SPWLA Webinars:
Introduction to Basic Well Log Analysis
A webinar series for everyone else

Instructor: Dr. Dan Krygowski, The Discovery Group
Dates: Six consecutive Thursdays; April 26, May 03, 10, 17, 24, 31
Time: 8:00am to 9:30am CST (1:00pm to 2:30pm UTC)
Session length: 90 minutes for each of the 6 sessions
Cost: see www.SPWLA .org for details

The Society of Petrophysicists and Well Log Analysts (SPWLA) is pleased to offer a 6-part webinar series, *Introduction to Basic Well Log Analysis, f*or non-petrophysicist and beginners in petrophysics and well log analysis. The goal of the sessions is to present petrophysical technology to those who have been exposed to petrophysical data and results, or to those who use those data and results, but who haven't studied the entire range of common openhole measurements.

The six webinars will introduce non-petrophysicists to the basics of acquiring and interpreting well log data in the context of a generic petrophysical workflow, rather than by the physics of the measurements. We'll do that introduction with a very minimum of physics (no triple integrals or matrix algebra), and with as few equations as possible. The results of the workflow will provide basic information from the openhole data: porosity, lithology, fluid content, and will point toward other information derived from those measurements, such as mechanical properties, acoustic properties, permeability, brittleness, fractures, and others. Given the time allotted, the information covered will be a very small part of petrophysical technology but should provide a strong base on which to build more information.

If you are someone who could benefit from a coherent high-level view of petrophysics presented over a short period of time, or know of someone who might benefit, please consider attending or recommending this webinar series.

Webinar session details:

Webinar 1: The openhole acquisition environment

> We consider the subsurface environment in which petrophysical measurements are made, both by wireline and logging-while-drilling (LWD) methods, and how borehole conditions, including fluids, affect the measurements, and sometimes limit the measurements that can be made. This session sets the stage for a closer look at the measurements in the context of our workflow.

Webinar 2: Correlation/Reservoir measurements

> This group of measurements: gamma ray, spontaneous potential (SP), caliper, and tension, help us determine the intervals of interest to us in what is usually a very long interval which is often of little value. The measurements also provide parameters for calculations later in the workflow which determine properties such as effective porosity from total porosity, and amount of total organic carbon in place.

Webinar 3: Porosity/Lithology measurements, individually

> This group of measurements: acoustic slowness, bulk density, and neutron porosity, indirectly determine formation porosity. We'll consider the methods used to go from the measurements

> to porosity, what parameters are needed with those methods, and the geological significance of those parameters

Webinar 4: Porosity/Lithology measurements, in concert

> This session adds another measurement, photoelectric effect (from the "density" log) to the three measurements exposed in the last session, and how the four measurements can be used in pairs and triads to improve our estimate of porosity and to predict one- to three-component lithologies.

Webinar 5: Resistivity measurements and fluids

> This group of resistivity measurements: Induction Logs, Laterologs, and Electric Logs, are the last that we need to determine fluid saturation. We'll consider the concepts involved in resistivity, and address how and where resistivity is measured.

> We'll briefly consider Archie's saturation equation as a lead-in to the methods, numerical and graphical, that are used to determine saturations.

Webinar 6: Completing the workflow: formation fluids

> In this final session we look at the final steps in the workflow; determining formation fluid content through the addition of resistivity measurements to our previous measurements.

> We'll consider pattern recognition (graphical) techniques which were developed to determine saturations without calculations, and which are now used to determine calculation parameters in the equations that we previously avoided.

> One goal of this last session is to entice you to spend a week becoming immersed in petrophysics, but again only in the basics.

If after attending this series people are interested in more acquisition and interpretation details (but still at an introductory level), a 5-day course will be offered by the SPWLA:

> *Basic Well Log Analysis*

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> | Instructors: | Dr. George Asquith, Texas Tech University |
> | | Dr. Dan Krygowski, The Discovery Group |
> | | Dr. Rick Lewis, Schlumberger |
> | Dates: | August 6-10, 2018 |
> | Location: | SPWLA Millard Training Center, Houston Texas USA |

Until 2016, *Basic Well Log Analysis* was taught through the AAPG continuously for 30 years, changing to accommodate the introduction of new measurements and the enhancements to their interpretation as exploration and production targets expanded. The instructors look forward to the exchange of petrophysical information with the class participants under SPWLA sponsorship.

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About the instructor:

Dan Krygowski is a Senior Petrophysical Advisor with The Discovery Group, which he joined in late 2006. He has over 35 years of experience in the art and science of petrophysics, and in the development and design of petrophysical software. Dan earned a B.A. in Physics from the State University of New York at Geneseo. After earning M.S. and Ph.D. degrees in geophysics from the Colorado School of Mines (with a focus on petrophysics), he joined Cities Service Company, and worked in Denver and Tulsa. After Citco, he joined Atlantic Richfield Company (ARCO). In both companies he gained experience in a variety of geologic and geographic areas in both technical and management positions in petrophysics.

After ARCO, he joined Landmark Graphics, and was a member of the PetroWorks development team as the team's petrophysical Subject Matter Expert. He was also involved in interface design, and development of documentation and training materials. When Landmark closed its Austin, Texas office, Dan joined Chevron, working in deep Gulf of Mexico and Chad, Africa projects. He also supported internal petrophysical training efforts.

Dan is a member of the Society of Petrophysicists and Well Log Analysts (SPWLA), American Association of Petroleum Geologists (AAPG), Society of Petroleum Engineers (SPE), Society of Exploration Geophysicists (SEG), the Denver Well Logging Society (DWLS), and the Rocky Mountain Association of Geologists (RMAG).

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