



SpecCam Mineral Logging

Example 6: Plug & Sidewall Core Analyses

Rapid, continuous mineral logging at well-site, laboratory or core store

SpecCam imaging infrared spectroscopy is a non-destructive technique that can be used to measure any rock surface. The only requirement is that it is water-dry and the surface is moderately clean. No other sample preparation is required.

With plugs and sidewall cores we measure both ends and around the cylindrical surface, effectively unwrapping it to obtain full coverage of all exposed surfaces.

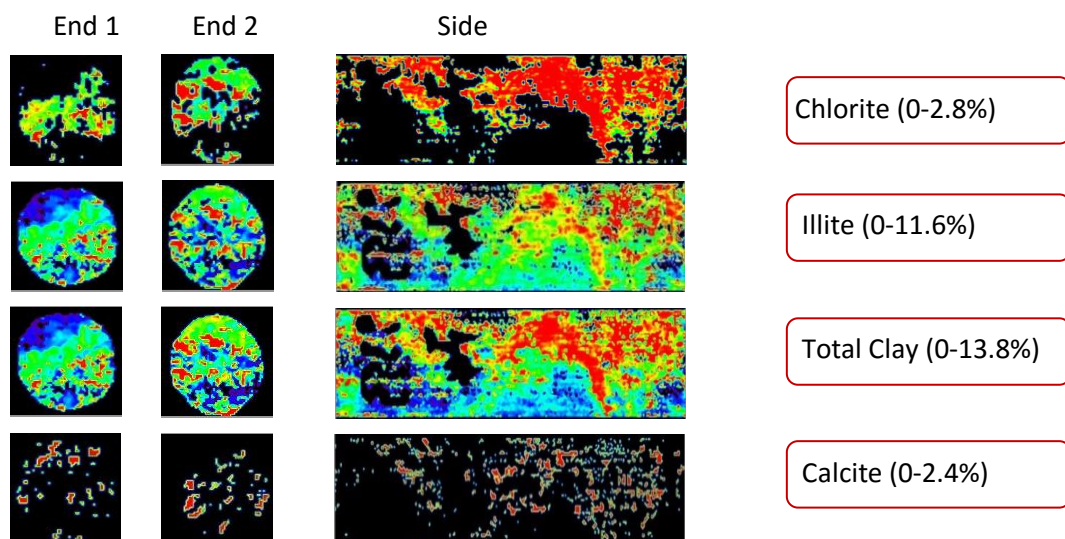
By comparing each end, and any apparent gradient in the oil content and composition, it is often possible to see the extent of mud invasion as well as map the heterogeneity of the sample.

Example 1): Core Plugs, UK Central North Sea, Block 21, Durward Field – Fulmar sands reservoir.

The client wished to quantify the clays and carbonates and better understand the clay compositions, in order to quantify the clay-bound water more effectively. The scanning was completed prior to extraction of the fluids, so the amount and distribution of hydrocarbons could be measured.



Selected SpecCam Mineral Maps for one plug



Example 2): Sidewall Cores, UK North Sea.

The samples varied from heavily broken up to complete; some were water or oil wet, others appeared entirely dry.

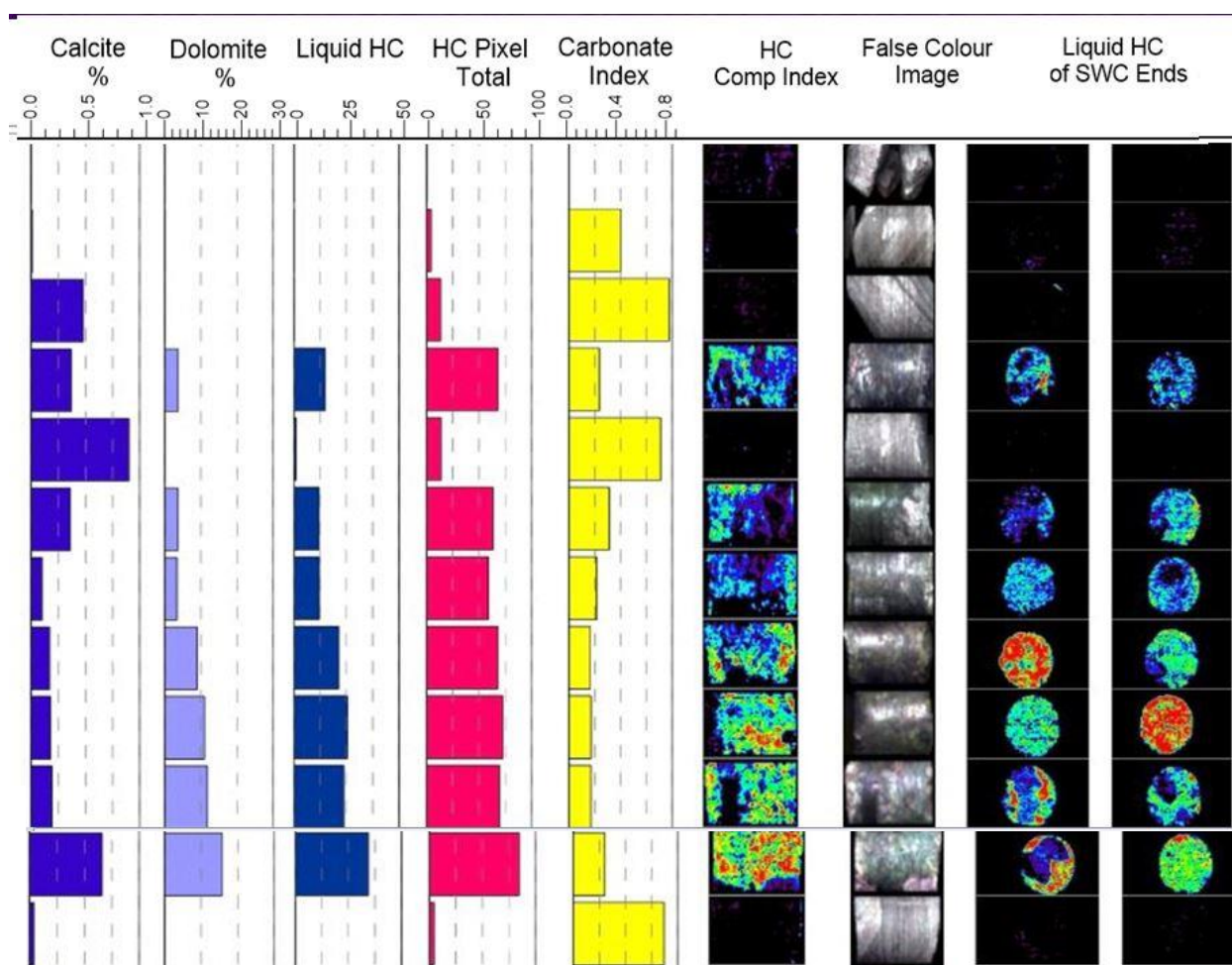


The client wanted to better understand clay types and mineralogy, map the distribution of any oil, and identify whether the oil was formation oil or OBM (oil based mud). An additional desire was to see whether the clay mineralogies could explain the high gamma response.

Unfortunately it was not known which end of each plug was from the wellbore wall and which was deeper into the formation.

In order to discriminate the oils, samples of formation oil and OBM were measured.

Typically OBM is very different due to the presence of additives. It may also have different spectral features due to the greater variety of hydrocarbons in the formation oil.



Results show the heterogeneity of the cores and the corresponding distribution of oils. The oil spectra were all similar to the OBM and the evidence indicated that OBM invasion was responsible for all of the oil identified. Analysis of the clay mineral polytypes was able to identify the K-rich clays that might influence the gamma log, it was clear these were not present in sufficient quantity to explain the high gamma values.