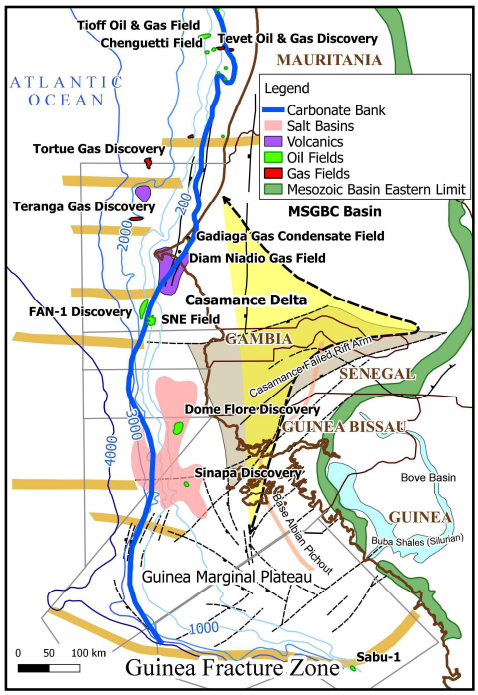
THE PETROLEUM GEOLOGY & GEOCHEMISTRY OF OFFSHORE / NEARSHORE SENEGAL

This report was prepared by **First Exchange Corporation** (FEC) in 2016 to further understanding of the geological setting of 2014 Cairn Group's SNE and FAN oil discoveries in southern Senegal and Kosmos' subsequently found TCF gas accumulations in the Senegal-Mauritania border region. The objective was to determine why oil and gas finds appeared to segmented along strike in Senegal when the geology did not appear to be that different. As is the practice now of FEC, basin modeling was chosen as the primary method of attack. This attack was founded on a comprehensive review of the regional and local geology, the preparation of horizon depth maps prepared from FEC seismic and the construction of dip and strike geoseismic profiles. A further strand of attack was the biomarker analysis of oils and gases from the Dakar region. These included oils from Fortesa wells. It was found that the entire margin of Senegal is segmented with the segment boundaries created by early rift faults and that the resulting sediment fill and its structural evolution was unique to each segment. Fill thickness and type was dominated by the exit points of the Casamance Delta though time. Dip direction control is provided by the location and form of the Jurassic to early Cretaceous carbonate bank. The Cenozoic aged, Dakar and Cayar exert further influences, notably as regards heatflow and young uplift.



The Exploration Geology of Senegal and its Surrounds.

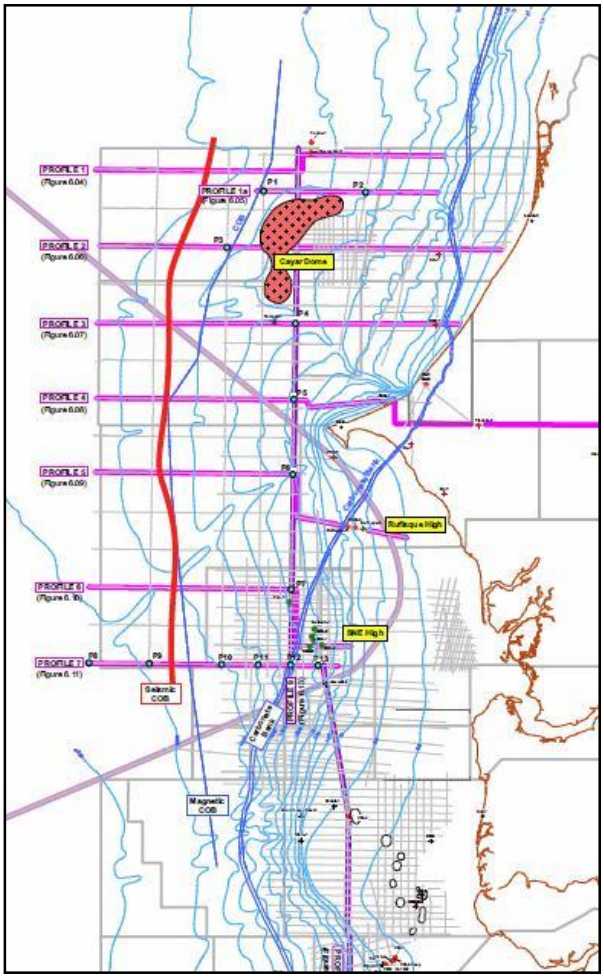
FIRST EXCHANGE CORPORATION

GI

advanced geochemical systems

Subterrane

GETZ-Co

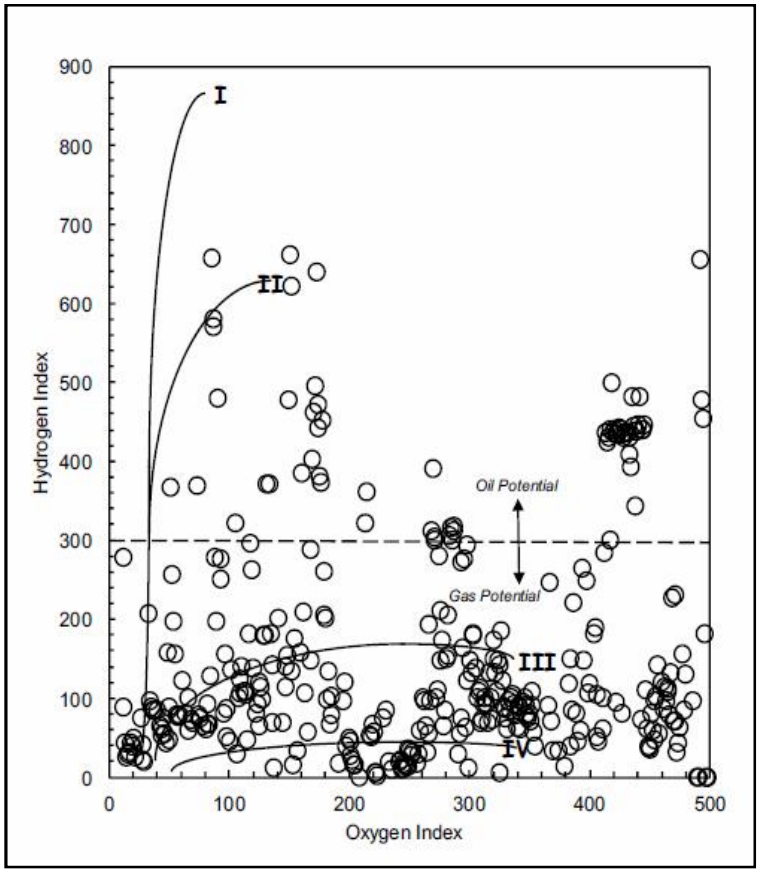


The Geoseismic Profiles.

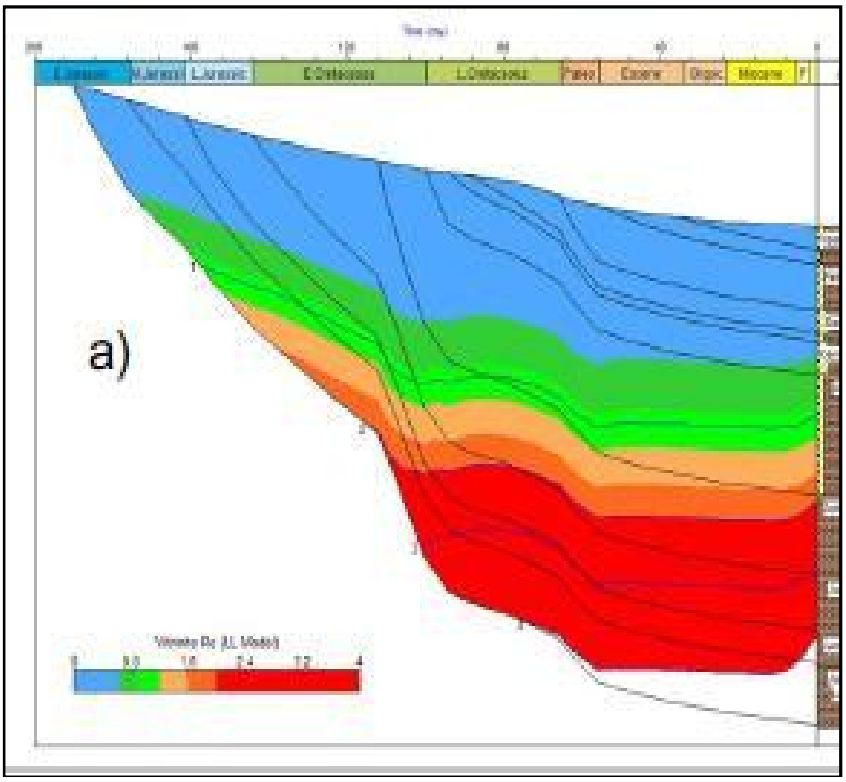
Pivotal in unraveling the Petroleum Systems was the confirmation by biomarker analysis of the long predicted, older Jurassic, oil-prone source. Post-report, summary information on this source is provided by:

Carr A. D, N .R. Cameron and R. E. Beall, 2017. Petroleum geochemistry of hydrocarbons in Gadiaga Field, Senegal: A new Lower Jurassic lacustrine source rock and play identified. AAPG/SEG International Conference & Exhibition, London, 15-18 October 2017.
http://www.searchanddiscovery.com/pdfz/abstracts/pdf/2017/90310aapg/abstracts/ndx_carr.pdf.html

Cameron N. R., R. E. Beall and A. D. Carr, 2017. A novel oil opens up a new play beneath the Gadiaga Gas Field, Senegal. AAPG Hidden Potential in Mature Basin: Play Analogs and Best Practices, Bandung, Indonesia, 13-14 September 2017.
http://www.searchanddiscovery.com/pdfz/documents/2017/20407cameron/ndx_cameron.pdf.html



Van Krevelen (OI vs HI) Plot.



Pseudowell Maturation History.

Though the study predates the three most recent Kosmos wells and the new SNE / FAN area wells, its predictions regarding exploration risks, both in terms of source quality and maturity remain fully pertinent, as do its reservoir predictions.

The authors' are Nick Cameron (GeoInsight, geology), Dr. Andy Carr (AGC, geochemistry), Steven Getz (Getz-Co, seismic / geology) and Andrew Long (Subterrane, gravmag). Leon Resendez (FEC, technical manager) and Deberah Hearn (FEC. geologist) assisted in the preparation of the report.

The study was completed December 2016.
License Fee of US$79,900, includes reproduction and delivery costs.

The study includes an appendices of the geochemical database and, in addition, a database of the Samples with a TOC > 1%. In addition the licensee will receive digital xyz grids for maturity and depth structure maps.

The study contains over 188 figures and over 28 tables, plus a bibliography of 190 references. The contents include:

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