



PERSATUAN GEOLOGI MALAYSIA

WARTA GEOLOGI

NEWSLETTER of the GEOLOGICAL SOCIETY OF MALAYSIA

Jilid 39
No. 1

JANUARY–MARCH
2013

Volume 39
No. 1

ISSN 0126 - 5539

PP2509/07/2013(032786)



PERSATUAN GEOLOGI MALAYSIA
Geological Society of Malaysia

Council 2012/2013

President :	Prof. Dr. Joy Jacqueline Pereira
Vice President :	Dr. Mazlan Madon
Secretary :	Mr. Ling Nan Ley
Assistant Secretary :	Mr. Lim Choun Sian
Treasurer :	Mr. Ahmad Nizam Hasan
Editor :	Assoc. Prof. Dr. Ng Tham Fatt
Immediate Past President :	Dato' Yunus Abdul Razak
Councillors :	Dr. Meor Hakif Amir Hassan Mr. Nicholas Jacob Dr. Nur Iskandar Taib Mr. Robert Wong Dr. Samsudin Hj Taib Mr. Tan Boon Kong Dr. Tanot Unjah

The Geological Society of Malaysia was founded in 1967 with the aim of promoting the advancement of geoscience, particularly in Malaysia and Southeast Asia. The Society has a membership of about 600 local and international geoscientists.

Warta Geologi (Newsletter of the Geological Society of Malaysia) is published quarterly by the Society. Warta Geologi covers short geological communications and original research, as well as reports on activities and news about the Society. It is distributed free-of-charge to members of the Society. Further information can be obtained from:

The Editor
Geological Society of Malaysia
c/o Department of Geology,
University of Malaya,
50603 Kuala Lumpur, Malaysia
Tel: 603-79577036 Fax: 603-79563900
Email: geologicalsociety@gmail.com

Warta Geologi

Newsletter of the Geological Society of Malaysia

Editor-in-Chief

Ng Tham Fatt (University of Malaya)

Managing Editor

Ralph L. Kugler (University of Malaya)

Editorial Board

Prof. Dr. Abdul Rahim Samsudin
(Universiti Kebangsaan Malaysia)

Prof. Dr. Azman A. Ghani
(University of Malaya)

Prof. Dr. Basir Jasim
(Universiti Kebangsaan Malaysia)

Assoc. Prof. Dr. Chow Weng Sum
(Universiti Teknologi Petronas)

Prof. Dr. Felix Tongkul
(Universiti Malaysia Sabah)

Prof. Emeritus Dr. H.D. Tjia
(Universiti Kebangsaan Malaysia)

Prof. Dato' Dr. Ibrahim Komoo
(Universiti Malaysia Terengganu)

Prof. Dr. J.J. Pereira
(Universiti Kebangsaan Malaysia)

Prof. Dr. John K. Raj
(University of Malaya)

Prof. Dr. Lee Chai Peng
(University of Malaya)

Prof. Dr. Mohd Shafeea Leman
(Universiti Kebangsaan Malaysia)

Mr. Tan Boon Kong
(Consultant)

Prof. Dr. Wan Hasiah Abdullah
(University of Malaya)

Dato' Yunus Abdul Razak
(Minerals & Geoscience Department
Malaysia)

Secretariat

Anna Lim

CATATAN GEOLOGI GEOLOGICAL NOTES

The Batu Gading, Bukit Besungai Hollystone Quarry – Observations on an tectonically isolated carbonate sequence northeast of Long Lama, Sarawak

FRANZ L. KESSLER

Subsurface Manager Asia/Pacific, SGS/Petrotechnical Inspection,
17 Lorong Dungun, 50490 Damansara, Kuala Lumpur, Malaysia
Email address: Franzkessler32@gmail.com

Abstract: The Batu Gading Hollystone Quarry is located ENE of Long Lama, on the road between Long Lama and Tamalla. It forms one of several isolated carbonate blocks that are tectonically confined by regional faults, the nature of which remains uncertain. The carbonates, predominantly of reefal texture, are thoroughly fractured with a 'regional' component of 130° hading fractures, and a 17° 'local' hading fracture zone associated with a strike-slip system in the quarry. The carbonate body contains at least three unconformities, the second one being of angular nature. Several important questions in respect to both facies and stratigraphy remain to be answered.

Keywords: carbonate, limestone, Batu Gading, Sarawak, tectonics

INTRODUCTION

Outcrops in Sarawak are impermanent features, and this outcrop is no exception. Opened in the late seventies, the main deposit is almost exhausted. Some lower-level and strongly karstified limestone areas (pinnacles) remain unexploited. One reaches the quarry after some fifteen minutes driving under benign weather conditions, approaching the quarry area from Long Lama (Figure 1a).

The tectonic setting of the area is somewhat complex - firstly, we observe the SW-NE contact between strongly folded, anchi-metamorphic rocks of the Rajang Group, and the lesser tectonized shales (Setap Formation) of the Northern foreland basin (Figure 1b).

Given the Rajang Group is harder than the Setap Formation (claystone and slates), it forms a rock plateau on the Eastern side of the Baram River. Secondly, the Western edge of the Rajang is defined by a fault zone, possibly the Baram Line, a combined strike-slip/overtrust system of complex history (Kessler, 2010). Near Batu Gading, it is expressed by a valley flanked by folded Setap to the west, and Rajang to the east.

The Batu Gading carbonates are remnants of a larger carbonate plateau, in which Eocene reefal and platform carbonates were sedimented on a wave-cut shelf formed by Rajang Group deep-marine clastics and occasionally, carbonates. A good summary of previous literature is given by Hutchison (2005).

Based on an evaluation of foraminifera (Adams, 1965) it appears that a Miocene marine sequence developed on top of Eocene carbonates; however it is noted that this

relatively thin sequence of hard, and occasionally clayey limestone is patchy due to either to non-deposition and/or erosion. Tectonic movements, likely occurring at the Miocene/Pliocene boundary, led to a break-up of the combined Eocene/Miocene carbonate plateau, and only several segments survived in grabens or half-grabens, whilst others may have been uplifted and eroded. Most carbonate surfaces are strongly scoured by young karst processes.

OUTCROP DESCRIPTION

The outcrop was measured and sampled (Figures 2 and 3). The carbonates form a gently SW (locally also East) dipping plateau, bounded to the NE by a tectonic contact to the Rajang clastics. The nature of this fault is uncertain, with reverse faulting believed to be more likely than normal faulting. The carbonate plateau of the quarry area is constituted by at least two blocks, offset against each other by the 170° hading fault shown in Figure 3. The eastern quarry section appears to be uplifted in respect to the western section, and is now almost entirely exploited.

COMPOSITION OF ROCKS

The Batu Gading carbonates are formed by very pure limestone, only the uppermost and stratigraphically youngest sequence appears to contain some clay content. The main rock body (Figures 4 and 5) is formed by an association of reefal boundstone, in which Bryozoa appear to be prominent, and also packstone/grainstone facies; the bottom layer above the second unconformity contains

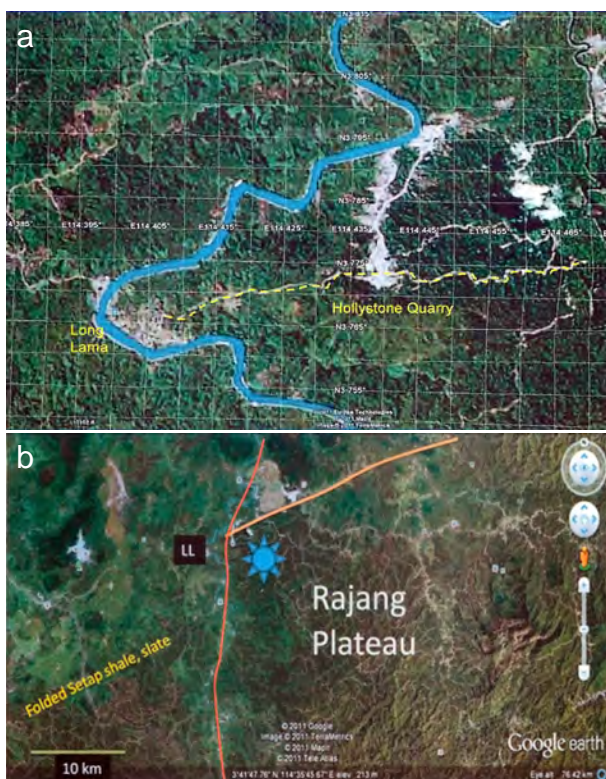


Figure 1: a) Satellite imagery (Google earth) showing access road and area of studies in the center of map. b) Satellite imagery (Gogle earth) of the area with sketch showing major geological boundaries. The star symbol indicates the occurrences of carbonates.



Figure 2: Quarry overview picture with area of sampling.

spectacularly large foraminifera (nummulite type), and this 1-2 m thick bank of rock can be traced throughout the outcrop. The several meters of carbonate rock between the first and second unconformity look markedly different - a highly fractured and possibly tectonized sequence of mudstones and wackestones.

UNCONFORMITIES

Within the confinements of the quarry, three unconformities were located, namely:

The lower or first unconformity, that place highly fractured carbonates on top of Rajang clastics. Evidence

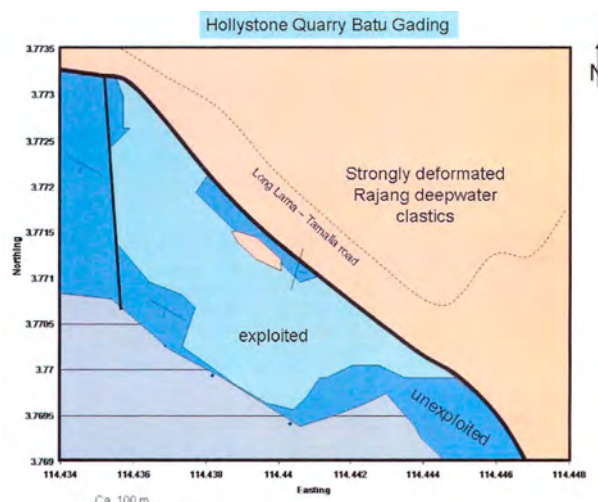


Figure 3: Sketch map of the quarry area based on GPS and optical laser distance finder data. Blue color stands limestone-light blue for the previously mined area, dark blue for remaining virgin rock (August 2011).

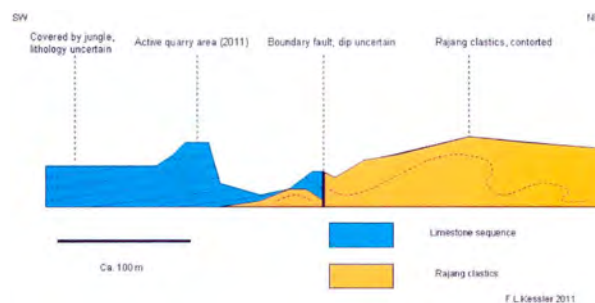


Figure 4: Crosssection through the Hollystone quarry.

for this unconformity is somewhat spurious, given it forms the very bottom of the excavation area and can be traced only by several shale blocks that appear to be in situ on the bottom of the quarry.

The second unconformity, that places a tectonized limestone, of variable dip, against an upper, and almost flat-lying, and little tectonized carbonate unit.

A third unconformity (sample Nr. 8, 9, see Figures 6b and 6c), located between an Eocene, and Miocene limestone body (Hutchison, 2005). There is a marked difference in facies between the uppermost series (samples 1-8) and the limestone located below, but the contact appears to be conformable.

FRACTURE SYSTEMS

Two fracture systems were observed in the outcrops. A prominent ca. 130° hading system that can be seen throughout most of the outcrop area. This fracture system rubs parallel to the major boundary fault offsetting the carbonates from the Rajang clastics. The second one is a more localized, parallel system of fractures and joints that run parallel to a strike-slip fault, hading ca 170° (Figure 7). All fractures, joints and faults are steeply dipping to vertical.

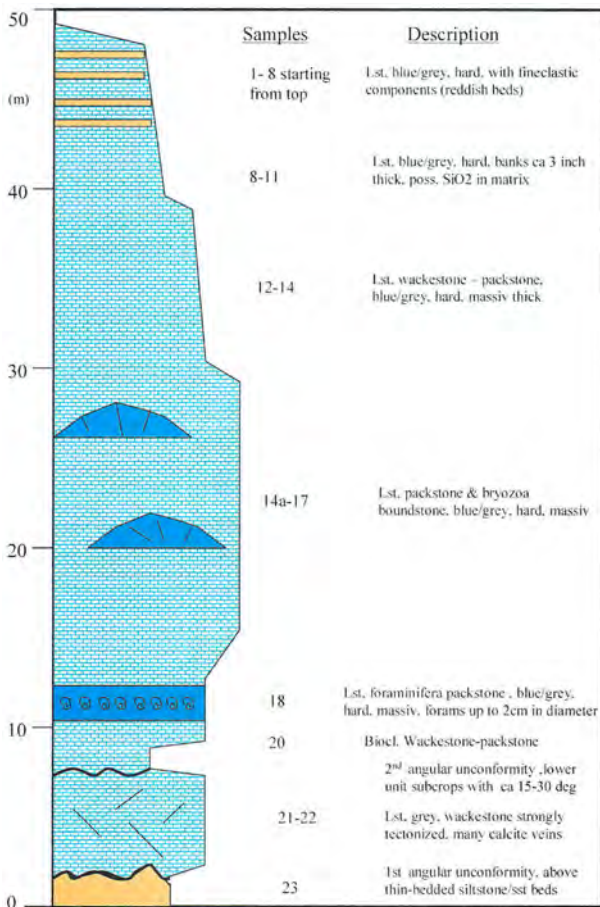


Figure 5: Vertical section through the Hollystone quarry.

INTERPRETATION- STRATIGRAPHY AND AGES

Batu Gading foraminifera were studied by Liechti et al. (1960), Adams & Haak (1962) and later Ngau (1989). A very good summary of the stratigraphic is also given in Hutchison (2005). According to these authors, the lower carbonate body is of Upper Eocene age, whereas the limestone above the second unconformity was dated as Lower Miocene. This said, the upper limestone body (above second unconformity) in the studied location appears to be far more prominent compared to literature.

INTERPRETATION- SEDIMENTARY ENVIRONMENT

Only the upper carbonate body above the second unconformity could be studied and logged in some detail. The sequence starts with foraminifera wackestones/packstones and indicates a moderate energy environment of fully marine conditions. The central sequence above is formed by patch reefs (this time not well exposed) surrounded by packstone/grainstone facies. We see here a high-energy environment with good sorting and marine-phreatic cementation. The uppermost, platy limestone

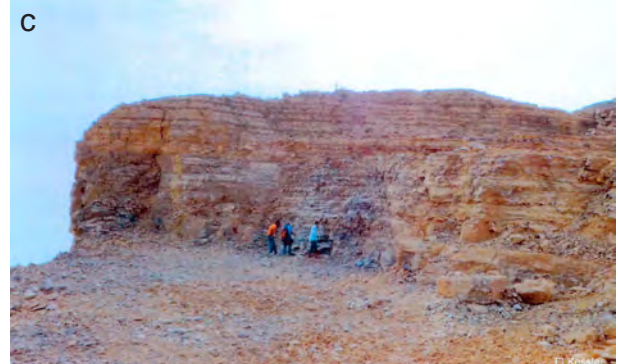


Figure 6: a) The second unconformity forms a marked boundary between a variably-dipping tectonized limestone sequence (below), and the overlying and hardly tectonized unit. b) Approximative location of the third unconformity in the quarry (red arrow). c) The third unconformity plane (here cleared by bulldozer) forms the economic ceiling of rock mining in the Hollystone quarry.

sequence above the third unconformity may, subject to confirmation by microfacies analysis, constitute an outer shelf - neritic carbonate sequence.

AGE AND FACIES

According to Hutchison (2005), who summarizes older stratigraphical work carried out in the sixties, the Batu Gading sequence is formed by two limestone bodies on top of each other: An Eocene unit, superimposed by a Lower Miocene unit in apparent concordance, with the Oligocene time section being missing. The mentioned

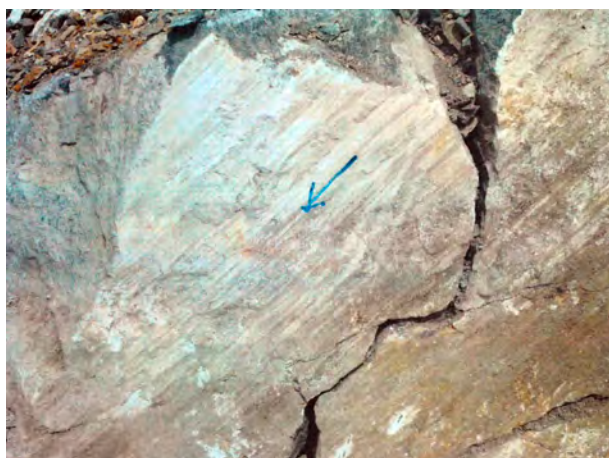


Figure 7: Slickensides in close-up view, horizontal with a dip-slip signature; surface of 170° hading fault as shown on map in Figure 8.

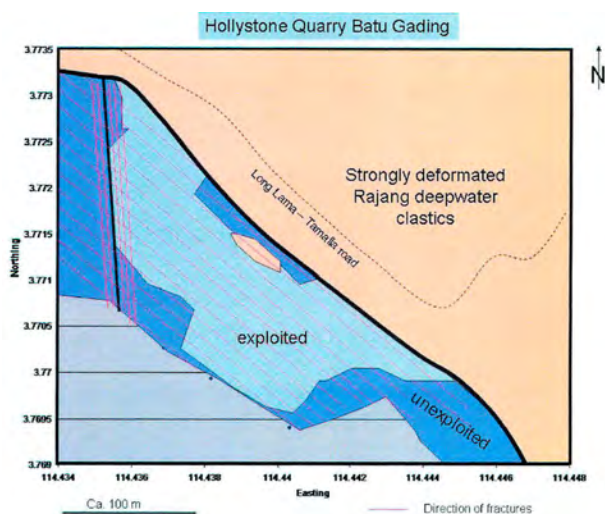


Figure 8: Simplified sketch map illustrating the direction of major fracture systems—regional: 130°; locally (along fault) 170°.

publication puts the boundary between Eocene and Miocene at the facies change between massive high-energy packstone/grainstone and slaty mudstone and wackestone; in one place (the now removed Batu Gading cave) reworked limestone fragments have been found in the bottom layer of the Miocene-dated rock. However, the situation in the quarry as observed in 2011 added a few more questions: The only prominent (angular) unconformity between carbonate bodies lies near to the

base of the carbonate column (Figure 6a), but certainly below the large foraminifera (nummulite) horizon; and the third unconformity, as quoted in the literature, might be located between the massive limestone and the overlying slaty limestone, but this requires further investigation.

The lack of Oligocene age rock appears to be particularly puzzling. If indeed the Oligocene is missing, why is there no sign of a marked unconformity? The observed situation is counter-intuitive for at least two reasons: If the sea-level had fallen at the end of the Eocene, and thus terminated reef development and led to exposure, there would be signs of a palaeokarst - but there are none; and if the sea-level had risen during the Eocene, and drowned the reefal carbonates, one would expect a slope/deep marine drape and the presence of Oligocene rock, such drape is indeed present, but published data strongly suggest the upper sequence to be of Miocene age.

Be it as it may, the age relationship between the three mentioned carbonate units (limestone below angular unconformity; massive limestone commonly dated as Eocene; slaty mudstone/wackestone above commonly dated as Miocene) calls for a facies and biostratigraphic re-evaluation.

REFERENCES

- Adams, C.G., 1965. The foraminifera and stratigraphy of the Melinau Limestone, Sarawak, and its importance in Tertiary correlation. *Quart. J. Geol. Soc. London*, 121, 283-338.
- Adams, C.G. & Haak, R., 1962. The stratigraphical succession in the Batu Gading area, middle Baram, north Sarawak. In: Haile, N.S. The geology and mineral resources of the Suai-Baram area, north Sarawak. Geological Survey Department British Territories in Borneo, Memoir 13, pp.141-150.
- Hutchison, C.S., 2005. *Geology of North-West Borneo*. Elsevier. 444 pages.
- Kessler, F.L., 2010. The Baram Line in Sarawak: Comments on its anatomy, history and implications for potential non-conventional gas deposits, *Warta Geologi*, 35(3), 105-110.
- Liechti, P., Roe, F.W. & Haile, N.S., 1960. The geology of Sarawak, Brunei, and the Western Part of North Borneo. Geol. Survey of Sarawak.
- Ngau, Anyi, 1989. The Geology of Batu Gading Area, Middle Baram, Sarawak, Malaysia. Unpubl. BSc thesis, University of Malaya.

Manuscript received 24 October 2011

PGCE 2013

Petroleum Geoscience Conference & Exhibition

Asia's Premier Geoscience Event

Innovative Geoscience: Securing Energy Needs

18-19 March 2013

Kuala Lumpur, Malaysia

The Petroleum Geoscience Conference & Exhibition (PGCE) 2013 founded by Geological Society of Malaysia (GSM) in 1977, is an annual event that is co-organised by PETRONAS and managed by the European Association of Geoscientist & Engineers (EAGE). The prestigious conference, which marks its 36th edition, is one of the largest premier Geoscience events in South East Asia and was successfully held on the 18 and 19 of March 2013 at the Kuala Lumpur Convention Centre.

This year, with its theme 'Innovative Geoscience: Securing Energy Needs', PGCE 2013 set a record with the highest number of registered delegates of 2600 and 40 exhibitors from various parts of the world. This conference was officiated by PETRONAS President and Group Chief Executive Officer, YBhg Tan Sri Dato' Shamsul Azhar Abbas accompanied by the President of Geological Society of Malaysia (GSM), Professor Dr Joy Jacqueline Pereira; PGCE Patron, Mr Effendy Cheng Abdullah and PGCE 2013 Chairman, Mr M Redhani Abdul Rahman.

The two-day programme included a comprehensive geoscience conference, technical exhibition, short courses, geological field trips, a golf tournament as well as a gala dinner. Its emphasis on multi-disciplinary approaches to geosciences and related engineering disciplines attract participants from all over the world. The Executive Programme, a first in PGCE, served as a platform for sharing and networking amongst the VIPs and was heralded a success by many of the senior management in the oil and gas industry that attended the programme. The extensive technical programme included posters and three special oral sessions on 'South East Asia Exploration', 'Innovative Geoscience' and 'Unconventionals' in which leading industry experts from around the globe shared their views. A total of 114 papers were presented, along with six short courses and two field trips organized in this year. PGCE 2013 also organised a student programme that featured special tailored talks and the Student-Industry Geo-Quiz where industry experts and students are joined as a team in tackling issues faced by the industry today.

This unique event designed for professionals of the geoscience community and future industry leaders provides excellent exposure and sponsorship opportunities offering ideal ways to showcase equipments and services, strengthen and expand networks as well as promote new businesses and alliances. Overall, PGCE 2013 met its goals of bringing thousands of geoscientists across continents to share their knowledge and expertise.

Reported by Ili Nuraini Afifuddin

Organised by:



Monday 18 March 2013

07:30	SPEAKERS BREAKFAST - Room 301							P O S T E R S	E X H I B I T I O N	R E G I S T R A T I O N
08:30	OPENING CEREMONY - Plenary Hall									
10.15	COFFEE BREAK/OPENING OF EXHIBITION - Exhibition Hall/ Foyer									
11:00	SPECIAL SESSION: SE ASIA EXPLORATION - Plenary Hall					Executive Programme - Room 301				
12:30 - 13:30	LUNCH - Conference Halls 1-3									
	ORAL SESSIONS			POSTER SESSIONS			Plenary Theatre			
	Plenary Hall	Banquet Hall	Room 302	Room 306A	Room 306B	Room 306C				
13:30	SE Asia Exploration	Formation Evaluation: Permeability	4D Seismic to Improve Reservoir Productivity	Fractured Reservoirs	Geochemistry	Rock Physics	Student Programme Presentations			
15:10	TEA BREAK - Exhibition Hall/ Foyer									
15:40	SE Asia New Gas Plays	Geophysics: Acquisition	Fractured Reservoirs	The Use of Present Day & Fossil Analogues	Carbonates	Geoscience to Improve Reservoir Productivity/EOR	Student/Industry GeoQuiz			
16:55 - 18.30	HAPPY HOUR - Exhibition Hall									
19:30 - 23:00	GALA NIGHT - Grand Hyatt Hotel									

Tuesday 19 March 2013

07:30	SPEAKERS BREAKFAST - Room 301							P O S T E R S	E X H I B I T I O N	R E G I S T R A T I O N
08:30	SPECIAL SESSION: INNOVATIVE GEOSCIENCE - Banquet Hall									
10:00	COFFEE BREAK - Exhibition Hall/ Foyer									
	ORAL SESSIONS				POSTER SESSIONS					
	Banquet Hall		Plenary Theatre	Room 302	Room 306A	Room 306B	Room 306C			
10:30	Carbonates		Geochemistry	Seismic Inversion	Thin Beds	Formation Evaluation: Borehole Imaging	Geophysics: Shallow Gas			
12:10	LUNCH - Conference Halls 1-3									
13:30	SPECIAL SESSION: UNCONVENTIONALS		Geophysics: Processing & Imaging	Formation Evaluation	Geoscience Integration	Sarawak Exploration	Pore Pressure & Geomechanics			
15:10	TEA BREAK - Exhibition Hall/ Foyer									
15:40	Broadband Seismic		The Use of Present Day & Fossil Analogues	Geoscience Integration	Unconventionals	Well Planning & Drilling	Formation Evaluation: Recommended Sampling			
17:20 - 18:10	CLOSING CEREMONY - Banquet Hall									



Welcoming Address by

Prof. Dr. Joy Jacqueline Pereira
President, Geological Society of Malaysia

Y. Bhg. Tan Sri Dato' Shamsul Azhar B Abbas, President & CEO of PETRONAS

Y. Bhg. Datuk Yunus Abdul Razak, Director-General of the Minerals and Geoscience Department Malaysia, Chairman of the GSM-PGCE Advisory Committee and Immediate Past-President of GSM

Y. Dihormati Mr. Effendy Cheng Abdullah, Vice-President Exploration PETRONAS, Patron of PGCE 2013

Y. Dihormati Mr. Idris Ibrahim, Senior General Manager, PMU-PETRONAS, Advisor of PGCE 2013

Y. Berusaha, Mr Redhani Rahman, Chairman of PGCE 2013 from PETRONAS Carigali Sdn Bhd

Past Presidents of the Geological Society of Malaysia, Senior Management of PETRONAS, Datuk-Datuk, Distinguished Guests, Ladies and Gentlemen

Salam Sejahtera, Salam Satu Malaysia and Good Morning.

Welcome to the 36th edition of the Petroleum Geoscience Conference and Exhibition, the premier petroleum geoscience event in Southeast Asia. PGCE 2013 is themed "Innovative Geoscience: Securing Energy Needs". The theme distinguishes "innovation" as a fundamental attribute that is required of geoscience in securing energy needs to drive economic growth in the country.

The Geological Society of Malaysia is highly conscious of the role we play in fostering the advancement of geoscience knowledge in the country and the region. We are also conscious of the responsibility that we have in supporting the important contribution of PETRONAS in realising exploration and development potential of oil and gas resources. In this respect, we will soon be signing a formal agreement with the Institute of Geology Malaysia, which has representation in the Board of Geologists Malaysia, to review geoscience curricula that are being offered by universities in the country. The review will be conducted to complement existing quality assurance programmes administered by the Ministry of Higher Education. The review of petroleum geoscience curricula, particularly for outcome based learning that promotes critical thinking and innovation, will be given the highest priority.

The Academy of Sciences Malaysia has recognised geoscience as an important contributor to Science, Technology and Innovation, and the role of the Geological Society as custodian of this field of knowledge. In support of the Societies' efforts to nurture innovative young geoscientists for the country, for the first time ever, the Academy sponsored 12 students from six public and private universities that offer geoscience programmes in Malaysia to present their research papers at the National Geoscience Conference 2012, held in Kuching last June. I am delighted to note that the students programme is also expanding in the PGCE, and for this I acknowledge the European Association of Geoscientists and Engineers (EAGE) for sharing their array of student programmes at the PGCE.

The PGCE has been organised since 1977 with strong support from Council Members of the Geological Society of Malaysia, who were then affiliated with PETRONAS. In recognition of this contribution, the Geological Society and PETRONAS became co-organisers in 2006. The contribution of PETRONAS has brought PGCE to greater heights. On behalf of the Geological Society of Malaysia, I thank PGCE Champion Mr. Effendy Cheng Abdullah, PGCE Advisor Mr. Idris bin Ibrahim and the Chair of PGCE 2012, Mr. Peter Majid for their leadership and guidance in framing a new cooperative framework for PGCE last year, whereby the net profit from PGCE is now channelled to both the Special Endowment Fund administered by the Geological Society and the Yayasan UTP.

In this context, I am delighted to inform all PGCE sponsors that the principal sum in the Special Endowment Fund of the Geological Society will be maintained in perpetuity whilst the interest accrued is to be used to conduct programmes that would strengthen the capacity of geoscientists in the country and the region. We hope that UTP would be able to channel funds from PGCE to strengthen geology and geophysics programmes in UTP, and expand the multidisciplinary spectrum of geoscience knowledge in the petroleum sector as it is practised today. Through

PGCE 2013

Petroleum Geoscience Conference & Exhibition
Asia's Premier Geoscience Event

the UTP, we would like to see the profits of PGCE transform into a new generation of knowledgeable, dynamic and innovative geoscientists for the petroleum sector.

The collaboration forged between Petronas and the Geological Society of Malaysia four decades ago, is in itself very unique and innovative based solely on goodwill, trust, mutual respect, and the underlying desire to make a positive difference, drawing on the synergies of our complementary institutional goals. It benefits the present geoscience fraternity in general, and through the sound leadership demonstrated by leading geoscientists in Petronas and the Society, both past and present, it now lays the foundation to build capacity of a future generation to practice innovative geoscience in securing energy needs. We look forward to expanding this collaboration, and together we can create the future we want, for our country and the region.

PGCE 2013 has received fantastic support from the oil and gas industry. We are hosting some 2000 delegates, 100 technical papers, 37 exhibition showcases, from local and international oil & gas companies and service providers over 2-days. The organising committee, under the leadership of Mr Redhani Rahman has not only put together a spectacular scientific and networking programme, but also raised some 2.0 million Ringgit worth of sponsorship from 26 sponsors, which is a 40% increase from the original target.

I would like to thank all our sponsors, in particular platinum sponsors ExxonMobil, Baker Hughes & PETRONAS as well as the gold, silver and bronze sponsors for your outstanding commitment to this event.

I would like to conclude by thanking Y. Bhg. Tan Sri Dato' Shamsul Azhar B Abbas, President & CEO of PETRONAS for making time to officiate PGCE 2013 and honouring us with his presence. Your presence here Y. Bhg. Tan Sri is the acknowledgment of the important role of geoscience in the petroleum industry, not only in Malaysia but at the global level given the fact that PETRONAS is a global brand. It is also a significant milestone to an ordinary volunteer Society such as ours, who work hard to advance geoscience knowledge. Thank you very much for joining us today. I wish everyone a successful and productive discourse today and tomorrow. Thank you very much.





Opening Speech by

Tan Sri Dato' Shamsul Azhar Abbas President & Group CEO, PETRONAS

Professor Dr Joy Jacqueline Pereira, President of Geological Society of Malaysia;
Distinguished Guests;
My PETRONAS Colleagues;
Conference Speakers and Participants;
Ladies and Gentlemen,

Good morning.

It gives me great pleasure to be here and welcome all of you to the 36th Petroleum Geoscience Conference & Exhibition. It is a privilege for us at PETRONAS to organise this prominent petroleum geoscience event alongside the Geological Society of Malaysia; and more encouragingly, to see so many familiar faces - friends and colleagues from the industry - to be present in this hall today in support of it. Your contribution and participation is a commitment that will ensure this important industry assembly and knowledge sharing platform will continue to thrive and prosper.

Let us take an objective outlook of the world today – what do we see around us? We can see power struggle and political instability in less developed countries, whilst the rest of the world has barely recovered from the economic recessions from four, five years ago. And it doesn't look like the worst is over; the world is anxious that the US just announced curtailment on its national budget, the Chinese business sentiment is worsening and Europe continues to deteriorate. What ripple effects would these have on our industry?

Growth is expected to remain sluggish, with price and demand for energy in 2013 not expected to be much different from last year. The outlook for the next few years remains to be seen. Yet our operational challenges do not appear to stay stagnant. In addition to existing challenges of accessibility and geopolitical uncertainties, we also have to come to terms that the days of easy oil is over.

But where energy is concerned, we cannot afford to think only in the short term. We cannot simply keep still; refuse to take action based on the internal challenges and discouraging outlook we face today. The lead-time for change is long and the strategies we implement now will have repercussions that go far into the future.

As far as four decades ago, we've been hearing that the world oil supply will run out, and that there would be no oil left by now. To the outside world, perhaps the fear was never actually real. But for us within the industry, we know otherwise. The continued increase in resource addition is not by sheer luck, but rather, through persistence, hard work, and continuous search for advancement in technology. Also by taking bold actions and new measures not previously done before; to test new play types, and to push beyond previous limits of exploration and exploitation. Otherwise, it would be a different world we live in today.

But the challenges of securing resources are far from over. "Abundant untapped reserves" is sadly a concept that belongs in the past. Over the recent years, we have had to address issues related to exploring new play types, and ways to mitigate high-pressure-high-temperature prospects, deepwater to ultra deepwater exploration, and the emergence of unconventional energy. As resources become more obscure and harder to produce, we have seen substantial increase in costs; squeezing our margins tighter. Despite putting in huge investments, there will still be considerable risks involved, giving little certainty of economic returns. As such, focus has to be firmly not just on securing, but also in monetising producing barrels.

It is against this backdrop that this year's PGCE is aptly themed "Innovative Geoscience: Securing Energy Needs". It is to remind us to continue coming up with value adding, innovative solutions through a combination of human expertise and advanced technologies. Innovation is necessary so that seismic applications such as controlled source electromagnetic technology (CSEM), circular shooting seismic survey (COIL) and acquisition technology

such as ocean bottom cable (OBC) can be integrated with geoscience to unlock new potentials, discover obscure resources, increase resource addition, and ultimately, production.

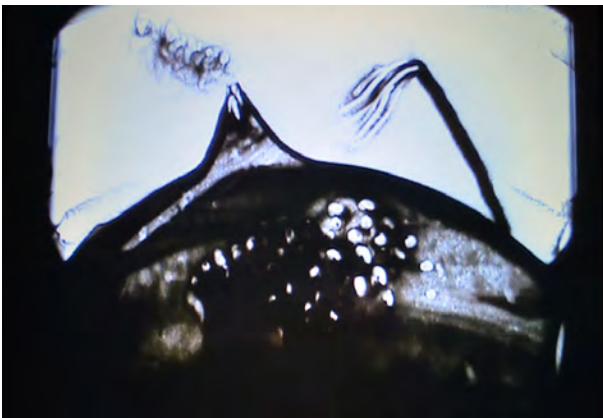
The principal steps of exploration and development relatively remain unchanged; but when placed against more geologically complex scenarios, the daily work of data acquisition and processing, seismic interpretation, prospect maturation, well drilling, all the way through to development handover, require improved technology in modeling and evaluation of reservoirs. To top that of, the whole industry is in dire need of qualified and experienced geoscientists.

As an important knowledge sharing and networking platform in the region, it is through this that PGCE aims to promote geoscience and the new technologies, technical knowledge and new ideas related to it. PGCE intends to play a vital role in sharing the wisdoms and experiences of the “old-timers” with the younger geoscientists. Collectively, this is hoped that the knowledge we capture today will prepare us for the challenges of tomorrow in securing and monetising resources for a successful future ahead.

You have a full and demanding agenda over the next two days, and so I don't wish to keep you from it any longer. My hope is that you continue to remember that at the end of the day, this is all for long-term sustainable solutions to the world energy needs, and this can only be achieved through working together. Again, my sincere thanks to you and your company, for your commitment to support the progression of geoscience fraternity in Asia, and in Malaysia particularly.

Let us carry on with the program, and may we continue to deliberate and collaborate beyond just these two days. On this note, it is with great pleasure that I declare the launching of the 36th Petroleum Geoscience Conference and Exhibition.

Thank you for your attention.



PGCE 2013 COMMITTEES

ADVISORY COMMITTEE

Effendy Cheng Abdullah, Patron
PETRONAS

Idris Ibrahim, Advisor
PETRONAS

ORGANIZING COMMITTEE

M Redhani A Rahman, Chairman
PETRONAS

Othman Ali Mahmud
PETRONAS

Gerard Wieggerink, Vice Chairman
EAGE

M Amar Amir
PETRONAS

Ili Nuraini Afifuddin, Secretary
PETRONAS

Fariza M Zanal
PETRONAS

Ahmad Nizam Hassan, Treasurer
Geological Society of Malaysia

Haizum Nadirah Mohd Zaideen
PETRONAS

Anna Lee
Geological Society of Malaysia

Liau Min Hoe
PETRONAS

Basiron Jalil
PETRONAS

Garry Malo-Paul
PETRONAS

Peter Majid
PETRONAS

Harrick So Seng Hui
PETRONAS

TECHNICAL PROGRAMME COMMITTEE

Deva Ghosh (Co-chairman), Universiti Teknologi PETRONAS

Michael Challis (Co-chairman), ConocoPhillips/KPOC

Ralph Kugler (Co-chairman), University of Malaya

Adriaan Bal, Baker Hughes

Paul Carroll, BHP Billiton Petroleum

Graham Hodgkiss, CGGVeritas

Kevin Anderson, ExxonMobil E&P Malaysia

Craig Sherley, Halliburton

Paul Fejer, Hess

Mark Sams, Ikon Science

Piyush Panwar, Leap Energy

Richard Jones, Lundin

Pedro A. Restrepo-Pace, Mubadala

Yashkor Yunus, Murphy Sarawak Oil Company

Patrick Gou Abdullah, Newfield Exploration
Othman Ali Mahmud, PETRONAS Carigali

Azlina Anuar, PETRONAS Carigali

Firdaus Halim, PETRONAS EPTC

Mohammad Yamin Ali, PETRONAS EPTC

Jesmee Zainal Rashid, PGS

Melissa Johansson, Schlumberger

David Stevens, Shell

Allagu Balaguru, Shell

Chris Howells, TGS

Arnaud Lenail, Total Malaysia E&P

Michelle Tham, WesternGeco

Zuhar Zahir Tuan Harith, Universiti Teknologi PETRONAS

SPONSORS

PLATINUM SPONSORS

Baker Hughes

ExxonMobil

PETRONAS

GOLD SPONSORS

CGG
Schlumberger

Murphy
Shell

PGS
Total

SILVER SPONSORS

BHPBilliton
JX Nippon

Halliburton

ConocoPhillips
Lundin

BRONZE SPONSORS

GeoKnowledge
Jason
Petrofac

Hess
Mubadala Petroleum
Pexco Sarawak
Mitsubishi

ION GeoVentures
Newfield
Talisman

EXHIBITORS

Almitra Energy	Archimedes Consulting	Baker Hughes
CGG	Corelab	dGB Earth Sciences
DownUnder Geosolutions	EAGE	EMGS
Energy Quest	Geo ExPro	GeoKnowledge
Geologix	Geotrace	GETECH
Halliburton	IHS Global Limited	Ikon Science
ION GeoVentures	JGI	JX Nippon
LandOcean	ONYX Engineering	Orogenic
PetroEDGE	Petrofac	PETRONAS
PETRONAS Education & Learning	Petroskills	Petrosys
Petrotechnical Inspection (SGS)	PGS	Polarcus
Rock Fluid Imaging Lab	Roxar	RPS Consultants
Schlumberger	Talisman	Tear Proof
TGS		Weatherford

PGCE 2013

Petroleum Geoscience Conference & Exhibition
Asia's Premier Geoscience Event



PGCE 2013

Petroleum Geoscience Conference & Exhibition
Asia's Premier Geoscience Event



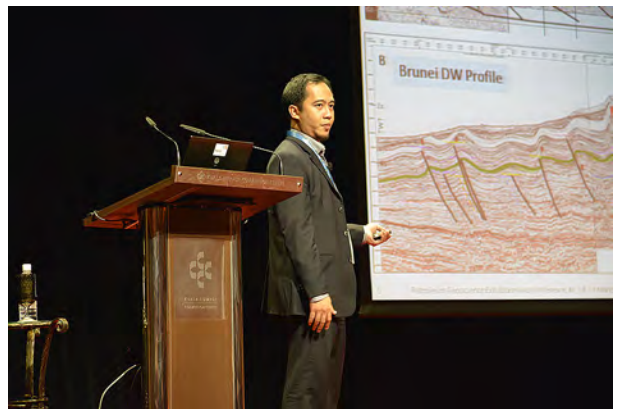
PGCE 2013

Petroleum Geoscience Conference & Exhibition
Asia's Premier Geoscience Event



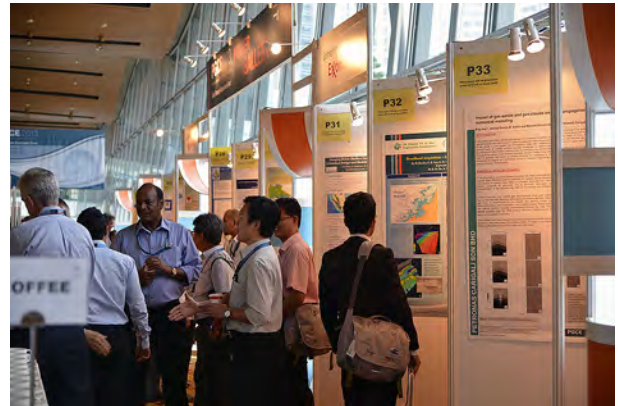
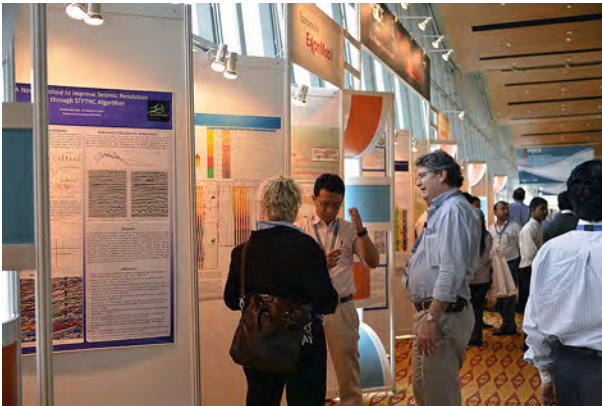
PGCE 2013

Petroleum Geoscience Conference & Exhibition
Asia's Premier Geoscience Event



PGCE 2013

Petroleum Geoscience Conference & Exhibition
Asia's Premier Geoscience Event



PGCE 2013

Petroleum Geoscience Conference & Exhibition
Asia's Premier Geoscience Event



PGCE 2013

Petroleum Geoscience Conference & Exhibition
Asia's Premier Geoscience Event



Chairman's Lecture No. 18

Slope Failures Associated with Water Tank and Reservoir Sites – Some Case Studies in the Kuching Area, Sarawak

Tan Boon Kong

9 January 2013

Department of Geology, University of Malaya

Mr. Tan Boon Kong presented the 18th Chairman's Lecture on the 9th January 2013. His lecture was an extension of the talk presented at the GSM National Geoscience Conference 2012 at Kuching. The lecture was attended by more than 10 practising geologists and engineers.

Abstract: Water tanks and reservoirs are sited on top of hills and in hilly terrains. As such, slope failures can and are often encountered associated with these sites. This paper presents case studies on slope failures associated with five water tank and reservoir sites in the Kuching and vicinity areas. The engineering geologic studies cover: site geology, soil profile, soil/rock materials involved in the slope failures, causes of failures, and risk classification. The results of the studies are summarised in Table 1 below. Slope failures involved the weaker surficial soils such as fill materials and Old Alluvium, and in two cases, the residual soils as well. Rainfall/water infiltration into the slope is a common causative or triggering factor. Steeper slopes have higher slope failure risk as compared to gentler slopes. The plotting of isopach maps showing the thickness of the fill materials and Old Alluvium at the various water tank and reservoir sites is particularly useful in depicting and assessing potential slope failures.

Table 1: Slope Failures Associated with 5 Water Tank and Reservoir Sites.

Location	Fill/Alluvium	Residual Soil	Bedrock	Slope Failure
Pending	Old Alluvium, 2-9m sand, pebbles, cobbles	clayey silt 6-24m	Tuang Fm dark grey-black phyllite	Flow slide involving Old Alluvium
Datu Muda	Fill (clayey silt & silty sand), 2-8m	silty sand, gravels 1-12m	Tuang Fm Light grey metagraywacke	Slide remedied fill/residual soils
9 3/4 Mile	Fill (clayey silt) 2-8m	clayey silt 1-5m	Microtonalite	Failure involved fill and residual soils
Matang	Fill (cobbles, boulders, sand) 1-9m	clayey silt 5-20m	Pedawan Fm sandstone/shale	Failure involved fill materials dumped into a natural valley
Muara Tuang	Tipped fill 2.7-7.1m	clayey silt - silty clay 2-8m	Tuang Fm dark grey phyllite	Failure involved fill materials dumped into a natural valley



CERAMAH TEKNIK TECHNICAL TALK

Geological Structural Data Collection & Application in Rock Engineering

Mogana Sundaram (Aurecon, Brisbane)

31 January 2013

Department of Geology, University of Malaya

The talk on “Geological Structural Data Collection & Application in Rock Engineering” was delivered by Dr Mogana Sundaram on 31st January, 2013 at the Department of Geology, University Malaya, Kuala Lumpur. Sdr Mogana is a true-blue product of UKM, where he did his BSc, MSc and PhD. He later moved to Australia where he has remained and worked for more than 10 years in projects involving tunnelling, rock slopes, etc, hence acquiring much experiences and expertise in these subjects – a case of Malaysia’s loss and Australia’s gain.

The presentation covered a comprehensive and thorough account of various techniques used in data collection for rock slopes and tunnelling applications, as practised in Australia. Details of the talk are contained in the abstract below. As usual, ample time was allocated for the numerous questions and discussions.

We thank Mogana for an interesting and enlightening talk, and look forward to more talks from him during his home-coming or “balik-kampung” trips in the future.

Tan Boon Kong,

Chairman, W/G on Engineering Geology, Hydrogeology & Environmental Geology

Abstract: Comprising of intact rock and geological defects, rock mass is complex. Due to this, it can behave as a discontinuous, in-homogenous, anisotropic and non-linear elastic medium. Its behaviour at an engineering scale is dependent on these intact rock properties and geological structural features, and their characteristics, coupled with stress and ground water conditions. It is important that the intact rock properties and defects are characterised appropriately to understand their behaviour in engineering projects.

In this presentation, the geological defects that govern the engineering behaviour of the rock mass are defined, and methods of data collection are discussed. The importance of consistent and established methods of data collection and description (e.g. ISRM) is emphasised as it is the communication tool between the geologists and the designers. Description using standardised methods will enable translation of the descriptive terms to parameters that can be applied in analysis and design.

The presentation highlights data management and processing using commercially available soft wares. Estimation of joint shear strength and geological strength index (GSI) from borehole data and utilisation of these data to estimate rock mass strength (using Hoek-Brown Criterion) and rock mass classification are also discussed (Q-System & RMR). The application of the data collected from the field and subsurface investigations, and converting those data to engineering design parameters, and subsequently the use of these data in design are demonstrated using two case studies involving design in rocks.

In the first case study, clear distinction is made between failure through defects and through rock mass for a green field site rail cutting. The data collected from boreholes and field mapping is used to determine the potential failure modes through defects (block failure) and through rock mass. In block failure model, data collected from boreholes and field were used to perform kinematic analysis and subsequently, block stability analysis. Clear distinction is made between the two analyses as the former cannot include factors such as cohesion, rock density, slope height, and forces (e.g. external load, seismic/vibration, water, stress) and does not provide factor of safety. Failure through rock mass was analysed using rock mass shear strength derived from Hoek-Brown Criterion. The implementation of the design during construction is also discussed to ensure potential failure mechanisms are identified and unstable blocks are stabilised before proceeding with further excavation.

The second case study demonstrates how the geological data gathered from orientated boreholes and field mapping were analysed and used to derive design parameters for a large cavern design and creation of block model for numerical analysis by tunnel designers.



CERAMAH TEKNIK TECHNICAL TALK

Listen, Listen, Listen, GROUNDWATER is definitely better

Azuhan Mohamed (Erinco)

13 March 2013

Department of Geology, University of Malaya

The talk on “Listen, Listen, Listen, GROUNDWATER is definitely better” was delivered by Ir. Dr. Azuhan Mohamed (Erinco/DID) on 13th March, 2013 at the Dept. of Geology, Univ. Malaya, K.L. Sdr Azuhan is fully qualified to talk on the subject of groundwater since he has spent a large part of his working life working on groundwater.

Sdr Azuhan gave a very comprehensive and “entertaining” talk on why groundwater is a better resource as compared to surface water (large resource, good water quality, easy and low cost abstraction, continuous recharge, etc.). He also touched on the common misconceptions among lay-man and professionals with regard to groundwater. He laments that in spite of numerous works/campaigns conducted on groundwater, there still exist resistance and reluctance to the greater development of groundwater resources, including from the business and political sectors. For example, a recent major project on the exploration and tapping of groundwater from deep-seated bedrock/hard rock aquifer was suddenly aborted mid-stream, to the disappointment of the professionals involved in the project. Further details of the talk are contained in the abstract below. As usual, a lively Q&A session followed the presentation.

On behalf of the Society, we thank Sdr Azuhan for his most enlightening and entertaining talk.

Tan Boon Kong,

Chairman, W/G on Engineering Geology, Hydrogeology & Environmental Geology

Abstract: Water is a gift of God. Water exists in four forms: solid, liquid, gas and in the form of “H” separated from “OH”. The fourth form refers to water that is baked into the molecular structure of rock which is located between 400 km and 640 km deep in the earth. The paths taken by rain droplets include: (i) evaporate before reaching the ground; (ii) intercept by vegetation – evaporated, consumed and flow down to the ground; (iii) reaches the ground – flow as surface runoff or infiltrated into the ground and subsequently percolated to groundwater bodies or aquifers; and (iv) joins surface water bodies – rivers, lakes, wetlands and oceans. In Malaysia, visible water resources account for more than 98 per cent of raw water for public water supply. In countries with high annual rainfall, groundwater is an out-of-sight, out-of-mind water resource and is assumed to be viable only for low rainfall countries. There are many benefits of groundwater development and they include shorter transmission pipelines and inundation free water resources development. The former utilises the pipeline function of aquifers whereby water is transferred from recharge areas to abstraction points and the latter utilises the massive storage capacity function of aquifers. It is estimated that more than 95 per cent of the readily available global freshwater resources is in the ground. There are many methods of groundwater abstractions and the suitable method depends on the desired quantity and quality of water as well as geological conditions. River bank filtration (RBF) is gaining acceptance to enhance water supply services by improving water quality, permitting water abstraction during river low flows and overcoming water intake damages by floating logs. RBF utilises the “filter plant” function of aquifers. RBF involves the use of groundwater abstraction methods. The suitable method of abstraction and the success of RBF depend on the conditions of local geology and river. Detailed study that is undertaken by a team of multi-discipline groundwater professionals will ensure sustainable groundwater development. There are many barriers to groundwater development in the country and include opposition from business as usual sector (river abstraction and dam construction) and public perception on the safety of groundwater use as well as professionals perception on the sustainability of groundwater use. With respect the latter, the presenter noted that geoscientists and engineers are divided in addressing all geo-hazards except groundwater related hazards. It is now time for change – develop groundwater to improve water supply services and mitigate the impacts of climate change. This change can be realised if there is a political will – groundwater is high on the development agenda.

NEW MEMBERSHIP

Full Membership

1. Afira bt Azland Zulfizzazuddin
2. Ahmad Tariq bin Ahmad Ziyao
3. Ali Sayed Moussa Hassabelnaby
4. Chai Shin Ni
5. Daud Abdul-Fattah Batchelor
6. Farhana binti Mansor
7. Laurent de Verteuid
8. Mohamad Sidek bin Othman
9. Muhammad Muqtada Ali Khan
10. Naim Abd Rahman

11. Nathan Achuk
12. Nor'ain binti Ibrahim
13. Norhasniza Hashim
14. Norzlinda binti Zainal Abidin
15. Sean Westbrook
16. Shangar A/L Ramasamy
17. Sibam Chakraborty
18. Siti Hassulaini binti Abdul Rahman
19. Siti Syairah bt Mohd Sokri
20. Suhaila binti Suleiman
21. Vijaindran S/O Ganesan

Student Membership

1. Ahmad Fadhli bin Kamarollzaman
2. Amzar bin Azhar
3. Chu Hui Voon
4. Emi Suhana Mat Noor
5. Fadli bin Johari
6. Faridah Hanim binti Abu Bakar
7. Lim Hui Tin
8. Lum Chee Kong
9. Mohamad Aidel bin Abu Bakar
10. Mohamad Danial bin Mohammad Pasuki
11. Mohamad Luqman Hakim bin Mohd Lizan
12. Mohamad Syahmi bin Halim
13. Mohd Nur-Iman bin Mohammad Naim
14. Morgan Raj A/L Krishnasamy
15. Muhammad Asyraf bin Zulkafli
16. Muhammad Azmi bin Mohammad Asri
17. Muhammad Fakhri bin Abu Bakar
18. Muhammad Haziq bin Azizan
19. Muhammad Mustaqim bin Hamdan
20. Muhammad Mustaqim bin Mohd Rosli

21. Nabil Fikri b Abdul Rani
22. Nafizah Md. Paozim
23. Nor Faizah bt Saudin
24. Nur Amelya binti Mohammed Jamal
25. Nur Hazmira bt Nawli
26. Nur Izzati binti Mohd Asri
27. Nur Yudra Izzati Che Mansor
28. Nurul Eizzaty bt Ahmad Mistam
29. Nurul Shamimie binti Mat Nafi
30. Quek Long Xiang
31. Safwah Fathi bin Ab Latif
32. Saiful Hakim bin Mohd Roslan
33. Sharene Ang Ee Shin
34. Sharipah Sakinah bt Sayed Abd. Azam
35. Siti Alina binti Shahbudin
36. Siti Nur Liyana bt Adzman
37. Siti Rahimah binti Samsunanwar
38. Tan Sim Wah
39. Yousif Mohammed Nakeen Ahmed
40. Zatil Hoesna bt Che Nazir
41. Zatumajihah bte Mohd Noor

Dear Members

Please update your contact details by sending your email address, telephone no. and fax no. to : geologicalsociety@gmail.com



UPCOMING EVENTS

July 1-5, 2013: Basic Petroleum Geology in the Field, Whitby, UK. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; Email: training@hoteng.com; website: www.hoteng.com

July 1-5, 2013: Basin Analysis Workshop: An Integrated Approach, Singapore. Tel: +603 21664751; email: asiapacific@petroskills.com

July 3 - 5, 2013: Geological Society of South African (GSSA) GeoForum 2013: Mineralization and Geosciences in Africa. Johannesburg, South Africa. <http://www.gssa.org.za/event/geoforum-2013/>

August 5-9, 2013: Reservoir Engineering for Non-Reservoir Engineers, Perth, Australia. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; Email: training@hoteng.com; website: www.hoteng.com

August 5-11, 2013: North Sea Petroleum Geology and field trip, Aberdeen, UK. Tel: +603 21664751; email: asiapacific@petroskills.com

July 7-11, 2013: 15th International Clay Conference (XVICC), Rio de Janeiro, Brazil. <http://www.aiepa.org/> or www.15icc.org; email: info@15icc.org

August 5 - 9, 2013: The International Mine Water Association and the Colorado School of Mines are hosting the 2013 International Mine Water Association Symposium in Golden, Colorado, USA. <http://csmospace.com/events/imwa2013/>

August 12-14, 2013: Unconventional Resources Technology Conference (URTeC), Denver, USA. Contact: jsimmons@urtec.org

August 19-23, 2013: Introduction to the Oil & Gas Industry, Vienna, Austria. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; Email: training@hoteng.com; website: www.hoteng.com

August 25-29, 2013: MEDGEO 2013. IMGA 5th International Conference on Medical Geology, USA. http://rock.geosociety.org/GeoHealth/MEDGEO_2013/Welcome.html

August 26-28, 2013: Introduction to Petroleum Engineering, Vienna, Austria. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; Email: training@hoteng.com; website: www.hoteng.com

August 26-30, 2013: Introduction to Seismic Stratigraphy: A Basin Scale Regional Exploration Workshop, Kuala Lumpur, Malaysia. Tel: +603 21664751; email: asiapacific@petroskills.com

August 26-30, 2013: Carbonate Reservoir Characterisation, Vienna, Austria. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; Email: training@hoteng.com; website: www.hoteng.com

September 1-5, 2013: Foundations of Petrophysics, Abu Dhabi, UAE. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; Email: training@hoteng.com; website: www.hoteng.com

September 2-4, 2013: Building Strong Continents: Evolution of the Continental Crust: Growth, Stabilisation, Preservation and Recycling, University of Portsmouth, UK. Contact: Craig Storey: craig.storey@port.ac.uk; Mike Fowler: mike.fowler@port.ac.uk; website: <http://www.port.ac.uk/special/buildingstrongcontinents/>

September 2-6, 2013: Advanced Seismic Stratigraphy: A Sequence – Wavelet Analysis Exploration – Exploitation Workshop, Kuala Lumpur, Malaysia. Tel: +603 21664751; email: asiapacific@petroskills.com

September 2-6, 2013: 15th Annual Conference of the International Association for Mathematical Geosciences, Madrid, Spain. Contact: Carolina Guardiola Albert, Tel: +34 91 349 5829; Fax: +34 91 349 5929; email: c.guardiola@igme.es; e.pardo@igme.es

September 3-6, 2013: Reservoir Characterisation: Modern-Day Analogues of the Aquitaine Basin (SW France), Bordeaux Area, France. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; Email: training@hoteng.com; website: www.hoteng.com

September 4–6, 2013: 12th European Geopark Conference. Geoparks: an innovative approach to raise public awareness about geohazard, climate change and the sustain-able use of our natural resources. Ascea-Velia-Elea, southern Italy. <http://egnconference2013.cilentoediano.it/index.asp?ref=pagine&id=109&lan=ita>

September 8-11, 2013: AAPG 2013 International Conference & Exhibition, Cartagena Convention Center, Cartagena. Email: convenc@aapg.org

September 8-11, 2013: Second South African Geoheritage meeting. Oudtshoorn, South Africa. Field excursions will highlight the geology and geomorphology of the Cape Fold Belt; the meeting will address various aspects of geoheritage in South Africa and globally, with special interest on the Klein Karoo. Email: info@gssa.org.za

September 8-12, 2013: Reservoir Engineering for Non-Reservoir Engineers, Dubai, UAE. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; Email: training@hoteng.com; website: www.hoteng.com

September 9-13, 2013: Petroleum Geology for Early Career Geoscientists and Engineers and field trip, Weymouth, UK. Tel: +603 21664751; email: asiapacific@petroskills.com

September 16-20, 2013: Naturally Fractured Reservoirs: Geologic and Engineering Analysis, London, UK. Tel: +603 21664751; email: asiapacific@petroskills.com

September 22-24, 2013: Energy Elevated, Salt Lake City, Utah, USA. Email: kalyea@aapg.org

September 23-27, 2013: Production Geology for Other Disciplines, Kuala Lumpur, Malaysia. Tel: +603 21664751; email: asiapacific@petroskills.com

September 26-28, 2013: Medical Geology meeting, University of Johannesburg. The meeting will consist of 2 days short course by Prof Jose Centeno (USA) and collaborators, followed by 1 day presentations, with a possibility of a 1 day excursion. Contact: Hassina Mouri at: hmouri@uj.ac.za

October 7-11, 2013: Seismic Interpretation, Kuala Lumpur, Malaysia. Tel: +603 21664751; email: asiapacific@petroskills.com

October 7-11, 2013: Seismic Velocities and Depth Conversion, Kuala Lumpur, Malaysia. Tel: +603 21664751; email: asiapacific@petroskills.com

October 14-18, 2013: Carbonate Reservoirs, London, UK. Tel: +603 21664751; email: asiapacific@petroskills.com

October 14-18, 2013: Petroleum Geochemistry: Tools for Effective Exploration and Development, London, UK. Tel: +603 21664751; email: asiapacific@petroskills.com

October 20-24, 2013: Production Logging and Reservoir Monitoring, Doha, Qatar. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; email: training@hoteng.com; website: www.hoteng.com

October 21-25, 2013: Analysis of Structural Traps in Extensional Settings, Las Vegas, USA. Tel: +603 21664751; email: asiapacific@petroskills.com

October 21-25, 2013: Introduction to Petroleum Prospect Appraisal, Vienna, Austria. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; email: training@hoteng.com; website: www.hoteng.com

October 21-25, 2013: Geochemical Techniques for Solving Reservoir Management and Field Development Problems, London, UK. Tel: +603 21664751; email: asiapacific@petroskills.com

October 27-30, 2013: Geological Society of America (GSA) Annual Meeting & Exposition 2013, Denver, Colorado USA. GSA is celebrating its 125th anniversary

in 2013 with a yearlong series of events focusing on Celebrating Advances in Geosciences – Our Science, Societal Impact and Unique Thought Processes. <http://www.geosociety.org/meetings/2013/>

October 27-31, 2013: Introduction to Open Hole Log Analysis, Doha, Qatar. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; email: training@hoteng.com; website: www.hoteng.com

October 28 – November 1, 2013: Dee-water Turbidite Depositional Systems and Reservoirs, Houston, USA. Tel: +603 21664751; email: asiapacific@petroskills.com

November 17-21, 2013: Integrated Petrophysics for Reservoir Characterisation, Dubai, UAE. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; email: training@hoteng.com; website: www.hoteng.com

November 18-22, 2013: Basin Analysis and Petroleum Systems, Vienna, Austria. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; email: training@hoteng.com; website: www.hoteng.com

November 24-28, 2013: Carbonate and Fracture Petrophysics – A Roadmap. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; email: training@hoteng.com; website: www.hoteng.com

December 9-13, 2013: Pore Pressure, Fracture Pressure and Wellbore Stability Management, Vienna, Austria. Tel: +43 3842 43053-0; Fax: +43 3842 43053-1; Email: training@hoteng.com; website: www.hoteng.com

April 3-5, 2014: Soil-Waste-Water 2013 workshop, Landau, Germany. www.soil-waste-water.de

May 11 – 16, 2014: 5th Edition of the International Congress on Arsenic in the Environment will be held in Buenos Aires, Argentina. Details can be found at: <http://www.as2014.com.ar>

September 1 – 5, 2014: The International Mineralogical Association 21st general meeting (IMA 2014 – Delving Deeper: Minerals as Mines of Information). Johannesburg, South Africa. <http://www.ima2014.co.za>

September 15-18, 2014: IAEG X11 Congress. Torino, Italy. Theme: “Engineering Geology for Society and Territory”. <http://www.iaeg2014.com/>

November 12 – 19, 2014: IUCN World Parks Congress 2014, Sydney, Australia. The Congress will serve as a vital link to achieving IUCN’s overall vision of a “just world that values and conserves nature”. <http://www.iucn.org/>

August 27 to September 5 2016: The 35th International Geological Congress: Cape Town, South Africa. Danie Barnado, Secretary-General: 35th IGC. barnardo@geoscience.org.za; <http://www.35igc.org>

GEOLOGICAL SOCIETY OF MALAYSIA PUBLICATIONS

- Bulletin 1** (1968). Studies in Malaysian Geology. 79 p. Edited by P.H. Stauffer. (out of stock)
- Bulletin 2** (1968). Bibliography and Index of the Geology of West Malaysia and Singapore. 152 p. D.J. Gobbett. Price: RM5.00.
- Bulletin 3** (1970). Papers in Geomorphology and Stratigraphy (with Bibliography supplement). 146 p. Edited by P.H. Stauffer. Price: RM5.00.
- Bulletin 4** (1971). Papers in Petrology, Structure and Economic Geology. 100 p. Edited by P.H. Stauffer. Price: RM5.00.
- Bulletin 5** (1973). The Search for Tungsten Deposits. 70 p. K.F.G. Hosking. (out of stock)
- Bulletin 6** (1973). Proceedings, Regional Conference on the Geology of Southeast Asia. A Collection of papers, Kuala Lumpur, March, 1972. 334 p. Edited by B.K. Tan. Price: RM5.00.
- Bulletin 7** (1974). A collection of papers on geology. 138 p. Edited by B.K. Tan. Price RM5.00.
- Bulletin 8** (1977). A collection of papers on geology. 158 p. Edited by T.T. Khoo. (out of stock)
- Bulletin 9** (1977). The relationship between granitoids and associated ore deposits of the Circum Pacific region. 277 p. Edited by J.A. Roddick & T.T. Khoo. (out of stock)
- Bulletin 10** (1978). A collection of papers on geology. 95 p. Edited by C.H. Yeap. (out of stock)
- Bulletin 11** (1979). Geology of tin deposits. A collection of papers presented at the International Symposium on Geology of Tin Deposits. 393 p. Edited by C.H. Yeap. (out of stock)
- Bulletin 12** (1980). A collection of papers on geology. 86 p. Edited by G.H. Teh. (out of stock)
- Bulletin 13** (1980). A collection of papers on geology of Malaysia and Thailand. 111 p. Edited by G.H. Teh. Price RM5.00.
- Bulletin 14** (1981). A collection of papers on geology of Southeast Asia. 151 p. Edited by G.H. Teh. (out of stock)
- Bulletin 15** (1982). A collection of papers on geology. 151 p. Edited by G.H. Teh. (out of stock)
- Bulletin 16** (1983). A collection of papers on geology. 239 p. Edited by G.H. Teh. (out of stock)
- Bulletin 17** (1984). A collection of papers on geology. 371 p. Edited by G.H. Teh. (out of stock)
- Bulletin 18** (1985) Special issue on Petroleum Geology. 209 p. Edited by G.H. Teh. & S. Paramanathan. (out of stock)
- Bulletins 19** (1986). GEOSEA V Proceedings Fifth Regional Congress on Geology, Mineral and Energy Resources of SE Asia. Vol. I. 652 p. Edited by G.H. Teh & S. Paramanathan. Members: RM30.00; Non-members: RM60.00
- Bulletins 20** (1986). GEOSEA V Proceedings Fifth Regional Congress on Geology, Mineral and Energy Resources of SE Asia. Vol. II. 881 p. Edited by G.H. Teh & S. Paramanathan. Members: RM30.00; Non-members: RM60.00
- Bulletin 21** (1987). Special issue on Petroleum Geology. 271 p. Edited by G.H. Teh. Price: RM20.00.
- Bulletin 22** (1988). Special issue on Petroleum Geology. 272 p. Edited by G.H. Teh. Price: RM20.00.
- Bulletin 23** (1989). A collection of papers on the geology of Malaysia, Thailand and Burma. 215 p. Edited by G.H. Teh. Price: RM10.00.
- Bulletin 24** (1989). A collection of papers presented at Annual Geological Conference 1987 & 1988. 199 p. Edited by G.H. Teh. Price: RM10.00.
- Bulletin 25** (1989). Special issue on Petroleum Geology. 161 p. Edited by G.H. Teh. Price: RM20.00.
- Bulletin 26** (1990). A collection of papers presented at Annual Geological Conference 1989 and others. 223 p. Edited by G.H. Teh. Price: RM10.00.
- Bulletin 27** (1990). Special issue on Petroleum Geology 292 p. Edited by G.H. Teh. Price: RM20.00.
- Bulletin 28** (1991). Special issue on Petroleum Geology 292 p. Edited by G.H. Teh. Price: RM20.00.
- Bulletin 29** (1991). A collection of papers presented at Annual Geological Conference 1990 and others. 255 p. Edited by G.H. Teh. Price: RM10.00
- Bulletin 30** (1992). Annotated bibliography of the geology of the South China Sea and adjacent parts of Borneo. 90 p. N.S. Haile. Price: RM10.00.
- Bulletin 31** (1992). A collection of papers presented at Annual Geological Conference 1991 and others. 176 p. Edited by G.H. Teh. Price: RM10.00.
- Bulletin 32** (1992). Special issue on Petroleum Geology. 283 p. Edited by G.H. Teh. Price: RM30.00.
- Bulletin 33** (1993). Proceedings Symposium on Tectonic Framework and Energy Resources of the Western Margin of the Pacific Basin. 419 p. Edited by G.H. Teh. Price: RM40.00.
- Bulletin 34** (1993). Bibliography and Index – Publications of the Geological Society of Malaysia 1967-1993. 181 p. Compiled by T.F. Ng. Edited by G.H. Teh. Price: RM20.00.
- Bulletin 35** (1994). A collection of papers presented at Annual Geological Conference 1992 and others. 174 p. Edited by G.H. Teh. (out of stock)
- Bulletin 36** (1994). Special issue on Petroleum Geology. 186 p. Edited by G.H. Teh. Price: RM50.00.
- Bulletin 37** (1995). Proceedings AAPG-GSM International Conference 1994. Southeast Asian Basins: Oil and Gas for the 21st Century. 506 p. Edited by G.H. Teh. Price: RM60.00.
- Bulletin 38** (1995). A collection of papers presented at GSM Annual Geological Conference 1994 and others. 190 p. Edited by G.H. Teh. Price: RM30.00.
- Bulletin 39** (1996). A collection of papers on geology. 258 p. Edited by G.H. Teh. (out of stock)
- Bulletin 40** (1997). A collection of papers presented at Annual Geological Conference 1996 and others. 247 p. Edited by G.H. Teh. Price: RM30.00.
- Bulletin 41** (1997). A collection of papers presented at Petroleum Geology Conference 1996 and others. 165 p. Edited by G.H. Teh. (out of stock)
- Bulletin 42** (1998). Papers from Petroleum Geology Conference 1997, Seminar on Tertiary Basins of Peninsular Malaysia and others. 268 p. Edited by G.H. Teh. Price: RM50.00.
- Bulletin 43** (1999). Papers from GEOSEA '98 (Ninth Regional Congress on Geology, Mineral and Energy Resources of Southeast Asia). 698 p. Edited by G.H. Teh. Price: RM70.00.
- Bulletin 44** (2000). A collection of papers from Annual Geological Conference 1999. Western Belt & Paleozoic of Peninsular Malaysia Seminar 1999 & others. 178 p. Edited by G.H. Teh. Price: RM30.00
- Bulletin 45** (2002). Annual Geological Conference 2002. Conference Issue. 375 p. Edited by G.H. Teh, Ismail Yusoff, Azman A. Ghani & T.F. Ng. Price: RM50.00.
- Bulletin 46** (2003). Annual Geological Conference 2003 Issue. 489 p. Edited by G.H. Teh, Alex Unya Ambun, Askury Abd. Kadir & T.F. Ng (out of stock)
- Bulletin 47** (2003). Petroleum Geology Conference & Exhibition 2002. 179 p. Edited by G.H. Teh. Price: RM30.00.
- Bulletin 48** (2004). Annual Geological Conference 2004 Issue. 130 p. Edited by Lee Chai Peng, Mohd. Shafeea Leman, J.J. Pereira & T.F. Ng. (out of stock)
- Bulletin 49** (2006). Collection of Geological Papers. 167 p. Edited by K.K. Liew, Nur Iskandar Taib & T.F. Ng. Price: RM30.00.
- Bulletin 50** (2007). Bibliography and Index of GSM Publications 1994 – 2004. 160 p. Compiled by Robert B. Tate. Price: RM30.00
- Bulletin 51** (2005). Annual Geological Conference 2005 Issue. 199 p. Edited by Nur Iskandar Taib. Price: RM30.00
- Bulletin 52** (2006). Collection of geological papers. 135 p. Edited by Nur Iskandar Taib. Price: RM30.00.
- Bulletin 53** (2007). Collection of geological papers. 128 p. Edited by T.F. Ng, Nur Iskandar Taib & Joy J. Pereira. Price: RM30.00.
- Bulletin 54** (2008). Collection of geological papers. 169 p. Edited by T.F. Ng, Nur Iskandar Taib & Samsudin Hj Taib. Price: RM30.00.
- Bulletin 55** (2009). Collection of geological papers. 100 p. Edited by T.F. Ng & Y.L. Lau. Price: RM30.00.
- Bulletin 56** (2010). Collection of geological papers. 132 p. Edited by Mohd Shafeea Leman, Basir Jasin, T.F. Ng & C.S. Lim. Price: RM30.00.
- Bulletin 57** (2011). Collection of geological papers. 84 p. Edited by T.F. Ng, R.L. Kugler, J.J. Pereira & Ibrahim Komoo. Price: RM30.00.
- Bulletin 58** (2012). Collection of geological papers. 96 p. Edited by T.F. Ng & M. Johansson. Price: RM30.00.
- Common Rocks of Malaysia (Colour Poster)**. Price: Member: RM8.00; Non-Member: RM10.00; Student: RM7.00.
- Proceedings of the Workshop on Stratigraphic Correlation of Thailand and Malaysia. Volume 1 Technical papers.** (1983) Jointly published by Geological Society of Thailand and Geological Society of Malaysia. 383 p. (out of stock)
- Proceedings Annual Geological Conference 2000.** 435 p. Edited by G.H. Teh, Joy J. Pereira and T.F. Ng. Price: RM60.00.
- Proceedings Annual Geological Conference 2001.** 320 p. Edited by G.H. Teh, Mohd. Shafeea Leman and T.F. Ng. Price: RM50.00.
- Geology of Borneo Island (2001) (CD, Map (2 sheets) and explanatory notes.** Compiled by Robert B. Tate. Price: RM60.00.
- Stratigraphic Lexicon of Malaysia** (2004). By Lee Chai Peng, Mohd. Shafeea Leman, Kamaludin Hassan, Bahari Md. Nasib & Roshidah Karim. 162 p. Price: RM30.00.
- Geological Evolution of Southeast Asia** (1996) Reprinted Edition. By C. S. Hutchison. 368 p. (out of stock)
- Geological Evolution of Southeast Asia** (2007) (Second Edition) by C. S. Hutchison. 433 p. Price: RM100.00; Student :RM50.00.
- Geology of Peninsular Malaysia (2009)** 479 p. Hardcover. Edited by C.S. Hutchison & D.N.K. Tan. Inclusive of Geological Map of Peninsular Malaysia. Price: Member RM150.00; Student Member RM70.00; Non-Member RM200.00
- Geological Map of Peninsular Malaysia (2008)**. Scale 1:1 000 000. Price: RM50.00; Student: RM20.00.
- Warta Geologi** (Newsletter of the Geological Society of Malaysia). Price: RM5.00 per issue from July 1966.

All prices quoted are not inclusive of postage. Please write in for details on postage. Allow 8-10 weeks for delivery. For orders, please write to the Society and you will be invoiced. Cheques, money orders and bank drafts must accompany all orders.

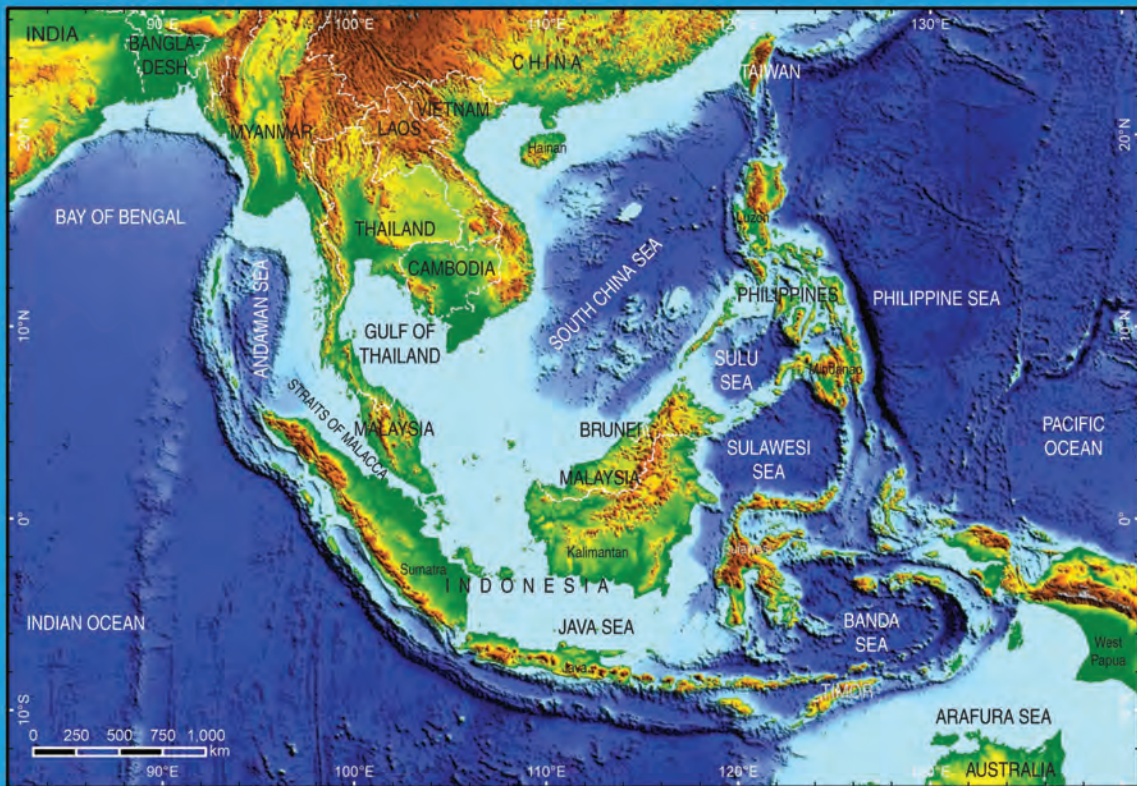
Orders should be addressed to:

Geological Society of Malaysia,
c/o Department of Geology,
University of Malaya,
50603 Kuala Lumpur, MALAYSIA
Tel: 603-79577036, Fax: 603-79563900
E-mail: geologicalsociety@gmail.com

Geological Evolution of South-East Asia

Second Edition

CHARLES S. HUTCHISON

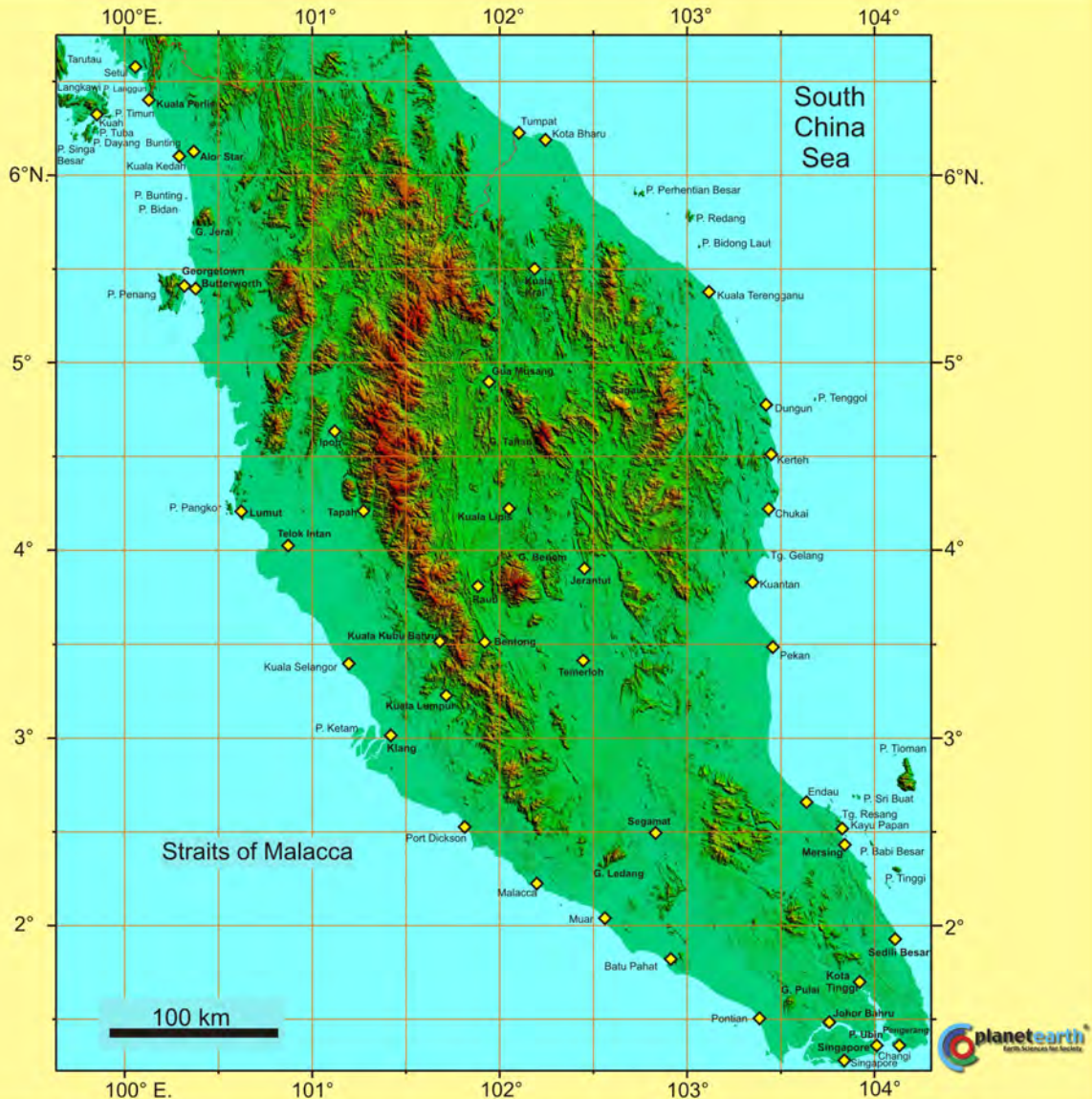


Geological Society of Malaysia
2007

Geological Evolution of South East Asia (2007) (Second Edition) by C.S. Hutchison
Price (excluding postage): RM100.00; Student : RM50.00
For Overseas mail order please send your enquiry to : geologicalsociety@gmail.com

GEOLOGY OF PENINSULAR MALAYSIA

Editors: C. S. Hutchison and D. N. K. Tan



Published by the University of Malaya and the Geological Society of Malaysia



Sponsored by Murphy Oil Corporation
and the University of Malaya



Geology of Peninsular Malaysia (2009) Edited by C.S. Hutchison & D.N.K. Tan.
Hardcover, 479 pages. Inclusive of Geological Map of Peninsular Malaysia, scale 1 000 000.
Price (excluding postage): Member RM150.00; Student Member RM70.00; Non-Member RM200.00
For overseas mail order please send your enquiry to : geologicalsociety@gmail.com

Geological Society of Malaysia Publications

GENERAL POLICY

Papers should be as concise as possible. They may include original results of basic, applied and policy research of national or international significance, current reviews, or discussions on techniques, research programs, organisations, information, or national and international policies in geoscience.

SUBMISSION OF PAPERS

Only papers that have not been published elsewhere will be considered for publication. Authors must agree not to publish elsewhere a paper submitted and accepted. All papers will be subjected to review by two or more reviewers. Authors wishing to include published and unmodified figures or text passages are required to obtain permission from the copyright owner(s). Authors of English papers are strongly urged to have their manuscript edited for language before submission by a person whose first language is English.

The Editor reserves the right to reject all or any part of the paper submitted. The Geological Society of Malaysia assumes no responsibility for statements made by authors.

Three (3) original copies of the paper should be submitted to:

The Editor,
Geological Society of Malaysia
c/o Department of Geology
University of Malaya
50603 Kuala Lumpur,
Malaysia
Tel: (603) 7957 7036
Fax: (603) 7956 3900
Email: geologicalsociety@gmail.com

MANUSCRIPT

The paper can be written in Bahasa Malaysia (Malay) or English. For English papers, use either British or American spelling but not a combination of both. The paper should be checked thoroughly for spelling and grammar. The manuscript must be printed at 1.5 spacing in a single column on one side of A4 paper. All pages should be numbered. Length of paper should be between 3,000 and 6,000 words for the *Bulletin* and between 2,000 and 3000 words for *Warta Geologi*, excluding tables and illustrations. Metric units should be used and all non-standard symbols, abbreviations and acronyms must be defined.

TITLE

Title must be informative and reflects the content of the paper. Title in Malay should include an English translation. It should be concise (less than 20 words). Avoid using abbreviation in the title.

AUTHOR'S ADDRESS

Addresses of all authors must be provided. The addresses should be sufficient for correspondence. Please include email address, telephone and fax of the corresponding author.

ABSTRACT

Abstract in both Malay and English, each in one paragraph and should not exceed 300 words. It should clearly identify the subject matter, results obtained, interpretations discussed and conclusions reached.

KEYWORDS

Please include 3 to 8 keywords that best describe the content of the paper.

REFERENCES

In the text, references should be cited by author and year and listed chronologically (e.g. Smith, 1964; Jones *et al.*, 1998; Smith & Tan, 2000). For both Malay and English paper, all references must be listed in English. Title of non-English articles should be translated to English.

The list of references should only include articles cited in the text. The list should be arranged in alphabetical order. Please ensure that the reference list is complete and the bibliographical details are accurate. The references should be in the following manner:

Journal article:

Suntharalingam, T., 1968. Upper Palaeozoic stratigraphy of the area west of Kampar, Perak. *Geol. Soc. Malaysia Bull.*, 1, 1-15.

Book:

Hutchison, C.S., 1989. *Geological Evolution of South-east Asia*. Clarendon Press, Oxford. 368 p.

Chapter of book and Symposium volume:

Hosking, K.F.G., 1973. Primary mineral deposits. In: Gobbett, D.J. and Hutchison, C.S. (Eds.), *Geology of the Malay Peninsular (West Malaysia and Singapore)*. Wiley-Interscience, New York, 335-390.

Article in Malay:

Lim, C.H. & Mohd. Shafeea Leman, 1994. The occurrence of Lambir Formation in Ulu Bok Syncline, North Sarawak. *Geol. Soc. Malaysia Bull.*, 35, 1-5. (in Malay with English abstract)

TABLES

All tables should be cited in the text and numbered consecutively. Tables should have a title and a legend explaining any abbreviation or symbol used. Each table must be printed on a separate piece of paper. Do not insert the tables within the text. Data in tables should be aligned using tab stops rather than spaces. Avoid excessive tabulation of data.

ILLUSTRATIONS

Please make sure that all illustrations are useful, necessary and of good quality. A maximum of ten (10) illustrations (photographs, graphs and diagrams) are allowed and these should be cited in the text and numbered consecutively as Figures. The papers are usually published in black-and-white but it may sometimes be possible to include colour figures at the author's expense. The scales for maps and photomicrographs should be drawn on the figure and not given as a magnification. Originals should not be greater than A4 size and annotations should be capable of being reduced down to 50 percent. The caption should be listed on a separate piece of paper. Do not insert the illustration within the text.

SUBMISSION OF ELECTRONIC FILES

Authors are required to submit electronic files together with three hardcopies of their papers. Submission should be made using CD-ROM. The CD-ROM should be accompanied with a listing of all files and the software (name and version) used. The file names should reflect the content of the files (e.g. Ali_Fig1.tif). Please make sure that the files and the hardcopies are the same.

PREFERRED SOFTWARE

Text: Microsoft Word. Please save in two versions, Word (.doc) and Rich Text Format (.rtf). Do not insert tables and illustration within the text.

Tables: Microsoft Word or Microsoft Excel. Please submit as separate files.

Illustrations – Vector Graphics: Adobe Illustrator (preferred), CorelDraw and Freehand. Final line thickness should be at least 0.5 point or 0.17 mm. For other software, please submit one copy in the native file format and export one copy as a PDF file with all fonts embedded and one copy as a high resolution TIFF or JPEG image.

Photographs or bitmap (raster) images: Adobe Photoshop. Please save as TIFF or PSD files. Save/scan line art at 600 to 1200 dpi and greyscale figures at 300 to 600 dpi. High resolution JPEG, TIFF or GIF files from other sources are also acceptable. The resolution must be high enough for printing at 300 dpi.

REPRINTS

Twenty five copies of each article published are supplied free of charge. Additional reprints are available at cost price provided that orders are placed prior to publication. Authors will also received a softcopy of the article published in .pdf format.

WARTA GEOLOGI PERSATUAN GEOLOGI MALAYSIA

Newsletter of the Geological Society of Malaysia

Jilid 39, No. 1 • Volume 39, No. 1 • January–March 2013

KANDUNGAN (CONTENTS)

CATATAN GEOLOGI (Geological Notes)

- FRANZ L KESSLER: The Batu Gading, Bukit Besungai Hollystone Quarry – Observations on an tectonically isolated carbonate sequence northeast of Long Lama, Sarawak 1

PERTEMUAN PERSATUAN (Meetings of the Society)

- PETROLEUM GEOSCIENCE CONFERENCE & EXHIBITION 2013 5
- Program 6
 - Welcoming Address 7
 - Opening Speech 9
 - PGCE 2013 Committees 11
 - Sponsors & Exhibitors 12
- TAN BOON KONG: Chairman's Lecture No. 18 – Slope Failures Associated with Water Tank and Reservoir Sites – Some Case Studies in the Kuching Area, Sarawak 20
- MOGANA SUNDARAM : Geological Structural Data Collection & Application in Rock Engineering 21
- AZUHAN MOHAMED: Listen, Listen, Listen, GROUNDWATER is definitely better 22

BERITA-BERITA PERSATUAN (News of the Society)

- National Geoscience Conference 2013 – First Circular 23
- Keahlian (Membership) 25

BERITA LAIN (Other News)

- Upcoming Events 26



Published by the GEOLOGICAL SOCIETY OF MALAYSIA
 Department of Geology, University of Malaya, 50603 Kuala Lumpur, MALAYSIA
 Tel: 603-7957 7036 Fax: 603-7956 3900 E-mail: geologicalsociety@gmail.com