About Geochemical Solutions International (GSI)

Geochemical Solutions International was established in 1998 to provide the oil and gas industry geochemical technology for use in the exploration, production, refining, transportation and marketing of natural hydrocarbon resources. ***Geochemical Solutions'*** objective is to offer focused, cost-effective, technical solutions that address our client's needs while setting the standard for quality, customer service and business ethics.

In addition to providing routine technical service in association with high-quality laboratories such as Baseline Resolution Labs, ***Geochemical Solutions*** has conducted more than 40 non-exclusive multi-client and/or exclusive proprietary projects for assessment of both offshore and onshore areas in Brazil, Argentina, Peru, Trinidad, the Greater Caribbean and elsewhere in Latin America. These projects, which have been widely subscribed by the energy industry, were designed to evaluate hydrocarbon charge and source characteristics in order to identify petroleum systems and associated risk at the ***Regional, Basin, Field*** and ***Prospect*** scale**.** These projects utilized a variety of different approaches including ***Surface Geochemistry, Remote Sensing, Basin Modeling, Crude Oil, Source Rock*** and ***Integrated Studies.***

During the past twenty-five years ***Geochemical Solutions*** and our associated companies ***TDI Brooks International (***tdi-bi.com***), Dickson International Geosciences (***digsgeo.com***), and Urien & Associates*** have provided our clients with the unparalleled expertise of world-renowned experts, state-of-art analytical capabilities, automated data transfer, and improved technology for application of geochemical principles. During this period, ***GSI*** has:

- Collected and analyzed 2000+ piston cores to detect seabed hydrocarbon seeps;
- Analyzed satellite imagery to identify oil slicks related to seeps;
- Collected and analyzed 2800+ soil gas samples to detect subsurface hydrocarbon accumulations;
- Collected Seabed heat flow measurements to characterize subsurface thermal regimes;
- Performed 1D, 2D and 2.5D basin models to simulate hydrocarbon generation and migration;
- Performed Regional Petroleum System Study of Brazilian Marginal Basins (180 oils/11 basins);
- Performed Campos Basin Oil Study (155 crude oils from all fields and producing horizons);
- Performed Santos Basin Oil Study (33 oils representing all fields and producing horizons);
- Performed Espírito Santo Oil Study (45 oils representing all fields and producing horizons);
- Performed Study of Source Rocks from the Campos, Santos and Espírito Santo basins;
- Performed Biostratigraphic Study of Source Rocks from the Great Campos Basin;
- Performed Study of Crude Oils and Source Rocks from the Equatorial Margin Basins;
- Performed Potiguar Basin Oil Study (125 oils representing all fields and producing horizons);
- Performed Sergipe-Alagoas Basin Oil Study (70 oils from all fields and producing horizons);
- Performed Regional Study of Crude Oils and Source Rocks from the Central Margin Basins;
- Performed Diamondoid Study of Crude Oils from the Great Campos Basin;
- Conducted Integrated Study of Great Campos using 2D seismic data from Western Geco/TGS;
- Conducted Integrated Multi-Disciplinary Study of South Atlantic Margin with DIGS/GRIZGEO (MARIMBA);
- Performed Neuquén Basin Argentina Oil Study (140 oils);
- Performed Greater Caribbean Oil Study (500+ oils);
- Performed Columbus Basin Trinidad Integrated Study (300+ oil, gas and piston core samples);
- Performed Southern Trinidad Integrated Study (140+ oil samples from all fields);
- Performed Gulf of Mexico Shelf Regional Oil Study (500 oil samples);
- Performed Santos Basin Pre-Salt Source Rock Study (15 wells; 300 samples)
- Performed Deep Water Sergipe Basin Crude Oil Study (80+ samples)
- Performed Numerous Supplementary Oil Studies of the Great Campos Basin (+samples
- Performed Great Campos Pre-Salt Kinetic Study
- Performed Northeast Brazil Deepwater Crude Oil Study (samples)
- Performed Sergipe Basin Deepwater Source Rock Study (4 wells; 500+ cuttings/sidewall cores)

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All ***GSI*** studies are presented in both analytical and interpretive formats to ensure that all findings are accessible to explorationists and research personnel. All geochemical data are provided in hard copy and electronic format. A synthesis and interpretation of all information is presented in comprehensive final reports. For additional information, please visit geochemsol.com.

Craig Schiefelbein

Mr. Schiefelbein has over forty years of experience in the fields of petroleum geochemistry, chemometrics and data analysis. He is a graduate of the University of Tulsa (Master of Science, Organic Geochemistry; Bachelor of Science, Chemistry). He worked fifteen years as a research scientist in the petroleum industry with Cities Service Oil Company and Conoco, Inc. where his main research efforts were directed toward providing a better understanding of oil generation and destruction processes, with pertinent results being incorporated into maturity and basin modeling programs. Mr. Schiefelbein worked three years as a Senior Project Geochemist for Core Laboratories and was responsible for the hydrous pyrolysis laboratory, interpretive technical service projects, and large-scale regional studies in West Africa and South America (Sub-Andean). Mr. Schiefelbein was formerly Vice President and Chief Geochemist at GeoMark Research, Inc. where his responsibilities included the analytical laboratory and performing interpretive technical service projects. He also developed and managed several large-scale regional oil studies in Colombia, Peru, Bolivia, Alaska, and the Basins of the Circum-Pacific, South Central Asia, and the South Atlantic Margin.

Papers & Publications

"South Atlantic Hydrocarbons through Space and Time" (AAPG VTS/South Atlantic Conjugate Margins; Dec. 2022)

"Peruvian Petroleum System Assessment – Offshore Basins" (3rd HGS/EAGE Conf. on Latin America; Nov 2021)

"The Southern Toe: A Closer (Zoom) Look" (GEOLSOC - Petroleum Geology of the Southern South Atlantic; Oct. 2021)

"The Same but Different: Extrapolated Exploration for Brazil's Southeast Basins." (AAPG VTS/South Atlantic Basins; Dec. 2020)

"Petroleum System Assessment of Trinidad Tobago, Barbados and Suriname Area" (AAPG VTS/Lain America & Caribbean Region, September 2020)

"Greater Caribbean Petroleum Systems" (HGS-EAGE Conference/Latin America & Caribbean Region; Nov. 2019)

"Geochemical Assessment of Basins along the Western South Atlantic Margin" (AAPG ICE Buenos Aires 2019)

"To Deepwater Sergipe Basin and Beyond: Q&A from Integrated Geoscience Investigations of Oils from Recent Wells" (AAPG ACE San Antonio 2019)

"Genetic Comparison of Crude Oils from West Africa and South American Conjugate Basins" (ALAGO 2018)

"To Deepwater Sergipe-Alagoas Basin and Beyond: Projections and Cautions from Recent Drilling and Geochemical Analysis" (IBP 2018)

"A Royal Flush in the Great Campos (Brazil's Santos-Campos) Basin" (AAPG 2017)

"Connecting the Dots: Correlating Oil Geochemistries (Points) Along and Across the South Atlantic Margins" (AAPG 2016)

"Southern South Atlantic Conjugates Passive Volcanic Margins Reconstruction: Building on Geology, Geophysics and Geochemical Data" (AAPG 2015)

"Petroleum Systems Asymmetry Across the South Atlantic Equatorial Margins" (AAPG 2015)

"Oil Terroirs of West Africa and the South American Conjugate Basins" (HGS 2015)

"Defining Frontier Petroleum Systems with Higher Granularity: Examples from Plate Reconstructions of the Atlantic Margins" (AAPG 2014)

"Girassol – Angola's First Deepwater Pre-salt Discovery?" (AAPG 2012)

"Searching High and Low: Correlating Shallow and Deep Structural Trends along the West African Margin to Determine Sediment Transport and Hydrocarbon Migration Controls" (AAPG 2011)

"East, West, Which Is Best? Brazilian versus West African Transform Margin Hydrocarbon Play Elements" (AAPG 2010)

"Hydrocarbon Prospectivity of the South West Atlantic Margin" (AAPG 2010)

"Shaken, Not Stirred: Oil Family Cocktails in Brazil Margin Basins, With and Without Salt" (AAPG 2009)

"Western South Atlantic Margin Sedimentary Basins: Petroleum Systems and New Exploration" (AAPG 2009)

"Stretching a Point: Correlating Oil Family Signatures to Reunite Orphans with Their Families in a Trans-Atlantic Village of Basins" (AAPG 2009)

"Petroleum Systems along the Western South Atlantic Margin Assessed from Oil Geochemistry and Basin Redefinitions" (AAPG 2009)

"Extended Families: Predicting and Correlating Lacustrine Sourced Oils in a Pre-Salt Play, Santos Basin, Brazil and Along the Eastern Brazil Margin" (AAPG 2008)

"The Jurassic Petroleum System of the Sub-Andean Basins - Paleogeography and Geochemistry of the Organic Rich Sequences" (AAPG 2008)

"Upgrading SAR Slick Interpretations in West Africa with Piston Cores, Oil Samples and Potential Fields Data" (AAPG 2008)

"Multidisciplinary Study of the Cuyana Basin, Argentina" (AAPG 2008)

"Doing The Geochemical "Cotton Eye Joe" In West Africa (Niger Delta To Angola): Identifying The Source Of RadarSat Slicks With Piston Cores, Oil Samples, Potential Fields And Near-surface Seismic" (AAPG 2007)

"MD2 (Multi-Dimensional, Multi-Disciplinary) Interpretation: Geochemical and Heat Flow Integration with 2.5-D Seismic Interpretation Examples from Gabon, the Congo Fan, Kwanza Basin and Niger Delta" (AAPG 2006)

"Exploration Opportunities in Western South Atlantic Continental Margin Sedimentary Basins" (AAPG 2006)

"Oils Have the Answers—Defining Petroleum Systems Using Geochemistry" (2006)

"Melding Geoscience and Information Technology to Enhance Exploration Success: A Case Study from Peru" (2006)

"Basin Analysis in Brazilian and West African conjugates: Combining Disciplines to Deconstruct Petroleum Systems" (SEPM Foundation 2005)

"Petroleum Systems of the Sub-Andean Basins" (AAPG 2005)

"Busted Flush in the Santos Basin (Brazil) Becomes a Winning Hand—Hydrocarbon Generation and Multi-Path Migration on Shallow and Deepwater Flanks of the Basin" (AAPG 2005)

"Sedimentary Sequences and Petroleum Systems in the Austral Foreland Basin" (AAPG 2005)

"Controls on Oil Quality in Deep and Ultra-Deep Water Fields of the Campos Basin, Brazil" (AAPG 2004)

"Hydrocarbon Neighbourhoods, Salt Diapirs & Oil Migration Limits: G3 Interpretation in Campos and Santos Basins of Brazil" (AAPG 2004)

"Regional Assessment of Petroleum Systems and Hydrocarbon Phase in the Deep Water Santos Basin" (AAPG 2004)

"Hydrocarbon Neighbourhoods and Migration Limits: Results from Co-interpreting Geochemical and Geophysical Data in Brazilian Basins" (AAPG 2004)

"Origin and Distribution of Hydrocarbon Gases in the Columbus Basin of Trinidad: An Emerging Gas Province" (AAPG 2004)

"Petroleum Geochemistry as an Exploration Tool as Applied to the South Atlantic Margin" (AAPG 2002)

"A worldwide geochemical comparison of lacustrine crude oils" (AAPG 2000)

"Maturation and Distribution of South Atlantic Source Rocks: Examples from Deepwater Angola" (AAPG 1998)

"Integrated Surface/Subsurface Geochemical Exploration Surveys Identify Active Petroleum System in Deepwater Angola" (AAPG 1998)