

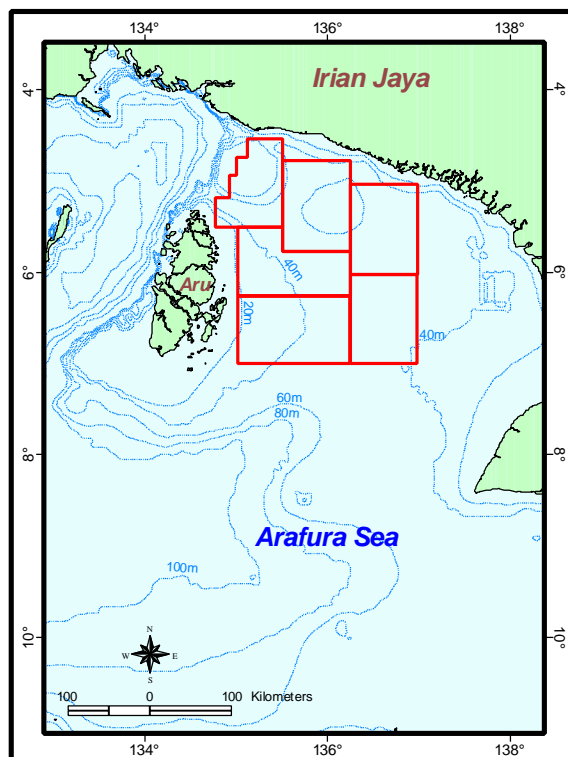


2002 ARAFURA SEA SUB-SEABED EXPLORATION PROGRAMS

Announcements by the Directorate General of Oil and Gas (MIGAS) inviting tenders for new Production Sharing Contracts (PSCs) in Indonesia has manifest a sense of urgency to evaluate potential acreage in the Arafura Sea. Hydrocarbon shows in the new Blocks are limited, but the geology of the Arafura Sea suggests that a petroleum system should be actively charging reservoirs in the region.

Confirmation of a working petroleum system however, is essential prior to acquiring or drilling this acreage. Such confirmation can be cost effectively derived, pre-drill, from seabed geochemical coring, heat-flow probe measurements and paleontologically dated seafloor cores.

TDI-Brooks Int'l Inc. is negotiating with the Directorate General of Oil and Gas (MIGAS) of the Indonesian Department of Energy and Mineral Resources to conduct topical seabed studies to assess the presence and adequacy of the Petroleum System in the Arafura Sea. TDI-Brooks is pleased to offer the following non-exclusive programs. Data acquisition is scheduled to commence in April 2002 using our research vessel R/V GeoExplorer. This vessel is currently working in the Gulf of Mexico and will be mobilizing for several projects in NW Australia from mid-December 2001.



The following programs are immediately available for subscription either in total or by block:

Surface Geochemical Exploration (SGE) Study:

- Acquisition of approximately 150 seabed piston cores to locate and sample naturally occurring hydrocarbon seepage.
- Correlation of seepage occurrences with deep sub-surface tectono-stratigraphic patterns.
- Analysis of percolating hydrocarbons for correlation to probable source intervals at depth.
- Biomarker analysis for selected samples.

Seabed Heat Flow Study:

- Acquisition of multi-thermistor probe measurements of the regional seabed to measure basal heat flow and estimate upward fluid movement will be undertaken should participants desire data for deepwater acreage located in the western Arafura Sea.

Acoustic Profiling:

- Sub-bottom Chirp II acoustic profile records over all core and heat flow probe locations.

Select Paleontological Sampling:

- Acquisition of selected subcrop samples for paleontological analysis is available at additional costs/participant (TBD).

Pre-acquisition subscription cost per participant for SGE program:

USD \$165,000.

Estimated post-acquisition subscription cost per participant for SGE program:

USD \$215,000.

N.B. These prices are exclusive of paleontological analysis and heat flow probes as well as local imposts and taxes. Prices are valid through 31 January 2002. Added discount of 10% for those companies participating by 31 December 2001

For Information please contact:

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10 December, 01

MEMORANDUM

TO: INTERESTED OIL COMPANIES - INDONESIA

FROM: James M. Brooks, Ph.D.
President

**RE: 2002 ARAFURA SEA SURFACE GEOCHEMICAL
EXPLORATION (SGE) CONSORTIUM PROGRAM**

TDI-Brooks International, Inc., in collaboration with **GeoMark**, is negotiating with the Indonesian Department of Mines and Energy (MIGAS) to offer a 2002 Arafura Sea SGE program following the same design as our prior worldwide consortium programs in which most E&P companies have participated. The proposed Arafura Sea SGE Consortium Program is scheduled to be acquired between April and July 2002. Cost for participation in this program comprising approximately 150 SGE cores is US\$165,000/company, with a minimum of four participants.

2002 ARAFURA SEA SGE Program - The proposed Arafura Sea SGE program will involve the collection of approximately 150 cores offshore Irian Jaya in the Arafura Sea in primarily shallow water acreage that is scheduled for tender by MIGAS under Production Sharing Contract (PSC) terms sometime in the near future. After a review of available regional seismic data, we suggest that each oil company participant nominate their locations for acquisition. This technique of program design has worked effectively for similar programs in the Gulf of Mexico and West Africa.

The first goal of this program will be to determine regionally the distribution of active oil generation and migration to the seafloor in the Arafura Sea. The second goal is to define the distribution of oil families and maturities in the region based on biological marker and isotope analysis provided by GeoMark Research.

SGE studies can be used at two levels. Most previous studies have been used to define the regional distribution of oil, condensate, and gas seepage on the continental margin in order to high grade areas and prospects by defining areas of active oil migration and charge through routine gas and high molecular weight hydrocarbon screening methods. Over the last fifteen years, our programs have had major impact on deepwater exploration worldwide by delineating areas of active oil migration to the seafloor. This active migration acts to charge accompanying reservoirs in the same geological system. On a secondary level, SGE coring studies can be used

to define the distribution of oil families and maturities since there is often considerable macroseepage of 'live' oil into seafloor sediments. Thus, our SGE study should expect to acquire macroseep samples that can be further analyzed by GeoMark Research for correlation with their Indonesian oil database.

Heat Flow: For companies wishing to explore the western areas of the Arafura Sea in deeper water regimes, a regional heat flow program will be undertaken in collaboration with Dr. Trevor Lewis using heat flow probes manufactured by the Pacific Geoscience Center (NRCAN). This program will be similar to other such studies the team has undertaken in West Africa in which many international E&P companies have participated. Additional details of the heat flow programs can be provided to those companies unfamiliar with the technology.

The heat flow (HF) program will consist of heat flow probe sites directed toward determining the regional distribution of heat flow across the study area in relatively undisturbed sediment sections. These heat flow sites are generally independent of the SGE core sites and away from active conduits for the upward migration of fluids. Additional experiments may be proposed to examine variability across (1) domes and diapirs; (2) toe thrusts; (3) listric normal faults; (4) crustal type changes; and (5) macroseep core sites. The heat flow sites will be selected in water depth greater than 500 meters. The final distribution of heat flow sites will be determined by the participating companies.

Program Team - The program team consists of the extensive surface geochemical exploration (SGE) experience of TDI-Brooks and the unparalleled oil expertise and database of GeoMark Research. The program will follow the same very successful strategy we used on our previous Gulf of Mexico and west African consortium programs that nearly thirty (30) international exploration companies have participated.

Acquisition & Analysis - The core collections will consist of our standard 2,000 lb., 20 ft. piston coring with differential GPS navigation. All samples are processed in a clean laboratory and immediately frozen on the vessel. A suite of geochemical analyses (headspace gases, total scanning fluorescence and C15+ hydrocarbon using GC-FID) are conducted on three sections from each core to determine regional seepage and R1 distribution patterns. The SGE component will be conducted using the same acquisition and analytical methods of Dr. Brooks' many other consortium SGE programs worldwide. In order to aid in understanding the origin and maturity of the seepages, Geomark will provide detailed geochemical analysis of all core samples containing macroseepage or significant amounts of microseepage. Key tricyclic terpane biomarkers are used to distinguish between source depositional types. These markers are also very resistant to biodegradation, allowing for correlation between heavily biodegraded seep oils and nondegraded subsurface oils. Aromatic biomarkers will also be evaluated. The detailed analytical program provided by GeoMark for cross-correlation with their Indonesian oil data base is listed below:

- Liquid Chromatography for % Saturate, % Aromatic Hydrocarbons and % NSOs
- Stable Carbon Isotope Composition of both Saturate and Aromatic Hydrocarbons
- Whole Crude Gas Chromatography
- Molecular Sieve Separation of Saturate Hydrocarbons
- Quantitative GC/MS Analysis of Sterane and Terpane Biomarkers

- **GC/MS Analysis of Aromatic Hydrocarbons**

Multivariate statistical techniques (cluster and principal component analyses) using isotopic and key biomarker ratios will aid in grouping oils/seeps which share a common source. In addition, relative thermal histories of the oils/seeps will be evaluated based on certain biomarker distributions. Results will be presented in hard copy data volumes as well as in digital form (Access Database and Excel Spreadsheets). A comprehensive hardbound interpretive volume and wall-sized color montages will also be provided to assist in evaluating the exploration significance of the region.

Ancillary Programs - TDI-BI is offering several ancillary programs as part of this SGE study as follows:

Paleontology: Paleontology will be performed to determine the age of the sediments penetrated by the 150 cores as an aid to understanding geologic structures. Age determinations are performed primarily by means of calcareous nanno fossils. The report will consist of a complete assemblage list, semi-quantitative estimates of the abundance of all elements of the assemblage, and age evaluation according to the currently accepted nannofossil biochronology. This supplemental study is priced at \$5,000

Additional Cores: For companies wishing to acquire additional SGE cores, this can be arranged for \$2,900 each, inclusive of basic analysis of three intervals/core.

Additional Biomarker Analysis: for companies wishing to analyse more than the 16 samples allocated in the program for biomarker and isotope analysis, this can be arranged for \$1,000/sample and \$250/sample for correlation to GeoMark's worldwide data base.

Additional Heat Flow Stations: For companies wishing to acquire additional HF stations for greater control points, this can be arranged for \$4,500/station.

Contacts - For additional information on this program, please contact the following individuals:

James M. Brooks 409-696-3634 (direct) 409-693-6389 (fax). E-mail: Drjmbrooks@aol.com
Bernie B. Bernard 409-693-3446 (direct) 409-693-6389 (fax). E-mail: berniebernard@tdi-bi.com

JMB;jb

2002 Arafura Sea Program(s) Agreement:

Yes, our company wishes to participate as an early participant in TDI-Brooks' Arafura Sea SGE Program(s) assuming execution of a mutually acceptable contract as follows:

_____ *We wish to participate in the 2002 Arafura Sea SGE and HF Programs at \$165,000.*

_____ *We wish to participate in the paleontological component at \$5,000.*

_____ *We wish to acquire additional SGE Cores at \$2,900/each.*

_____ *We wish to acquire additional Heat Flow Probes at \$ 4,500/each*

_____ Company

_____ Title _____ Date