



# AL HAJAR

Geological Society of Oman  
Quarterly Newsletter

Fourth Edition

November 2004

## President's message

Everything in the world around us is built upon the Earth, grows on the Earth, or depends on the environment of the Earth in some way. Much of human history has been influenced directly or indirectly by earth science. Today as much as ever, major opportunities and problems are tied to Earth and to our understanding of it.

In Oman, from before the discovery of oil to the most recent successful discovery, the inhabitants have had an intimate relationship with geology. Within its boundaries, Oman contains examples of virtually everything geological. This Geological Heritage and its conservation are now high visibility areas of public concern through out the modern world. Geological heritage and its valuable contents is the foundation of society; without earth resources - rocks and hydrocarbons - development of society and culture, as we know it today would have been very different. We depend on geological resources for all the material things we use.

Our cultural heritage is underpinned by geology just as the biological world is dependent on the physical earth. Biodiversity and geodiversity are intimately linked. To many people nature conservation means protecting the plants, the birds, the animals and the habitats they need to survive. To geologists, nature conservation includes looking after our best sites for seeing and understanding the geology and landscape of Oman and our planet Earth. Geological heritage is more than just looking after sites. It includes the complementary fossils, minerals and archives in museums and collections. Finally, let us strive to protect, preserve and promote our geological heritage for generations to come.

Omar Al-Ja'aidi

## Note from the Editor

Welcome the 4th Edition of Al Hajar. This year marks the 50th Anniversary of the first geological mapping of the Fahud, work which in part heralded the birth of the Oil Industry in Oman. We are please to honour this work by publishing an article which documents the trial and tribulations of the first party of Geologists to reach the Jebel, and the work carried out that lead to the drilling of Fahud 1. The society has membership that works in many parts of the world and we have two articles written by Juma Balushi and Siti Hajr who have exchanged jobs, moved abroad and now reflect on there first year.

GSO is particularly committed to the management of Omans Geological resources such that the can be enjoyed in a sustainable way by all. The next few months will see the promotion of schemes aimed at conservation of the world class outcrops and the Geotourism to the Sultanate. Please give them your support.

One last note, I am very keen to promote the society within the Oman student body and would like to encourage students to use the newsletter to share the good work they are doing. Please keep in touch.

John S Willoughby

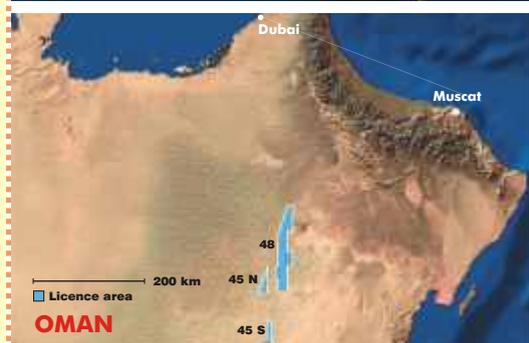
## What's inside

- Geological Exploration In Oman: The Early Years Page 2
- Working and Living experience in Oman. Page 5
- Life on a Sleeping Giant – Seria Field Page 8
- Sedimentary Rocks and Evidence for Aqueous Environment on the Surface of Mars Page 9
- GSO International News Page 10
- Events Calendar Page 12

This issue is sponsored by



**MÆRSK OLIE OG GAS AS**



# GEOLOGICAL EXPLORATION IN OMAN: THE EARLY YEARS

## 50 Years anniversary of Fahud

*Mike Morton, was a geologist employed by the Iraq Petroleum Company from 1945 to 1971. During his career, he worked in every concession area of the company, including camel-borne expeditions to Mahra and Dhofar in 1947/48. In early 1954, he was appointed leader of a geological party which was planned to penetrate the interior of Oman and, in particular, to survey the Fahud anticline. This expedition, known as DEF, owed its origin to the company's ambitions in Oman, which began to take root in the late 1940'. It took a number of years to establish a base from which the Exploration of Oman could take place. This is the story of the Fahud Jebel, and a review of the work leading up to the decision to drill Fahud 1 in 1956.*



MIKE MORTON, 1924 - 2003

### The Approach to Fahud

The field season started with the establishment of a camp at the top of Aqaba Bai, about thirty miles from Duqm, on 11th October, 1954. Conditions were not ideal and, owing to a shortage of tents, the camp was ill-equipped for the five geologists who were forced to share a single tent.

From this base, field mapping and stratigraphic investigation work was carried out on the surrounding terrain



On the 19th October 1954 - some eight months after landing at Duqm - the expedition was ready to move on Fahud. That day, at 4 a.m., a start was made: the silence of the desert broken by the sound of Landrovers and Nubian trucks starting up, their exhaust fumes mingling with a soft breeze coming in from the sea.

The convoy reached the Wadi Amairi on the third day and set up camp at the Muqbira well.

The camp at Muqbira well was just over twenty miles from Jebel Fahud, as the crow flies, and its shape was visible from the top of a nearby hillside. Mike and Jim McGinty were determined to make an early sortie to the jebel. Jim was a tall, thin, bespectacled man who had been working in Palestine when Mike arrived there in 1945 and was now Senior Geologist based at Dukhan. They set off early in the morning,

heading north west, across a succession of gravel hills intersected by wadis. They would not have seen the jebel until it was almost upon them, their Land Rovers climbing one crest before dropping down into another dip, the jebel obscured behind a wadi bank or the flank of a gravel-strewn hill until, at last, they had a clear uninterrupted view of its vast brown limestone flanks. The whale-like shape they had seen from the distance had now given way to a more rugged, incised look, erosion having worn away a once-smooth top surface.

As might be expected, the geologists' notes were factual and restrained:

"Fahud arches abruptly from the gravels which cover thousands of square miles of this desert belt, and reaches maximum elevation of 120 metres above the surrounding plain, 340 metres above sea level.

The structure has a classic anticlinal form and its slight asymmetry is difficult to discern. The western half of the fold is covered by a Paleocene limestone which by virtue of its little eroded surface preserves the true anticlinal shape. At the eastern end, however, erosion has removed this limestone from the crestal area, and a cirque with opposing scarps and dip slopes reveals older beds of rock."

Of course, they had seen the 40 kilometre-long jebel from the air before, bumping about the hot sky at a few hundred feet in a De Havilland Dove, so it would have held few surprises for them when they first came to see it at close quarters.

But this is not to say that the scientific mind could not fail to be moved by the sight of Fahud rising above the terrain. The mystique remained - a jebel seen but untouched - and

this must have been a special moment for the geologists, as their Land Rover cleared the last crest. There were no mists, clouds, or dust storms to hinder their view: only faint distortions in the air caused by the rising mid-morning heat. The jewel - in a geological sense - was spread out before them.



On 8th November, the party moved camp from the Muqbira well to a site just south of Fahud, and began its work in earnest, the aim being to map Jebel Fahud so that the structure could be approved and a site for the first well located.

For the location of the well to be sited, the geologists had to be sure that the structure was favourable, and

that no igneous rocks lay beneath the surface where the drilling was to take place. When the evidence was collected and presented to F.E. Wellings, he confirmed the decision to locate the well within the cirque of Fahud. The geological indications were very good, and the geologists' hopes of making a major strike were riding high..

### Exploring the Interior

Natih lay some ten miles to the north of Fahud, a structure once higher than Fahud but now eroded down to a height of 305 metres above sea level. From the crest of Fahud, Natih was plainly visible, and it was only on those rare occasions when three day sand and dust storms known as shimals swept through from the north west that instrument work became difficult if not impossible to perform.



At the start of their journey into central Oman, there was precious little information to rely on, only that gleaned from the travels of Thesiger, information provided by nomadic tribesmen and maps drawn up as a result of overflights. There were no such things as satellite weather charts, in fact no weather records at all, and the expedition presented the geologists with the opportunity to compile the first climate data for this part of the world.

They found that the months of November and December were cool, with consistently fine weather. The temperatures then began a steady rise before peaking in the summer: maximum temperatures for January to March were in the 70 - 90 degree range, with a known minimum of 49; by April, the temperature topped the 100 mark; there was a gradual rise through May and June until the peak was reached in July, when on one occasion 130 degrees was measured at Fahud.

The geologists' primary object over the next few weeks was to survey the jebel and nearby features, following the instructions of F.E. Wellings:

1. To map Jebel Fahud by measured sections using plane-table methods in order to precise the structure and produce a detailed structure contour map. Eleven cross-sections were to be measured, spaced at one mile intervals in the crestal area, and expanding to two-mile spacing towards the plunge;
2. To map the Natih structure by a similar method;
3. To investigate and plane-table the Maradi structure. Recently discovered, little was known about it except its marked structural trend, and therefore a preliminary ground reconnaissance was called for.

During their six-month survey of Central Oman, the geologists extended their structure mapping to the Gala's Nose, a small feature adjacent to the eastern end of Natih, and regional mapping on 1:200,000 scale north west of Maradi.

### The Season's End

Natih was mapped as planned during the period January-February, and a certain amount of outside reconnaissance geology was done during this time. On the 8th March, the party moved to Awaifa on the Wadi Amairi, where a fly-camp was established. From this base, Maradi was mapped. More long-range reconnaissance was done during this period, and the fly-camp was struck at the end of the month.

Water remained a problem. Drinking water was an immediate issue at Fahud, and was not resolved satisfactorily throughout their first season. During the survey, one Thorneycroft three-ton Nubian was used continuously to bring water from the falaj at Ibri to Fahud, a distance of eighty-six miles. According to needs, either a one ton Austin or Commer load-carrier was also made available.

A water well programme was commenced in January 1955, and with a Ruston cable-tool rig, Fahud wells 1 & 2 were drilled in the south flank. Both wells found water at between 150 and 200 feet, but it was extremely saline and unpotable. These wells, however, were to be useful for the Fahud drilling water and the camp services, such as showers. The Wadi Hania was drilled in two places, and saline water was tapped at about 80 feet. The heavy rains and floods, which isolated the geological party at Awaifa in March, caused a breakdown in the Ibri water run and the construction staff in camp were eventually supplied by some twenty drums of fresh water flown in by Bristol Freighter from Umm Said, in Qatar. The Abaila water well, located by Tom Jameson in July 1955, found water at 15 feet and supplied the Fahud drilling camp with drinking water, and continued to do so for several months. A well drilled in Wadi Aswad, 40 miles to the north of Fahud at Ghurab, in May, found sweet water at a shallow depth, but this well was not really exploited owing to mechanical difficulties.



These were busy times for Mike and his team. In addition to the geological work, they were engaged at various times in pathfinding for convoy routes from Duqm, discovering and marking out airfields, finding the location of water-well sites, controlling the water-well drilling party, administering the Fahud camp during building and accompanying non-geological Company visitors on inspections. No wonder it was with some relief that they received the news that the geological season would end early so that all efforts

**GEOLOGICAL EXPLORATION IN OMAN: THE EARLY YEARS 50 Years anniversary of Fahud**

could be concentrated on the Fahud site, when they returned in April.

By now, the Fahud camp had developed from a collection of tents to air-conditioned huts with all the facilities - including a mess raised a few feet above the desert on a criss-cross of struts. There were geological Nissan huts, office huts, four man accommodation units and a number of smaller huts gathered around. Instead of being home to a few geologists and their helpers, the Fahud scene was ever-changing, with a seemingly endless stream of personnel flying in and out. The geological field parties had long since moved on to explore other parts of the interior.

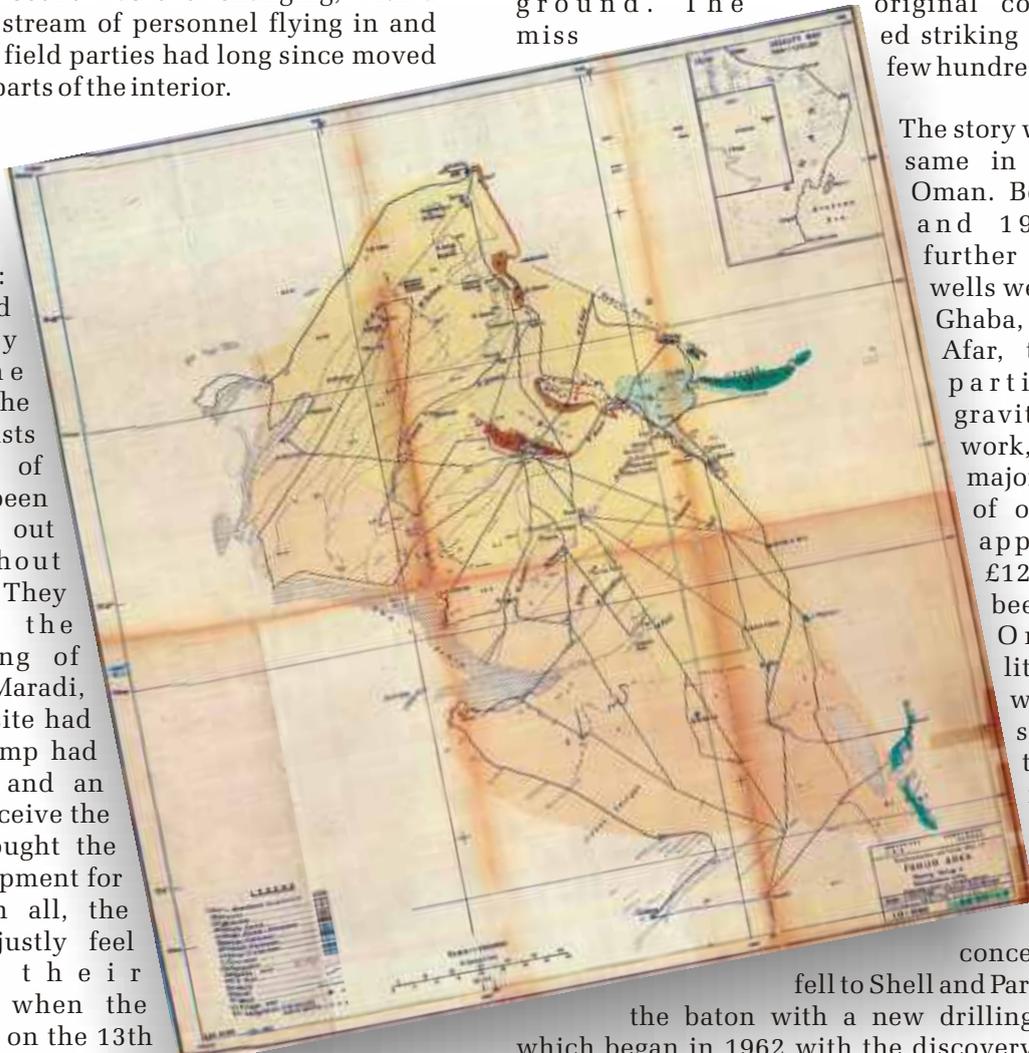
The geological balance sheet at the end of this season was definitely in credit: the party had successfully penetrated the interior of Oman, the first body of geologists to enter this part of Arabia. They had been allowed to carry out their work without major hindrance. They had completed the structure mapping of Fahud, Natih and Maradi, and the first well site had been chosen. A camp had been established, and an airfield set up to receive the aircraft which brought the heavy drilling equipment for the well. All in all, the geologists could justly feel proud of their accomplishments when the field season closed on the 13th April, and the party departed the autumn.

In January, 1956, the Sultan toured the interior and included the Fahud site in his itinerary. Then, on the 18th January, drilling operations were ready to start: Fahud No.1 was "spudded in".

**Postscript**

The Fahud well was completed at 12,235 feet. Unfortunately, it was a dry hole except for a very small quantity of gas and oil. During the course of drilling, the geologists had become aware of a fault, and requested permission from higher up the management chain to "skid" the rig to the other side of the fault, but permission was not given. Because the stratigraphy was unpromising, the company did not drill the neighbouring anticline, Natih, and decided to try elsewhere, but this was equally unsuccessful.

Three of the IPC partners decided to withdraw from the Omani concession, leaving Shell (85%) and Partex (15%) to take it over and resume exploration. A new drilling programme revealed new oil sources indicated that oil might be present at Fahud after all, in the Wasia Limestone. Only a few hundred yards from the original test well site, a second test well was sunk at Fahud and, in 1964, and found oil in commercial quantities. It was discovered that, as a result of the fault, the reservoir rocks had dropped some three thousand feet in the ground. The original company had missed striking oil by only a few hundred yards.

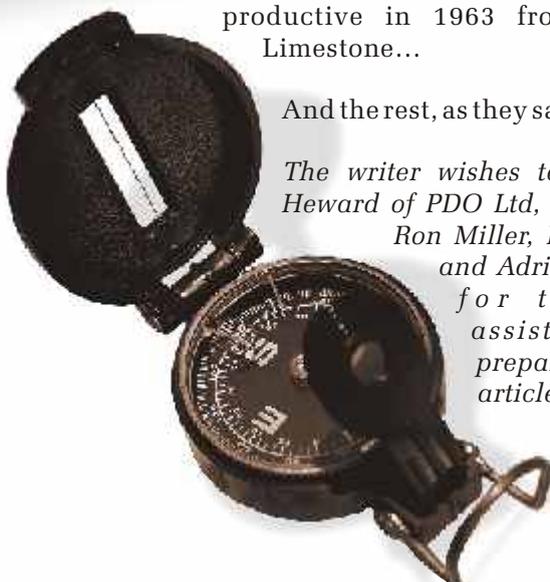


The story was much the same in the rest of Oman. Between 1956 and 1960, three further exploration wells were drilled, at Ghaba, Heima and Afar, two seismic parties and a gravity party at work, and still no major indications of oil. By 1960, approximately £12 million had been spent in Oman with little to show. It was hardly surprising that three major partners should withdraw from the concession and it

fell to Shell and Partex to pick up the baton with a new drilling programme which began in 1962 with the discovery of the Yibal field 30 miles west of the Fahud structure... the Natih anticline, 20 miles east of Fahud proved productive in 1963 from the Wasia Limestone...

And the rest, as they say, is history.

*The writer wishes to thanks Alan Heward of PDO Ltd, Don Sheridan, Ron Miller, Peter Walmsley and Adrian Humphreys for their kind assistance in the preparation of this article.*



# Working and Living experience in Oman.

SITI HAJAR

Siti has been cross-posted from Brunei to PDO and these are her thoughts after one year abroad.  
Siti is a Geologist working in PDO exploration

*I was asked to write an article to describe on the differences between the first my home country Sultanate of Brunei Darussalam and the Sultanate of Oman where I have been cross posted to PDO. Where would I begin.....so here it goes?*

Working for Petroleum Development of Oman, is my first international broadening assignment, and an opportunity to work outside the "norm" Brunei Shell Petroleum where I have been a Petroleum Geologist for the last 10 years

I came to Oman in October 2003 and upon arrival, there was a warm welcome by my Bruneian colleagues working in Oman. I was overwhelmed with the oceanic view that comes with a small flat in Fahud



Photo of Brunei Bay

Street. It was quite a contrast from my home in Brunei to living in Oman. Within a few weeks time, I had moved to my permanent 2 bedrooms apartment with a very beautiful view of the ocean and the "Majan" beach.

The first few months, I missed my family, friends and Brunei in general and have to adjust to the lack of thunder storms and heavy rains, thick green rain forests and the wild animals and creatures and also slowly adapting to the heat. All that I missed have been replaced by enjoying the picturesque view of the Oman Mountain and the geological history that comes with it. It truly amazed me that I have touched and walked on a basement rock that once used to be "an oceanic" plate in one GSO fieldtrip.

There are a lot of differences in working operations between Brunei and Oman. The first is the scale of operations in Oman is larger than in Brunei and this was reflected in a higher level of well and exploration activities. It came as no surprise because of the broad range of geological scale of the producing hydrocarbon bearing reservoirs (Precambrian-Cretaceous) and the deposition from fluvial to carbonate setting in Oman to

a more restricted younger (Tertiary) deltaic to shoreface environmental setting in Brunei.

The second is that Brunei oil production mainly dominated from the offshore fields like Champion and South West Ampa with up to 40m water depth from 768 producing wells and 183 offshore structures. Seria is Brunei oldest onshore oil field, first discovered in 1929 and current production made up only 10% of total oil production in Brunei.

The third and most amazing difference between Brunei and Oman is in the beautiful geological outcrops that Oman has to offer. The Omani outcrops are very diverse in varieties of depositional setting and age located in remote interior areas in its pristine existence. The only set back from enjoying these geological trips are not organized throughout the year because during the summer where temperature might go up to 50° Celcius, going to these places will be like being inside a microwave oven. Lack of rain falls make these trips more manageable and lack of some facilities in and around the outcrops created an amazing camping geological trip for some and offer an unforgettable and enjoyable outdoor experience.

With all the major differences, the working and living style are still very similar to Brunei. Islam as the main religion for both countries and to work in a friendly



Scenery in one of the PDO camp.

with high respect to cultural diversity has made me feel very much in Brunei. Warm smiles and encountering traditional Omani "extended" daily greetings to each other is an original Islamic culture that I will miss after I leave. The Omani hospitality and generosity has made my assignment in Oman an enjoyable and truly unforgettable experience that I feel fortunate to be given this opportunity to assist in finding and developing the natural resources for Oman.



ALGERIA



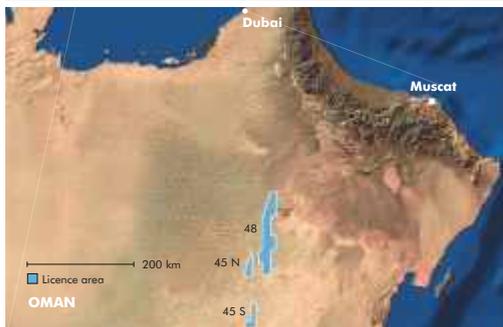
DENMARK



KAZAKHSTAN



QATAR



OMAN



OMAN

# MAERSK OIL

Mærskolie og Gas AS (Maersk Oil) is an independent oil company in the A.P. Møller – Maersk Group.

Maersk Oil is operating oil and gas production in Denmark, Qatar and Kazakhstan of some 750,000 barrels of oil equivalent per day. In addition Maersk Oil participates in the 500,000 barrels of oil per day Berkine Basin development in Algeria.

Exploration and development activities are ongoing in Denmark, Qatar, Algeria, Oman, Turkmenistan, Brazil, Norway, Morocco, the UK and a number of other countries.

## OMAN

In 2001, Maersk Oil acquired a 100% interest in the onshore Blocks 45 and 48, located in central Oman. The acreage is operated under an Exploration and Production Sharing Contract. One exploration well was drilled in 2004.

Maersk Oil Oman B.V • Office 1, P.O. Box 138, Postal Code 134  
 Jawharat A'Shati Complex • Muscat • Sultanate of Oman  
 Telephone No. +968 692 307 • Telefax No. +968 698 513  
 E-mail: [csmaersk@omantel.net.om](mailto:csmaersk@omantel.net.om)

MAERSK OIL CONTINUES TO SEEK NEW VENTURES IN PARTNERSHIP OR ALONE.



 **MAERSK OLIE OG GAS AS**

50, Esplanaden • DK-1263 Copenhagen K. • Denmark  
Telephone No. +45 3363 4000 • Telefax No. +45 3314 1554  
[www.maersk.com](http://www.maersk.com)

# Life on a Sleeping Giant

SERIA FIELD JUMA AL-BELUSHI, BRUNEI SHELL PETROLEUM SDN. BHD.

Juma has been cross-posted from PDO to Brunei and these are his reflections after one year abroad

15th August 2003 – that was the day we arrived in Bandar Seri Begawan, the capital city of Negara Brunei Darussalam. Leaving the airport, it took us just over an hour to get to the oil town, Seria. For us Brunei was different in some ways and similar to our home country in other ways. The heavy and almost daily thunderstorms were amongst the different things, but the Islamic culture was something that kept us feeling almost at home.

*Brunei Darussalam is located on the northwest coast of Borneo, near the equator. The country is bounded along the southern and eastern sides by the Malaysian state of Sarawak. The country's landscape is mainly tropical rainforest with only a narrow coastal strip. The rainforest receives as much as 146 inches of rain in the interior, but only 108 inches a year is recorded on the coast. The two defined rainy seasons are from September to January (with December being the wettest month) and May to July. The climate is equatorial with uniform temperatures and high humidity.*



Brunei's oil and gas industry is centered in the towns of Seria and Kuala Belait, approximately 90 km southwest of the capital, as well as offshore. Other large towns include Tutong, midway between Bandar Seri Begawan and Kuala Belait, and Bangar in the Temburong District. Geologically, I personally was subjected to somewhat a shock. I suddenly found myself dealing with a stratigraphic record that does not go beyond the Tertiary, a section that is often neglected at least in the oil industry in Oman. The Tertiary and younger rocks of onshore and offshore Brunei Darussalam consist of a thick sand - shale sequence, deposited in a relatively short time approximately 15 Ma), with very few time-significant fossils. There has been a continuous drive to refine the stratigraphic framework in terms of biostratigraphy and lithostratigraphy. Stratigraphic analysis has evolved from

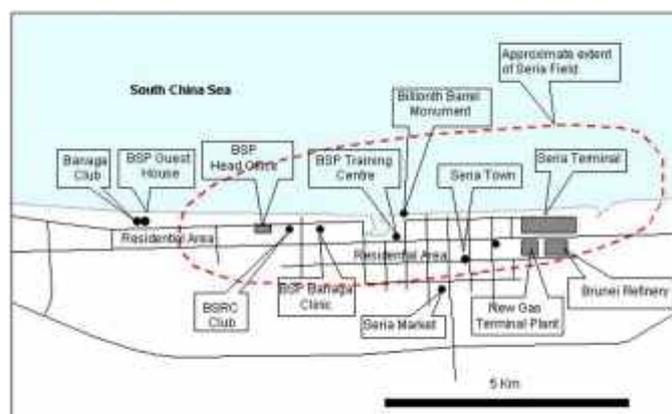
crude practical subdivisions through Cycle stratigraphy to Sequence stratigraphy. For me, I had to adjust my mind to using timelines rather than lithostratigraphic units (rock unit formations).

The seventy five year history of the Seria Field reflects the history of the oil and gas industry in the nation of Brunei Darussalam. The discovery of hydrocarbons in Brunei Darussalam dates back to the earliest years of this century. Exploration activities began in 1913 and a number of "dry holes" were drilled until, on July 12, 1929, the well Seria No.1 was spudded and in August of that year the first oil began to flow from a depth of around 300m. The discovery well produced over 5,000 barrels of oil in total before being abandoned one year later. The field, though, has gone from strength to strength.

By 1991, the Seria field had produced a total of a billion barrels of oil (159 million m<sup>3</sup>). On July 18 1991, His Majesty Sultan Haji Hassanal Bolkhiah Mu'izzaddin Waddaulah, Sultan dan Yang Di-Pertuan Negara Brunei Darussalam officially opened the Billionth Barrel Monument, built near the site of the first Seria well. Today it still contributes some 26,000 barrels per day from a coastal corridor 13 kilometres long by 2.5 kilometres wide.

In human terms, a lifespan of 75 years might suggest the approach of maturity and even old age. In the case of the Seria Field, however, this is far from the truth. Last week, BSP announced that it has made a successful discovery of new oil in the Seria North Flank, a previously un-drilled part of the field.

Seria Field is also unusual in many ways: on top of the field, Seria town, the refinery, Crude gathering terminal, BSP offices as well as the BSP residential houses. It is common to have a nodding donkey next to your house or just at the end of the shopping street. Together with crude produced from the offshore, Seria crude gets refined locally. I find the fact that within 500m, you can see the oil well, the refinery and the petrol station is rather unique!

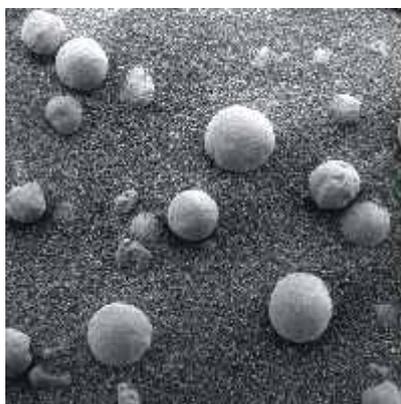


## Sedimentary Rocks and Evidence for Aqueous Environment on the Surface of Mars

*GSO is very fortunate to be visited by John Grotzinger, Associate Professor of Geology at MIT in Boston Massachusetts. John is leading a team of "Earth Bound" Geologists study the recent images sent by the NASA Martian Rovers Spirit and Opportunity. John is a regular visitor to Oman and has carried out a lot of field work in the interior. He will share the opportunity to explore the red planet on the 30th November when the Geological Society of Oman will present **Sedimentary Rocks and Evidence for Aqueous Environment on the Surface of Mars***

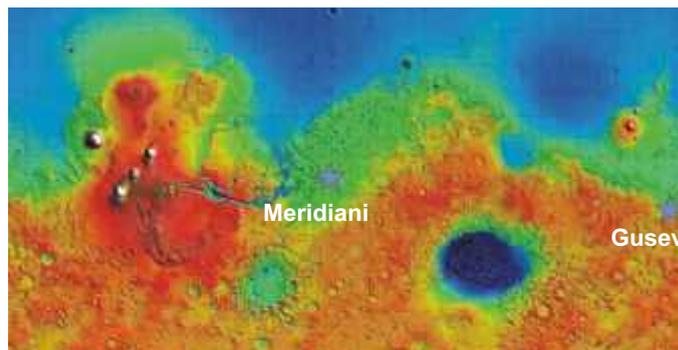
### John P. Grotzinger and the Athena Science Team

On January 24, 2004 the Mars Exploration Rover Opportunity landed at Meridiani Planum. The landing region lies on a broad, flat plain near the Martian equator. The landing site itself is within an impact crater about 20 meters in diameter which exposes small rock outcrops along its northwestern rim.



Hematitic concretions

As of October 1, 2004, the Opportunity rover has explored the outcrops exposed within Eagle crater, along with much larger outcrops exposed almost continuously

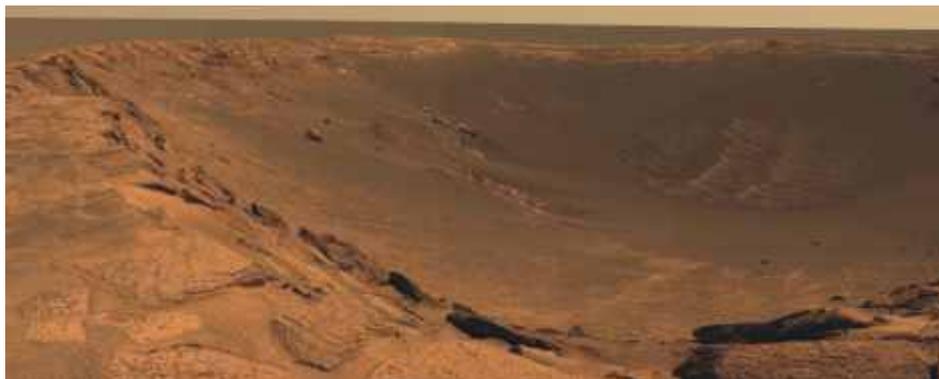


Topography of Mars showing the two landing sites

along the rim of Endurance crater, about 175 m in diameter and approximately 750 m away from Eagle crater. 6 Gigabytes of data and 50,000 images have been returned to earth, far more than all other missions to Mars combined.

The initial results indicate episodic inundation of the Meridiani region by surface water to shallow depths, followed by evaporation, exposure and desiccation. Terrestrial analogs for such a suite of facies and surface processes include interdune depressions, playa lakes like the Umm a Samin, and sabkhas adjacent to marginal seaways such as the coastline of Abu Dhabi.

The primary objective of the Mars Exploration Rover mission is to search for evidence in the Martian geologic record of environmental conditions that might once have been suitable for life. The results obtained by the Athena Science Team demonstrate that liquid water, regarded as a key condition for life, was once abundant at Meridiani Planum. Because evaporite sediments can easily entomb micro-organisms, Meridiani Planum is a significant target for future landed or sample return missions aimed at life detection.



Endurance Crater



Athena Rover

### Glennie Receives AAPG's Powers Medal

Professor Ken Glennie has been chosen to receive the Powers Medal from the AAPG ( American Association of Petroleum Geologists) for his contribution to global petroleum geology. The Powers medal is the highest award made by AAPG, hence the highest award for the petroleum geologist possible. This is the first time that the Powers Medal has been awarded to any non-resident of USA, possibly the first non- US citizen. Ken will receive the medal at the AAPG Annual Conference in Calgary, June 19-21 2005.

Ken has been a stalwart support to research and teaching at the Geology and Petroleum Geology Department, University of Aberdeen where he served as Honorary Research Professor. He has contributed tremendously to the understanding of geology of Oman. He is an Honorary Member of the Geological Society of Oman.



# GSO INTERNATIONAL NEWS



## BAHRAIN



Maintaining the same rigid tight hole status it employed for the first well, ChevronTexaco is believed to have terminated the Fasht Tighalib 2 wildcat, its second commitment well within the 412 sq km offshore Block 5 concession, at the beginning of October 2004. No details are currently available, although the Noble Drilling "Dick Favor" J/U, is only believed to have been on location for around 30 days. The unit is now moving to fulfill a two-exploratory-well contract for Petronas in the 705 sq km Block 4 that commences with Fasht Adhom West 1. In mid-February 2003, Petronas plugged and abandoned its Fasht Adom 1 wildcat, the company's first in Bahrain. The company has also drilled its initial well, Hawar East 1, in the 842 sq km Block 6 that it also operates and where a drilling obligation remains. This well was completed in May 2003 and gas shows are understood to have been encountered. In November 2003 Bahrain's Oil Minister Sheikh Isa bin Ali Al-Khalifa confirmed that both Hawar East 1 and the earlier Block 4 wildcat Fasht Adom 1, had both found no oil. Created by the Bahraini Government following the International Court of Justice ruling on the border dispute between Bahrain and Qatar in March 2001, all three blocks are located on the eastern side of Bahrain. They extend from east of Muharraq Island, in the north, southward to include the Hawar Islands.

## INDIA



The Cabinet Committee on Economic Affairs has given its blessing to Cairn Energy's plans to farm out to ONGC two recent discoveries as well as farm into two ONGC exploration blocks and form a strategic alliance with the Indian company for future opportunities. First proposed nearly a year ago, the transaction -- which remains subject to sale and purchase agreements agreed upon by both parties -- includes the farm-out of a 90% interest and operatorship of Cairn's exclusively held KG-DWN-98/2 (Krishna-Godavari Offshore) deepwater block, effective 30 September 2003, together with a 15% interest in the CB-OS-2 (Cambay Basin) block and a 10% interest in the ring-fenced Lakshmi and Gauri development areas with an effective date of 1 January 2003. For the interests, ONGC will pay Cairn US\$ 135 million in cash, comprised of US\$ 85 million for the KG-DWN-98/2 block and US\$ 50 million for the CB-OS-2 block. Meanwhile, Cairn intends to farm in to ONGC's GV-ONN-97/1 (Ganga Valley) and CB-ONN-2001/1 (Cambay Onshore) blocks for a 30% working interest, effective 30 September 2003. Cash consideration for the transaction is believed to be in the rate of US\$ 165,000. Small independent Cairn is widely perceived as being more adept at finding rather than developing large reserves.

## KUWAIT



The feedback of international oil companies (IOCs) has been incorporated into Project Kuwait, Ahmed Al-

Arbeed, chairman and managing director of Kuwait Oil Co. (KOC), said at the Society Petroleum Engineer's ATCE 2004 on 27 September 2004 in Houston. Under the project, the ownership of several North Kuwaiti fields will be transferred to IOCs. Al-Arbeed said while the contract model meets constitutional standards demanding reimbursement be made in cash rather than production, which is state property, it is designed to be beneficial to both Kuwait and IOCs. He admitted that Kuwait, which is losing its water drive, needs the IOCs in order to utilize the latest technology for secondary recovery. While not offering any specifics on the draft contract, which is to be submitted to parliament in late October 2004, Al-Arbeed said Kuwait will offer 20-year licenses, with an option for a 30-year extension. In addition, a production ceiling will be imposed so the country's reserves are not depleted. Nonetheless, Kuwait acknowledges the contracts must be economically attractive to IOCs. Therefore, the state is committed to sharing risks and looking after the interests of both parties. Successful bidders will have complete say in the choice of service companies. A new subsidiary of KOC will oversee the successful bidder(s). Three groups of companies have been accepted to bid for the rights to manage the project, these are as follows:

ChevronTexaco	50%
Total	20%
Petro-Canada	10%
Sibneft	10%
Sinopec	10%
BP	65%
Occidental	25%
ONGC/IOC	10%
ExxonMobil	37.5%
Shell	32.5%
ConocoPhillips	20%
Maersk	10%

## OMAN



Petroleum Development Oman (PDO) is offering a rare and innovative opportunity for the industry to get involved in its plans to revitalize the development of its small oilfields. The company has stated there are 64 producing oil fields with reserves of 10 MMb or less plus 94 oil discoveries. In this new approach it is proposed that around 50 fields, grouped in 4-6 clusters, are to be managed over their full lifecycle, in an alliance partnership with PDO. Spearheading this initiative is the "Alliance Contract", described as a service agreement with a high degree of autonomy for the alliance partner that will provide incentives for improved delivery of oil. Although details are still sketchy, PDO anticipates the first such contract, for a cluster east of the Nimr-Karim area that is currently yielding 16,000 b/d from 17 fields, should be signed early in 2005. PDO estimates some 70

MMb of remaining recoverable reserves in this opportunity. Early indications suggest this has been well received by the industry which is showing a willingness to invest.

## PAKISTAN



Shell is looking for a third partner in its deepwater Offshore Indus-E Exploration License in the Indus Delta. A significant interest is being offered in this 7,389.95 sq km, permit where Shell is keen to drill an exploration well in the untested hydrocarbon system. In addition to the 5% stake held by the Government of Pakistan, Shell's partners include Premier Oil and Kufpec, each with 23.75%. The most attractive lead is the "Anne-Frances" prospect, which was identified by 3D seismic in about 1,300m of water. Mean oil reserves for six individual stacked reservoirs are believed to be in the order of 100 MMbo each (a total in excess of 600 MMbo). Upside potential has been identified not only in a structurally similar prospect within the 3D survey area, but also in areas of the block that have only been covered by 2D seismic.

## QATAR



With operations still ongoing, Total has confirmed that it has brought onstream the third phase of development on the offshore Al Khalij oil field (Al Khalij North) together with a platform for water separation and treatment. The field is primarily located in Block 6 but in June 2002, Total was awarded the 365 sq km offshore (Al Khalij) Block 10 to facilitate the additional (Phase 3) northern Al Khalij field development. Now that Phase 3 is producing, peak production should reach 50,000 bo/d by January 2005. The oil has an average gravity of 28° API.

## SYRIA



Tanganyika Oil's wholly owned subsidiary Dublin International, which continues to acquire 3D seismic over the entire Oudeh field, has been boosted by the news of a significant increase in reserves. Originally estimated to have 2.4 billion barrels of proved, probable and possible oil in place, this figure has now been raised to 2.56 billion with around 178 MMb recoverable. This figure however, does not include the latest three successful horizontal wells, the results of which will boost the totals further. This third party assessment has also commented on potential oil in place resource of around 1.34 billion barrels in the western and central parts of the Shiranish Formation, appraisal drilling in these areas is planned upon the processing and interpretation of the 3D seismic. Gross production from the field is currently around 1,800 bo/d.

In a development largely overlooked by the media but which did not escape the attentions of IHS Energy, Iraq has been cleared to join the Arab Gas Pipeline (AGP) in partnership with Egypt, Jordan, Lebanon and Syria. In May 2001, Jordan and Egypt signed agreements to build the first phase of this 850km line, extending from Egypt into Jordan. This phase was officially inaugurated in July 2003. The line is now continuing through Jordan into Syria, where gas deliveries are expected late in 2005. It will then be extended to Lebanon, Turkey and concluding in Cyprus, the latter committed to a switch from oil to gas for electricity generation by 2006. Construction of the

370km second phase began in May 2004. This leg will run from Jordan's port city of Aqaba to the al-Samra and Rihab power stations in the north and will be capable of delivering 353 Bcf annually.

## TURKEY



Given the success of the recent Ayazli 1 wildcat located in the 486 sq km Block 3499 on the Black Sea shelf, District II, Madison Oil plans additional work and has increased its 2004 capital expenditure from US\$ 13 million to US\$ 16 million. The company will start a 100 sq km high-definition 3D seismic survey over the structure in the 4th Qtr. 2004 and has plans for several appraisal and exploratory wells in 2005. Madison also revealed that the Ayazli 1 well costs increased from US\$ 4.5 million to US\$ 7 million due to both weather and formation-related problems. Future drilling on this shelf-edge play will focus only on the shallower gas-producing zones. In other developments, the company has indicated plans to re-enter at least one well on its onshore Sinop acreage and that it is on schedule for a late 2004 spud of a well to test the Calgan prospect in Block 3805, District XII in the south-east Turkey Fold Belt. If this 5-10 MMb prospect is successful, a second well will be drilled on a separate prospect to the east.

## YEMEN



A fourth drill stem test has confirmed DNO Yemen's Nabrajah 2 appraisal in the 2,033 sq km South Hoowarime, Block 43 as a very successful well. Re-testing the Lower Cretaceous, Qishn S2 sandstone between 1,933m and 1,935m, this achieved a flow of 1,300 bo/d. DNO had completed two earlier tests of the Qishn S2 Sandstone. DST#2 between 1,927m and 1,931m had flowed 320 bo/d, 6,093 bw/d and a small amount of gas through a 64/64-inch choke while DST#3 had flowed 379 bo/d, 7,022 bw/d and 102 Mscf/d from combined intervals between 1,927m and 1,931m and between 1,933m and 1,935m on 96/64-inch choke. The high water production has been attributed to a poor casing cement job. Also of significance was DST #1, a basement production test which flowed a stabilised 15.2 MMcf/d, 313 bc/d and 49 bw/d from the interval 2,376m and 2,545m. The fractured basement play has become a key objective in Yemen following recent impressive flow rates from wells in both Block 14 and Block 10.

Continuing its evaluation of the Roidhat structure elsewhere on Malik Block 9, Calvalley Petroleum is believed to have spudded the Ras Noor 1 wildcat around the middle of September 2004. Ras Noor 1 is targeting Lower Cretaceous, Qishn Formation primary objectives and Saar, Shuqra, Kohlan and basement secondary objectives. This seismically defined independent prospect lies on the top of a plateau approximately 7km south-east of the Al Roidhat 1 discovery.

**Stuart Lewis**  
**IHS Energy Enterprise House**  
**Cirencester Road, Ilsom,**  
**Tetbury, Gloucestershire,**  
**GL8 8RX, UK**  
**Tel : +44 (0)1666 50127**  
**Stuart.lewis@ihsenergy.com**  
**www.ihsenergy.com**

# GSO EVENTS CALENDAR

## 2004

### November

4th GSO Talk (30/11/04)

**Dr. John Grotzinger**

Mars Exploration

Massachusetts Institute of Technology

1st GSO Field trip (25-26/11/04)

**Dr. Gordon Coy**

The Saiq Plato

Badley Ashton

### December

5th GSO Talk (12/12/04)

**Dr. David Boote**

Evolution of Petroleum Systems in the Libyan Ghadames - Proven and Possible

6th GSO Talk (28/12/04)

**Mr Ali Al-Kiyumi**

Ministry of Municipalities, Environment & Water Resources

2nd GSO Field trip (Thursday 9/12/04)

**Dr. John Aitken**

Geology of the Ordovician Amdeh Formation

Badley Ashton

## 2005

### January

7th GSO Talk (25/1/05)

**Dr. Mohammed Al-Mazrui**

Fluid characterization using 4D seismic amplitude and coherence analysis

PDO

### February

8th GSO Talk (22/02/05)

**Dr. Salah Khirbash**

Evolution of the Precambrian Yemeni Terranes:

Al-Bayda Island arc as a starter, SQU

3rd GSO Field Trip (24-25/02/05)

**Dr. Hisham Al-Siyabi & Dr. Mark Newell**

Salt domes in North Oman

PDO

### March

9th GSO Talk (22/03/05)

**Dr. Alan Heward**

Exploration & Production History in Oman

PDO

4th GSO Field Trip (16-18/03/05)

**Dr. Alan Heward**

Geology of the Saiwan Area, Northern Huqf

PDO

### April

10th GSO Talk (26/4/05)

**Dr. AbdulNasser Darkal**

General aspects of the main structural units in the northern part of the Arabian Plate, SQU

5th GSO Field Trip (21/4/05)

**Dr. Abdulrahman Al-Harthy**

The Seeb Formation & Palaeogene succession of the Al-Khod area

SQU

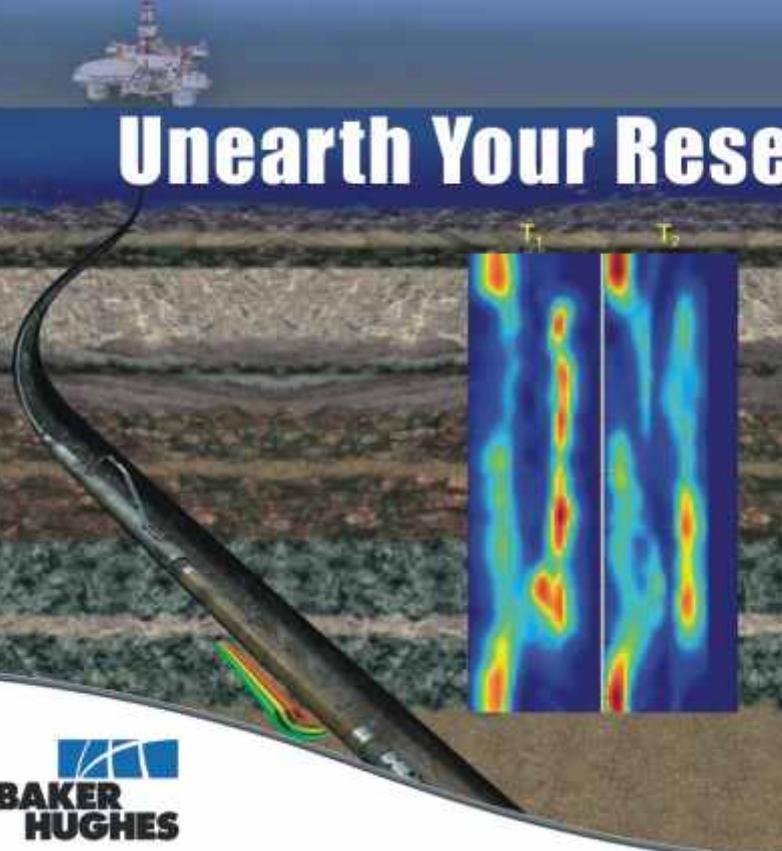
### May

11th GSO Talk (24/5/05)

A GSO-SPE Joint Talk

[www.bakerhughes.com](http://www.bakerhughes.com)

## Unearth Your Reservoir Potential



### Better, Faster NMR Answers

The Baker Atlas MR Explorer<sup>SM</sup> (MREX<sup>SM</sup>) provides the key answers to reduce reservoir evaluation uncertainty, improve reserve estimates and minimize field development costs.

**Better** – Comprehensive data sets and the latest visualization methods provide thorough hydrocarbon characterization and accurate reservoir fluid volumes.

**Faster** – The latest downhole technology and innovative acquisition techniques are combined to acquire complete NMR data in a single logging pass at higher logging speeds— saving rig time and reducing logging costs.

**NMR Answers** – Backed by more than a decade of MR logging and interpretation experience, Baker Atlas utilizes the best acquisition and analysis techniques to ensure you get the formation evaluation and analysis answers you need.

For Better, Faster NMR Answers, contact Baker Atlas.

### Baker Atlas – The Best Choice

[www.bakeratlas.com](http://www.bakeratlas.com)



