

Applications of Portable XRF, Chemical Stratigraphy and SEM in the Horn River Basin

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Abstract

The Horn River shale sequence is thick and heterogeneous in composition. In order to achieve a profitable well, horizontal legs must remain within organic rich shale intervals exhibiting rock properties conducive to hydraulic fracturing. The nature of organic rich shale can make it difficult to recognize compositional changes through the conventional techniques of binary microscopy and natural gamma measurements. The introduction of portable XRF (x-ray fluorescence) instruments gives us the ability to quickly and accurately view compositional changes by creating chemical stratigraphy logs. Through SEM (scanning electron microscope) study of drill cuttings from a variety of chemical zones the fabrics and rock properties related to specific chemical compositions are inferred. The XRF instruments also make it possible to create logs during drilling operations and effectively steer horizontal legs into zones which will yield greater production.