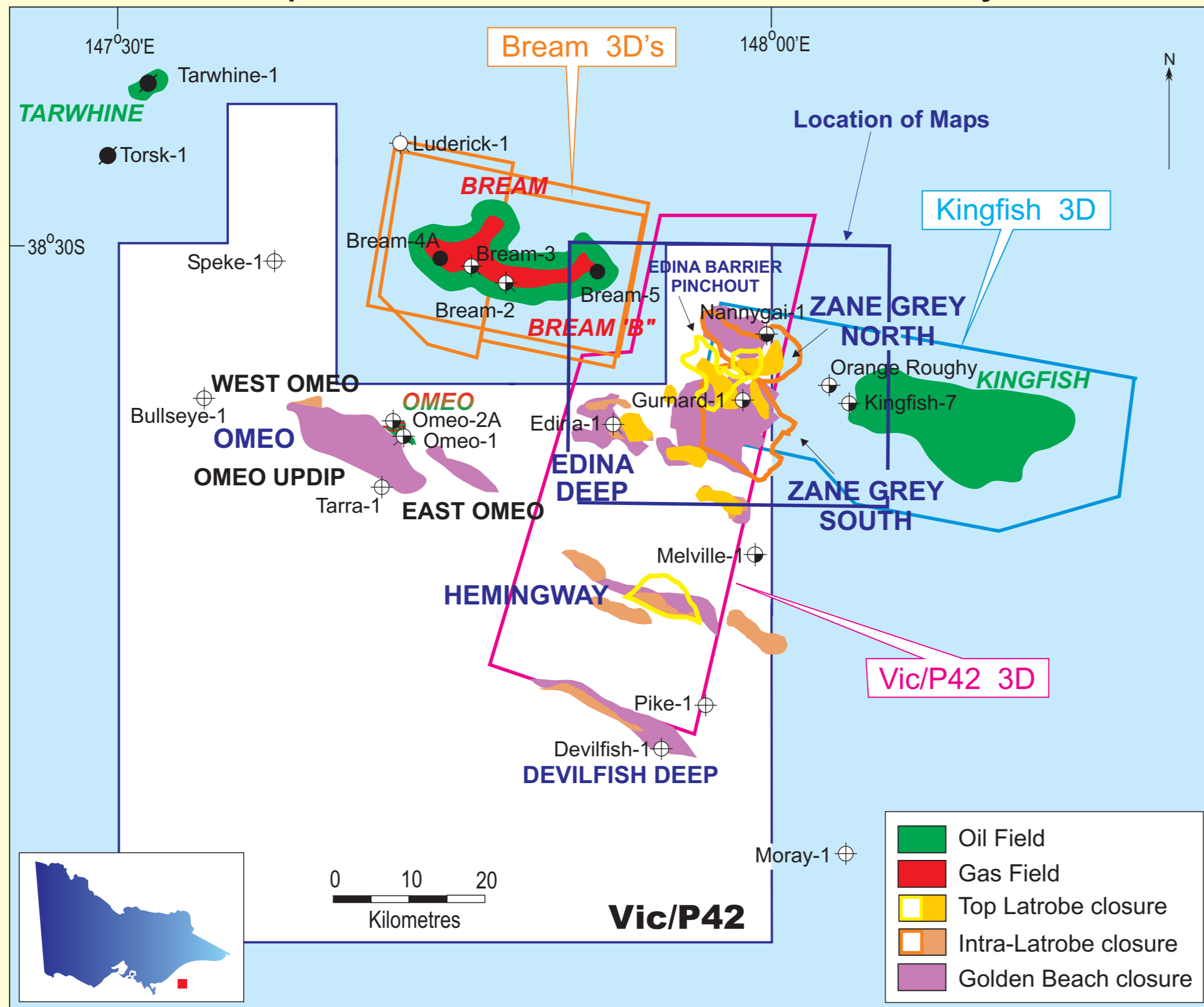
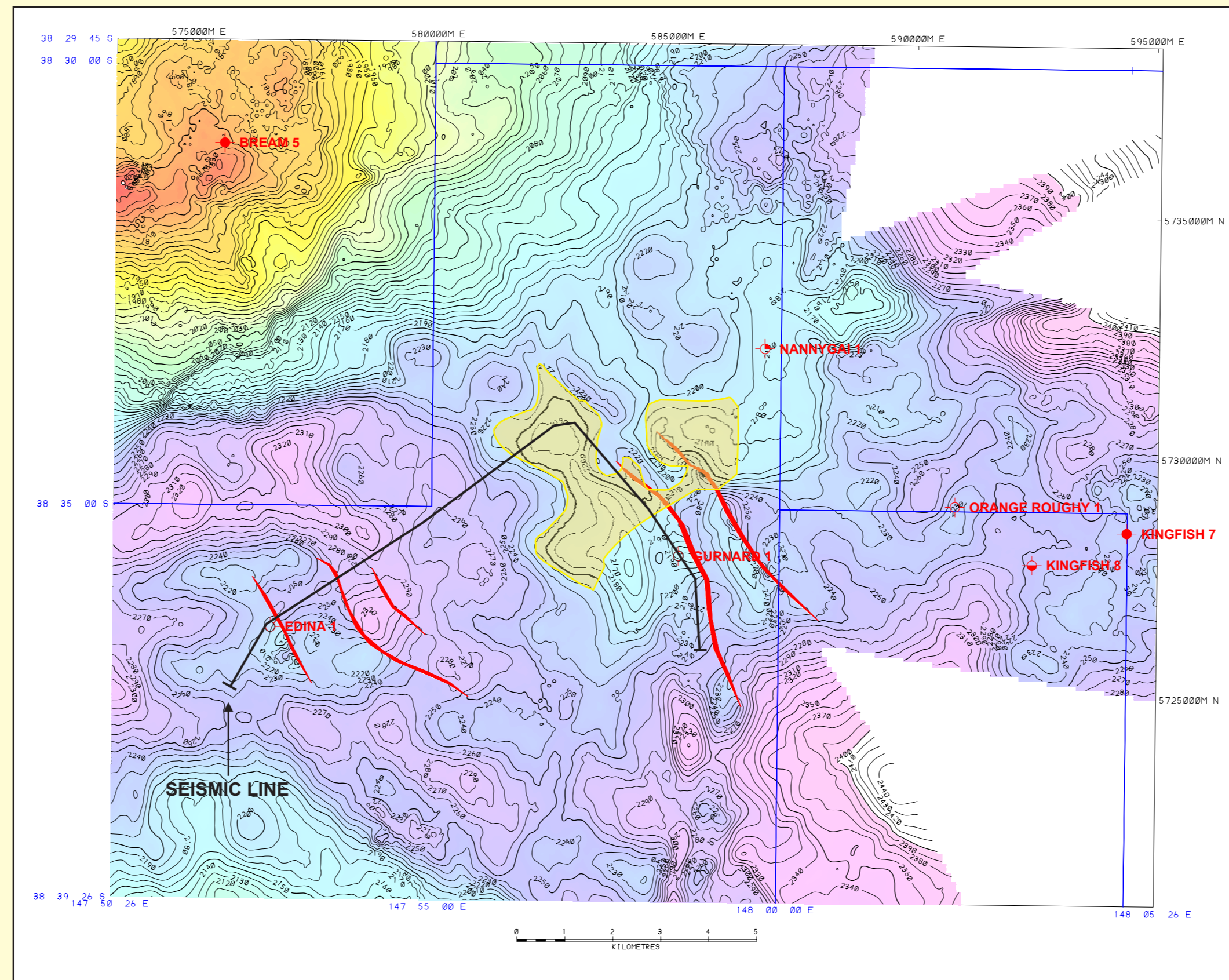


VIC/P42 - ZANEGREY, EDINA BARRIER PINCHOUT, OFFSHORE GIPPSLAND BASIN, VICTORIA

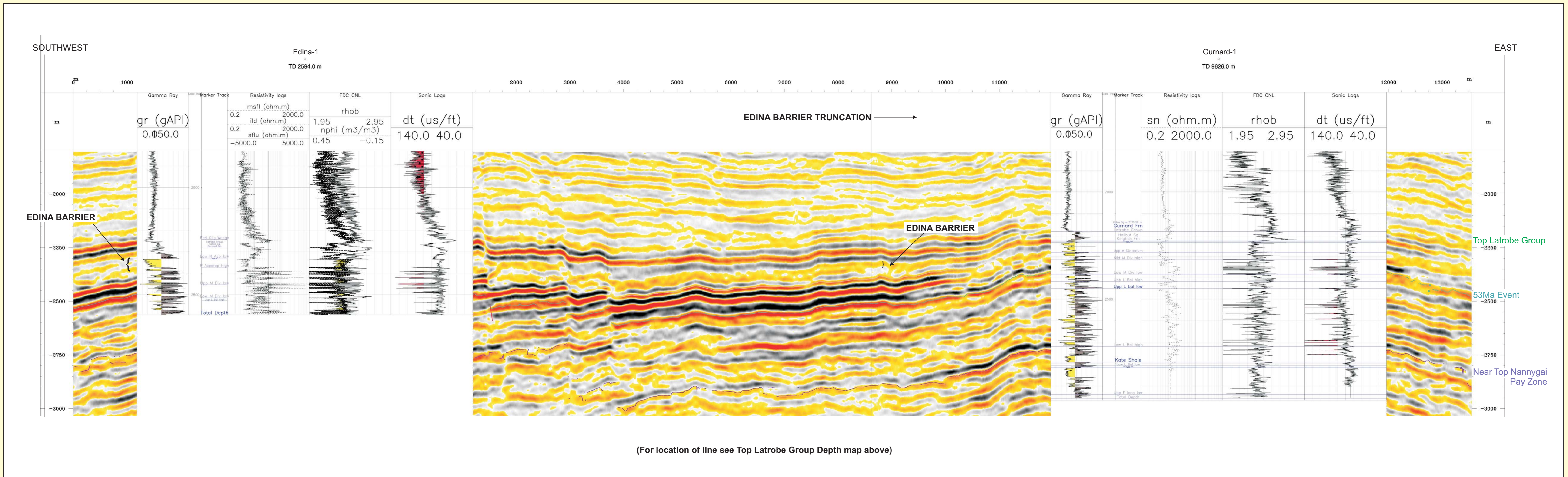
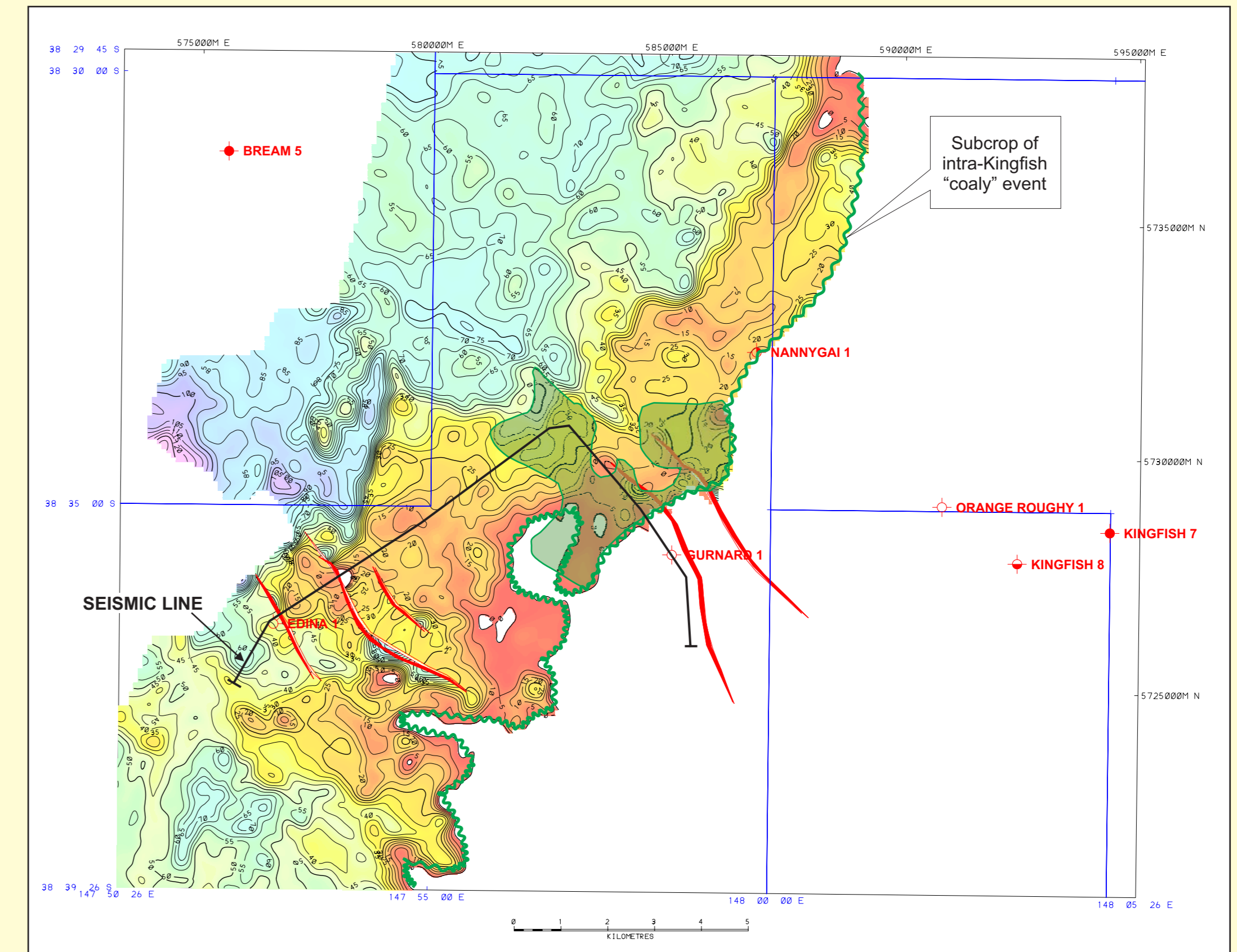
Identified Prospects & Leads in Vic/P42 and 3D seismic survey outlines



Top Latrobe Group Depth Map



Edina Barrier Play Isopach Map



ZaneGrey (Edina Barrier Pinchout)

ZaneGrey (Edina Barrier Pinchout) is a faulted anticline and erosional truncation of barrier sandstones of the Kingfish Formation, west of Gurnard-1 and Nannygai-1 (drilled in 1969 and 1972 respectively). The prospect has several similarities to the Fortescue Field to the northeast. Fortescue occurs where fluvial to barrier sandstones are stratigraphically trapped from the Halibut Field by erosional truncation at the Top Latrobe Group 'coarse clastics'. Seat seal is provided by an 11.5m thick shale/coal unit.

Gurnard-1 was drilled in 1969 to test a large top Latrobe fault dependent closure, beneath a Miocene submarine canyon. Structure is valid in time, but in depth the structural closure is complex due to the high velocity fill in the Miocene submarine canyon and associated pull-up effect. Nannygai-1 was drilled in 1972 on a TWT structure beneath a 'high velocity' submarine canyon. This well had an interpreted low relief closure at Top Latrobe level, valid in time. Edina-1 was drilled in 1982 to test a small faulted anticline (3.4 km) mapped at the top Latrobe Group. The structure was considered to be due to compactional drape over an Eocene coastal barrier / deltaic sand reservoir sequence, now interpreted to be the 'Edina barrier'. The well was unsuccessful and reason for failure interpreted to be lack of fault seal.

The uppermost part of the Kingfish Formation (2333 to 2371 m mt) is interpreted to be a barrier sand. A difference in salinity between this sand (33,000ppm) and sands below a shale unit at 2371 to 2380 m (23,000ppm) suggests an active seat seal to this interval. This barrier sequence and deposits of the same age are interpreted to be absent in Gurnard-1 and Nannygai-1. Seismic interpretation on the BSCC 3D has correlated the top of the Kingfish Formation between these three wells, and a coaly sequence immediately beneath the Edina Barrier. The potential for a rim play west of Gurnard-1 and Nannygai-1 has been identified from this seismic interpretation (the Edina Barrier Pinchout Prospect).

Reservoirs

The Kingfish Formation forms the primary reservoir objectives in the prospect, specifically the thick Edina Barrier sandstone identified in Edina-1. This barrier sequence has excellent reservoir properties in Edina-1, with porosities of 21-23%. In the nearby Kingfish Oil Field, Kingfish Formation reservoirs are a sequence of sandstones deposited in lower and upper shelf settings with minor marine shale interbeds. Reservoir quality is expected to be excellent with average porosities around 20% and permeabilities of several Darcies.

Seals

Top seal is necessary within the Gurnard Formation for this rim play. Seat seal is required within back barrier lagoonal shales at the base of the Edina Barrier sequence (these occur in Edina-1, as indicated by salinity variations) or within coastal plain deposits interpreted to be truncated west of Gurnard-1 and Nannygai-1. A general eastwards truncation of the Kingfish Formation strata is evidenced on the 3D and leads to the potential for deeper 'rim' plays with seat seals within coastal plain deposits beneath this barrier bar and top seal from Gurnard Formation shales and lateral seals from intraformational shales of the Kingfish Formation.

Mapping of the 'zero edge' and the likely extent of the rim play are difficult. Two possible zero edges have been identified. An isopach map of the Edina Barrier sequence has been determined from the seismic and well data using a 'wedge' function for the gross thickness of the Top Latrobe to 53Mya event and known thickness of the same sequence and Edina Barrier in Edina-1. This isopach is shown above. In addition, a bright 'intra-Kingfish Formation event, subcropping west of Gurnard-1 is likely to represent coastal plain coaly deposits and this represents a possible seat seal unit beneath the barrier. The subcrop of this event, which constrains the eastern limit of the barrier, is also shown on the isopach above. Lateral seal presents a significant risk to the prospect. The barrier sequence is likely to have an erosional base which may breach the seat seal away from Edina-1. In addition, identification and mapping of potential seat seal units is problematic and subjective. Whilst the ZaneGrey Edina Barrier Subcrop is predominantly an anticlinal closure and rim play, faults evident around Gurnard-1 may breach seals and pose a further risk.

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 this 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. However, charge is unlikely to reach this prospect via spill from the Kingfish field through the saddle to the east if an effective seat seal is present. Gas is known at the top Latrobe in Bream to the west, although this structure is much shallower and unlikely to be a conduit for gas migration. Charge may be accessible via migration from deeper Latrobe Group levels to the Central Deep. Simplicity would suggest that, as this prospect 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 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 CO₂ gas cap. No indication of H₂S is identified in nearby wells.

Risks

The main risks for the ZaneGrey Edina Barrier Subcrop Prospect relate to the seat seal and the mapped zero edge, and to a lesser extent, access to charge. Faulting and depth conversion pose additional risks. A strong lateral velocity variation in the overburden makes the depth conversion problematic. Detailed seismic velocity data has been used to minimise the risk.

Scope for Reserves

Reserves potential is poorly constrained at this time due to uncertainties in areal and vertical closure due to uncertainty in zero edge limits and depth conversion uncertainty. Further work is needed to determine the scope for reserves.

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January, 2004