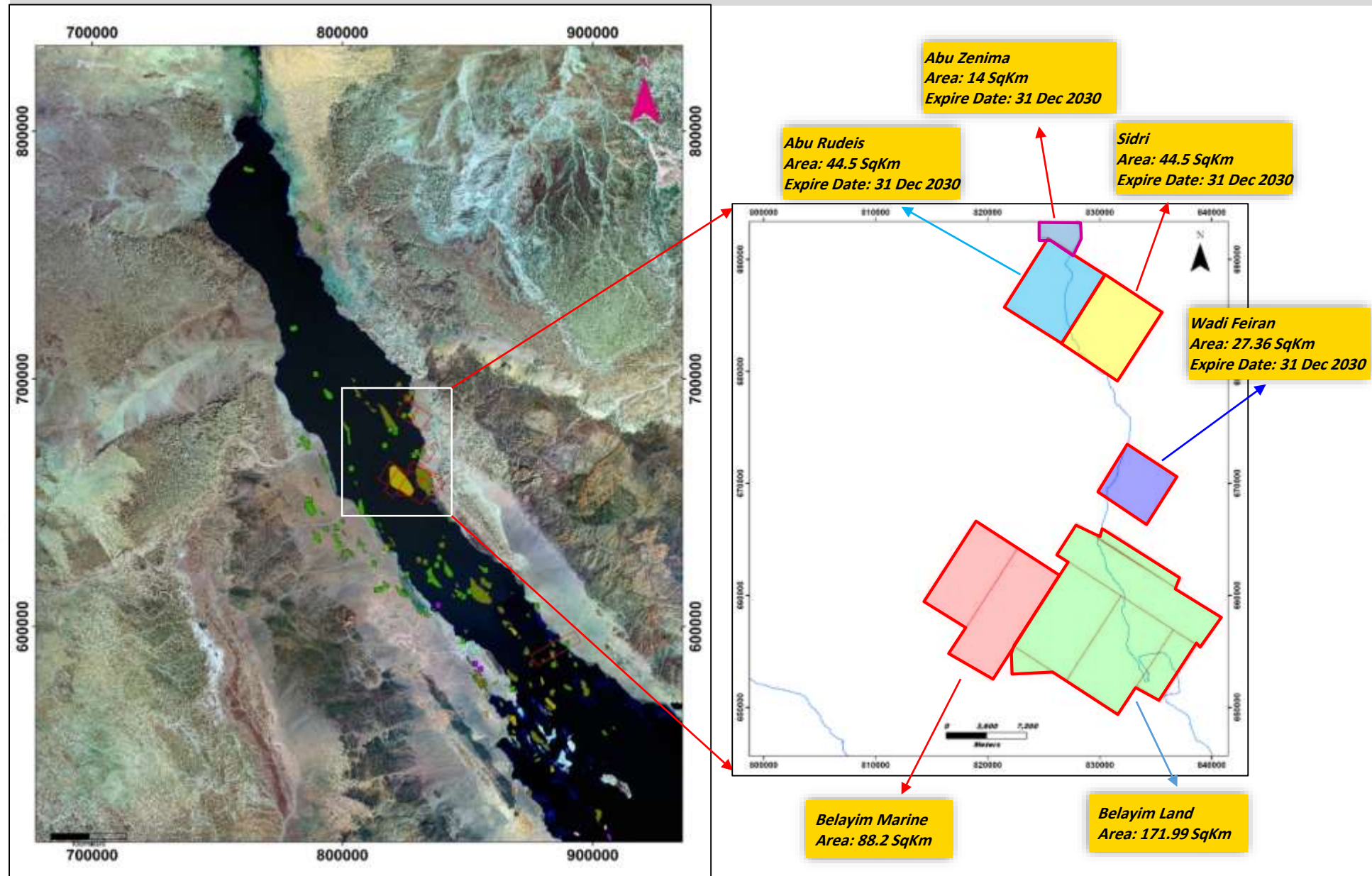


The background features a large, faded Petrobel logo. It is a circular emblem with a yellow sun in the center, a red flame at the bottom, and a blue sea below. A white oil rig is positioned behind the sun. The word "PETROBEL" is written in a semi-circle at the bottom, and Arabic script is at the top.

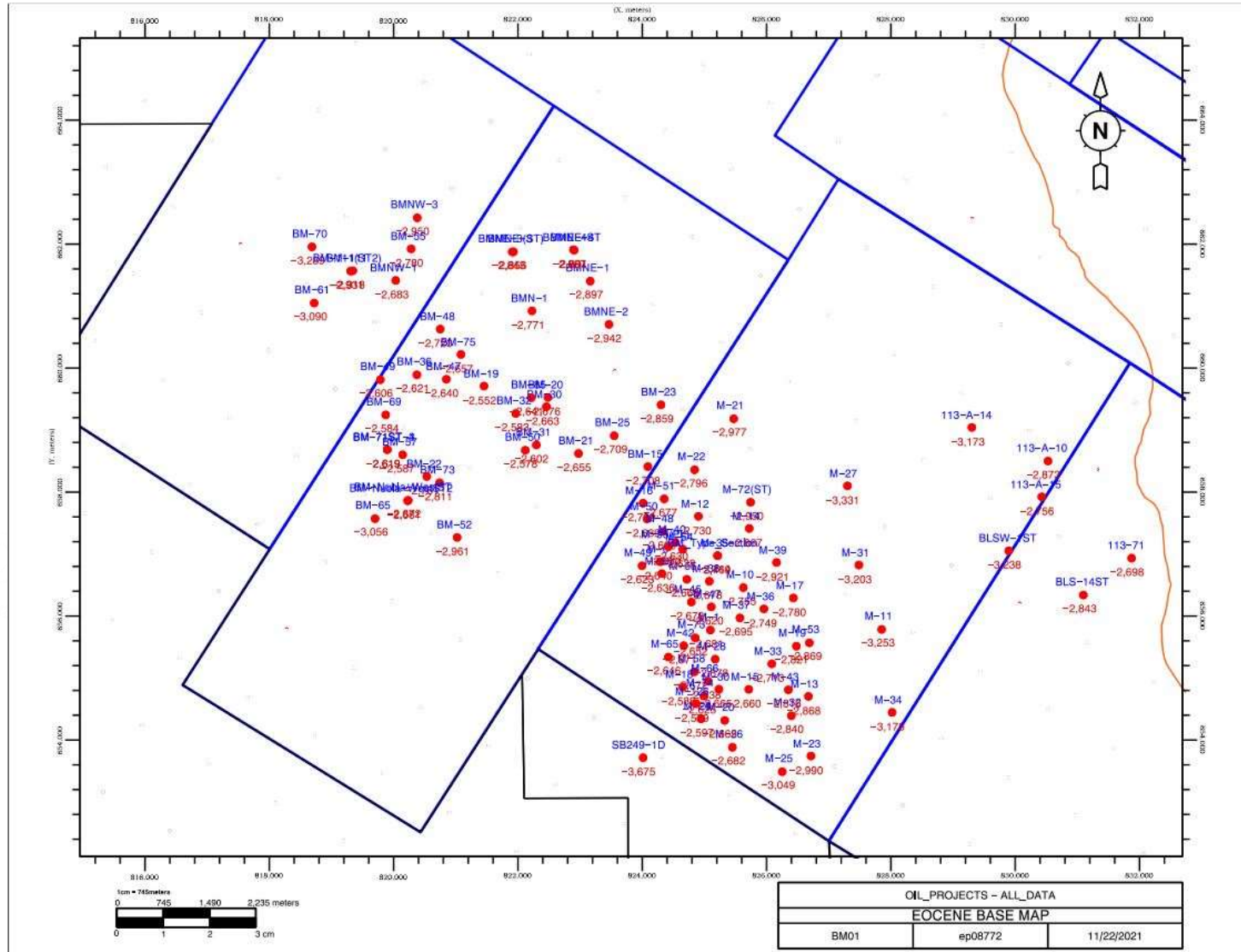
Carboante Workshop Belayim Marine Field Nov. 2021



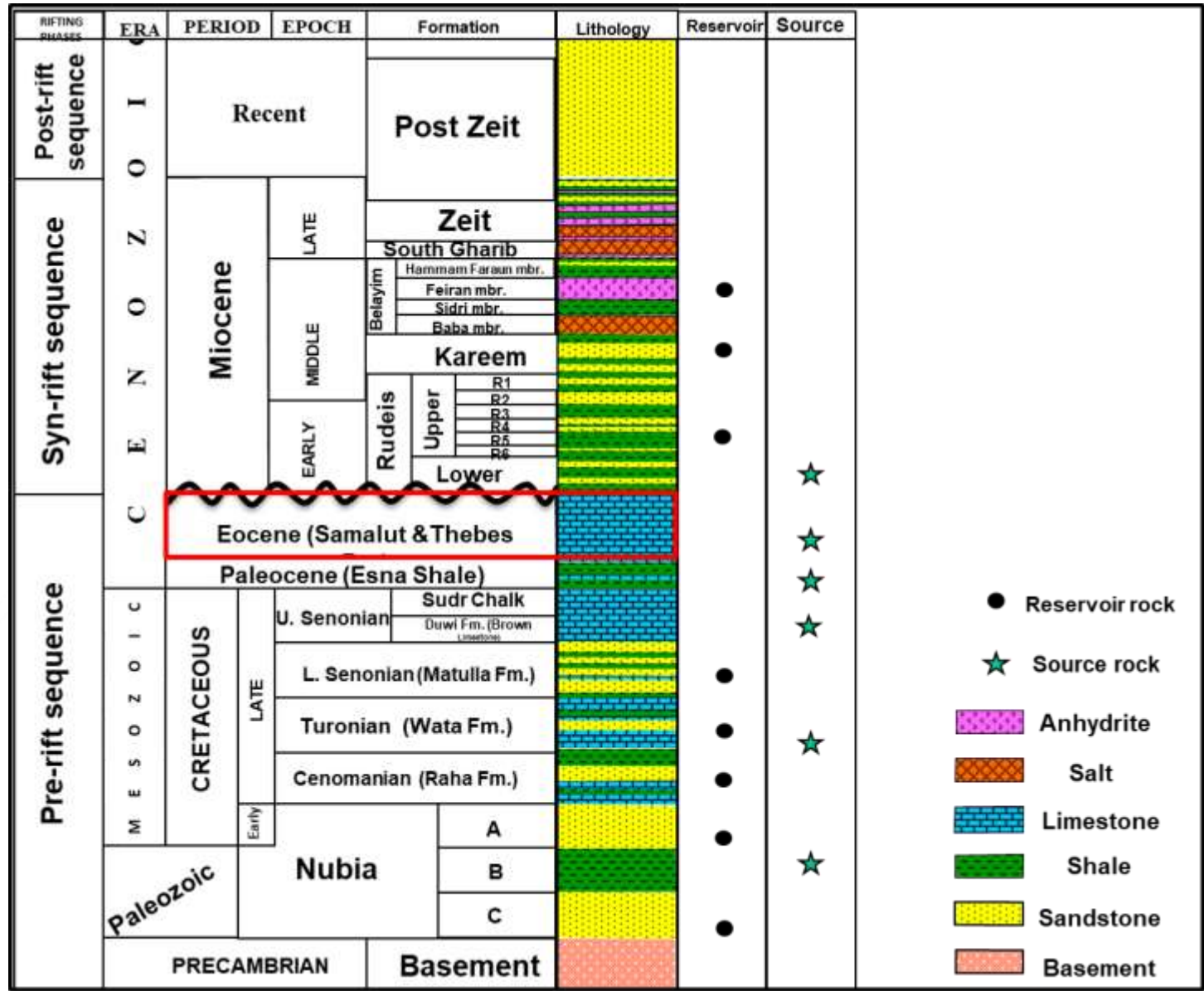
Location Map of Belayim Marine Field



Eocene Location Map



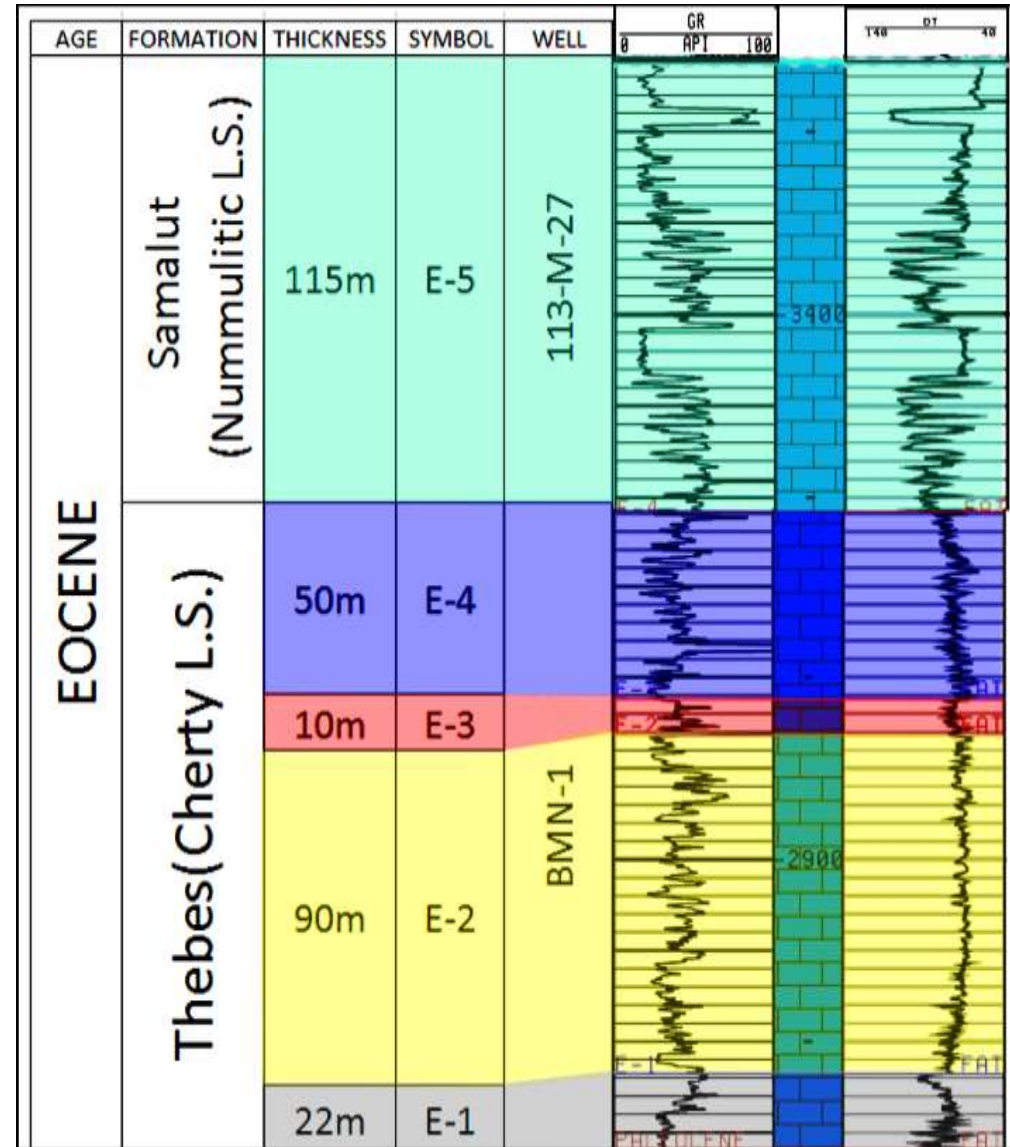
Stratigraphic Column of Belayim Marine Field



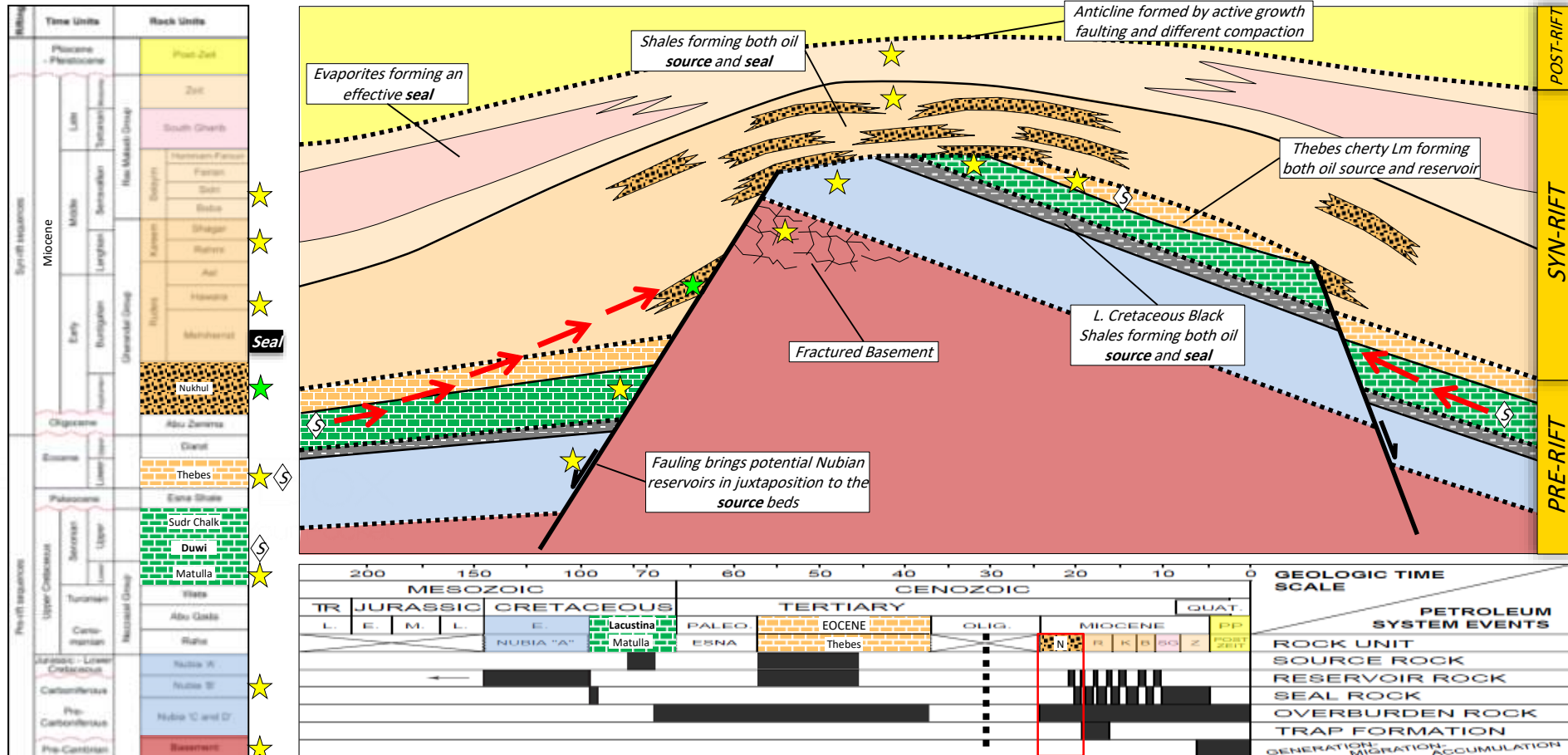
Sub-Division of Eocene in Belayim Marine Field

This division was mentioned in the report (Stratigraphy of Eocene rocks), made by El-Heiny and Enani 1984.

- The Eocene type log was taken from wells BMN-1, 113-M-13 & 113-M-27 taking sonic log as a base for the division.
- The composite Sonic log type (287m) could be subdivided into 5 suggestive Sonic log units mentioned from older to younger E1, E2, E3, E4 and E5.
- Sonic log unit E1 corresponds to the argillaceous limestone of the Lower Eocene age (Thebes Fm., most lower part).
- Sonic log units E2, E3 and E4 correspond to the cherty lime stone of the Lower Eocene age (Thebes Fm., upper part).
- While sonic log unit E5 is equivalent to chalky limestone of Middle Eocene age (Nummulites spp. Zone), (Samalut or Darat Fm).



Gulf of Suez: Play Concept



Eocene Structural Contour Map

91 wells entered Eocene
59 wells entered E2

25 wells enter E2 as a Erosion Surface

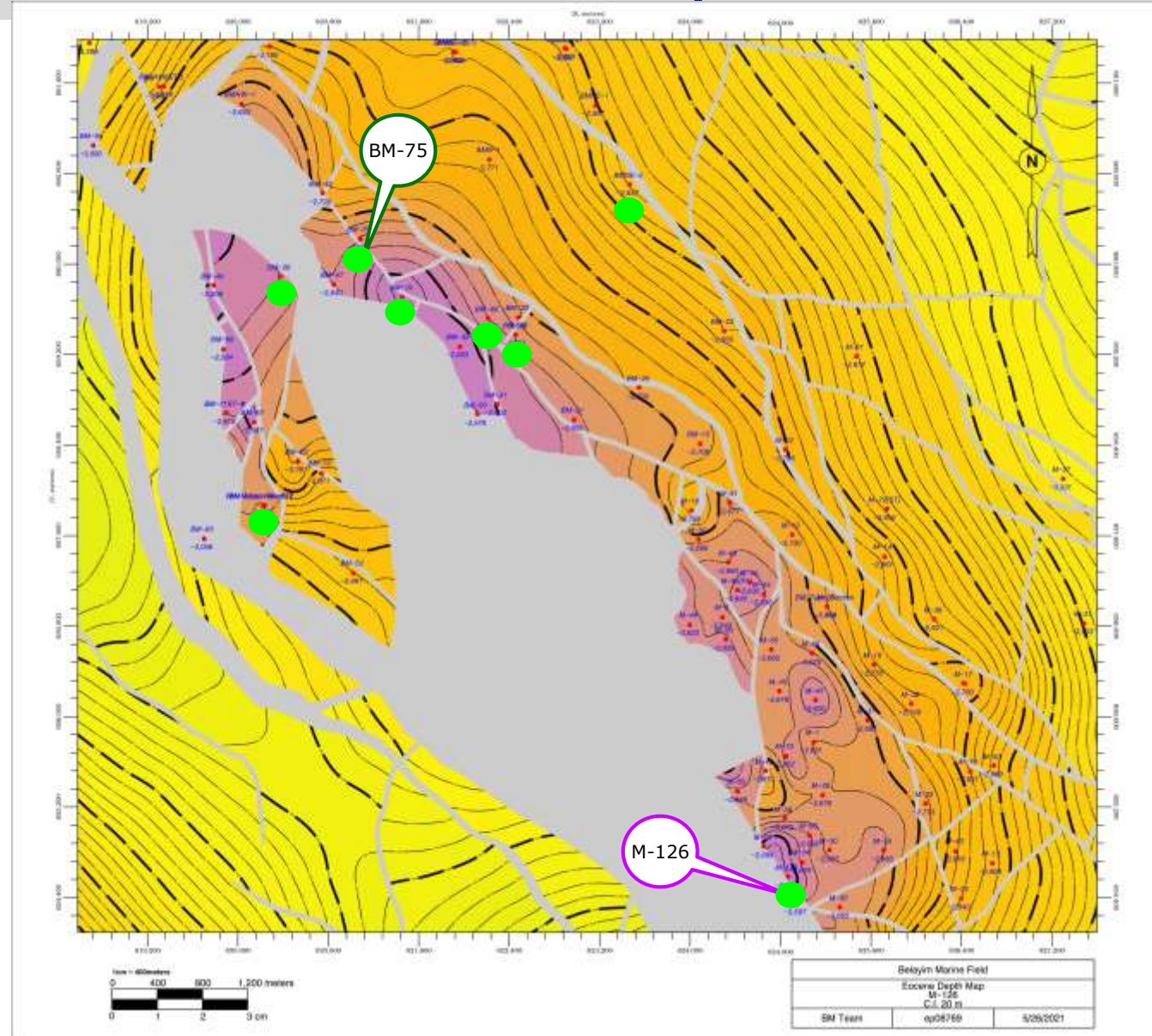
18 Wells Entered E1

6 Wells TD in E2

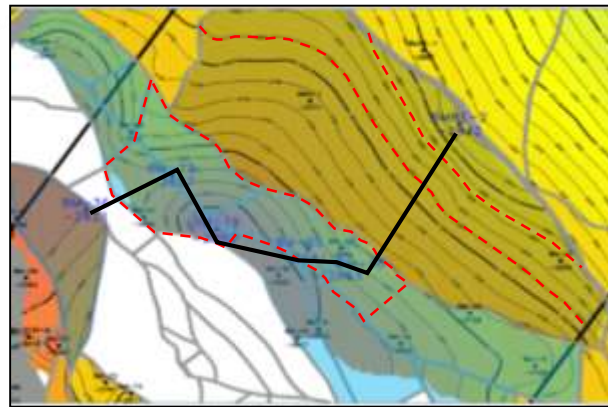
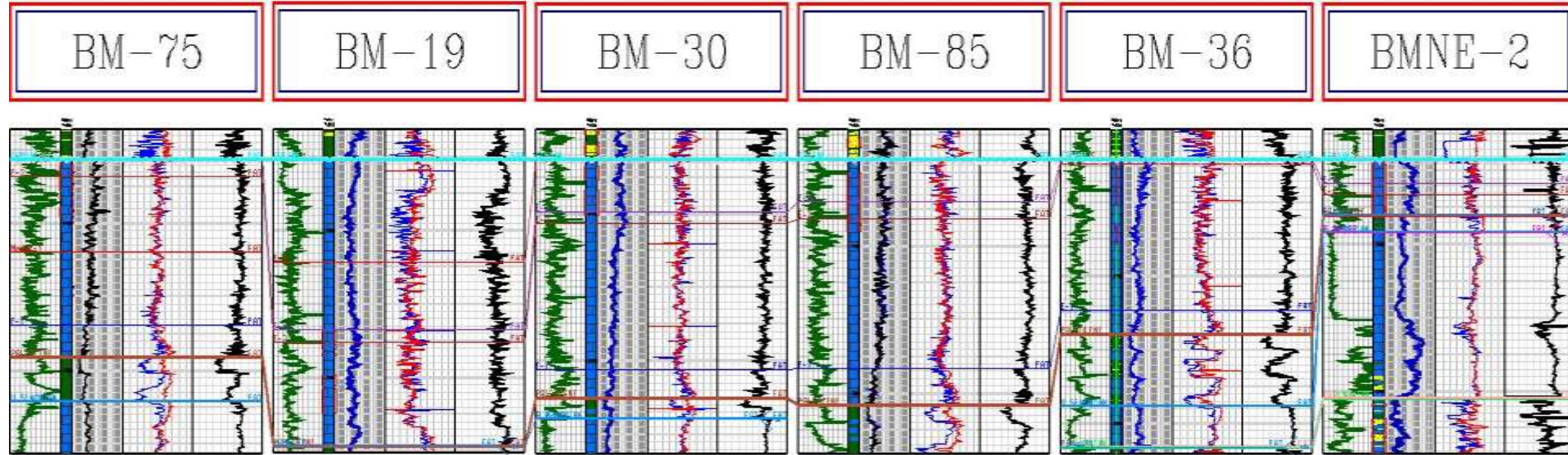
1 Well Faulted to Paleocene

8 Wells perforated in Thebes

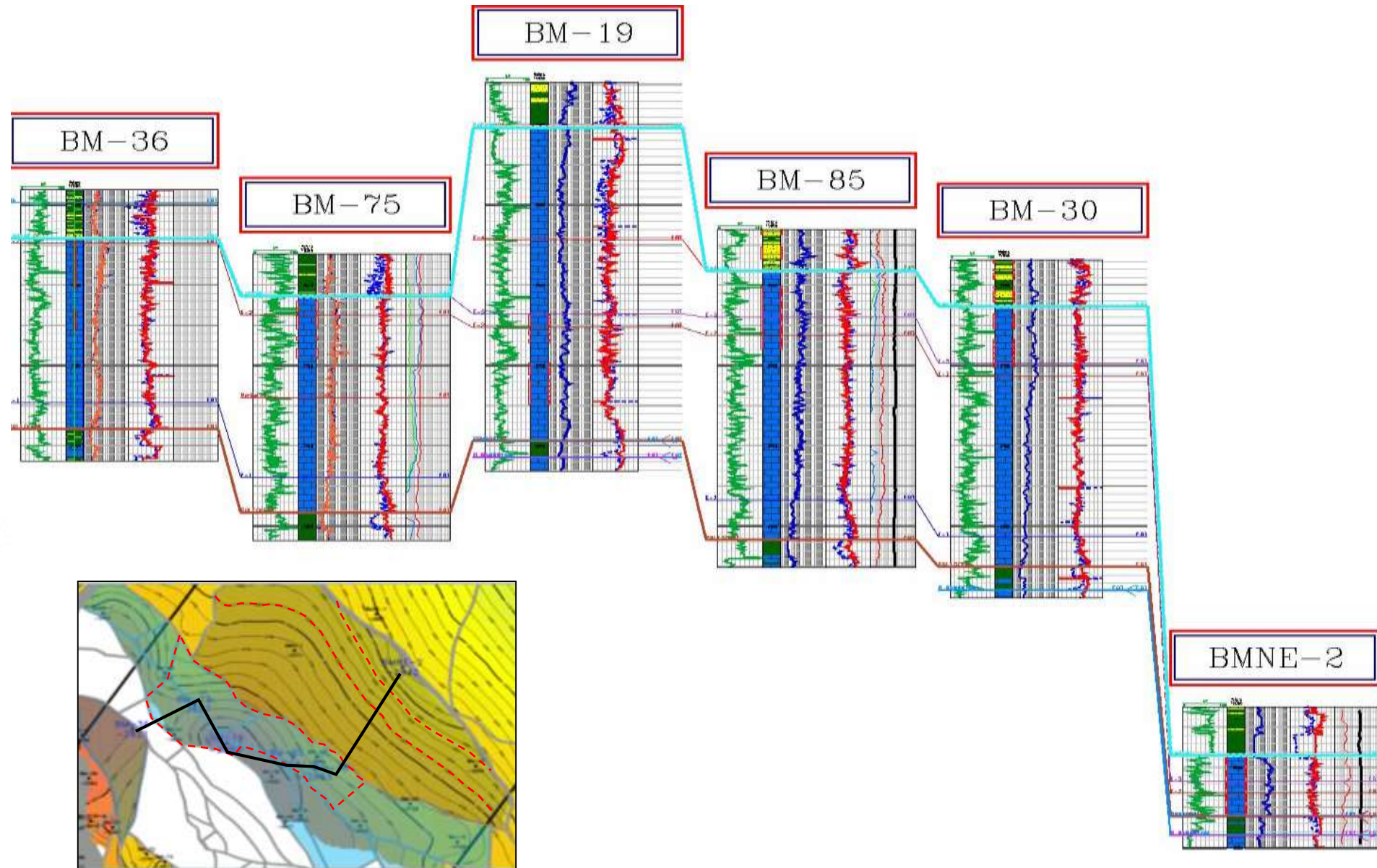
7 Wells produced



Stratigraphic Correlation Panel for Eocene



Structure Correlation Panel for Eocene

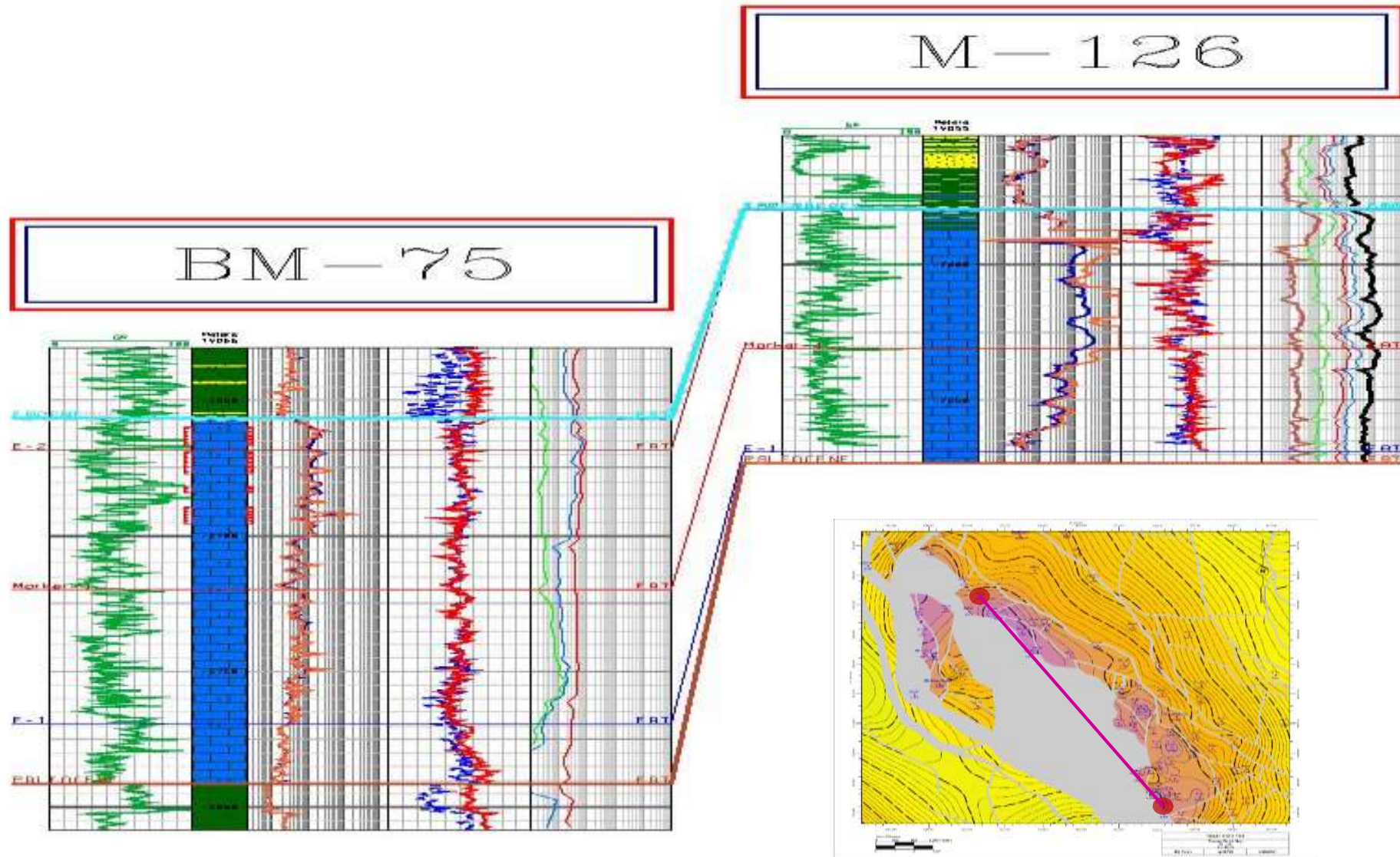


XRD Petrography Data analysis

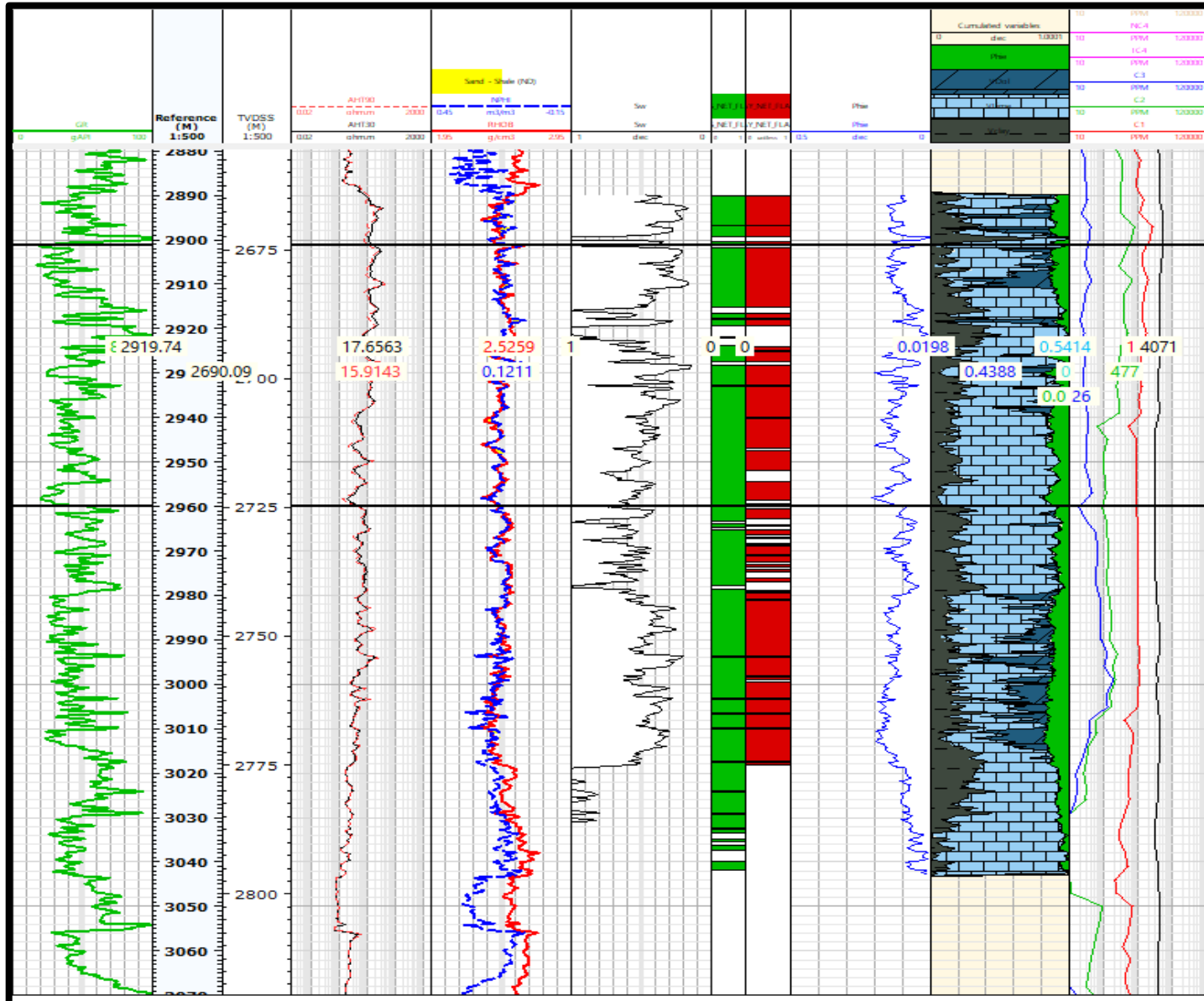
well\ Mineral %	Calcite %	Dolomite %	Quartz %	Caly %	No. of Samples	Production (bbls)
BM-75	58	7	25	10	20	143000
BM-36	50	5	35	10	5	15000
BM-19	10	50	40	0	8	139000
BMNE-2	65	0	30	5	6	279000
BM-85	74	0	15	13	3	3000
M-126	55	6	35	4	15	5000
						1731000



Structure Correlation Panel for Eocene



Petrophysical Evaluation for well BM-75



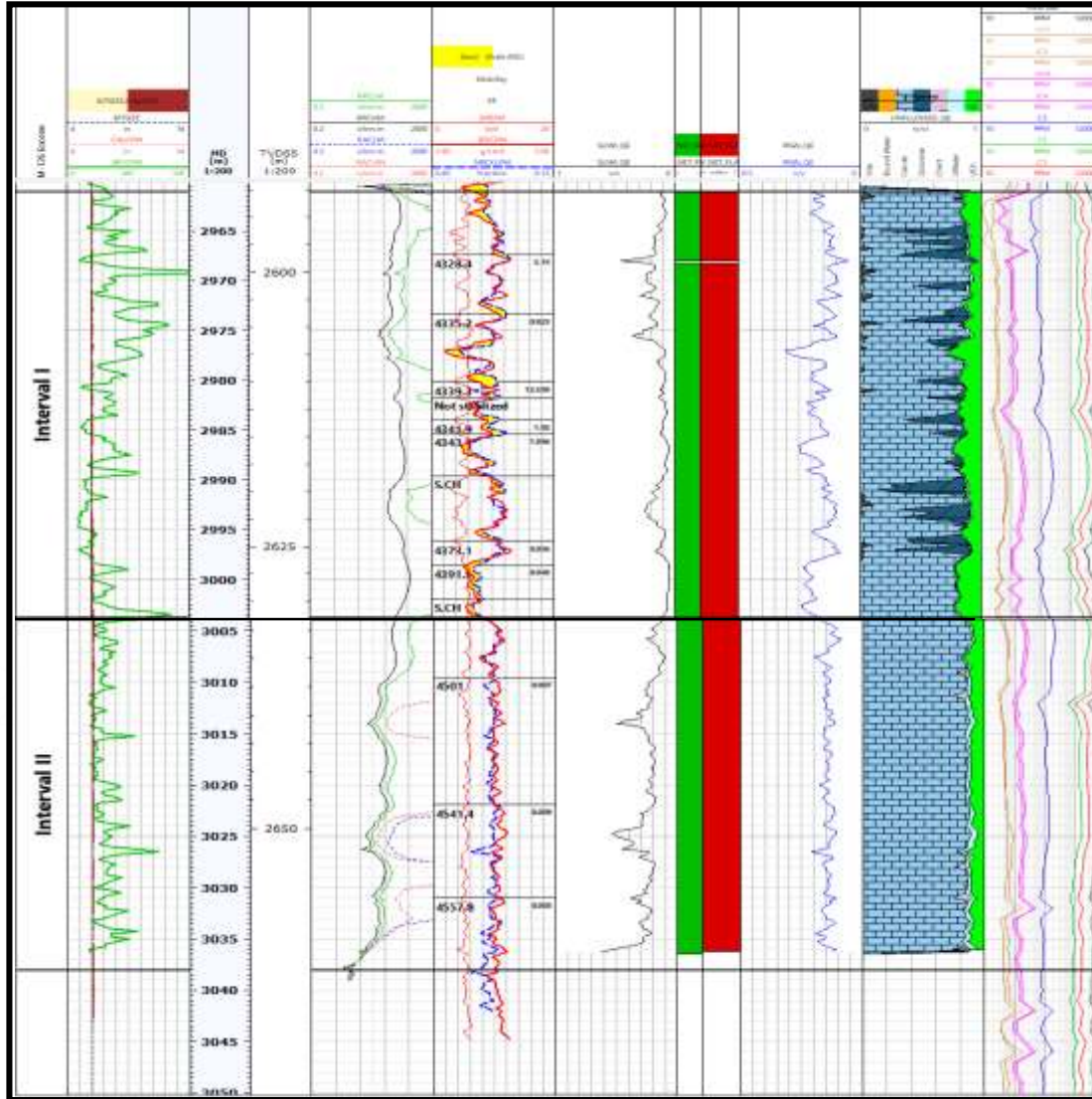
Cut off Parameters
 Vsh : 40 %
 φ : 6 %
 Sw : 60 %

E-2
 G.Thickness: 117 m
 Net reservoir: 95 m
 pay: 80 m
 φ av.: 13 %
 Sw av.: 48%

E-1
 G.Thickness: 26 m
 Net reservoir: 20 m
 pay: 0 m



Petrophysical Evaluation for well M-126



Salinity used 70,000 ppm
Rw : 0.044 ohm.m

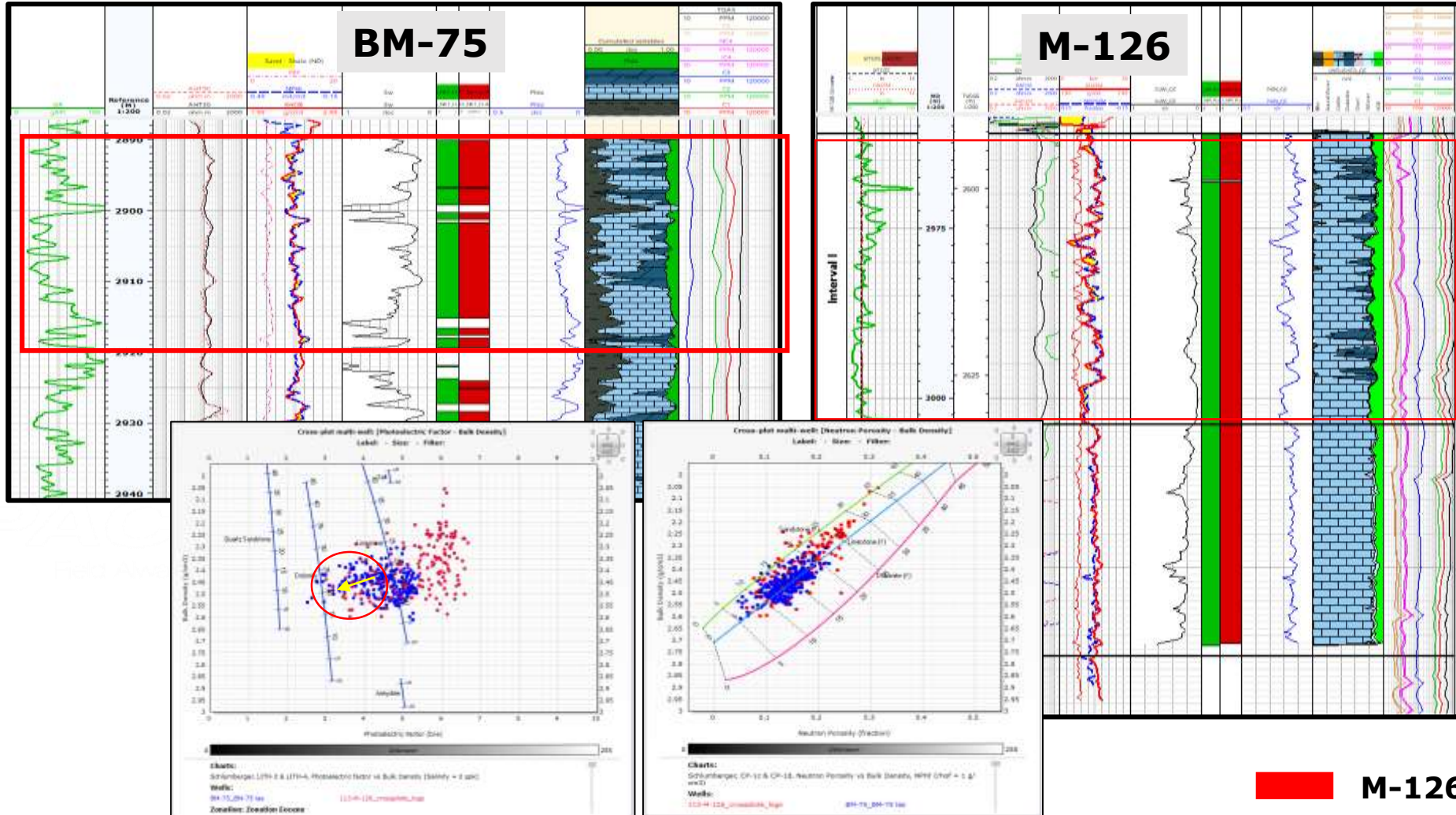
Cutoffs
Phi = 6 % & Sw =
60 % & Vsh = 40
%

Eocene (Interval I)
Interval: 2961-3004(TVDSS 2593-2631.5)m
Gross thickness: 43(TVDss: 39 m)
Gross reservoir: 43 m (TVDss: 395 m)
Net. Pay : 43 m (TVDss: 39 m.)
Phi Av. : 16%
Sw av. : 11%

Eocene (Interval II)
Interval: 3004-3036(TVDSS 2631.5-2661)m
Gross thickness: 32(TVDss: 29 m)
Gross reservoir: 32 m (TVDss: 29 m)
Net. Pay : 32 m (TVDss: 29 m.)
Phi Av. : 14%
Sw av. : 25%



113-M-126 Vs BM-75



Lithology Identification crossplots:

- Density neutron crossplot indicate that the main lithology is limestone
- Density-Pef crossplot (independent the porosity) show the presence of dolomite with limestone

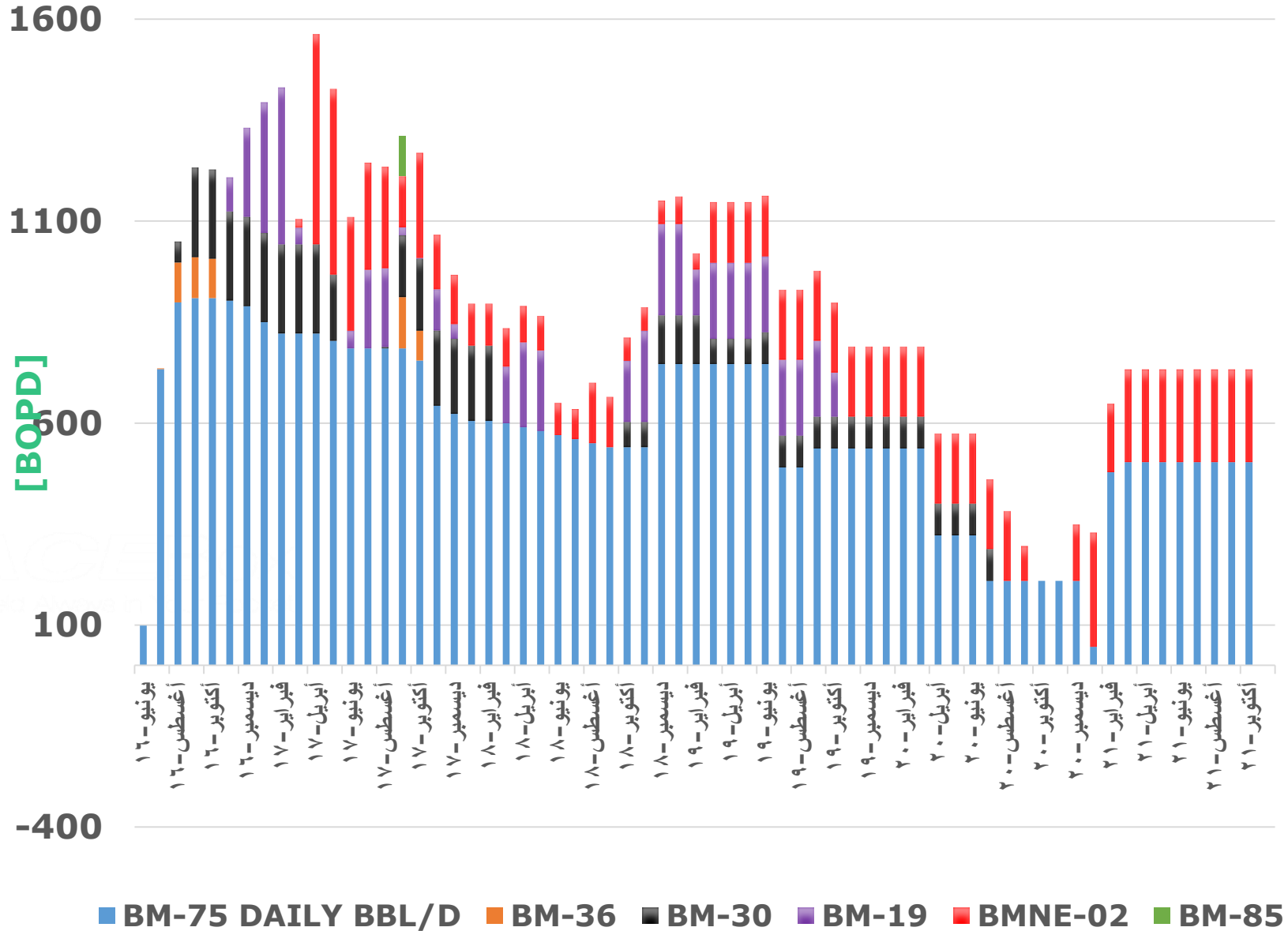


OOIP & RESERVE

Reservoir	Well name	OOIP	Add. Reserves	Ult. RF %	Cumm. Production @31-10-2021	Current RF %	Remaining Reserves
		MMSTB	MMSTB		MMSTB		MMSTB
EOCENE CARBONATE	BM-36 area BMNE-02 area, BM-75 area	15.5	1.55	10%	1.73	3%	4.65
	113M-126	48.25	4.83	10%			
TOTAL		63.75	6.38	10%	1.73	3%	4.65



Eocene wells production

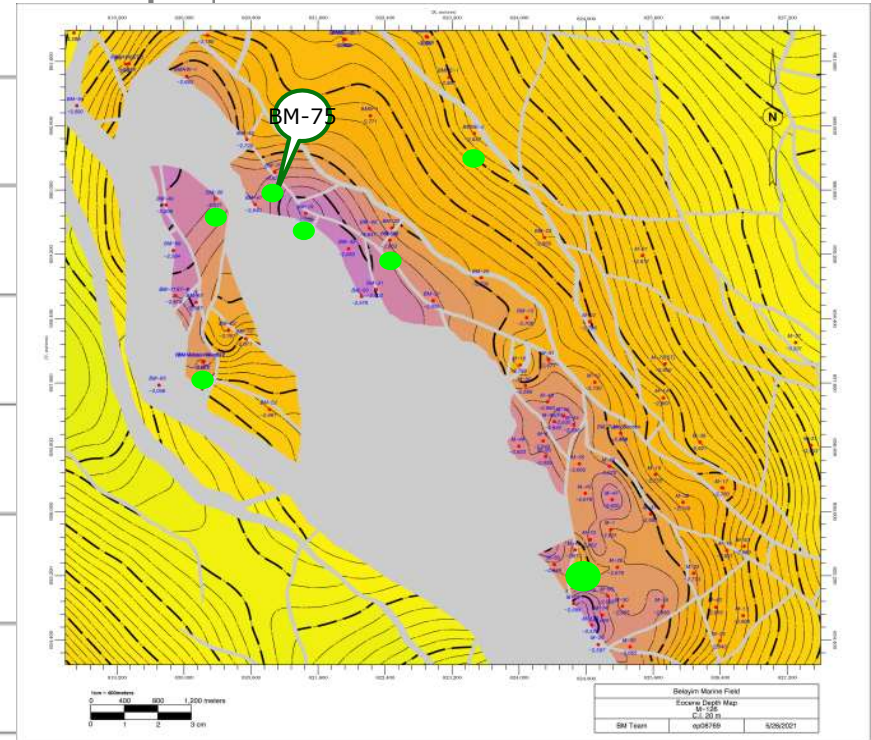
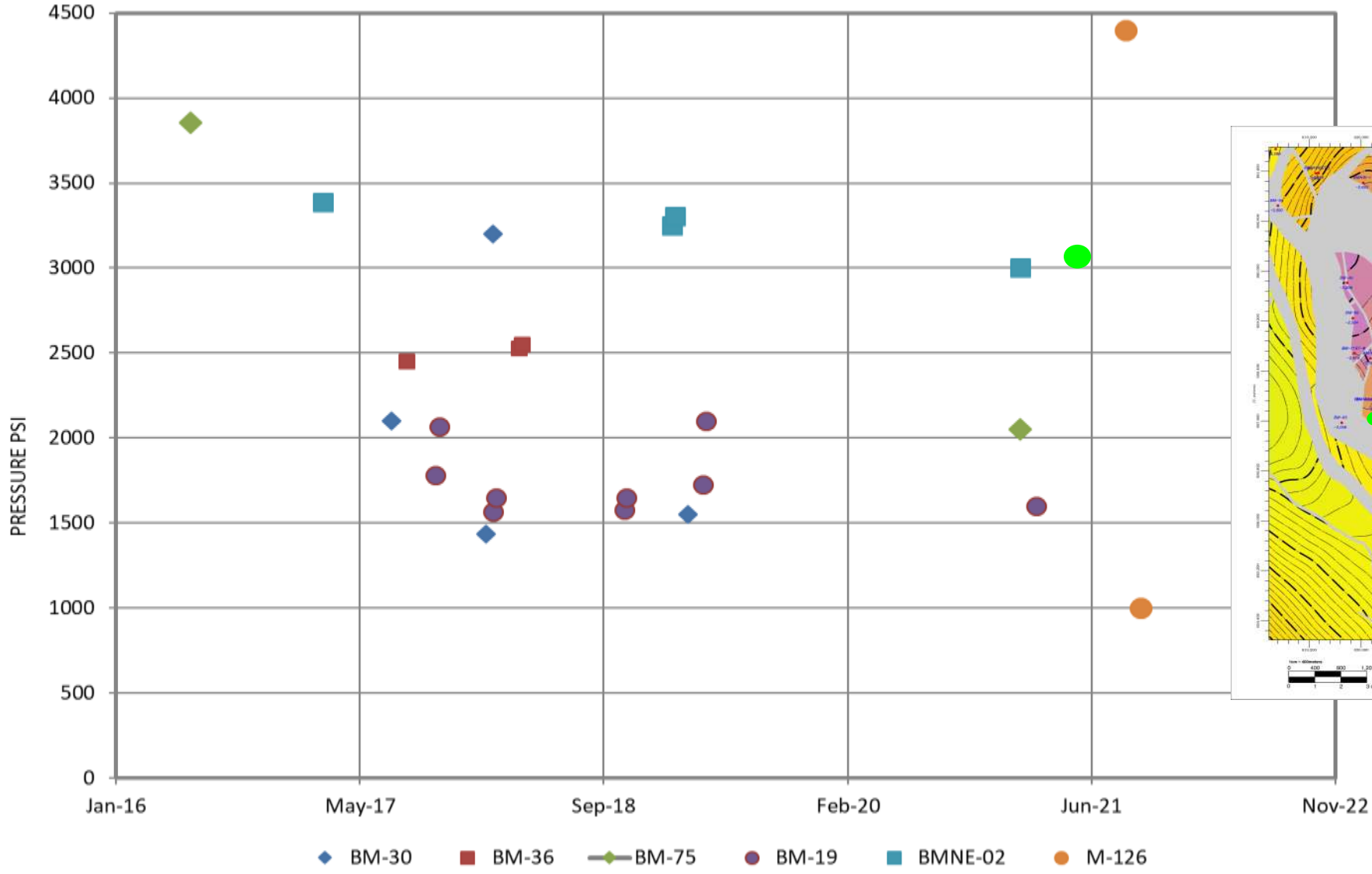


Acidizing Stimulation Jobs for Marine Wells

well order	Well Name	Formation rock (XRD)	pef interval	Used Acid acid dose	pre-flush dose	post-flush dose	Solubility with Acid %	Pressure @ datum 9000 ftssl	Porosity	Injectivity Rate bpm	Production Rate m3/d	remark
1	BM-75	Calcite 64.4% Kaolinite 4.4% Quartz 20.4% Barite 2% Dolomite 8.8%	27	HCl 7.5% 35 gal/ft	pre-flush1 40 gal/ft pre-flush2 35 gal/ft	25 gal/ft	10 % HCL(46-63 %) 15 % HCL(37-57.7 %)	3800	(16 -20) %	1700 psi 0.3 pre flush 1400 psi 3 treatment	150	
2	BM-36	Calcite 43.63-57.99 % clay 0.8-6.49% Quartz 27.17-37.6 % Barite 2.41-5.38 % Dolomite 1.49- 4.67 % Muscovite 2.72-17.66 %	48	HCl 7.5% 35 gal/ft	pre-flush1 40 gal/ft pre-flush2 35 gal/ft	25 gal/ft	7.5 % HCL(45-57 %) 15 % HCL(48.6-58.6 %)	± 2000 still increase	(13 -16) %	2000-2500 psi 0.25 pre flush 1900 psi 2 treatment	20	
3	BM-30	Calcite 46.47-63.56 % Kaolinite 3.59-4.93 % Quartz 24.56-37.86 % Barite 2.36-4.64 % Dolomite 1.83- 12.09 % Siderite 2.08-4.17 %	36	HCl 7.5% 35 gal/ft	pre-flush1 40 gal/ft pre-flush2 35 gal/ft	25 gal/ft	7.5 % HCL (56-65.27 %) 15 % HCL(56-65.21 %) 7.5 % HCL+1.5 % HF (58-65.97 %) 10 % HCL+2.5 % acetic (56.65-61.8%)	± 3200	(13 -16) %	1200 psi (0.2-1.9 BPM)	35	
4	BM-19	Calcite 62-53.56% Dolomite 7.63- 12.56 % Quartz 33.88-41%	39	Emulsified acid 10% (MSR) 25 gal/ft	pre-flush1 35 gal/ft	35 gal/ft	10 % HCL+10% acetic (60.4-67.9 %) 9 % formic acid (61.8-68.5 %) 7.5 %MSR(50.23-56.46%) 10 %MSR(53.9-58.8%) 15 %MSR(59.88-65.16%)	± 2900	(16 -20) %	900 psi 0.5 pre flush 1500 psi 2.5 treatment	75	using 10 % MSR against perf
	SIDRI-8	Calcite 46 % Quartz 16.7 % Barite 8.35 % Dolomite 12 % Siderite 8.5 %	100	HCl 15% 40 gal/ft coil tubing soaking2 Hour	40 gal/ft	40 gal/ft	10 % HCL(47.8-52.4 %) 15 % HCL(52-57.1 %)				50	
5	BM-NE-2	Calcite 62.33-75.77 % clay 2.46-9.36% Quartz 20.46-40.61%	37	HCl 10% 50 gal/ft	pre-flush1 40 gal/ft pre-flush2 35 gal/ft	25 gal/ft	7.5 % HCL(46.24-67.84 %) 15 % HCL(48.7-70.74 %)	± 3400		1500 psi 0.2-0.4 pre flush 1600 psi 0.9 to 1.5 treat 1500 psi 1.5-2 post flush	80	using 15 % HCL against perf
6	BM-85	Calcite 72.75-79.66% Quartz 3.83 - 16.37% Kaolinite 12.17-16.51%	46	HCL 10% 50 gal/ft	50gal/ft	36 gal/ft	10 % MSR(61.65-62.88 %) 15 % MSR(68.88-72.38 %)		900 psi (1.2-2.4) 500 psi to 300 psi then to zero 5 min (3 bpm)		using 15 % HCL against perf



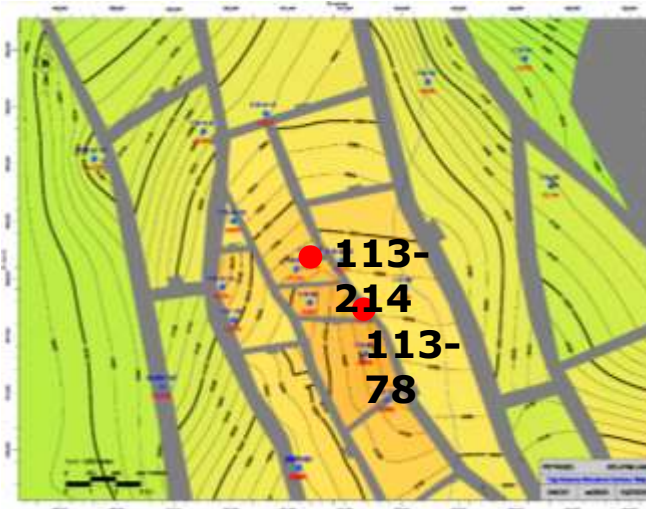
EOCENE PRESSURE PERFORMANCE



Belayim Land Field

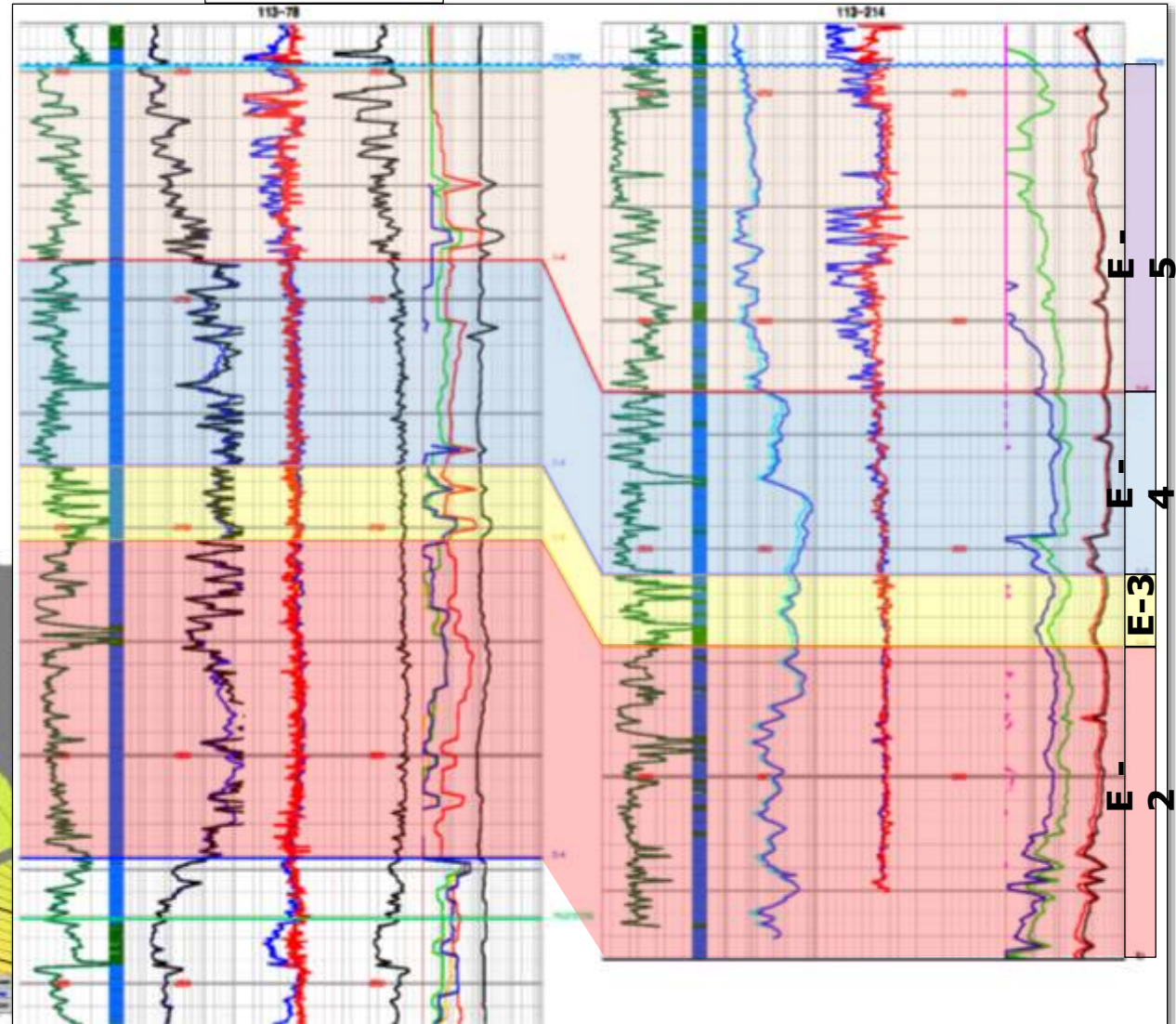


Stratigraphic Correlation on Eocene

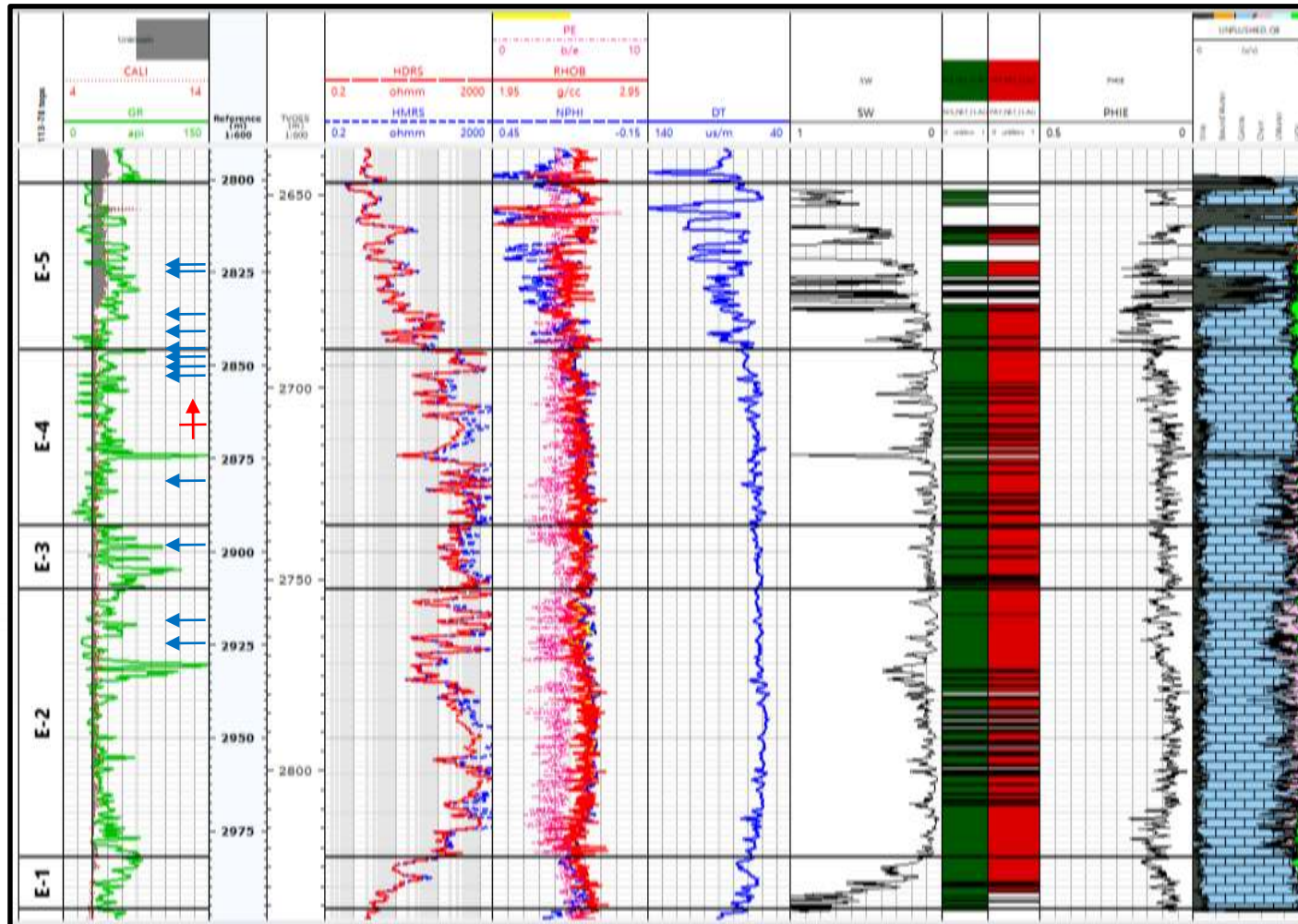


113-78

113-214



Petrophysical Evaluation for 113-78 well (Eocene Fm)

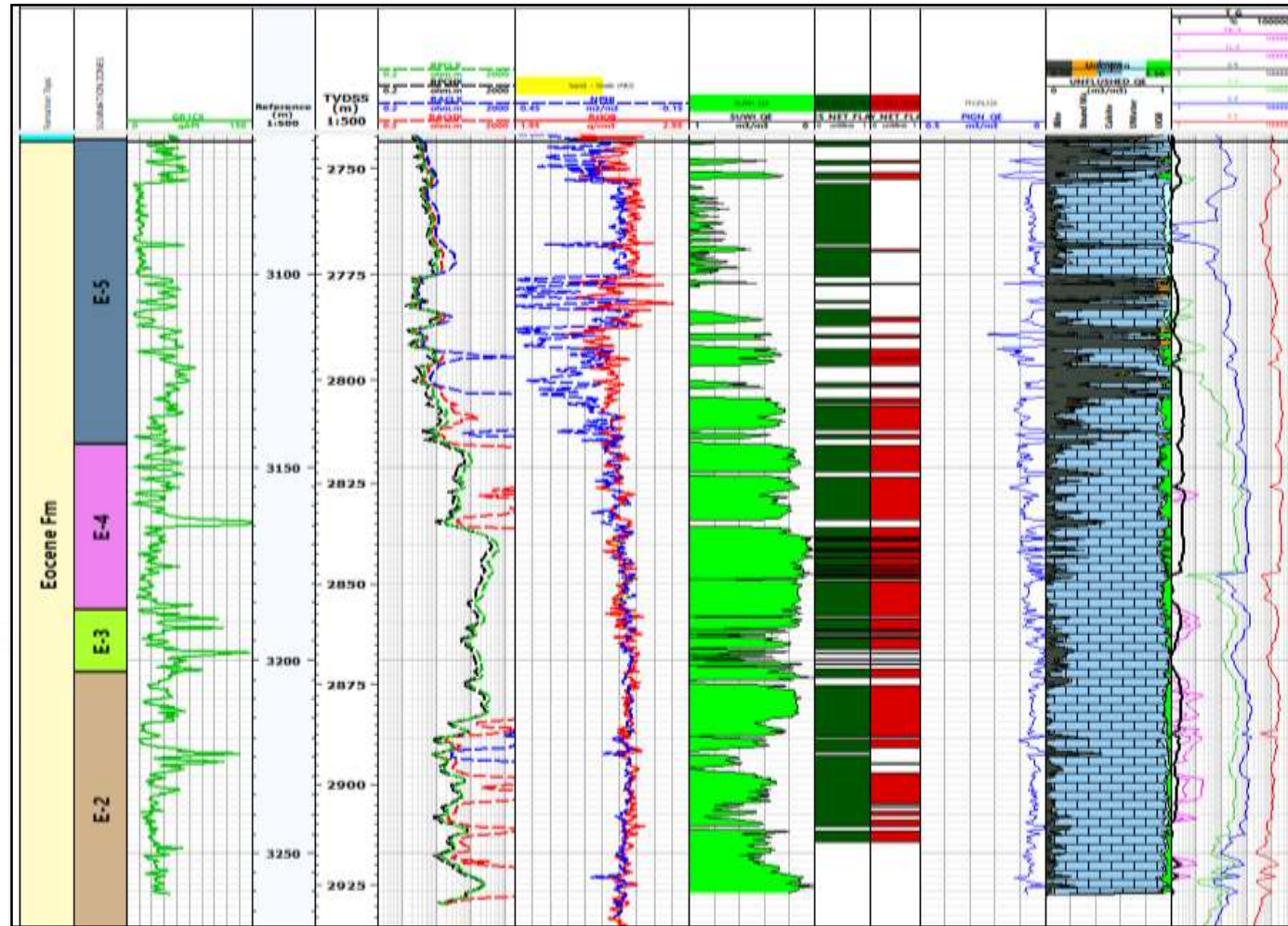


Eocene (E-5) Interval: 2801-2845.5 (TVDSS: 2646.5-2690m) Gross thickness: 44.5(TVDss: 43 m) Gross reservoir: 24 m (TVDss: 23 m) Net. Pay : 20.5 m (TVDss: 20 m.) Phi Av. : 14% Sw av. : 22%
Eocene (E-4) Interval: 2845.5-2892.5 (TVDSS: 2690-2735.5m) Gross thickness: 47(TVDss: 45.5 m) Gross reservoir: 36 m (TVDss: 35 m) Net. Pay : 36 m (TVDss: 35 m.) Phi Av. : 10% Sw av. : 10%
Eocene (E-3) Interval: 2892.5-2910 (TVDSS: 2735.5-2752.5m) Gross thickness: 17.5(TVDss: 17 m) Gross reservoir: 11 m (TVDss: 10.5 m) Net. Pay : 11 m (TVDss: 10.5 m.) Phi Av. : 08% Sw av. : 10%
Eocene (E-2) Interval: 2910-2982 (TVDSS: 2752.5-2822.5m) Gross thickness: 72(TVDss: 70 m) Gross reservoir: 42 m (TVDss: 40.7 m) Net. Pay : 42 m (TVDss: 40.7 m.) Phi Av. : 09% Sw av. : 11%
Eocene (E-1) Interval: 2982-2995.5 (TVDSS: 2822.5-2836m) Gross thickness: 13.5(TVDss: 13.5 m) Gross reservoir: 11.7 m (TVDss: 11.5 m) Net. Pay : 8.7 m (TVDss: 8.5 m.) Phi Av. : 11% Sw av. : 28%

+ RFI Test
+ 35 Bbls Oil Cushion W/ Gases While CIRC. BTM UP



Petrophysical Evaluation for 113-214 Well (6" HOLE) ((Eocene Fm))



E-5: 3065 – 3144 m. (TVDss: 2743 - 2815 m.)
Gross Thickness : 78 m. (TVDss: 72 m.)
Net Reservoir : 47 m. (TVDss: 43 m.)
Net Pay : 18 m. (TVDss: 17 m.)
Avg. Por. (Pay) : 11 %
Avg.SW (Pay) : 37 %

E-4: 3144 – 3186 m. (TVDss: 2815 - 2856 m.)
Gross Thickness : 42 m. (TVDss: 40 m.)
Net Reservoir : 36 m. (TVDss: 34 m.)
Net Pay : 36 m. (TVDss: 34 m.)
Avg. Por. (Pay) : 7 %
Avg.SW (Pay) : 17 %

E-3: : 3186 – 3202 m. (TVDss: 2756 - 2871 m.)
Gross Thickness : 16 m. (TVDss: 15 m.)
Net Reservoir : 9 m. (TVDss: 9 m.)
Net Pay : 9 m. (TVDss: 9 m.)
Avg. Por. (Pay) : 5 %
Avg.SW (Pay) : 20 %

E-2: : 3202 – 3274 m. (TVDss: 2871 - 2940 m.)
Gross Thickness : 71 m. (TVDss: 68 m.)
Net Reservoir : 39 m. (TVDss: 37 m.)
Net Pay : 30 m. (TVDss: 29 m.)
Avg. Por. (Pay) : 11 %
Avg.SW (Pay) : 27 %



Abu Rudeis/Sidri Field

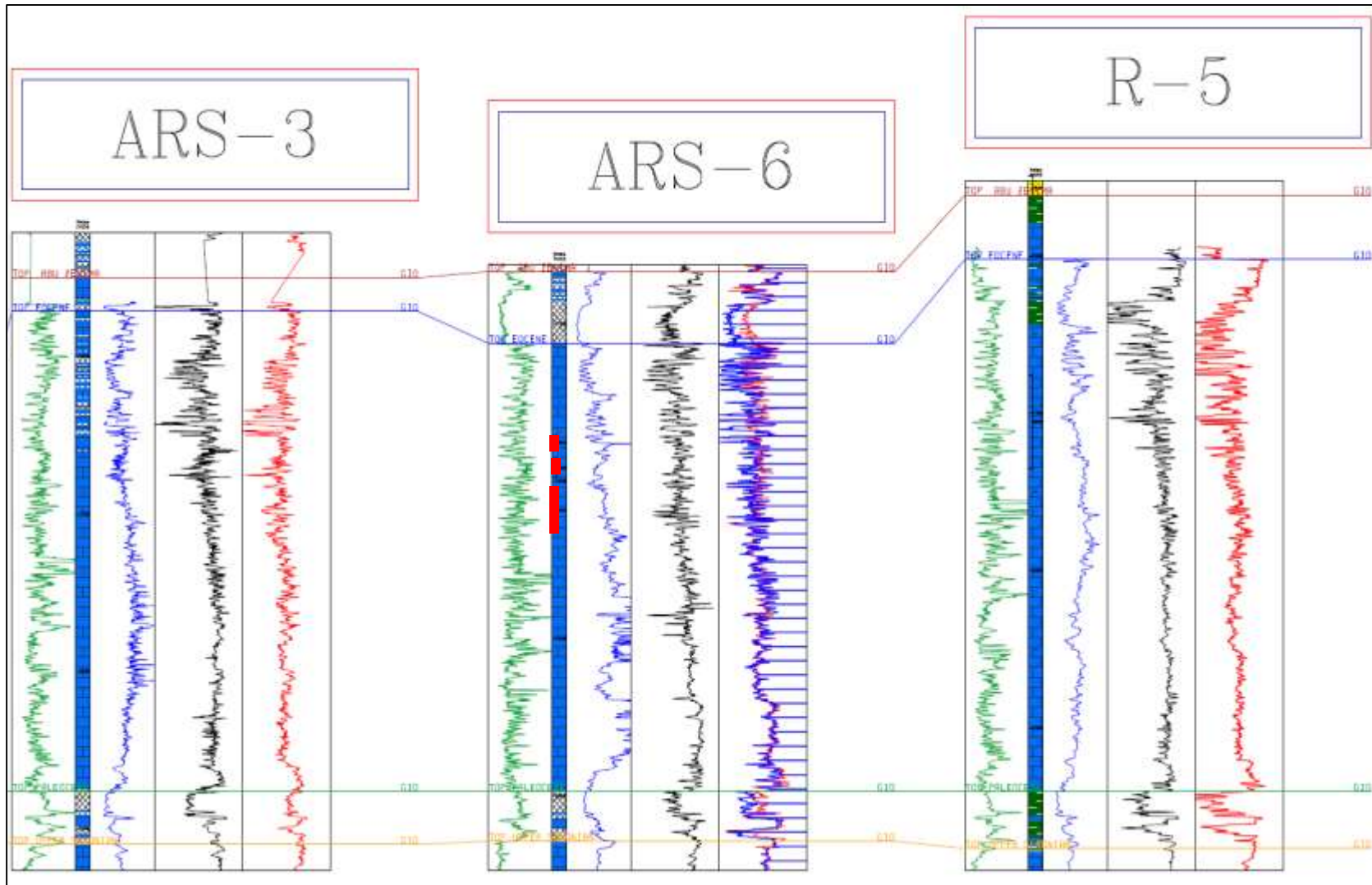


Main events of Eocene in Rudeis – Sidri Field

- 1- In 1981, while drilling the Eocene section of the well ARS-3, oil was kicked out with 10 bbls/hrs. The decision was taken to cut cores (oil staining along fractures) and to test the Eocene carbonates. The result was negative with very short oil flow after two acid jobs.
- 2- In 1989, for the first time in Petrobel history, oil flowed at a commercial rate from the Eocene fractured limestone in the well ARS-6.
- 3- In 1990, while deepening the well R-5, it was recommended to test the stratigraphically equivalent interval to the producing horizon of the well ARS-6 and to run the Formation MicroScanner (FMS) log. Unfortunately, the test result was negative, in spite of the fact that the well R- 5 is in structurally higher level than ARS-6.
- 4- In 1995, the horizontal well ARS-8H was drilled according to the recommendation of AG IP study. The well was oriented in a NW direction parallel to the main NW trending fault, assuming that the well will intersect the highest number of fractures that oriented NE-SW orthogonal to the main NW trending fault.



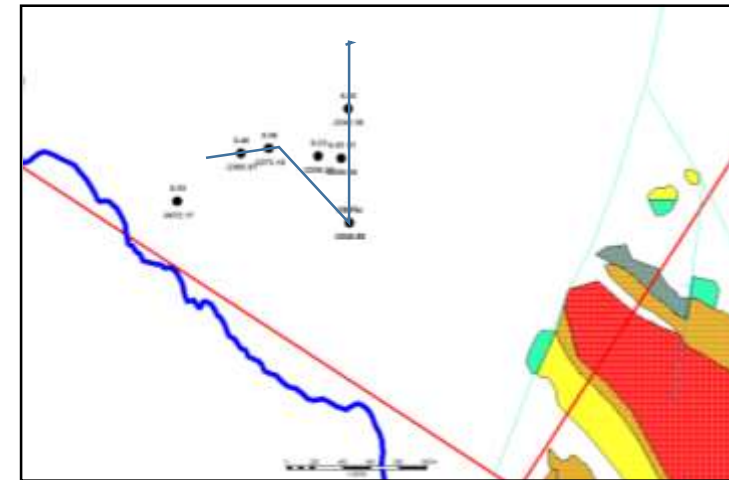
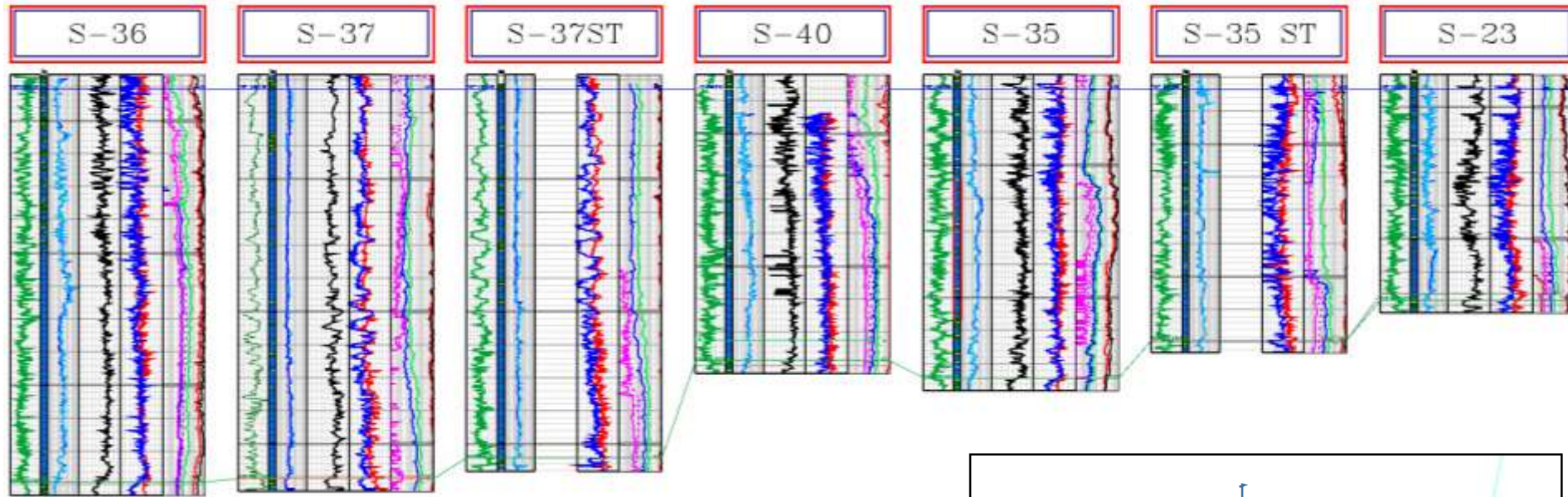
Stratigraphic Correlation of Eocene wells



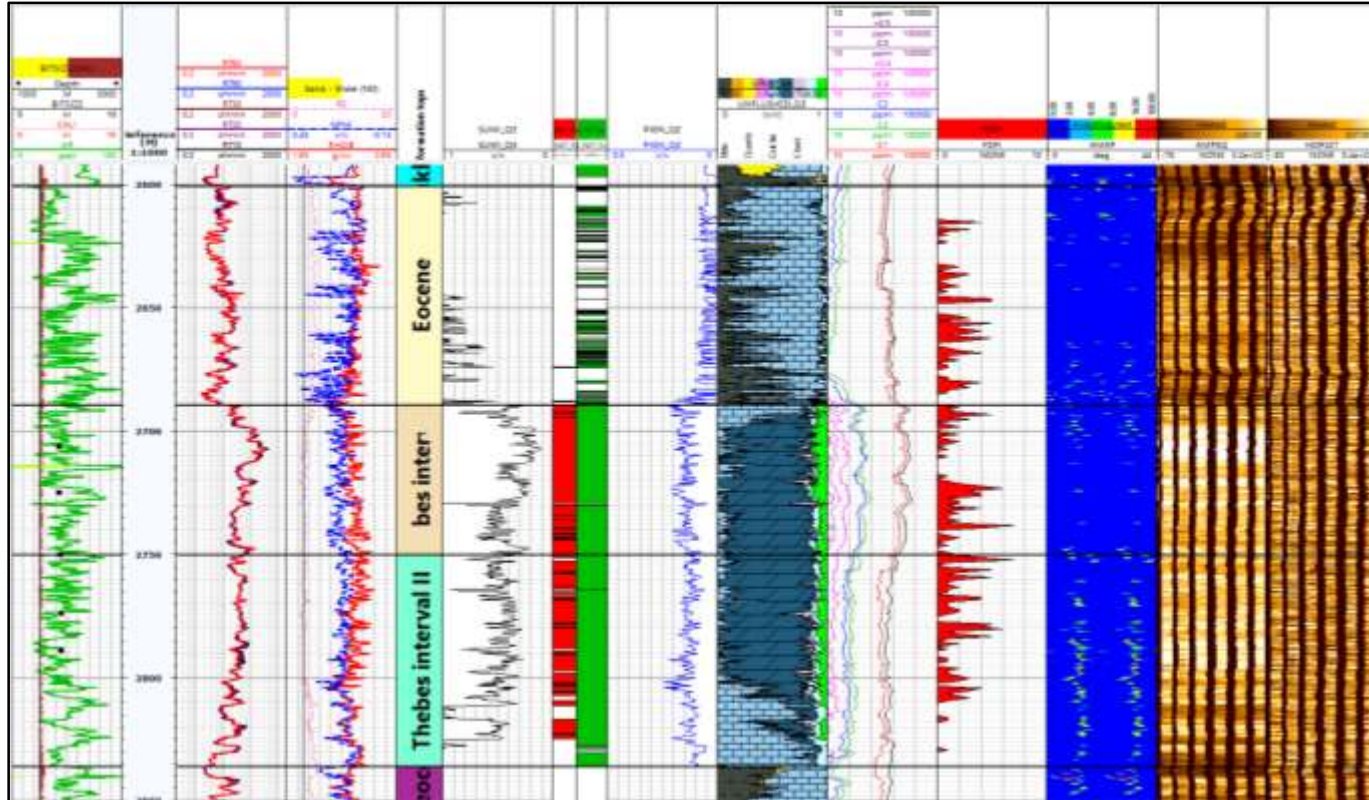
Index map



Correlation of Eocene in Sidri South wells



Eocene Petrophysical Evaluation for well Sidri-35



Darat
 Interval: 2601-2689(TVDSS 2242-2316) m
 Gross reservoir: 27 m
 Net pay : Zero

Thebes upper
 Interval : 2689-2750 (TVDSS 2316-2367)m
 Gross reservoir: 60 m
 Possi. Net pay : 57 m
 Phi Av. : 15 %
 Sw av. : 35 %

Thebes Lower
 Interval : 2750-2836(TVDSS 2367-2439) m
 Gross reservoir: 83 m
 Possi. Net pay : 60 m
 Phi Av. : 14 %
 Sw av. : 44 %

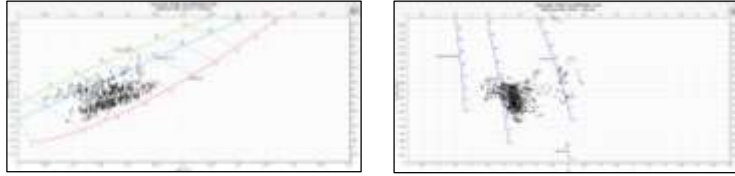
Salinity used 25,000 ppm
 R_w : 0.1 ohm.m

Cutoff used
 Phi = 6% Sw = 60 %



Eocene Petrophysical Evaluation for well Sidri-35 (Thebes Fm.)

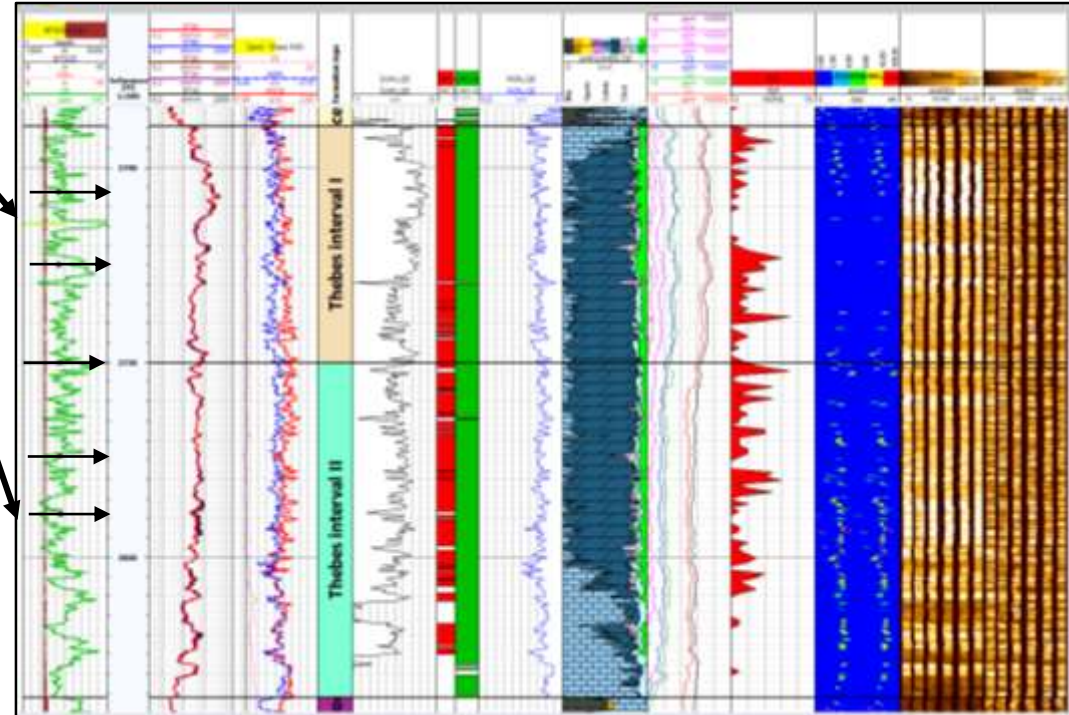
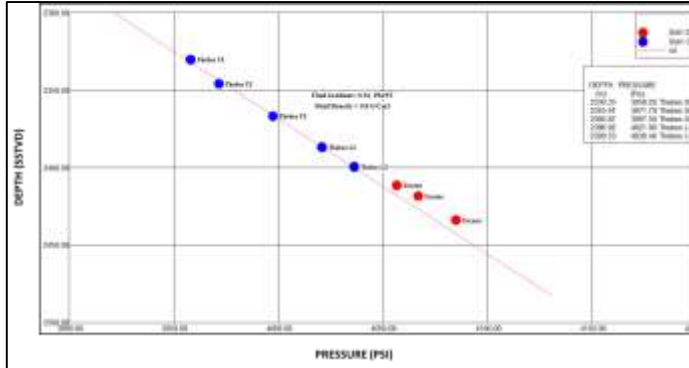
Interval I Mineralogy identification charts



Interval II



DEPTH-PRESSURE CROSS PLOT FOR SIDRI-35 VS SIDRI-23 WELL (EOCENE (Thebes))



Thebes upper
Interval : 2689-2750 (TVDSS 2316-2367)m
Gross reservoir:60 m
Possi. Net pay : 57 m
Phi Av. : 15 %
Sw av. : 35 %

Thebes Lower
Interval : 2750-2836(TVDSS 2367-2439) m
Gross reservoir:83 m
Possi. Net pay : 60 m
Phi Av. : 14 %
Sw av. : 44 %



Thank You

