEG are to supply copies of the insurance documents to BMR.

BMR and TEG agree to consult fully and well in advance of program requirements in order to ensure maximum efficient usage of the unit within the constraints of the BMR and TEG Programs. Should BMR and TEG not be able to resolve the allocation of equipment use they agree to follow the Arbitration procedure shown in Appendix 4.

5. Exchange of Information

BMR and TEG agree to exchange freely all relevant data and information as is allowed under the laws of Australia and the United States and as limited by:

(i) contractual agreements entered into for commercial purposes by TEG;

(ii) arrangements entered into by BMR as part of any joint venture with industry;

(iii) conditions of release of public domain data collected as part of BMR Continental Margins Program.

For data collected as part of the Initial Obligations (Clause 2) the following conditions are applicable:

That data gathered for Amoco shall be treated as subject to Clause 5(i) above.

That data gathered for Shell shall be treated as subject to Clause 5(ii) above.

That data gathered in the Gippsland and Otway Basins by BMR shall be treated under Clause 5(iii) above.

When any moratorium on data collected in the Australian region expires, BMR and TEG agree to seek the approval of any clients as appropriate to exchange such data.

Noting that BMR is the Federal agency responsible for archiving all exploration data collected under the Petroleum (Submerged Lands) Act, TEG, as a matter of goodwill, will seek the agreement of its Australian clients to provide BMR with a copy of the edited basic data in digital form prior to, or at the time of release, of that data to the Designated Authority. A pro-forma, which BMR requests TEG to bring to the attention of its clients, is attached (Appendix 5). This request begins with the TEG program in July 1989.

Data, information, concepts and technology exchanged under this agreement will be treated as "Commercial-in-Confidence". These will not be sold, or otherwise made available to any third party without written consent of the originating organisations, clients or joint venture partners as appropriate.

6. Rights to Technology

Rights to the proprietary technology contained in the system identified in paragraph 3 remains, where appropriate, with TEG. The technology has been made available to the BMR at no charge as part of this Agreement. BMR undertakes not to pass this technology to a third party.

Rights to new technology and/or interpretative techniques developed solely by either BMR or TEG belongs to the organisation developing the technology and/or technique. The originators agree to make any such new technology or techniques available to the other organisation during the period of the agreement, who undertakes, in turn, not to pass that technology to a third party.

Rights to new technology and/or interpretative techniques developed jointly by BMR and TEG belongs jointly to BMR and TEG. The release of new technology, developed jointly, should be made jointly or in such a manner as to not jeopardise the rights of the other party.

7. Publication of Results

Publication of results, subject to the restrictions identified in paragraph 5 and 6 above, is encouraged in order to promote the application of the method in petroleum exploration and to identify and promote the petroleum potential of Australia's offshore basins.

The publication and display of all data, gathered in the Australian region, by the BMR or TEG at meetings, trade expositions and conferences must be accompanied by the BMR/TEG logo and must recognise the BMR/TEG joint research agreement.

Any publication by the BMR or public report or announcement by TEG will display the BMR/TEG logo and a statement recognising the joint research program in Australia.

TEG agrees to include in reports to clients for work done in Australia a disclaimer, set out in Appendix 6, that recognises the joint research agreement.

BMR and TEG have the option to agree to share the costs, on a negotiated and mutually agreed basis, of travel, accommodation and incidental expenses during any exchanges of personnel between Australia and the United States for the purposes of data analyses, research (including technology transfer) and publication of results.

8. Apportionment of Costs

Except where identified elsewhere in this Agreement, costs of system manufacture, system replacement, maintenance, data processing and interpretation and operation of the system supplied to BMR will fall to BMR within its own program, and to TEG when leased back.

BMR and TEG agree that costs of upgrades and new developments to existing technology will be shared on a negotiated and mutually agreed basis. BMR will not subsidise upgrades and new developments applicable to TEG equipment only. The following guidelines apply:

(i) BMR has the option to acquire upgrades and new developments in both hardware and software developed by TEG by contributing to the development cost on a negotiated and mutually agreed basis;

(ii) TEG has the option to acquire upgrades and new developments in both hardware and software developed by BMR by contributing to the development costs on a negotiated and mutually agreed basis;

(iii) all upgrades become an integral part of the system and replacements and spares are treated as under Clause 3.

Under the terms of Clause 8(i) BMR agrees to contribute US$1800 to the manufacture of a new mould for one-piece fairings. In return TEG agrees to provide 4000 of the new design one-piece fairings for one cable plus 1000 spares to BMR by 1 September as part of the original delivery. The cost of delivery to Australia will be borne by TEG. The investment by BMR in the mould entitles the BMR to additional fairings which will be treated as under Clause 3, and provided at cost + 10%.

9. Duration and Withdrawal

The duration of this Record of Understanding will be three years from 1 August 1989.

On early termination by BMR for any reason:

(i) should BMR decide to dispose of the equipment, TEG has the first option to buy-back the system provided to BMR (Appendix 2) at an appropriate depreciated value as outlined in Appendix 7;

(ii) should BMR retain the equipment outlined in Appendix 2, and in recognition of the residual value in the technology transfer, BMR agrees to pay to TEG an appropriate depreciated value as outlined in Appendix 7.

On early termination by TEG for any reason, TEG or any creditor(s), recognises it has no residual lien on the equipment provided under Clause 3, and described in Appendix 2. TEG furthermore recognises it has no lien on any improvements installed to the equipment in Australia.

10. Governing Law

This agreement shall be governed by and construed in accordance with the laws of the Australian Capital Territory and the parties submit to the jurisdiction of the courts of the Australian Capital Territory.

11. Execution

This agreement has been executed by the parties as at 26th September 1989

Signed on behalf of the)
Commonwealth of Australia)
by DAVID A. FALVEY)
in the presence of:)
MICHAEL O. LEE)

Signed on behalf of)
Transglobal Exploration and)
Geoscience by .....)
BLAYNE HARTMAN, PRESIDENT)
in the presence of:)
SHERI HARTMAN, TREASURER)

APPENDIX 1

Transfer of Ownership Document

With respect to the equipment described in Appendix 2 attached hereto and incorporated herein, located within the jurisdiction of the Commonwealth of Australia, it is our belief that Transglobal Exploration & Geoscience, Inc, a United States Corporation (hereinafter called the "Corporation"), has voluntarily abandoned all rights, whether equity or in law, to such property. Accordingly, the Bureau of Mineral Resources, Geology and Geophysics, a research bureau of the Federal Department of Primary Industries and Energy, of the Commonwealth of Australia, hereby gives the Corporation notice that it has taken legal possession of the property described in Appendix 2 without payment of compensation to the Corporation for such property being required or requested.

APPENDIX 2

Equipment to be provided by TEG

1. Analytical units

a. 1 Shimadzu gas chromatograph fitted with dual FID (flame ionisation detectors) for analyses of C_2-C_4 hydrocarbons every 2 min.

b. 1 Shimadzu gas chromatograph fitted with dual FID detectors for total hydrocarbon (THC) analyses every 30 seconds and C_5-C_8 hydrocarbons every 8 minutes.

c. 1 Shimadzu gas chromatograph fitted with dual FID detectors for C_1 analyses every 2 minutes and C_5-C_6 analyses every 2 minutes.

All gas chromatographs will be fitted with the appropriate relays and valves for continuous and sequential analyses of hydrocarbons.

d. 1 complete Gas stripper, equilibrator, vacuum pump and associated spares.

e. 1 Conductivity, temperature depth (CTD) unit.

2. Data acquisition units

a. This will include all the software and hardware to 'drive' the gas chromatographs for continuous operation, including data acquisition of all hydrocarbon, temperature, salinity and depth data. All the necessary interfaces, cables and instrumentation but excluding the personal computers are to be supplied.

b. Six Hewlett Packard integrators.

3. Deck Hardware

a. 1 x 425 m stainless steel cable with a complete set of fairings.

b. 1 x submersible fish and all internal components.

4. Spares provided

a. one submersible pump and motor
b. one pressure transducer
c. one termination bottle
d. 1000 one piece fairings
e. one oil-gas vacuum pump
f. two Jasco exhaust pump kits
g. one on/off solenoid
h. two stripper probes
i. one temperature thermister
k. two Valco valve rotors
l. two time delay relays
m. one Valco air activator
n. two air activated solenoids
o. two columns for LHC, G, THC.

Terms of operation of equipment by BMR

In recognition of the contribution by TEG to the cooperative research program in terms of intellectual property, BMR will operate the equipment according to the following.

The Australian region refers to the Australian EEZ (Exclusive Economic Zone), its Legal Continental Shelf and contiguous deepwater areas.

Work Outside the Australian Region

1. BMR may use the underway geochemical system for use outside the Australian region as part of its own or foreign assistance or intergovernmental programs without payment of royalties to TEG.

2. BMR will not carry out commercial work (see defined below) for oil companies, individually or as a group, over proprietary or open acreage without prior discussion with TEG, and under an arrangement acceptable to both parties. Should both parties not be able to agree a mutually acceptable independent arbitrator will be appointed.

Work Within the Australian Region

1. When using the underway geochemical system as part of BMR Program of a non-proprietary nature, and where data falls in the public domain, TEG will not receive royalties.

2. Commercial work for an oil company or group of companies will be restricted to less than a total of 500 km in any program. TEG will be entitled to receive a royalty of A$25 per kilometre travelled for each client of BMR, i.e. company or joint venture or study group directly from that company, joint venture or study group involved. Any agreement between BMR and client(s) will incorporate a pro-forma royalty agreement that indicates a royalty be paid directly to TEG, and not via BMR. BMR will advise TEG of any such arrangement. TEG and any company(s) involved will independently arrange for payment of the royalty.

3. Commercial work for the oil industry of greater than 500 km are to be discussed with TEG and only carried out under an arrangement satisfactory to both TEG and BMR. Should both parties not be able to agree, a mutually acceptable independent arbitrator will be appointed.

NOTE: Commercial work for the purpose of this Agreement is defined as survey operations conducted specifically for a company, joint venture or study group for which full or partial payment is made and the data derived from which is confidential under the terms of the Petroleum (Submerged Lands) Act, or equivalent State/NT legislation covering petroleum exploration in internal waters.

Arbitration

In the event of any dispute arising between the Contractor and the Commonwealth regarding the Contract the parties shall forthwith meet and discuss the dispute endeavouring to settle the difference. Should the difference be irreconcilable such dispute shall be forthwith referred for determination to an arbitrator agreed upon by both parties. If the parties are unable to agree upon an arbitrator, the matter shall then be referred for determination according to the laws regarding arbitration in the Australian Capital Territory.

Pro-forma: Release of Digital Geochemical Data to BMR

The BMR has requested attachment of the following statement to this report.

One of the aims of BMR's Continental Margins Program, established by the Australian Government, is to foster the development of techniques that will assist in the exploration and development of petroleum resources. As part of that policy, the Bureau of Mineral Resources has entered into a cooperative research program with Transglobal Exploration and Geoscience to encourage the use of geochemical exploration techniques, specifically direct detection of hydrocarbons in seawaters of the Australian continental margin.

Recognising that the BMR is the Federal Agency responsible for archiving all offshore exploration data collected under the Petroleum (Submerged Lands) Act, your Company is invited to provide the geochemical data contained here in digital format to BMR to assist the cooperative research program, as well as meeting the requirements of the P(SL)A. BMR requests that you authorise TEG to provide such copies directly in compatible format on floppy disk. Any such data transfer will comply with the confidentiality requirements of both your organisation, and the P(SL)A.

These data when transferred to BMR form part of a geochemical database in the Division of Marine Geosciences and Petroleum Geology. These data will be used for in-house processing to examine the geochemical properties of hydrocarbon seeps from the seafloor and their relationship to the subseafloor geology and hydrocarbon accumulations. Subsequent analyses and mapping will be aimed at contributing to an assessment of new approaches to offshore petroleum exploration in the Australian region. Any publications will take into account existing confidentiality requirements and BMR will seek the approval of companies, where appropriate, prior to publication of data.

TEG and BMR have entered into a joint research agreement to study hydrocarbon gas seeps with geochemical exploration techniques on the Australian margin. This research agreement in no way affects the confidentiality between TEG and its clients.

Your support in assisting in the development and appraisal of geochemical exploration techniques will, we believe, be to the greater benefit of the exploration industry in its search for oil in Australia.

Disclaimer

The BMR and TEG have entered a joint research agreement to encourage development of geochemical exploration techniques. This initiative is an element of BMR's Continental Margins Program, established by the Australian Government to assist in the exploration for and development of Australian petroleum resources. This research agreement in no way affects the confidentiality between TEG and its clients. All data obtained by TEG for clients remains proprietary to those clients until the expiration of any moratorium on these data, as specified under the provisions of the Petroleum (Submerged Lands) Act.

Table of Depreciation

Date	Laboratory	Deck	Total Depreciated Value $A
1 August 89	69 000	54 000	123 000
1 August 90	47 000	36 000	84 000
1 August 91	25 000	18 000	43 000
1 August 92	3 000	0	3 000 (residual software)

Depreciation Table

Laboratory Equipment

Cost of A$69 000, with straight line depreciation over 3 years.

This includes 3 gas chromatographs.	$53 000
6 HP integrators at $2 000	$12 000
1 gas extractor	$ 4 000
	A$69 000

Deck and over-the-side Hardware to be depreciated over 3 years.

1 cable	$40 000
fish + CTD unit	$14 000
	A$54 000