Attributes corresponding to probability of facies are also analyzed for pay zones. Analysis of Basement composition in producing wells, integrating well and core data brings out that lows/flanks near exposed granitic or granite gneiss are more likely to encounter reservoir facies in Basal Clastics. Based on the above framework a geological model has been conceived satisfying the following criteria for placing infill location as illustrated in Figures 12-13.

- Sufficient thickness on isochronopach.
- Impedance range matching with concerned PDFs in the area.
- Proximity to granitic/granite gneiss provenance
- Connectivity within Basement fracture

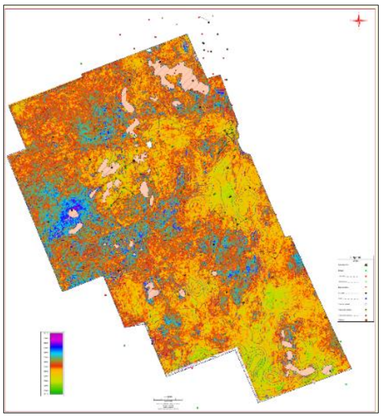

Figure12: Impedance overlain with isochrono between Basal Clastics and Basement for identifying locale with substantial thickness and impedance matching with nearby wells .

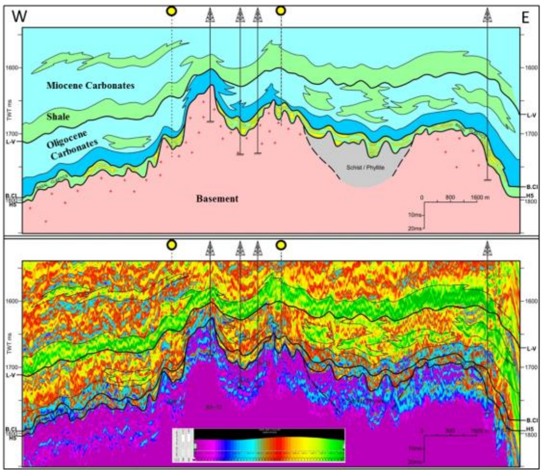

Figure13: Schematic seismogeological cross section showing demonstarting distribution.

Case Study:

Based on the above methodology a few areas were selected for placing infill locations for field development. The case study pertains to one such area around platform M1. The area around platform M1 has several prominent structural highs oriented in NE-SW direction which are likely to act as good provenance for Basal Clastics deposition. The producers in the vicinity have proved to be hydrocarbon bearing in Basement and overlying Basal Clastics. The impedance, effective porosity and probabilistic facies have been analyzed calibrating with major producers (Wells A, B, C, D and E) tabulated below in Figure 14.

Well Name	BCL Time Thickness(ms)	mpedance(m/s*g/cc	ffective Porosi	Sand Probability Mean	Shale Probability Mean
PLATFORM M1					
LOC_F	16	8740	14	0.45	0.49
Well A	10	10331	5	0.49	0.13
Well B	10	8817	14	0.54	0.47
Well C	23	8396	15	0.38	0.6
Well D	19	8938	13	0.45	0.52
Well E	15	7981	17	0.25	0.68

Figure 14: Table demonstrating property analyzed for infill location along with the producing wells (highlighted in green).

The P-Impedance range varies from 7500-10500 m/s*g/cc and porosity range varies from 15-20% for these wells (Figure14). Based on the above analysis Well F was optimally shifted and drilled recently. Figure 15-16 demonstrates the variation of P-Impedance and Effective porosity for area adjoining platform M1.

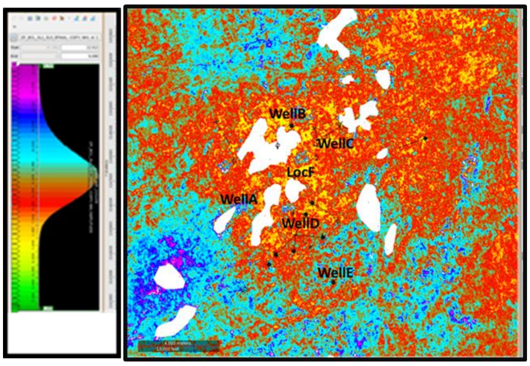

Figure 15: Mean P-Impedance between proportional slice corresponding to Basal Clastics pay for area around platform M1

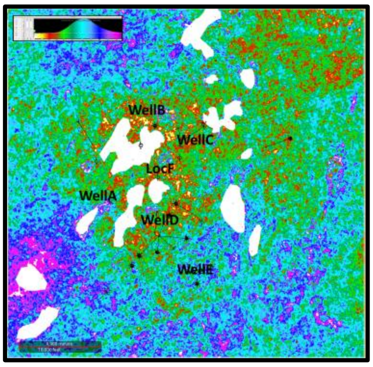

Figure16: Mean EffectivePorosity between proportional slice corresponding to Basal Clastics pay for area around platform M1.

Well F encountered good reservoir section (24m thick) within Basal Clastics. On testing, this section flowed oil@ 4000 bpd .The hydrocarbon saturation for the well F is shown in Figure17.

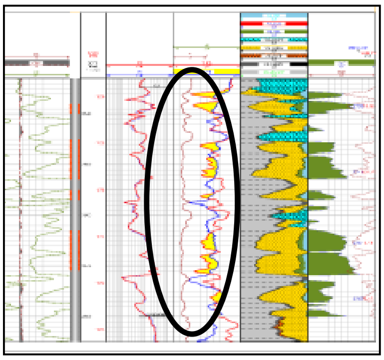

Figure 17: ELAN processed log of Well F showing HC saturation

Conclusions

- The Basal Clastics play of Mumbai High field is thin sedimentary clastics deposited in local lows or flanks of the Basement with inherent vertical and lateral heterogeneity.
- Vintage seismic data with suboptimal resolution provides limited information in this regard.
- Full stack bandwidth extended seismic has improved the spatio-temporal resolution of seismic data making it more amenable to interpretation.
- Integration of well data and pay maps with bandwidth extended seismic and derived attributes provides better insights for delineation of reservoir boundary.

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