(indicating prospective areas) as that around producers also appear on the downthrown fault block west of well A corridor. The probable reservoir facies shows NNW-SSE trend bounded by faults having same trend.

Horizon slice extracted with a window of Pliocene-I -5 m to Pliocene-I +25ms window from the fluid factor volume depicts similar reservoir distribution pattern as that for P-impedance **(Fig.8).** Envisaged

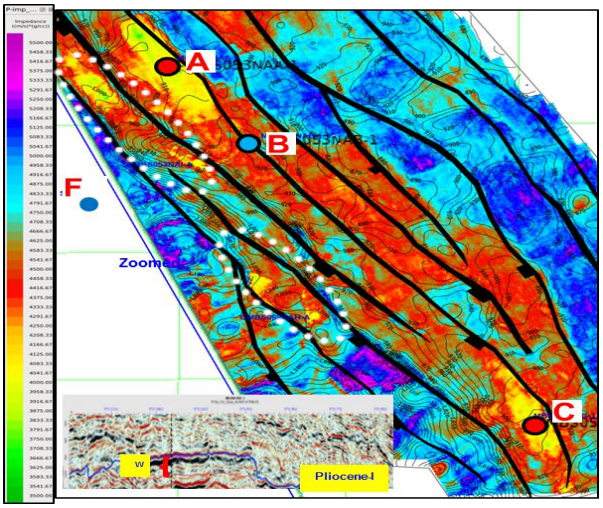

Fig.8. Inverted P-impedance horizon slice extracted from Pliocene-1 W:-15-+20 ms overlaid by structure contour of Pliocene-1. Prospective areas are indicated by dotted white ellipse

prospective areas show similar lower fluid factor value range as that in the producers (Well A and C). In addition to attributes extracted from prestack seismic inversion, amplitude based seismic attributes were also analysed. One of such attribute is Sweetness. It is known that Sweetness is an empirical seismic attribute designed to identify "sweet spots," places that are oil and gas prone. This definition is motivated by the observation that, in young clastic sediments, sweet spots are often characterized seismically by high amplitudes and low frequencies. Sweetness closely resembles reflection strength. Sweetness anomalies of most interest are those that are relatively stronger than their corresponding reflection strength anomalies. Horizon slice extracted from Sweetness volume within window Pliocene-1 - Pliocene-1+60 ms very clearly brings out fault bounded high amplitude anomaly (**Fig.10**). These high amplitude anomalies or bright spots are very conspicuous in and around the producing wells A and C, but absent around the non- producing well B. Similar kind of anomalies is also observed on the other fault block in the down thrown side of the block hosting well A and C. These

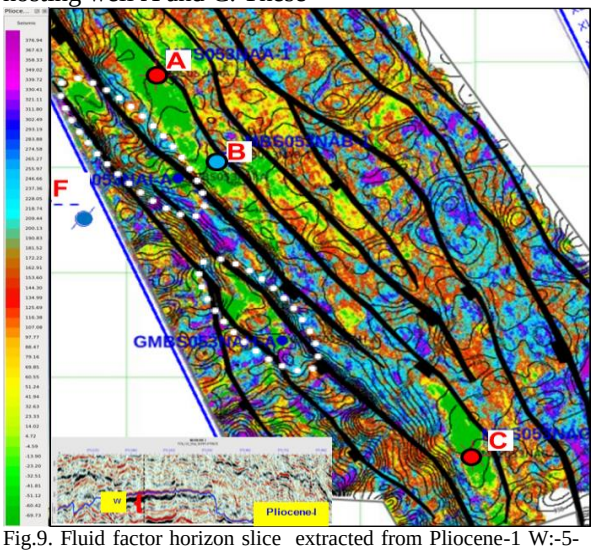

Fig.9. Fluid factor horizon slice extracted from Pliocene-1 W:-5-+25 ms overlaid by structure contour of Pliocene-1. Prospective areas are indicated by dotted white ellipse

Anomalous patterns are largely aligned along the NNW- SSE trending fault which is the regional strike direction at the time of deposition of Pliocene-I.

So, all the seismic attributes shown in the preceding sections very well bring out the disposition of

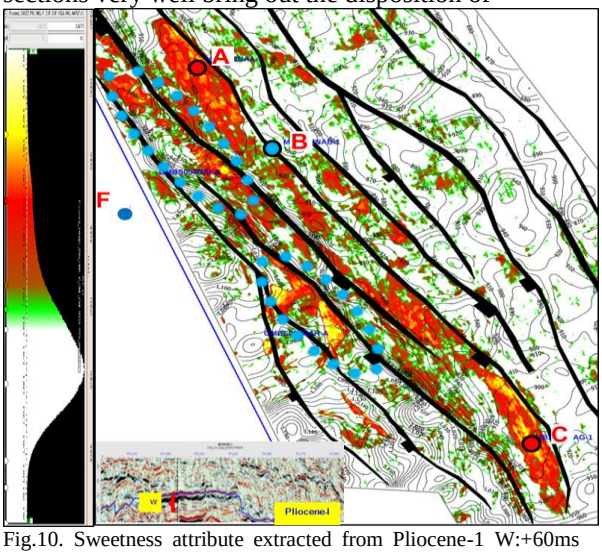

Fig.10. Sweetness attribute extracted from Pliocene-1 W:+60ms overlaid by structure contour of Pliocene-1. Prospective areas are indicated by dotted blue ellipse

Pliocene-I reservoir, in general and probable hydrocarbon distribution pattern, in particular. Based on the study, prospective locales are identified for future exploration.

Conclusions

The most significant conclusions are summarized below:

1. The NELP Block MBOSN-2005/3 covered by broadband data has given impetus for future exploration beyond shelf margin in Mumbai Offshore Basin through the gaseous hydrocarbon discovery in the well A. This success is also augmented by hydrocarbon strike in the recently drilled well C. Pays are confined mostly in Pliocene-I interval and are characterized by low resistivity (~1-2.5 ohm-m), lower impedance than the surrounding shales and low thickness in the range of 3-12 m

2. 2D Paleo- structural restoration using MOVE software revealed a possible major Post Mid-Miocene tectonic event which in turn triggered gravity- driven processes (Gravity gliding and Spreading) resulting in the formation of NNW-SSE trending, listric, parallel series of extensional normal faults in Pliocene sequence and also induced gravity driven debris flow processes which bring out relatively coarser clastics within this clay- shale dominated area. This gravity flow process is also supported by lab studies which indicated presence of radiolarian fossil implying bathymetry of 300-350 m and mixing of broken shell fragment with deep water biota.

3. Integrated attribute study brought out Reservoir geometry throughout the area. Attribute extracted from Pre- stack inversion volume (P-impedance and fulid factor) and 3D PSTM volume (Sweetness) exhibited NNW-SSE trending fault parallel, elongated reservoir facies distribution pattern. Coincidentally hydrocarbon bearing reservoirs gets discriminated on all the attribute maps. For example, hydrocarbon bearing pay showed lower P-impedance, Lower Fluid Factor value and higher Sweetness value than the surrounding facies. Thus, based on integrated attribute studies, prestack inversion results analysis coupled with structural disposition, two prospective locales have been identified in the downthrown fault block of producers (Well A and C) to probe younger Mio-Pliocene which are further likely to add to the reserve base.

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