Find the oil

This section contains some possible interpretations for the find the oil exercise.

The interpretation is available on both black and white and colour sections. The solutions are the same on both, however please note these exercises are for teaching purposes only and are not intended for commercial use.

Stratigraphy		
Tertiary		
Cretaceous	Upper	Chalk
	Lower	Greensand/Gault
		Wealden
		Purbeck
Jurassic	Upper	Portland
		Kimmeridge Clay
		Corallian
		Oxford Clay
		Kellaways
	Middle	Cornbrash/Forest Marble
		Great Oolite
		Inferior Oolite
	Lower	Upper Lias
		Middle Lias
		Lower Lias
Triassic		
Permian		
Upper Carboniferous		
Basement		

This is the completed stratigraphic column for the Weald area. The exercise asked you to find 3 marker horizons, think about what sort of exploration feature these horizons could be (e.g. source, reservoir or cap):

Purbeck Sandstone -possible reservoir rock

Kimmeridge Clay -possible source and cap rock

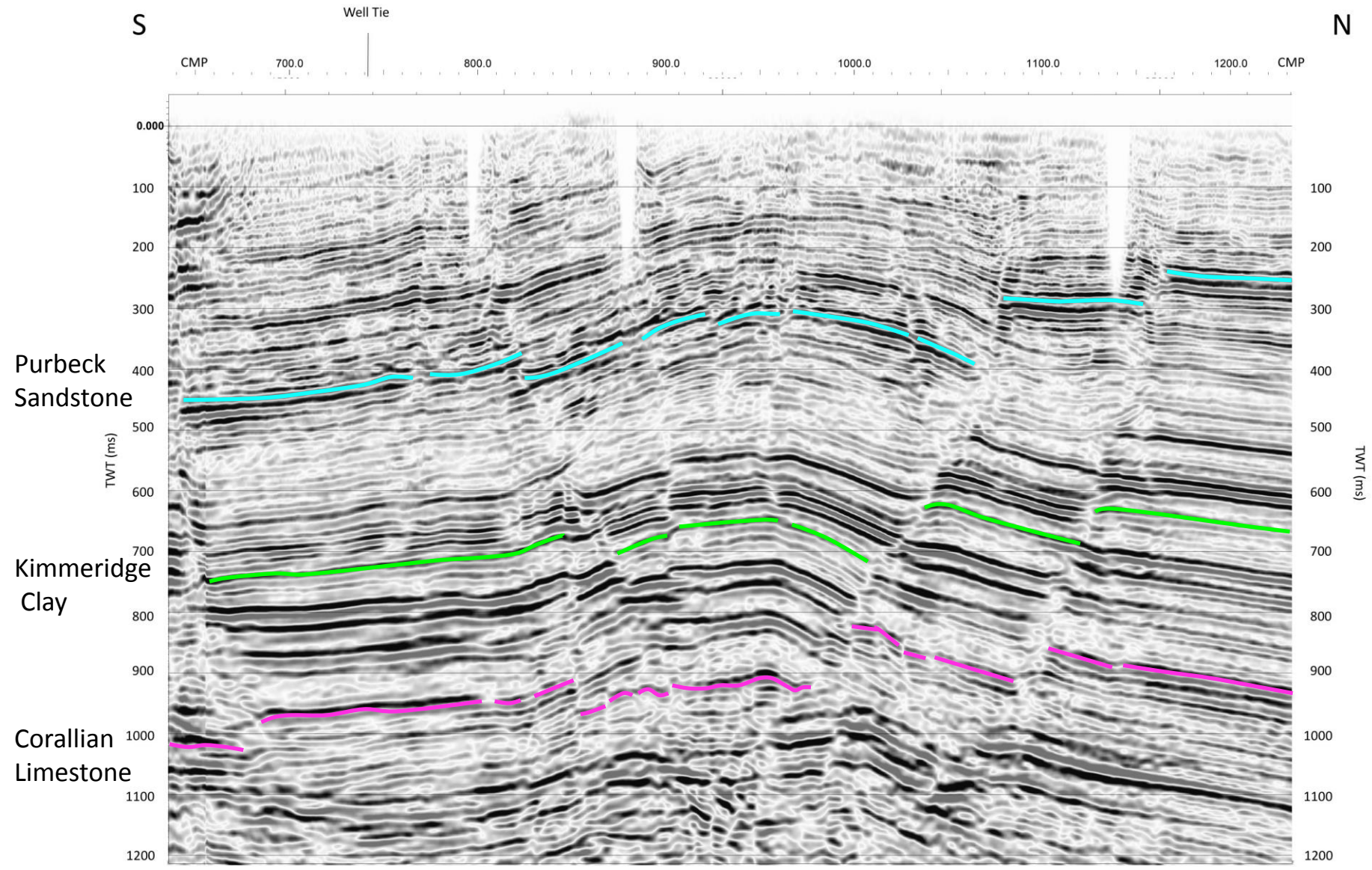
Corallian Limestone -possible reservoir rock

You can use the stratigraphic column available on the geology page of the case study to find out. Click to reveal the answers.

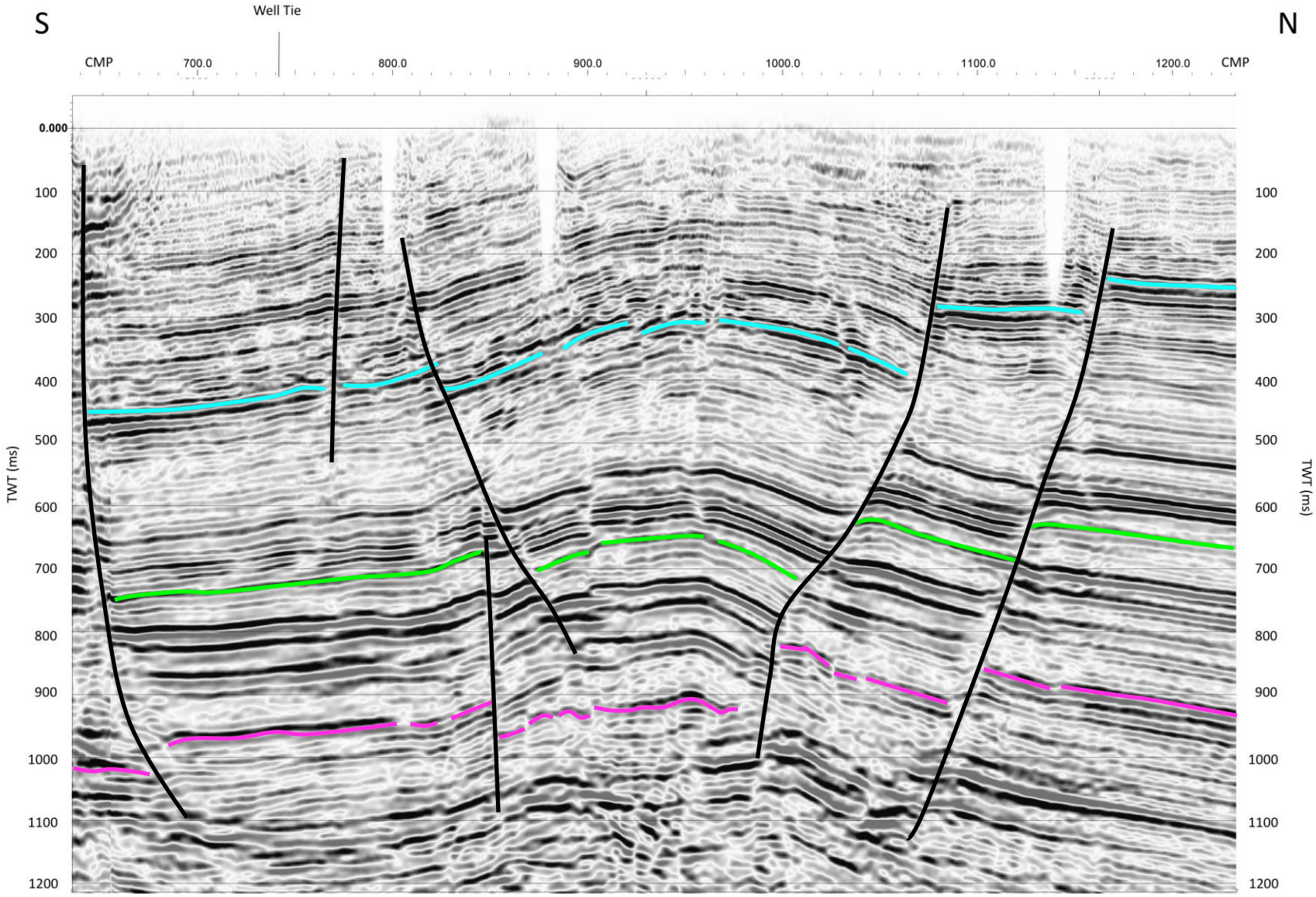
Extension: The Kimmeridge clay is organic rich and therefore a possible source rock. For it to be a cap rock as well, either another source rock lower in the stratigraphic column is needed (can you suggest any other sources?), or hydrocarbons from the Kimmeridge Clay elsewhere in the basin could have accumulated up dip.
The idea that Kimmmeridge Clay from elsewhere in the basin could be the source shows that it is important to consider depth of burial and hydrocarbon maturity as well as structural relationships.
Click here to see a map of hydrocarbon maturity in the Weald Basin.

Interpretation on black and white sections

Interpretation of marker horizons

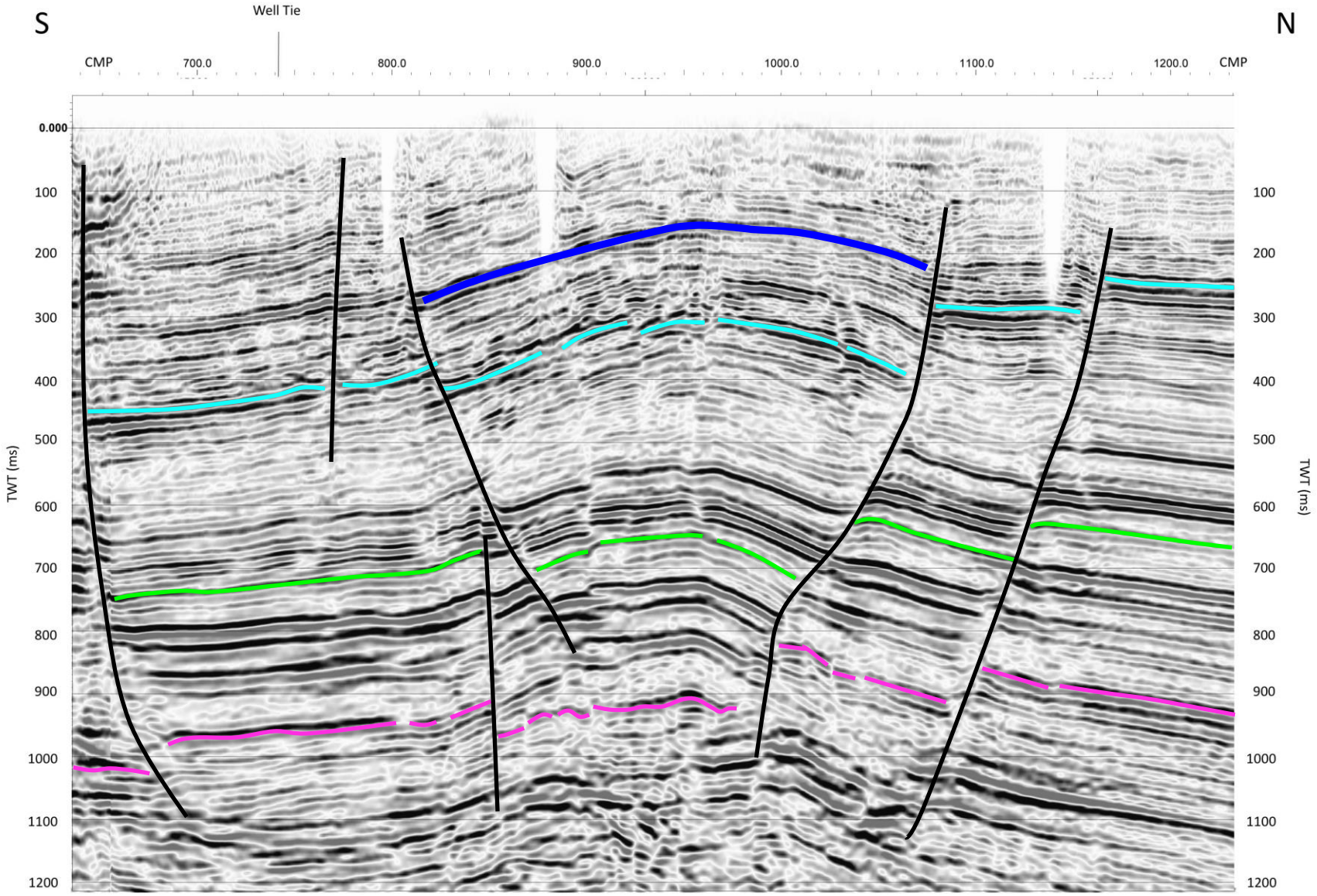


Faults marked in black



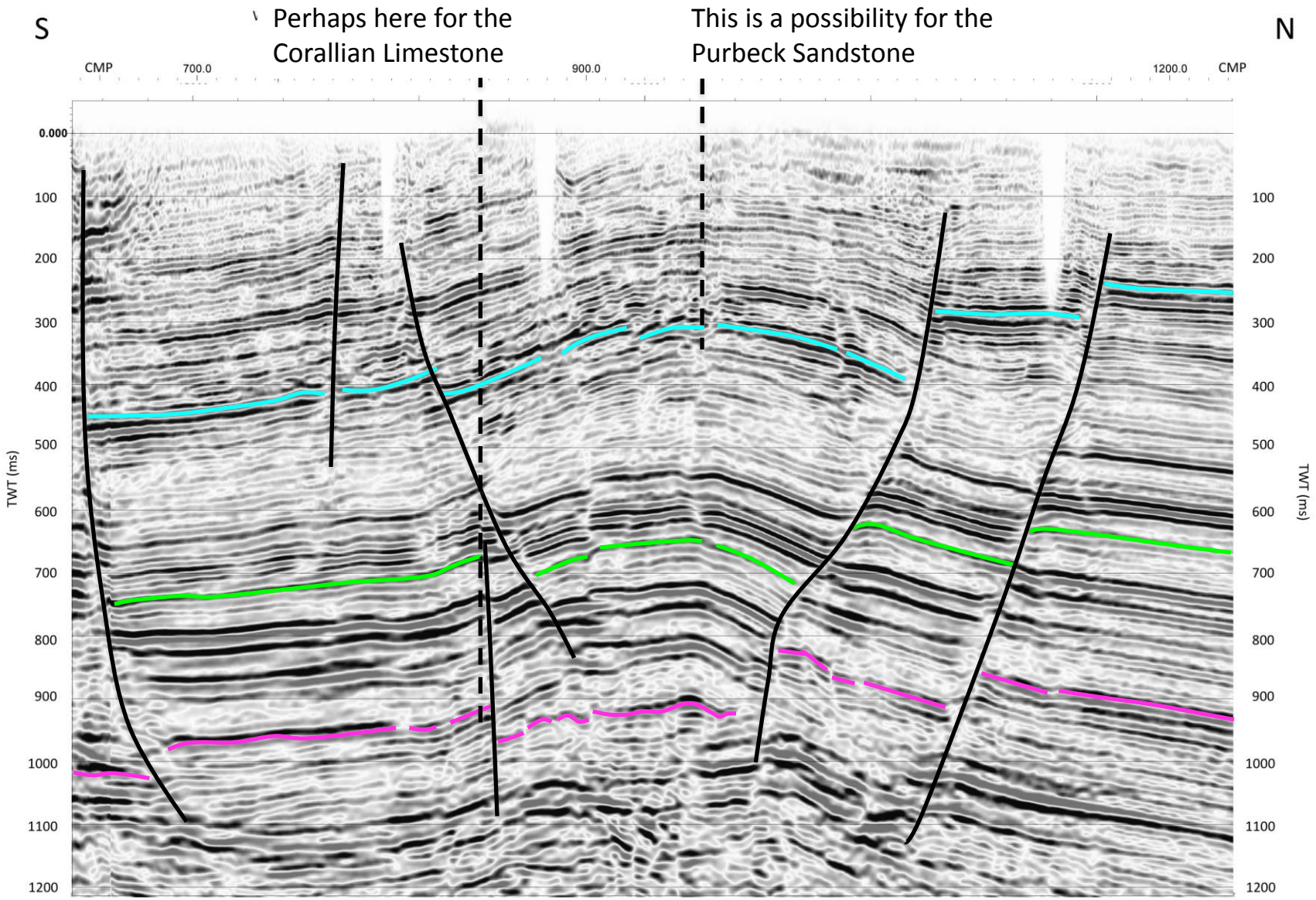
Can you see any other structures that are associated with structural traps?

Anticline



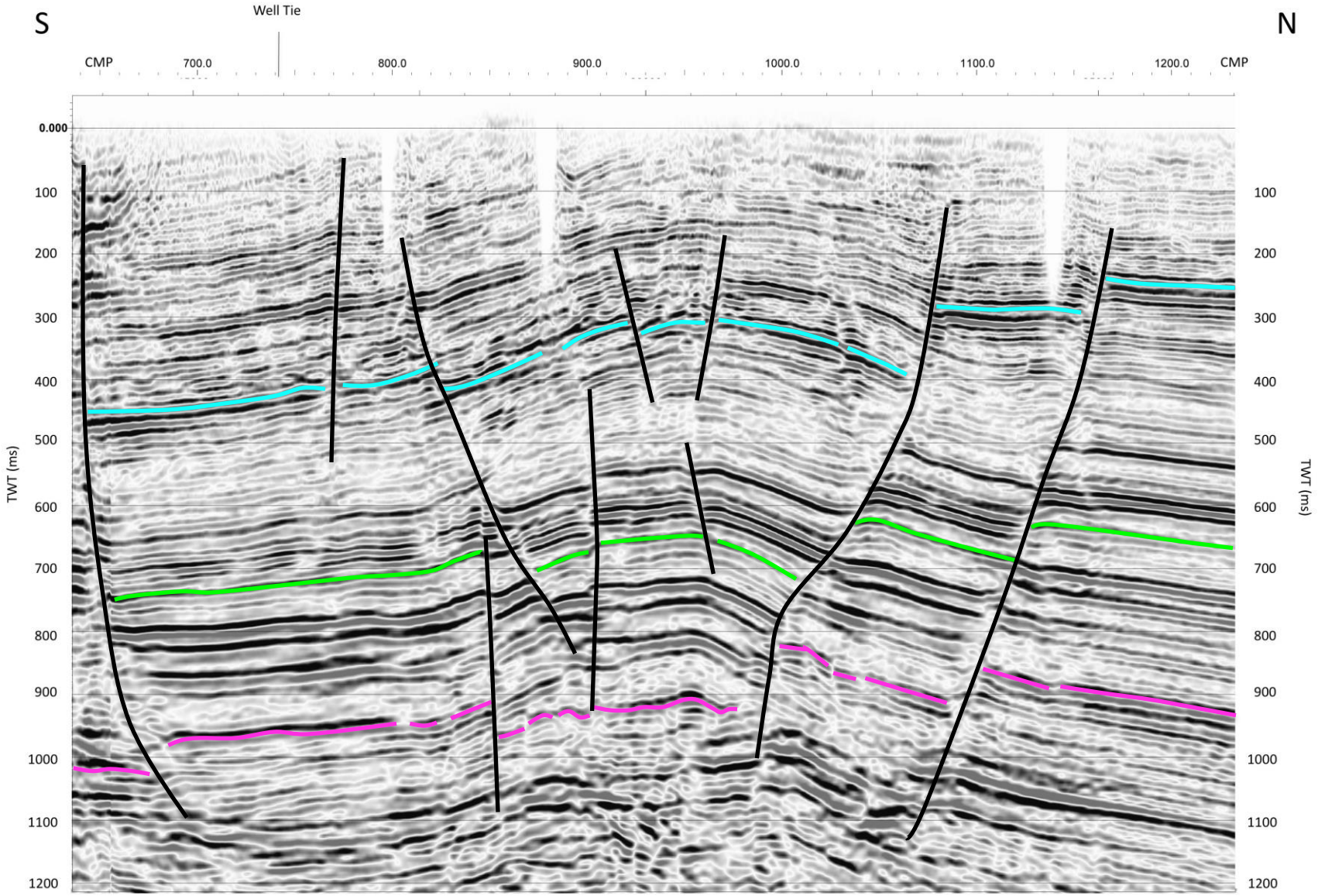
There is an anticline on this seismic profile. Click to reveal it.

Locating an exploration well



Would you drill for oil or gas on this structure? If so, where? Click to reveal the best location.

Another scenario



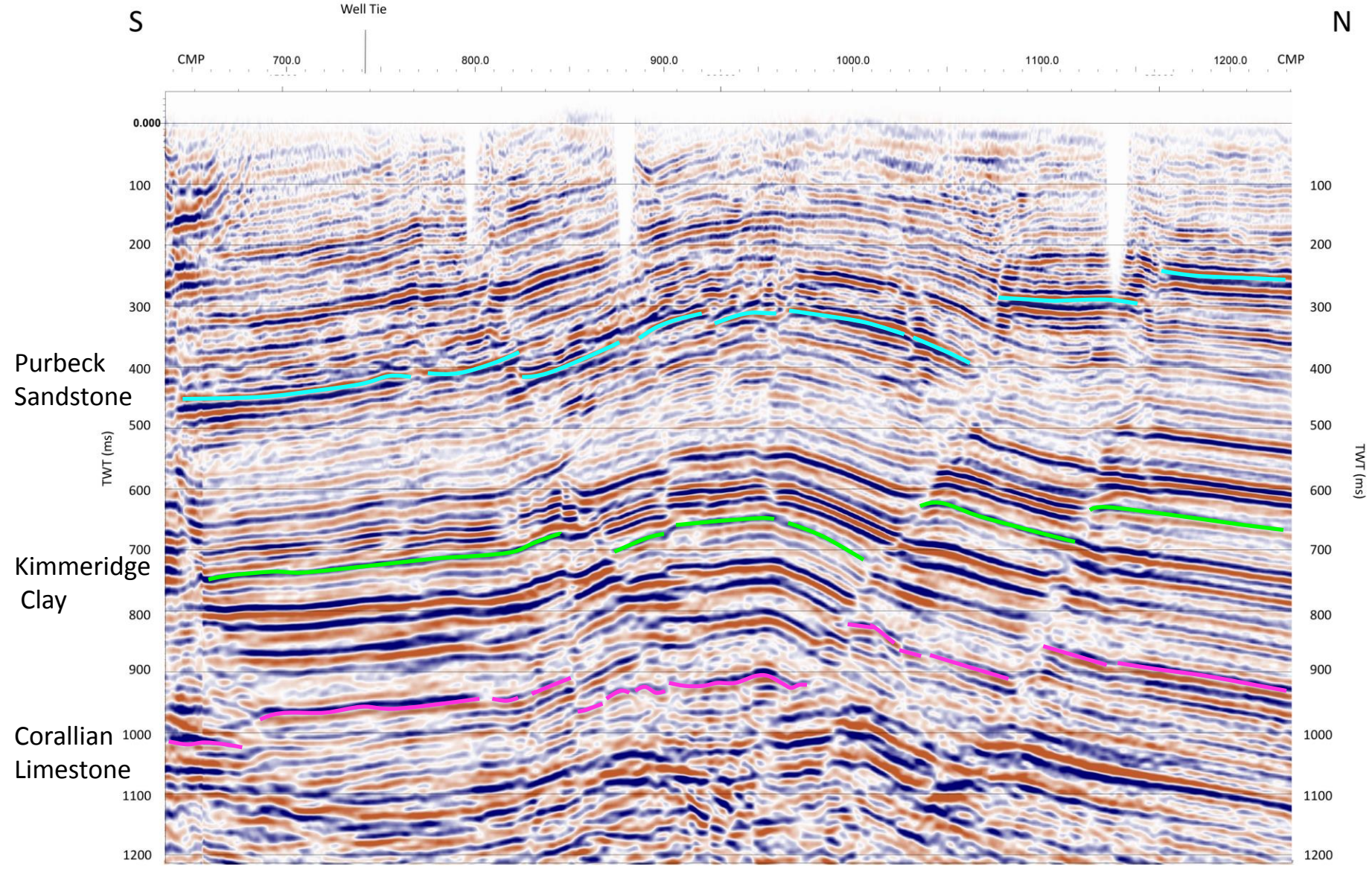
Look at the central area of the anticline, some extra faults have been picked there. Does the trap look so reliable now?

Conclusions

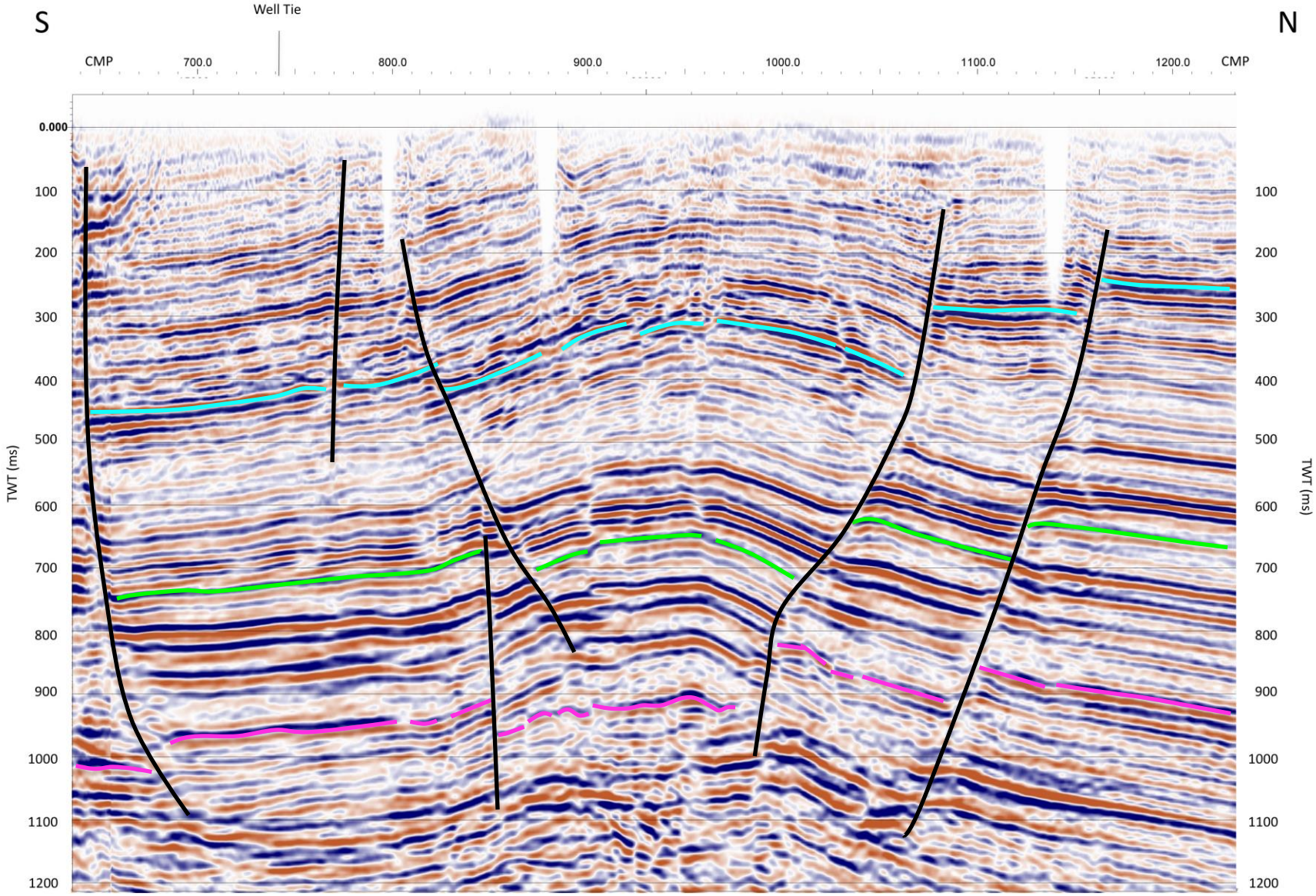
- The results of seismic interpretation can be varied. It depends upon the person doing the interpretation.
- Deciding where to drill is a long and complex procedure that sometimes takes many years.
- Not all exploration wells are successful. See the article on a North Sea dry well for July 2009 with this link: StatoilHydro article

Interpretation on colour sections

Interpretation of marker horizons

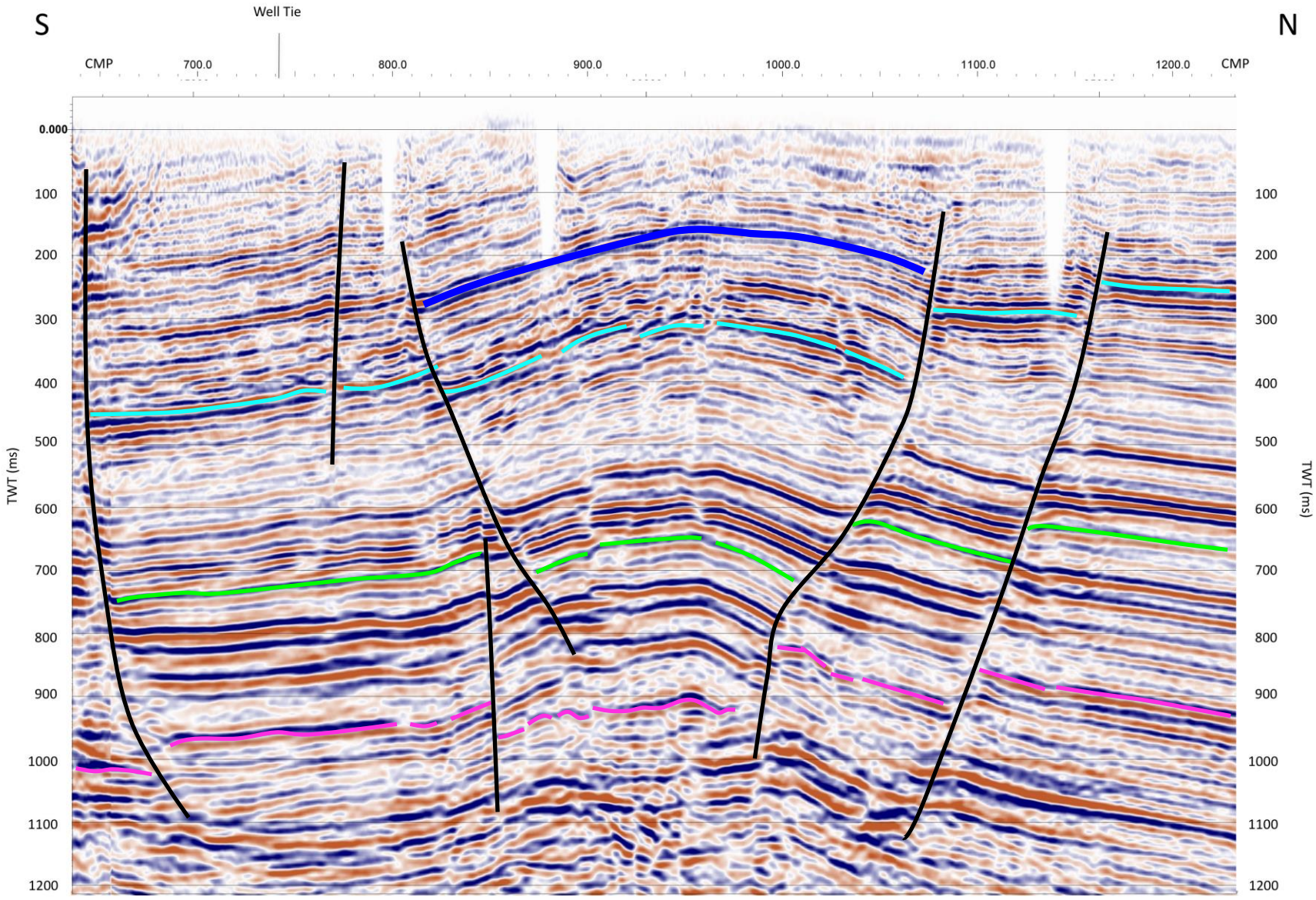


Faults marked in black



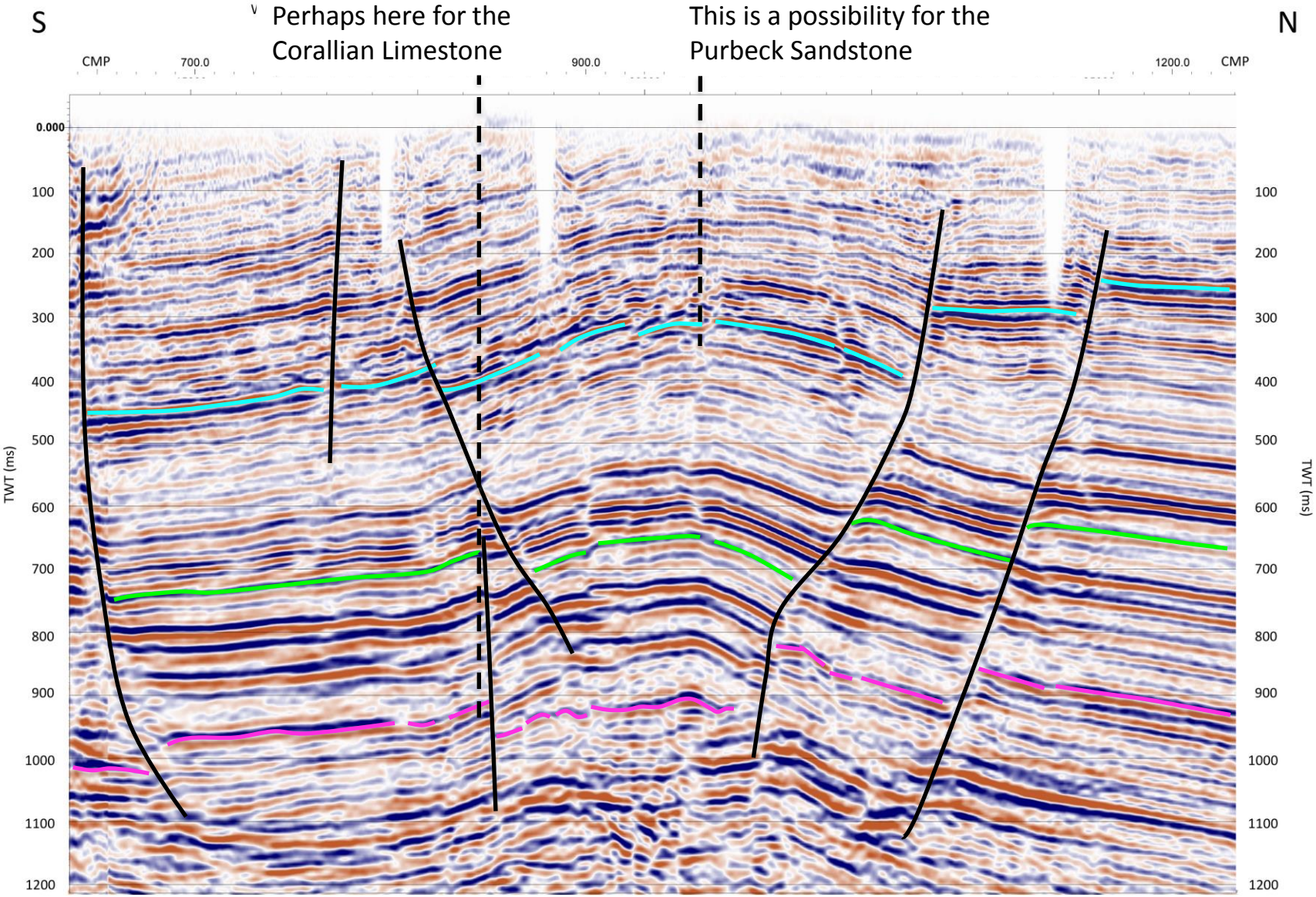
Can you see any other structures that are associated with structural traps?

Anticline



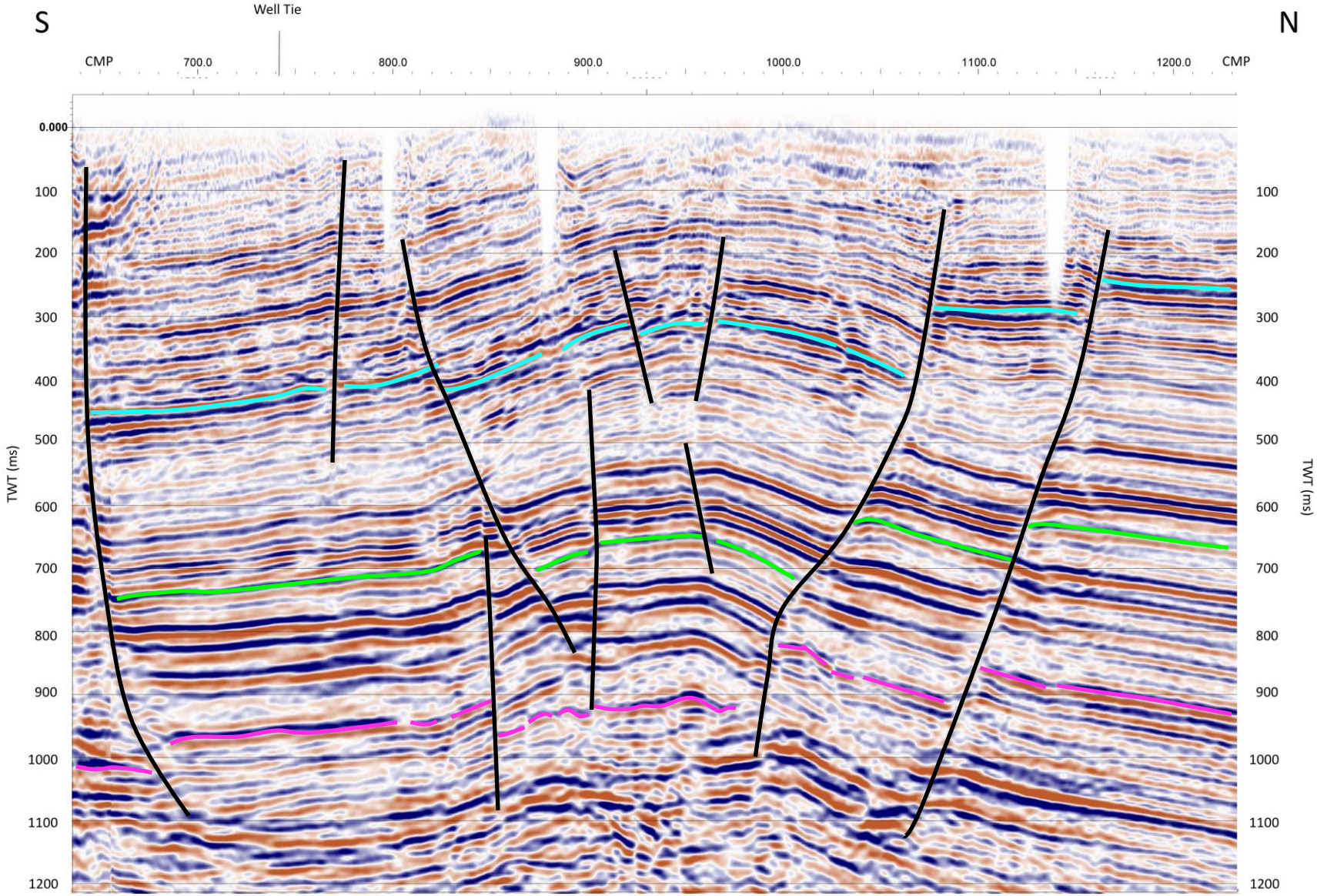
There is an anticline on this seismic profile. Click to reveal it.

Locating an exploration well



Would you drill for oil or gas on this structure? If so, where? Click to reveal the best location.

Another scenario



Look at the central area of the anticline, some extra faults have been picked there. Does the trap look so reliable now?

Conclusions

- The results of seismic interpretation can be varied. It depends upon the person doing the interpretation.
- Deciding where to drill is a long and complex procedure that sometimes takes many years.
- Not all exploration wells are successful. See the article on a North Sea dry well for July 2009 with this link: StatoilHydro article