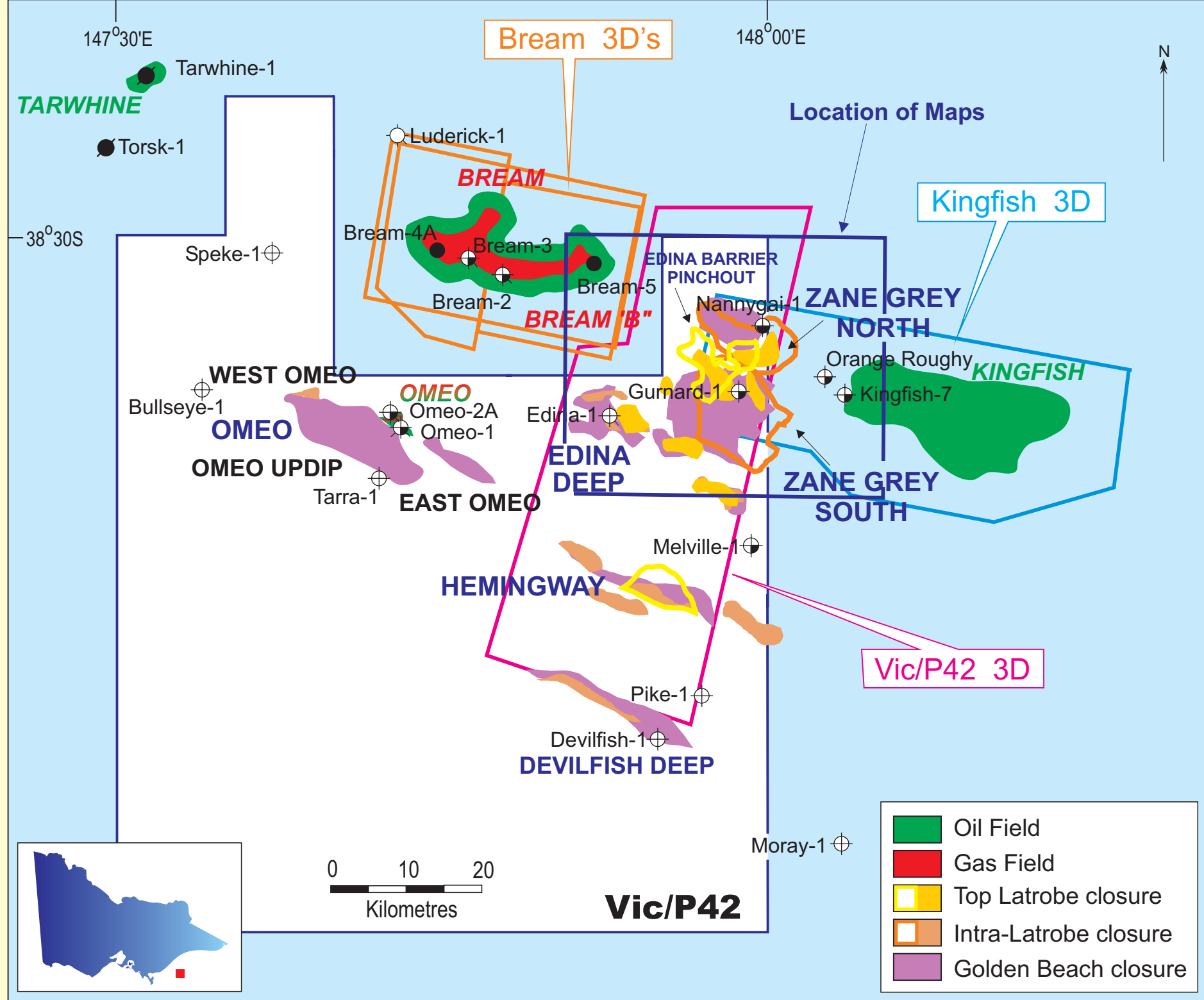
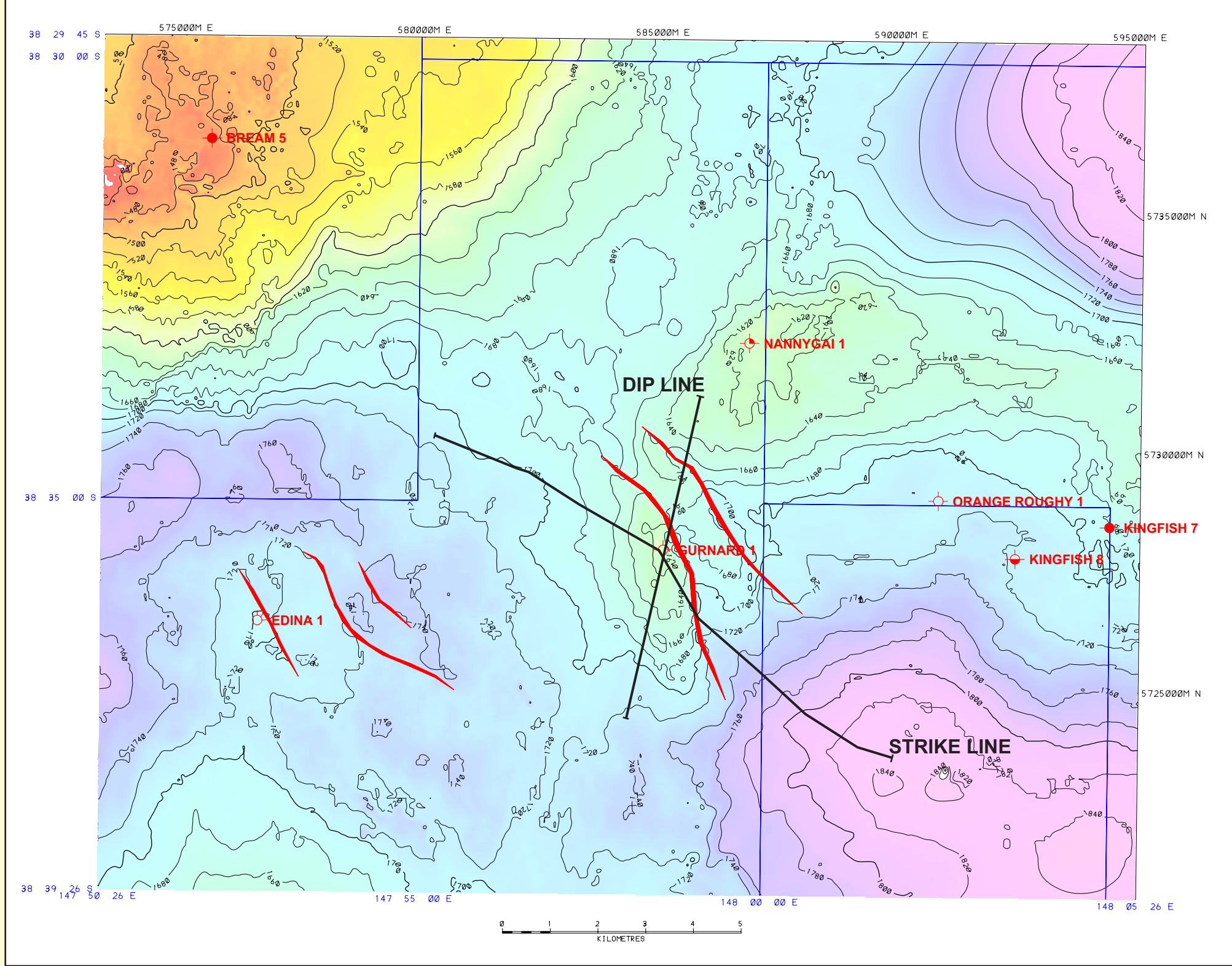


## VIC/P42 - ZANEGREY SOUTH, OFFSHORE GIPPSLAND BASIN, VICTORIA

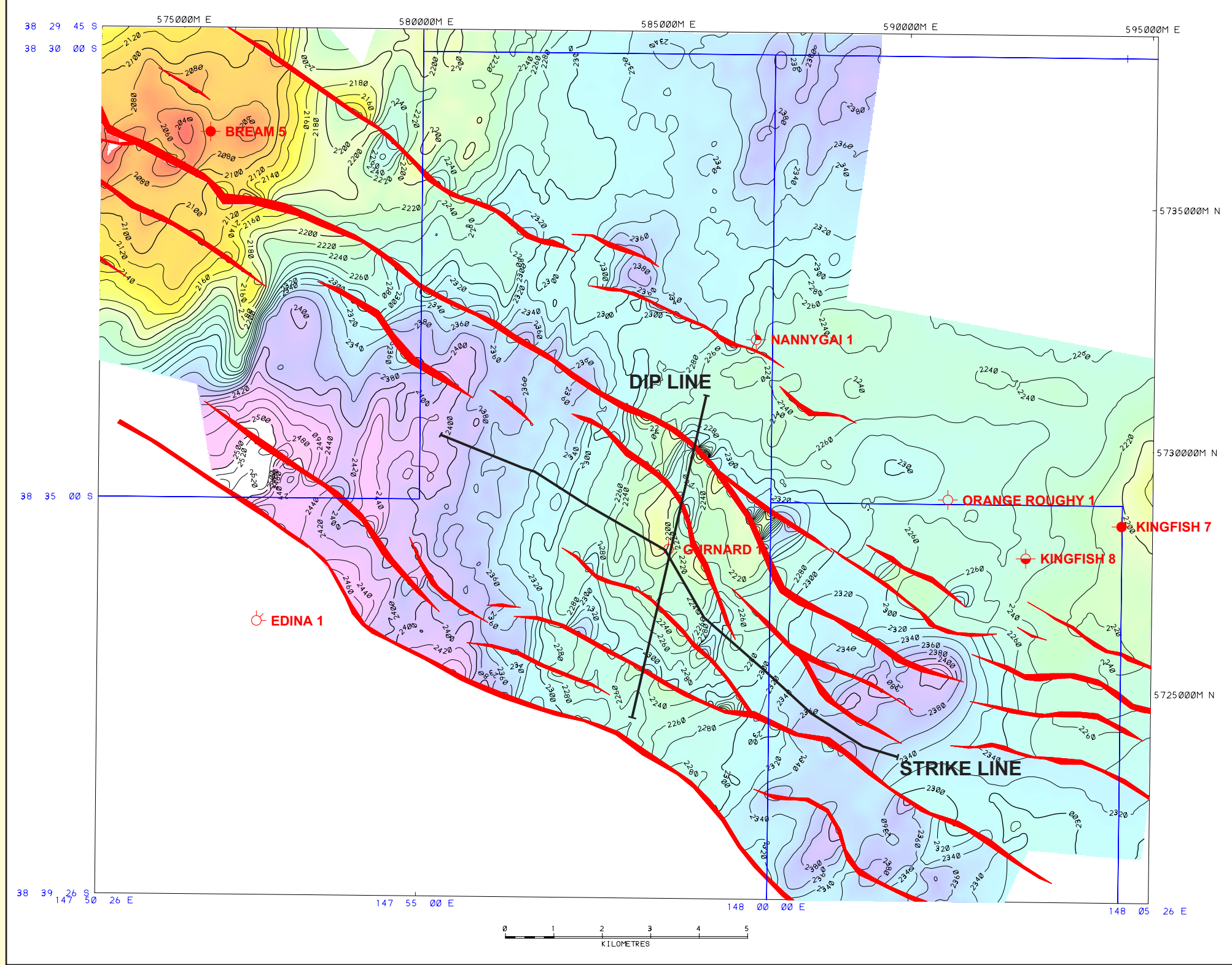
### Identified Prospects & Leads in Vic/P42 and 3D seismic survey outlines



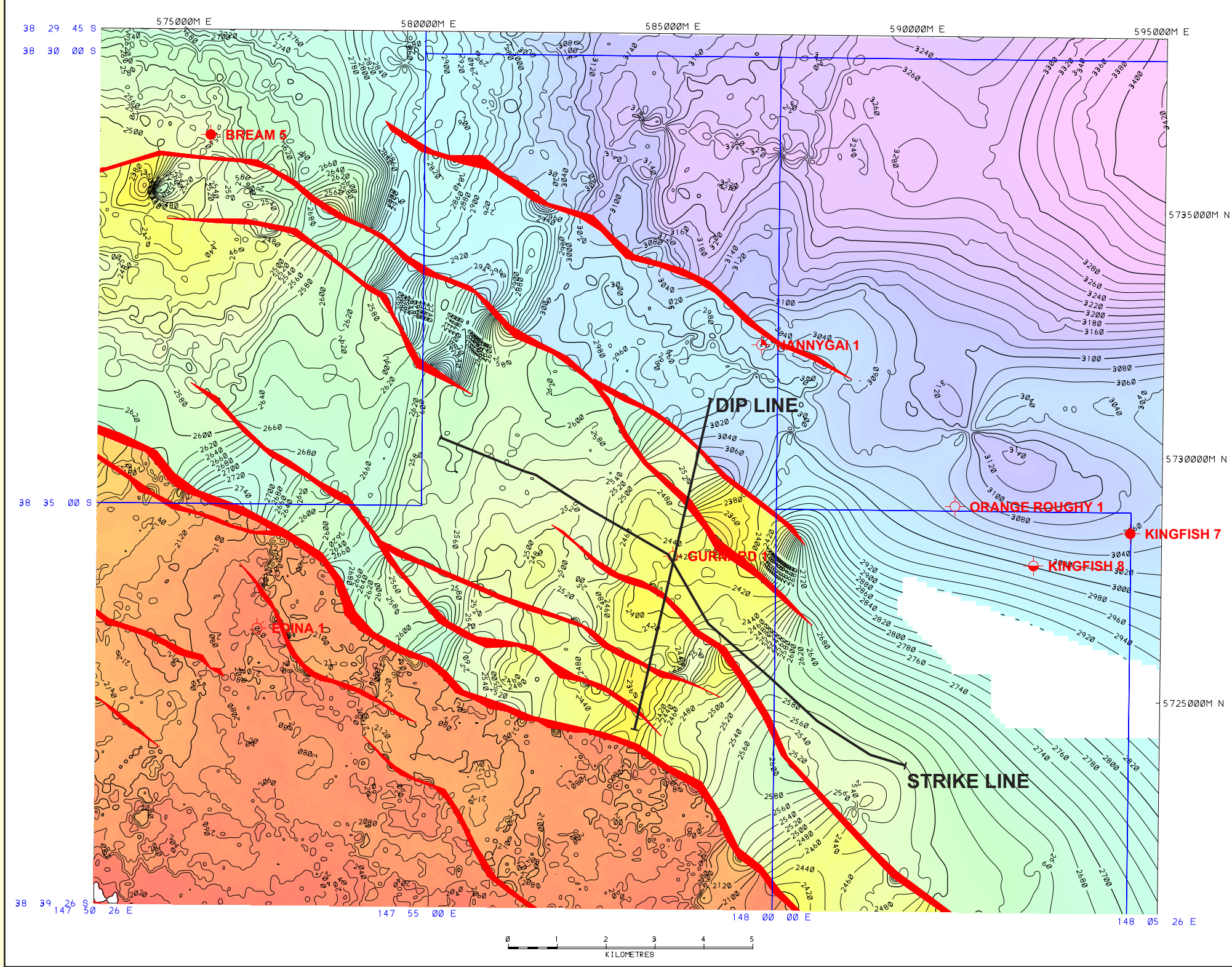
### Top Latrobe Group TWT Map



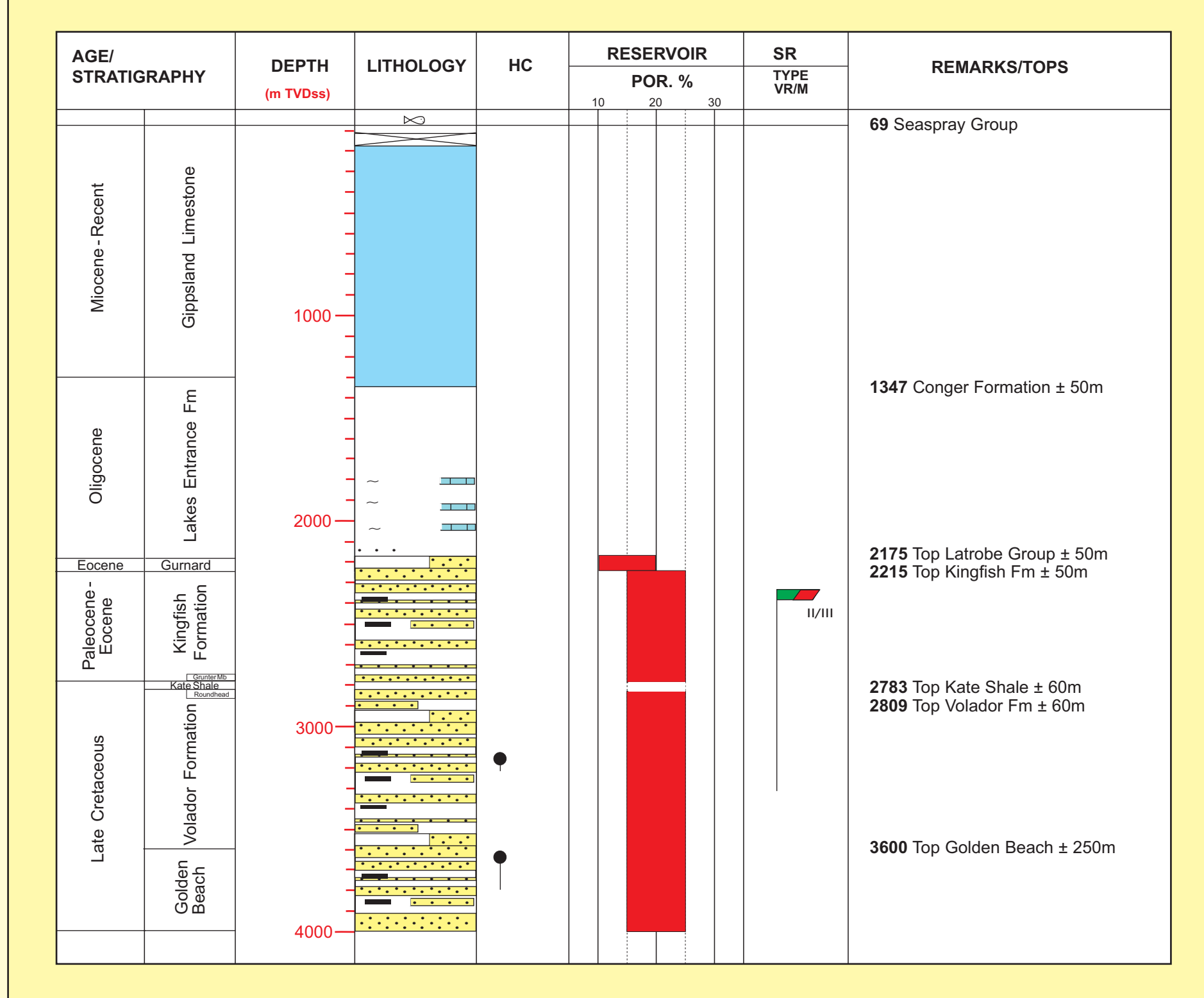
### Deep Latrobe Event (Intra Volador Formation, *F. longus*) TWT Map



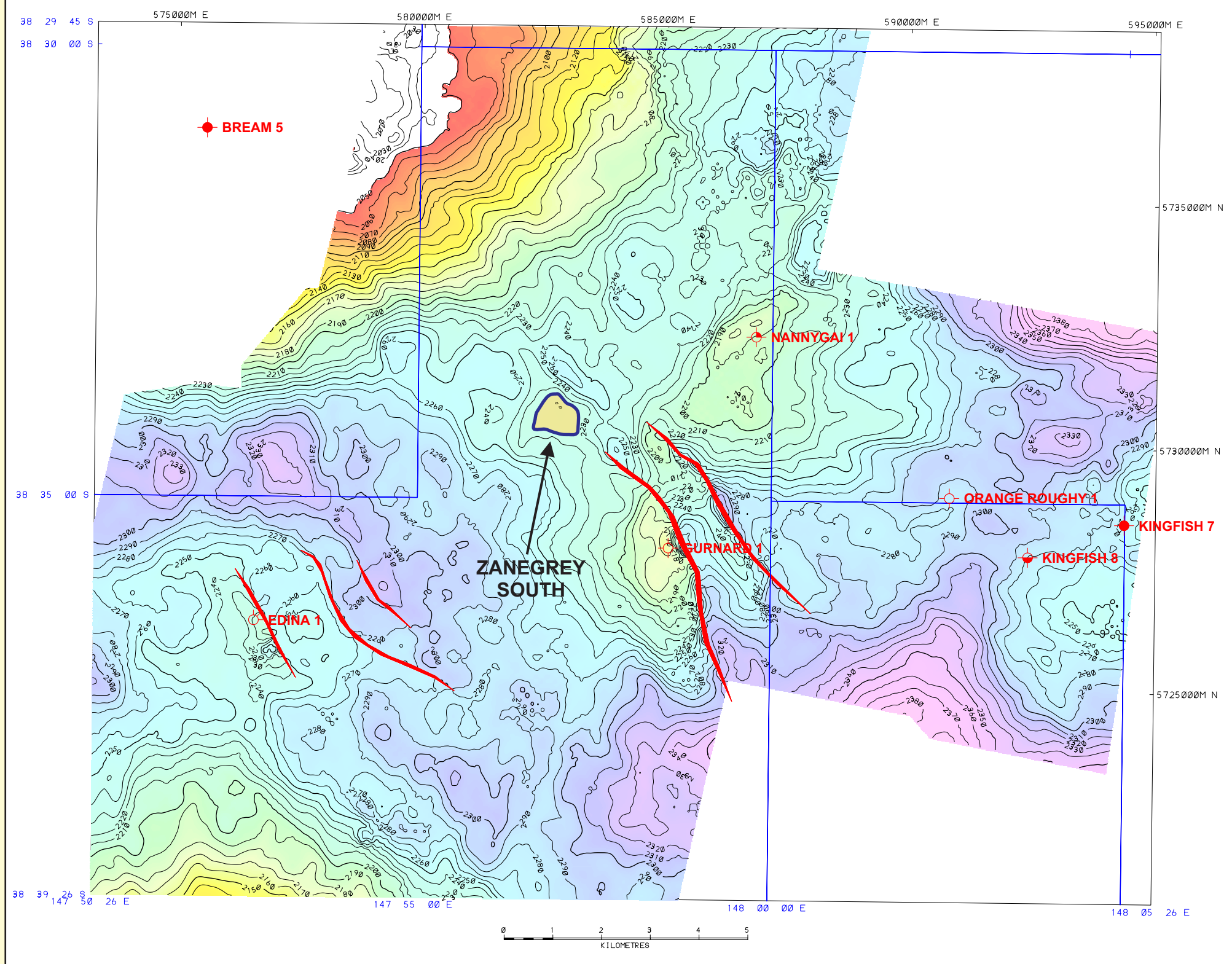
### Top Golden Beach Subgroup TWT Map



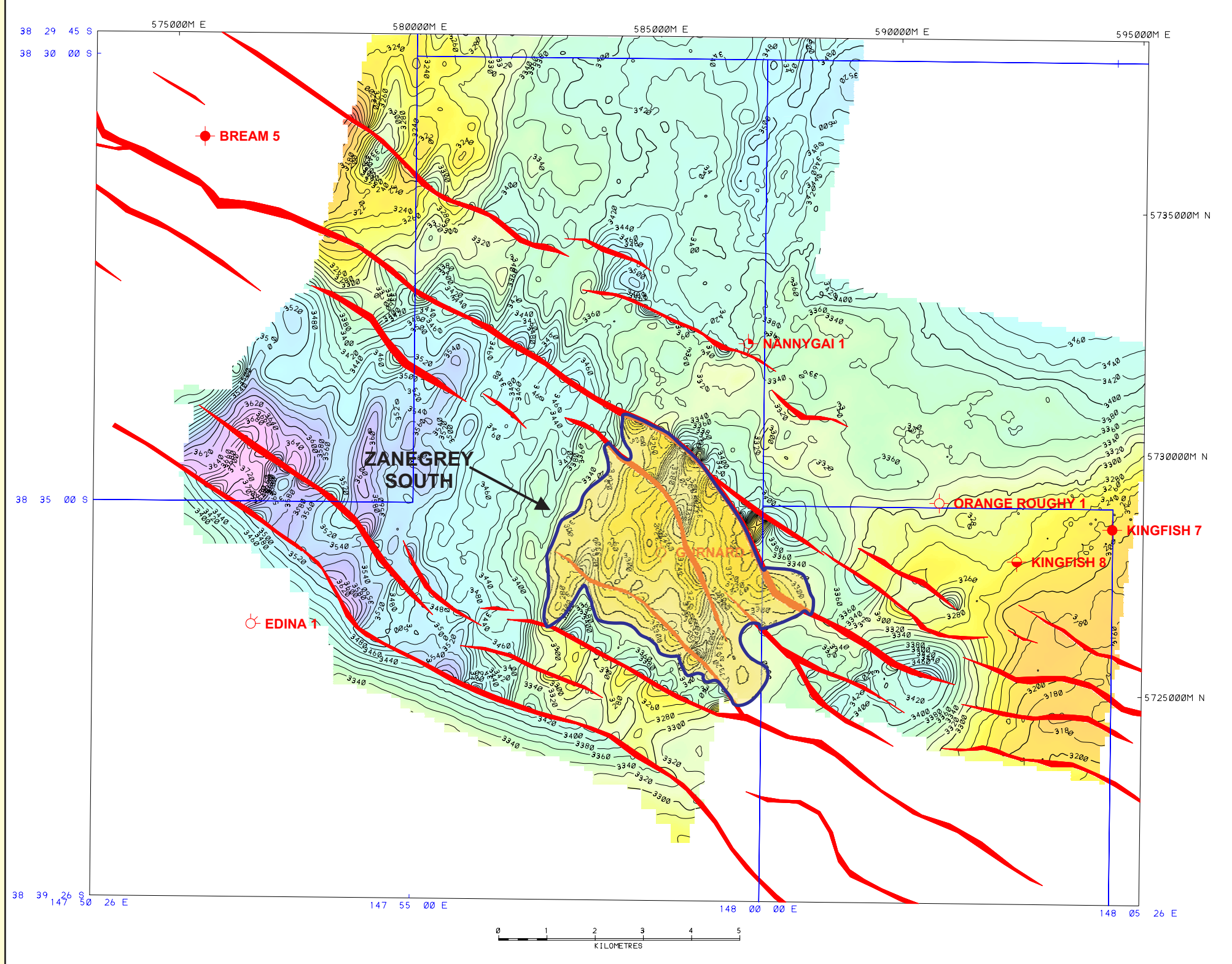
### ZaneGrey South Prognosis



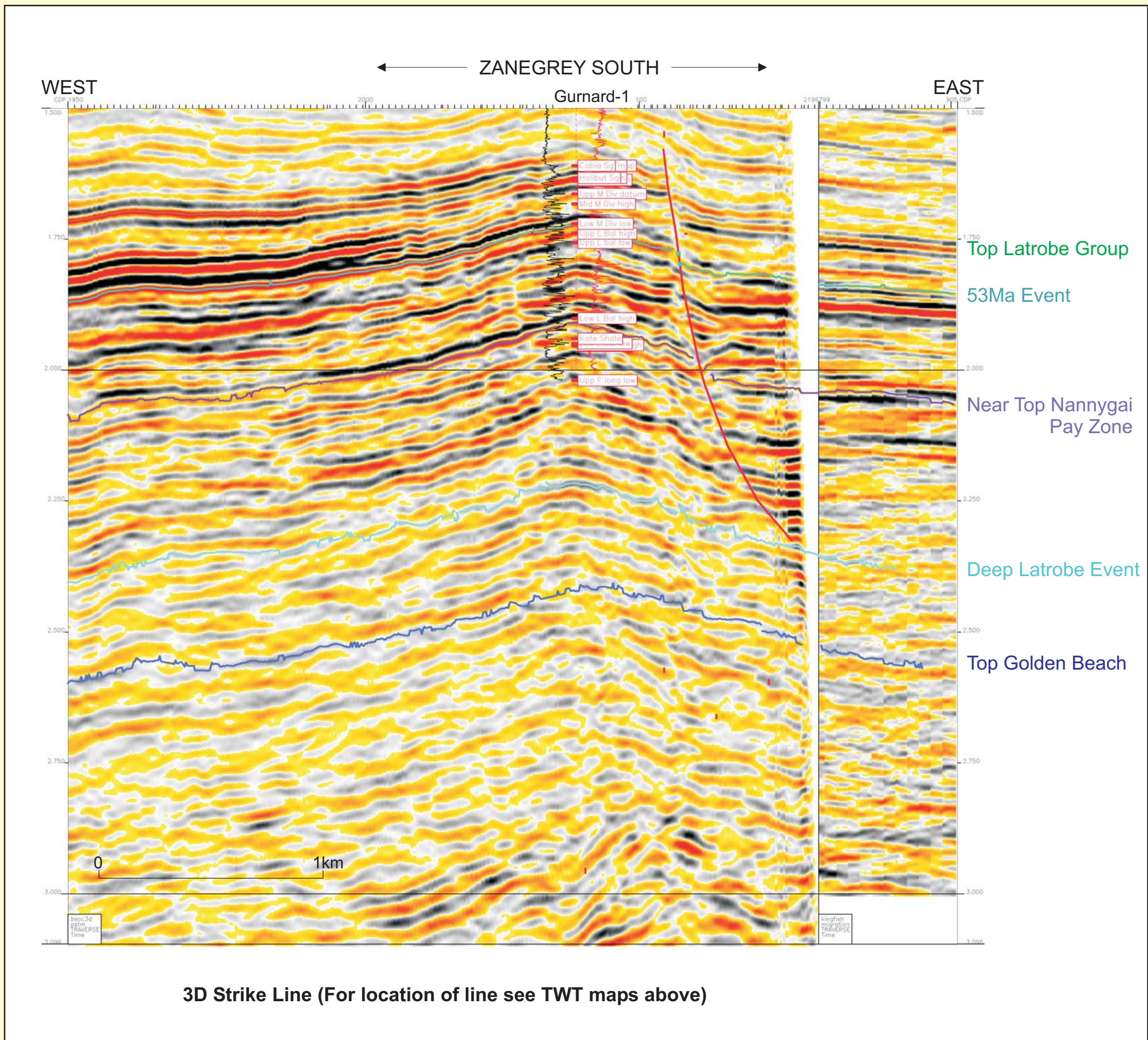
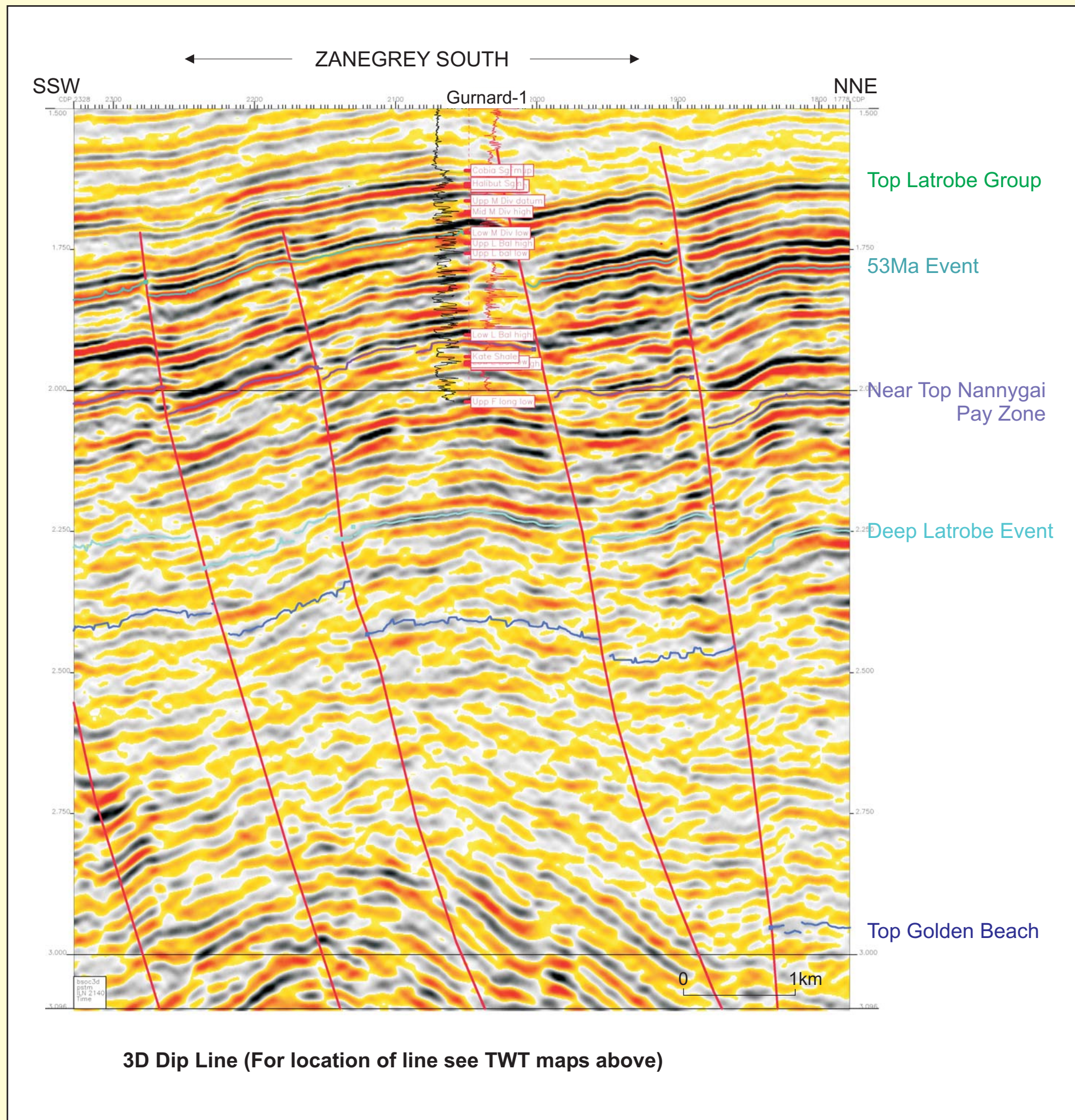
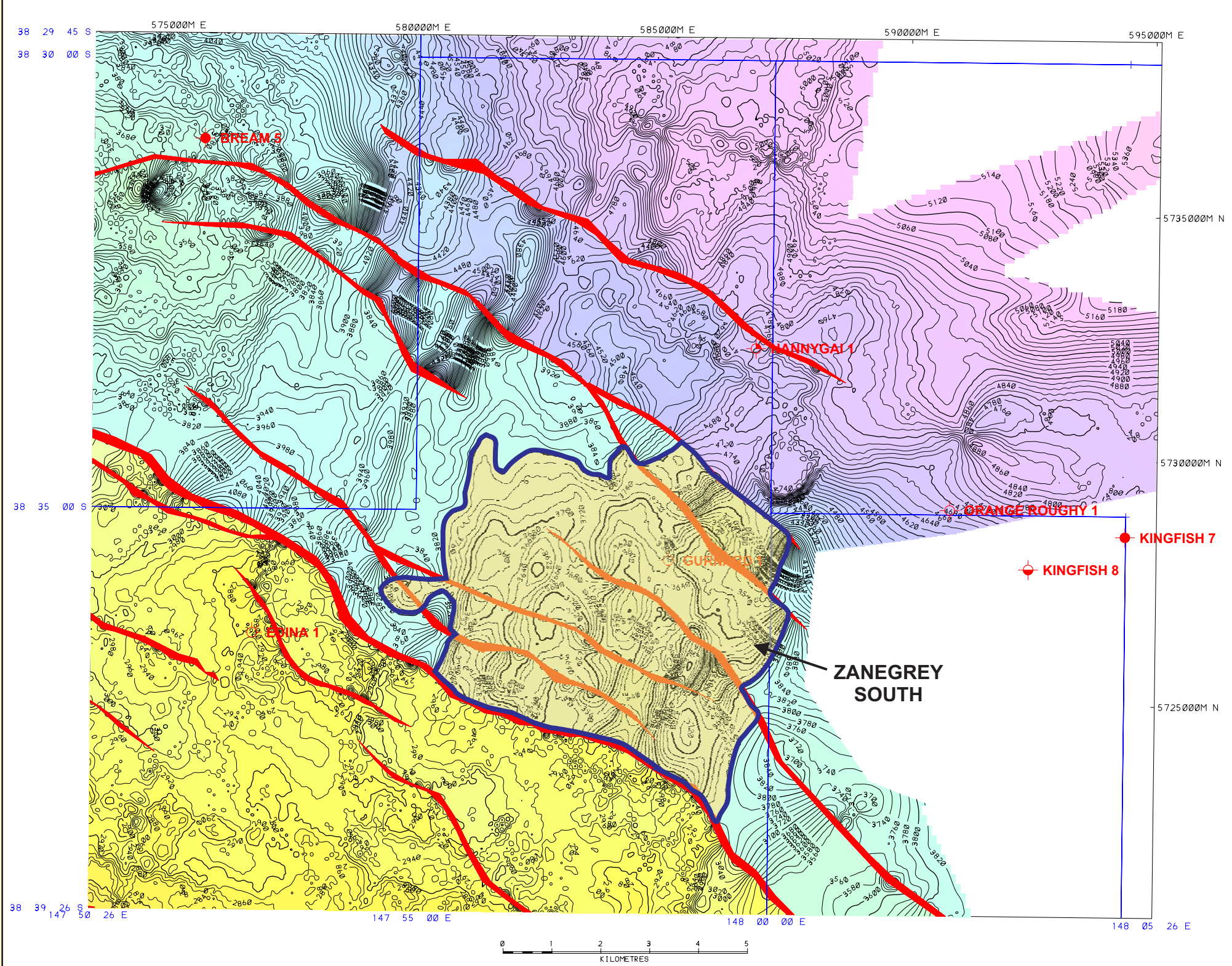
### Top Latrobe Group Depth Map



### Deep Latrobe Event (Intra Volador Formation, *F. longus*) Depth Map



### Top Golden Beach Subgroup Depth Map



### ZaneGrey South

ZaneGrey South is an upthrown fault block closure. Gurnard-1 drilled the structure in 1969 to test a large top Latrobe fault dependent closure, beneath a Miocene submarine canyon. Depth conversion is complicated by the high velocity fill in the Miocene submarine canyon and associated pull-up effect. Sophisticated 'image-ray' depth conversion suggests it remains a fault closure at the Kingfish Formation level and upper Volador Formation (sequences penetrated). Gurnard Formation was penetrated in the well with a thickness of 27 m with an apparent, although questionable, mud gas kick at the top of the sequence. The reason for failure of the well is still equivocal, although it is considered that there is no cross fault seal with the ZaneGrey North fault block to the northeast of the well. Regional correlation indicates that the upper Kingfish and upper Volador formations penetrated in Gurnard-1 are juxtaposed with upper Kingfish and Gurnard formation deposits in the downthrown fault block to the north, hence fault closure is considered invalid. The gas kick in the Gurnard formation may be explained by the likely cross fault juxtaposition of Lakes Entrance Formation for the uppermost part of the sequence. Two formation interval tests were run within sediments of the Kingfish Formation (*F. longus* zone); the first at 2944 m recovered formation water and contamination; the second at 2924 m encountered pale yellow fluorescence and a hydrocarbon odour. There may be minor fault closed clay zones in the vicinity of the well at this latter level.

Minor updip potential is identified at the Top Latrobe level and within units penetrated by Gurnard-1, although the greatest potential is envisaged in the sequences unpenetrated by Gurnard-1 where better top and fault seals are interpreted.

The structure is formed by a major basin forming normal fault striking NW-SE through the northeastern graticular block of Vic/P42. An interpreted spill point is mapped to the southeast into the area south of Kingfish.

The acquisition of 3D seismic in 2002 by BSOC over the area has recognised a significant closure beneath Gurnard-1 at the deeper Volador Formation and the Golden Beach Subgroup levels in both time and depth. Detailed velocity interpretation through the high velocity submarine canyon sequence has been derived from advanced geophysical processing techniques, although a significant depth conversion risk remains.

Regional correlation across the southern Gippsland Basin has identified that a potentially prospective sequence of reservoir seal pairs remains untested (by Gurnard-1) in ZaneGrey South for the deeper undrilled sequences of the Volador Formation and within deep Golden Beach Subgroup deposits (the latter correlated over long distance with Archer-1 and Anemone-1 wells to the southeast).

### Reservoirs

The Volador Formation forms the primary reservoir objectives in the prospect. Whilst the Roundhead Member was encountered near TD in Gurnard-1, significant sandstone reservoirs are known to occur deeper in this formation regionally. Reservoir quality is expected to be excellent with average porosities around 16% and good permeabilities. Deeper porosities decline due to compaction although porosities of over 25% can remain even at depths of 3000m. The Golden Beach Subgroup forms a secondary objective, although the prognosticated depth and expected sequence for this unit are difficult to predict. The nearest correlation is at Melville-1 10km to the south, although the sequence there was present on the Southern Terrace and very much condensed. It is expected that a comparable sequence to that penetrated in the Archer-1 and Anemone-1 wells would be encountered in ZaneGrey South. In Anemone-1A unusually high porosities are observed in marine sandstones of the Golden Beach Subgroup. Average porosities of 15% or greater exist down to 4500 meters.

### Seals

Top seals are likely to be provided (in a stacked pay) by back barrier lagoonal and interdistributary shales of the lower Volador Formation becoming more prevalent deeper in the sequence. Lateral fault seal on the major basin forming fault to its northeast is expected to be enhanced with depth as the more shaly deeper Volador Formation deposits become fault juxtaposed in the downthrown block (at approximately 3000m subsea in the upthrown block). Extensive marine shale seals are predicted in the objective sequence at ZaneGrey South, by analogy along trend from Archer-1.

Archer-1 is significant in that a total of 17 stacked oil and gas pay zones were penetrated through the lower Halibut and Golden Beach subgroups in the well, often separated by these marine shale units. The well was also significant in showing that pay zones have column heights in excess of dip closure. At the level of the S2 marine shale (top Campanian) of the Golden Beach Sub-group, an additional fault dependent closure is interpreted.

### Source Rocks

Non-marine coastal plain organic rich mudstones and coals represent the source rocks for both oil and gas in the basin. These are dominantly of terrestrial plant origin and widely distributed throughout the Latrobe Group. Gas and oil mature source rocks for the ZaneGrey South Prospect are interpreted to occur in the Central Deep to the northeast. Potential oil mature source rocks are interpreted within the Halibut Subgroup immediately to the northeast, which is interpreted to have provided an oil charge to the undersaturated giant Kingfish oil field. Charge is expected to originate directly from the northeast.

As a mature kitchen is mapped at the top Golden Beach level immediately to the northeast of ZaneGrey, however the lack of gas within Kingfish suggests that vertical migration may not be occurring. Gas is known at the top Latrobe in Bream to the west, although this structure is much shallower than ZaneGrey and unlikely to be a conduit for gas migration. Simplicity would suggest that, as ZaneGrey is between a gas and oil field, and an oil field, then it might be expected that any hydrocarbons encountered would be 'oil with some gas'.

Any oil encountered in ZaneGrey is likely to have properties comparable with Bream and Kingfish. The Bream oil is described as a paraffinic crude with 45° API and a pour point of 60°F. Kingfish oil is 47° API and a pour point of 60°F. The Bream oil is saturated at reservoir conditions and is in contact with a large, low CO<sub>2</sub> gas cap. No indication of H<sub>2</sub>S is identified in nearby wells.

### Risks

The main risks for the ZaneGrey South Prospect relate to lateral fault seal and the mapped depth closure and hence the depth conversion. Gurnard-1 is suggested to have demonstrated a lack of fault seal in the Kingfish Formation and the shallow Volador Formation sediments penetrated. However, at depth better seal potential (both top and lateral fault) is prognosticated. A strong lateral velocity variation in the overburden makes the depth conversion problematic and another significant risk. Detailed seismic velocity data has been used to minimise this risk. The nature of the Golden Beach Subgroup and potential reservoir seal pairs has not been determined locally and constitutes a risk for this deeper play.

### Reserves Potential

Risked and unrisked reserves potential has been estimated for the potential plays in the prospect and are summarised below. These reserve estimates are for Vic/P42 only.

	UNRISKED RESERVES (RECOVERABLE)		POS	RISKED RESERVES (RECOVERABLE)				
				MSV		P90	P50	P10
	OIL Mmb	GAS Bcf		OIL Mmb	GAS Bcf	OIL Mmb	OIL Mmb	OIL Mmb
ZaneGrey South	155.9	142.0	16%	57.1	47.7	12.1	53.3	106.7

### VIC/P42 ZANEGREY SOUTH OFFSHORE GIPPSLAND BASIN

January, 2004