SPWLA France Chapter Lunch and Learn
Martin Storey and Paul Spooner

The SPWLA France chapter is inviting you to attend an information packed L&L (SPWLA GoToWebinar) given by

Martin Storey – "Log Quality Control, easy as 1-2-3!" ; SPWLA Distinguished lecturer

and Paul Spooner – "Lifting the Fog of Confusion Surrounding Deterministic Petrophysics".

On Friday June 19 2020 : 12:00 pm – 1:00 pm CEST

Speaker Bio:

Martin Storey is an independent practicing Petrophysicist with over 25 years of industry experience, of which over 20 in the Asia-Pacific region. His academic background in mathematics makes him passionate about clear and rigorous work, and he learned during his early career in the field, to focus on practicality. He is based in Perth, Western Australia, from where he runs Well Data QA, "helping organisations increase the value of their well data while lowering costs of acquisition and exploitation".

Speaker Abstract :

Martin Storey: Log Quality Control, easy as 1-2-3!

LQC... All would agree that bad data should not be let into the organization's systems and its decision-making processes, yet there are no industry standard methods on how best to assure this for well log data. Electric well logs are the principal data sets for all geotechnical personnel in this industry: logs generally constitute the main continuous and relatively high-resolution records describing a wellbore, and they are available over the main depth intervals of most wells drilled for hydrocarbon exploration and production.

The specialized contractor companies that acquire the logs have quality management systems in place to ensure compliance and consistency with their own specifications. The data deliverables are therefore subject to some quality control before delivery to the operating companies, although it is of a general nature and focused on the acquired data, rather than on their future exploitation.

On delivery, the responsibility for any post-acquisition quality control of the well logs frequently falls on inadequately trained and supervised geotechnical persons, who may skim over it on account of its being "too hard" or "too urgent". People responsible for log quality control frequently report that they find it "difficult" or "overwhelming" and that they "don't know where to start". Subject matter experts themselves know that logs must always be checked and perhaps conditioned before they can be used. Yet few of them have simultaneously the knowledge, the experience, the reference information, the tools and the time to verify the fitness-for-purpose of the data methodically and confidently. This systematic requirement is costly for organizations, and its uncertainty exposes them to unnecessary risks. The situation is exacerbated by concurrent increases in the variety, volume and complexity of the log data and in their rates of change.

There must be a better way to assure log data quality and readiness for exploitation. A framework is proposed to formalize and simplify log quality control in operating companies and other data-user organizations.

Speaker Bio:

Paul Spooner has over 30 years industry experience. The first 10 years as a Wireline Engineer, followed by 10 years in a Geoscience Centre, which Paul managed for the latter 6 years. Paul then worked as a Principal Petrophysicist on many complex, integrated projects within the LR Consultancy group, formerly Senergy and Production Geoscience Ltd, before joining LR Software where he has been IP Product Champion for several years, providing support, training and helping with the development of the IP software product. Recently Paul helped with the development and delivery of the Petrophysics and Formation Evaluation MSc course at Aberdeen University.

Speaker Abstract :

Paul Spooner: Lifting the Fog of Confusion Surrounding Deterministic Petrophysics

Clay:

Consideration of the distinction between rocks and minerals is of vital importance in the petrophysical task of determining porosity and hence, water saturation. Given the significance of this task it is surprising how much confusion there is across the industry over this issue. The confusion between clay and shale is the most common, to the extent that many books, papers, training courses and software products still do not differentiate, or explain these clearly or correctly. Shale is a rock, typically defined as an indurated, finely laminated, sedimentary rock, composed primarily of clay, mud and silt. The important feature to note is that this definition does not describe the mineralogy but rather the grain size. In this definition, clay refers to clay sized particles, i.e. < 1/256 mm. Whilst clay can refer to grain size it can also refer to clay minerals, and it is the dual meaning of the word clay that is at the heart of the confusion in the industry. Clay minerals are a group of hydrous aluminium silicates with a sheet-like structure (phyllosilicates), which adsorb water on their surfaces. It is these clay minerals that we are concerned about when determining porosity and water saturation.

Porosity:

There are many definitions of effective porosity in the industry, for example there are six in Wikipedia. An appreciation of these different definitions is fundamental to petrophysics because volumetric results might be generated using one definition while the end-user of those results, maybe a Reservoir Engineer, might assume it was something else. Obviously, this can lead to considerable confusion and significant uncertainty in the STOIIP. It would be reasonable to expect consistent definitions of total and effective porosity across all petrophysical workflows, for example. in both deterministic and non-deterministic workflows. However, this is often not the case, for several reasons:

1. deterministic methods often use Vshale while non-deterministic methods normally use a mineral model and so use Vclay
2. the user may not be clear which definition were used in their interpretations
3. some software products use different definitions between methodologies.

One methodology is detailed that is volumetrically consistent regarding total and effective porosity, and that can be implemented in terms of Vclay or Vshale. This methodology is not new or novel, it has been in use within the industry in one shape or another for several decades, but it is often misunderstood as it solves effective porosity before total porosity.