

Inorganic Real-Time Field Geochemistry Analysis on Cuttings

GeoROX provides detailed chemical and mineralogy rock characterization on drill cuttings and core chips. A combination of X-Ray Fluorescence (XRF) analysis and X-Ray Diffraction (XRD) measurements are obtained in near real-time at the well site. All key chemical, mineralogy, and geomechanical information are delivered within 1-2 hours of drilling through a formation.



Benefits

- Mineral Brittleness evaluation for planning hydraulic stimulation
- Chemostratigraphic models used for picking casing and core points
- Carbonate XRD identification even with PDC drilled cuttings
- Replace downhole elemental spectroscopy and spectral gamma ray
- Obtaining geochemical data in near real-time, compared to delayed lab results
- Understanding diagenetic changes and depositional history
- Aiding horizontal well placement and trajectory via chemosteering
- Validate wireline interpretation models with ground truth cuttings measurements

Challenges and Solutions

A combination of long wait times for lab results and the costs associated with them can slow down exploration and development phases of a program.

GeoROX on-site geochemical analysis provides an ideal solution to these problems. Examining drill cutting samples at the wellsite enables operators to make time-sensitive decisions such as choosing correct casing points and coring intervals. This powerful information coupled with GeoSource service combine to create a full geochemical analysis solution onsite.

Deploying GeoROX service using fit for purpose equipment that is capable of measuring the chemical elements and mineralogy at the well site allows immediate results. Analysis can be used to make critical decisions for landing horizontal wells.

Applications

GeoROX is suitable for exploration, appraisal, and development projects where having early geochemical data is used for evaluation and rapid decision making. The service can be deployed as a complete standalone solution to mud logging services or integrated with other GEOLOG services.

GeoROX is ideal for unconventional plays, however it has proven to be very effective in all reservoir types where geochemistry can aid in formation evaluation.

Applicable for all drilling environments from remote land operations to ultra-deepwater, and not affected by any specific drilling techniques.

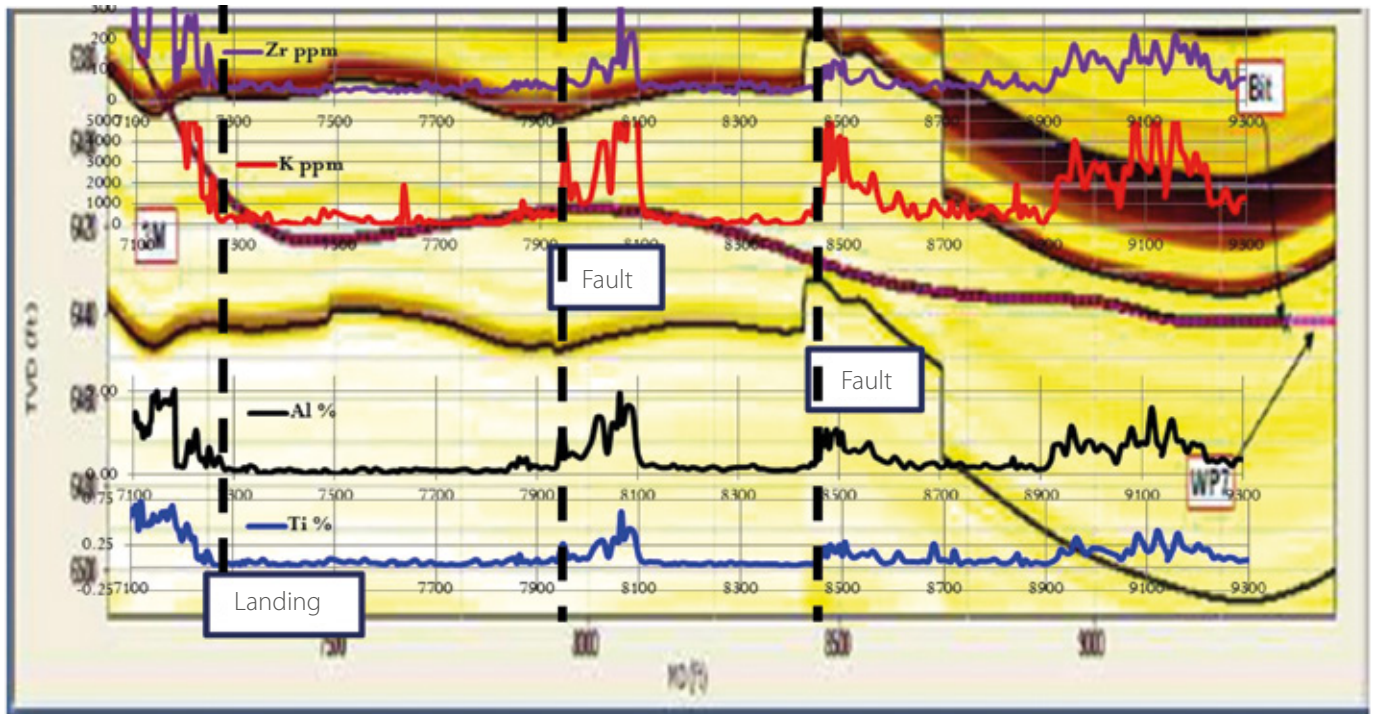


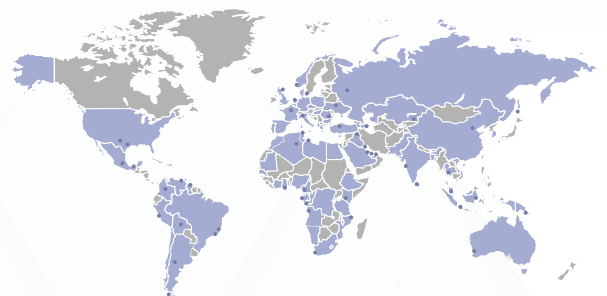
Figure 1. The horizontal plot highlights the elemental signatures used to identify the fault zones.

In this example, GeoROX was utilized to help geosteer a well through a relatively homogeneous sandstone sequence. The presence of faults dislocated the target, and the identification of specific chemical markers with GeoROX helped not only to identify the faulted zones but also aided in isolating them in the production string to optimize overall production.

Specifications

GeoROX	XRF	XRD
Measurements	Configurable for 25 Elements between Mg and Uranium	Mineralogy
Min sample size	15mg	15mg
Analysis Time	5-10min	60 min

GEOLOG around the World



Technical Paper References



Innovative Geosteering Technology Utilized in Drilling Smart Multi-lateral Wells, Kuwait. OTC 24002 (Offshore Technology Conference, Houston, May 2013, Kuwait Oil Company)