



# Exploring in the Mature Southern Basin, Onshore Trinidad

The Hummingbird  
Portfolio & Buenos  
Ayres Block Potential

June 2023

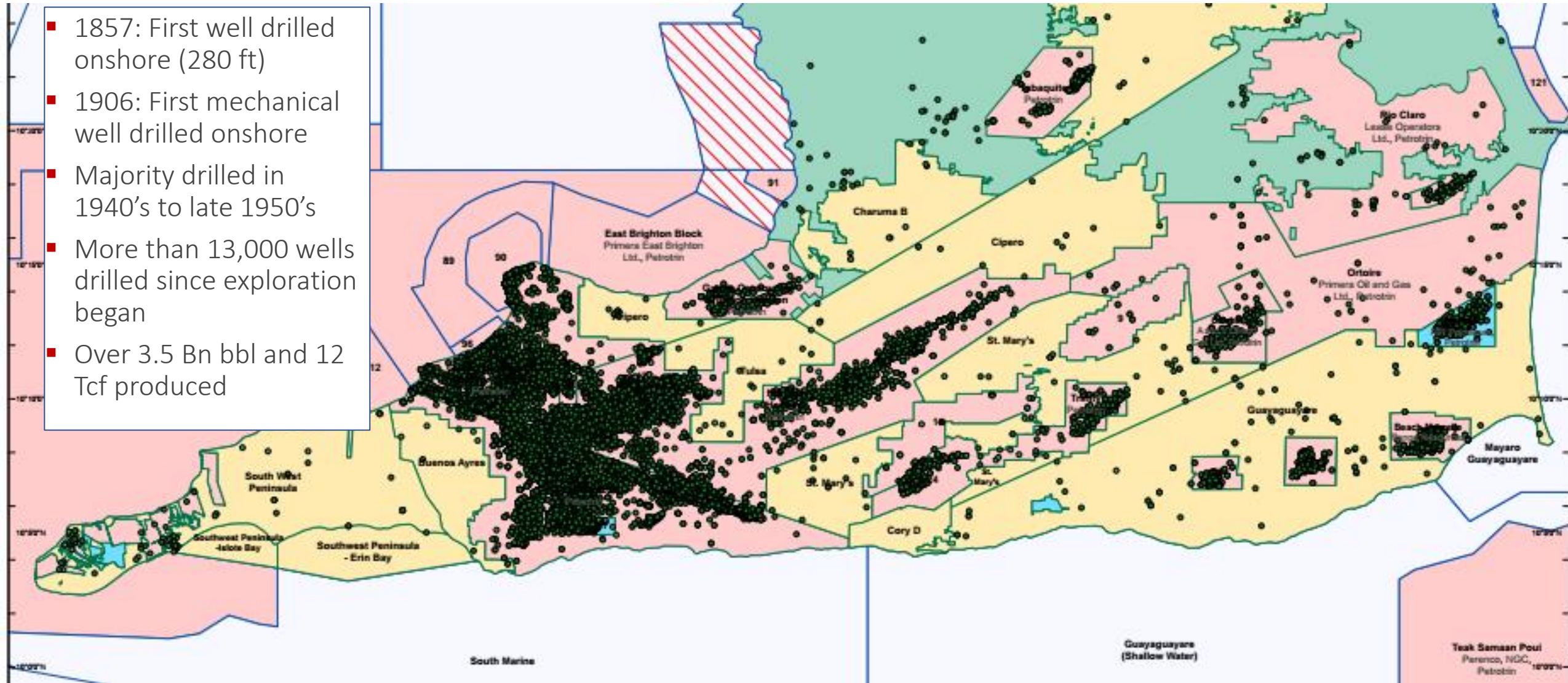


1. Onshore Trinidad in Context & Traditional Approach to Mapping
2. Fresh Insights Through 3D Seismic Interpretation
  - a) Structural Mapping: Jacobin & The Hummingbirds in the Lower Cruse
  - b) Structural – Stratigraphic Model For the Lower Forest
3. Buenos Ayres Block – Why We Like It
4. Conclusions

# Onshore Trinidad: Heavily Drilled Up

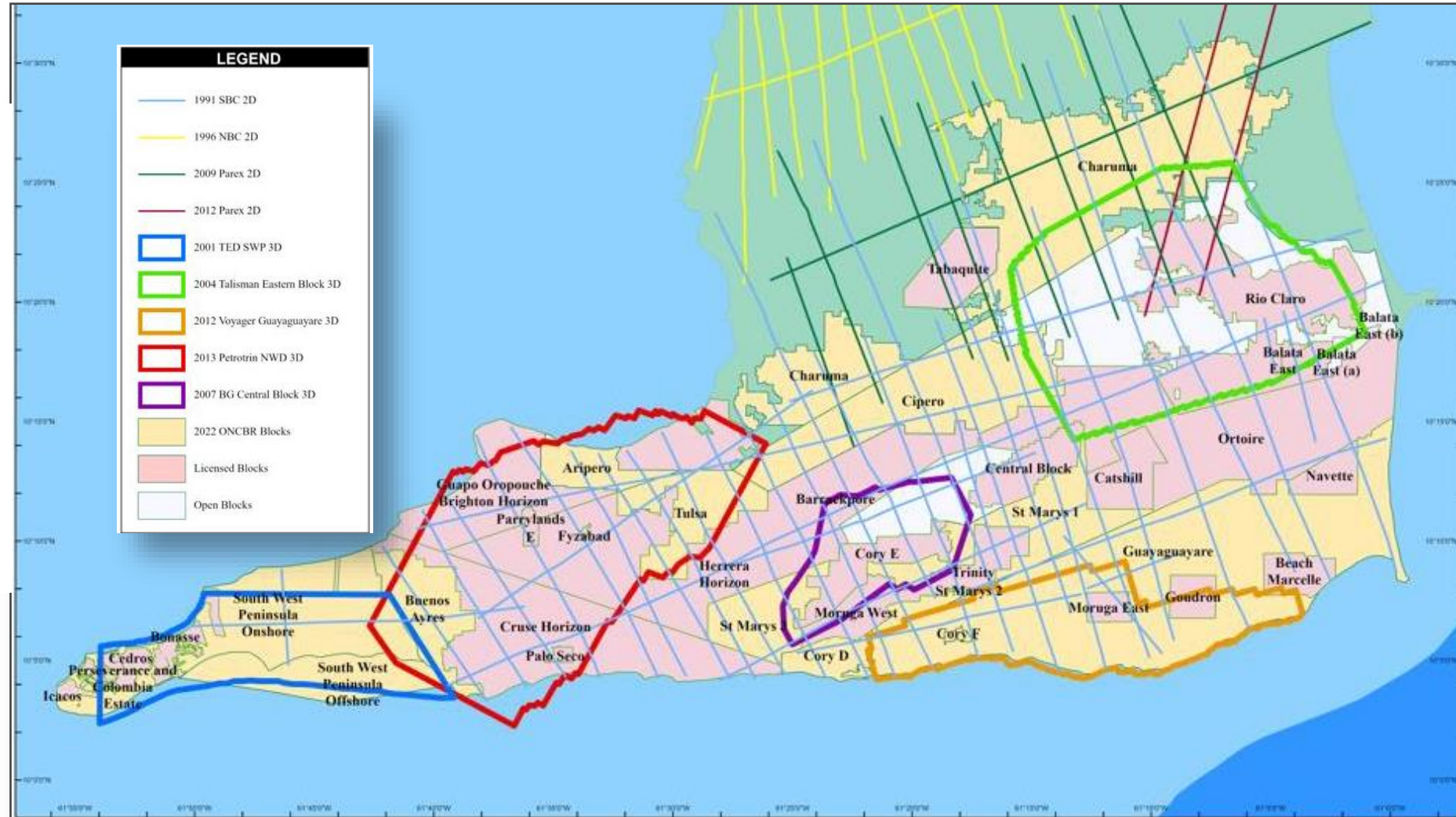
## Southern Basin and Central Range

- 1857: First well drilled onshore (280 ft)
- 1906: First mechanical well drilled onshore
- Majority drilled in 1940's to late 1950's
- More than 13,000 wells drilled since exploration began
- Over 3.5 Bn bbl and 12 Tcf produced



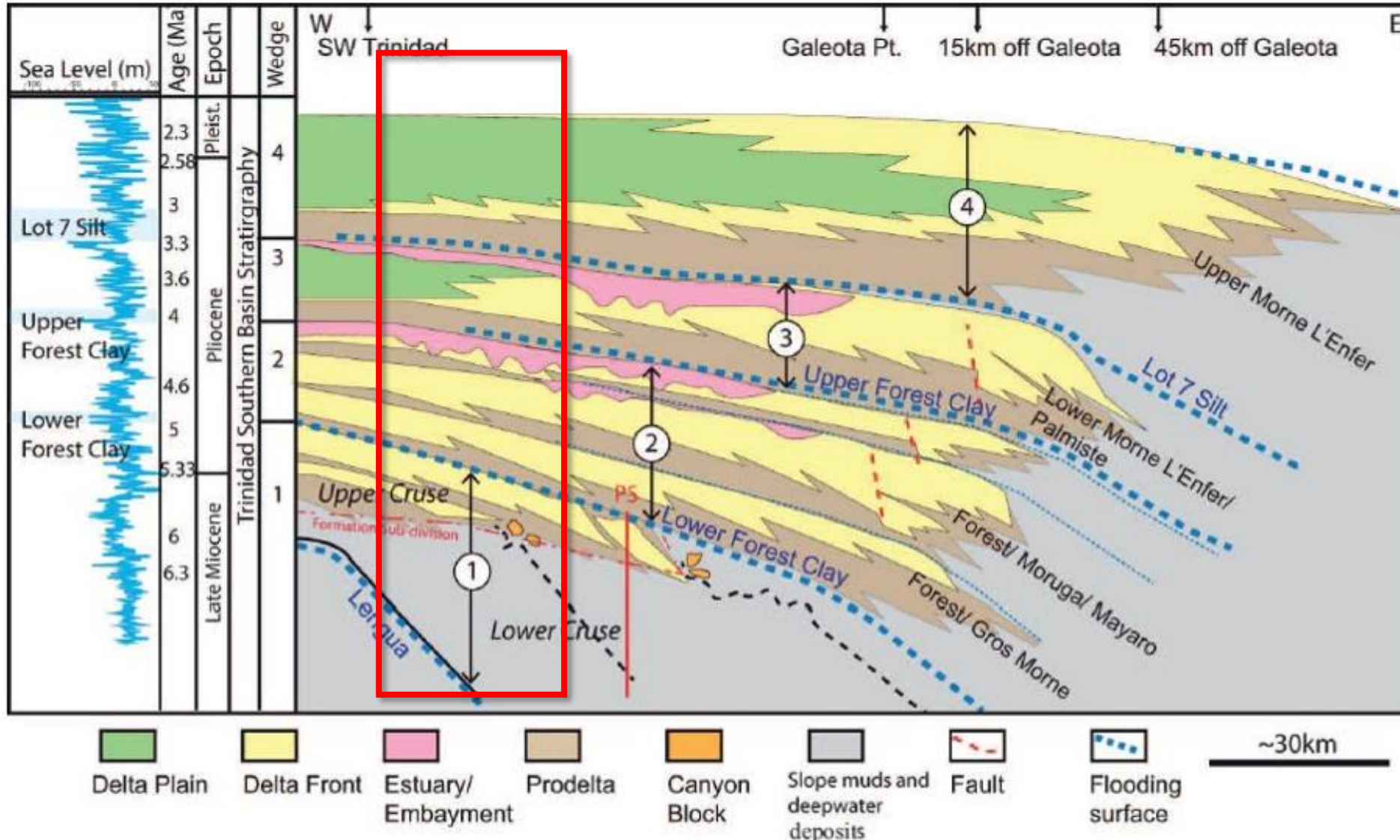
# Unusual Problem: Excessive number of wells, sparse seismic

- 1990: 2D seismic acquired by Southern Basin Consortium (Exxon, TOTAL, Chevron, Petrotrin)
- 2012: NWD (Northwest District) 3D seismic acquired by Petrotrin
- Last competitive bid round was 2013



# Reservoirs of interest in SW Trinidad

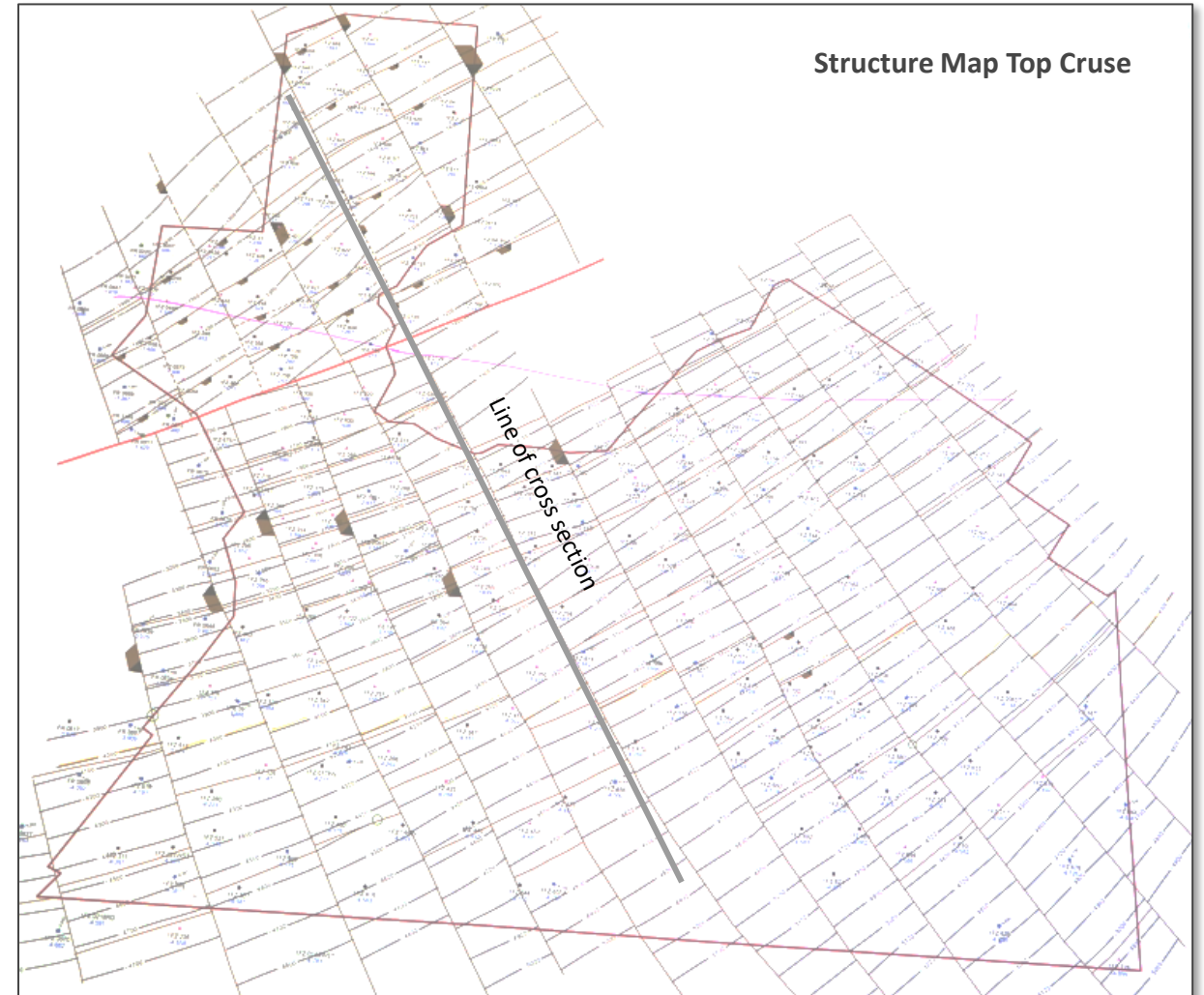
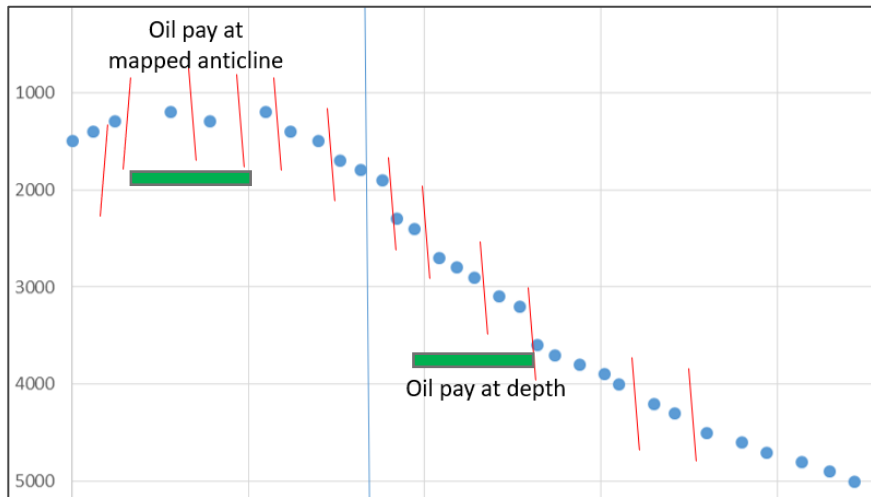
Late Miocene (Cruse) to Middle Pliocene (Forest)



# Mapping The Traditional Way

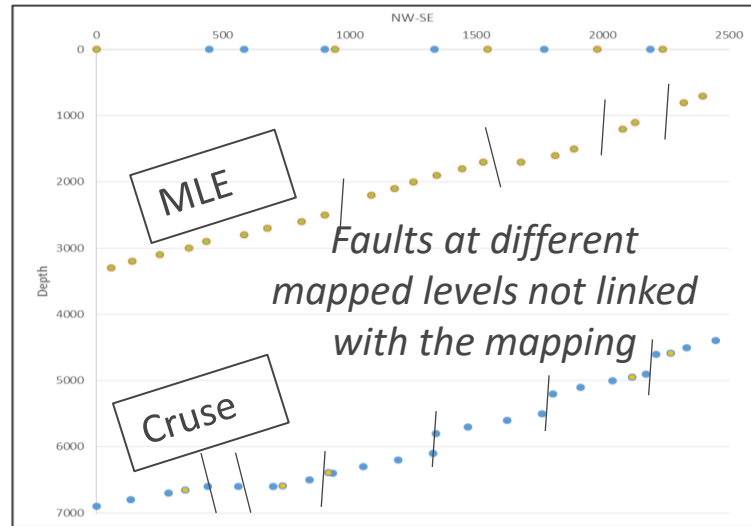
## The ChickenWire Map (1)

- Pre-Seismic: Mapping sub-surface from well data & surface dip
- Assumed monoclin dip from surface geology
- Well correlations proved to be difficult, invoking cross-faults helped
- Dip in one direction and orthogonal cross-faults = ChickenWire map
- However, largely failed to explain oil distribution

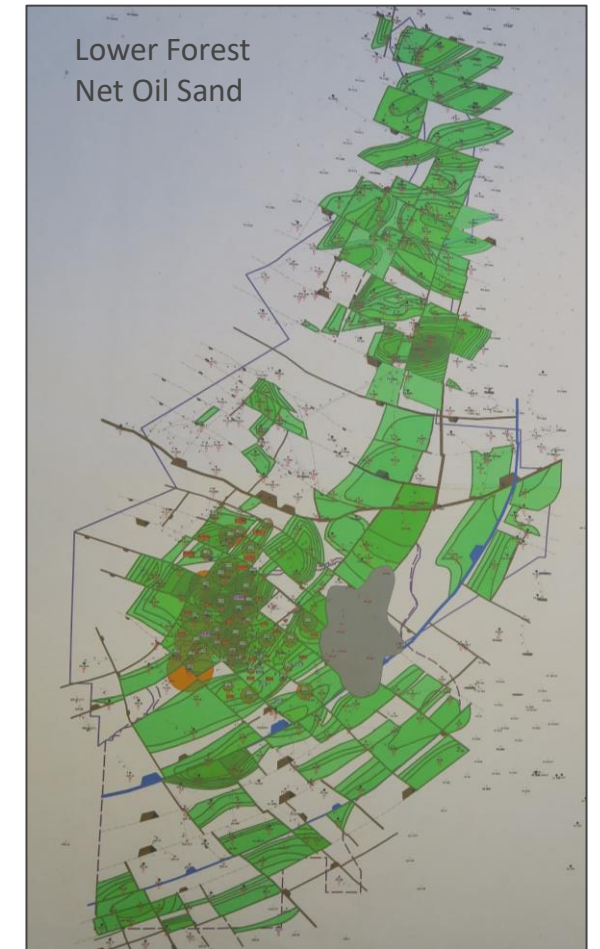


# Net Oil Sand Mapping, Chasing Sweet Spots

## The ChickenWire Map (2)



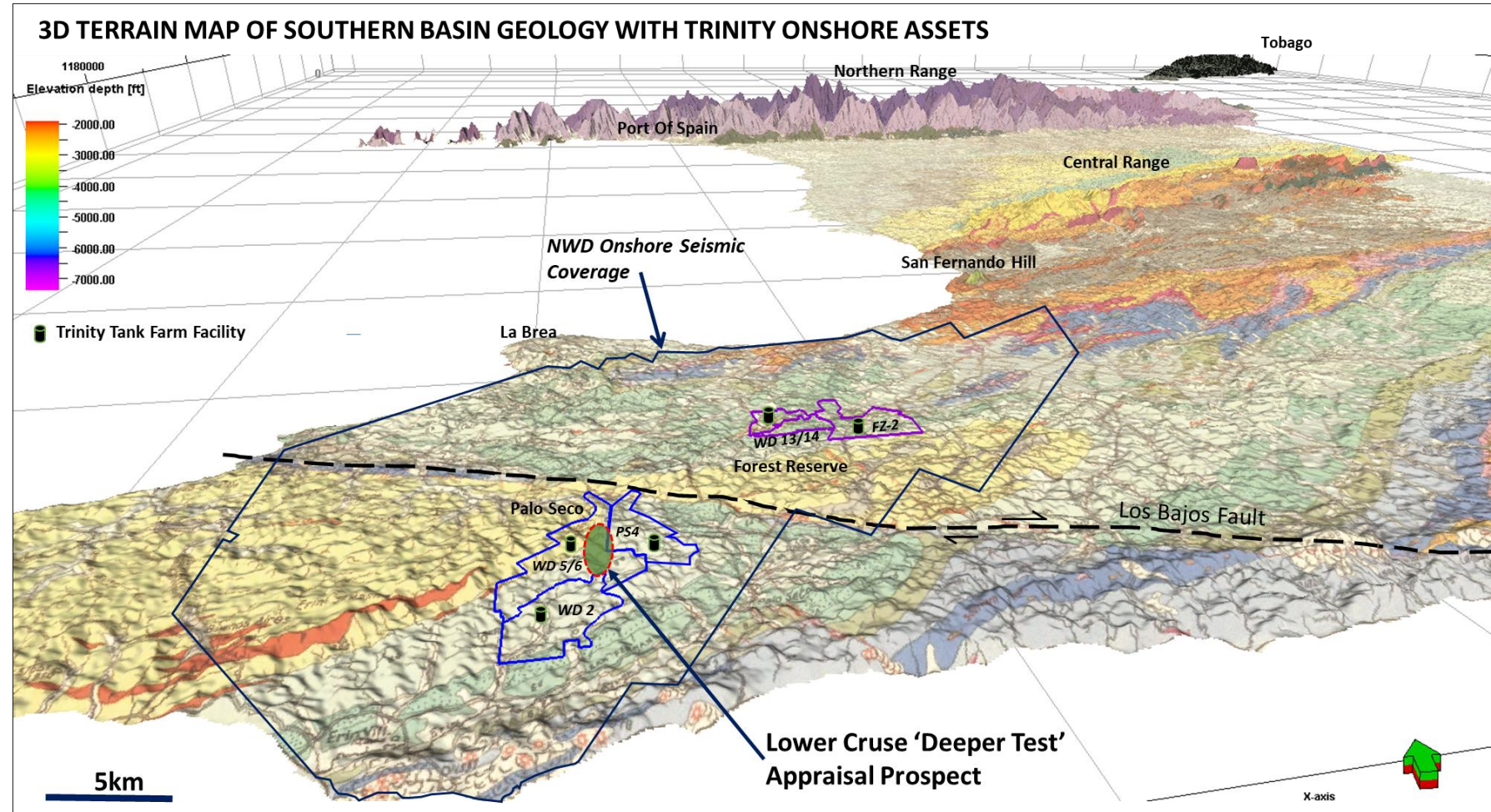
- Example from WD2, 5/6, Palo Seco
- Net Oil Sand calculated from GRV & assumed recovery per 'cell'
- Oil in up-dip part of license but no anticlinal trap present
- Fault traps assumed, some maybe outside acreage
- Sweet spots with max NOS may be sand thicks.



# Trinity's Investment: 3D Seismic & Technical Effort

## Could Trinity Develop A Competitive Advantage?

- Onshore 3D held by the State, rarely seen by others, but was it used effectively?
- Two 'postage stamps' purchased in 2021, over Palo Seco and Fyzabad areas
- Data quality challenges were evident, data quality deteriorates over anticlines, but fair - good in synclines
- Technical 'Heavy Guns' brought in
- Structural interpretation, well correlation and well ties

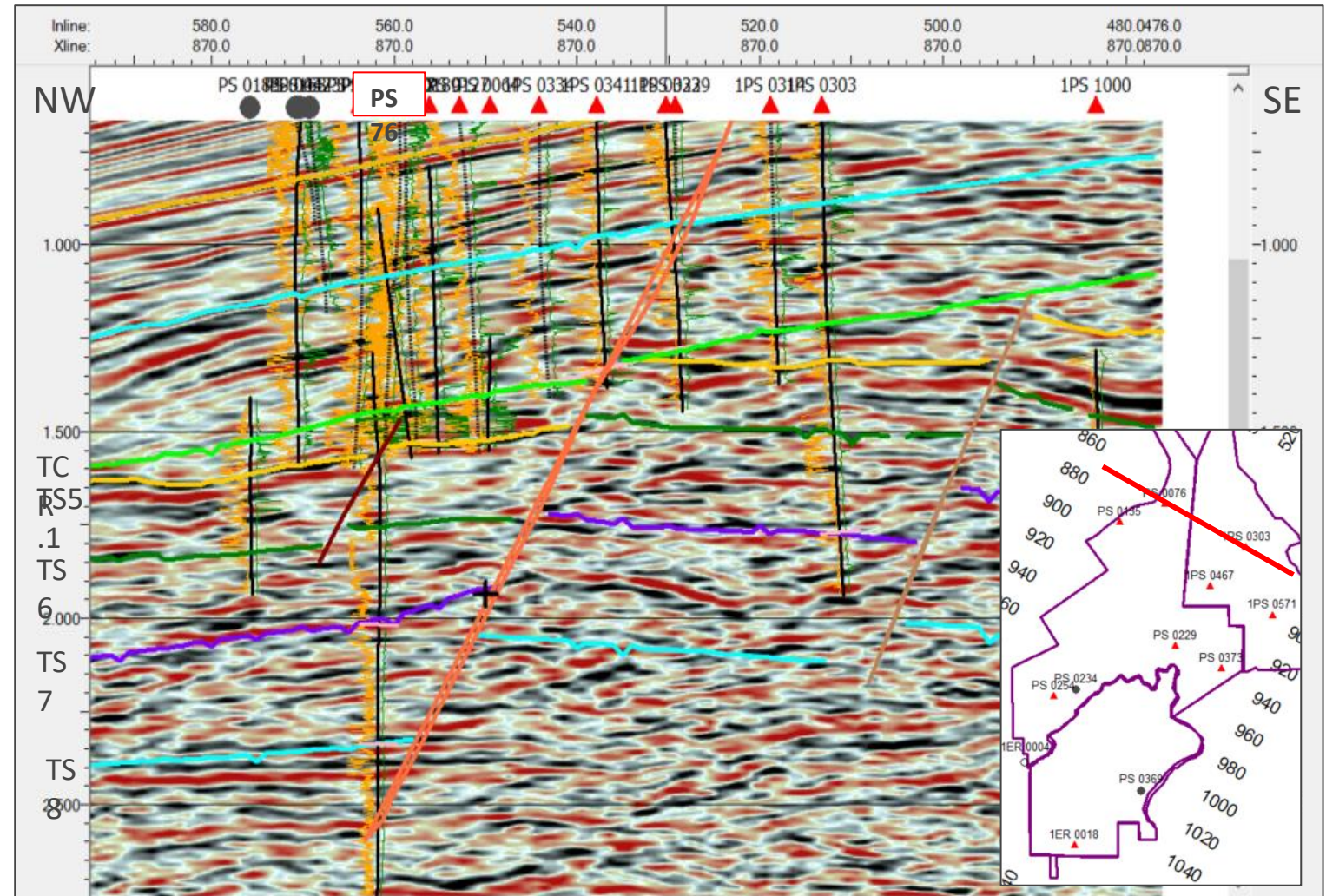




# Mapping of Intra-Cruise Faulting Is A Game Changer

Eye Of Faith Required - 3D Quality 'Variable'

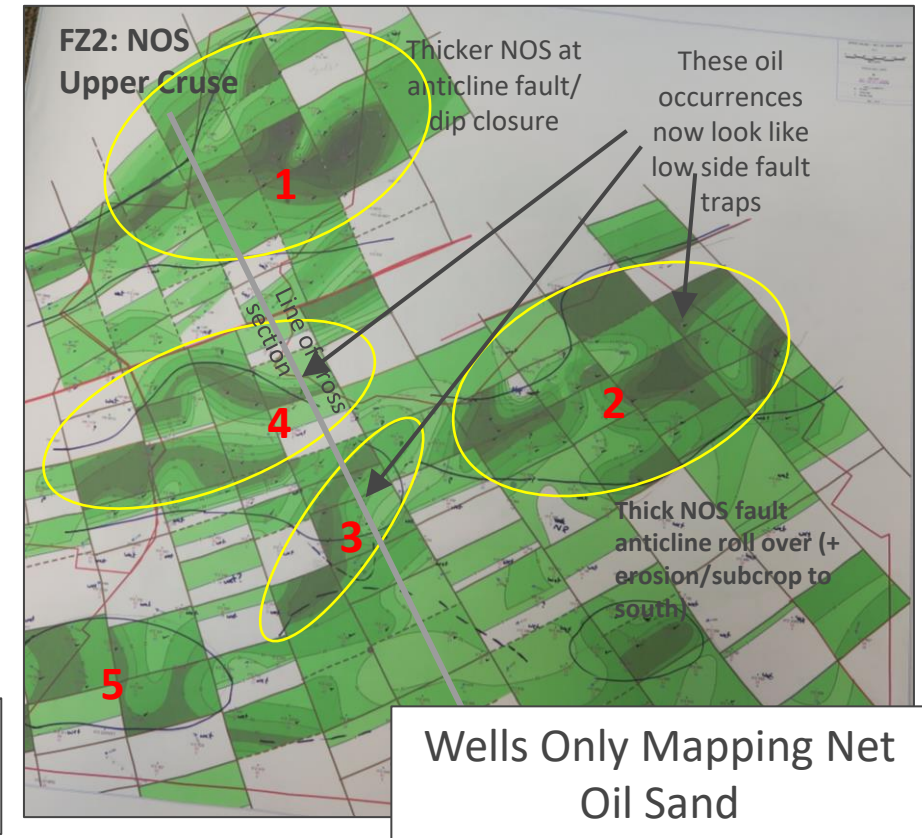
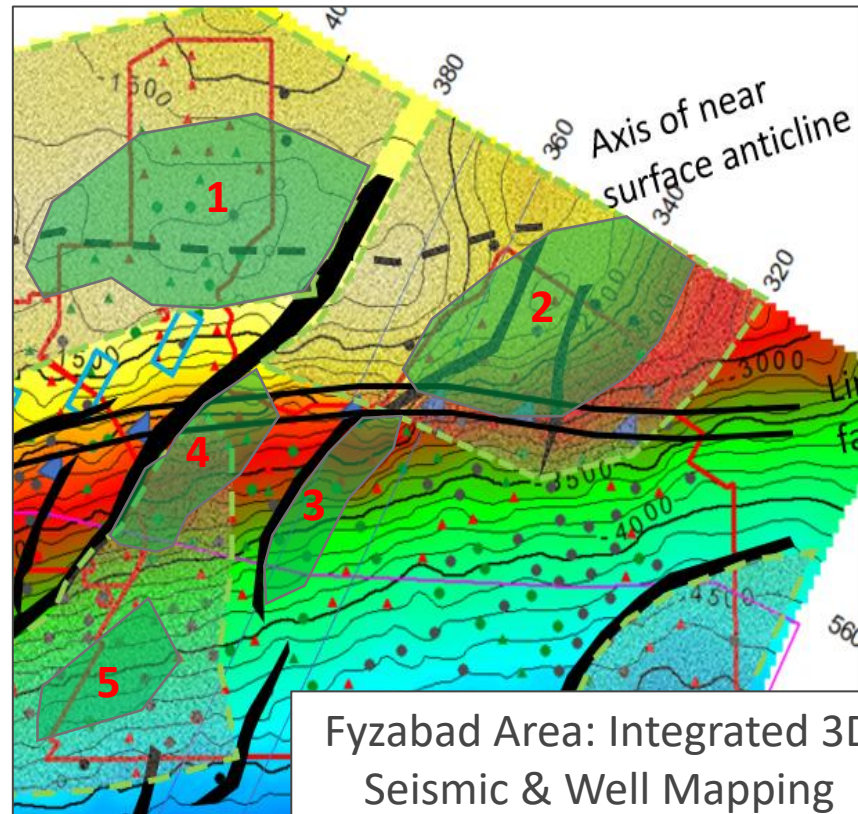
- Example Dip Line WD5/6 to PS4 in Palo Seco area
- Little of the well control extends below TS5.1 (nominal base Upper Cruse)
- Major down to west fault interpreted
- Small throw at Forest level, large offset at deeper Cruse levels



# NOS Sweet Spots Now Explained by New Structural Model

## New Fault Mapping v Traditional NOS Maps

- Example over Fyzabad Area
- Mapped gross structural trends married to NOS maps
- New mapping explains distribution of prolific areas
- Geologically coherent, leads to volumes and remaining resource

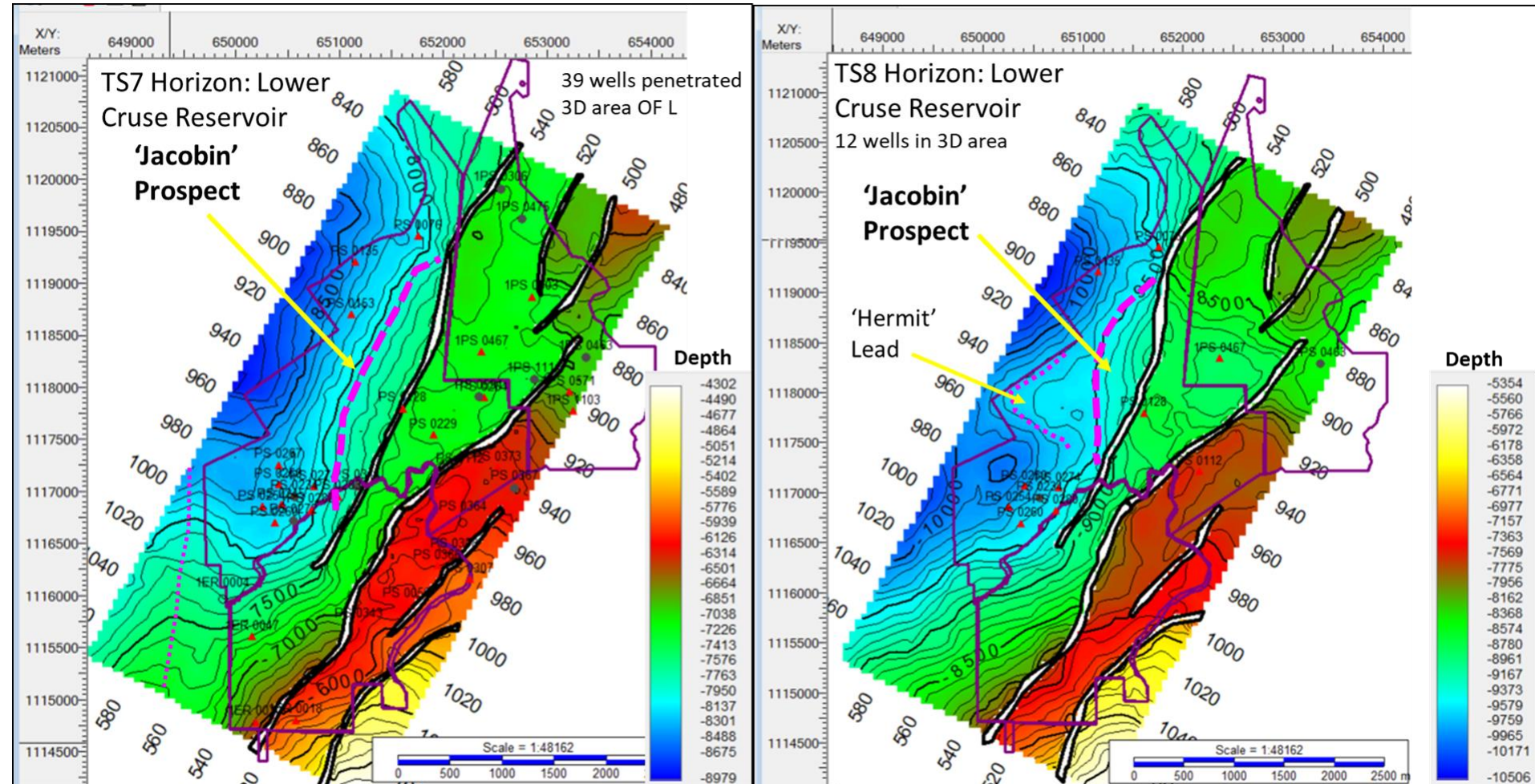


# 3D Seismic: Lower Cruse Mapping Across Palo Seco

## Structural Features seen For First Time

### Palo Seco: Lower Cruse Intervals T7 & T8 Structure Maps

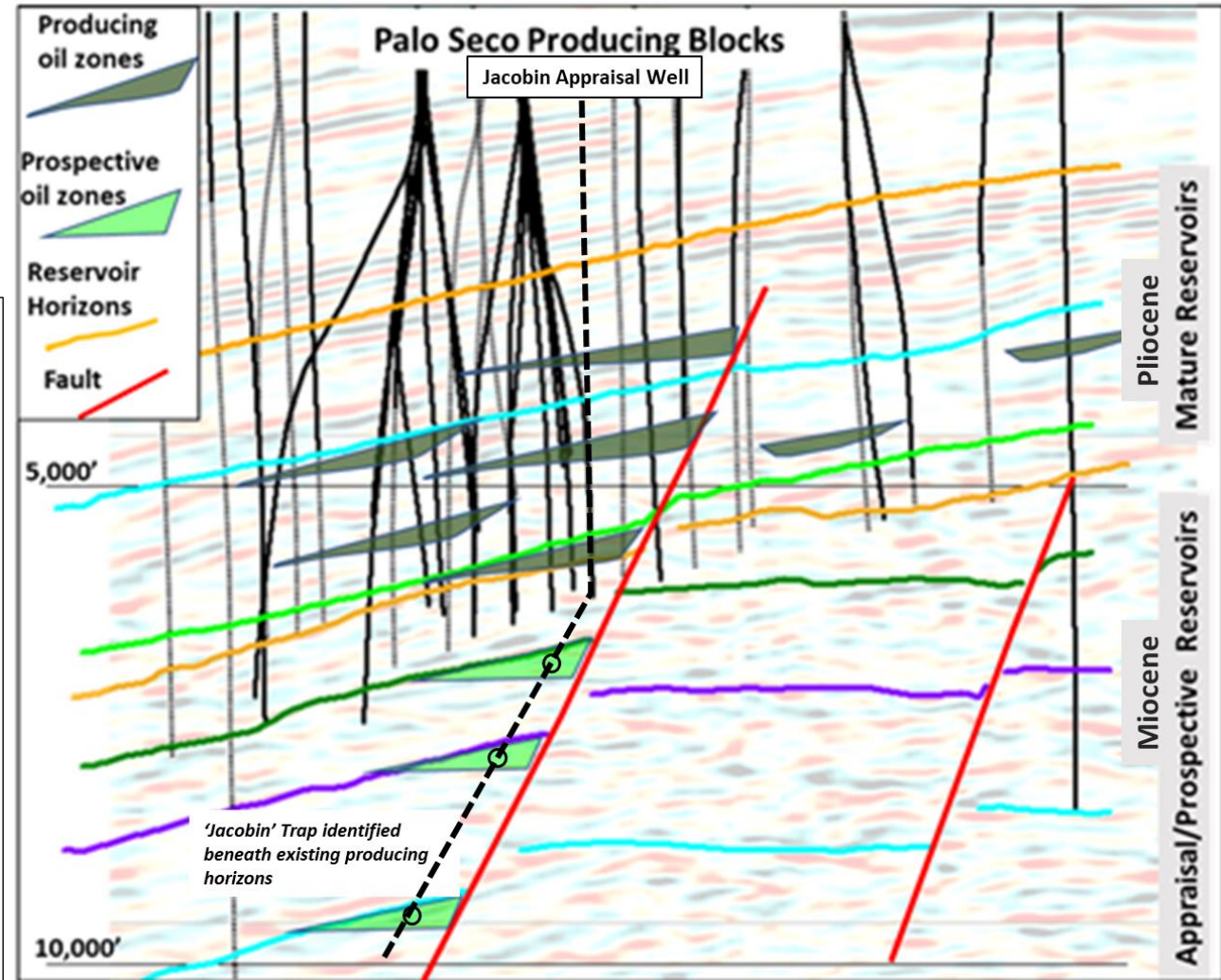
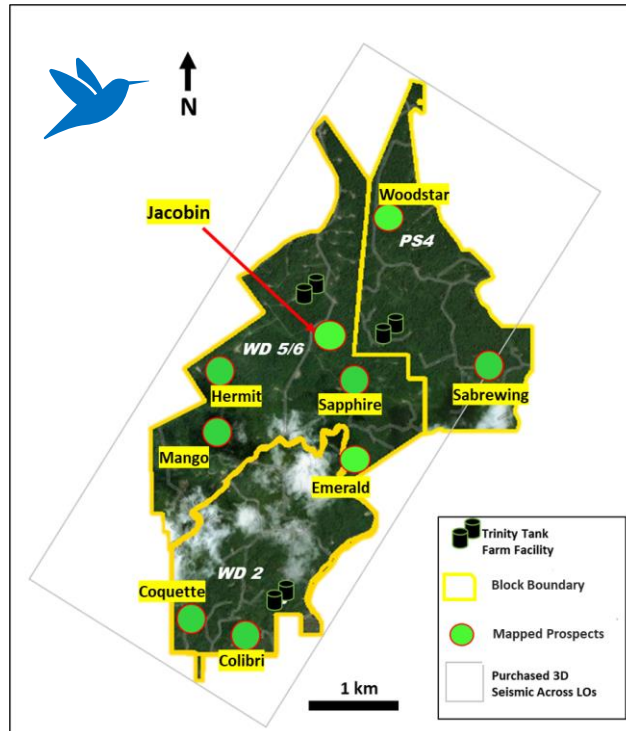
- New fault pattern mapped for the first time
- Series of down to the northwest fault terraces
- High-side and low-side structural closures
- Closures co-incident with high NOS areas in shallower, heavily drilled, Lower Forest interval



# A New Structural Model Is Born

## Structural Model Highlights New Deeper Potential – The Hummingbird Prospects

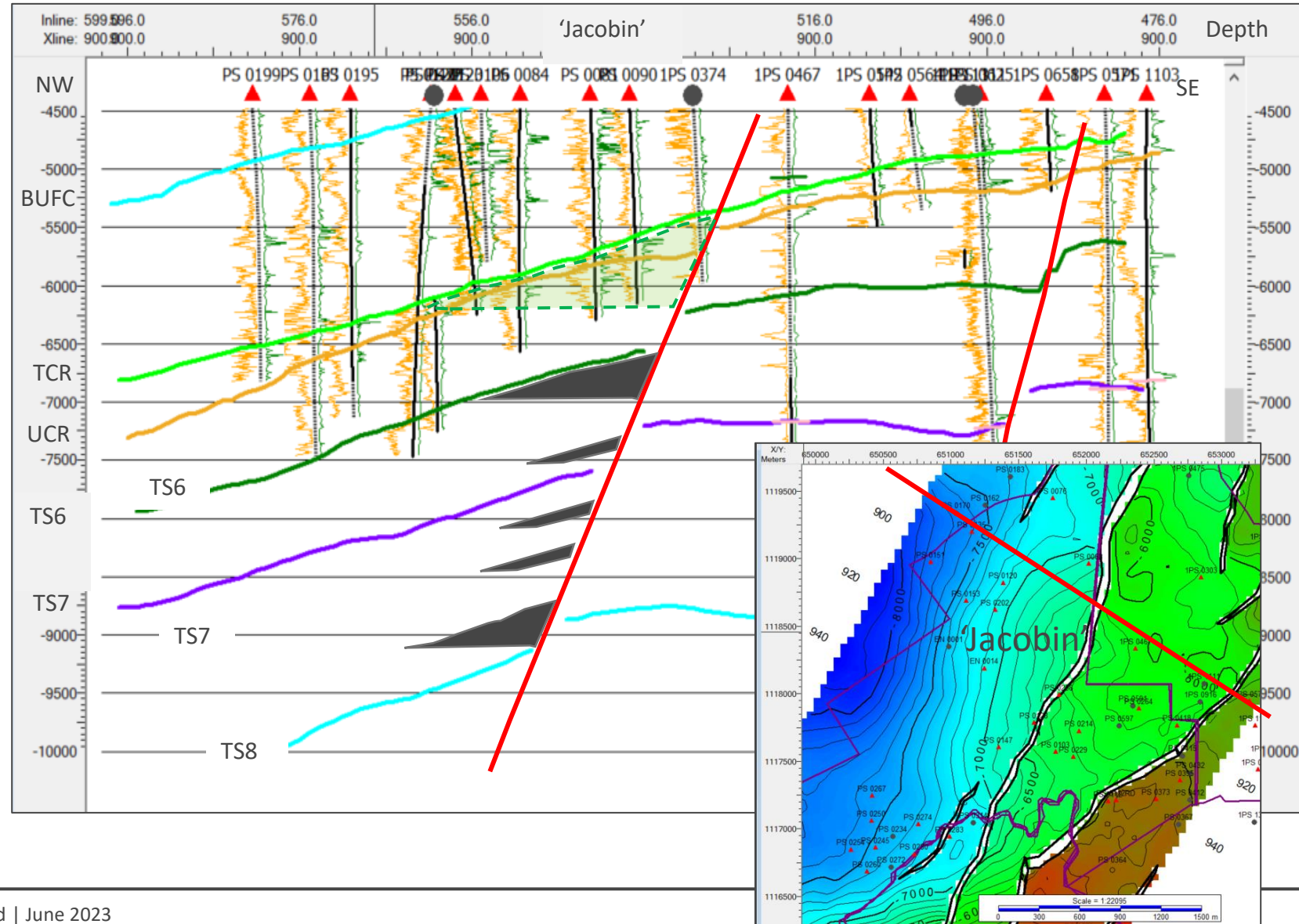
- Structural and stratigraphic aspects previously unseen
- Blockwide maps and cross sections; revisions to reservoir correlations
- Major update to ‘wells only’ mapping with constant dip and fault grid
- Oil traps identified to allow improved assessment
- Provides additional subsurface control to guide high angle drilling



# Dip Section Across The Jacobin Prospect

## Low Side Fault Closure – Same Structural Setting As Prolific Upper Cruse Level Field

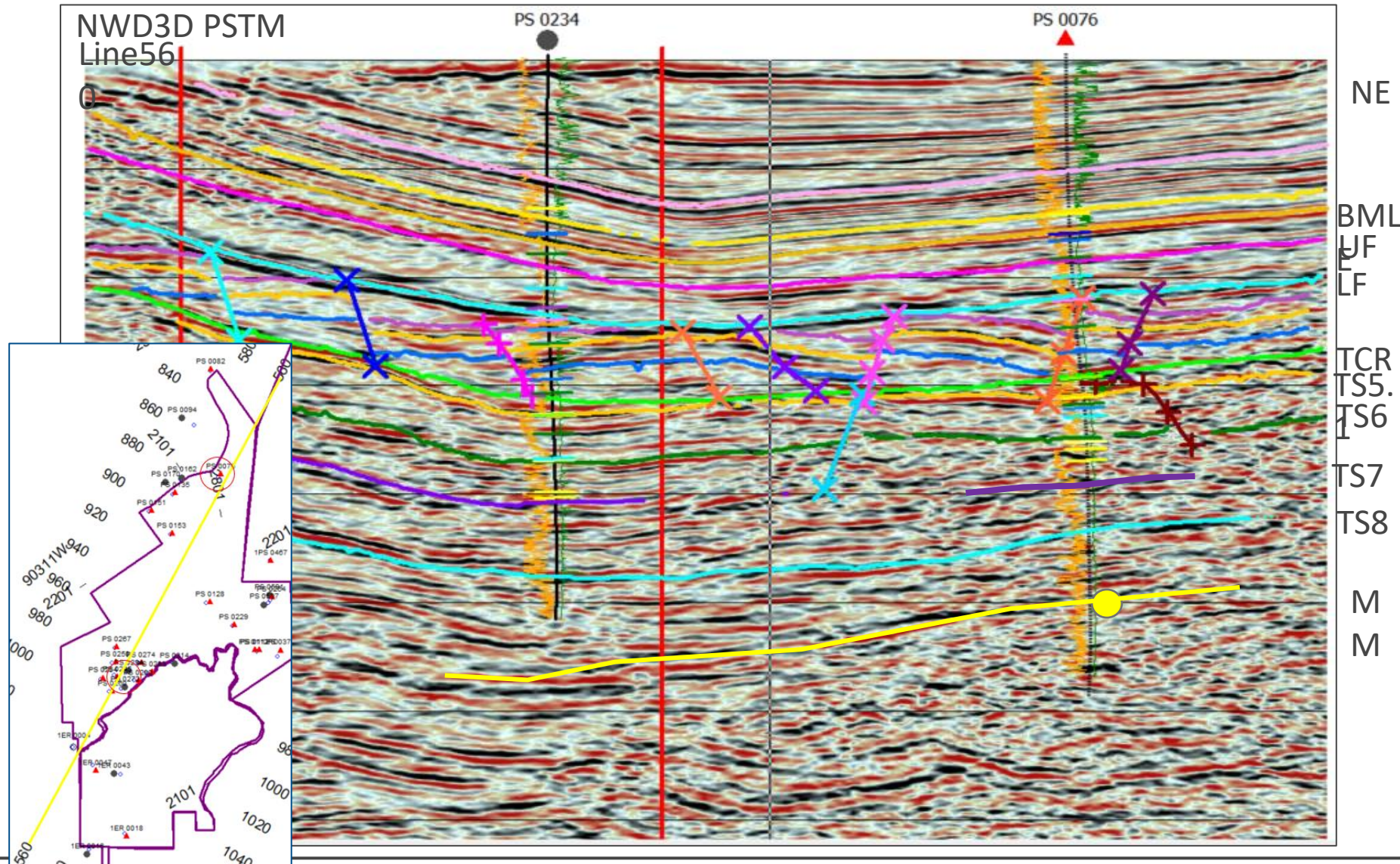
- Objectives
  - Appraise and test stacked turbidite sandstone reservoirs
  - Miocene-age, Lower Cruse fm
  - 9,800 ft TVDSS TD
- Chance Of Success
  - 1 in 3 at T6 level
  - 1 in 4 at T7 and T8 levels
  - Chance of at least 1 success 63%
- Resource Potential
  - Mean STOOIP 5.7 MMbbls
  - P10 over 10 MMbbls



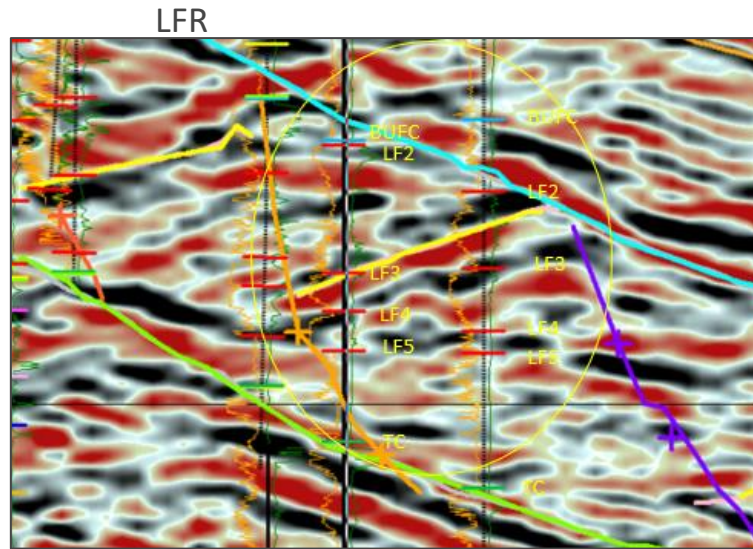
# Fresh Insight Into The Prolific Lower Forest Interval

## Intra-Lower Forest Structure Mapped For First Time

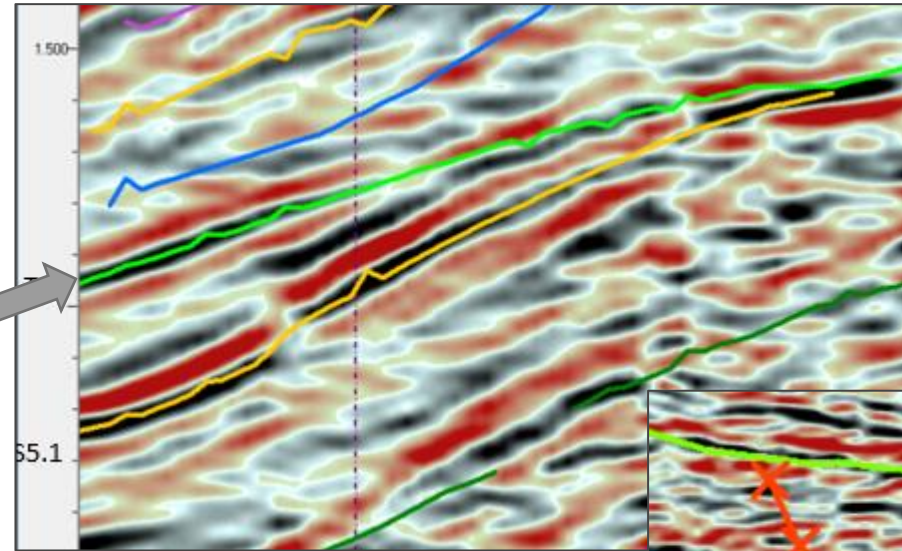
- Data is quite good but there are conflicting dips
- Seismic character and dip changes leads to a conceptual Intra Lower Forest correlation
- Significant dips & fault throws, with unconformable unit top and base
- Interpreted as fault-bounded rollovers within the Lower Forest



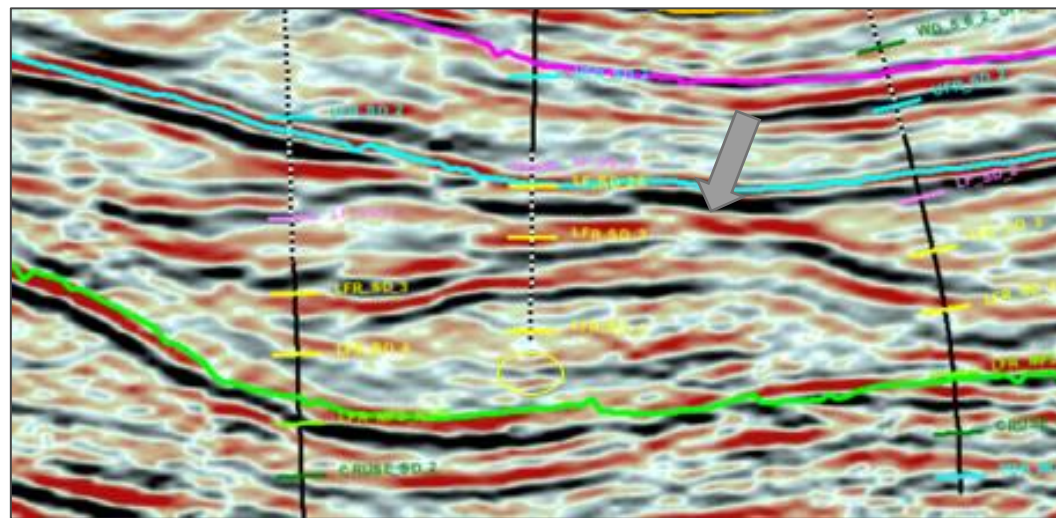
# 3D Seismic Interpretation 'Game Changers'



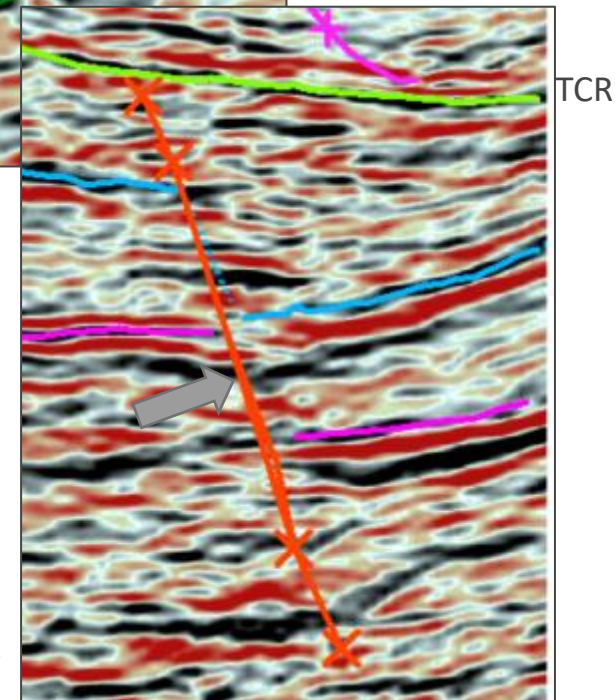
**1. Top Lower Forest Unconformity**



**3. Top Cruse Unconformity**



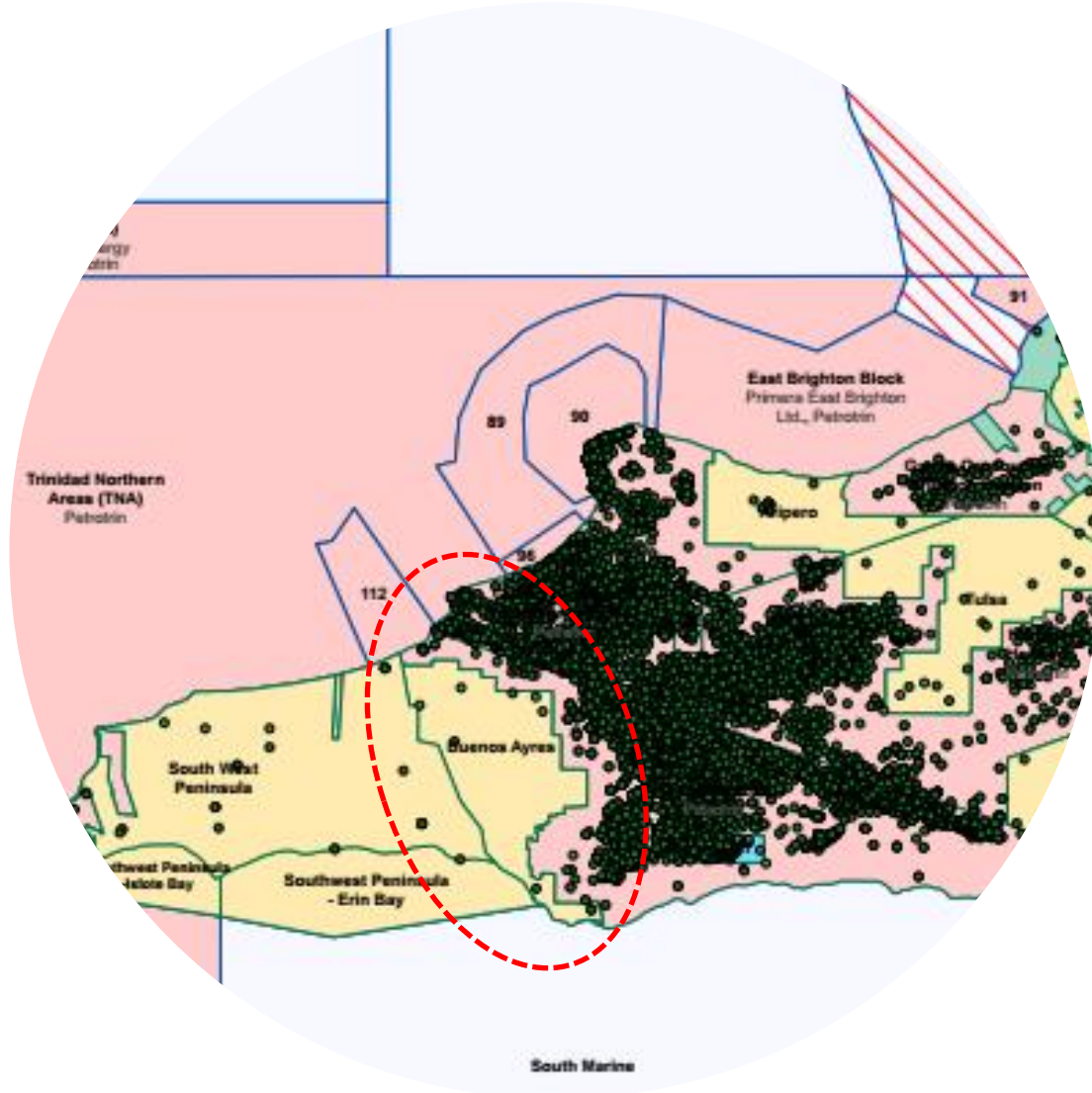
**2. Intra Lower Forest structures**



**4. Intra Cruse Faulting**

# Buenos Ayres Block

Successful Block Application, Virgin Acreage Next Door To Palo Seco



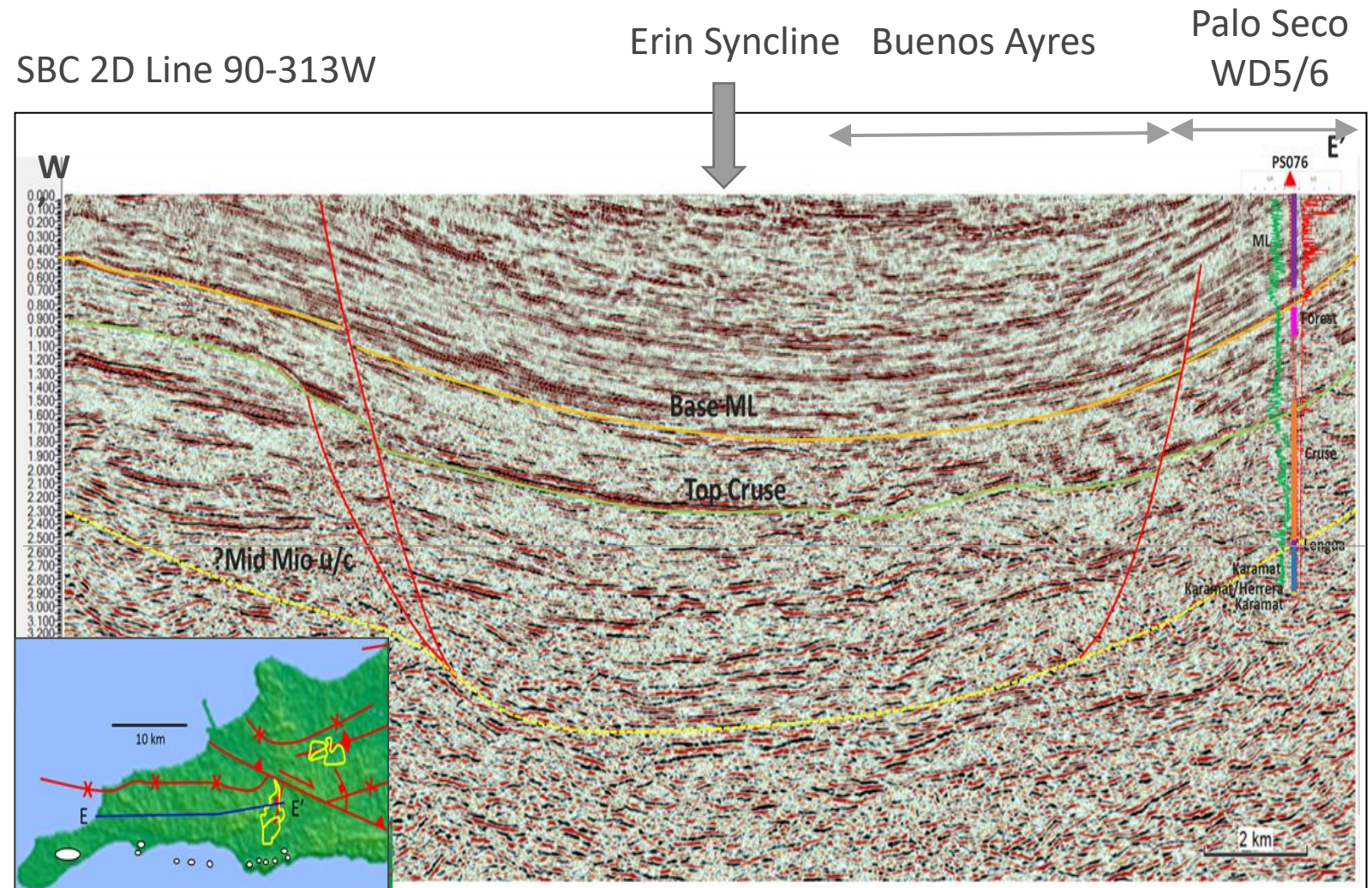
- Buenos Ayres was once part of the larger Block A awarded to Petrotrin in 2006
- In 2012, part of the block was relinquished and is now called Buenos Ayres Block
- The block is largely undrilled
- Why has it been avoided?



# Buenos Ayres Block: Unattractive At First Glance

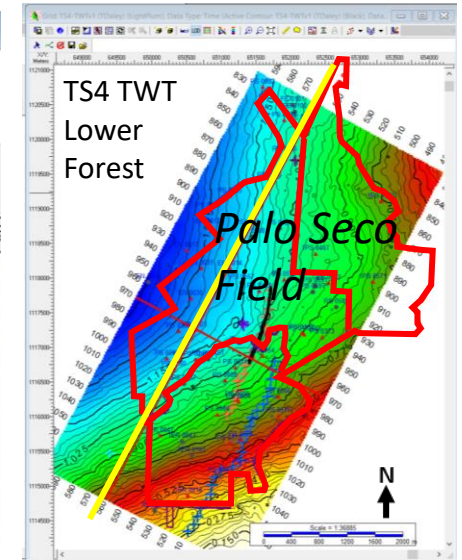
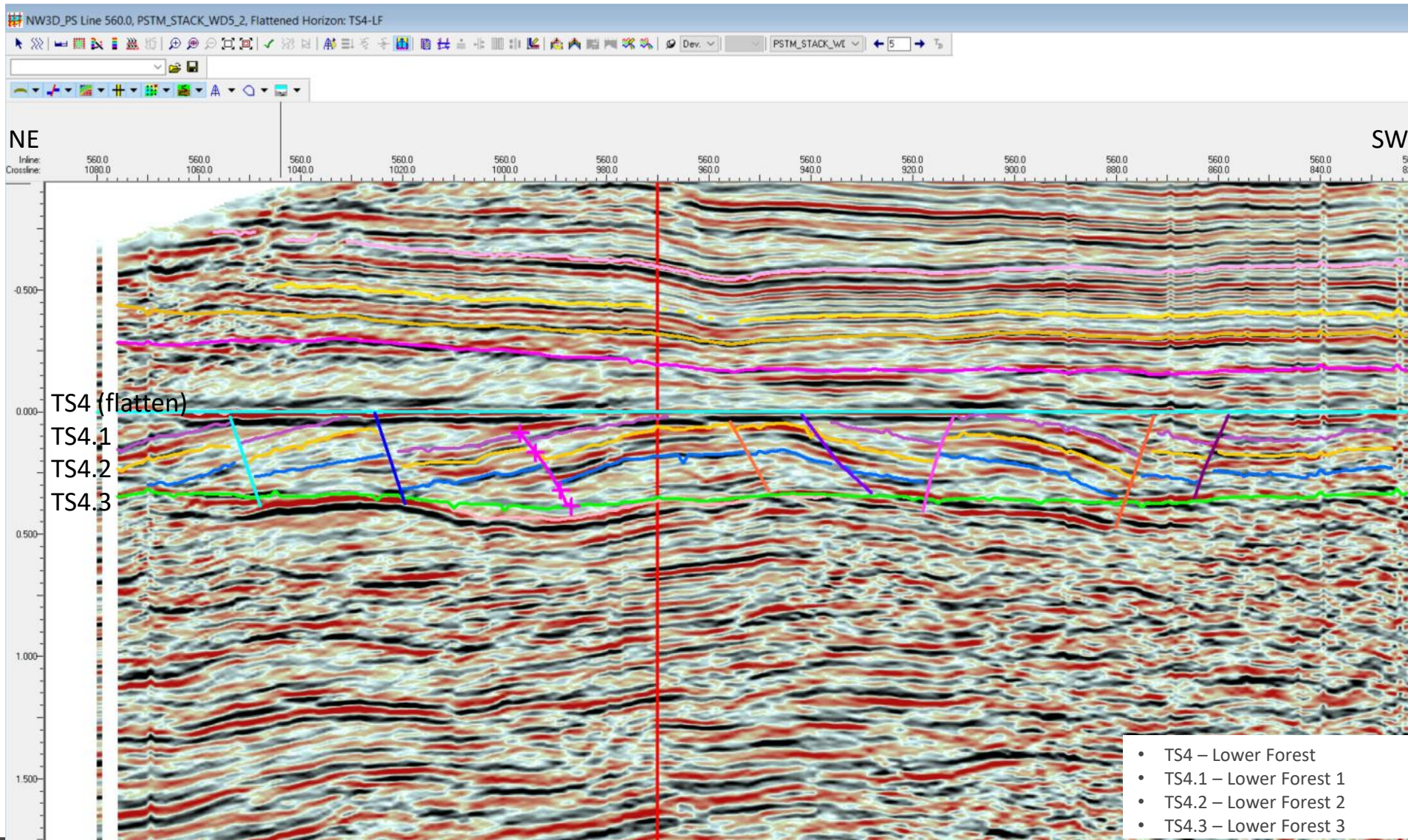
## Block Sits In Major Syncline

- West of Palo Seco, structure is a major syncline – the Erin Syncline
- Seismic data quality traditionally better in synclinal areas
- Regarded as non-prospective given block sits in a structural low
- This regional 2D strike line shows the Erin Syncline extends westward towards the coast



# Palo Seco Analogue

## Intra-Forest Structure – Illustrated On Strike Line Flattened On Top Lower Forest Unconformity



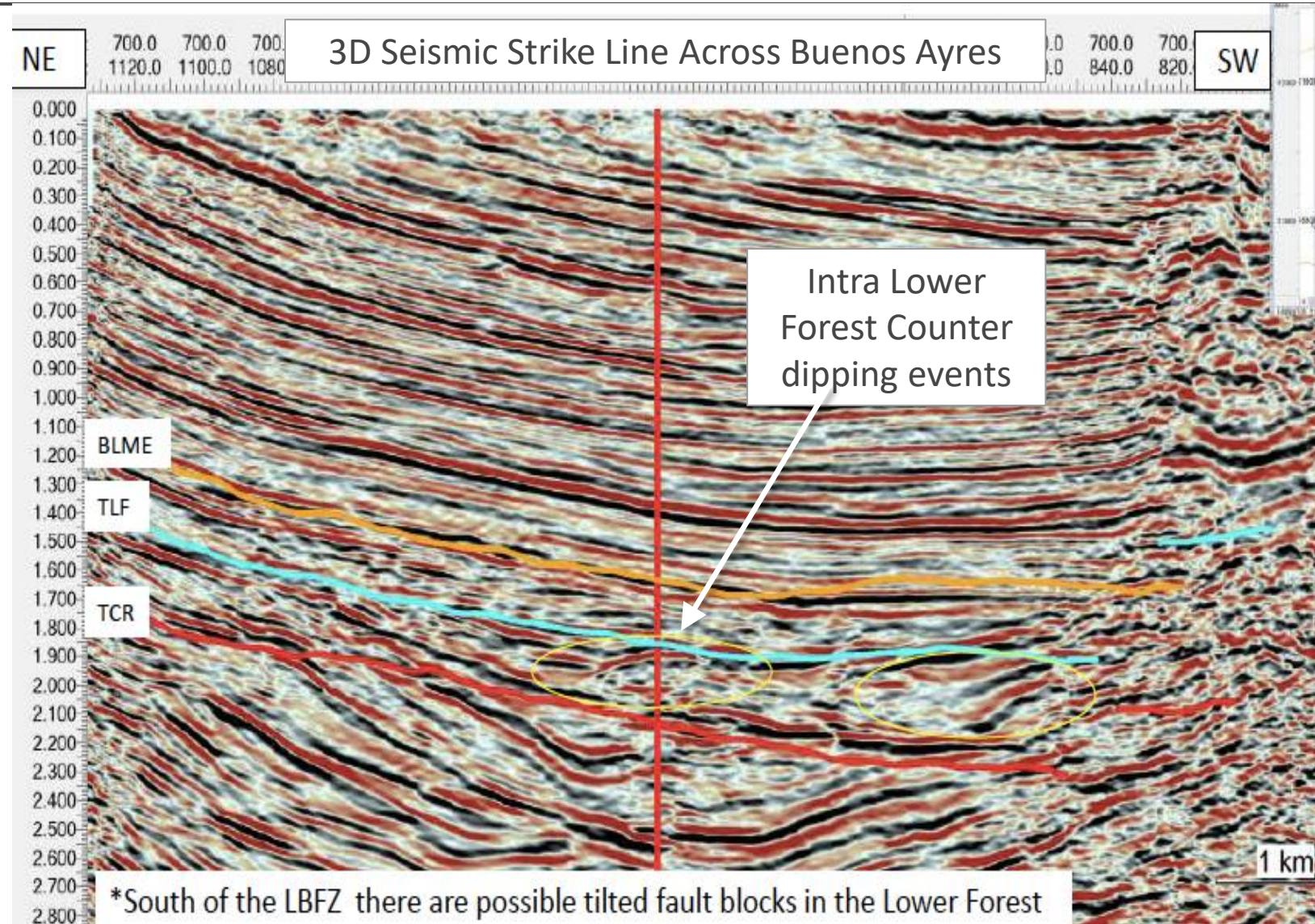
\*In the Palo Seco Field, the Lower Forest contains traps bounded by normal faults

\*Seismic character and dip changes leads to a conceptual intra Lower Forest fault blocks

# Taking Palo Seco Insights Into Buenos Ayres

## Same Counter Dips Evident In Lower Forest Interval – Prolific Next Door In Palo Seco

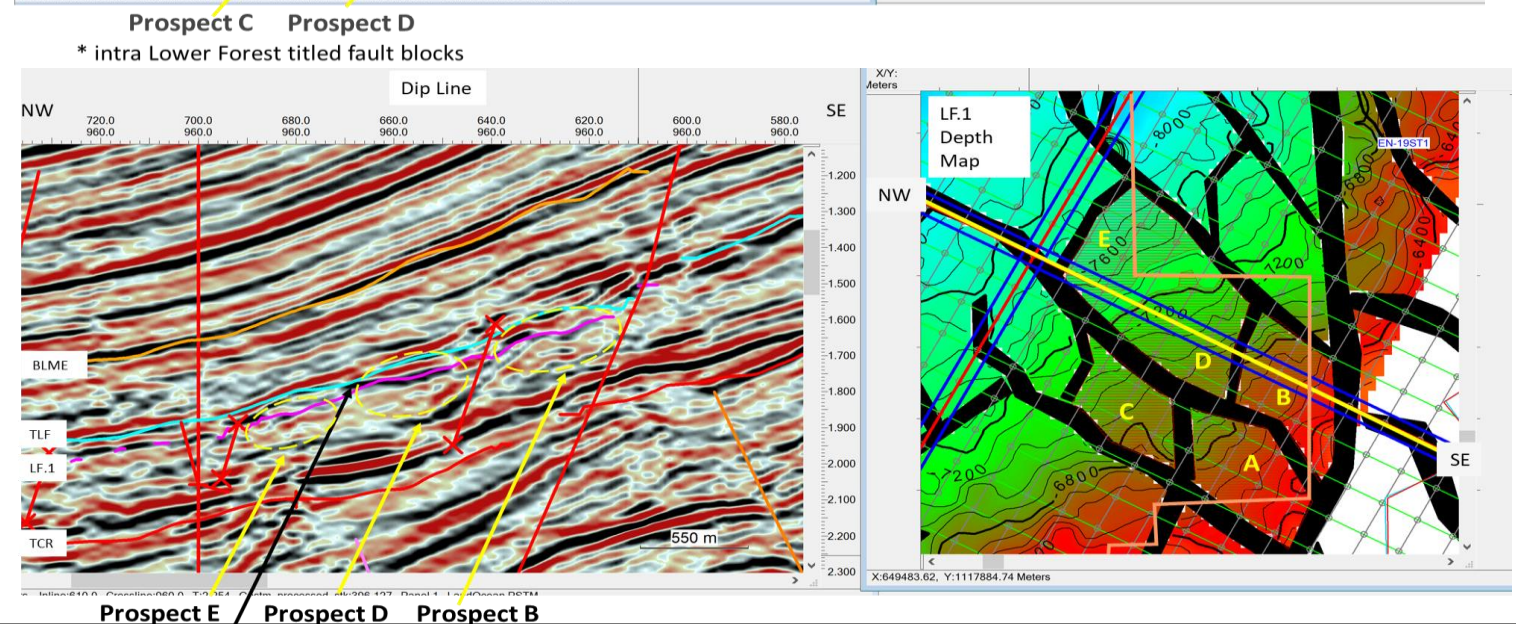
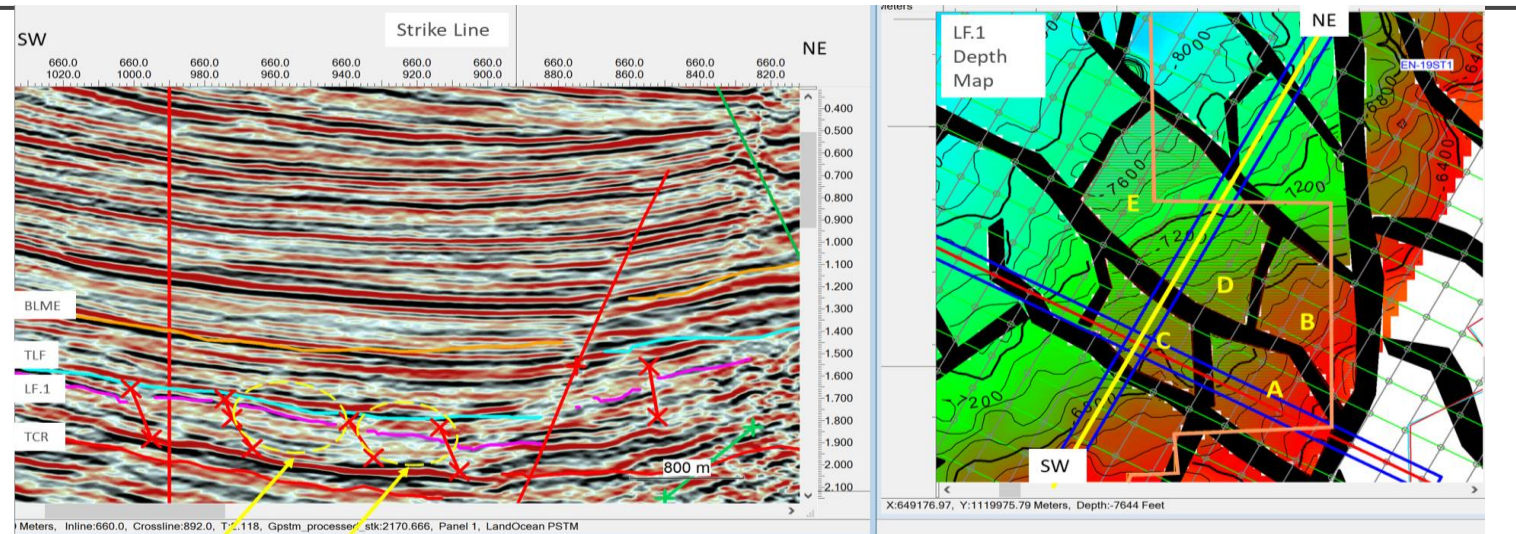
- Top and Base Lower Forest unconformities are clear, defining the prolific units in the SW basin
- Lower Forest counter dips seen – structuring as per Palo Seco
- Data quality much improved over Buenos Ayres, intra-Lower Forest unit has much better imaging



# High Quality 3D = Detailed Lower Forest Mapping

## Fault Lattice Mapping (ChickenWire) From High Quality 3d Seismic

- Listric faults within the Lower Forest can be mapped
- Same structural configuration and stratigraphy as seen in Palo Seco area
- Maps out as a lattice of faults – sets up multiple traps on the flank of the syncline
- Strong analogue to the prolific Lower Forest in Palo Seco
- Deeper Cruse structures also mapped



\*reflector truncated onto the TLF indicating possible eroded surface splitting the fault block into two Prospects

# Buenos Ayres Block - Multiple Traps at Forest and Cruse levels

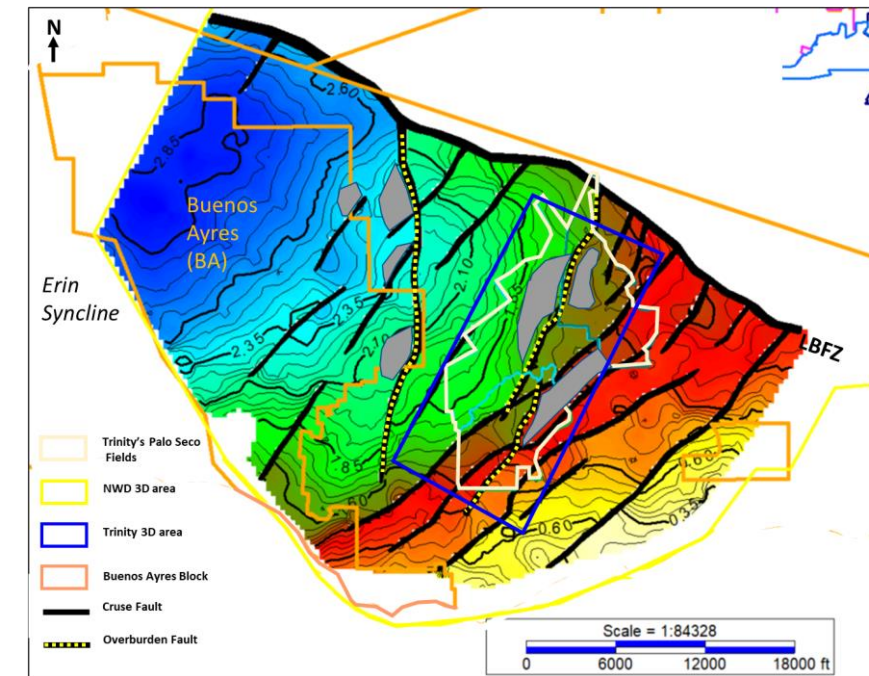
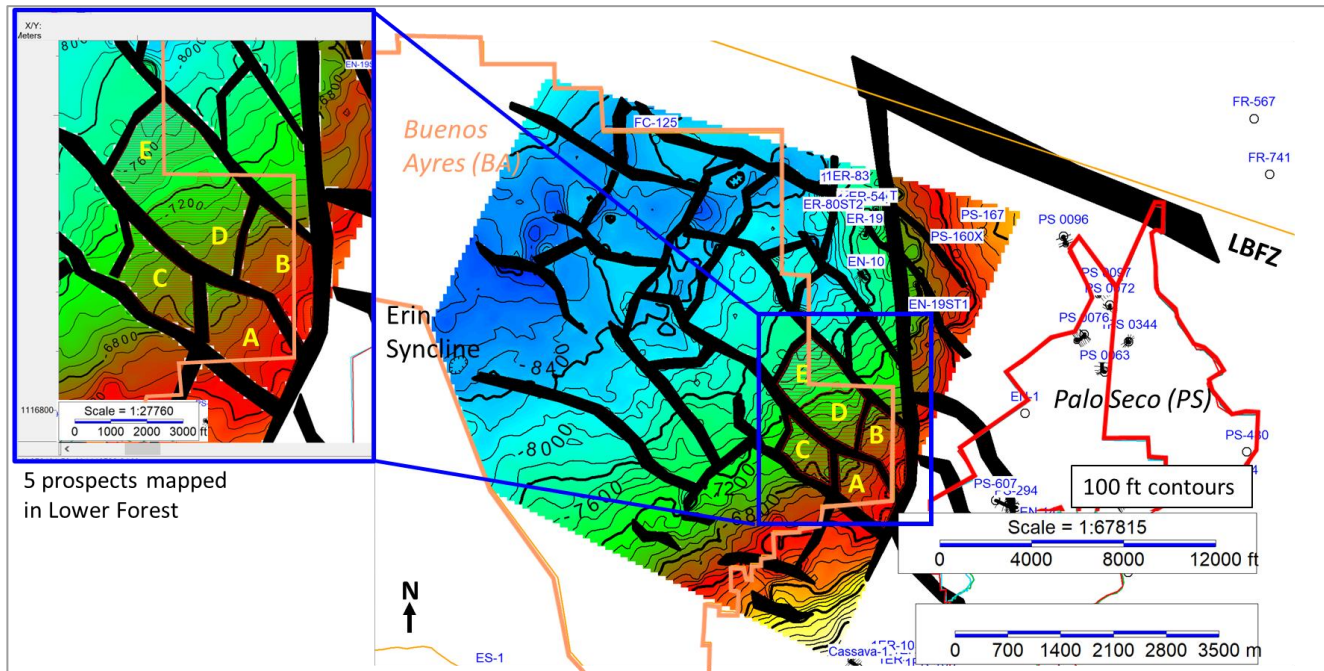
## Extensive Follow-on Potential At All Levels

### Lower Forest

- Scoping volumes per Forest level trap
- Fault panels typically hold a mean 7 - 9 MMbbls in place depending on panel size
- 10+ Fault panels identified
- Initial view CoS circa 20%

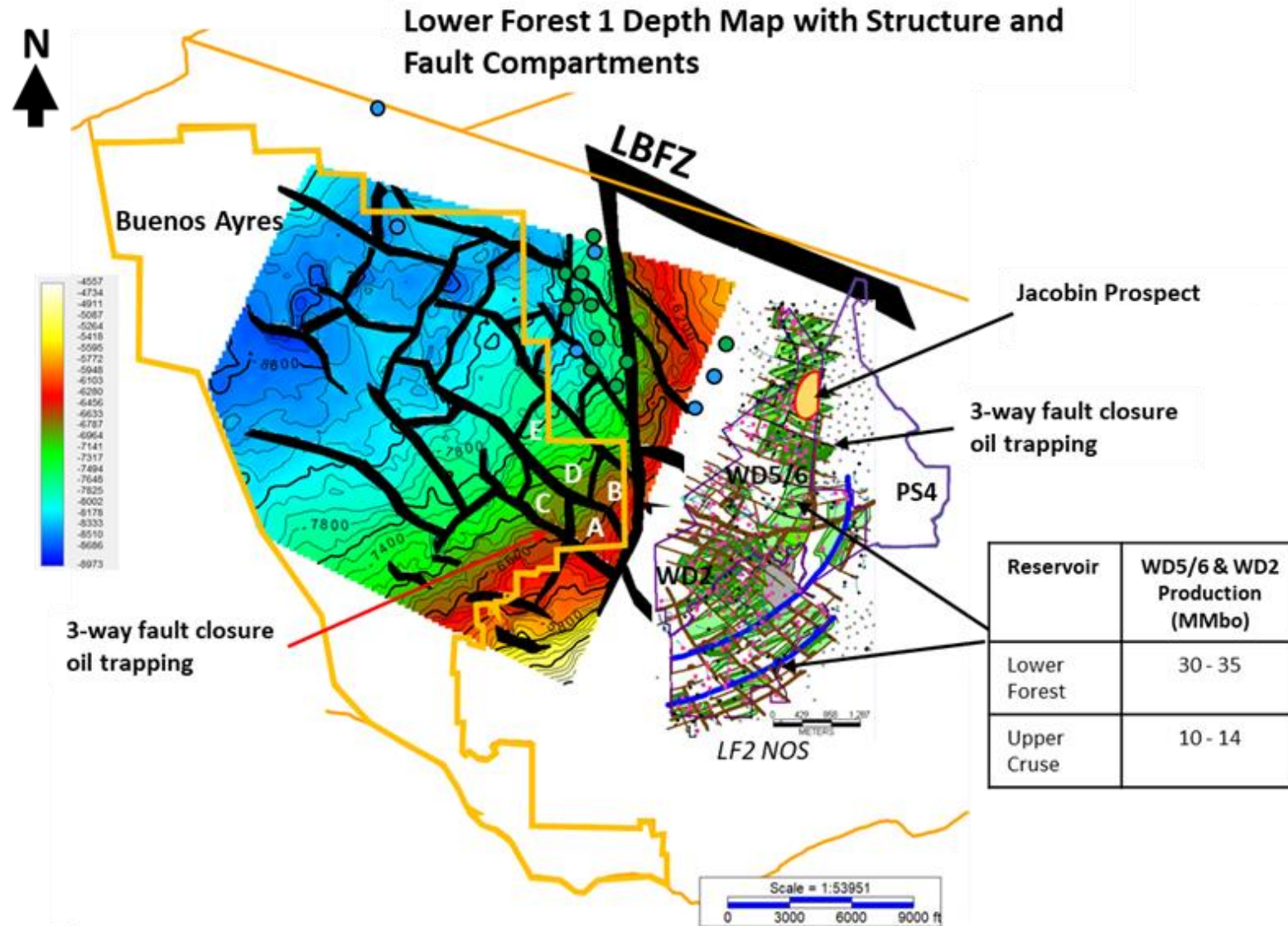
### Cruse

- Scoping volumes of a mean c. 3 – 11 MMbbls in-place typically
- Initial view, CoS circa 14%



# Buenos Ayres In Context

500 meters From Palo Seco Block Boundary



# Material Pipeline of Drilling Opportunities for an 18 mmbbl Company



- Trinity's early investment in 3D has provided a true competitive advantage
- Pushing data to limits, interpretation has provided new insights on structure and stratigraphy; Trapping mechanism now explained
- The Hummingbird portfolio : Lightly drilled Lower Cruse interval in Palo Seco, Jacobin first test, c. 5.7 MMbbls in-place mean potential
- Buenos Ayres block: Mapping out multiple traps in prolific Lower Forest unit using knowledge of Palo Seco; Lower Cruse structures also present
- Buenos Ayres virgin acreage in mature basin setting, Lower Forest panels in range 7 – 9 MMbbls in-place and Cruse from 3-11 MMbbls in-place
- Hummingbird; Buenos Ayres Lower Forest; Buenos Ayres Cruse – multiple targets, lots of repeatability