

Europa Oil & Gas

High Impact Atlantic Exploration

Plays of the Eastern Flank of the South Porcupine Basin and Inezgane Offshore Morocco

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Prospex 2019 Stand 62



Ireland

Introduction

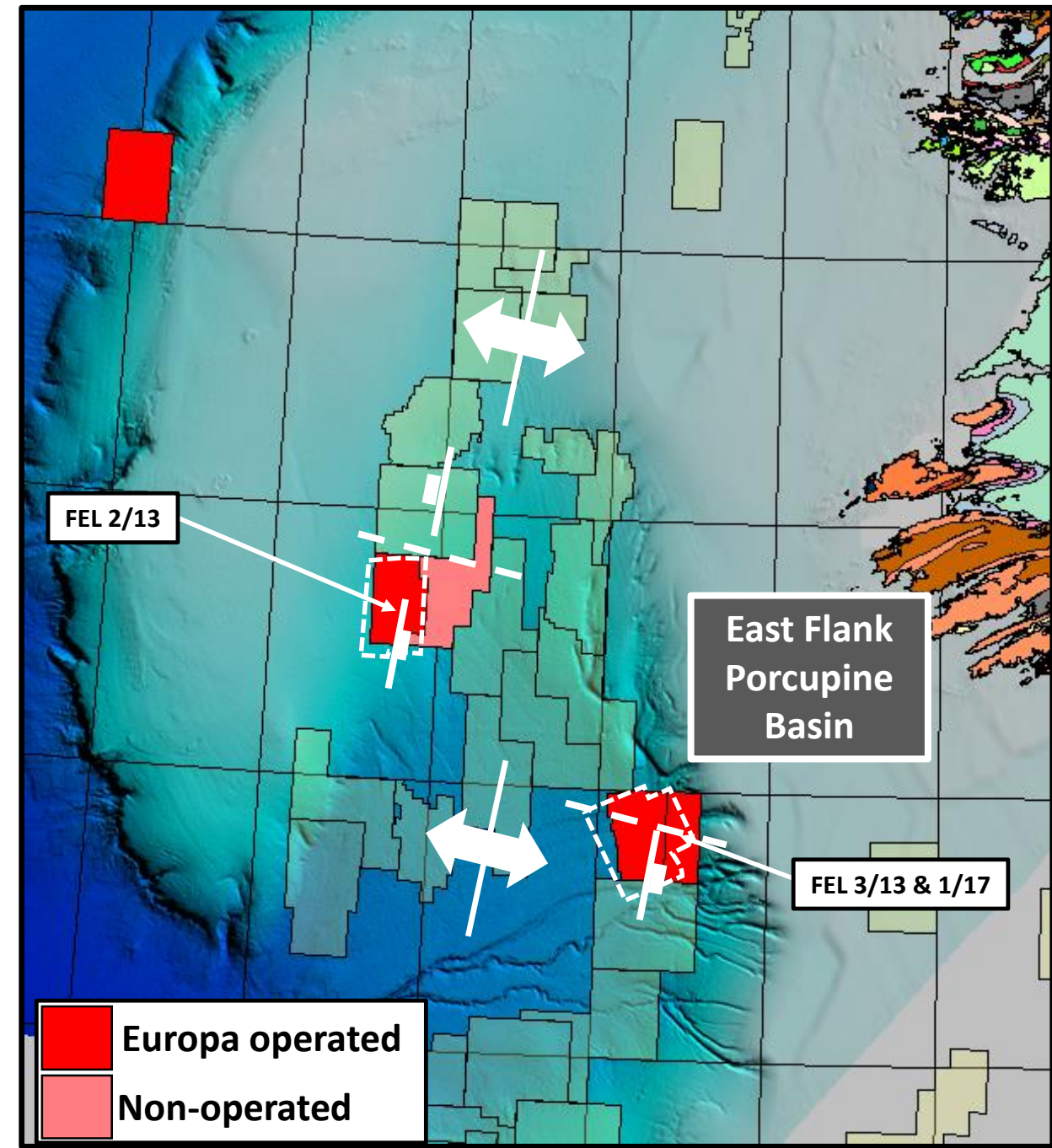
- FEL 1/17, 523 km² , since 2017
- FEL 3/13, 780 km², since 2013
- 1548 km² 3D acquired 2013
- Reprocessed to PSDM in 2018

Europa has been working the South Porcupine since 2011.

Since then the industry has acquired ~35,000 km² of 3D and drilled three exploration wells.

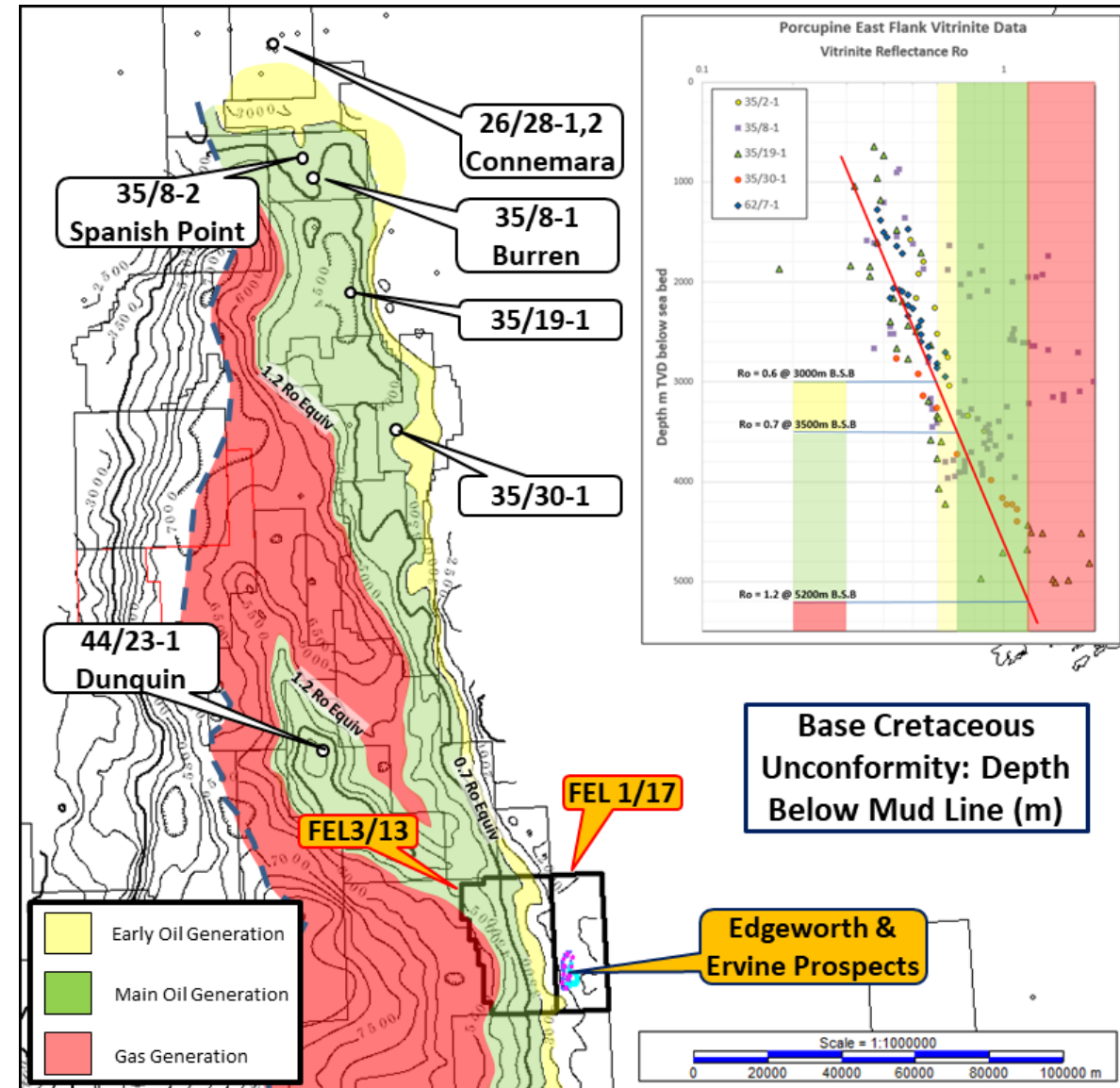
PIP funded Beicip-Franlab geochem and Merlin stratigraphy reports

This presentation is our 2019 synthesis and re-evaluation of the east flank of the South Porcupine Basin



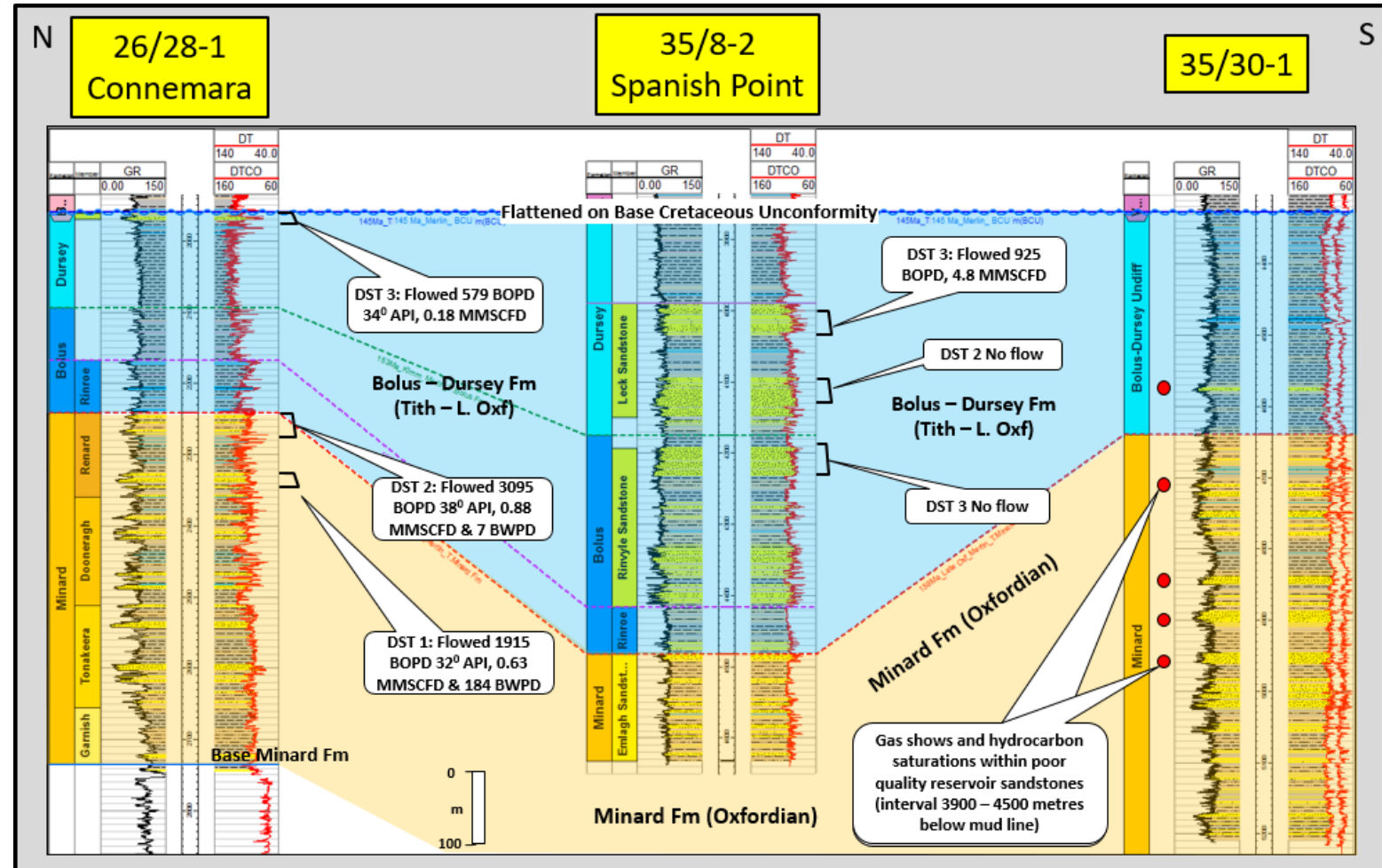
Proven Source and Effective Charge Mechanisms

- Multiple source rock intervals identified within the Tithonian, Kimmeridgian and Oxfordian.
- Effective oil charge demonstrated in Connemara 26/28-1,2, Spanish Point 35/8-2, Burren 35/8-1 and Dunquin 44/23-1 (breached).
- Gas saturations recognized in tight Upper Jurassic sandstones in 35/30-1.
- Oil generation window defined along eastern flank of Porcupine Basin
 - 0.6 Ro Equiv @ 3000m below mud line (early oil)
 - 0.7 Ro Equiv @ 3500m below mud line (main oil)
- Area of mature Upper Jurassic source rock defined within FEL 3/13



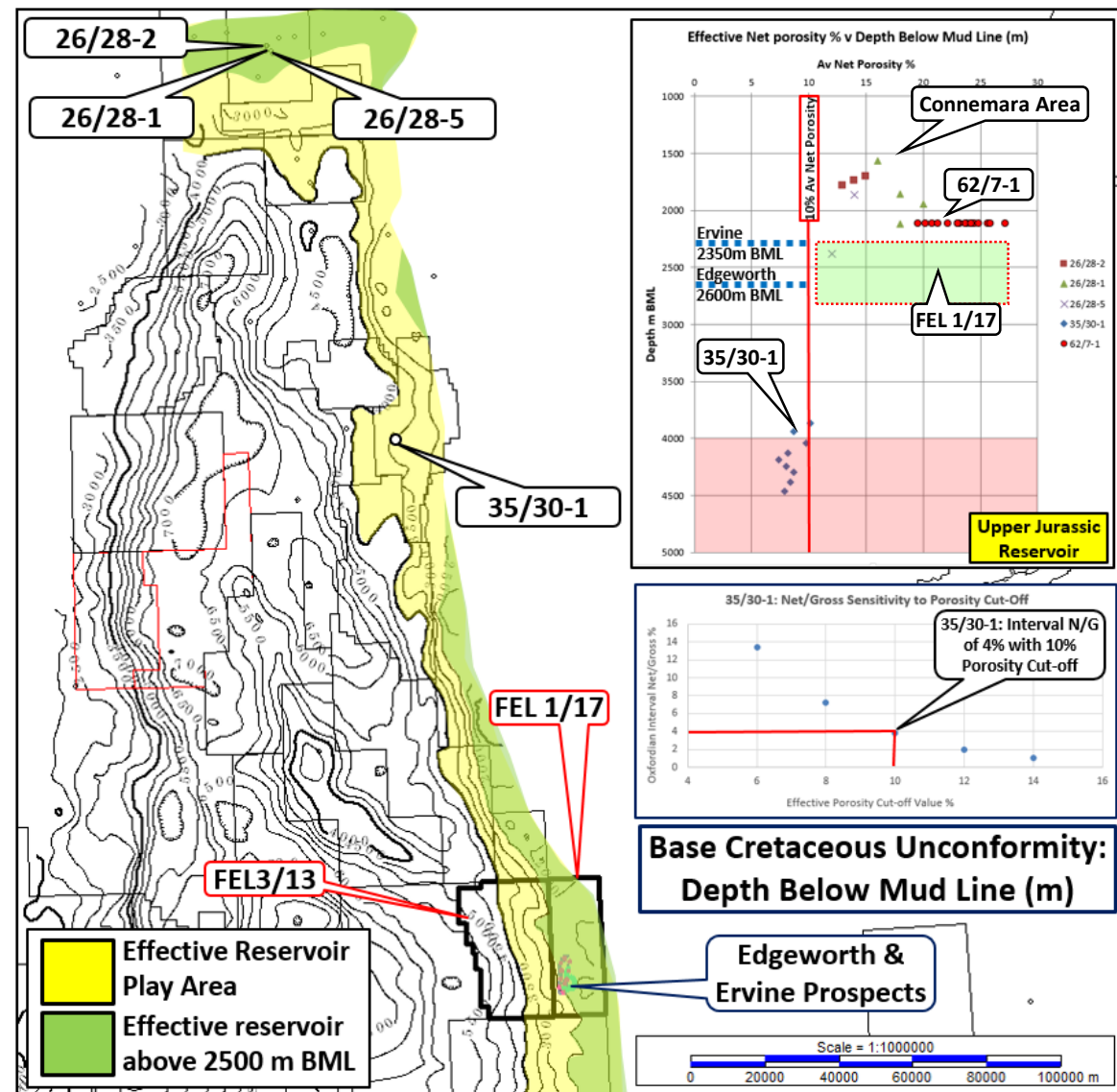
Upper Jurassic Stratigraphy and Tests

- Proven charge access to Upper Jurassic succession along eastern and northern flank of Porcupine Basin.
- Effective reservoir development recognized at multiple levels within the Upper Jurassic
 - Tithonian (Connemara DST3, Spanish Point DST 3)
 - Early Kimmeridgian – Oxfordian (Connemara DSTs 1 and 2)
- Connemara 26/28-1 combined rate of 5589 BOPD from 3 DSTs



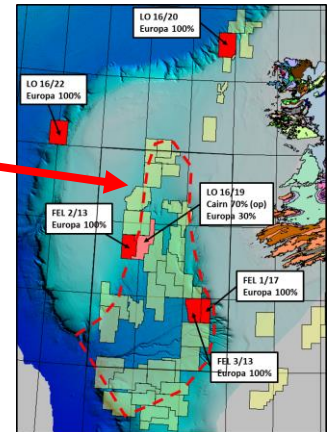
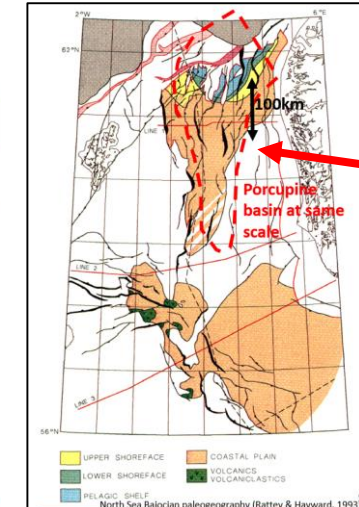
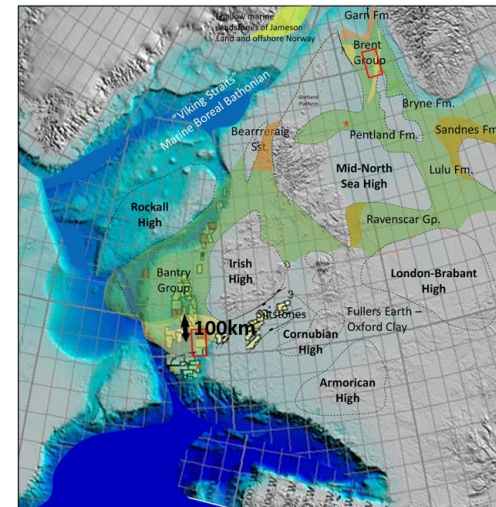
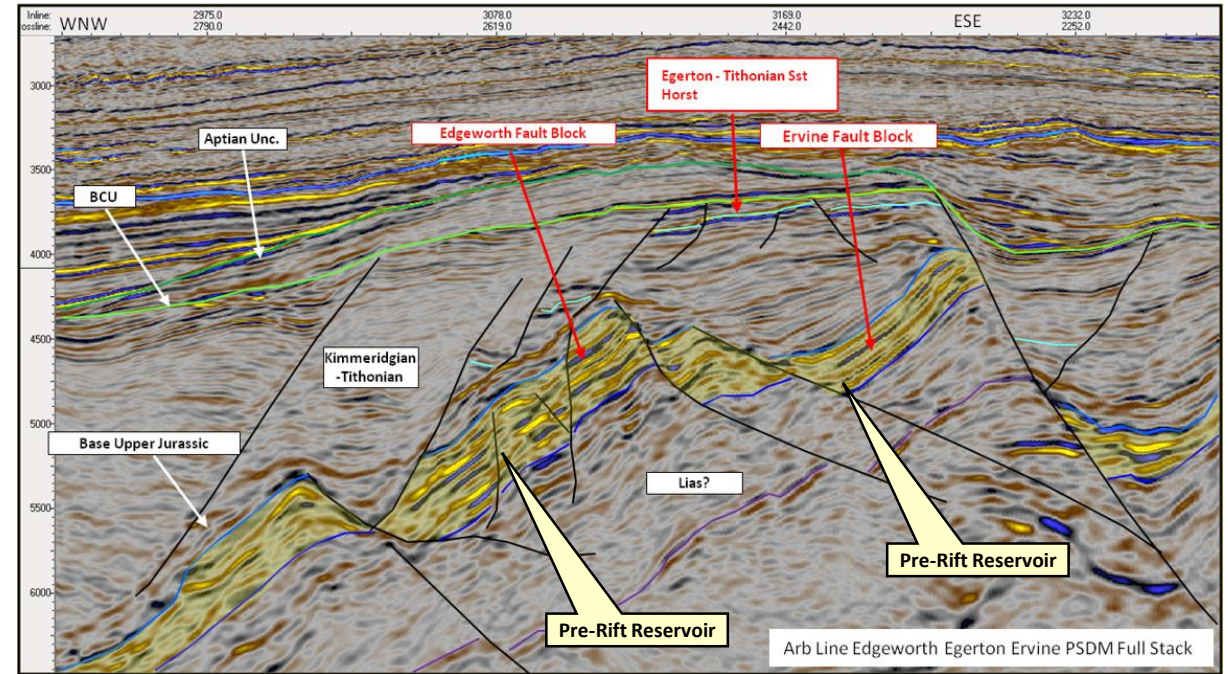
Jurassic Reservoir Fairway

- Jurassic reservoir play outline defined at BCU < 4000m BML
- Limits of Jurassic reservoir play for effective reservoir defined by marginal net reservoir development in the 35/30-1 Oxfordian interval 3800 – 4500m BML (BCU @ 3600m BML)
- Upper Jurassic Av. Net Porosity range 12 – 20% in Connemara area at 1500 – 2400m BML.
- Upper Jurassic (?Galley Fm) Sst in 62/7-1 (120 kms S of FEL 1/17 & 3/13) – core porosity range 19 - 27% at 2116 – 2122 m BML
- Effective reservoir development expected in FEL 1/17 at Jurassic level based on depth of burial criteria



Jurassic Pre - Rift Reservoir

- In FEL 1/17 & FEL 3/13, a seismically-defined interval below Base Upper Jurassic U/C has been mapped which exhibits:-
 - A distinct seismic facies character
 - Continuity across the Edgeworth & Ervine prospect areas.
 - A thickness of between 300 – 500m
- This interval is thought to represent a potential Pre-Rift (?Middle Jurassic) gross reservoir interval, which has not been penetrated along the Eastern Porcupine Basin Margin.
- The presence of similar Middle Jurassic depositional and reservoir play systems can be demonstrated regionally.
- The scale and extent of this undrilled Pre-Rift play along the east flank of the basin may potentially be comparable to the Brent Province

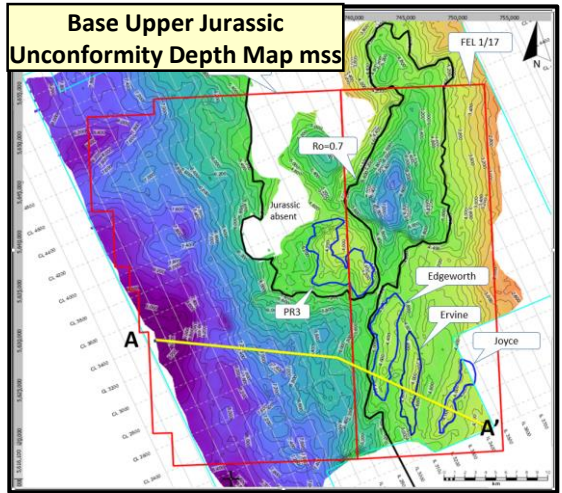
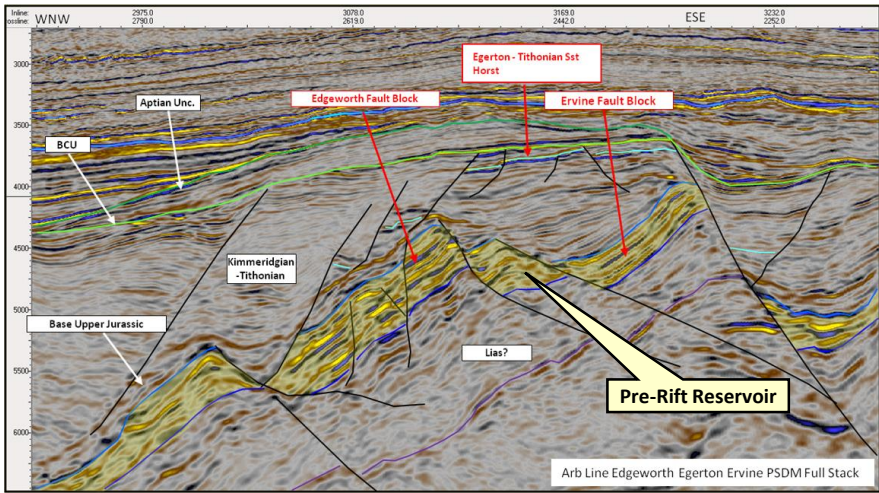
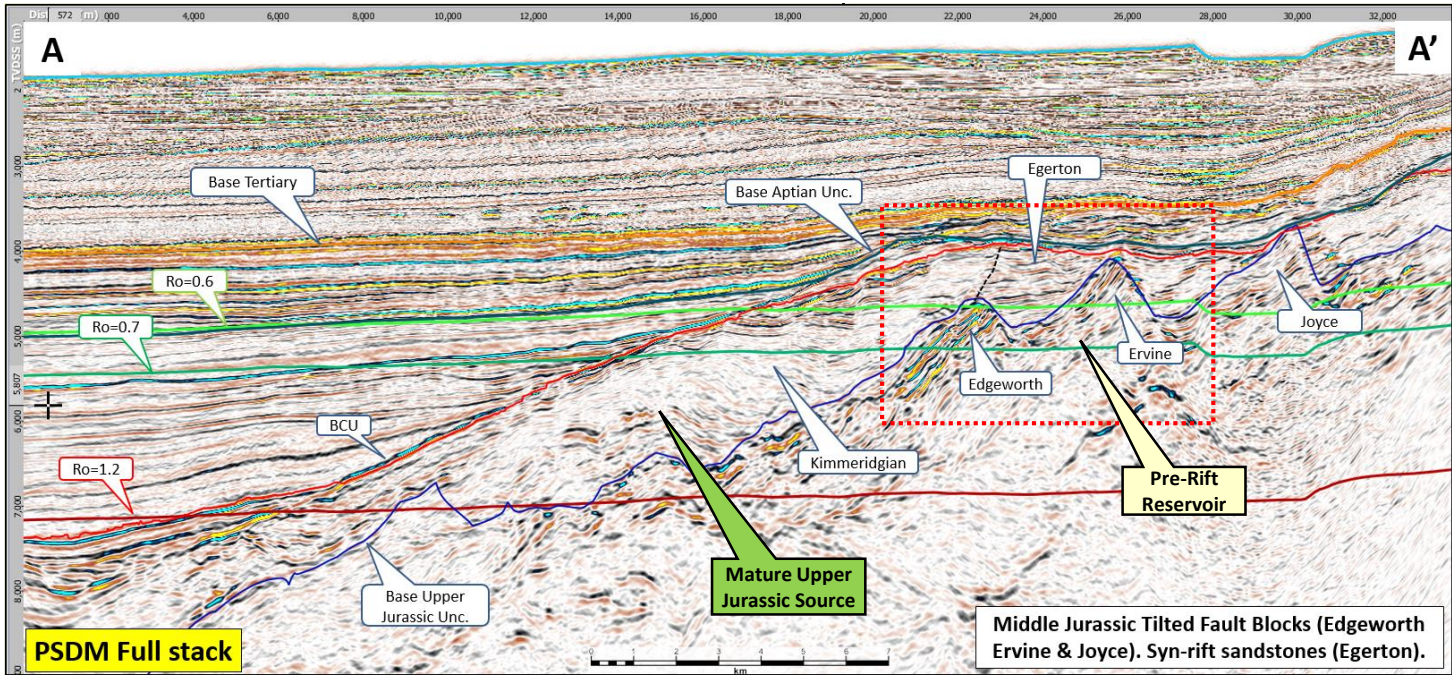


Jurassic Prospects

- Well-defined tilted fault block structures.
- Pre-Rift (?Middle Jurassic) untested play potential recognized in Porcupine Basin east flank setting.
- FEL 1/17 Edgeworth and Ervine Prospects have crestal culminations at 2600m BML and 2350m BML respectively.
 - Effective reservoir expected given prospect burial depths.
- Charge access from mature Upper Jurassic source rocks directly down-dip of prospects.
- Significant resource potential.

Licence	Prospect	Play	Gross Prospective Resources mmbœ*			
			Un-risked			
			Low	Best	High	Mean
FEL 1/17	Ervine	Pre-rift	63	159	363	192
FEL 1/17	Edgeworth	Pre-rift	49	156	476	225
FEL 1/17	Egerton	Syn-rift	59	148	301	167

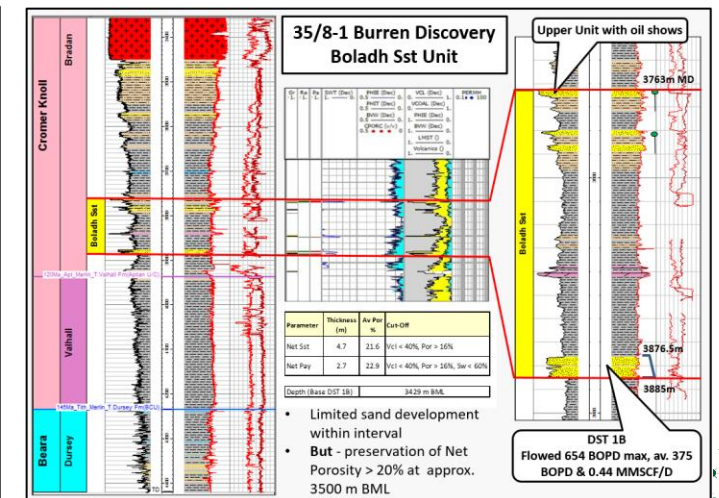
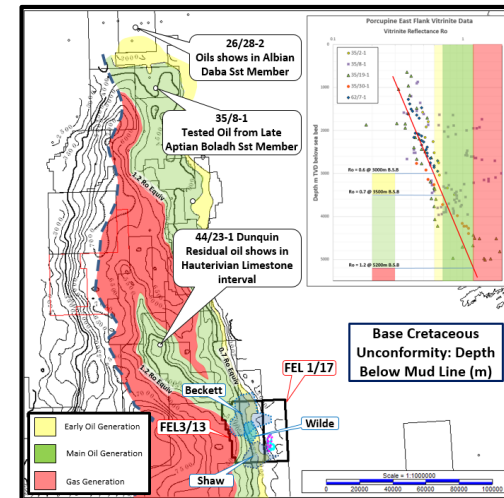
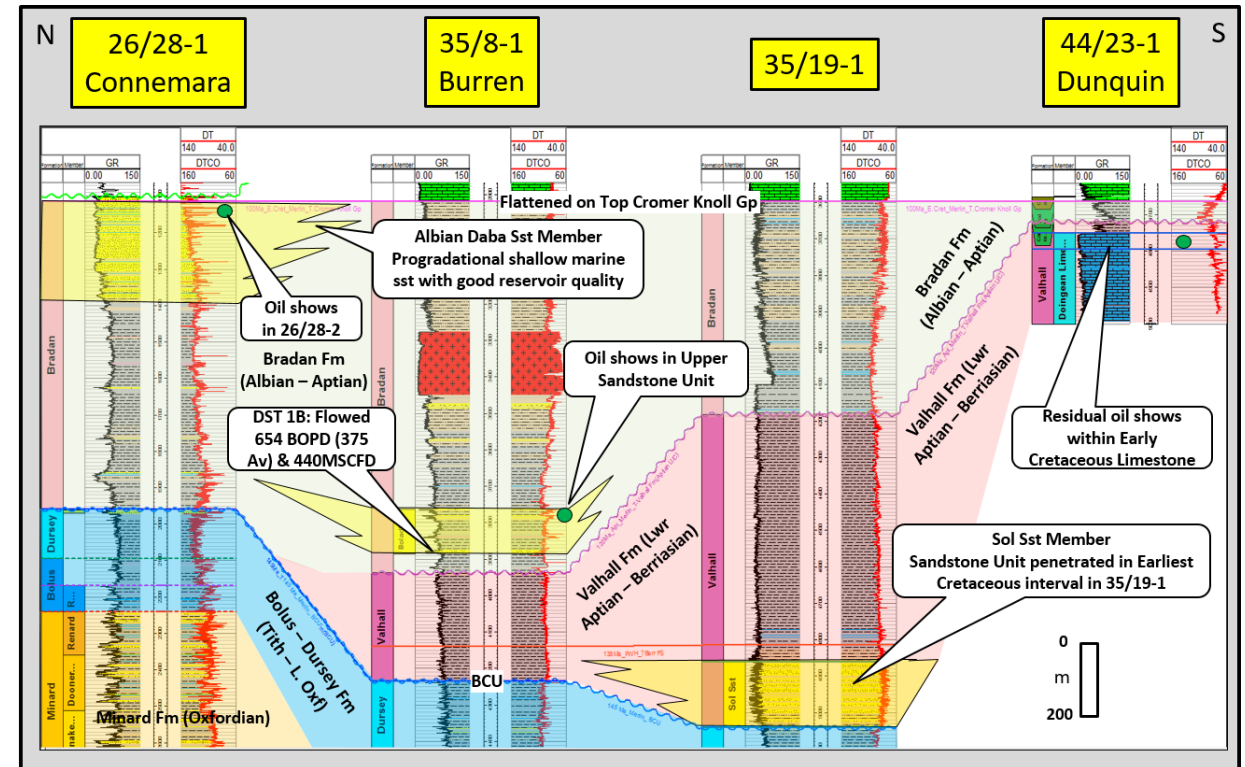
*million barrels of oil equivalent.



Cretaceous Play Configuration

Charge Access

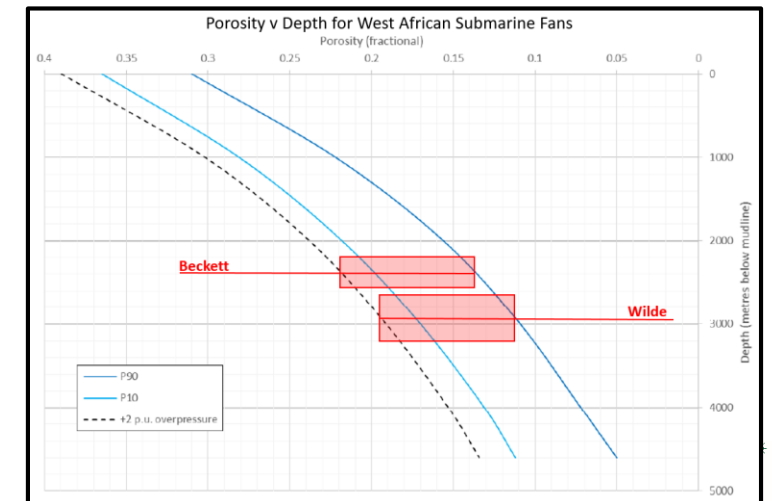
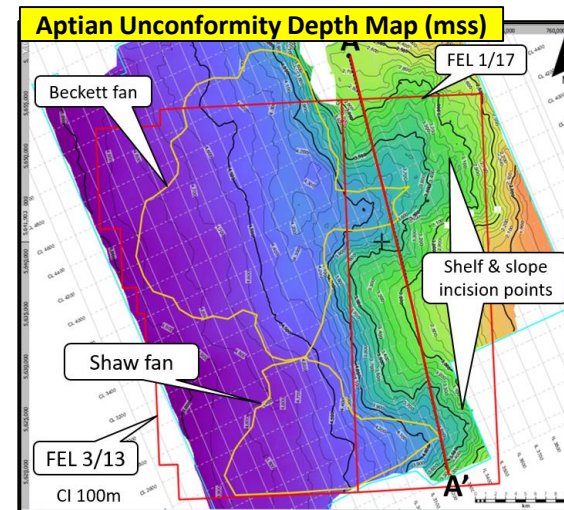
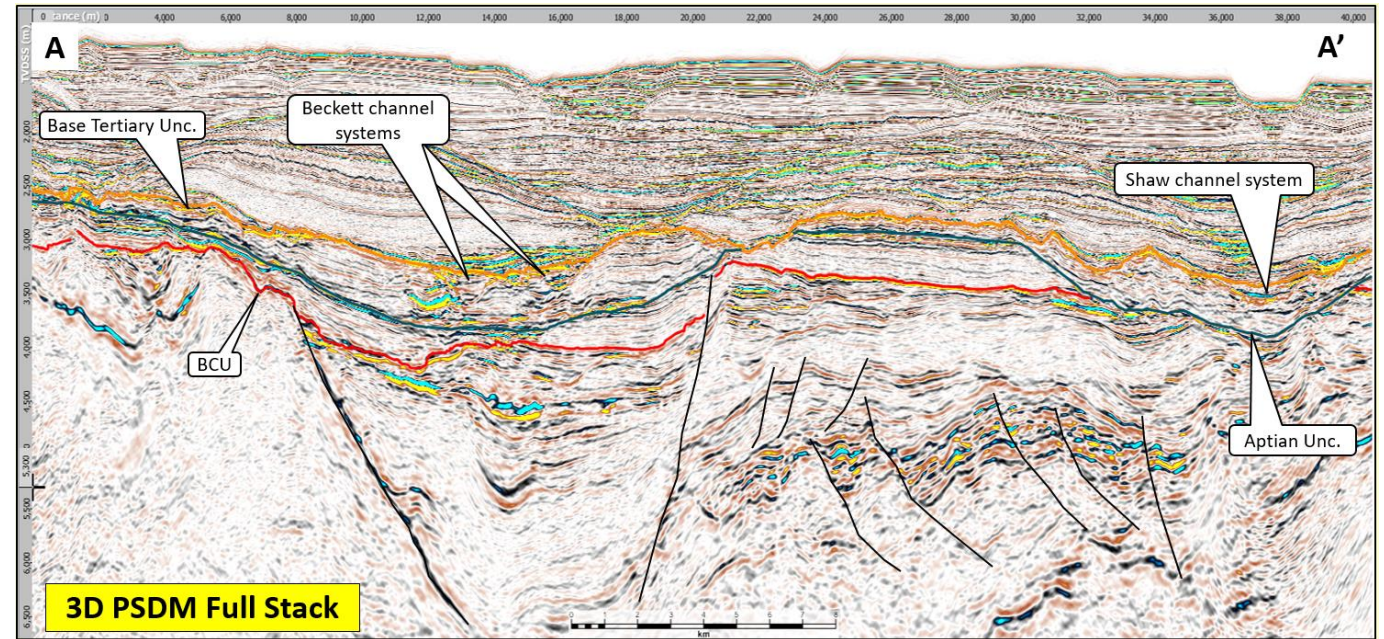
- Oil test within Late Aptian Sst in 35/8-1 Burren Discovery:-
 - Oil typed to Kimmeridgian source rock in 35/8-2 using GC-MS biomarker ratios (Beicip-Franlab 2017)
- Presence of oil shows within Albian shelfal sandstones in Connemara (26/28-2).
- Residual oil shows in Early Cretaceous limestones in 44/23-1 (Dunquin).
- Potential reservoir intervals recognized at multiple levels within the Early Cretaceous stratigraphy.



Cretaceous Play Configuration

Reservoir Development

- Interpretation of 3D seismic over the Cretaceous interval in FEL 1/17 & 3/13 identifies:-
 - Significant shelf/slope incision.
 - Long-lived sediment entry points
 - Development of constrained submarine fan geometries at base of slope
 - Wilde, Beckett and Shaw Prospects.
- Preservation of effective reservoir expected given prospect burial depths.

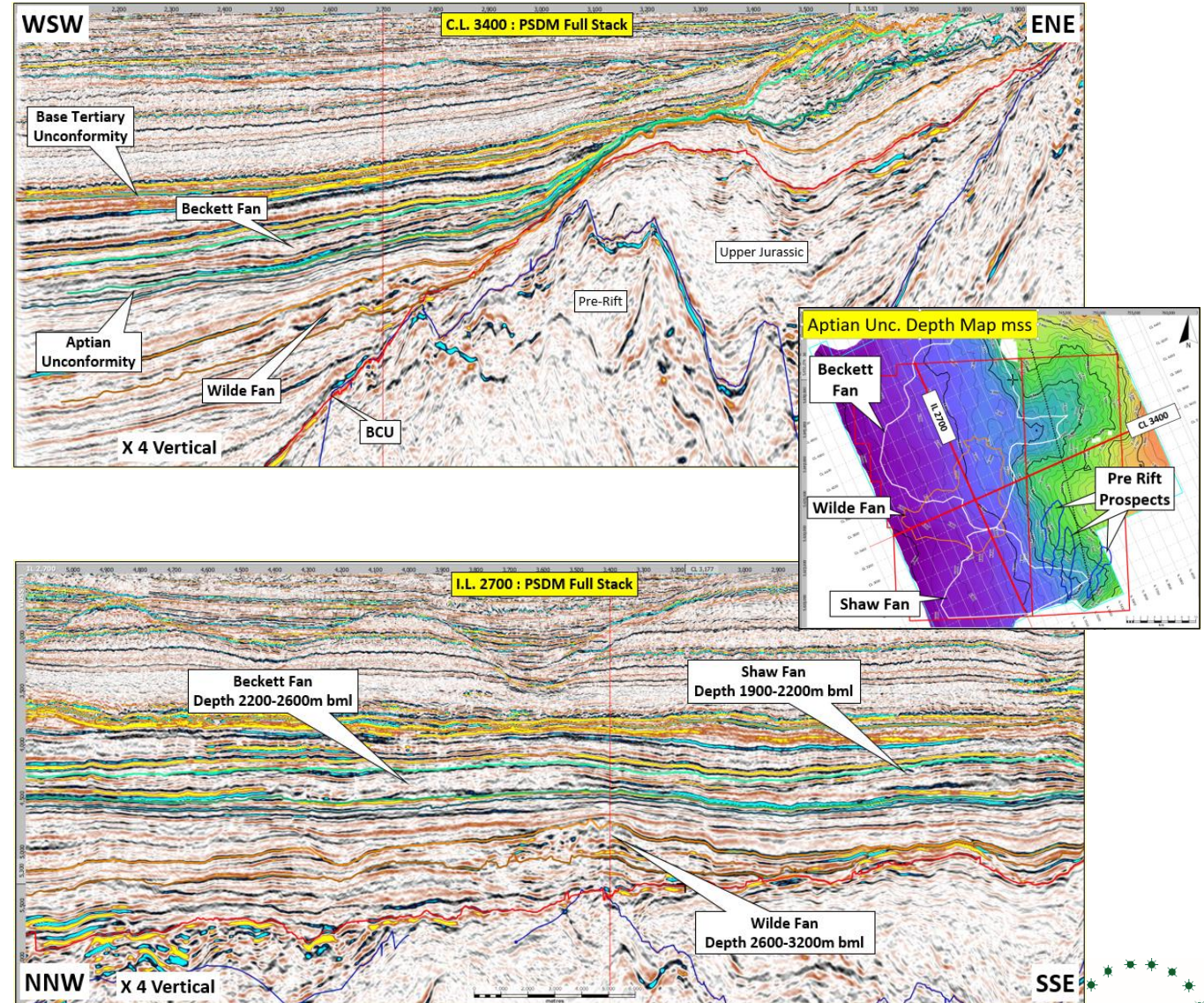


Cretaceous Prospects

- Wilde, Beckett and Shaw Fans developed at the base of a sharp, well-defined shelf-slope break.
- Fan geometries and onlap edges clearly define stratigraphic trapping geometries.
- All prospects can be charged by direct vertical migration from underlying mature Upper Jurassic source rocks.
- Beckett and Shaw Prospects situated 1900 – 2600m BML, Wilde Prospect @ 2600 – 3200m BML – effective reservoir development expected.
- Significant resource potential identified

Licence	Prospect	Play	Gross Prospective Resources mmmboe*			
			Un-risked			
			Low	Best	High	Mean
FEL 3/13	Beckett	mid-Cretaceous Fan	111	758	4229	1719
FEL 3/13	Shaw*	mid-Cretaceous Fan	20	196	1726	747
FEL 3/13	Wilde	Early Cretaceous Fan	45	241	1082	462

*million barrels of oil equivalent.
 *prospect extends outside licence, volumes are on-licence

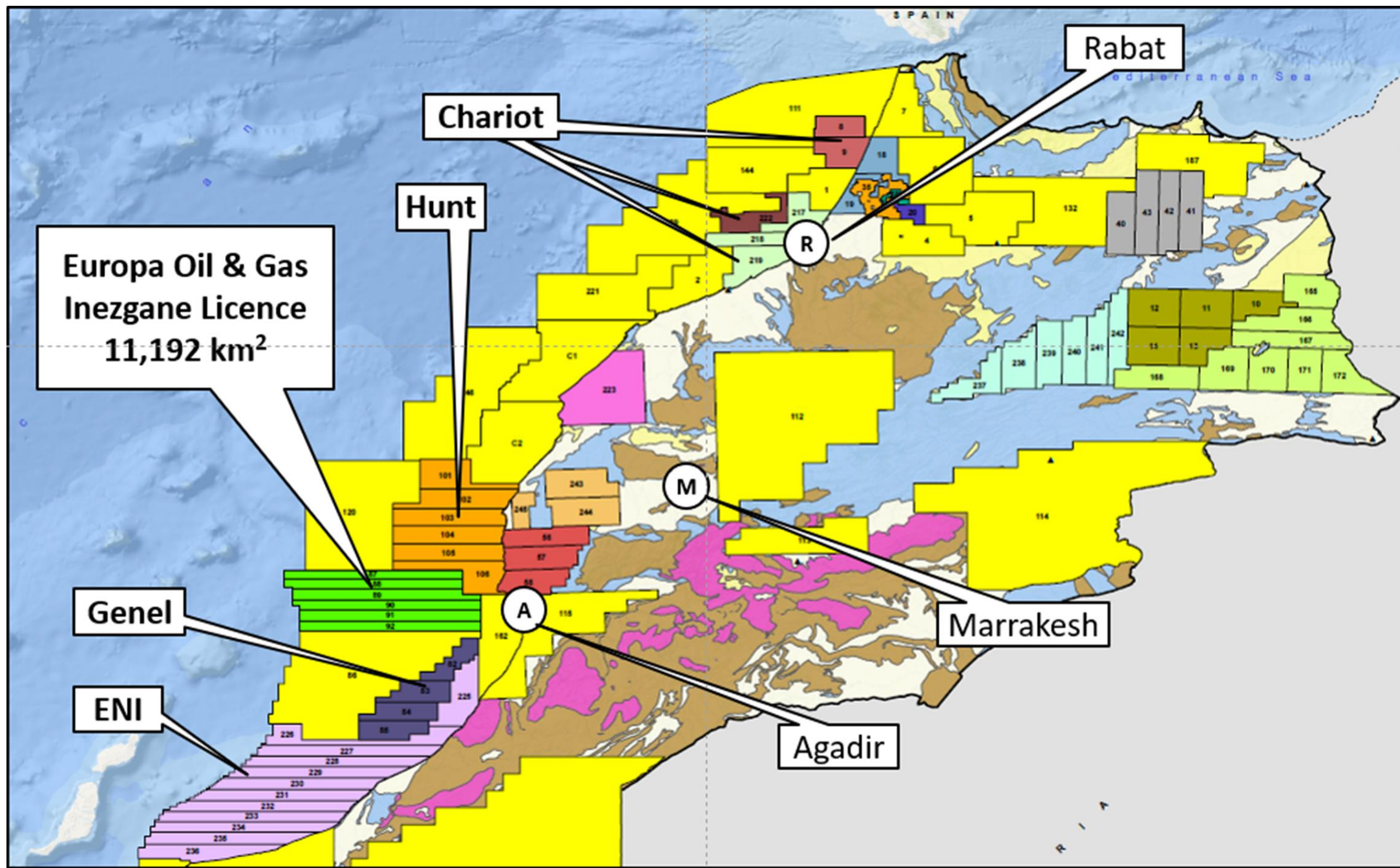


Conclusions

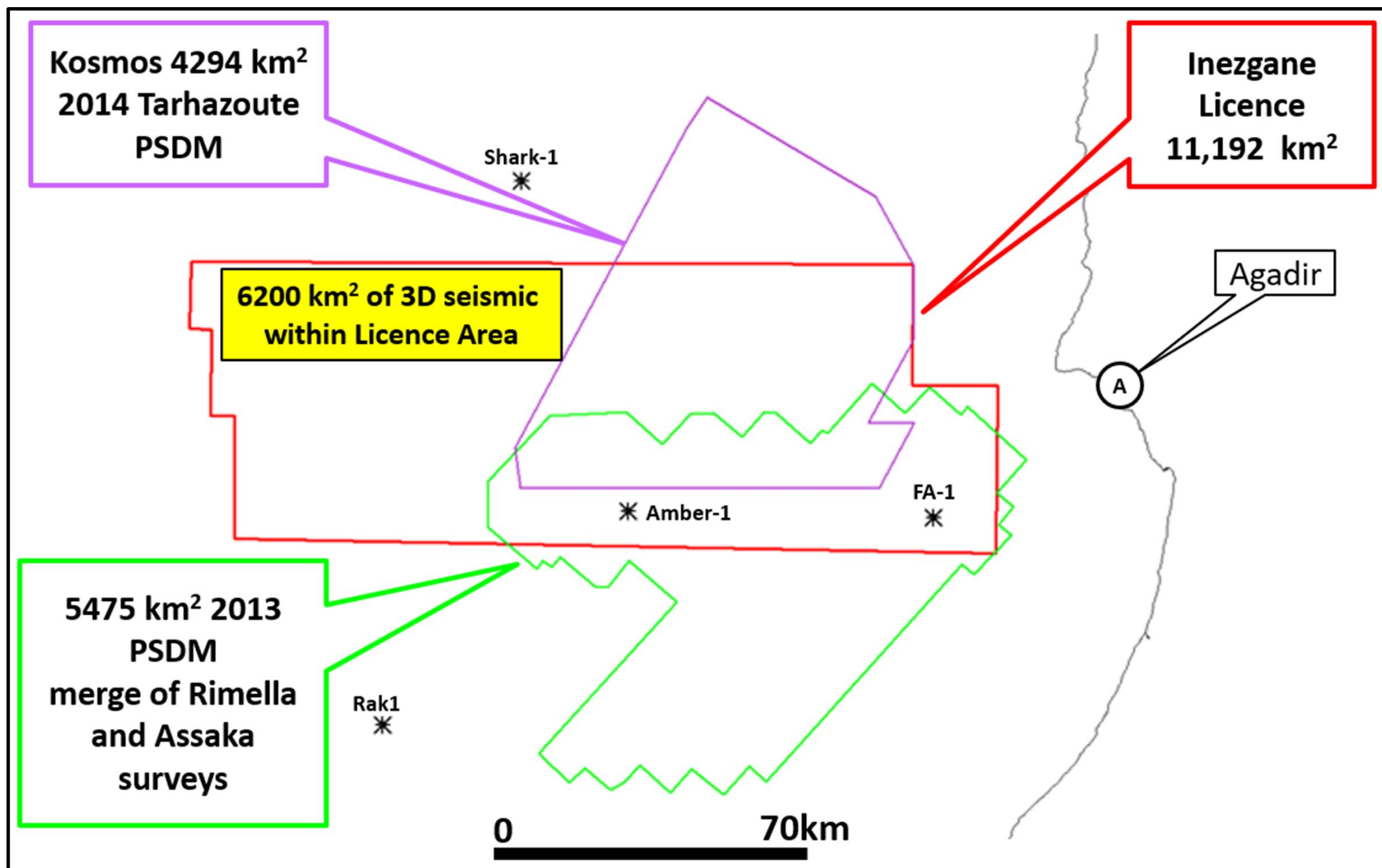
- South Porcupine is ~50,000 km² and with just four wells is underexplored, east flank is undrilled
- Frontier basin but oil, gas and condensate flowed to surface👍, proven source rocks👍, proven reservoir👍
- We need a thick interval of good quality reservoir, connected to mature effective source rock in a valid trap. Commercial threshold 200 mmbo and 5000 bopd per production well.
- Our east flank prospects in FEL 1/17 and 3/13 meet these criteria 👍
- South Porcupine deepwater drilling performance is excellent. No train wrecks, ahead of schedule, no safety incidents, no environmental incidents, no showstoppers. FEL 3/13 and 1/17 drill cost is \$37 million @ \$300k per day rig rate excluding mob and demob 👍
- Harsh environment FPSO production already proven at Foinaven Schiehallion and Skarv-Idun. Deepwater harsh environment FPSO being pioneered right now at Bay du Nord and Rosebank. Exploration, development and production operations are all “doable” 👍
- We are seeking farm-in partners for FEL 1/17 and FEL 3/13, visit us at stand 62 to discuss further

Morocco

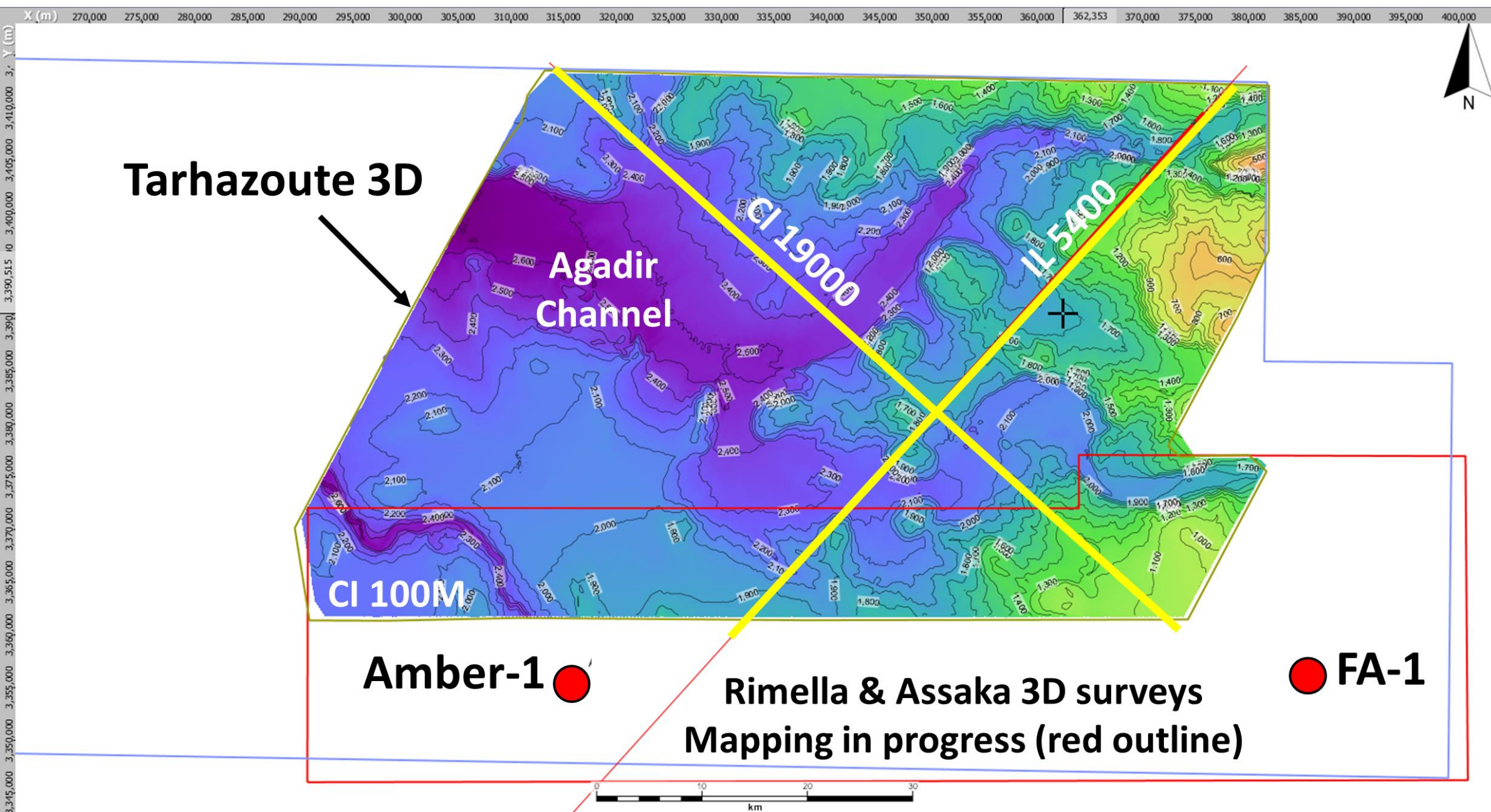
Inezgane Offshore location



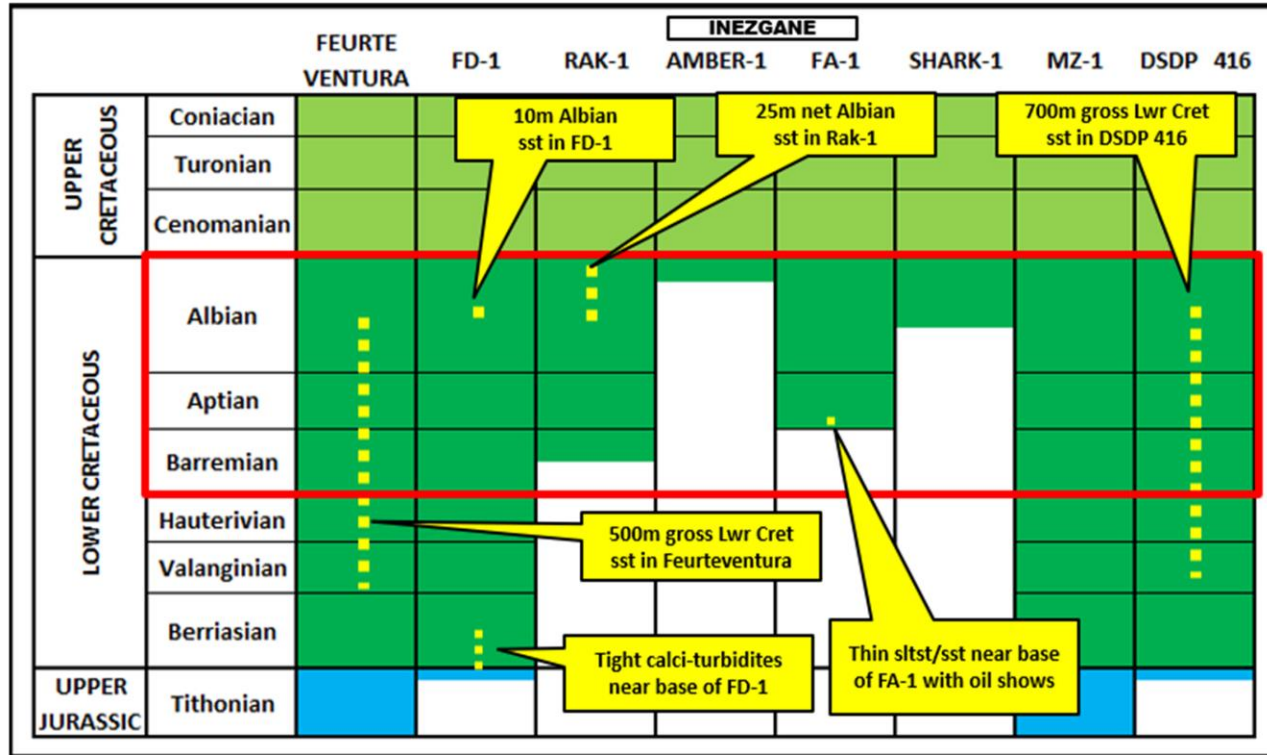
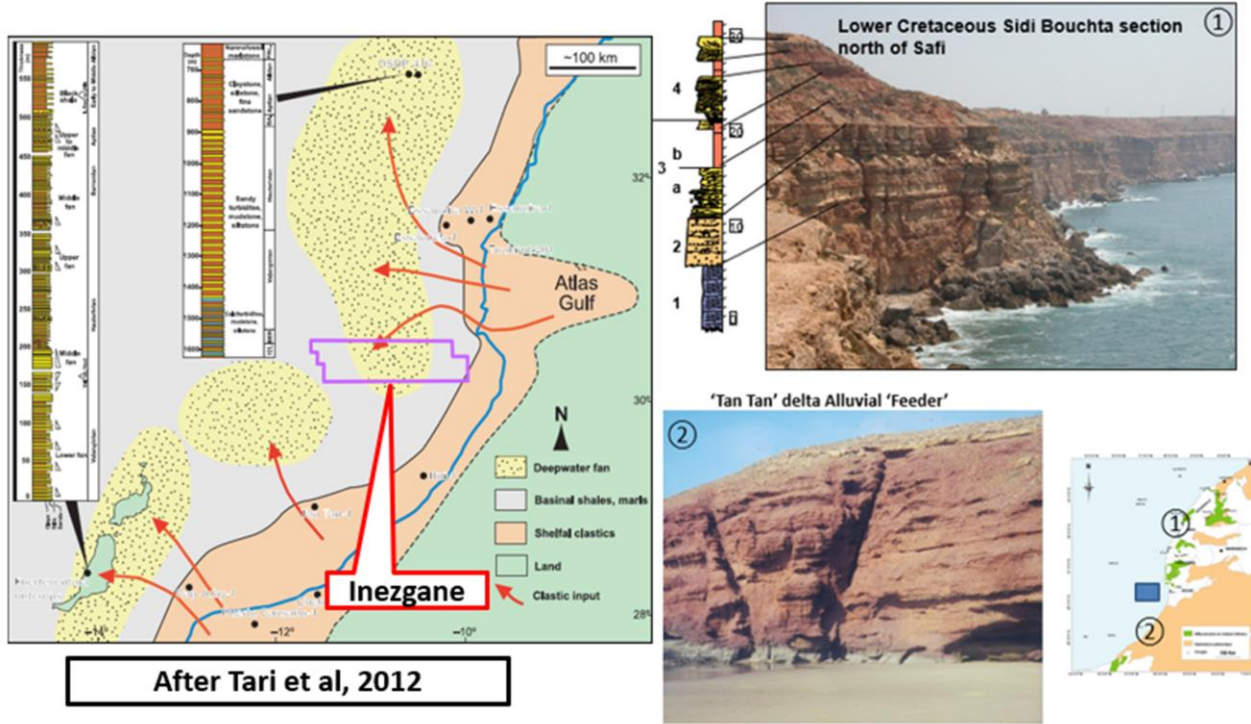
3D seismic data



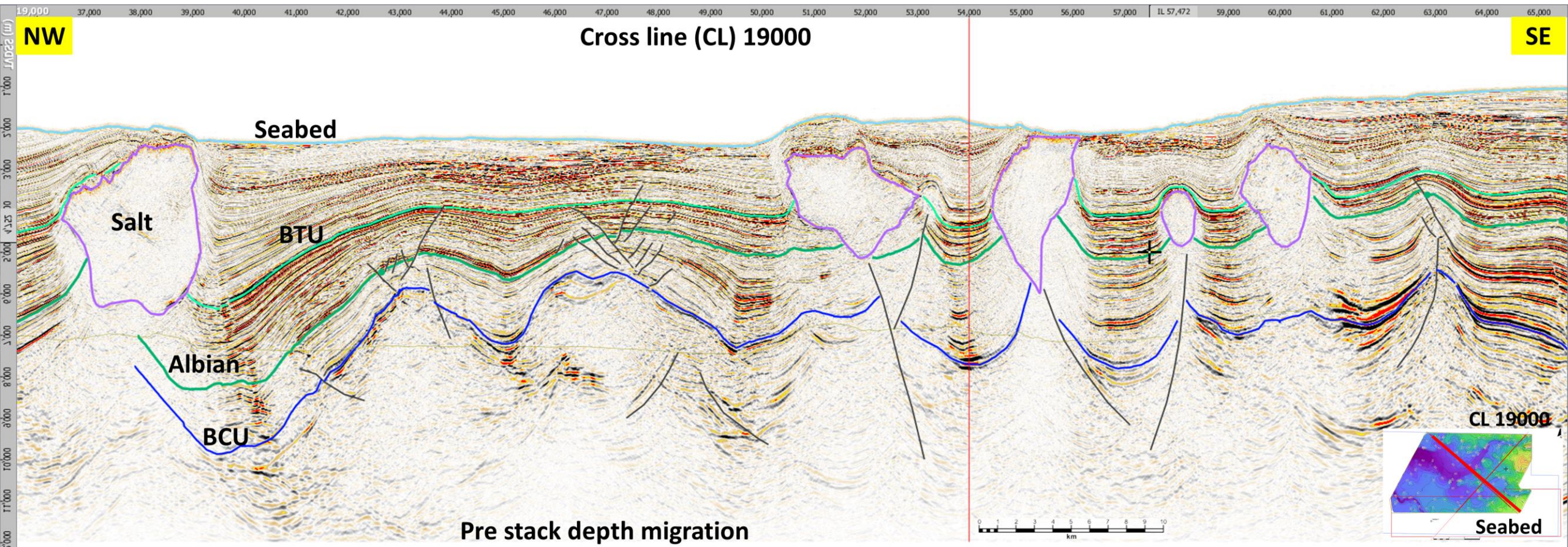
First impressions



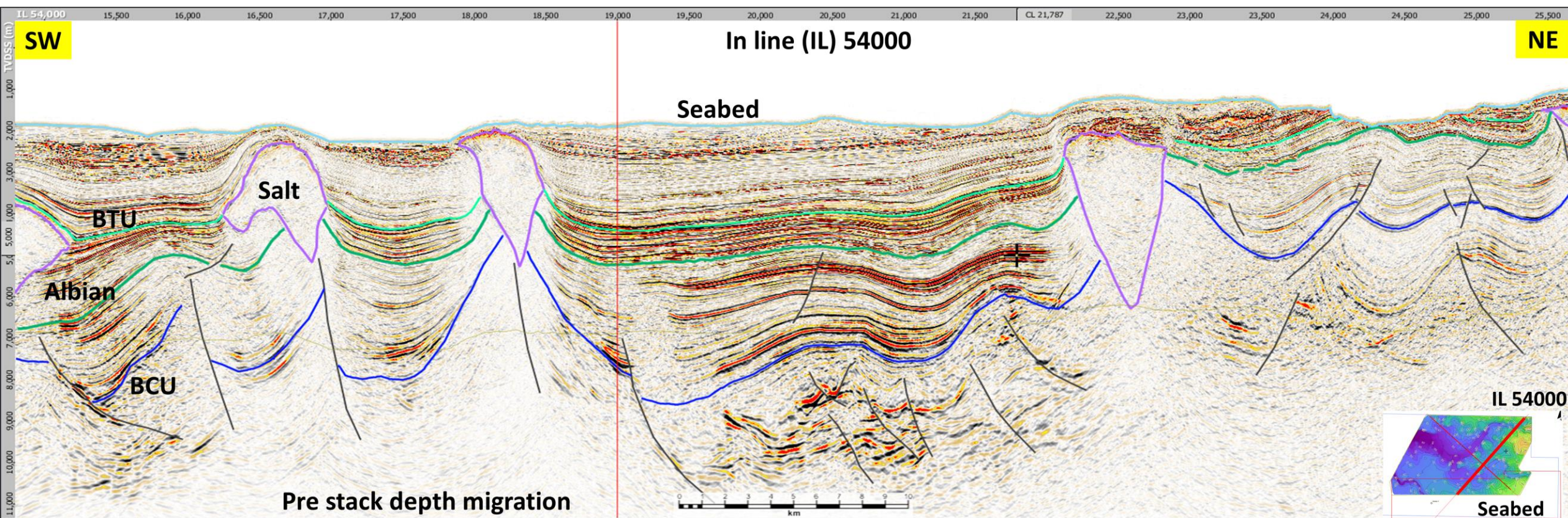
Lower Cretaceous Fan Sand Concept



Seismic line CL 19000



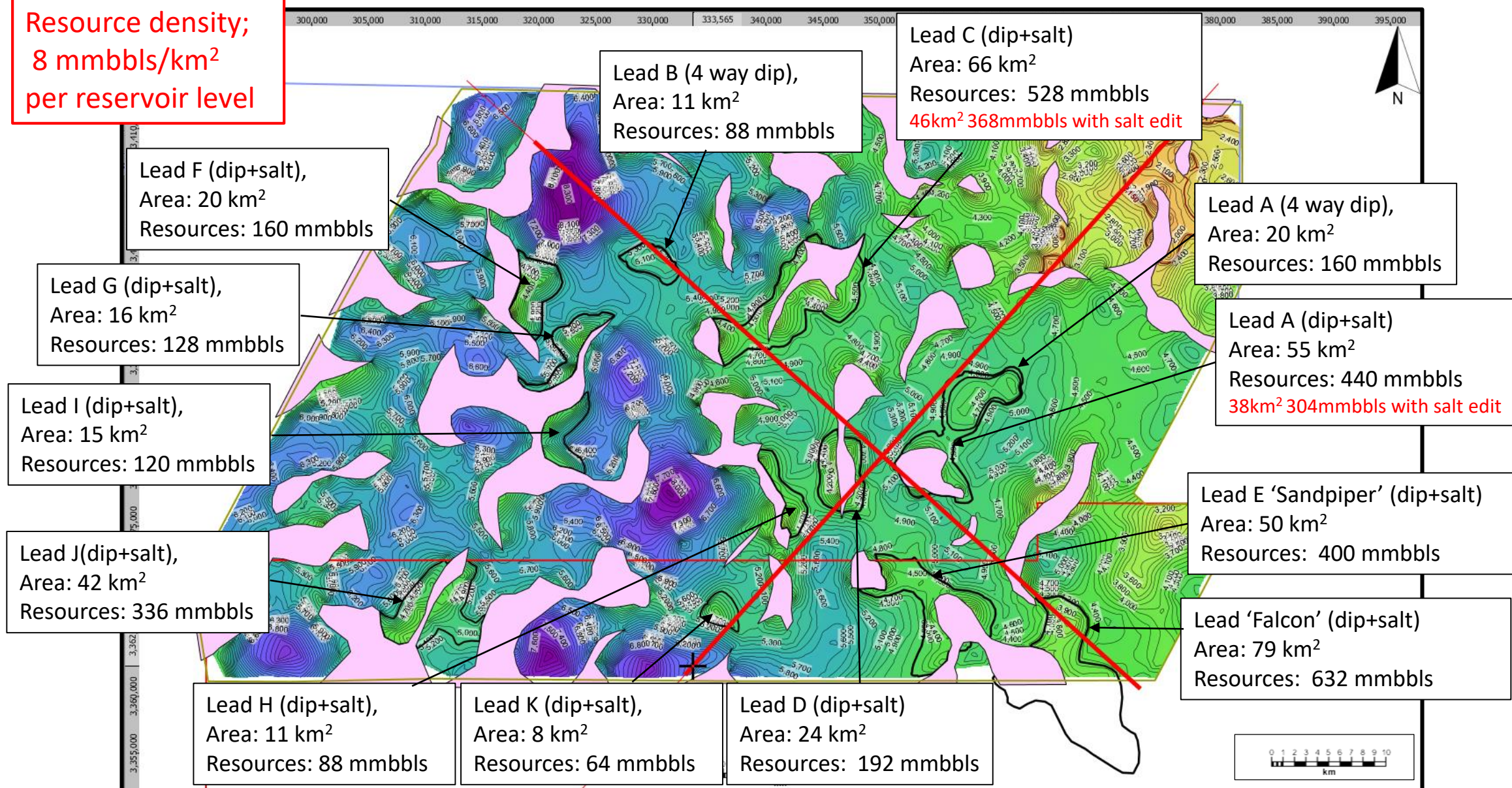
IL 54000

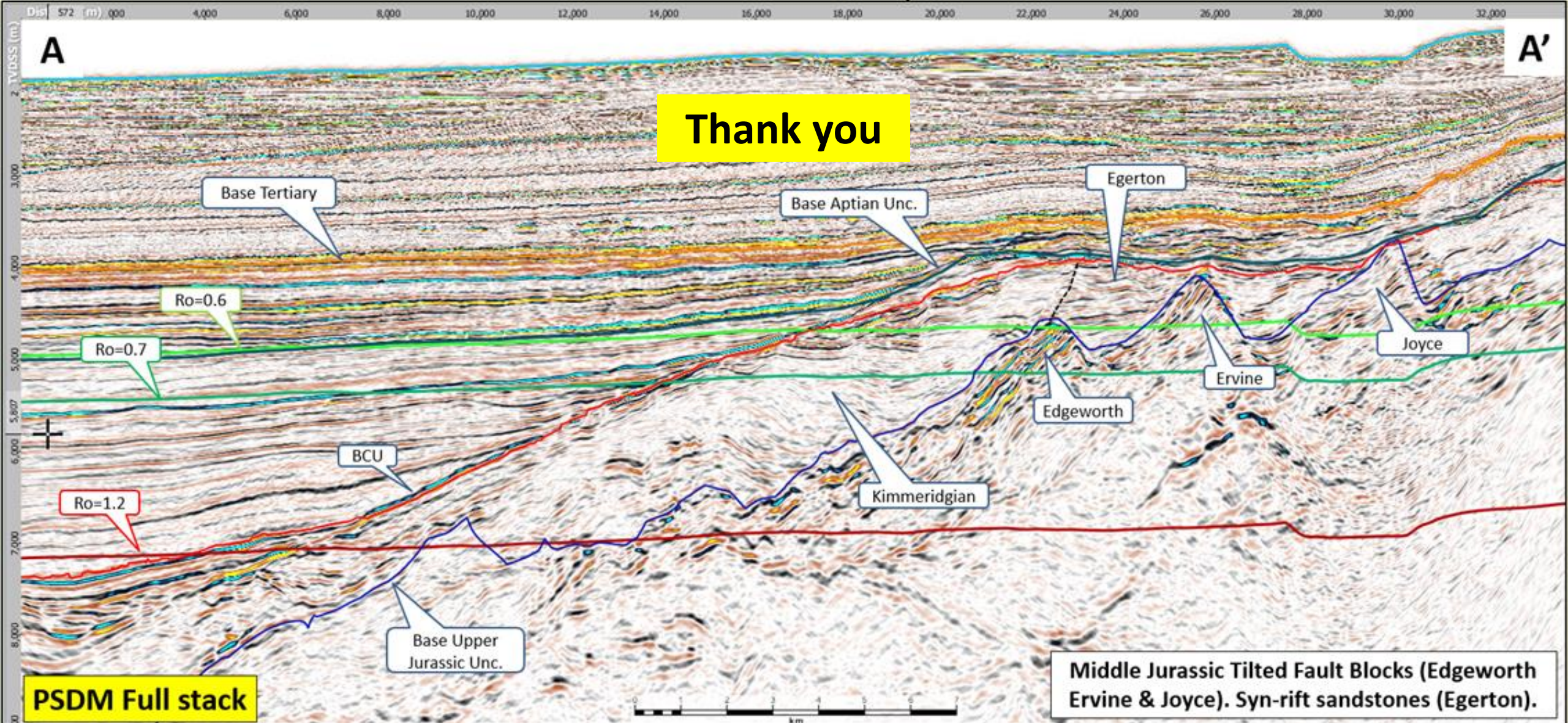


Inezgane Morocco. Lead map with indicative resources, 10th Dec 2019

For leads A & C area reduced for salt body

Resource density;
8 mmbbls/km²
per reservoir level





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