

From Ibe Ezisi,

On behalf of the Society of Petrophysicists and Well Log Analysts (SPWLA) Texas Tech University (TTU) chapter, I'd like to draw your attention to a very exciting event next month that will be hosted by TTU SPWLA. We're hosting a 2-day short course on Carbonate Petrophysics/Well Log Analysis and Cased Hole/Production Logging Analysis on April 13 and 14. These courses will be taught by 2 renowned Petrophysicists; George Asquith and Richard M. Bateman.

Please see the attachments for more detail. We want members of the North Texas Geological Society and beyond to take advantage of this rare and great opportunity to learn from these two legendary Petrophysicists. Just for emphasis, the Day 2 course on Cased-hole/production logging is rarely offered or taught in these quarters and should be very attractive to completion/Production/Reservoir engineers.

To make a reservation at Staybridge suites, please call (806) 765-8900. Tell them you're making a reservation for a block and mention SPWLA. You will get the state rate of \$89/night.

Let me know if you have any questions/clarifications.

Thank you.
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Carbonate Well Log Analysis: Dr. George B. Asquith

"If you only take 2 petrophysics courses in your entire career, this is it! Do not miss this once in a lifetime opportunity to learn from 2 legendary Petrophysicists in the oil & gas industry!!!

TTU SPWLA 2-day Industry short course

Date: Friday, April 13 & 14, 2018. Please bring your laptops!

Venue: Texas Tech University, Lubbock, Texas

Fee: 2-day attendance (\$400). 1-day attendance for any day (\$250). Fee includes breakfast and lunch as well as all class materials needed. We accept cash, check or card. Contact SPWLA President, Ibe Ezisi, ibe.ezisi@ttu.edu, (806) 445-2515 for registration and payment.

Day 1 (April 13): Carbonate Well Log Analysis – 8:00 am to 5:00 pm

Instructor: Dr. George Asquith

Day 2 (April 14): Cased-Hole Well Analysis – 8:00 am to 5:00 pm

Instructor: Richard M. Bateman

Only 50 spots available, so act fast! STAYBRIDGE SUITES (0.7 miles from Texas Tech) is offering State discounted rates (\$89/night) for all attendees!!!

April 13, 2018

This one-day course in carbonate well log analysis is built around a flow chart for Carbonate Well Log Analysis. This course will begin with a review of carbonate pore types plus a review of some basic principles of log interpretation including:

1. Hydrocarbon versus wet resistivity invasion profiles
2. Archie and Ratio water saturations
3. Moveable hydrocarbon index (S_w/S_{xo})
4. Bulk volume water (BVW)

The carbonate flow chart is designed so that the user can determine both carbonate pore type or types and if the carbonate is water-wet or oil-wet using comparisons of neutron-density (Φ_{nd}) to sonic (Φ_{sonic}) and resistivity (Φ_{rxo}) porosities plus comparison of Archie ($a=1, m=n=2$) and Ratio water saturations.

Next on the flow chart, the moveable hydrocarbon index (S_w/S_{xo}) and bulk volume water (BVW) values are used to determine if the carbonate reservoir is hydrocarbon or water productive. The final steps on the flow chart after pore type, potential production, and water-wet vs oil-wet have been determined, are the additional techniques that are used in the final analysis. These include:

- I. S_w determination in bimodal micro-porosity carbonates
- II. Cementation exponent (m) and S_w in low porosity (<6%) carbonates
- III. S_w determination in vuggy carbonates
- IV. S_w determination in oil-wet carbonates

Additional methods used in carbonate log analysis include:

- a) The DEW plot (R_t/R_w vs R_{xo}/R_{mf}) used to verify pore type and productive potential determined from the flow chart
- b) Maximum Producing Oil Index [$Y=(R_{mf}/R_{xo})^{0.5}-(R_w/R_t)^{0.5}$] used to determine mobile OOIP from resistivity logs
- c) Determination of porosity cut-offs using porosity vs cumulative porosity-foot cross plots

Fifteen case studies/problems are presented for the user to apply the flow chart. Using the flow chart along with the calculated porosities, $S_w(\text{archie})$, BVW, $S_w(\text{ratio})$, and S_w/S_{xo} , the following questions are presented to the user:

1. Pore type or types
2. Water-wet or oil-wet
3. Hydrocarbon, water-cut hydrocarbons or water productive.

The results are provided for each of the case studies.