SPWLA - Houston Chapter News
January 2011

Houston Chapter Officers 2010-2011

Interim President/Vice President – Westside
ALEXANDER KOSTIN
BHP Billiton
1360 Post Oak Boulevard
Houston, TX 77056
Office: 713.599.6477
alexander.kostin@bhpbilliton.com

Vice President – Northside
ROB HENGEL
ResTech, Inc
4201 FM 1960 West, Suite 500
Houston, TX 77068
Office: 281.537.8300
rhengel@restechinc.com

Vice President - Downtown
RANDY MITCHELL
Hess
500 Dallas Street
Houston, TX 77002
Office: 713.609.4427
ramitchell@hess.com

Treasurer
PAUL CONNOLLY
EOG Resources
1111 Bagby
Houston, TX 77002
Office: 713.651.6700
paul_connolly@eogresources.com

Secretary
LOREN ROBERTS
Baker Hughes, Inc
2001 Rankin Road
Houston, TX 77073
Office: 713.966.3321
loren.roberts@bakerhughes.com

Editor
THAIMAR RAMIREZ
ConocoPhillips
600 N. Dairy Ashford
Houston, TX 77079
Office: 281.293.1781
ramirtr@conocophillips.com

Webmaster
MAYANK MALIK
Chevron
1400 Smith 43034
Houston, TX 77002
Office: 713.372.7571
mmalik@chevron.com

January 2011 Luncheon Meetings

Westside BP Plaza Terrace Room Wednesday, January 12, 2011	Novel Approach to Quantifying Deepwater Laminated Sequences Using Integrated Evaluation of LWD Real-Time Shear, Porosity, Azimuthal Density, and High Resolution Propagation Resistivity *by Katerina Yared, Baker Hughes*
Northside The Greenspoint Club Monday, January 10, 2011	Real-Time Monitoring and Control in Formation Testing Applications *by Hani Elshahawi, Shell*
Downtown Hess Office Wednesday, January 19, 2011	Assessment of Rock Quality Using the Effect of Mud-Filtrate Invasion on Resistivity Measurements: A Case Study of a Tight Gas Sand Field in Offshore Vietnam *by Jesus Salazar, ConocoPhillips*

SPWLA Houston Chapter Upcoming Events

Mark your calendars!

Spring Topical Conference

to be held April, 2011

More information will be available at our website soon!
http://www.spwla-houston.org/pages/events.htm

President's Corner

January 2011

Dear SPWLA Houston Members,

As it often happens in the oil industry, our Chapter President Jesús Salazar will be transferred out of the country in January 2011. We all wish Jesús good luck in his new assignment and meanwhile Alexander Kostin will take his post as the Chapter President.

December is the month of holiday shopping and vacations and traditionally instead of monthly meetings SPWLA Houston hosts the Annual Petrophysical Software Show and Exhibition. This year it was held for the 17th time on December 9th. As always, we had a great participation from more than 15 vendors and attracted many of our Chapter members for whom this event has become a traditional place to meet up with friends and former colleagues and see what's new on the petrophysical software market.

Traditionally as well, the Houston Chapter Board held the year-end meeting after the show. The main subject was the Spring Topical Conference that we are planning to hold at the end of April.

We will resume our monthly meetings on January 10th, so don't forget to check our web site for the announcements http://www.spwla-houston.org/index.shtm

Happy New Year everybody!

Alexander Kostin
Interim Houston Chapter President

Westside Luncheon Meeting

BP Plaza Terrace Room, **1st floor next to the cafeteria** 501 Westlake Park Boulevard, Houston, TX 77079 **Parking:** BP Plaza Garage **Lunch:** 11:30 **Talk:** 12:00 Wednesday, January 12, 2011	Novel Approach to Quantifying Deepwater Laminated Sequences Using Integrated Evaluation of LWD Real-Time Shear, Porosity, Azimuthal Density, and High Resolution Propagation Resistivity ***by Katerina Yared, Baker Hughes*** **RSVP Alexander Kostin before 3:00 p.m. Tuesday, January 11** westvp@spwla-houston.org

Abstract

Accurate reserve volume determination is crucial in the early stages of a project since planned subsurface capacity is dependent on reserve expectations. The fundamental method of calculating reserves uses bulk formation resistivity and bulk porosity to determine water saturation. This approach cannot accurately quantify reserves in laminated sand shale sequences where the sensor resolution is insufficient to characterize the fine laminae. A tensor petrophysical model can determine laminar shale volume and laminar sand fraction conductivities reducing the problem to a single dispersed shaly sand model. Combining this with sand fraction porosities can lead to accurate reserve quantification.

Identification and quantification of hydrocarbons within low contrast, low resistivity formations can be difficult when using conventional log data. This is primarily due to the presence of laminar shale and the inherent vertical resolution of conventional wireline and logging while drilling (LWD) acquired measurements.

A Gulf of Mexico deepwater example is used to demonstrate this novel approach in quantifying hydrocarbons in laminated sand shale sequences. Real-time shear slowness is used in conjunction with LWD triple-combo data to identify potentially productive low contrast reservoirs. Then, advanced post resistivity processing will extract the vertical component of resistivity, enabling calculation of sand fraction resistivity. Sand fraction resistivity, combined with normalized sand fraction porosity will yield sand fraction water saturation. Shale volume, porosity and water saturation cut-offs determine the net hydrocarbon volume. The LWD calculated hydrocarbon volumes in place will be compared to results obtained from a wireline logging suite.

This approach demonstrates that the use of conventional empirically derived bulk volume porosity and saturation methods in laminated sand shale sequence formations will result in underestimation of the reservoir producibility and hydrocarbon reserves. Vertical resistivity, derived from LWD acquired propagation resistivity and electrical anisotropy sensitivity, can be used to quantify reserves in these environments.

Biography

Katerina Yared received a Master's degree in Geology from the University of Aachen in Germany. She joined Baker as an LWD field hand working on onshore and offshore rigs. She moved to Houston in 2007 working in the global tech support team for Baker Hughes INTEQ as the subject matter expert for nuclear LWD tools. Later, she joined the Geoscience team focusing on acoustic, NMR, and geomechanics data processing and interpretation. Currently, she is a formation evaluation advisor for GoM and US land.

Northside Luncheon Meeting

The Greenspoint Club 16925 Northcase Drive, Houston, TX 77060 **Price:** $30 (with reservations) **Lunch:** 11:30 **Talk:** 12:00 Monday, January 10, 2011	Real-Time Monitoring and Control in Formation Testing Applications ***By Hani Elshahawi, Shell*** **RSVP Rob Hengel before 9:00 a.m. Monday, January 10** rhengel@restechinc.com

Abstract

Modern wireline formation testers are capable of providing a wide range of downhole rock and fluid properties at in-situ reservoir conditions and can help identify subtleties such as reservoir compartmentalization and compositional grading. Increasingly more massive and complex strings are being run to obtain a wealth of information under ever more challenging conditions. Even in developed reservoirs, unexpected circumstances arise, requiring immediate response and modifications to the pre-planned job procedures. Unexpectedly low or high mobilities, probe plugging, unanticipated fluid types, presence of multiple phases, and excessive fluid contamination are but a few examples of such circumstances that would require real-time decision making and procedural modifications.

Real-time decisions may include acquiring more pressure data points, extending sampling depths to several zones, extending or shortening sampling times, repeating micro-hydraulic fracture re-opening/closure cycles, real-time permeability interpretation, and determination of optimum flow/buildup durations. This presentation will use examples to illustrate why real time monitoring and control is a must to ensure that the critical formation testing objectives are met on any exploration, appraisal, or otherwise high profile project.

Biography

Hani Elshahawi leads FEAST, Shell's Fluid Evaluation and Sampling Technologies center of excellence, which is responsible for the planning, execution and analysis of global high profile formation testing and fluid sampling operations. Hani has over 20 years of experience in the oil industry and has worked in both service and operating companies in over 10 countries in Africa, Asia, and North America. He has held various positions in interpretation, consulting, operations, marketing, and product development. He holds several patents and has authored close to 100 technical papers in various areas of petroleum engineering and the geosciences. He has long been active with the SPE and the SPWLA and is the 2009-2010 President of the SPWLA and a distinguished lecturer for both in 2010-2011. His email is Elshahawi@gmail.com.

Downtown Luncheon Meeting

Hess Conference Center **Room 1B/1C, ground floor** 500 Dallas Street Houston, TX 77002 **Lunch:** 11:30 **Talk:** 12:00 Wednesday, January 19, 2011	Assessment of Rock Quality Using the Effect of Mud-Filtrate Invasion on Resistivity Measurements: A Case Study of a Tight Gas Sand Field in Offshore Vietnam* ***by Jesus Salazar, ConocoPhillips*** **RSVP Randy Mitchell before 3:00 p.m. Tuesday, January 18** ramitchell@hess.com

Abstract

Estimation of rock quality in tight sands remains an outstanding issue in reservoir characterization. This paper shows the simulation of time-dependent resistivity measurements acquired during mud-filtrate invasion (dynamic modeling) to assess rock quality in a field located in the CuuLong Basin, offshore Vietnam. Four exploration wells were drilled with synthetic oil-base mud (SOBM) penetrating Oligocene tight-gas/condensate sands. Array-induction resistivity measurements from the discovery well and the three delineation wells produced conflicting invasion profiles. Resistivity measurements observed in the discovery well showed a conductive invasion profile, while resistive profiles were observed in the appraisal wells. Such resistivity response in the discovery well seemed anomalous since there is no obvious movable water in the formation of interest.

Forward resistivity modeling and inversion, calibrated to rock and fluid properties, were used to determine if the difference in resistivity profiles was due to tool error, or if it was an indication of reservoir quality. Core and PVT measurements were used to calibrate a log-based petrophysical model necessary to simulate the physics of fluid-flow mud-filtrate invasion. The dynamic process of mud-filtrate invasion was simulated with a multi-component formulation for the oil phase (SOBM and reservoir hydrocarbons). We assumed that hydrocarbon components are first-contact miscible and that water and surfactants form an emulsion with the SOBM invading a partially gas-saturated formation. Simulated array-induction resistivity measurements were compared to field logs and the model rock and mud properties were modified to secure a close agreement between simulated logs and field logs.

This work shows that in the discovery well the presence of surfactants in the mud induces a contrast of hydrocarbon viscosity that creates a water bank which is pushed into the formation. This effect creates a conductive annulus in the near-wellbore region. It further indicates that the deep invasion and high resistivity from the deepest-sensing resistivity measurements is due to excellent rock quality (large pore throats, low capillary pressure, etc) that is typical of a conventional sand reservoir. In contrast the shallow invasion and resistive profiles observed in the three delineation wells suggest a tight-gas sand reservoir. These results will control the definition of petro-facies in the field, and thus affect the location and number of future development wells.

Biography

Jesús M. Salazar has been a Petrophysicist with ConocoPhillips since 2008. He works in their Subsurface Technology Team in Houston, TX, where he is involved in a number of domestic and international reservoir characterization projects. Prior to joining ConocoPhillips, Jesús worked five years for PDVSA in Venezuela as a Petrophysicist and Reservoir Development Engineer and five years for the Center for Petroleum Engineering at the University of Texas, in Austin, TX as a research assistant. Jesús also worked for Occidental Oil and Gas as a summer intern, in Bakersfield, CA and Houston, TX. He received a Ph.D. and M.S. in Petroleum Engineering from The University of Texas at Austin and a B.S. in Physics with honors from Universidad Central de Venezuela. Jesús is interested in formation evaluation, inverse problems, and near-wellbore fluid-flow simulation. He is a technical reviewer for the *SPE Journal*, *SPERE&E*, and *Geophysics* and received an award for the best paper published in *Petrophysics* in 2006. Jesús was elected President of the SPWLA Houston Chapter in 2010.

* Originally presented at the SPWLA 51st Annual Logging Symposium, June 19-23, 2010 in Perth, Australia, Paper Z.