Gippsland Basin
VIC/P39(V)

Seismic Interpretation Report

July 2005

Contents

1. Available data

- Wells - onshore and offshore (Fig 1)
- New 2-D seismic – GNX05 survey (Fig 2,3)
- Northern Fields 3-D for well ties (Fig 4)
- Old 2-D seismic – G92A and GL88B for well ties and GB82A for mapping onshore area (Fig 4)

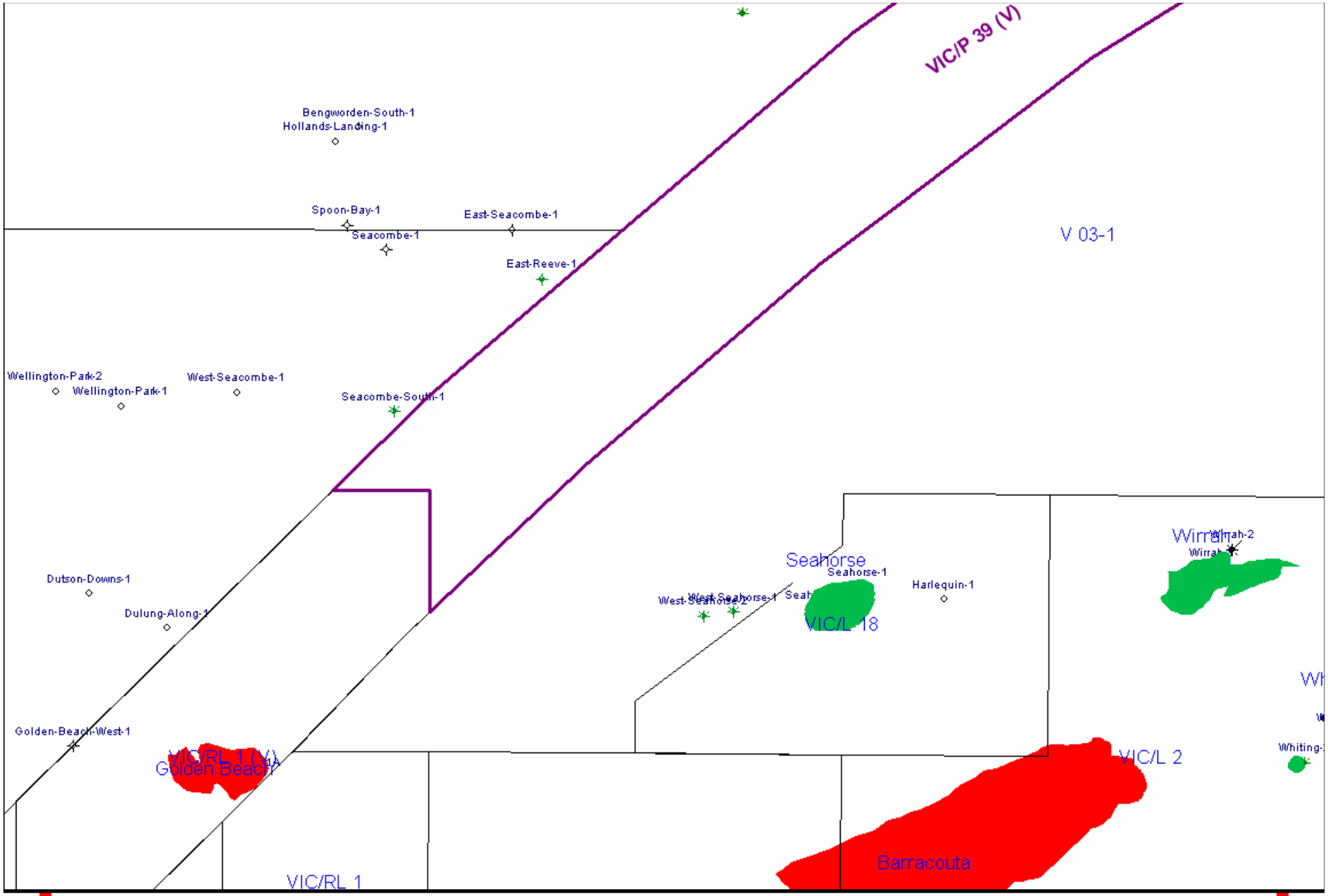


Figure 1 **Wells and Fields**

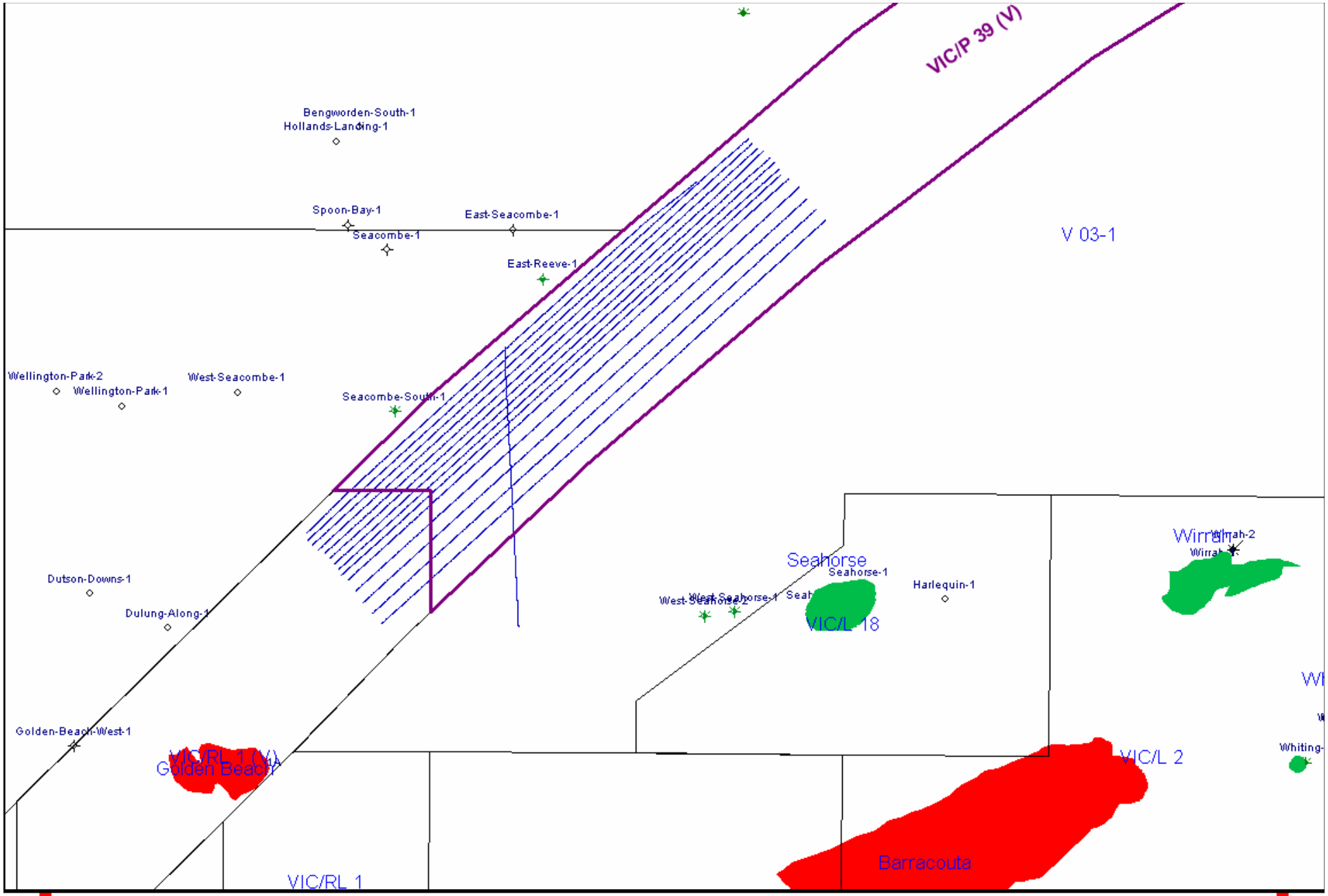


Figure 2 **GNX05 Seismic Survey** 4

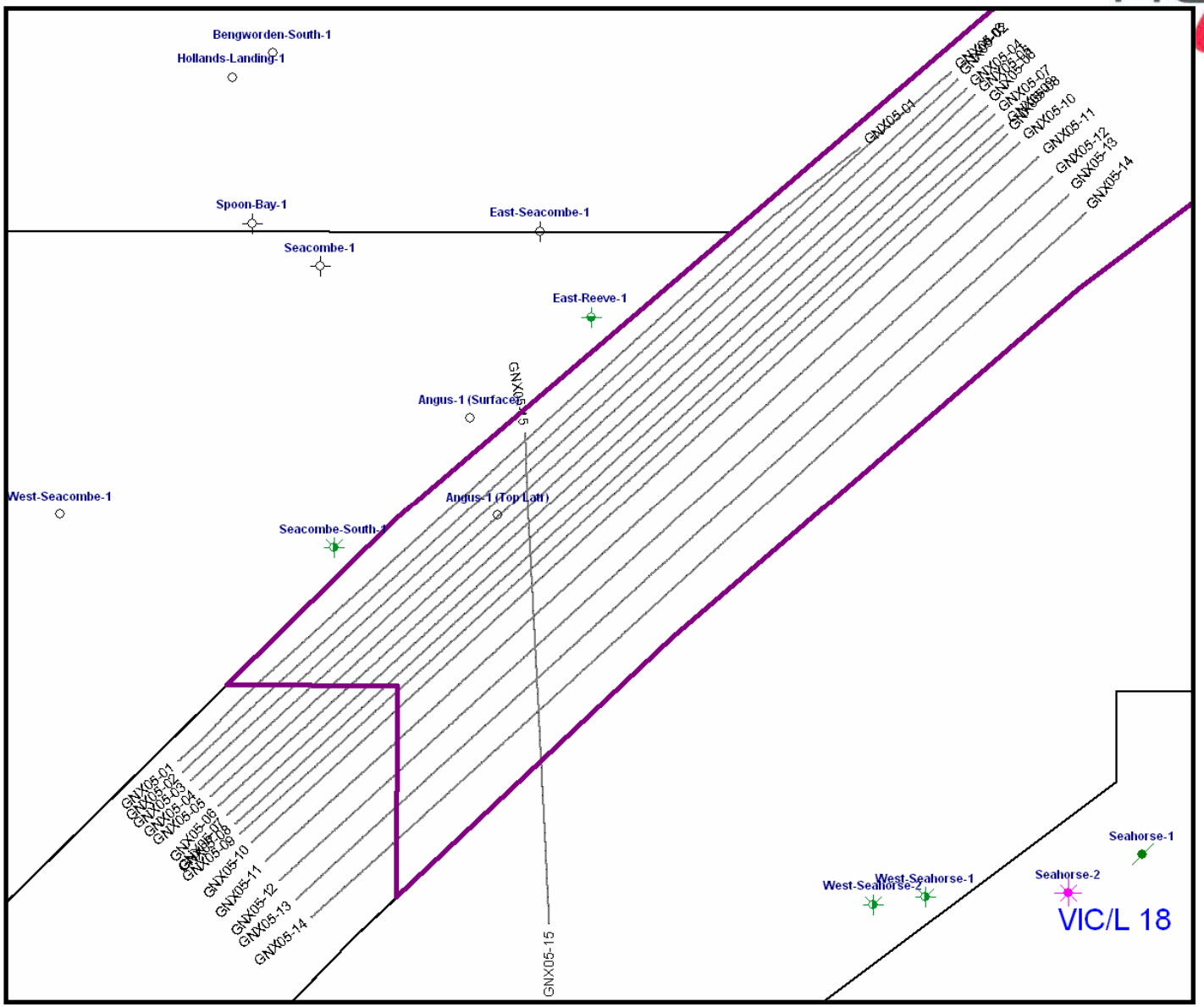


Figure 3 **GNX05 Seismic Survey (detail)**

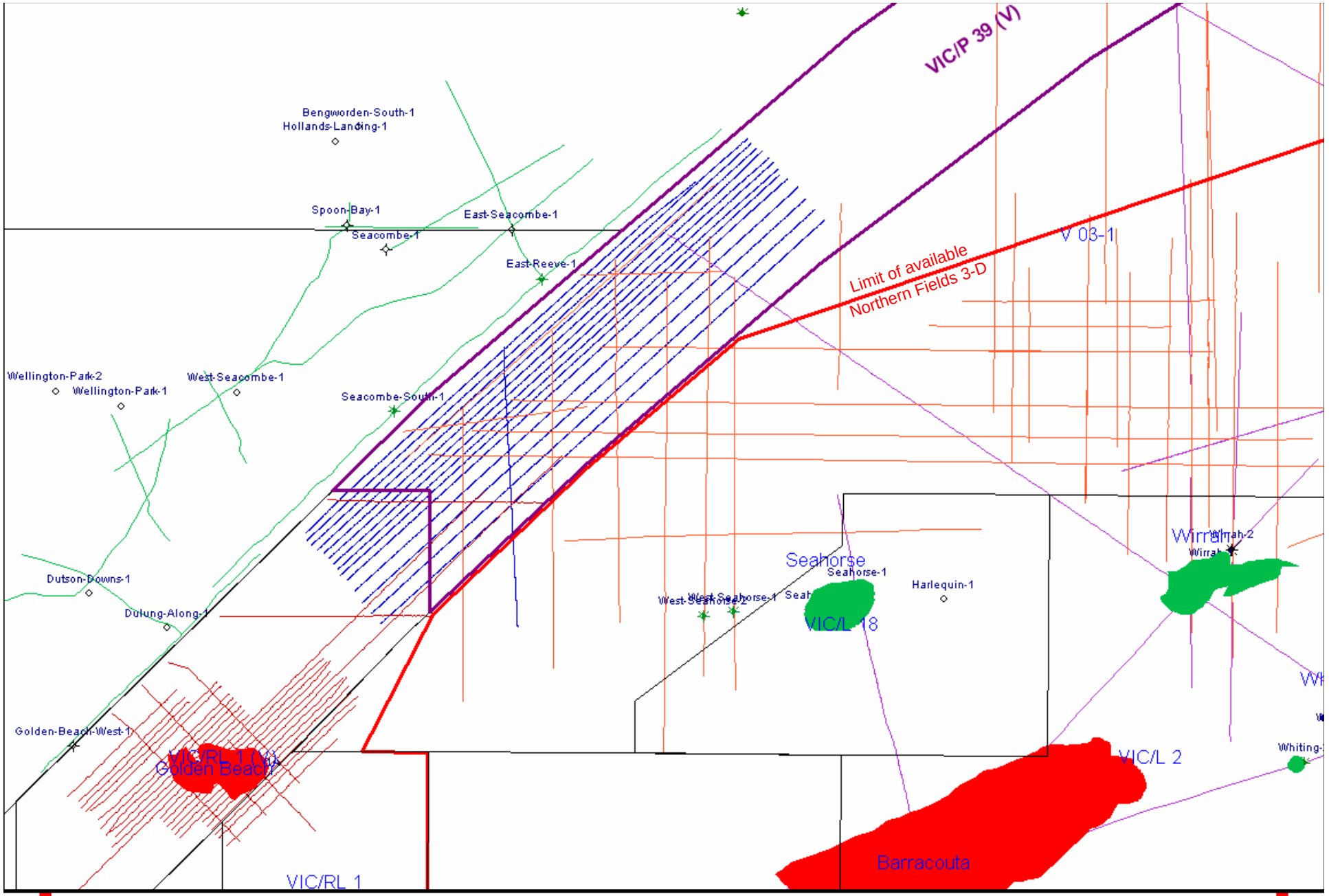


Figure 4 **All Seismic Surveys**

2. Well ties

- Medium distance ties from Golden Beach Wirrah and Seahorse
- No direct ties from onshore wells to prospect area

2.1 Golden Beach-1A (Fig 5,6)

- Golden Beach-1A, drilled 1967, poor logs and uncertainty in exact location
- Mixture of seismic lines from open file data, some 2-D migrated, some 3-D migrated – poor quality on flanks due to aliasing.
- Good character tie to seismic over crest of structure. Top Latrobe pick can be carried confidently to VIC/P39(V) area.

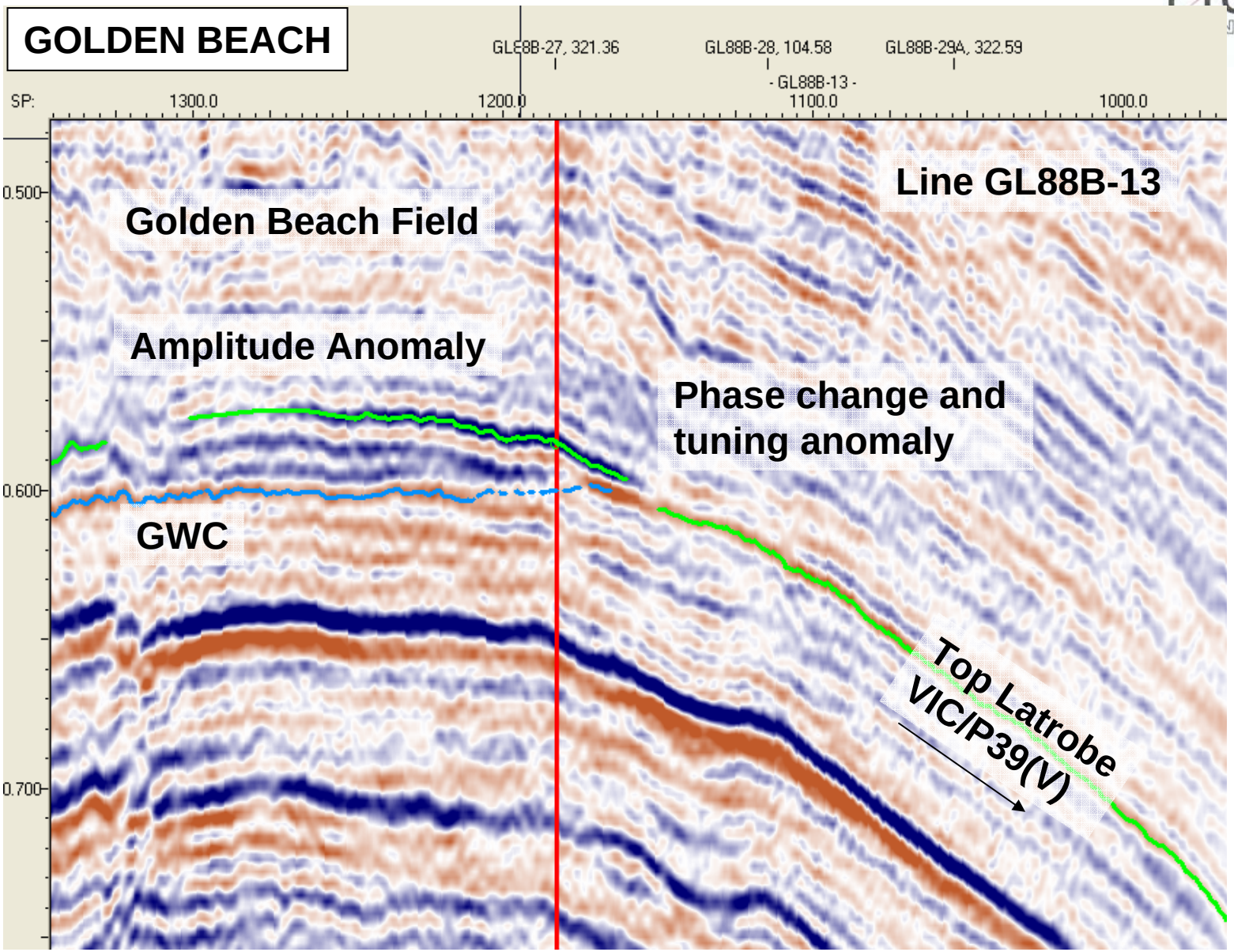


Figure 5 Golden Beach Tie

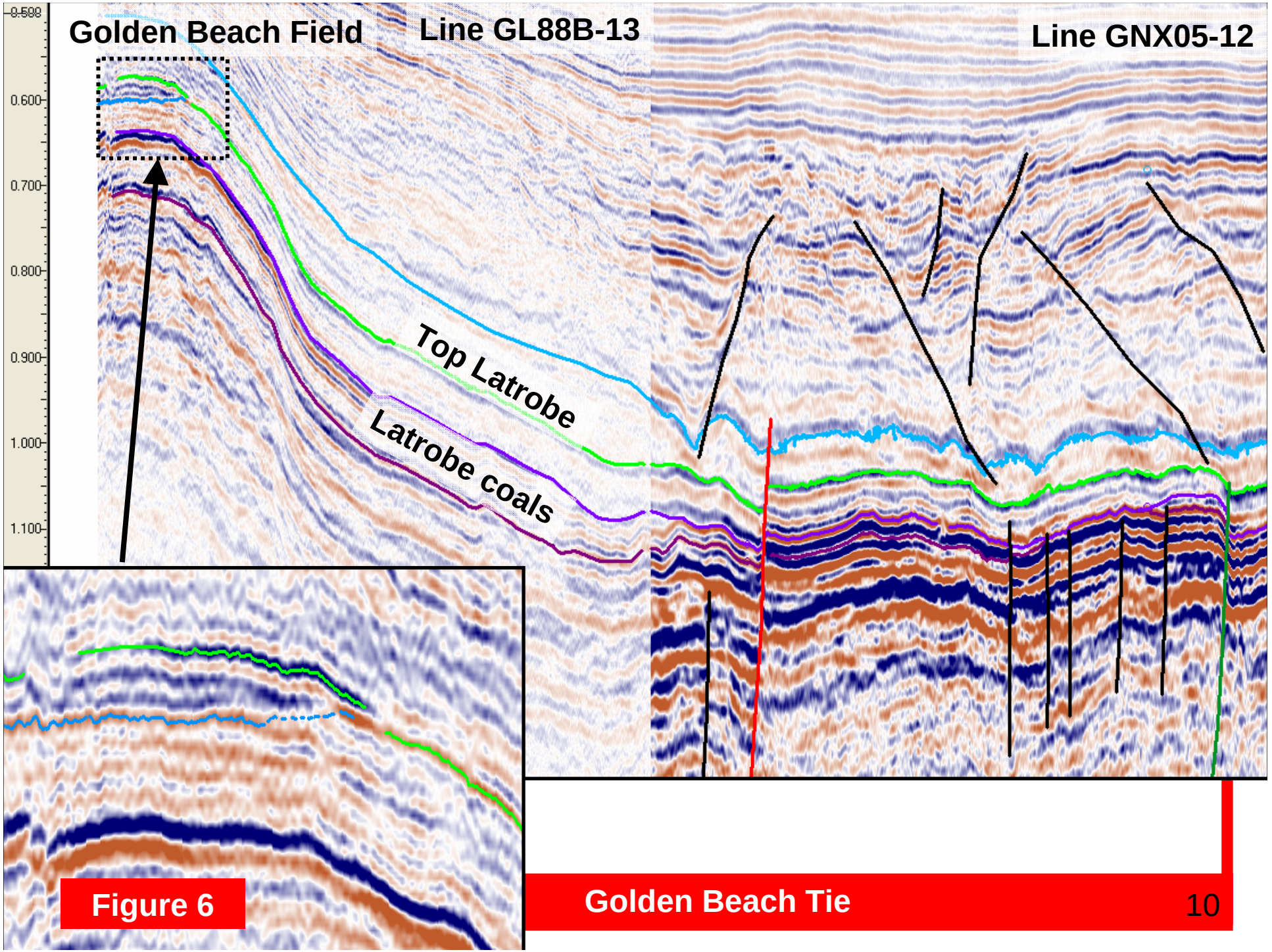


Figure 6

Golden Beach Tie

2.2 Seahorse wells (Fig 7,8)

- Four wells with good logs and check-shots
- Good control point although the clastic coastal barrier sequence is thinner at Seahorse and the top Latrobe is sometimes difficult to pick as a result.
- Tied by Northern Fields 3-D into GNX05 lines

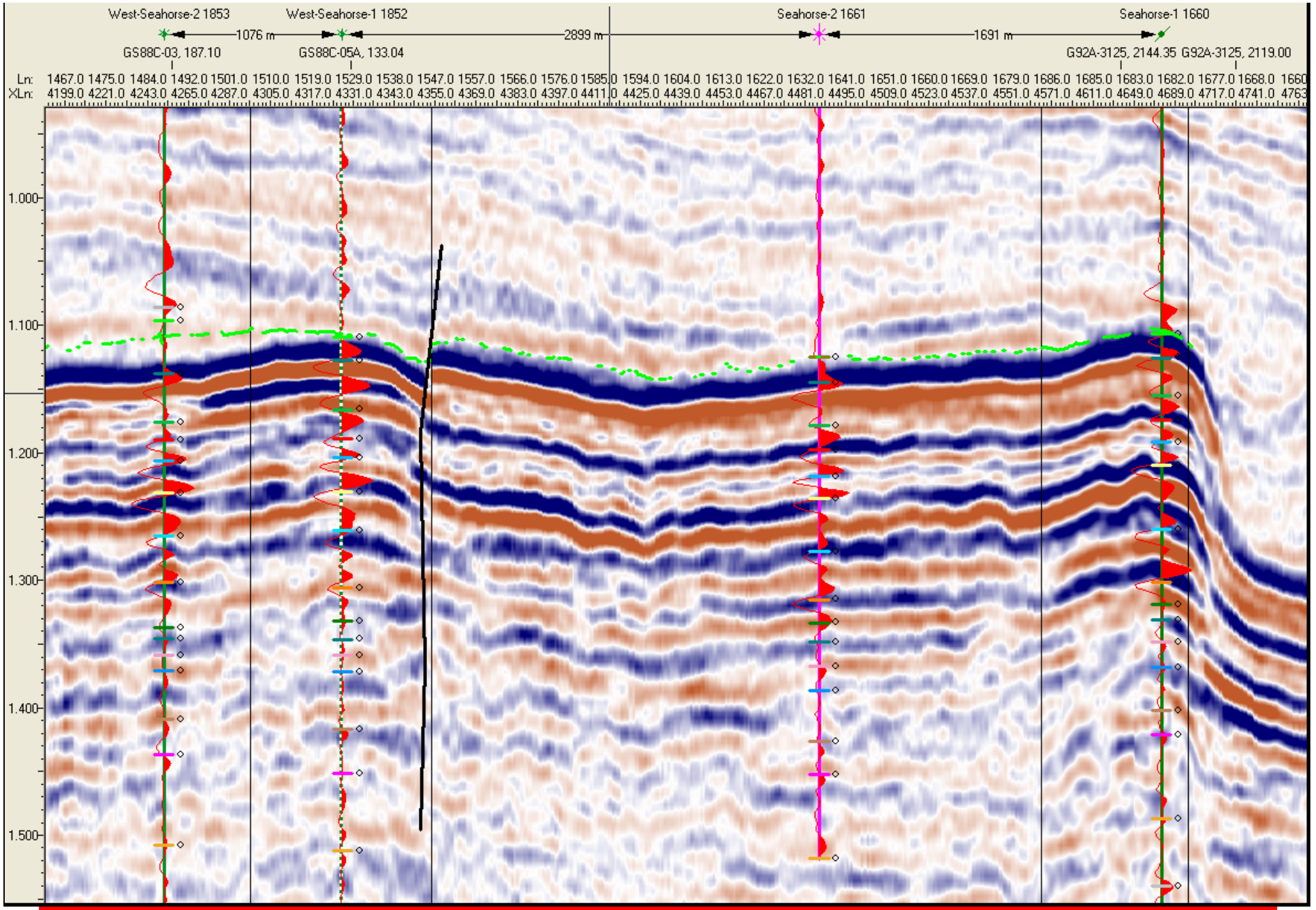


Figure 7 **Arbitrary Line from Northern Fields 3-D**

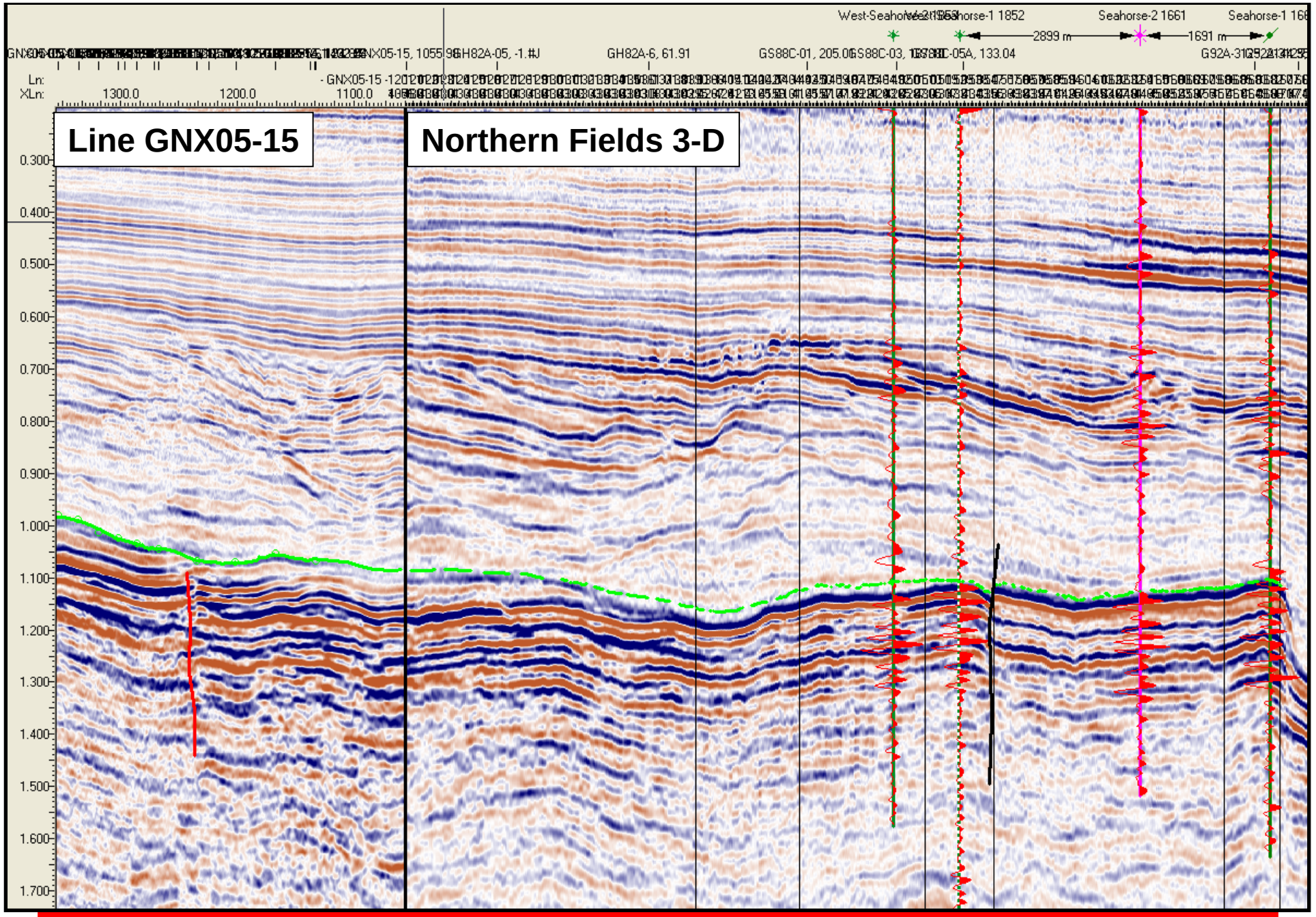


Figure 8 **Seahorse Tie** 13

2.3 Wirrah wells (Fig 9,10)

- Wells with good logs and check-shots
- Good control point
- Tied by G92A lines into GNX05 lines
- Top Latrobe correlated with high confidence to Galloway area

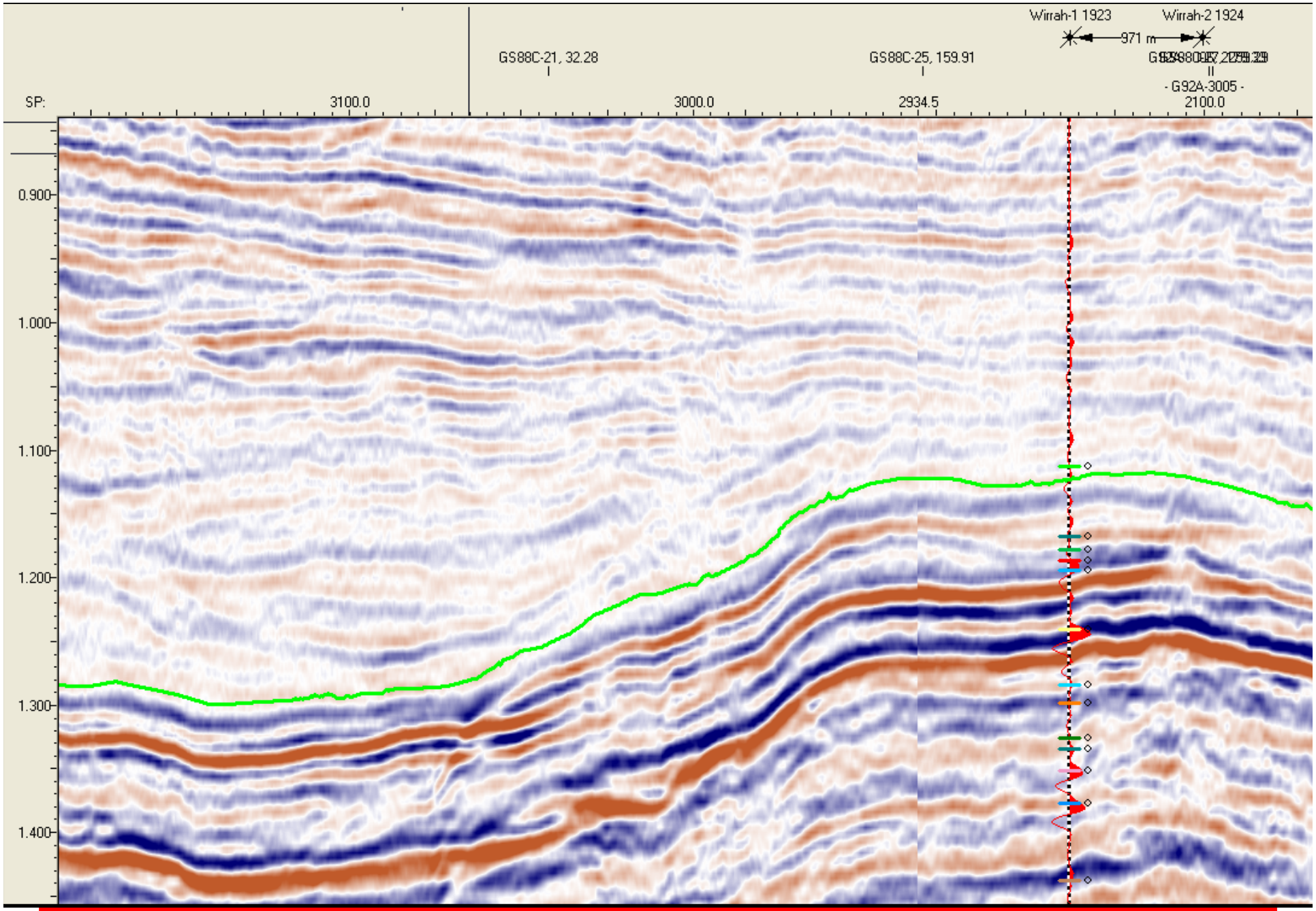


Figure 9 **Wirrah Tie**

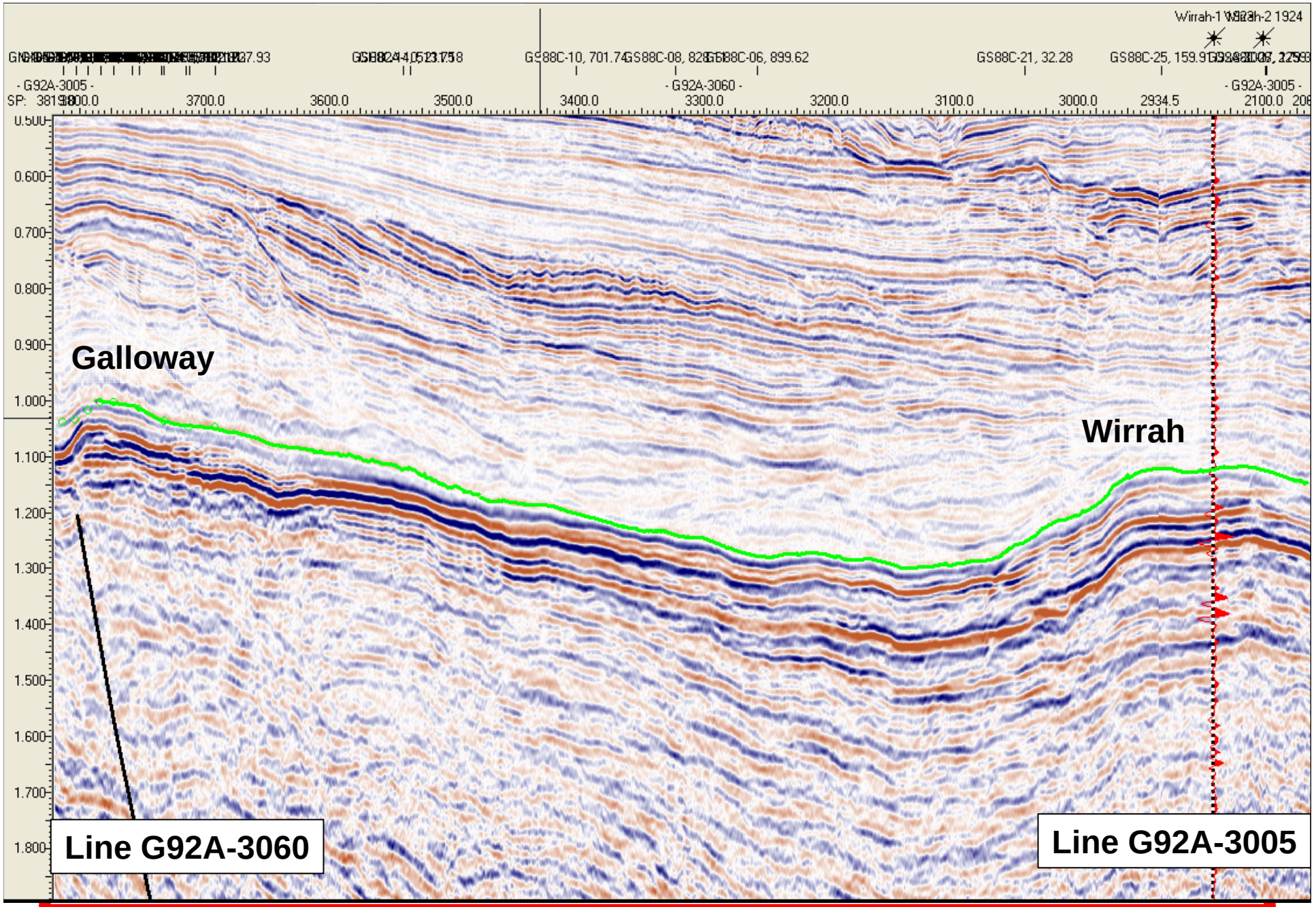
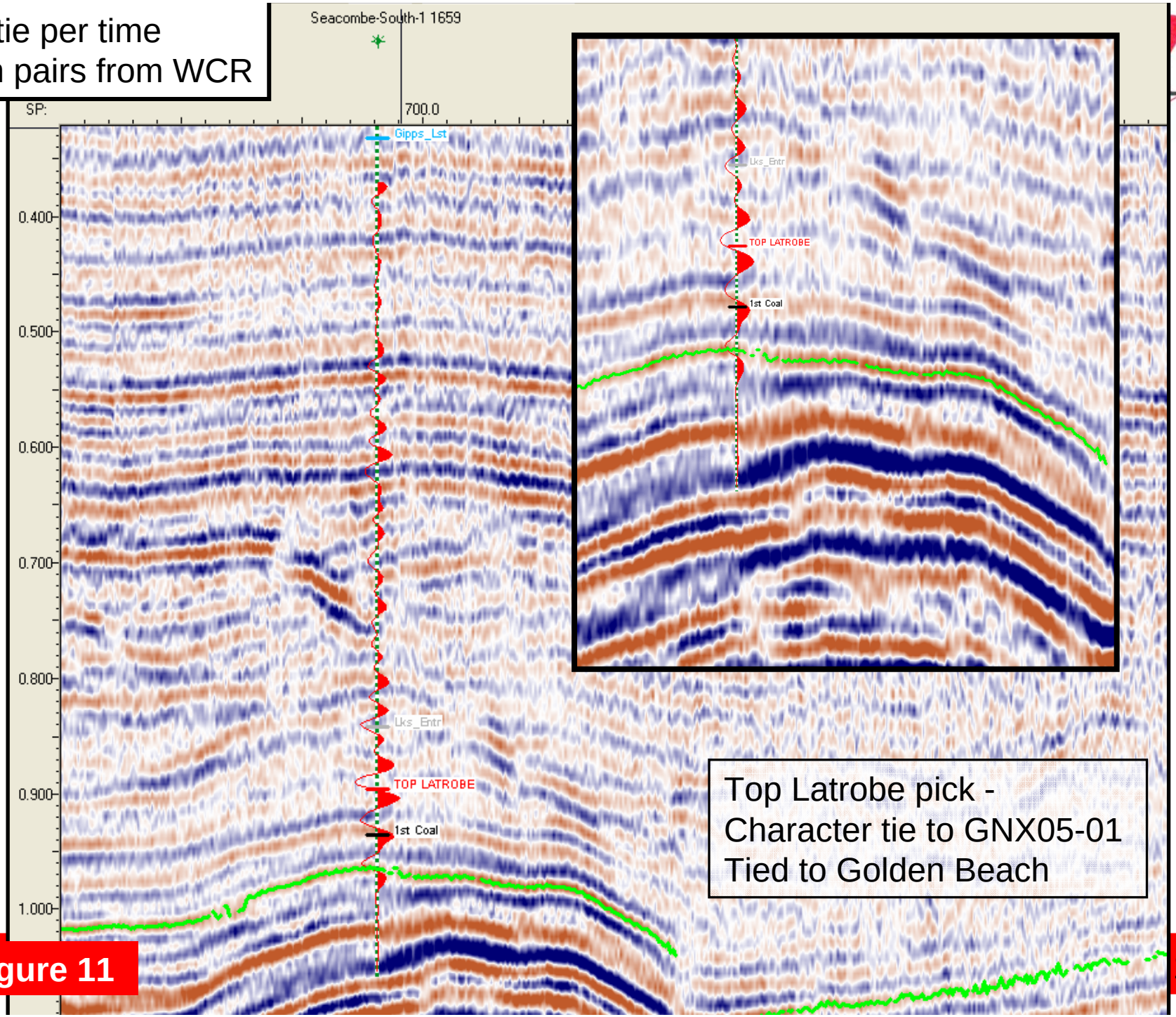


Figure 10 Wirrah Tie

2.4 Seacombe South -1 (Fig 11-13)

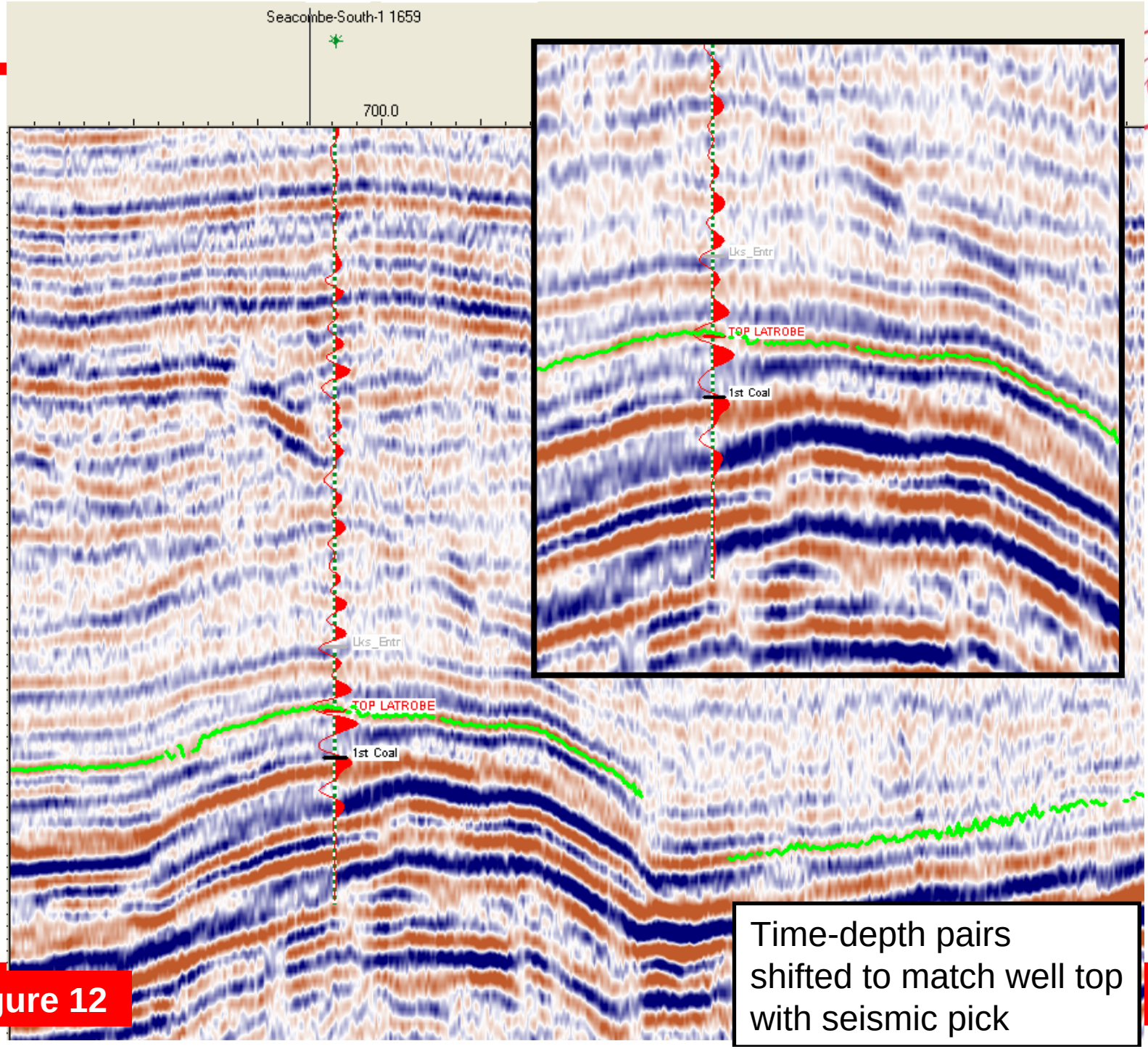
- Has velocity survey and is on a 1982 vintage onshore seismic line of fair quality
- No direct tie to offshore area
- Some issues with velocity survey data – only a Time vs Depth chart is included with the WCR.
- Some issues with well location and seismic line location
- Time depth pairs from the chart do not give a convincing tie to the seismic at the recorded well location.

Well tie per time depth pairs from WCR



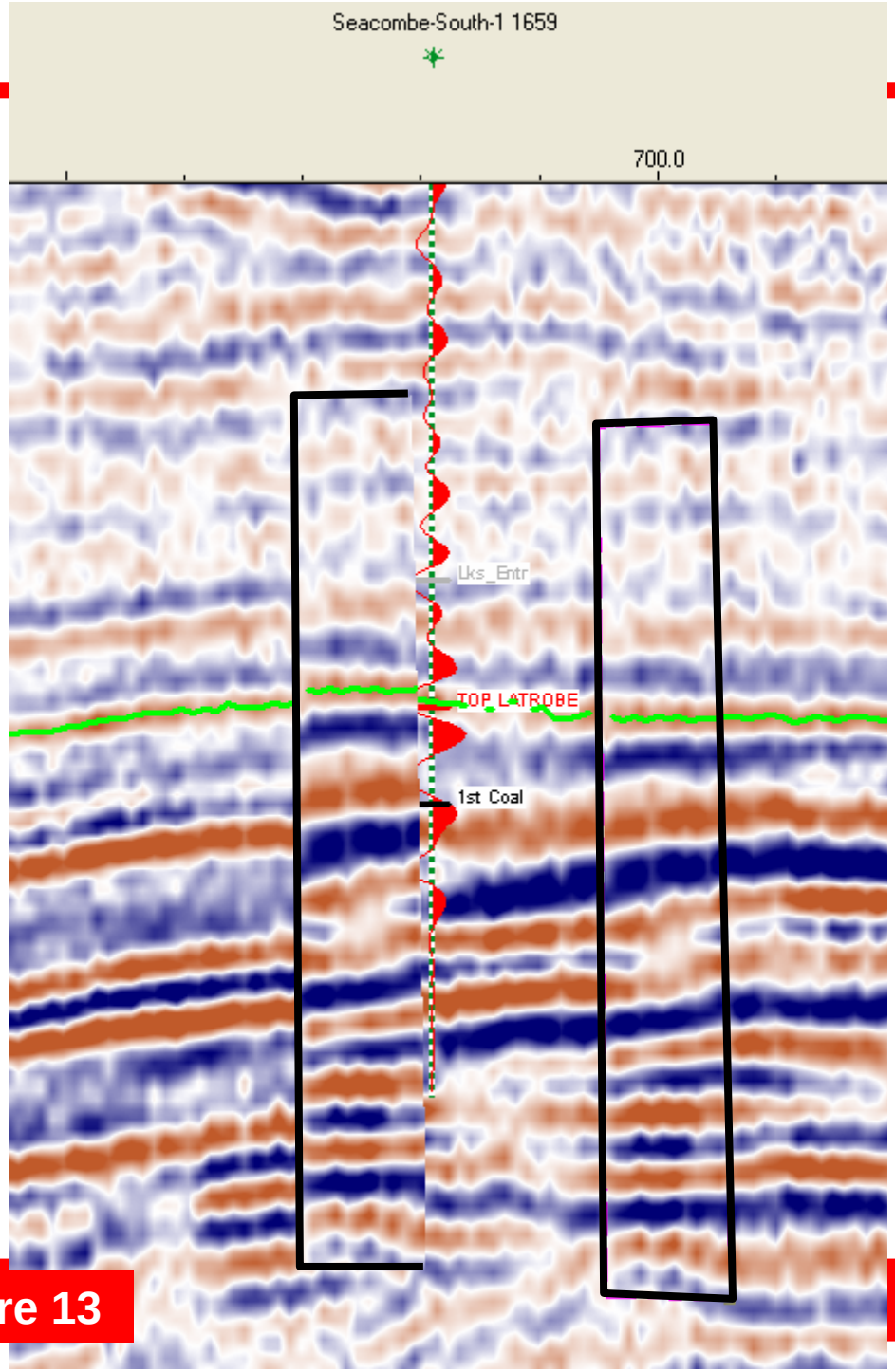
Top Latrobe pick -
Character tie to GNX05-01
Tied to Golden Beach

Figure 11



Time-depth pairs shifted to match well top with seismic pick

Figure 12



Time-depth pairs shifted to match well top with seismic pick

With time shift there is a good match of seismic character consistent with the Top Latrobe pick tied from elsewhere. The tie is even better some 300m along the line to the northeast.

Figure 13

2.5 East Reeve -1

- Is located on two 1982 onshore seismic lines but has no check-shot survey
- Has a 200m uncertainty on location
- Geological picks okay

3. Seismic Interpretation

- GNX05 seismic is primary data set in VIC/P39(V)
- Character ties to onshore area, GB82 data
- Ties to Golden Beach through “Snowy River” survey
- Ties to Seahorse area through Northern Fields 3-D data
- Ties to Wirrah area with G92A data

GNX05 Seismic Data

- Good Quality (Fig 14)
- Preliminary version was processed as Quadrature Phase - good for tying to Northern Fields 3D
- Final versions were Zero-Phase

Horizons interpreted

- Top Latrobe and N asperus coal were key horizons for prospectivity (Fig 15)
- Shallower and deeper horizons were interpreted for QC and control on structural elements (Fig 16)

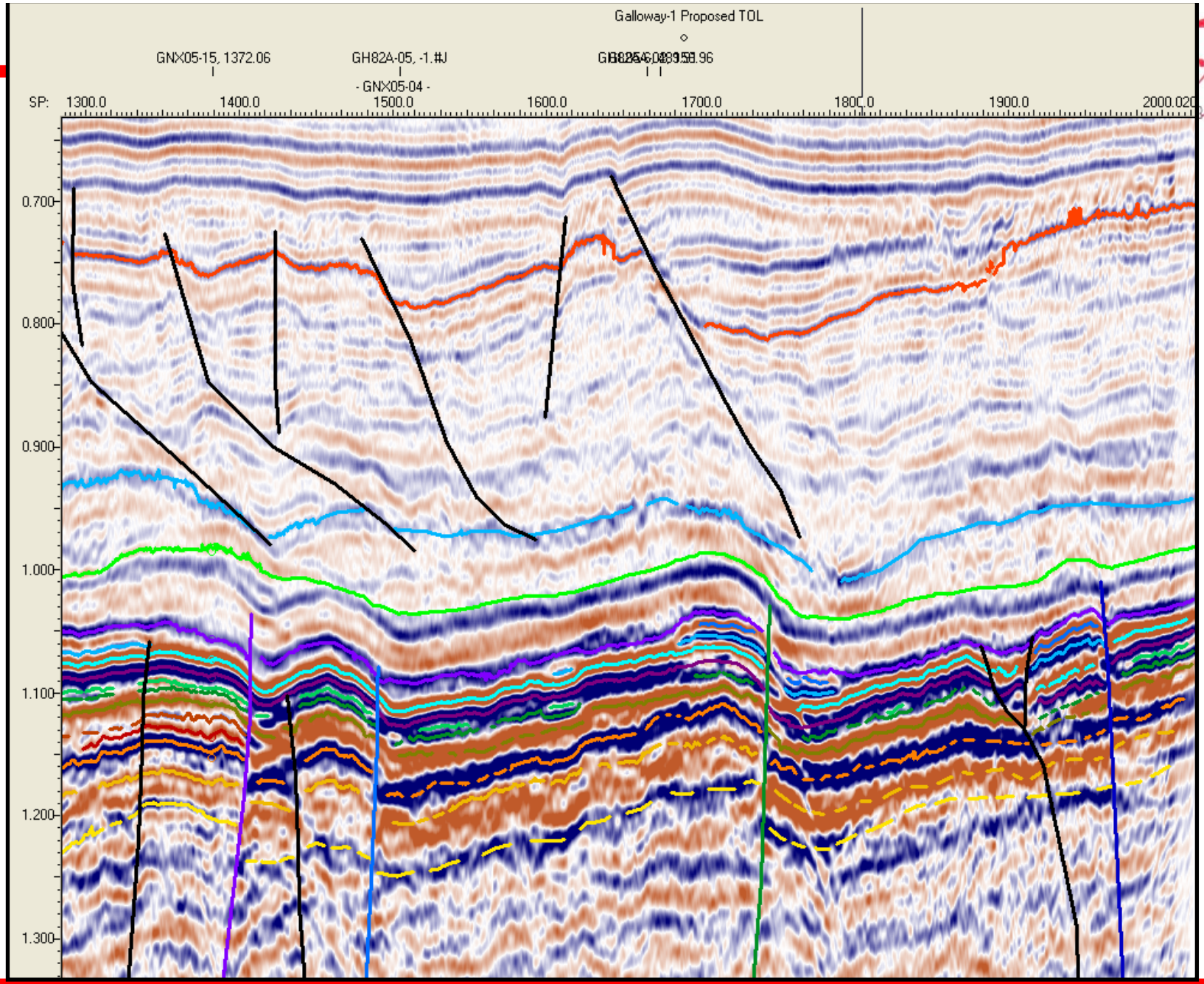


Figure 14 **GNX05 Data Quality Example - Line GNX05-04**

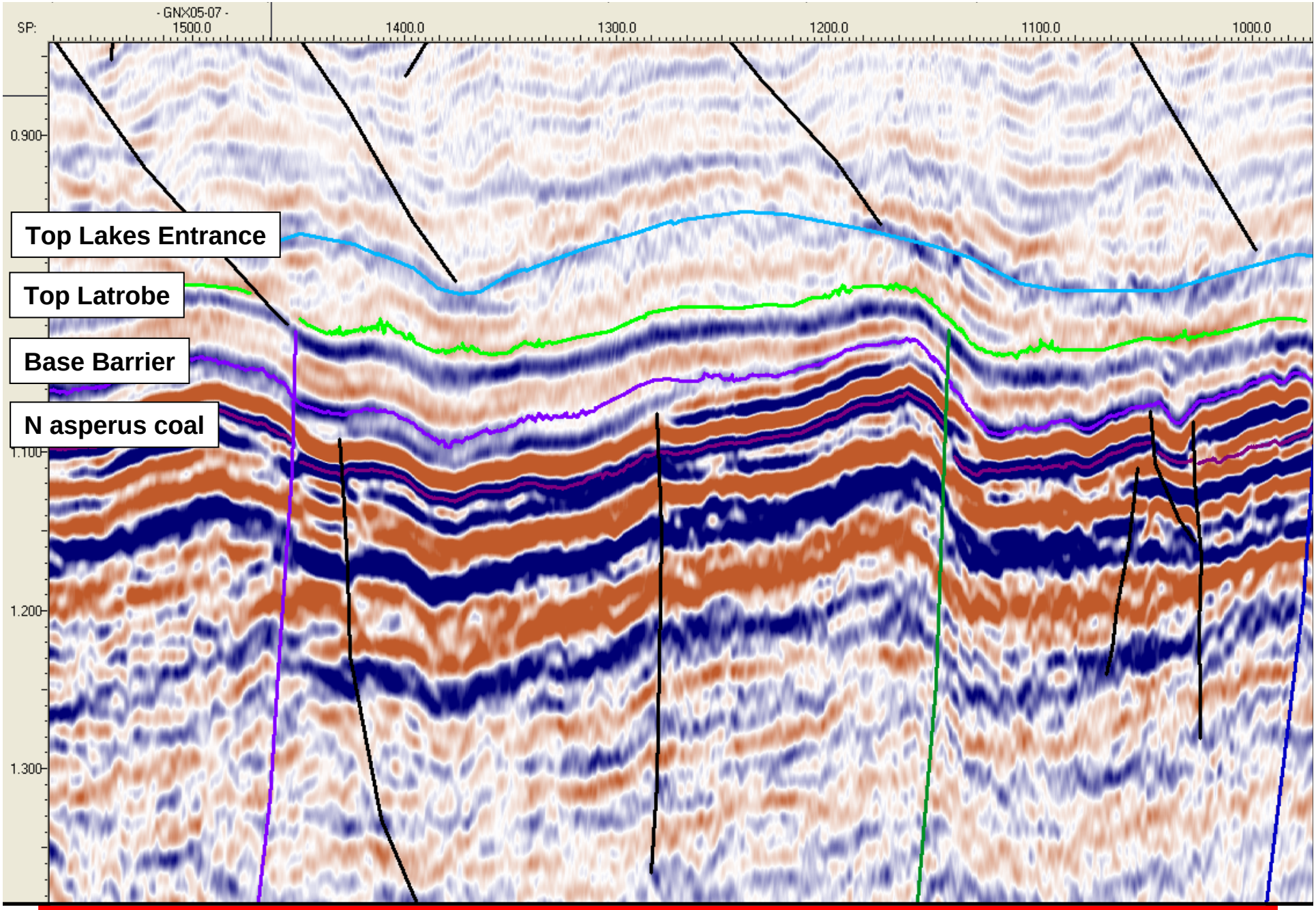
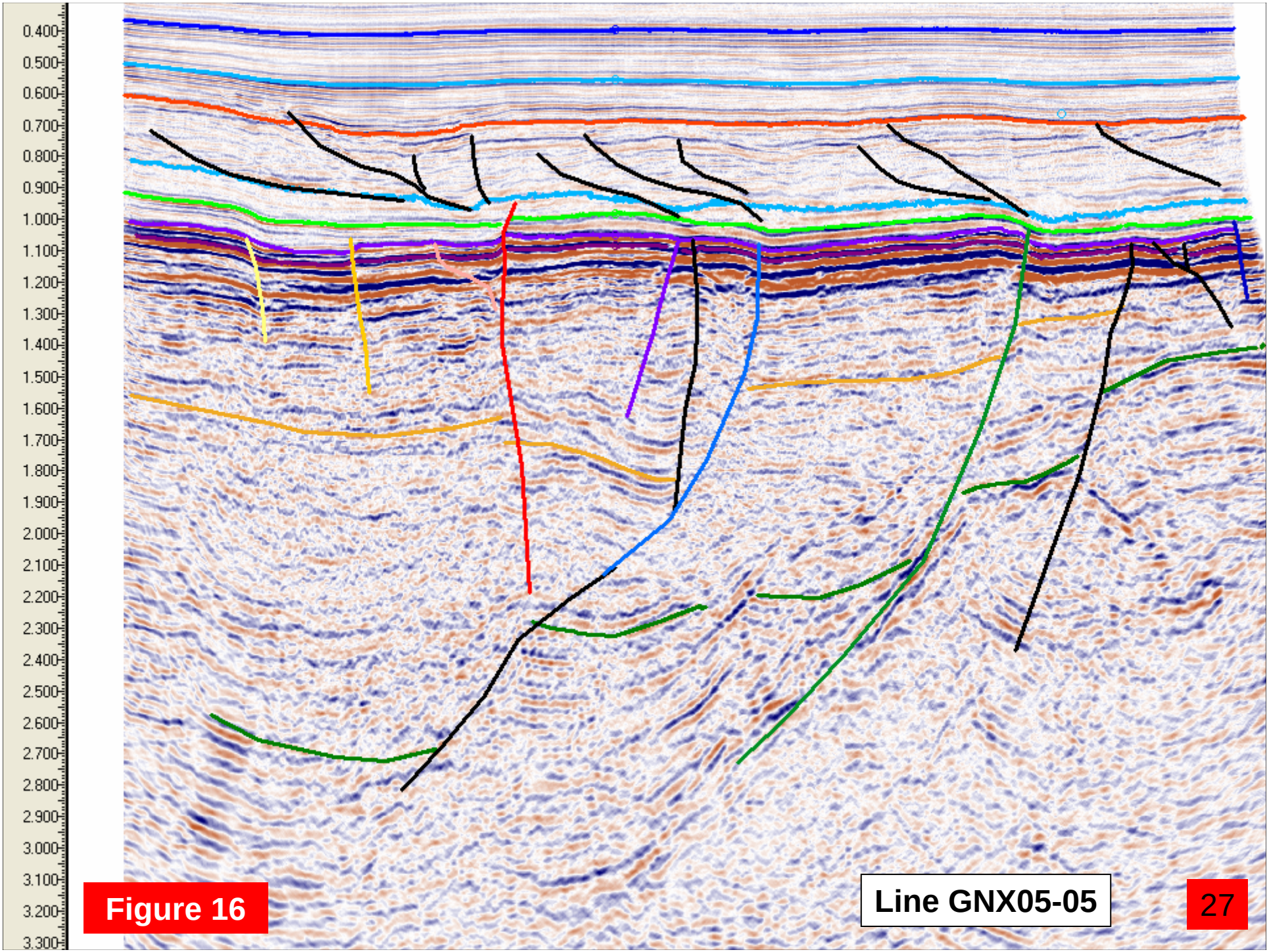


Figure 15 **Line GNX05-07 Seismic Picks**


0.400
0.500
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1.600
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2.200
2.300
2.400
2.500
2.600
2.700
2.800
2.900
3.000
3.100
3.200
3.300
Figure 16
Line GNX05-05

4. TWT mapping

- TWT maps were produced for the Top Latrobe (Fig 17-22) and N asperus coal (Fig 23-25)

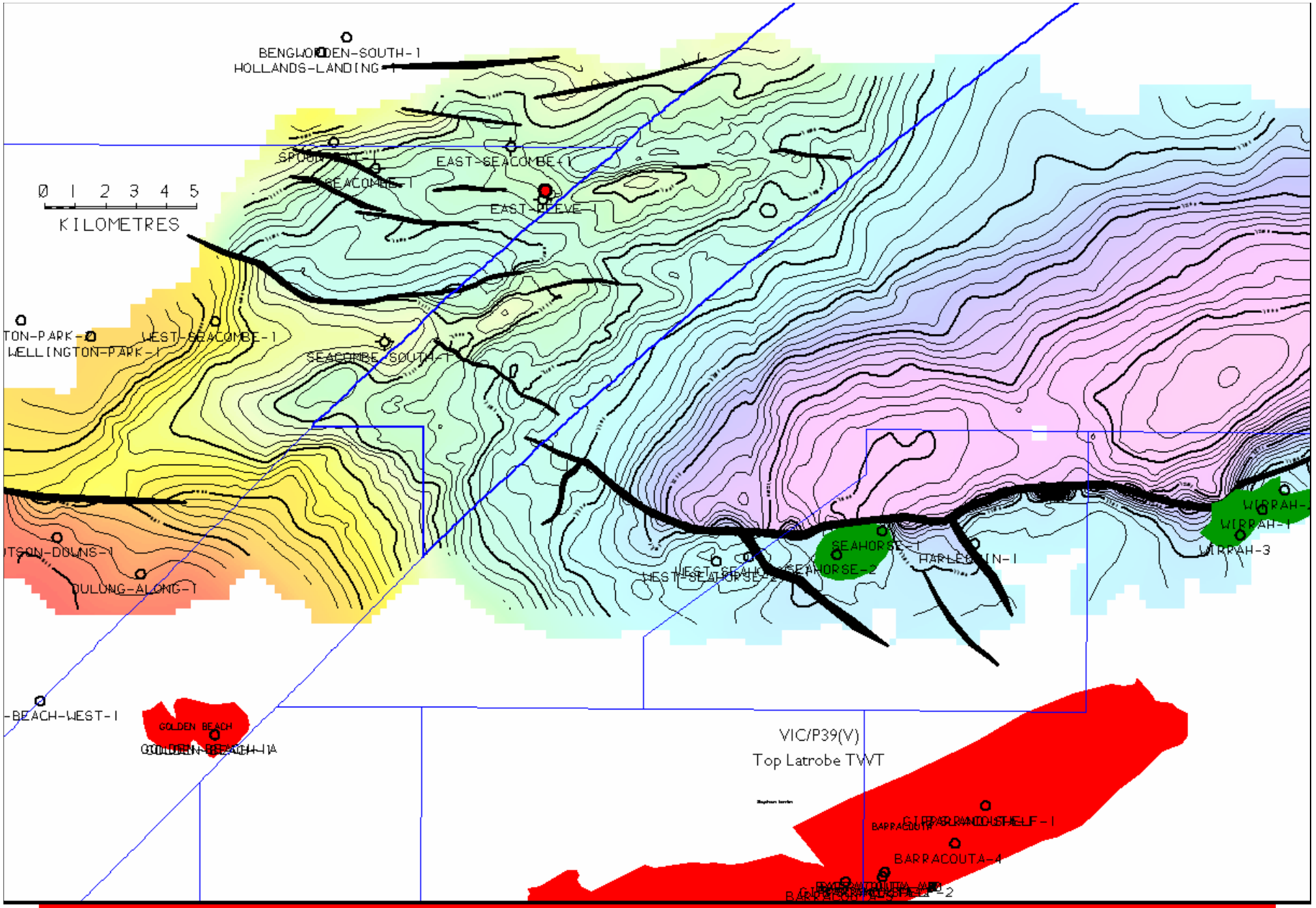

Figure 17 **Top Latrobe TWT semi-regional**

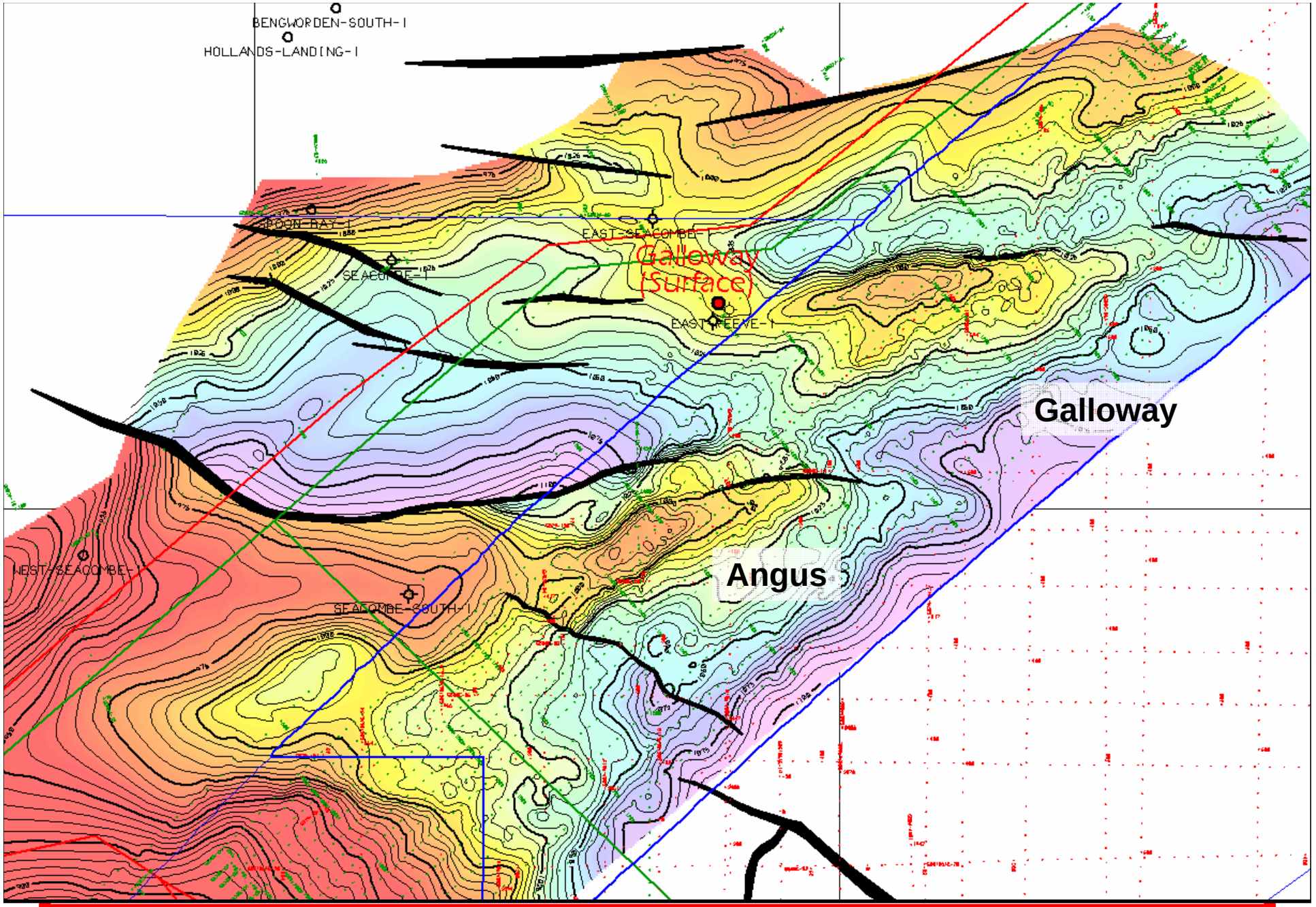

Figure 18 **Top Latrobe TWT – VIC/P39(V) and onshore**

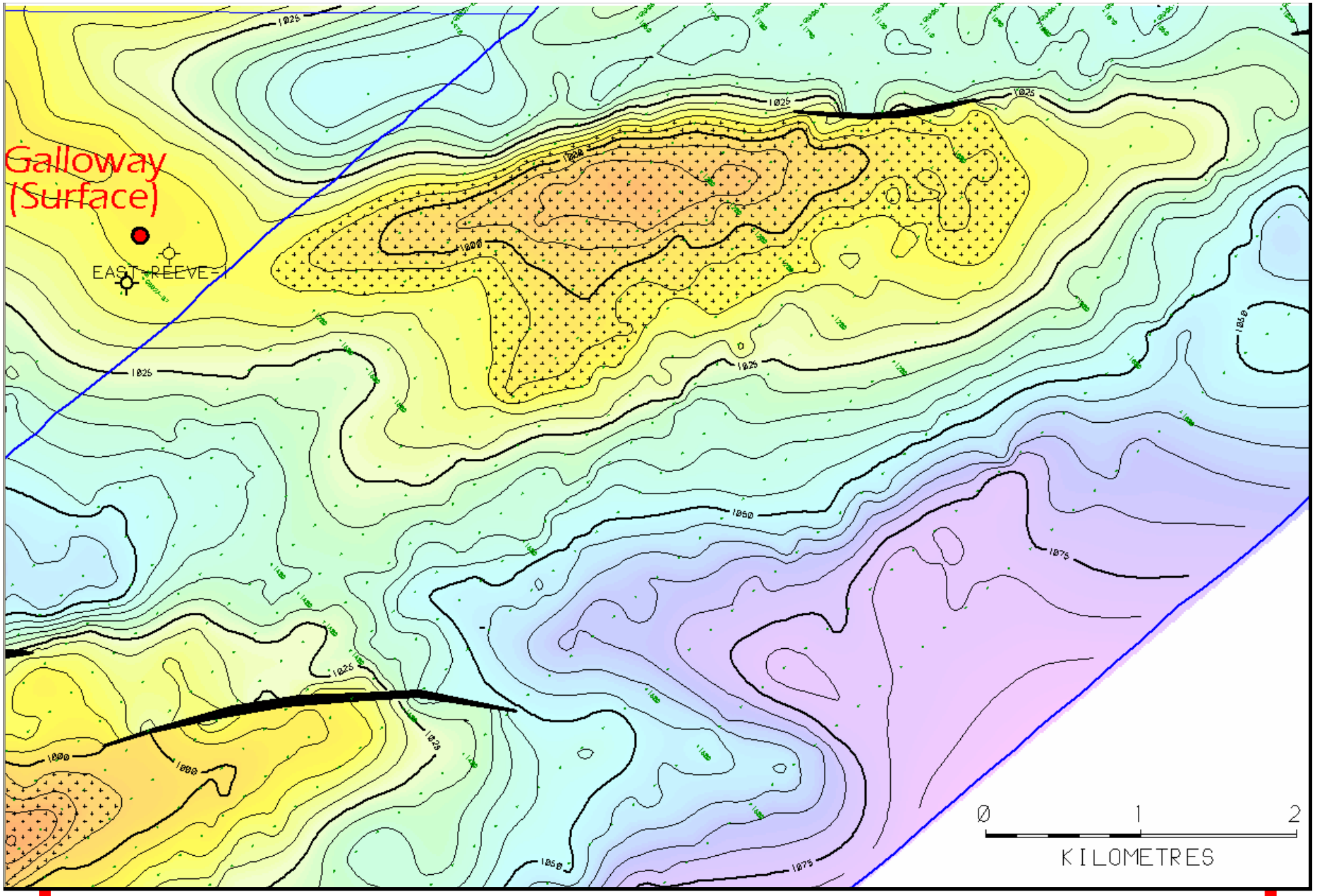

Figure 19 **Top Latrobe TWT – Galloway Prospect**

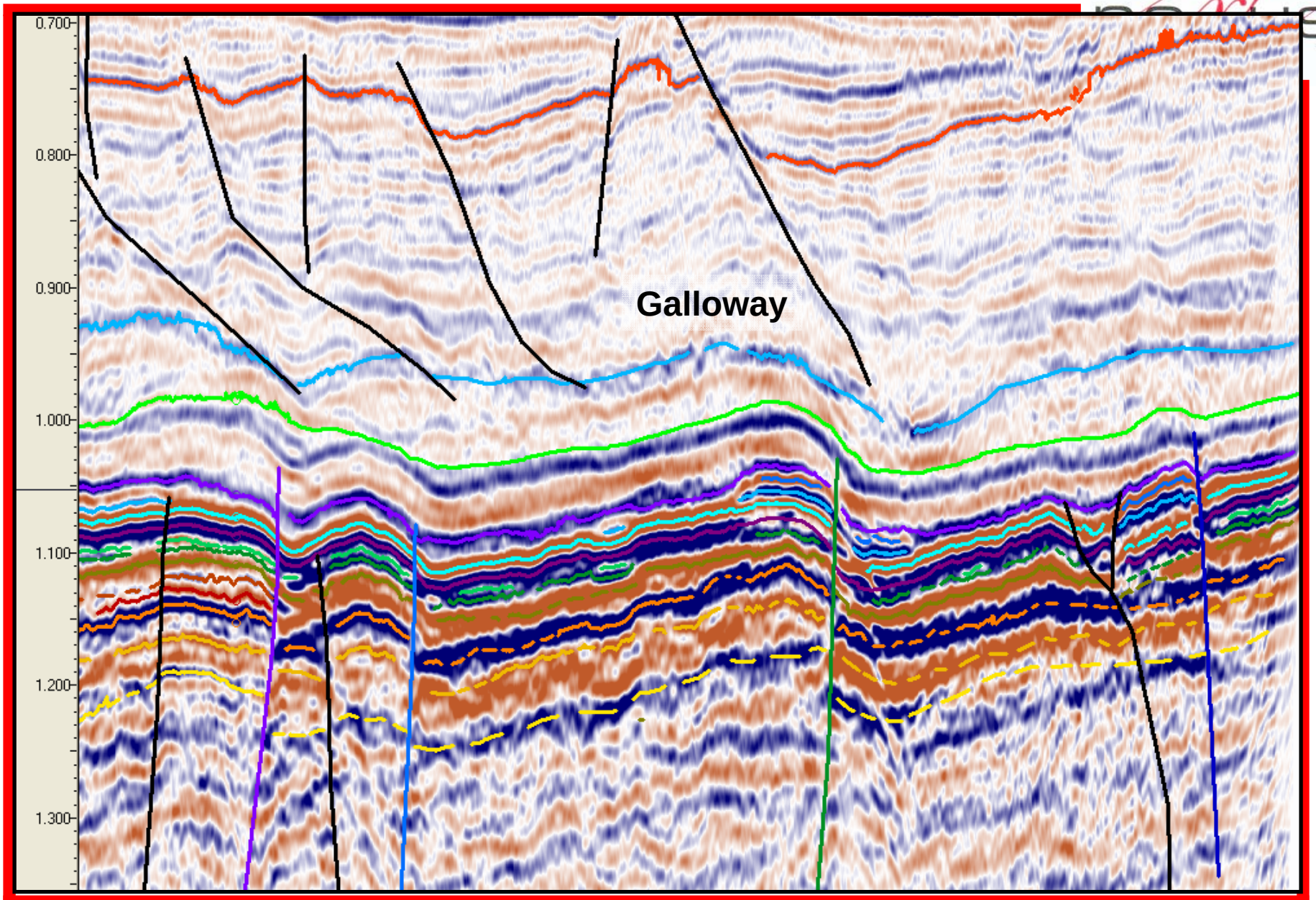

Figure 20 **Line GNX05-04 – Galloway Prospect**

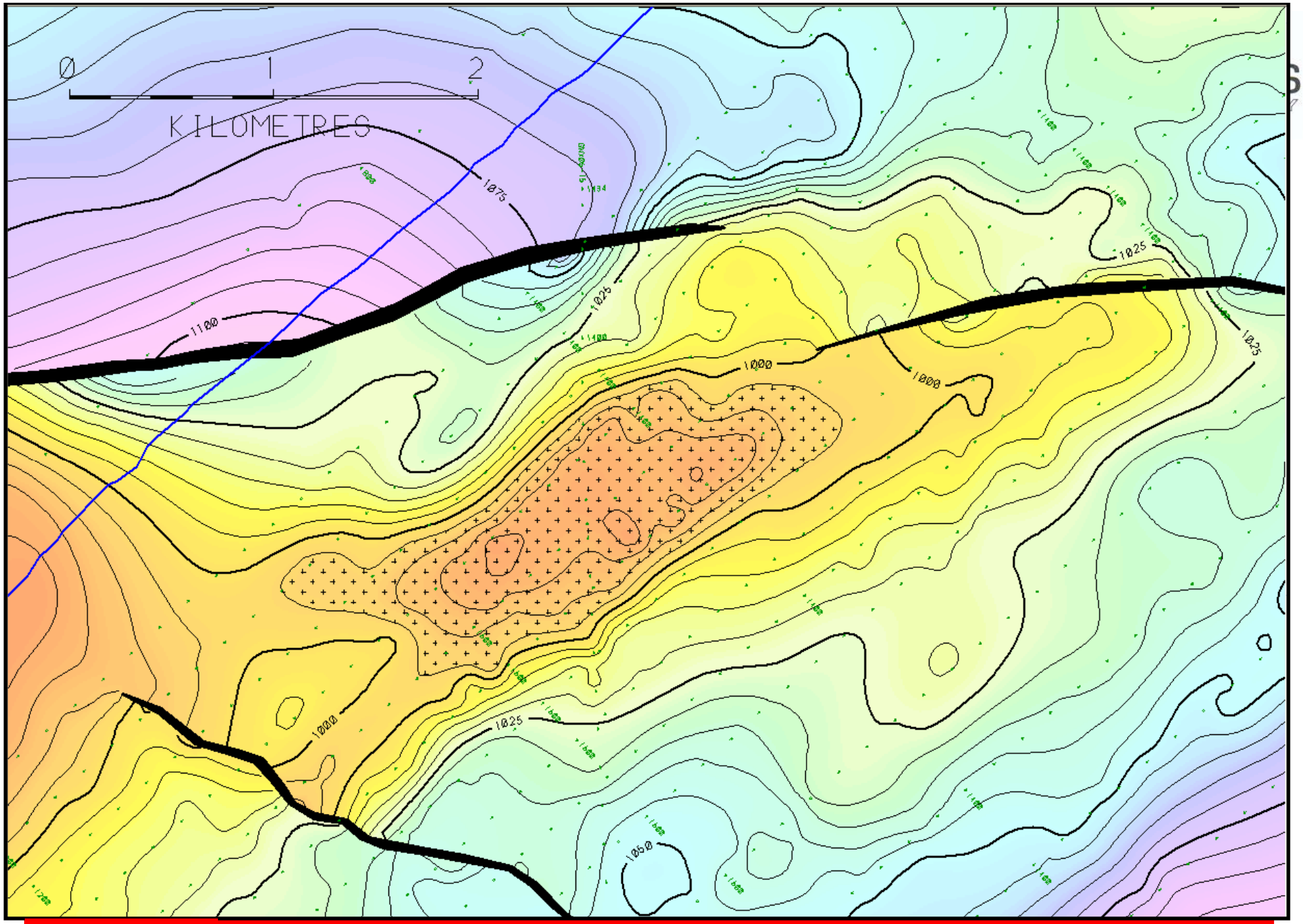

Figure 21 **Top Latrobe TWT – Angus Prospect** 33

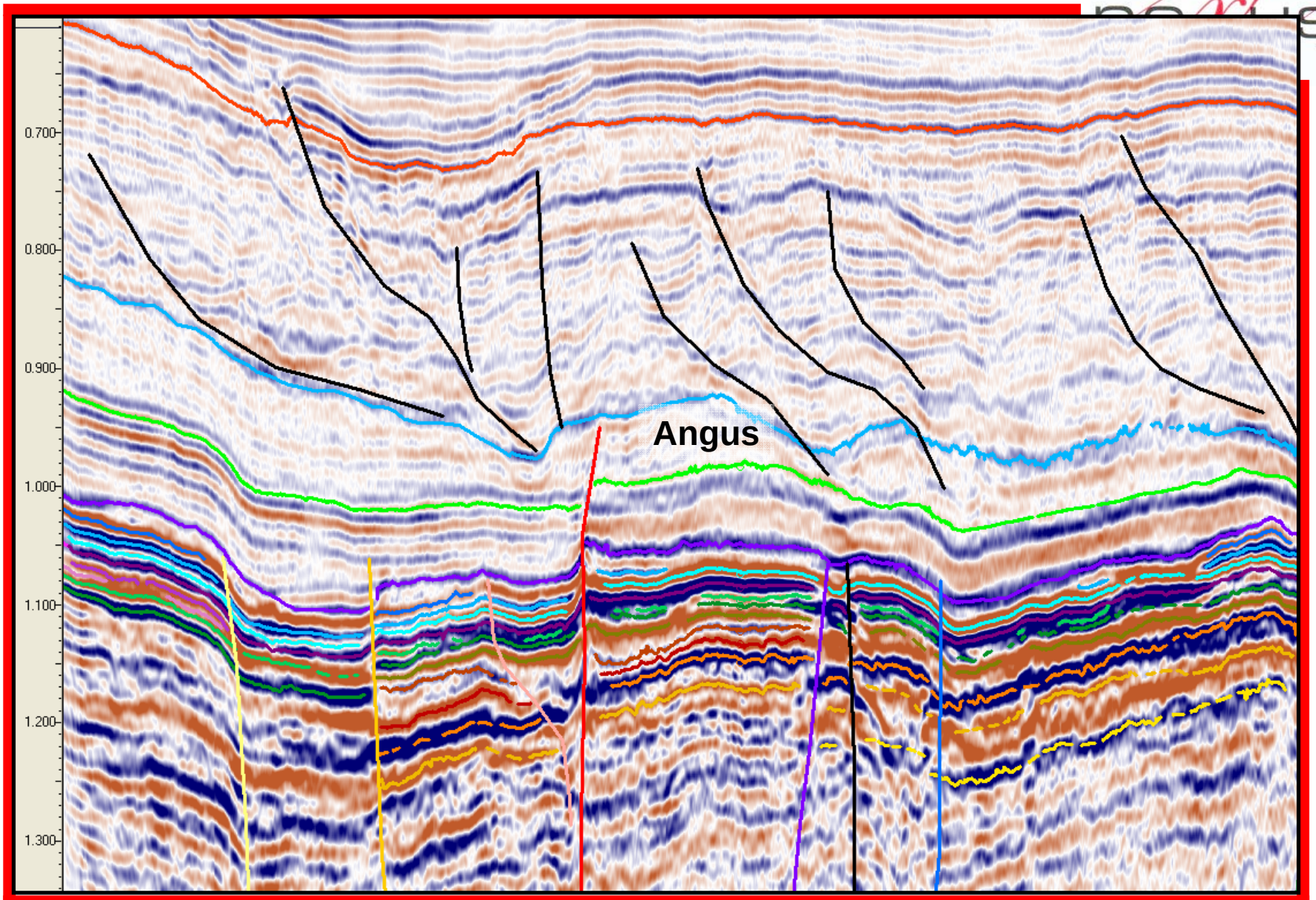

Figure 22 **Line GNX05-05 – Angus Prospect**

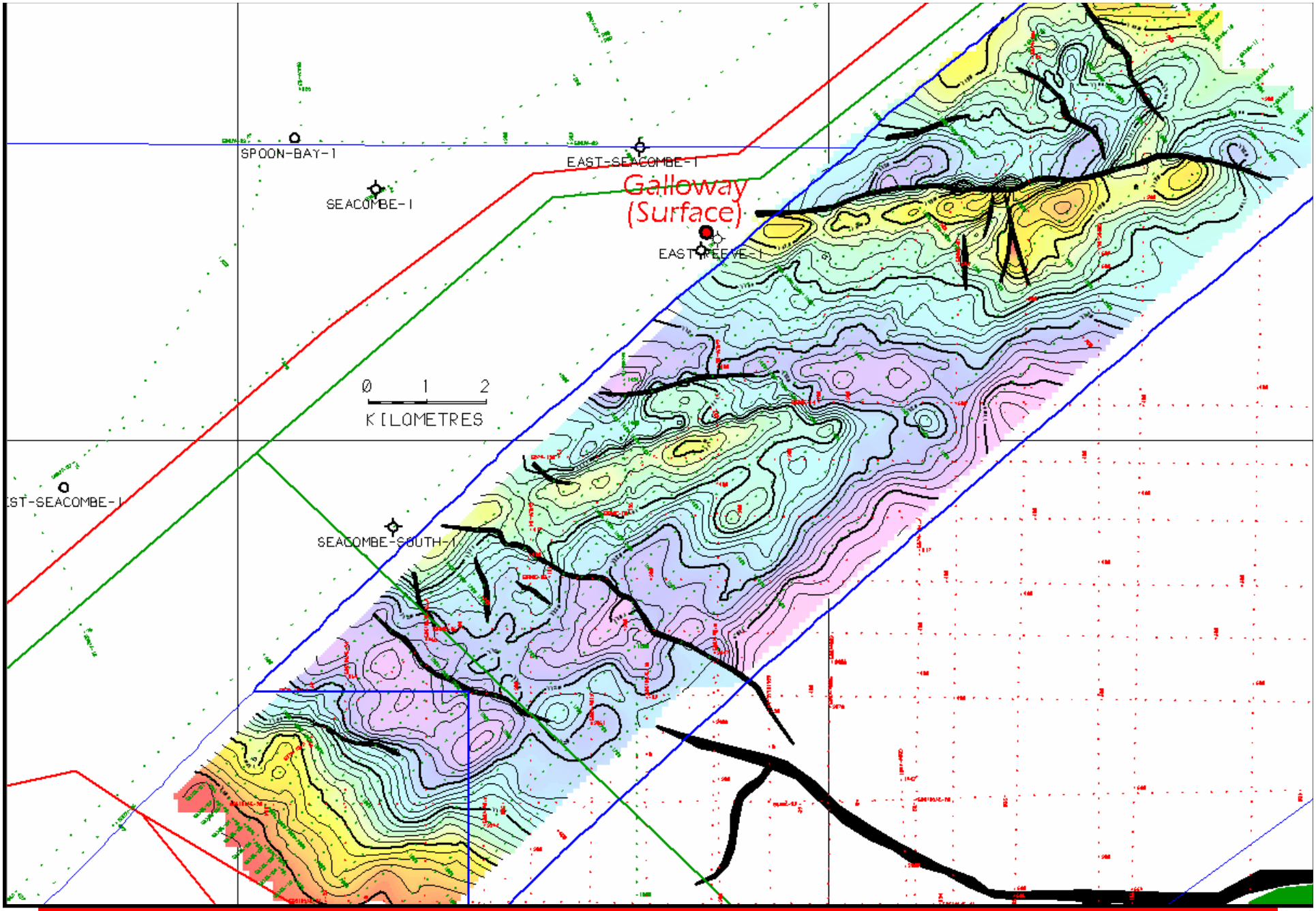

Figure 23 **Top First main coal (N asperus) TWT**

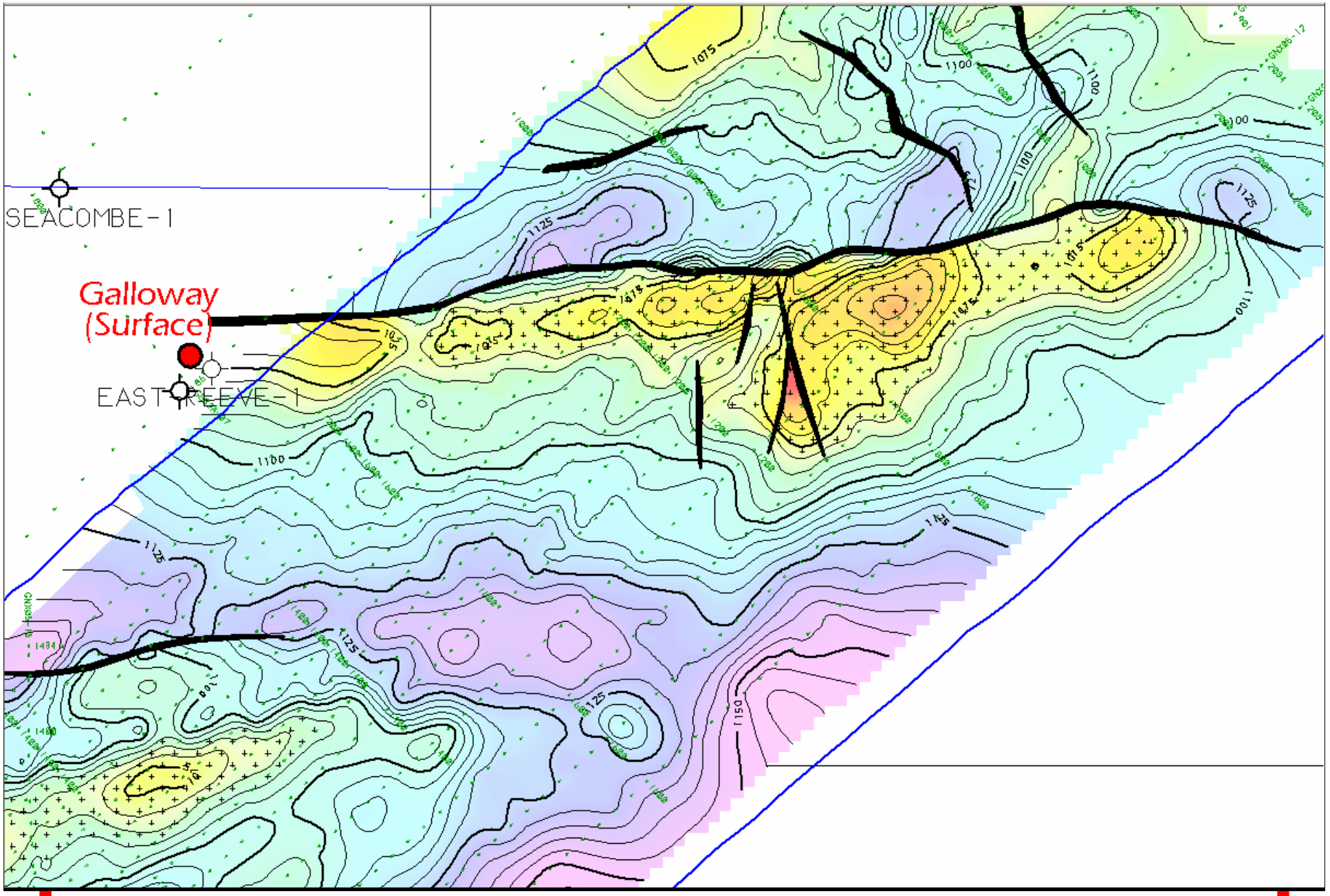

Figure 24 Top First main coal (N asperus) TWT – Galloway Prospect

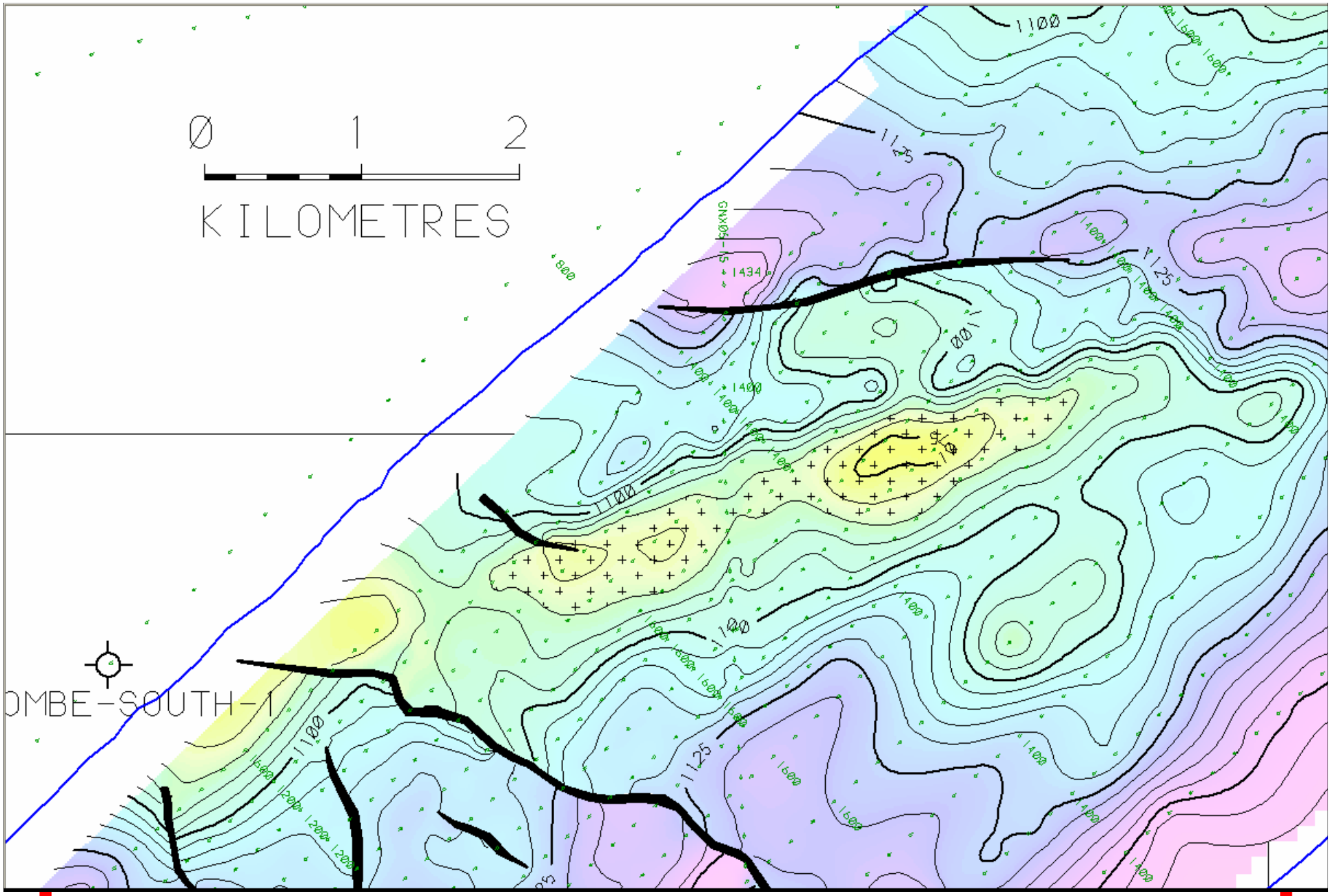

Figure 25 **Top First main coal (N asperus) TWT – Angus prospect**

5. Depth Conversion

- Depth conversion was carried out using average velocities to top Latrobe using pseudo velocities from:
  - East Reeve-1
  - Seacombe South-1
  - East Seacombe-1
  - Seahorse-1 & 2
  - West Seahorse 1
  - Wirrah-1

- Velocity grid honours the well control points and the TWT structure in gross terms
- Velocity grid varies smoothly and velocity increases towards the deeper areas.
- Depth conversion performed using grid-grid operations in Petroseis

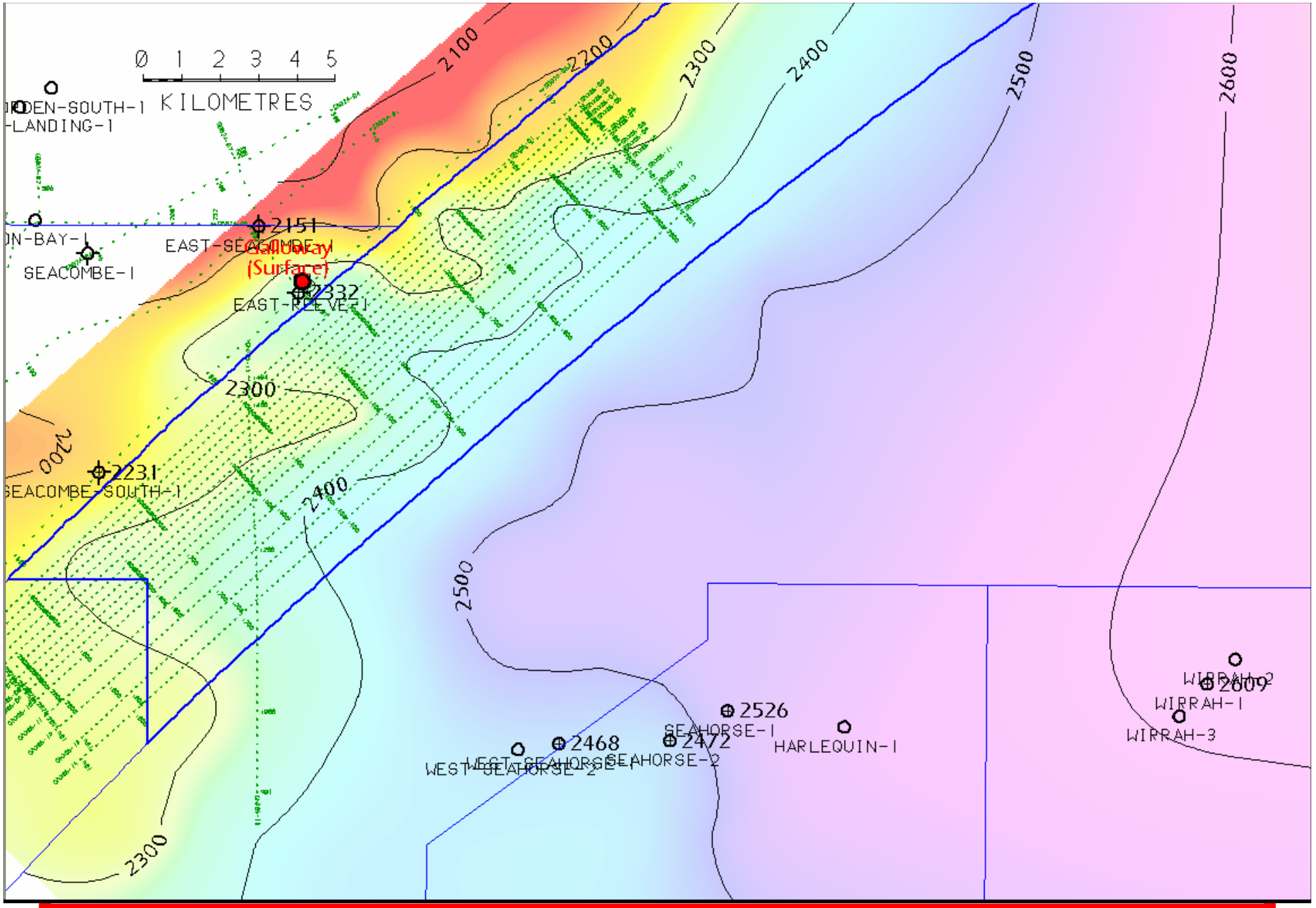

Figure 26 **Top Latrobe Average Velocity Field**

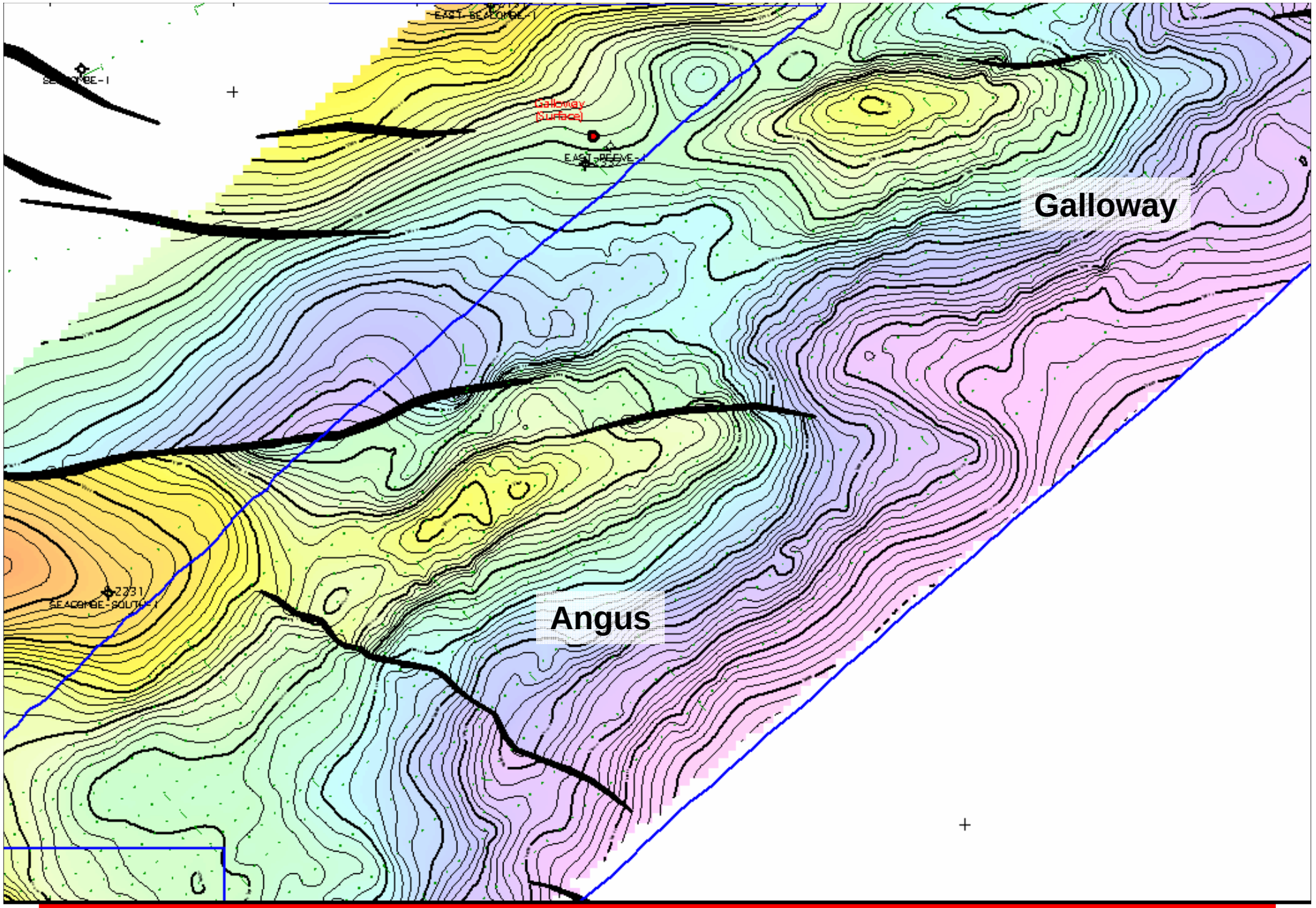

Figure 27 Top Latrobe Depth using Average Velocities

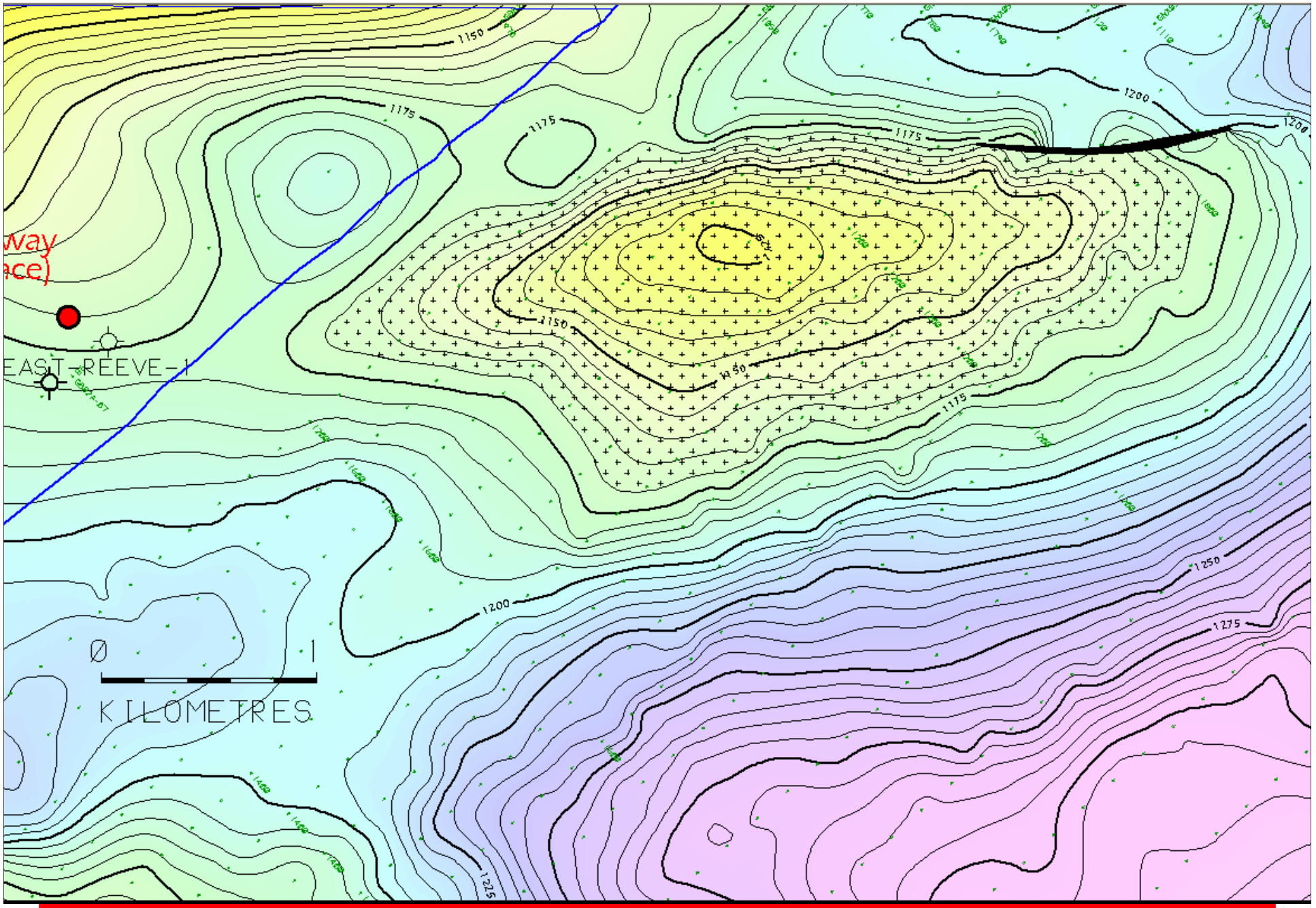

Figure 28 **Top Latrobe Depth – Galloway Prospect**

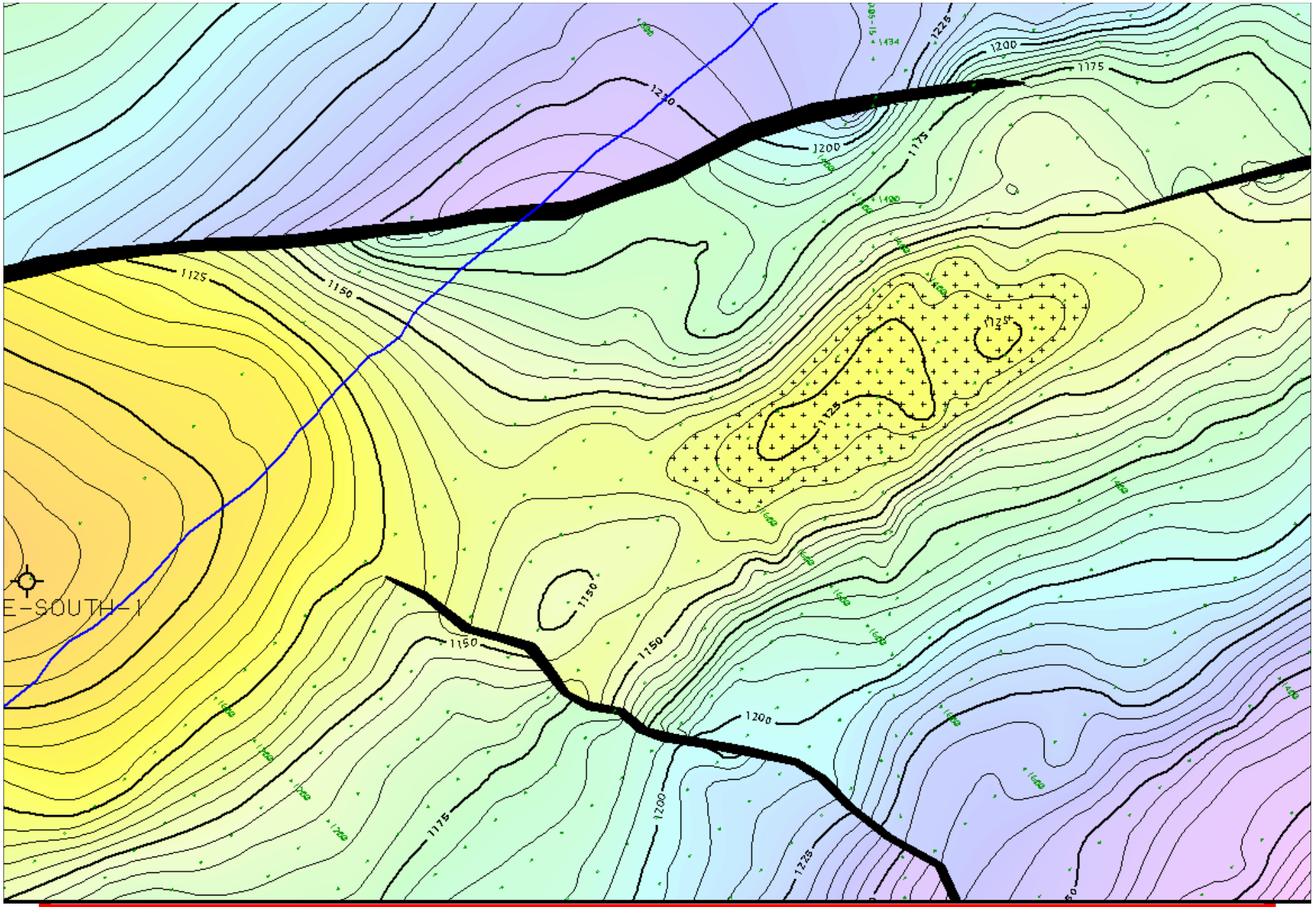

Figure 29 **Top Latrobe Depth – Angus Prospect**

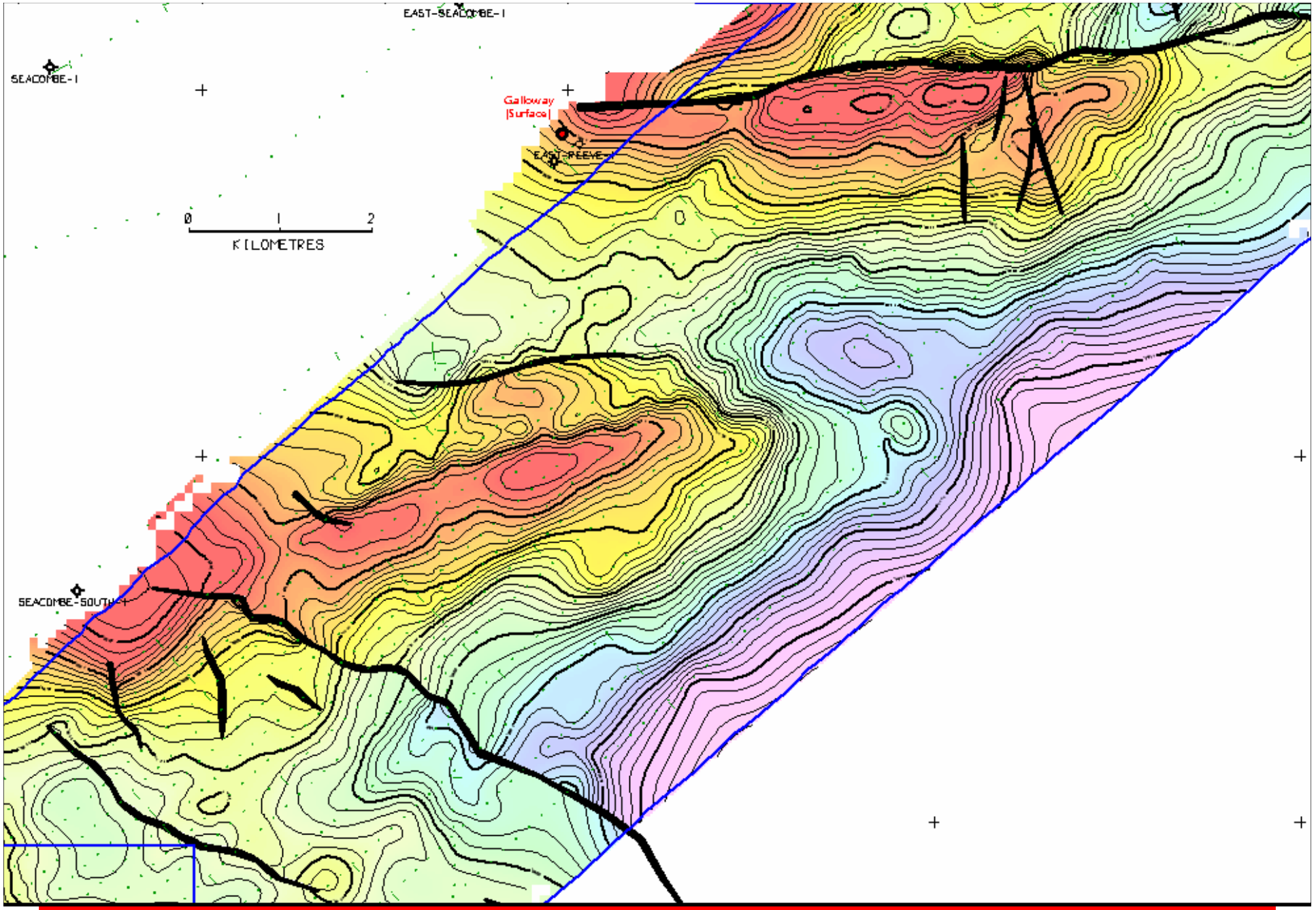

Figure 30 **Top First main coal (N asperus) DEPTH**

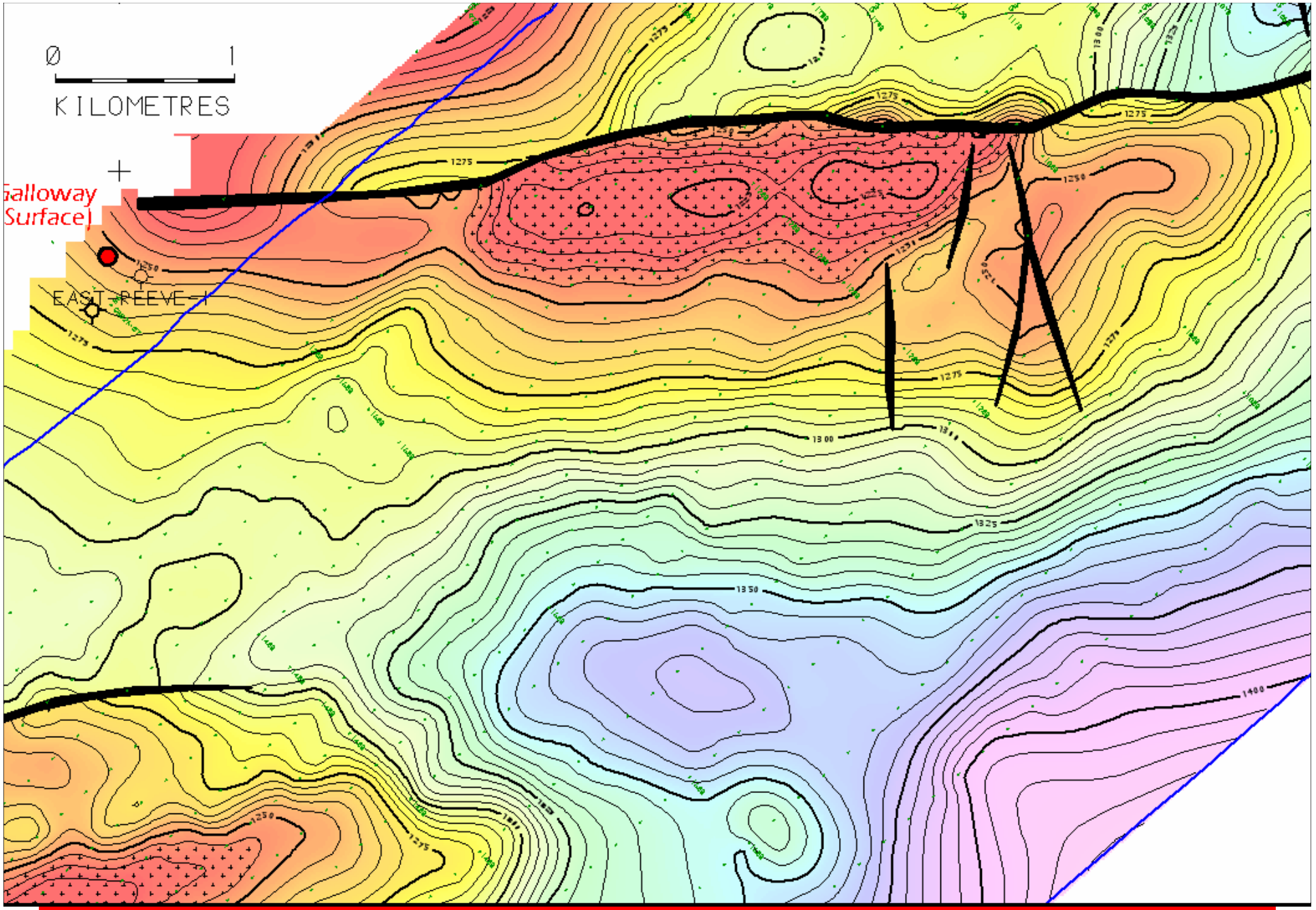

Figure 31 **Top First main coal (N asperus) DEPTH – Galloway Prospect**

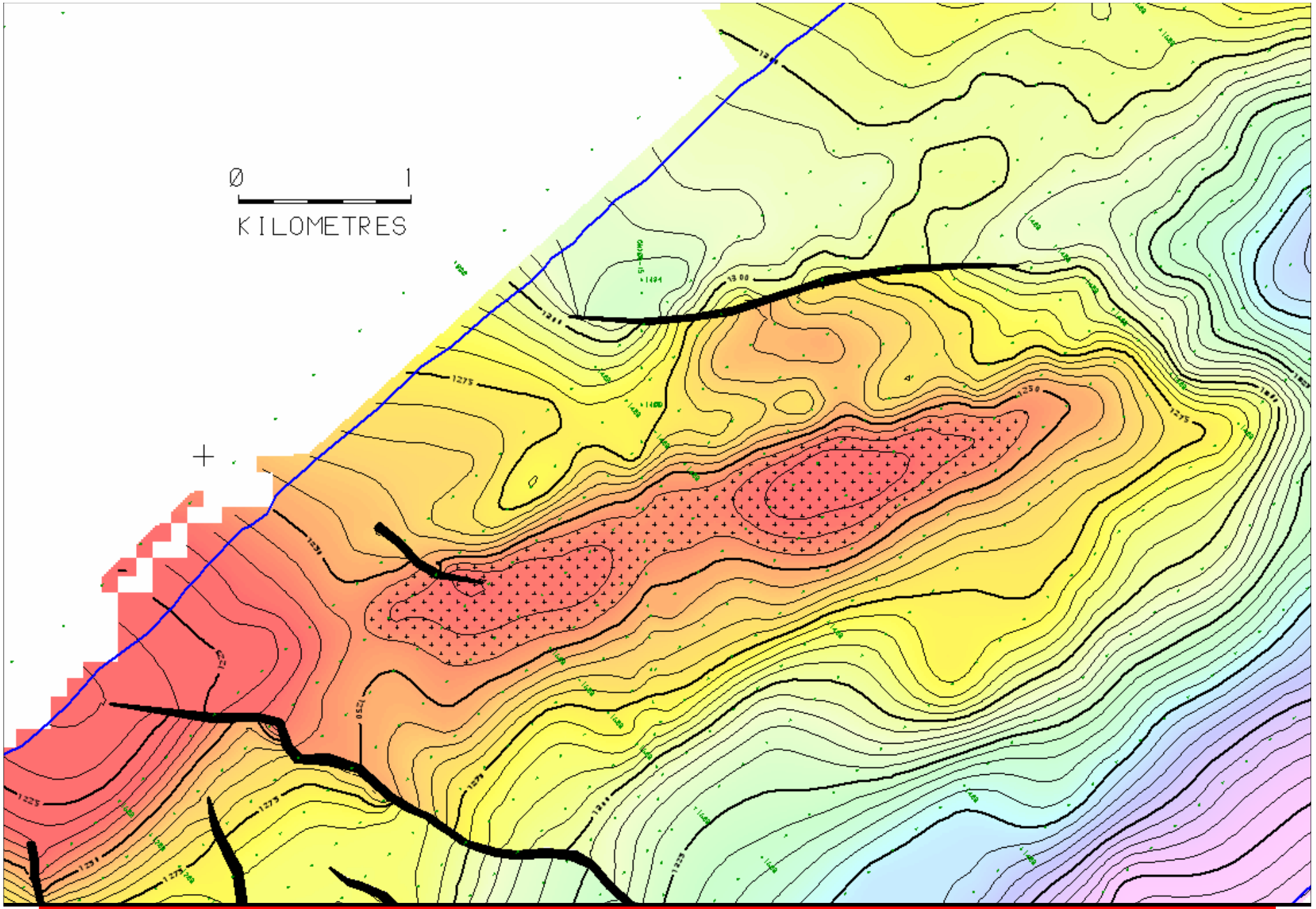

Figure 32 **Top First main coal (N asperus) DEPTH – Angus Prospect**