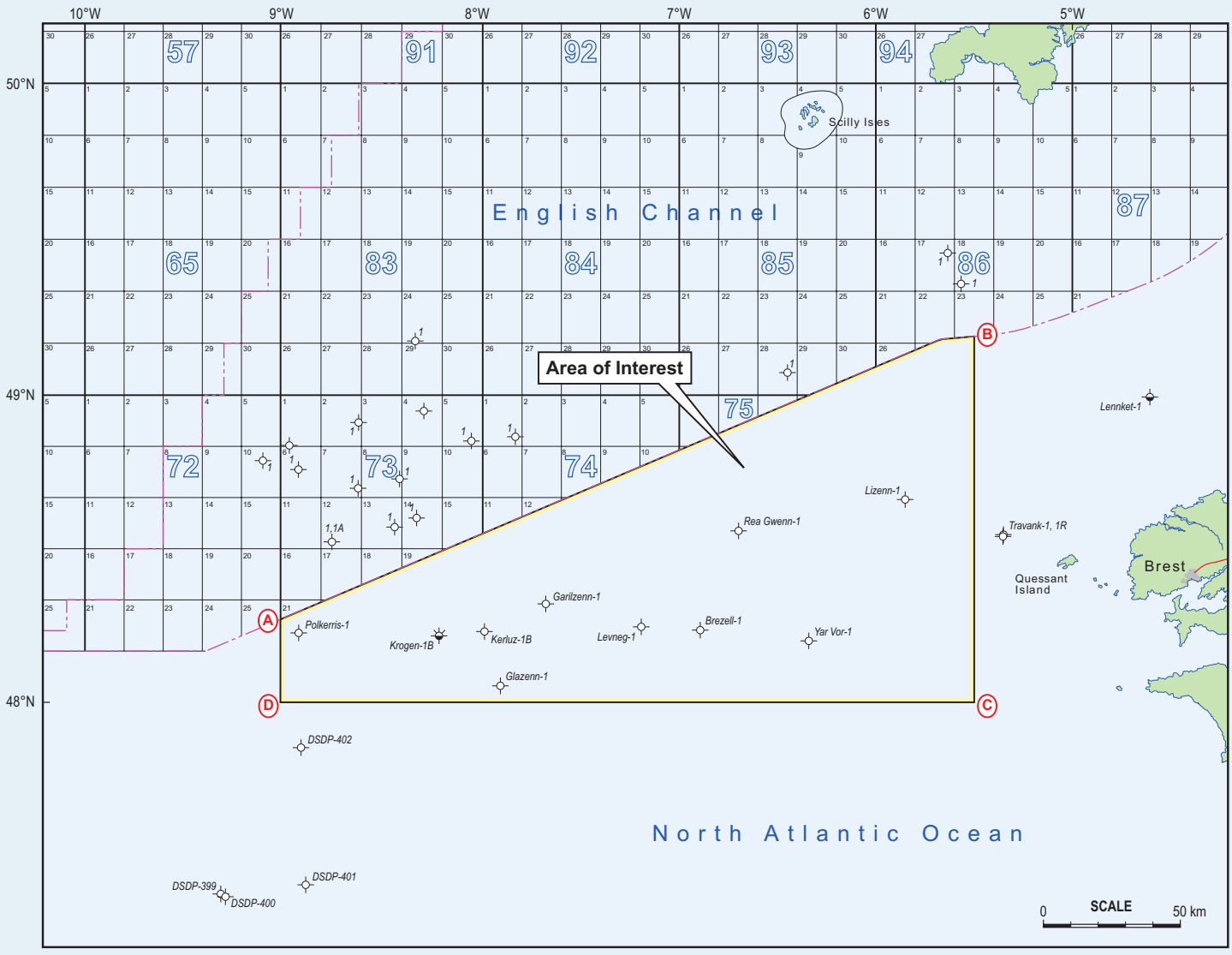
France
The Brittany Basin

GTO LIMITED

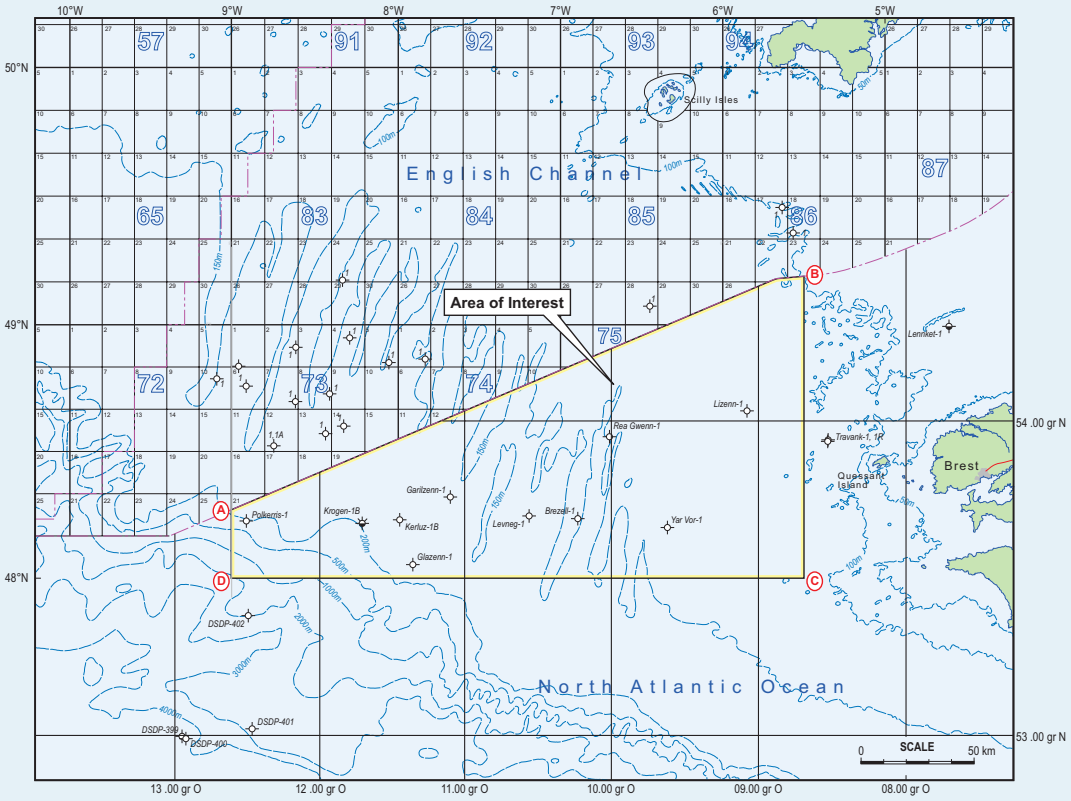


The Brittany Basin is a well documented Mesozoic extensional basin located west of the Armorican peninsula of NW France. It has seen a moderate amount of exploration with the drill bit, but aside from the Polkerris well drilled by CNR in 2003 most of this drilling was conducted from the mid 1970s to mid 1980s. GTO Limited considers that given the presence of proven mature source rocks (L. Jurassic) in the basin, and M-U Jurassic reservoirs and seals, that this basin is not well explored. It has not had the benefit of new seismic with enhanced processing, and no 3D seismic has been acquired in the basin. Furthermore, much of the drilling on the northern margin and into the UK sector has focussed on a Wytch farm analogue model with Triassic reservoir targets – and these have all failed.

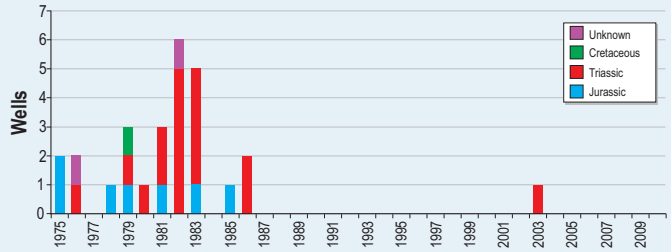
GTO Limited believes that a complete re-assessment of the area needs to be made using modern exploration techniques to bring up to date the Petroleum System analysis of the basin, define the play fairways, risk and evaluate the play concepts to encourage further exploration with new seismic acquisition and ultimately drilling.

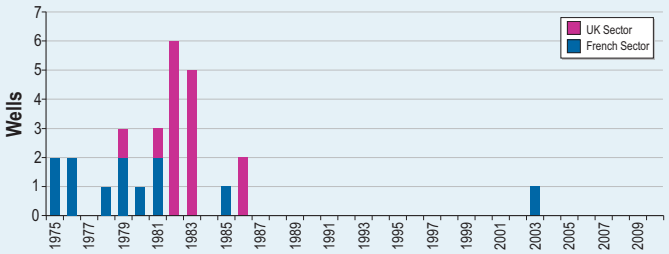
Well	Date Completed	Company
Lizenn-1	1975	SNPA
Brezell-1	1976	SNPA
Levneg-1	1978	SNEA(P)
Glazenn-1	1979	SNEA(P)
Yar Vor-1	1979	SNEA(P)
Rea Gwenn-1	1981	SNEA(P)
Garlizenn-1	1981	SNEA(P)
Krogen-1	1983	SNEA(P)
Kerluz-1	1985	SNEA(P)
Polkerris-1	2003	CNR*
Lenkett-1	1975	SNPA
DSDP-402	1976	DSDP**
Travank-1	1980	SNEA(P)

Bathymetrical map of the South West Approaches

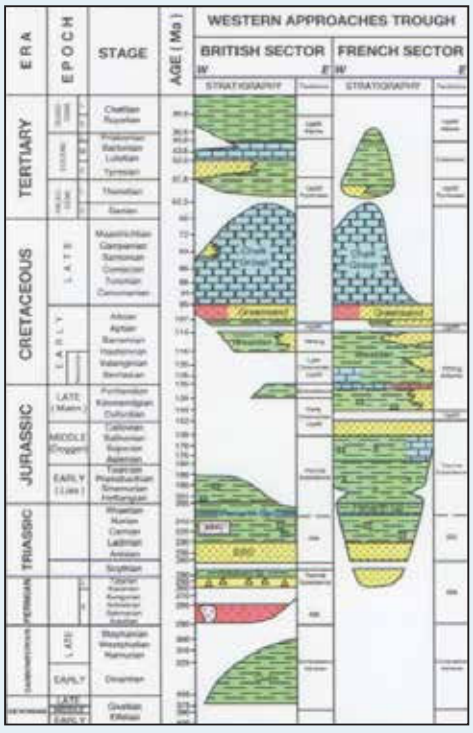


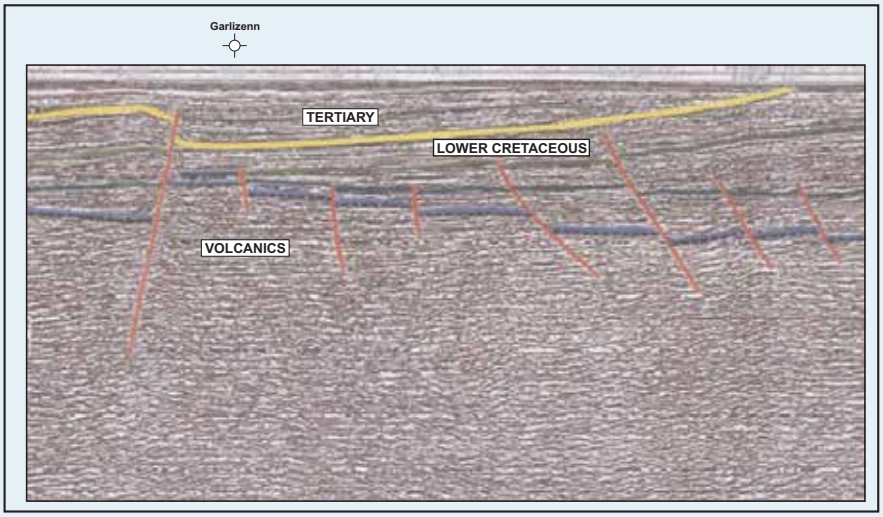
History of Exploration





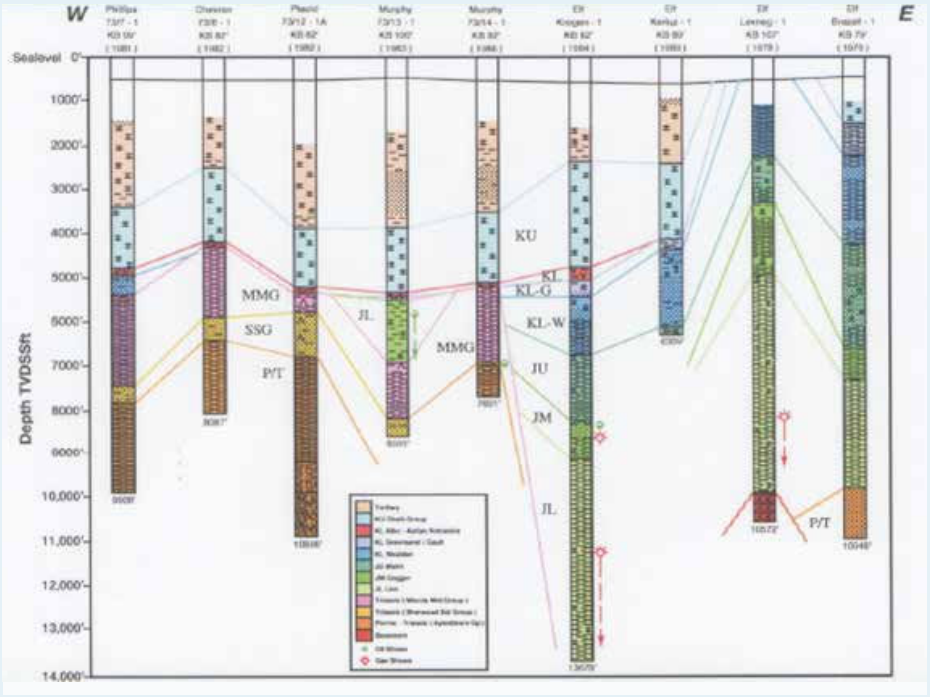
Stratigraphy





From the wells drilled in both the French and the UK sector a good general stratigraphy for the basin is well known and established.

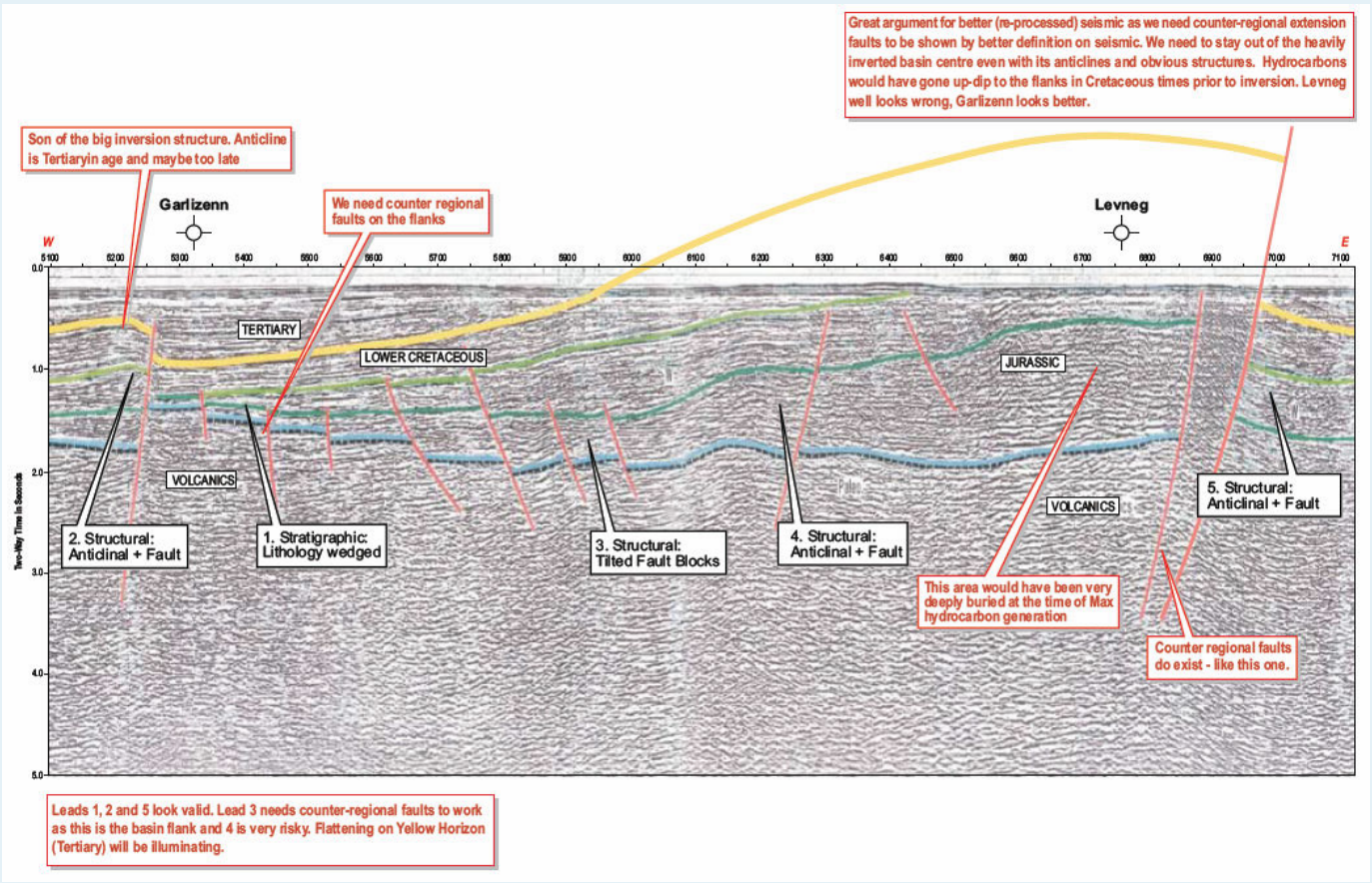
Source Rocks



Eight wells drilled in the Mer d'Isoire Basin have encountered varied thicknesses and quality of Lower Jurassic Source rock (Sinemurian) and has confirmed a potential complex facies and maturity distribution for these prime source rocks. However, recent analysis (GTO - 2009) has suggested that there is significant oil generation potential in the region and has encouraged our application to renew exploration in this underexplored basin area.

The basic stratigraphy of the wells drilled in the basin are shown here and shows the Lower Jurassic sections penetrated in the wells.

Well	Date	TD (m)	Reservoir	Source	Show	Reason for Failure
Krogen-1B	1983	4200 (JL)	JM sst., JL	JL	Oil + Gas	Lack of valid trap. Quality of reservoir rocks.
Garlizenn-1	1981	2526, (Palaeozoic)	JM, JL	JL		Quality of reservoir rocks. Lack of valid trap.
Kerluz-1B	1985	1950, (JU)	J	JL		Lack of source, migration, reservoir quality.
Glazenn-1	1979	3104, (KL Valanginian)	K			Did not reach Jurassic. Lack of good quality Cretaceous reservoir. Lack of hydrocarbon charge.
Levneg-1	1978	3525 (Basement)	JL	JL	Gas	Lack of trap. Quality of reservoir.
Brezell-1	1976	3337 (P/T)	JL, JM, Tr	JL		Lack of trap. Access to source/charge.
Rea Gwenn-1	1981	2526 (TU Norian)	Tr MMG	JL	Gas	Good source, lack of valid trap. Quality of reservoir rocks.
Yar Vor-1	1979	3543, (JL Hettangian/Basement)	J	JL		Lack of trap. Quality of reservoir. Access to source/charge.
Lizenn-1	1975	4552, (JL Hettanginian/Sinemurian)	J	JL		Lack of trap. Quality of reservoir.
Polkerris-1	2003	2131	Tr			Albian erosional unconformity: All oil generated beforehand escaped



Technical Conclusions

- The area is largely underexplored.
- The exploration that has been undertaken was mainly pre – 1987, for both seismic and drilling.
- The main play targeted – Triassic sands sourced with hydrocarbons from Liassic sediments, has failed. Most of these early wells were targeting Tertiary inversion structures which significantly post dated the maturation and expulsion of the oil and therefore received no charge. Other plays have had little attention.
- Wells drilled in the French sector have encountered mature and good quality Sinemurian sourcerocks for oil generation. Its distribution and control on quality is not well understood. However, previous operators have calculated the potential for significant quantities of oil to have been generated - more than 12BBO.
- Most of the early wells were targeting Tertiary inversion structures which significantly post dated the maturation and expulsion of the oil and therefore received no charge
- GTO considers that all aspects of the Petroleum Systems present, and the evaluation of prospective play concepts needs reviewing and updating with new technology and interactive approaches. This should start from a better understanding of the regional setting, basin development, depositional histories and sequence stratigraphy – to modelling of the source rock presence, hydrocarbon generation and reservoir distribution. This will identify and high grade areas for further exploration with new seismic and eventually drilling.
- GTO believes it can re-invigorate the exploration of this overlooked basin.

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