

## Basin Analysis and Petroleum Systems Modelling

*Target Exploration consultants* performed regional and basin analysis using industry standards **Lopatin©**, **BasinMod©** and/or **PetroMod©** software. However, Target ECL contributions to basin modelling can be:

1. Modifying local structural evolution methodology ([Ibrahim, et.al. 1981](#)) to basin-wide structural evolution tool, ([Ibrahim and Mahrouqi, 2001](#)).
2. Contouring Lopatin's TTIs (Time-Temperature Indices of Maturations) ([Ibrahim, 1983](#)).
3. Correcting, calculating, plotting and contouring geothermal gradients of wells and basins using BHT data using our **CGG-ESTI ©** Software ([Ibrahim 1986](#)), and
4. Introducing triangluler petroleum system diagram that illustrate generation, migration, accumulation, as well as dissipation in basins with stratigraphic columns incorporating multiple petroleum systems, ([Ibrahim, 2007](#)).



## Software

Target Exploration consultants generated their own basin analysis software for use in house analysis of our own and our clients data:

1. **ST-GRTH**: Local (one or a group of structures) and regional structural evolution analysis programme, designed to detect and illustrate the onset of development of local and regional structural closures against the background of source rocks maturation and hydrocarbons migration. Based on Ibrahim's (1981).
2. **CGG-ESTI**: An interactive geothermal gradient analysis and plotting and cross-plotting programme of single well and basin-wide group of wells to identify geothermal gradient/ surface temperature signature of discovery and producing wells, then use the same criteria to identify “un-discovery” wells in the area. It is based on Ibrahim's (1986, 1988).

## Non-exclusive Reports/Publications

1. Petroleum Geology of Western Iraq, Target Exploration, London, UK. 75p, 25 figures, 25 enclosures, 10 appendices. [Tar3.pdf](#)
2. Petroleum Geology of South Iraq, Target Exploration, London, UK. 350 P., 133 figs., 19 enclosures, 103 p appendices. [Tar2.pdf](#)
3. Geothermal gradient anomalies of hydrocarbon entrapment, Al-Hagfa Trough, Sirt Basin, Libya. Non Exclusive Report, 37 p. 70 Figures, 5 Enclosures and PDF CD. [Tar6.pdf](#)
4. Geology and Basin Analysis of Western Offshore Libya (Blocks O1, O2, O3, O4, O14, O15, O16 and NC41), 100 P. 170 Figures and Enclosures. [Tar11.pdf](#)
5. Undeveloped Oilfields and Remaining Potential of Kotla Trough, Sirte Basin, Libya, Target Exploration Report, 35 Pages, 130 Figures and one interactive PDF CD. [Tar39.pdf](#)
6. Structural Evolution and Petroleum System of the Hagfa Trough, Sirte Basin, Libya. Non-Exclusive Report, Target Exploration, 19 Pages, 14 Figures and One PDF CD. [TAR12.PDF](#).

7. Pierce, W. H., E. Rutherford Jr. and M.W. Ibrahim (2010). Construction of Large-scale Exploration Model of Northern Iraq from Diverse Regional Databases. In IPC10 (The 3rd Iraqi Petroleum Conference: Iraqi Oil and Gas Post 2003 Exploration and Production) Target Exploration, 22 & 23 September 2010, Imperial College, London, 98p and one PDF CD. [IPC10](#).

## External Publications

8. Ibrahim MW (1979). Shifting depositional axes of Iraq: an outline. J Petroleum Geology 2 (2) pp 181-193. [IBRAHIM 1979](#)
9. Ibrahim MW (1983) Petroleum geology of southern Iraq. AAPG Bull 67 (1) pp 97-130. [EXAMPLE-3 \(Note editor error: Fig. 7 caption is below Fig 6 and vice versa\)](#).
10. Ibrahim MW (1987) Tectonic history, basin evaluation and petroleum geology of the upper Jurassic of southern Iraq. AAPG Bull 71 (5) pp 569-570. Poster's Abstract. [IBRAHIM 1987](#)
11. Ibrahim MW (1992) Prospectivity of the Sirt group Sands, eastern Sirte basin, Libya. In 3rd Symposium of the Geology of Libya, 27-30 September 1987, College of Science, Al-Fateh University, Tripoli, Libya, Vol. 7, pp 2757-2779.
12. Ibrahim MW (1993) Basin Analysis, Play Model and Exploration Potential of Upper Jurassic Rocks of South Iraq. (Abstract). In Proceedings of 10th Iraqi Geological Congress, Union of Iraqi Geologist, Baghdad, 28-31 Feb. 1992. 1P.
13. Ibrahim MW (1996) Silurian "Hot" Shale Labyrinths in the Middle East and North Africa. (Abstract). In Proceedings of GEO 96, 15-17 April 1996, Bahrain, GeoArabia, Vol.1, No.1, March 1996. P51. [IBRAHIM 1996](#)
14. Ibrahim MW (1997) Palaeozoic Hydrocarbon Potential of Northern Arabia (with special emphases on Western Iraq), (Abstract). In PESGB Farm-in Seminar, 25 March 1997, London, 1p.
15. Ibrahim MW (1998A) Cycles of Generation, Migration, Accumulation and Destruction of Hydrocarbon in Iraq. (Abstract). In Proceedings of GEO 98, 20-22 April 1998, Bahrain, GeoArabia, Vol.3, No.1, March 1998, p. 102-103. [IBRAHIM 1998A](#)
16. Ibrahim MW (1998B) Paleozoic Hydrocarbon Potential of Western Iraq, In Proceedings of GEO 98, 20-22 April 1998, Bahrain, GeoArabia, Vol.3, No.1, March 1998, p 103. [IBRAHIM 1998B](#)

17. Ibrahim, MW (1998C) Chronology, Polarity and Re-Adjustments of Structural Closures in Arabian Anticlines: Implications to Hydrocarbon Entrapments and Field Development. (Extended Abstract). In Proc. of AAPG Annual Conv., 17-20 May 1998, Salt Lake City, Utah, V. 1, p. A-324-325. [IBRAHIM 1998C](#)
18. Ibrahim, MW (1998) Hydrocarbon Prospectivity of Western Desert, Iraq. (Abstract), In Iraq: Oil and Gas Post-Sanction, CWC Assoc. Conference, 30 Nov-1 Dec.1998, Trianon Palace, Versailles, France. 200P.
19. Ibrahim, MW (1999) Petroleum Systems and Hydrocarbon Prospectivity of Pre-Upper Cretaceous Rocks of Sirt Basin, Libya, 35p. In Libyan Oil and Gas, SMI Conference, 26-27 Jan. 1999, Hotel Ambassador, Paris, France.
20. Ibrahim, MW (1999) Petroleum Systems and Hydrocarbon Potential of Onshore and Offshore Kuwait, 26P. In Kuwaiti Petroleum Summit, SMI Conference, 20-21 April. 1999. The Lanesborough Hotel, London, UK.
21. Ibrahim, MW. and Al Mahruqi, S. (2000) Petroleum Systems of the Hagfa Trough, Libya, (Extended Abstract) in Petroleum Systems and Evolving Technologies in African E&P. PESGB-Geol. Soc. Convention, 16-18 May 2000, London. pp 26/1-4.
22. Ibrahim MW. (2001) Petroleum systems and Hydrocarbon Potential of Onshore and Offshore Kuwait, (Abstract). 7<sup>th</sup> Jordanian Geological Conference 2-4 April 2001, Amman, Jordan.
23. Ibrahim MW. (2001) Petroleum systems and Hydrocarbon Potential of Onshore and Offshore Kuwait. (Abstract). In The Petroleum Geology of the Middle East Basin, one-day seminar, 4 April 2001, JAPEC Training, The Scientific Societies Lecture Theatre, London, UK, 1p.
24. Ibrahim MW. (2001) Hydrocarbon Potential of the Western Desert of Iraq, in Iraq Oil and Gas II, an SMI Conference, 21-22 May 2001, Hotel Ambassadeur, Nice, France. 1p.
25. Ibrahim MW. and S. Al Mahrouqi (2001) Hydrocarbon Systems of the Hagfa Trough, Sirte Basin, Libya, (Extended Abstract). AAPG Annual Convention, 2-3 June 2001, Denver, Colorado, P. A97. ([Ibrahim & Mahrouqi 2001](#))
26. Muammar, K., M. Warrak and M W Ibrahim (2003) Petroleum Geology and Remaining Hydrocarbon Potential in the UAE, (Abstract) 1p. In Petroleum Geology of the Middle East (2 Days International Conference), 21-22 October 2003. The Geological Society, London, Abstracts Volume, 38 p.

27. Ibrahim, Muhammad W. (2004) Unconformable Stratigraphic Traps Potential of South Iraq, (Abstract). In Geo2004, 6<sup>th</sup> Middle East Conference and Exhibition, 7-10 March, Bahrain, Conference Abstracts, GeoArabia, V.9, No. 1, P. 80. [IBRAHIM 2004](#)

28. Ibrahim, MW, (2005) Unconformity Traps Potential of Sirte Basin, Libya. (Abstract). In AAPG Annual Convention 2005, 19-23 June, Calgary Convention Centre, Calgary, Alberta, Canada. Abstracts Volume, 160P. P. A65-A66. [IBRAHIM 2005A](#)

29. Ibrahim, MW (2007) Undeveloped Fields and Remaining Potential of a Typical Sirte Basin Graben, Libya. (Abstract). In Geo2006 7<sup>th</sup> Middle East Geosciences Conference and Exhibition, March 27-29, Bahrain, Conference Abstracts, GeoArabia, V12, No.3. pp. 130-131. [IBRAHIM 2007](#)

