The Use of XRF as a Petrophysical Tool in Exploration and Development

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Summary

This presentation will outline methodologies used to model the various Petrophysical and Geological properties. Elements associated with the identification of anoxic conditions, bigenic vs terrigenous quartz and even maximum flooding/regressive surfaces will be discussed with field examples.

Introduction

An X-ray fluorescence (XRF) spectrometer is an x-ray instrument used for routine, relatively non-destructive chemical analyses of rocks, minerals, sediments and fluids. It is one of the simplest, most accurate and most economic analytical methods for the determination of the chemical composition of many types of materials. Currently available in hand-held, portable and lab benchtop models, they have proved their use in the field.

Theory and/or Method

At Nexen, we have complemented our in-house core facility with XRF analyzers. We are currently using the XRF measurements in our Horn River Shale gas development project and in Colombia Unconventional Exploration program. In the Horn River, the XRF is being used to accurately access mineralogy, organic content and mechanical properties of the rock from drill cuttings. In the horizontal development wells, mineralogy, TOC, Poissions Ratio and Youngs Modulus are used in the frac program design. In Colombia, XRF measurements have been run on samples from different Cretaceous outcrop units to identify the major and trace elements associated with the anoxic/oxic environments, to model TOC levels, provide mineralogy, identify zones of biogenic silica in shales and provide information about transgressive-regressive cycles. These outcrop measurements have been used while drilling exploration wells in real time to identify potential sweet spots, coring points, formation tops and to follow the lithology and formations while drilling.

Examples

The examples should support your ideas.

Conclusions

Definitive conclusions are made and supported by your data and convincing arguments.

Acknowledgements

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References

Reference Style (use Arial 9pt normal)

Larry, S. M., Curly, H., and Moe, W. W., 1955, Prestidigitation, strabismic filtering and ocular violations in the San Andreas strike slip fault zone: Geophysics, **24**, 338-342.