Shale Volume Determination in Athabasca Oilsands Core: Comparing Images, Logs, and Sample Analysis.

Graham Spray

Agat Laboratories Ltd.

Abstract

Estimating the changing volume of shale (V-Shale or V_{Sh}) and clay (V-Clay or V_{cl}) through a formation is often a useful and important early step in the petrophysical and geological evaluation of a potential reservoir. There are a wide range of techniques available to suit an equally wide range of lithologic settings and resource types. However, all must be applied with a degree of geological, geophysical, and petrophysical awareness and context in order to extract meaningful information.

V-Shale derived from Image Analysis (e.g. pixel coloration) has been deployed by several operators and service providers, and in the last few years has been applied to core images from the Athabasca oilsands deposits. To execute a more reliable V-Shale from Image calculation, geologic context and understanding is essential. AGAT has developed a V-Shale from Image tool, as part of our ACES core description application, which simplifies the calibration of the Image Analysis using lithologic cues.

In this presentation we will – from a geologist's perspective – review the application and definitions of V-Shale and V-Clay, and compare V-Shale methods when applied to wells in the Athabasca oilsands. In particular we will compare some of the commonly applied geophysical and petrophysical techniques to V-Shale from image analysis and laboratory particle size analysis data. We hope to evaluate the effectiveness of the various techniques in the general context of the oilsands, and further, to examine related uses of the technologies and methods involved (such as interpreting pay volume, oil saturation, vuggy porosity in carbonates, etc.).