Surface Geochemical Exploration for Oil & Gas

Reliably predict commercially viable reservoirs through integration of non-seismic hydrocarbon detection and seismic indicators

26th - 28th of January 2015 at KUALA LUMPUR, MALAYSIA

PetroSync Distinguished Instructor:
DR. DIETMAR “DEET” SCHUMACHER
Vice-President for Geoscience & Technology
E&P Services

More than 30 years of experience with international oil and gas exploration companies (Phillips Petroleum-US, Pennzoil-US, Terralliance) and more than 30 years in acquiring and interpreting surface geochemical data worldwide

Specialized in the exploration and development applications of petroleum geochemistry

In the last 30 years, he has acquired and interpreted surface geochemical data for hundreds of surveys conducted in North and South America, Europe, Africa, Middle East, Asia & Australia

Certified Petroleum Geologist (CPG-4301), American Association of Petroleum Geologists (AAPG), Canadian Society of Petroleum Geologists (CSPG), Member, EAGE - Member

Previous President of the Association of Petroleum Geochemical Explorationists (1993)

Previous President of the Houston Geological Society (1988-1989)

COURSE OBJECTIVES

- INTEGRATE the surface geochemical data from hydrocarbon detection surveys to value add to geologic and seismic exploration methods
- APPLY surface geochemical data to identify traps most likely to be charged with hydrocarbons
- GAIN understanding of hydrocarbon seepage and microseepage, as well as seepage characteristics, mechanisms and rates
- APPLY direct and indirect geochemical, remote sensing, and non-seismic geophysical methods available for hydrocarbon detection
- ANALYZE varied surface and near-surface expressions of hydrocarbon seepage and microseepage - geochemical, mineralogic, and geophysical
- EXECUTE proper survey design and survey method selection
- AVOID pitfalls in acquisition and interpretation of geochemical and non-seismic data

TARGET AUDIENCE

This course is specially designed for exploration and development geoscientists, E&P managers, and those who are in need of a comprehensive overview of these highly effective but under-utilized technologies.

- Geochemists / Geologists / Geoscientists
- Exploration Geologists / Geophysicists / Geoscientists
- Development Geologists / Geophysicists / Geoscientists
- E&P Managers, Exploration Advisors, Technology Specialists

*Knowledge on exploration geology is advised, but no prior experience on geochemistry is required in order to appreciate the program*
The great majority of oil and gas pools and mature source rocks have recognizable surface geochemical expression. The O&G industry devotes significant time and resources in finding and defining traps, but little or none in establishing the likely presence of hydrocarbon in those traps, especially for older onshore basins.

This program will cover surface geochemical and non-seismic detection of oil and gas, the variety of surface and near-surface methods for high-grade basins and plays, and the pre-drilling prediction of hydrocarbon charge. Explorationists will learn the techniques and methodologies that will help refine the economic evaluation of reservoirs before investing in to new plays. Explorationists will be able to learn how surface geochemical exploration methods can be complementary to existing seismic and geological methods. This will be tackled during the discussion sections on survey design, frontier basin evaluation, high grading leads and prospects, applications for field development, data interpretation and integration, and scores of exploration examples. The course is illustrated from a wide range of international basins and plays, structural and stratigraphic case studies, onshore and offshore examples, and also the application to shale-chalk plays. The methods that will be discussed in this course can help reliably predict 70%-80% of subsequent commercial discoveries, and about 90% of the eventual dry holes.

**CASE STUDIES include SEAsian Basins**

Among the examples presented and discussed will be from:
- Malaysia (Sarawak)
- Indonesia (Kalimantan, Natuna Sea, several Deep Water basins)
- Khorat Plateau (Laos & Thailand)
- Taiwan

**Case Histories Include:**
- Stratigraphic and Structural Traps
- Onshore and Offshore Examples
- Carbonate and Clastic Reservoirs
- Potential applications of hydrocarbon microseepage surveys to Unconventional Reservoirs, chiefly on Shale and Chalk source rocks.

Testimonials:

"Very well-delivered and very informative. In fact, it is educating for those who have no idea of Surface Geochem and how it can help in hydrocarbon exploration and evaluating prospects."
- Exploration Senior Geophysicist, Petronas

"I liked that the fundamentals of surface geochemistry are clearly defined and explained in the form of case studies. Recommended for both exploration and development teams including reservoir engineers."
- Geologist, Newfield

"I got to learn what to look for in relation of surface geochem when doing a prospect evaluation. The training organization was beautifully handled. Class is just nice for the instructor to focus on the questions thrown at him."
- Geoscientist, Petronas

Attendees will be receiving CDs of Dr. Dietmar’s AAPG Publications:
- “Hydrocarbon Migration & Its Near-Surface Expression”
- “Surface Exploration Case Histories”
The first day will introduce the basic concept of hydrocarbon seepage, the varied surface expressions of seepage, and the exploration implications of this seepage. Delegates will receive an overview of hydrocarbon detection methods, learn how to apply properly design a geochemical exploration survey, and see exploration case histories from onshore and offshore frontier basins and other underexplored areas.

Session 1: Hydrocarbon Seepage and Geochemical Exploration
- History
- Near Surface Expression of Hydrocarbon Migration (Onshore & Offshore)
- Implications for Exploration

Session 2: Overview of Hydrocarbon Detection Methods
- Microbial
- Geochemical
- Non-Seismic Geophysical

Session 3: Geochemical Survey Objectives & Design
- Geochemical Survey Objectives
- Designing Surveys, Survey Patterns, Sample Spacing
- Pitfalls to Avoid

Day 2 will review exploration case histories from worldwide basins and geologic settings, with emphasis on the successful use of hydrocarbon detection surveys to high-grade leads and prospects, and to aid in field development and production. Explorationists will also be able to learn about the interpretation guidelines, and the importance of integrating geochemical data with other exploration data. A class mapping exercise will be introduced which will allow attendees to practices the knowledge gained so far in the training.

Session 6: Exploration Case Histories
Evaluation of Exploration Leads and Prospects
Pre-Drill Prediction of Hydrocarbon Charge

Session 7: Exploration Case Histories
Applications for Field Development and Production

Session 8: Interpretation Guidelines
- Inferring Hydrocarbon Composition
- What constitutes a Geochemical “Anomaly”
- Recognizing and Defining Significant Microseepage Anomalies

Session 9: Integrating Geological, Geochemical, and Geophysical Data for Maximum Value
- Uncertainties and Limitations

Session 10: Introduction to Class Mapping
Participants will be given a data set from a surface geochemical survey and asked to map these data and interpret the results.
DAY 3

On the final day, the program will take a critical look at various hydrocarbon detection methods, both direct and indirect, and consider their relative advantages and disadvantages, and limitations. We will also review hydrocarbon microseepage models, mechanisms, and rates. Lastly and most importantly, we will consider how these hydrocarbon detection methods can be most effectively incorporated in a company’s exploration strategy. Application to the exploration of unconventional resources will also be covered.

Session 11: A Closer Look at Hydrocarbon Detection Methods
- Geochemical
- Non-Seismic Geophysical
- Microbiological
- Satellite Remote Sensing

Session 12: Hydrocarbon Seepage Mechanisms, Models, and Rates

Session 13: Corporate Exploration Strategies
- What is the OPTIMUM PLACE & TIME for Hydrocarbon Detection Surveys?

Session 15: Unconventional Exploration
- Applications to Shale Gas Exploration
- Shale Oil Development

Session 14: Discussion of Class Mapping Project

Final Remarks

Program Schedule

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<th>Time</th>
<th>Activity</th>
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<tr>
<td>08:00 – 09:00</td>
<td>Registration (Day1)</td>
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<tr>
<td>09:00 – 11:00</td>
<td>Session I</td>
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<tr>
<td>11:00 – 11:15</td>
<td>Refreshment &amp; Networking Session I</td>
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<td>11:15 – 13:00</td>
<td>Session II</td>
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<td>13:00 – 14:00</td>
<td>Lunch</td>
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<td>14:00 – 15:30</td>
<td>Session III</td>
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<tr>
<td>15:30 – 15:45</td>
<td>Refreshment &amp; Networking Session II</td>
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<tr>
<td>15:45 – 17:00</td>
<td>Session IV</td>
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<tr>
<td>17:00</td>
<td>End of Day</td>
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IN-HOUSE SOLUTIONS [SAVE COST • IMPROVE PERFORMANCE • REDUCE RISK]

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Dr. Schumacher is Vice President for Geosciences and Technology for E&P Field Services, a Paris and Malaysia-based company providing surface geochemical exploration surveys and other geological E&P services worldwide. Before joining E&P Services, Deet was the Director of Geochemistry (1997-2012) for Geo-Microbial Technologies, an international provider of surface geochemical and microbiological surveys.

He received his B.S. and M.S. degrees in Geology from the Univ. of Wisconsin (Madison) and his Ph.D. from the Univ. of Missouri (Columbia). Dr. Schumacher taught geology at the University of Arizona for 7 years before joining Phillips Petroleum in 1977. He held a variety of positions at Phillips, including Research Supervisor for petroleum geology and Senior Geological Specialist. Deet joined Pennzoil in 1982 and served as manager of geology/geochemistry before transferring to assignments with Pennzoil International, Pennzoil Offshore, and Pennzoil Technology Group. From 1994 thru 1996, Deet was a Research Professor with the Energy and Geosciences Institute at the University of Utah. He also served as Sr Director of Geophysics for Terralliance, a small California-based exploration and technology company (2006-2009).

Dr. Schumacher has a long-standing interest in the exploration and development applications of petroleum geochemistry, particularly geochemical and geomicrobiological exploration methods. In the past 30 years, he has been responsible for acquiring and interpreting surface geochemical data for hundreds of surveys conducted in North and South America, Europe, Africa, the Middle East, Australia, and in Southeast Asia including Malaysia (Sarawak), Indonesia (Sumatra, Kalimantan, Sulawesi, Natuna Sea), Thailand, Laos, Papua New Guinea, Pakistan, India, Taiwan, and China.

He has organized and taught an industry short course, Geochemical Exploration for Oil and Gas, for AAPG and other geological organizations and individual companies worldwide for more than 20 years. Schumacher has edited several significant volumes on petroleum exploration, including AAPG Memoir 66 (1996), “Hydrocarbon Migration and Its Near-Surface Expression”, and “Surface Exploration Case Histories”, published jointly by AAPG and SEG in 2002. He is currently working on a new book for the Society of Exploration Geophysicists titled “Non-Seismic Detection of Hydrocarbons: Methods, Applications, and Exploration Case histories.” Dr. Schumacher is a Certified Petroleum Geologist (CPG-4301), a member of the American Association of Petroleum Geologists (AAPG), the Canadian Society of Petroleum Geologists (CSPG), and the European Association of Geoscientists and Engineers (EAGE).
COURSE DETAILS

Title: SURFACE GEOCHEMICAL EXPLORATION
Date: 26th - 28th January 2015
Location: Kuala Lumpur, Malaysia

INVESTMENT PACKAGES

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<th>Investment Package</th>
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<tbody>
<tr>
<td>Standard Price</td>
<td>23 JAN 2015</td>
<td>SGD $ 3,995</td>
</tr>
<tr>
<td>Early Bird Offer</td>
<td>19 DEC 2015</td>
<td>SGD $ 3,795</td>
</tr>
<tr>
<td>Group Discount (3 or more Delegates)</td>
<td>23 JAN 2015</td>
<td>10% discount for groups of 3 registering from the same organization at the same time</td>
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Group Discount is based on Standard Price

* To enjoy the promotion & discount offer, payment must be made before deadline
* For 7 or more delegates, please inquire for more attractive package.
* Prices include lunches, refreshments and materials. Promotion & discount cannot be combined with other promotional offers.
* Important: Please note that registration without payment will incur a SGD 200 administration fee.

DELEGATES DETAILS

1st Delegate Name _____________________________ Mr □ Mrs □ Ms □ Dr □ Others □
Direct Line Number: ___________________________ Email: ___________________________
Job Title: ___________________________ Department: ___________________________
Head of Department: ___________________________

2nd Delegate Name _____________________________ Mr □ Mrs □ Ms □ Dr □ Others □
Direct Line Number: ___________________________ Email: ___________________________
Job Title: ___________________________ Department: ___________________________
Head of Department: ___________________________

3rd Delegate Name _____________________________ Mr □ Mrs □ Ms □ Dr □ Others □
Direct Line Number: ___________________________ Email: ___________________________
Job Title: ___________________________ Department: ___________________________
Head of Department: ___________________________

INVOICE DETAILS

Attention Invoice to: ___________________________
Direct Line Number: ___________________________ Fax: ___________________________
Company: ___________________________ Industry: ___________________________
Address: ___________________________ Postcode: ___________________________
Country: ___________________________ Email: ___________________________

Please note:
- Indicate if you have already registered by Phone □ Fax □ Email □ Web □
- If you have not received an acknowledgement before the training, please call us to confirm your booking.

PAYMENT METHODS

- By Credit Card : Please quote invoice number(s) on remittance advice
  PetroSync Global Pte Ltd Bank details:
  Account Name: PetroSync Global Pte Ltd
  Bank Name : DBS Bank Ltd
  Bank Code : 7171 • Bank Swift Code : DBSSSGSGXXX • Branch code : 288
  Account No. : SGD : 2889018980 • USD : 0288002682016

All bank charges to be borne by payer. Please ensure that PetroSync Global Pte Ltd receives the full invoiced amount.

Course Confirmation

I agree to PetroSync’s terms & conditions, payment terms and cancellation policy.

Authorized Signature : ___________________________

PAYMENT TERMS : Payment is due in full at the time of registration. Full payment is mandatory for event attendance.

DISCLAIMER
The information you provide will be safeguarded by PetroSync that may be used to keep you informed of relevant products and services. As an international group we may transfer your data on a global basis for the purpose indicated above. If you do not want us to share your information with other reputable companies, please tick this box □

CERTIFICATE OF ATTENDANCE

70% attendance is required for PetroSync’s Certificate of Attendance.

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