

A photograph of an industrial structure, possibly a drilling rig or mining equipment. A white banner with the 'DILEX' logo is stretched across a metal railing. The logo consists of a blue 'D' with a white and orange swoosh, followed by the letters 'ILEX' in a bold, blue, sans-serif font. The background shows a complex network of white metal beams and pipes.

# THE PROSPECTIVITY OF THE WALLAL GRABEN

A UNIQUE CANNING BASIN OPPORTUNITY

Pete Bekkers

July 2015

The logo for DILEX LTD, featuring the word 'DILEX' in a bold, blue, sans-serif font, followed by 'LTD' in a lighter blue, sans-serif font. A small orange and white swoosh is positioned to the left of the 'D'.

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The information in this Presentation relating to the estimates of petroleum reserves, contingent resources and prospective resources is based on, and fairly represents, information and supporting documentation prepared by, or under the supervision of Peter Bekkers who is an employee of Oilex Ltd and a member of AAPG and SPE. Mr Bekkers has consented to the inclusion of the estimated petroleum reserves, contingent resources and prospective resources and supporting information in this Presentation in the form and context in which it is presented.

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## Reserves and Contingent Resources Report

(1) The Reserves and Contingent Resources estimates prepared by RISC as of 1 April 2015, and referred to on page 3, have been prepared in accordance with the definitions and guidelines set forth in Petroleum Resources Management System, 2007 (PRMS) approved by the Society of Petroleum Engineers (SPE). For further information, please refer to Oilex's announcement dated 16 April 2015 for details of the independently classified Cambay Field Reserves and Contingent Resources.

## Offices in Australia (Perth) and India (Gandhinagar)

### Key Projects

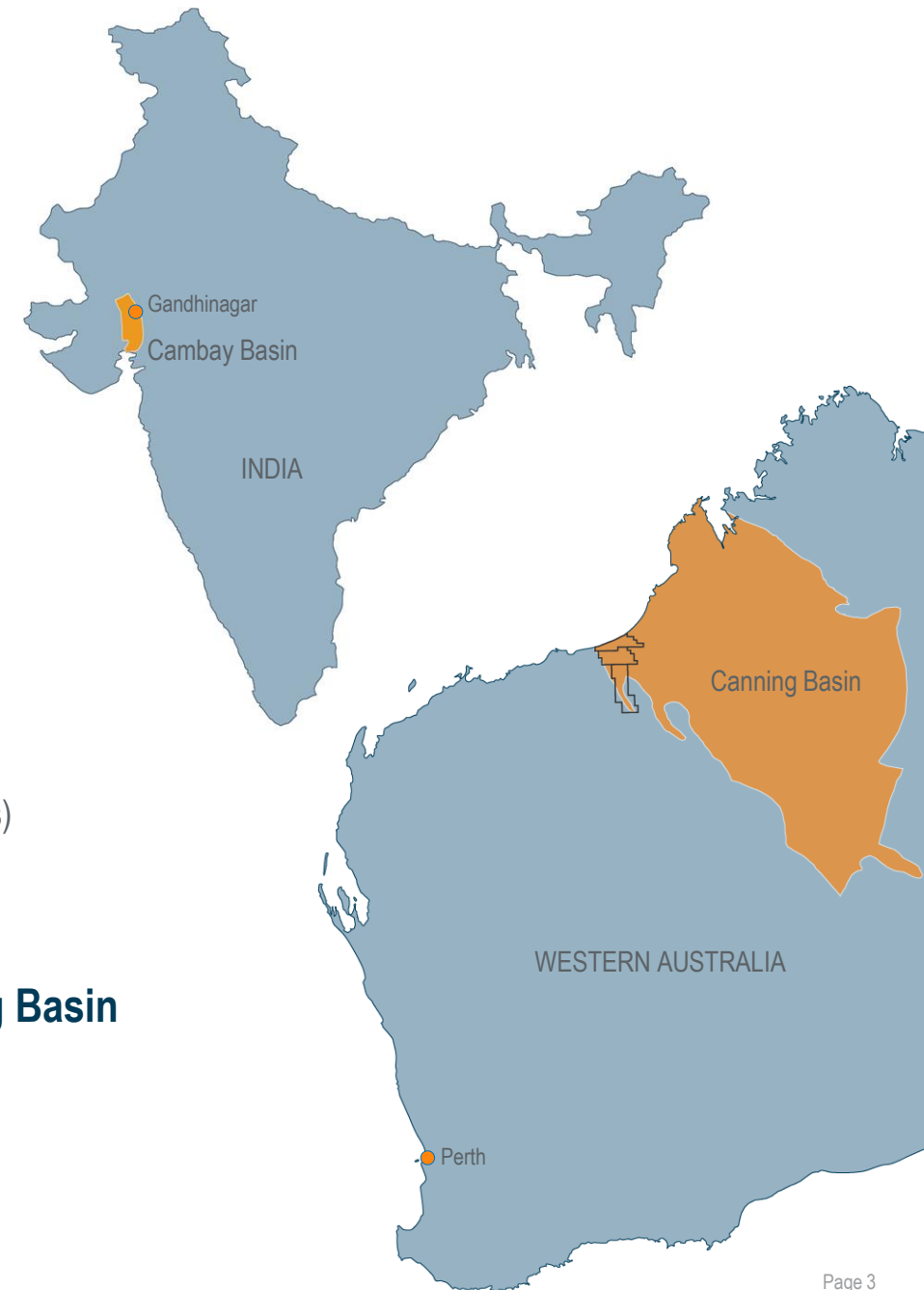
- India - Onshore Cambay Basin (40,000 acres)
- Australia – Onshore Canning Basin (3,000,000 acres)

### Drilled the first successful, multi-stage fractured horizontal well in India

- Cambay Field
- Production test of gas and light oil (independently assessed gross 2P Reserves = 206 Bcf and 8 MMbbls)
- Currently planning for production well drilling campaign

### Captured entire half-graben play fairway in an overlooked area of the Canning Basin

- Wallal Graben
- Combination of Government gazetted round and open acreage
- 3 million acres



# CANNING BASIN

MULTIPLE HYDROCARBON SYSTEMS ARE PROVEN - UNDEREXPLORED

## Numerous discoveries in the past

- Older wells discovered small, conventional oil pools
- Blina Oil Field (1981) IP ~1,000 bopd

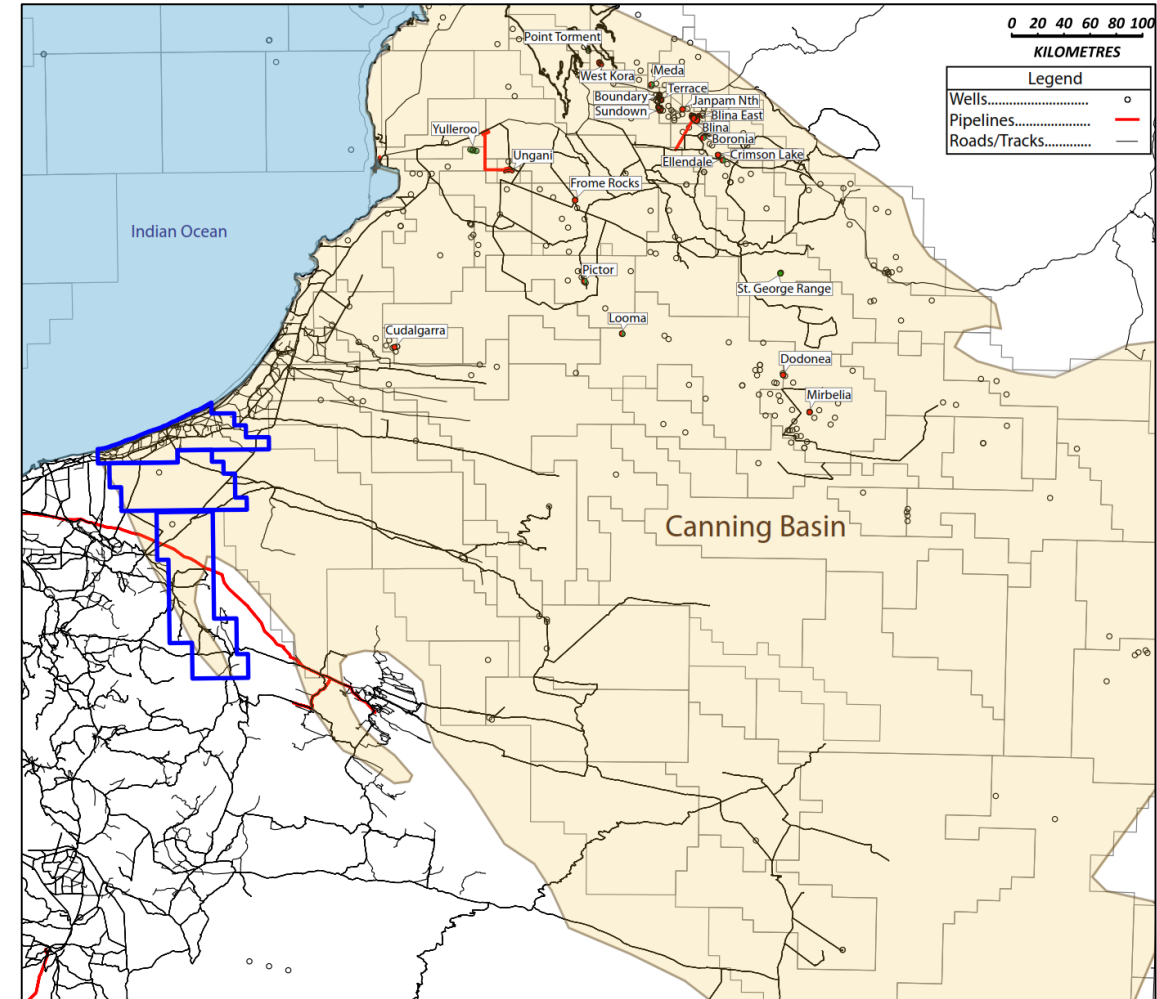
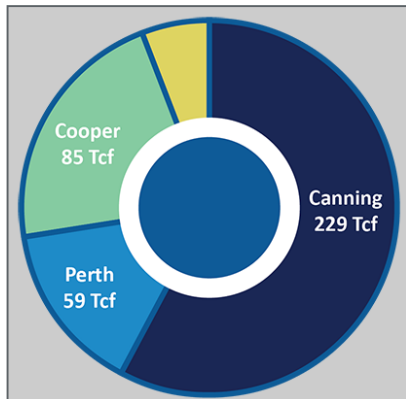
## Recent discoveries

- Buru Energy discovered Ungani Oil Field (2011) IP ~1,600 bopd
- First significant discovery for 30 years

## EIA (U.S. Energy Information Administration) - 2011

- Identified the Canning Basin as having the largest unconventional potential in Australia

**Canning Basin drilling density ~ 1 well / 500,000 acres!**



# INTRODUCTION

## OPPORTUNITY IDENTIFICATION AND CAPTURE OF 3 MILLION ACRES

### 2D seismic data clearly images deep half-graben and large structures

- Conventional and unconventional plays identified
  - Stacked objectives able to be tested with a vertical well

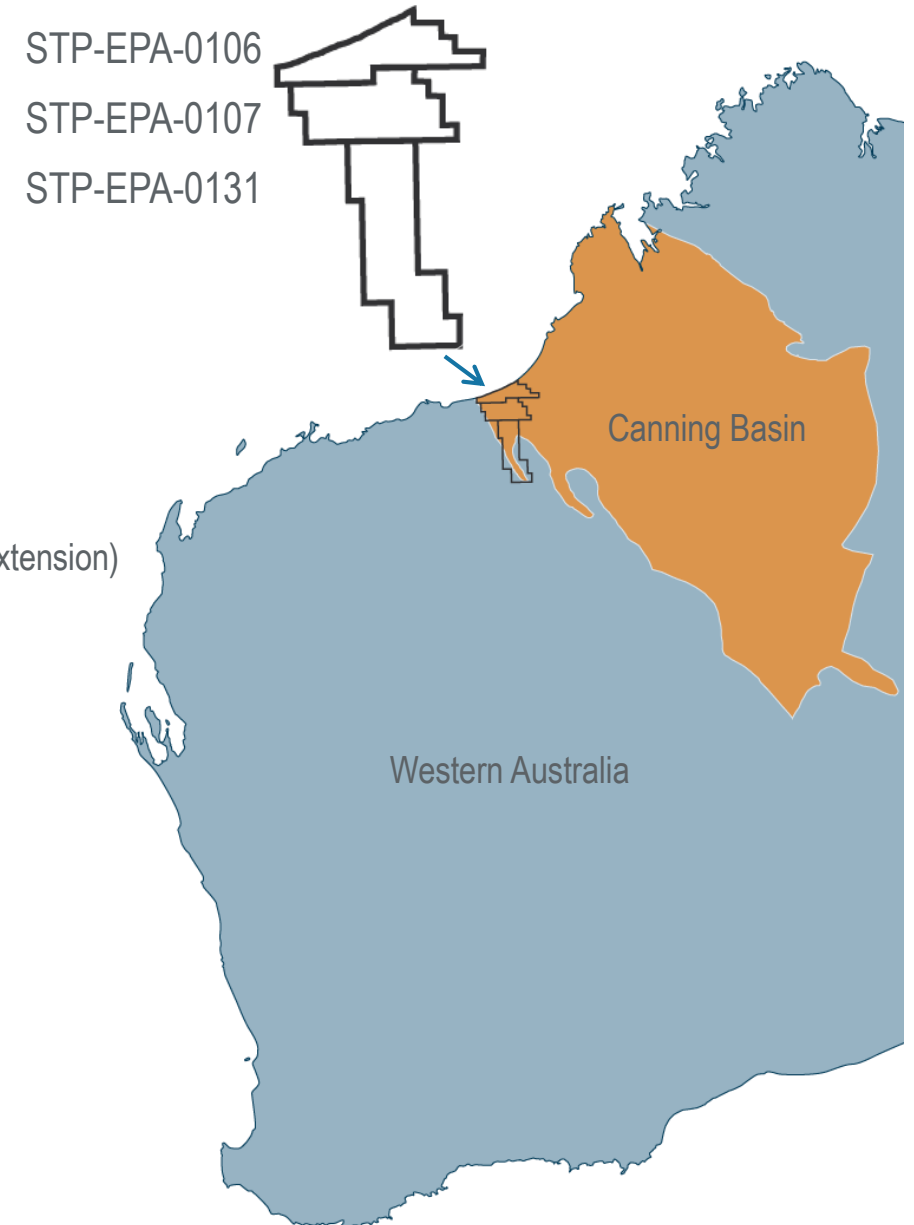
### Identified a deep, undrilled half-graben on 2D seismic data

- Special Prospecting Authority (now STP-EPA-0103) awarded over open acreage (potential half-graben extension)
- Adjacent gazettal blocks (now STP-EPA-0106 & -0107) to capture entire play fairway awarded

### Proven organic-rich Ordovician source rocks in adjacent wells

- Potential for increased organic richness due to confined environment of deposition

### Recent increase in drilling activity involving major international companies





# WALLAL GRABEN

SEISMIC DATA SHOWS TEXT-BOOK HALF-GRABEN

## Jump correlations with regional seismic infer:

- A near complete Ordovician sequence is preserved
- Possible organic-rich Goldwyer and Bongabinni Formations present
- Numerous play-types
  - Structural and stratigraphic
  - Conventional and unconventional

~5km

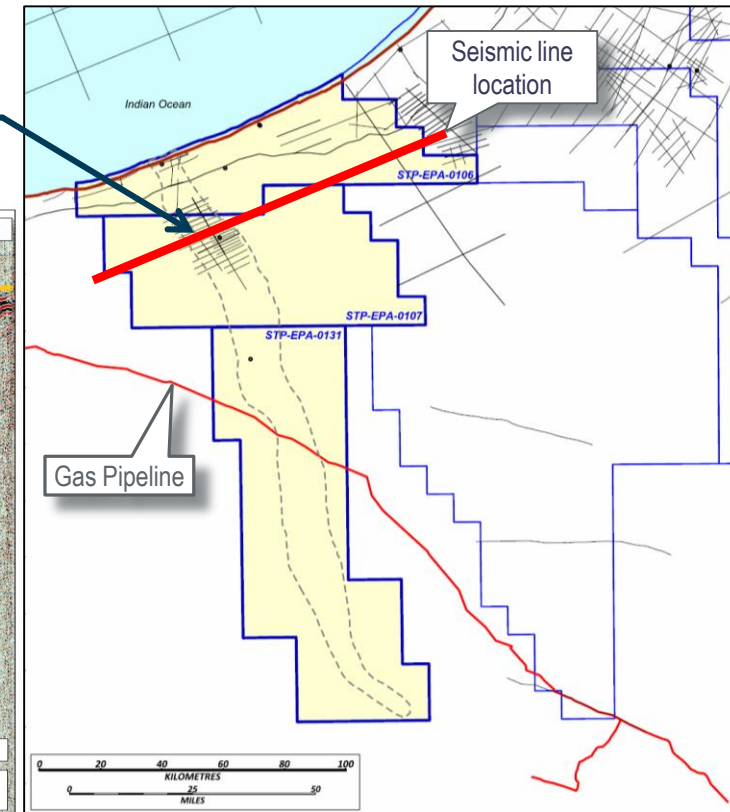
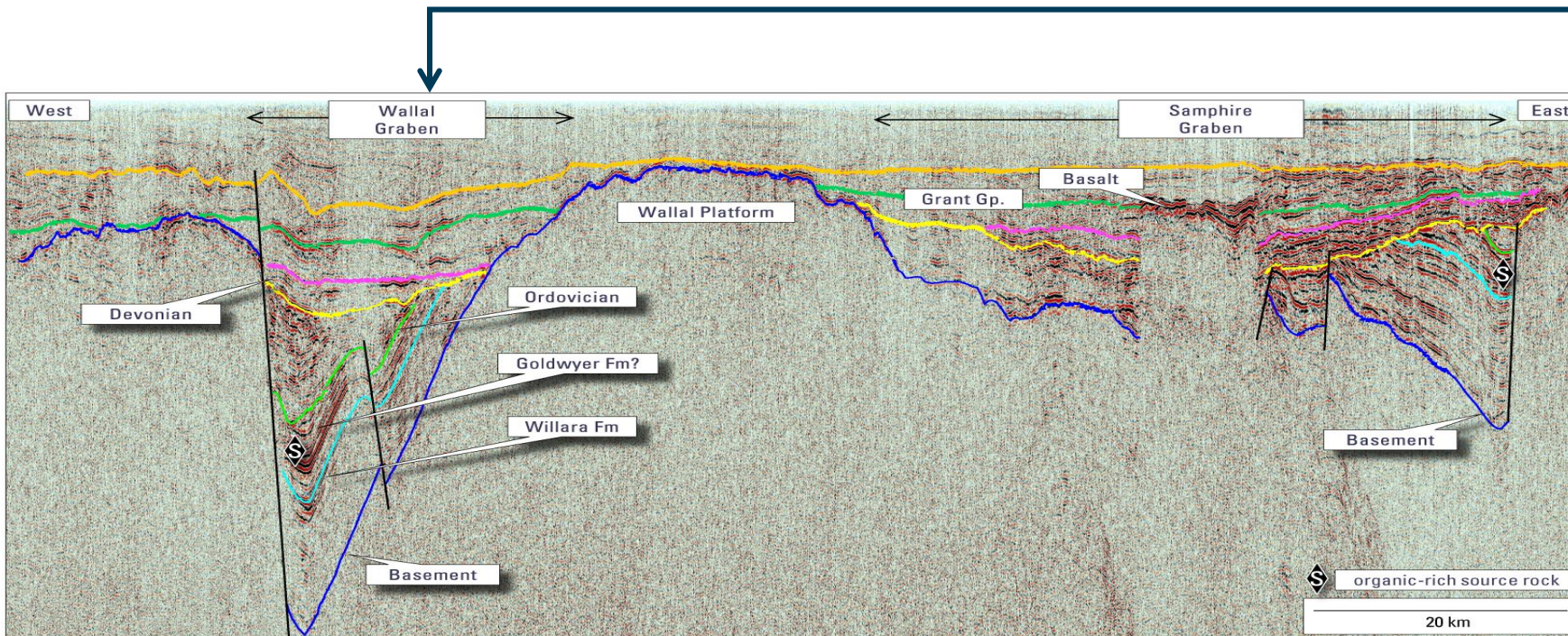
Depth to Basement

~20km

Narrow half-graben

~200km

Extends inland





# PALAEOGEOGRAPHY

## LOWER ORDOVICIAN (480-450 MA)

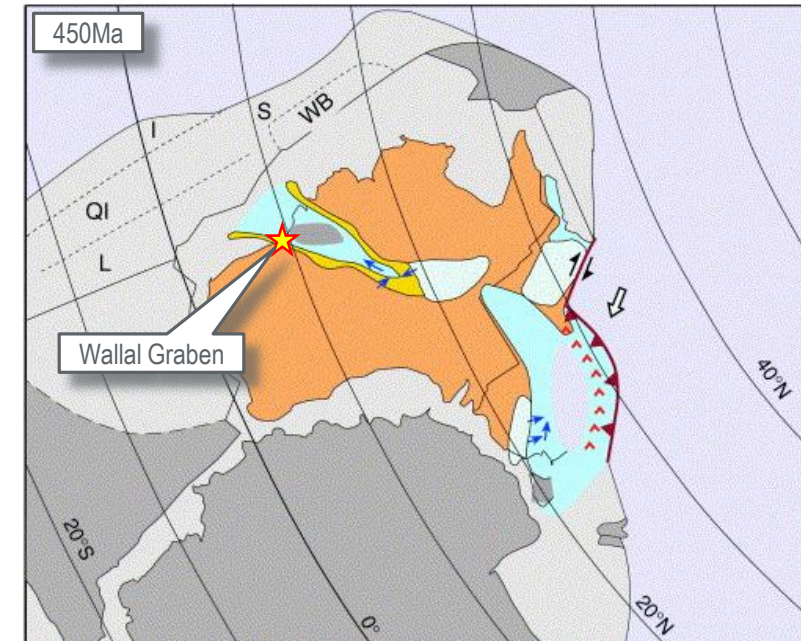
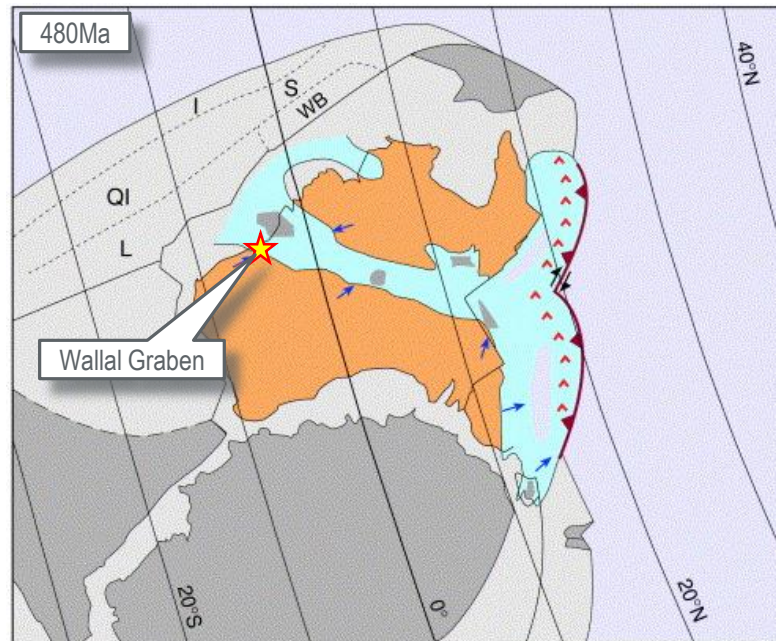
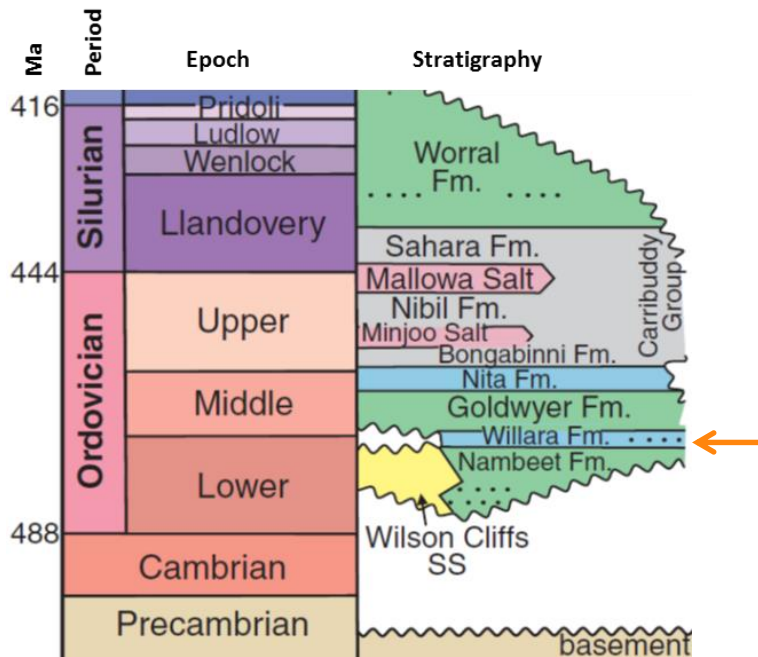
### Deposition in the Canning Basin began in the Early Ordovician

- in response to extensional tectonics

### The Larapintine Sea connected eastern Australia to the Canning Basin

### Deformation in NE Australia and uplift in northern Amadeus Basin closed the Seaway connection

- Note equatorial latitudes



# GRAVITY GRADIOMETRY/MAGNETIC SURVEY

## RESULTS AND INTERPRETATION

4060 line-km of high resolution data acquired by CGG in 2014

Confirmed Wallal Graben extends into SPA area

- ~200km long
- Only 20% of the graben is covered by 2D seismic data

Series of grabens and half-grabens separated by structural highs

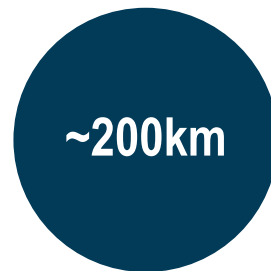
Sufficient depth for hydrocarbon generation



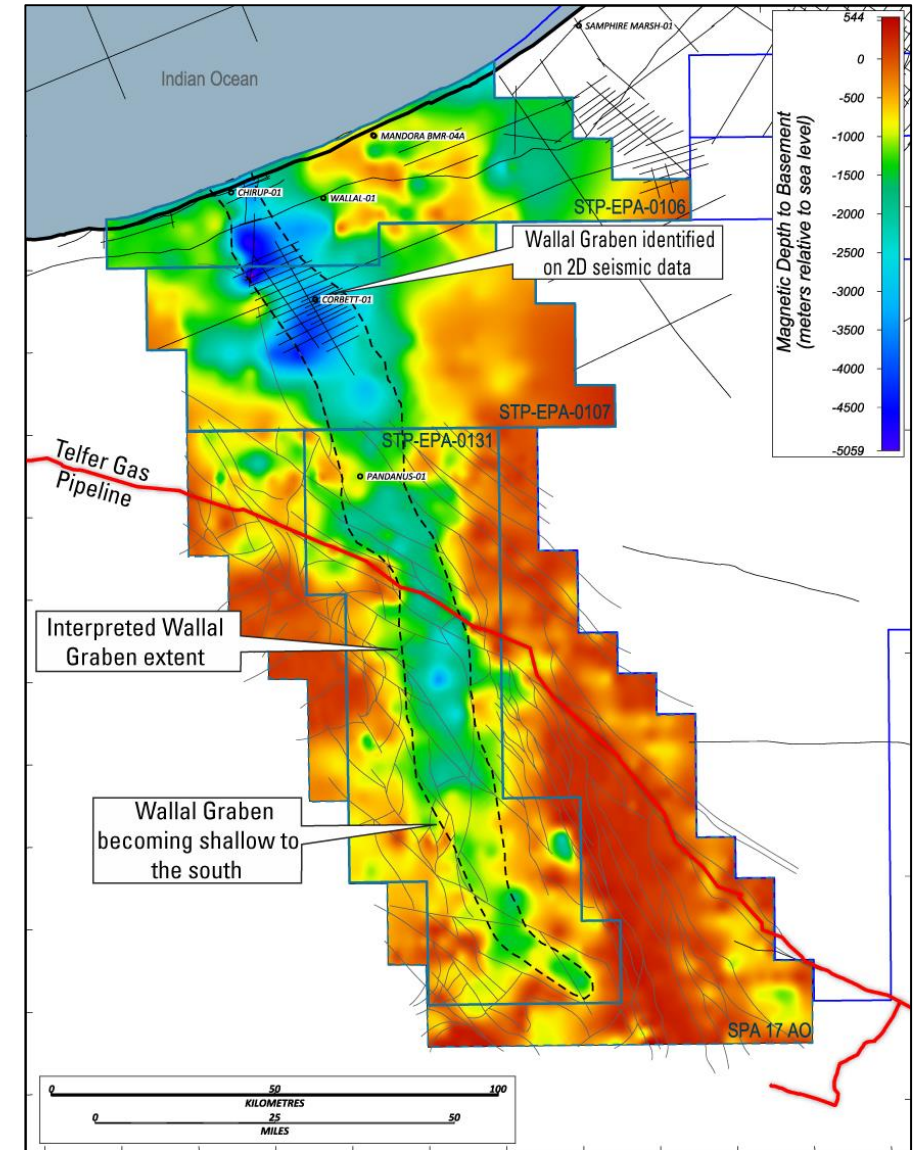
Depth to Basement



Narrow half graben



Extends inland





# MAGNETIC DEPTH TO BASEMENT

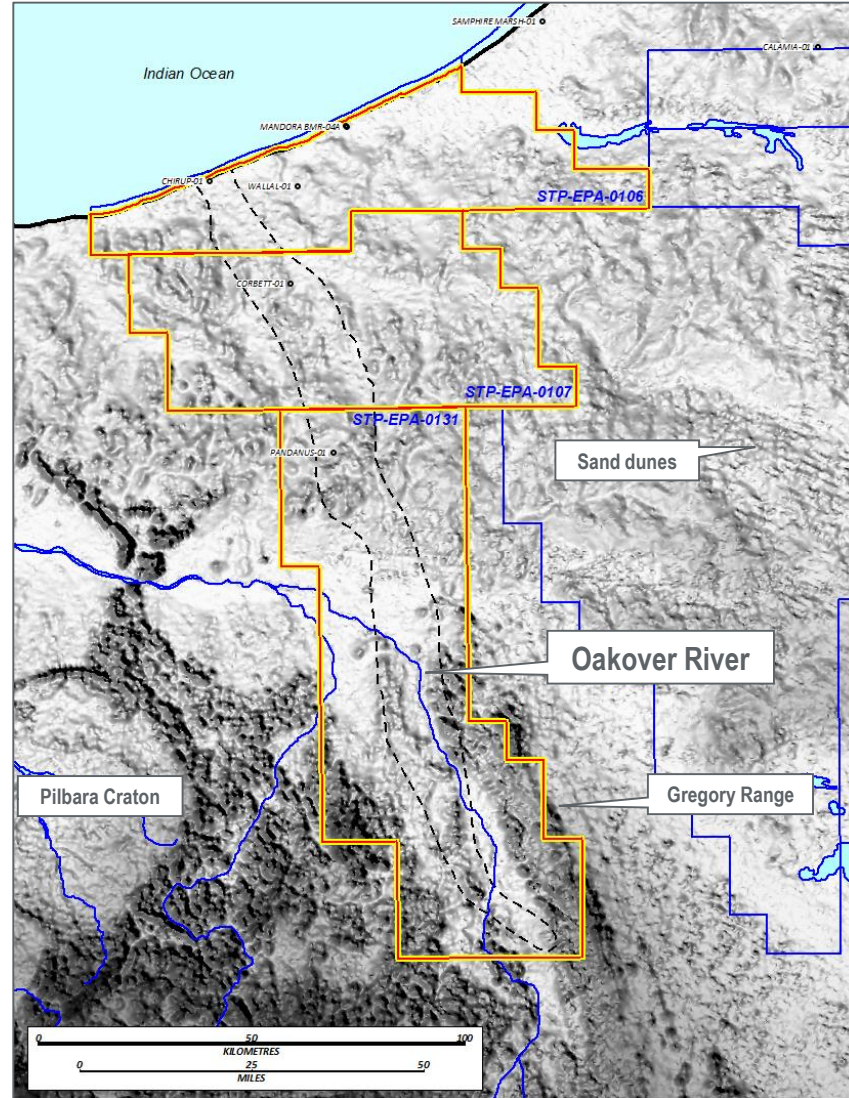
## PRESENT-DAY EXPRESSION

### Oakover River located in syncline axis

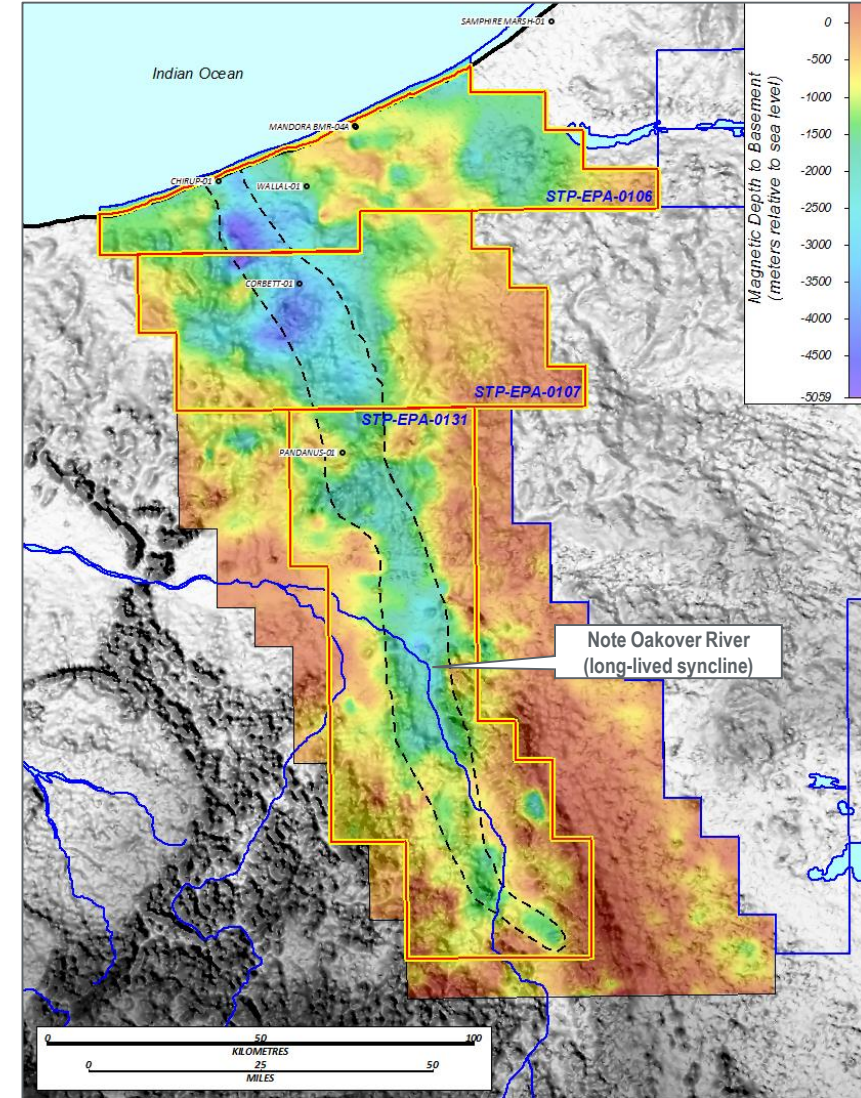
- Long-lived feature

### Basement outcrops along edges

- Surrounded by mining activity



Present Day Terrain



Magnetic Depth to Basement

# SOURCE ROCKS

## ORDOVICIAN - GOLDWYER FM.

### Goldwyer Formation

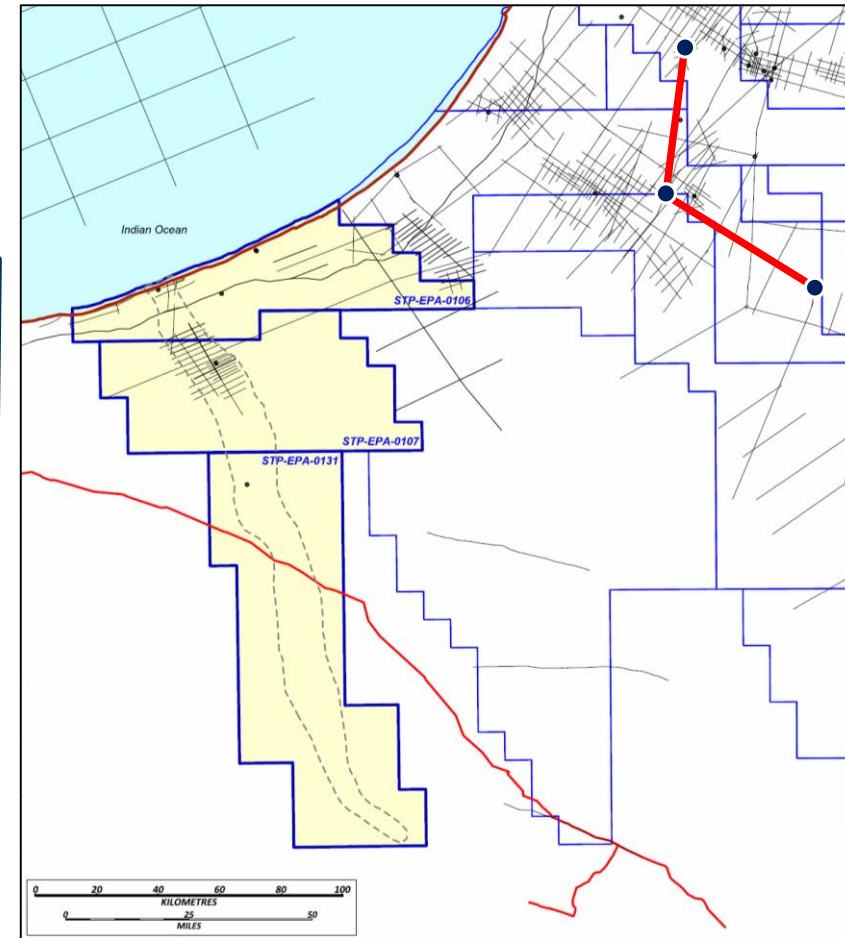
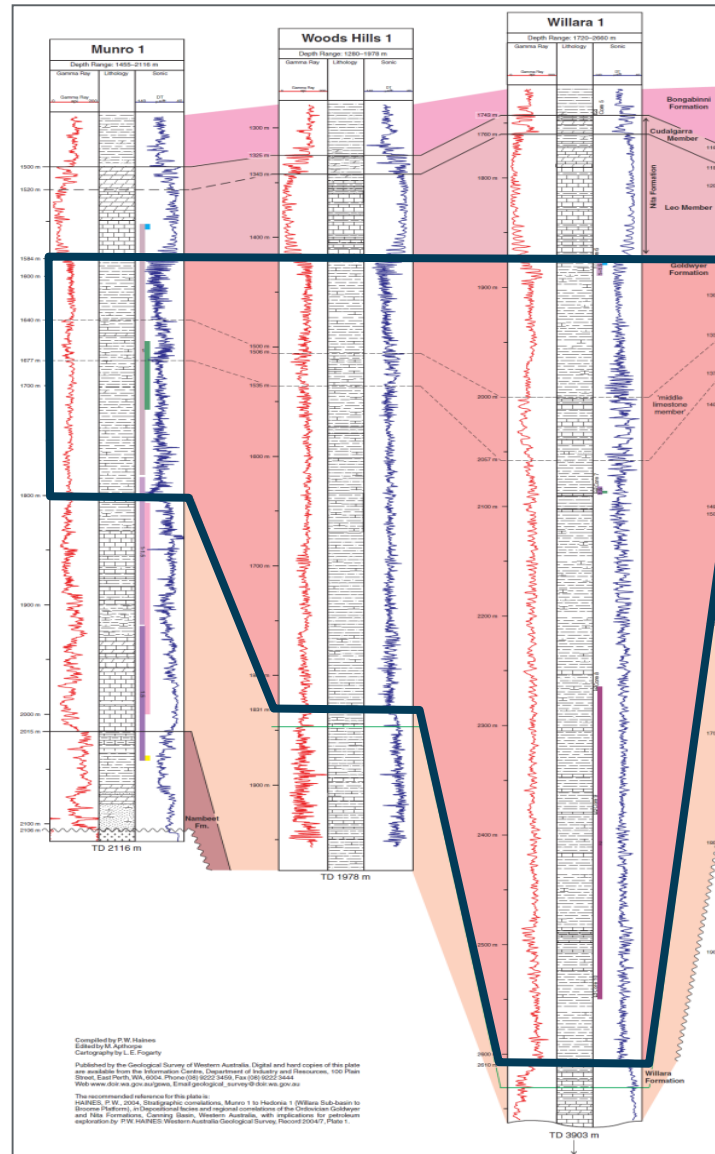
- >700m thick in nearby well (150km)

### High concentrations of marine alga *Gloeocapsomorpha Prisca*

- Excellent source rock potential

### This alga also abundant in the Baltic (Kukersite), Michigan-Illinois (Trenton Fm.) and Williston (Red River/Bighorn Group)

- All lay within 5° of the equator during the Ordovician





# SOURCE ROCKS/RESOURCE PLAY

ORDOVICIAN - GOLDWYER FM.

Deeper basinal areas are shale-dominated

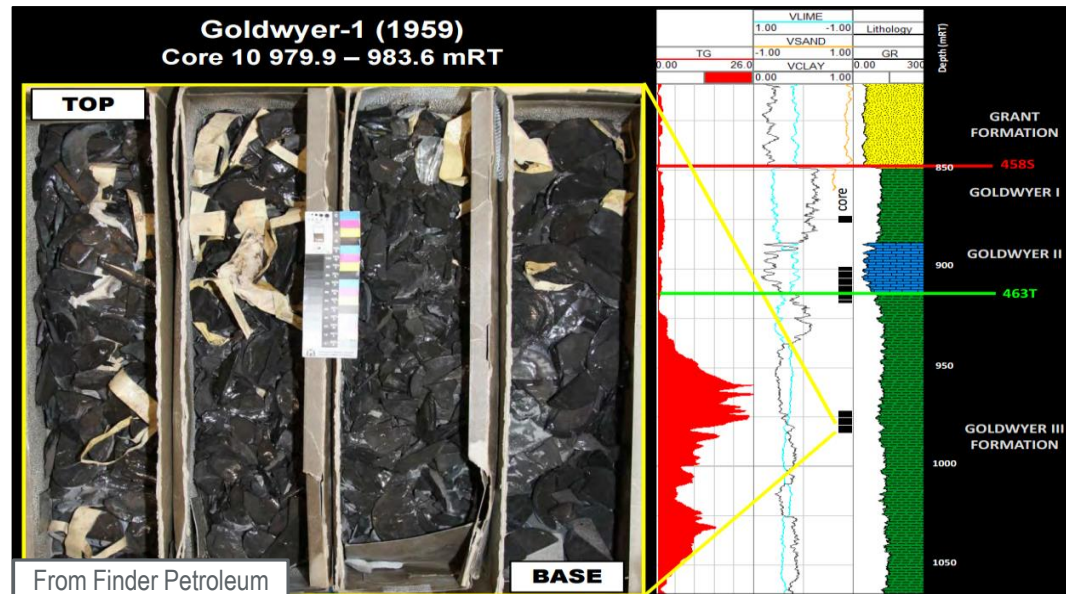
- Ratios vary widely across the basin

Grey-green to grey and black colour

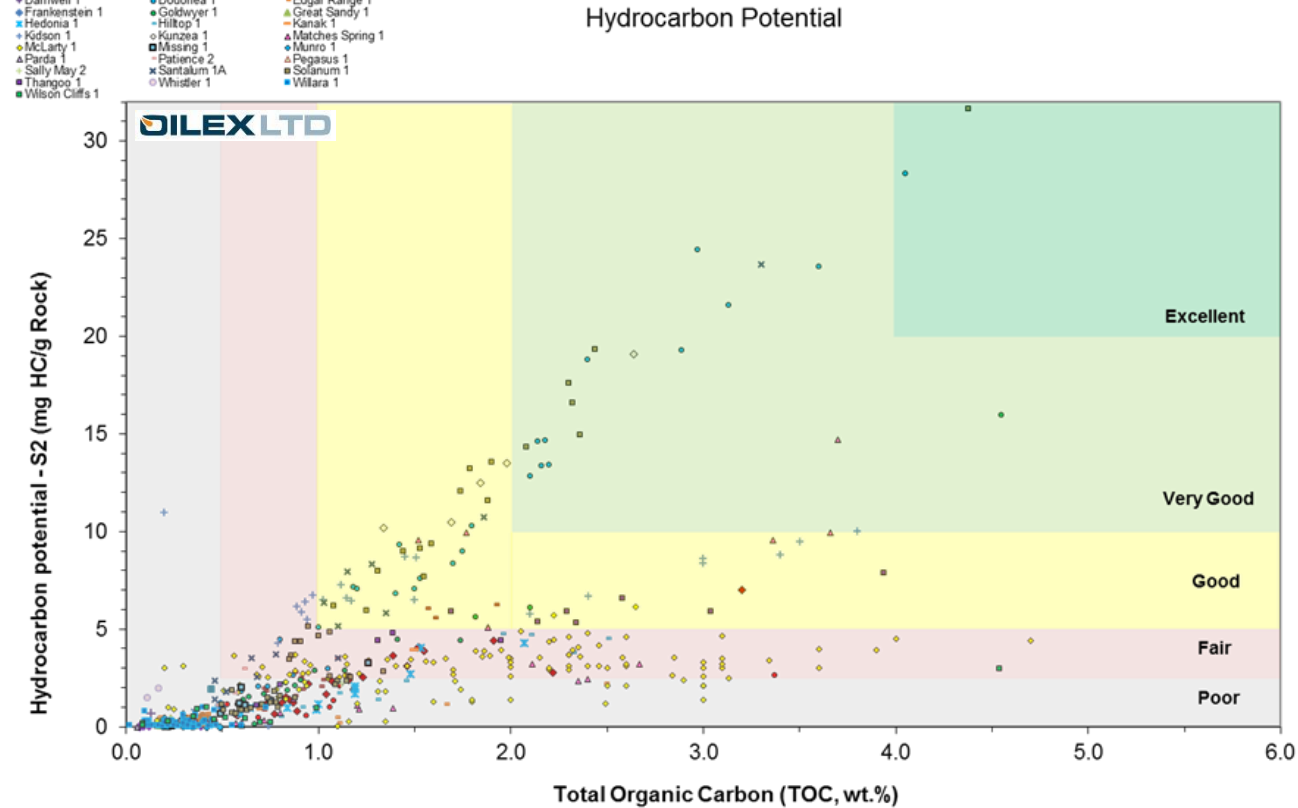
Contains millimetre scale carbonate laminae

- Beneficial for fracture stimulation

Macrofossils indicative of open marine shelf conditions



- Acacia 1
- Anna Plains 1
- Aquila 1
- Barbwire 1
- Calama 1
- Canopus 1
- Carina 1
- Contention Heights 1
- Crystal Creek 1
- Darnwell 1
- Dodonea 1
- Edgar Range 1
- Frankenstein 1
- Goldwyer 1
- Great Sandy 1
- Hedonia 1
- Hilltop 1
- Kanak 1
- Kidson 1
- Kunzea 1
- Matches Spring 1
- McLarty 1
- Munro 1
- Parda 1
- Patience 2
- Pegasus 1
- Sally May 2
- Santalum 1A
- Solarium 1
- Thangoo 1
- Whistler 1
- Wilson Cliffs 1





# SOURCE ROCKS/RESOURCE PLAY

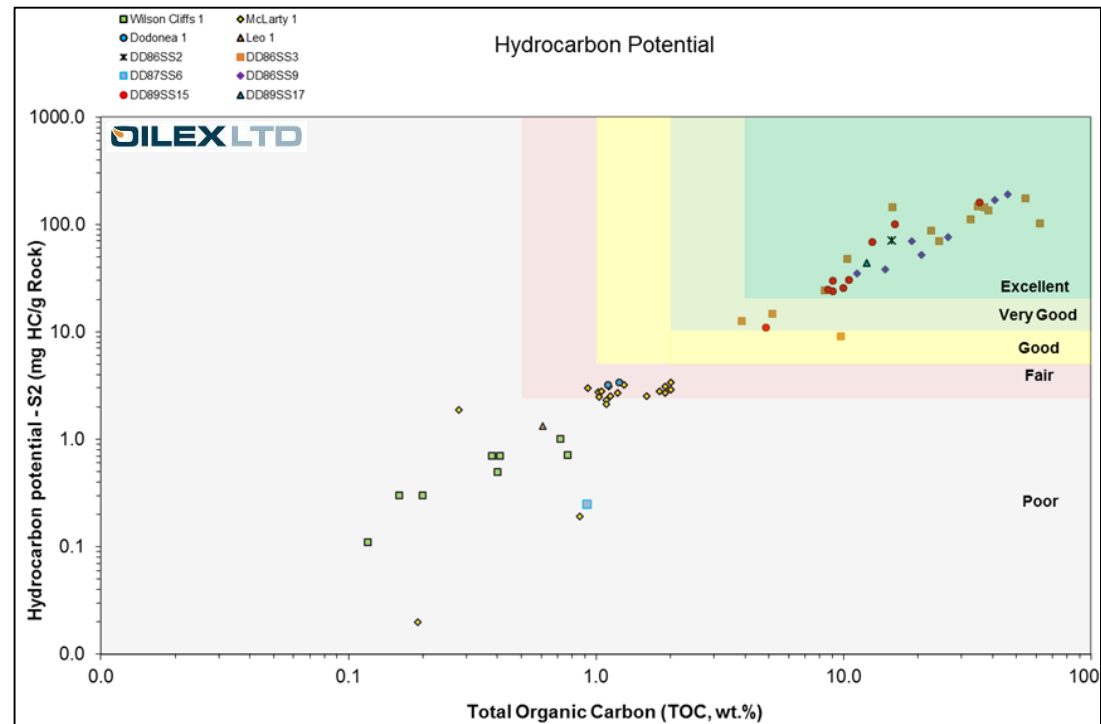
ORDOVICIAN - BONGABINNI FM.

Areas of local subsidence during deposition (e.g. the Admiral Bay Fault Zone and possibly the Wallal Graben)

- Facilitated a local system of restricted lagoons in which chemically-reduced/organic-rich sediments could accumulate

High TOC values with high potential yields

- Excellent source rocks



Bongabinni Formation core from mineral hole DD90SS21  
From Finder Exploration Presentation

# SOURCE ROCKS/RESOURCE PLAY

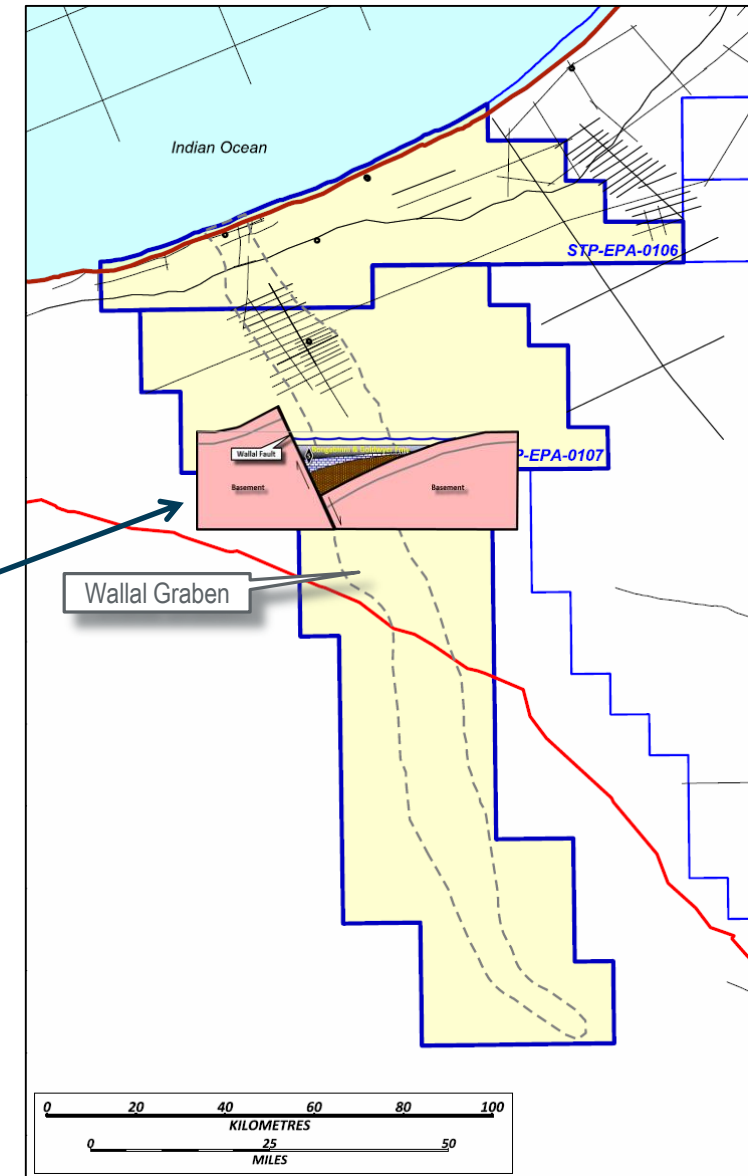
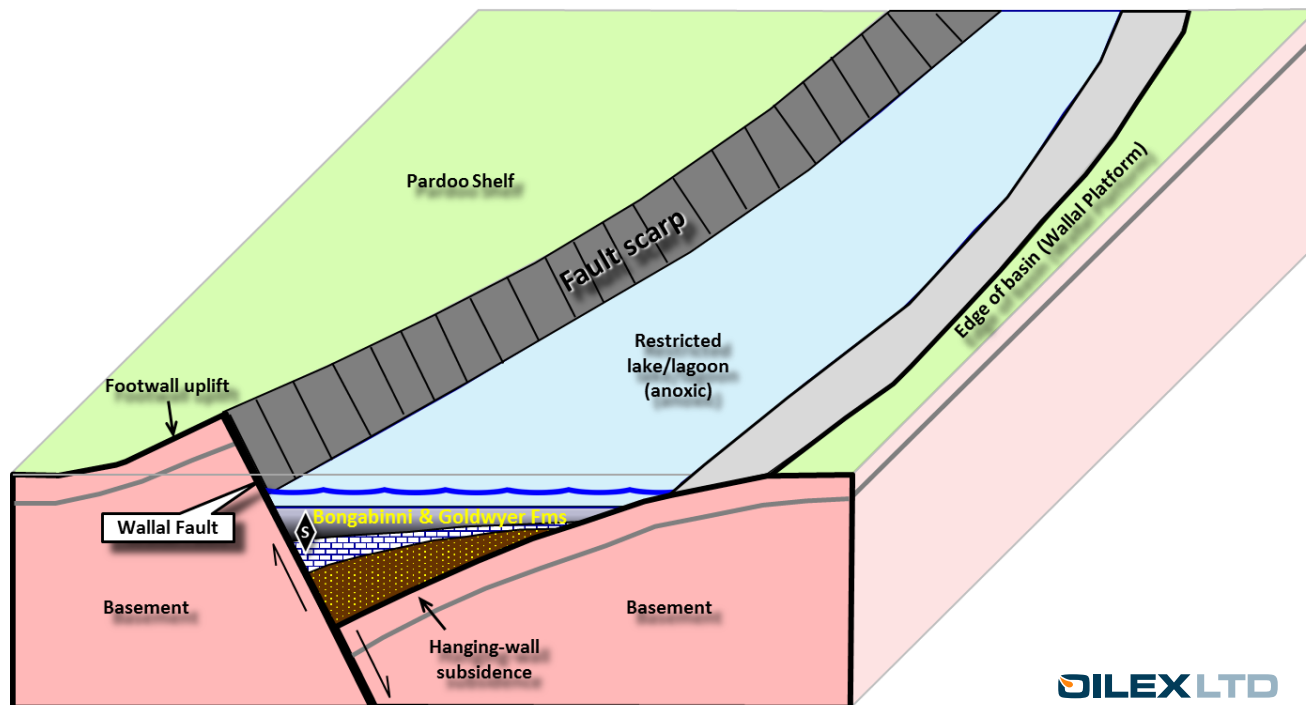
## DEPOSITIONAL MODEL

### Subsidence along the Wallal Fault enabled a localised marine incursion during the Ordovician

- Restricted lacustrine/lagoon system extends along the length of this half graben facilitating the deposition of high quality source rocks

### Confined/restricted depositional environment

- Source rocks may be richer than other areas of the Canning Basin that experienced greater oceanic circulation and more oxic conditions



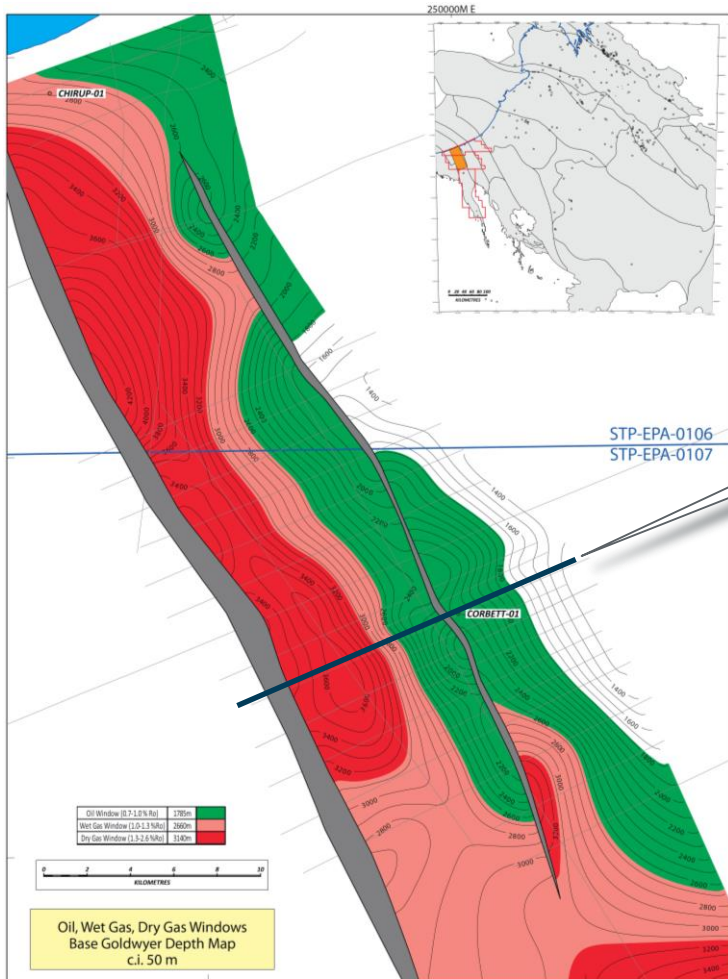


# SOURCE ROCK MATURITY

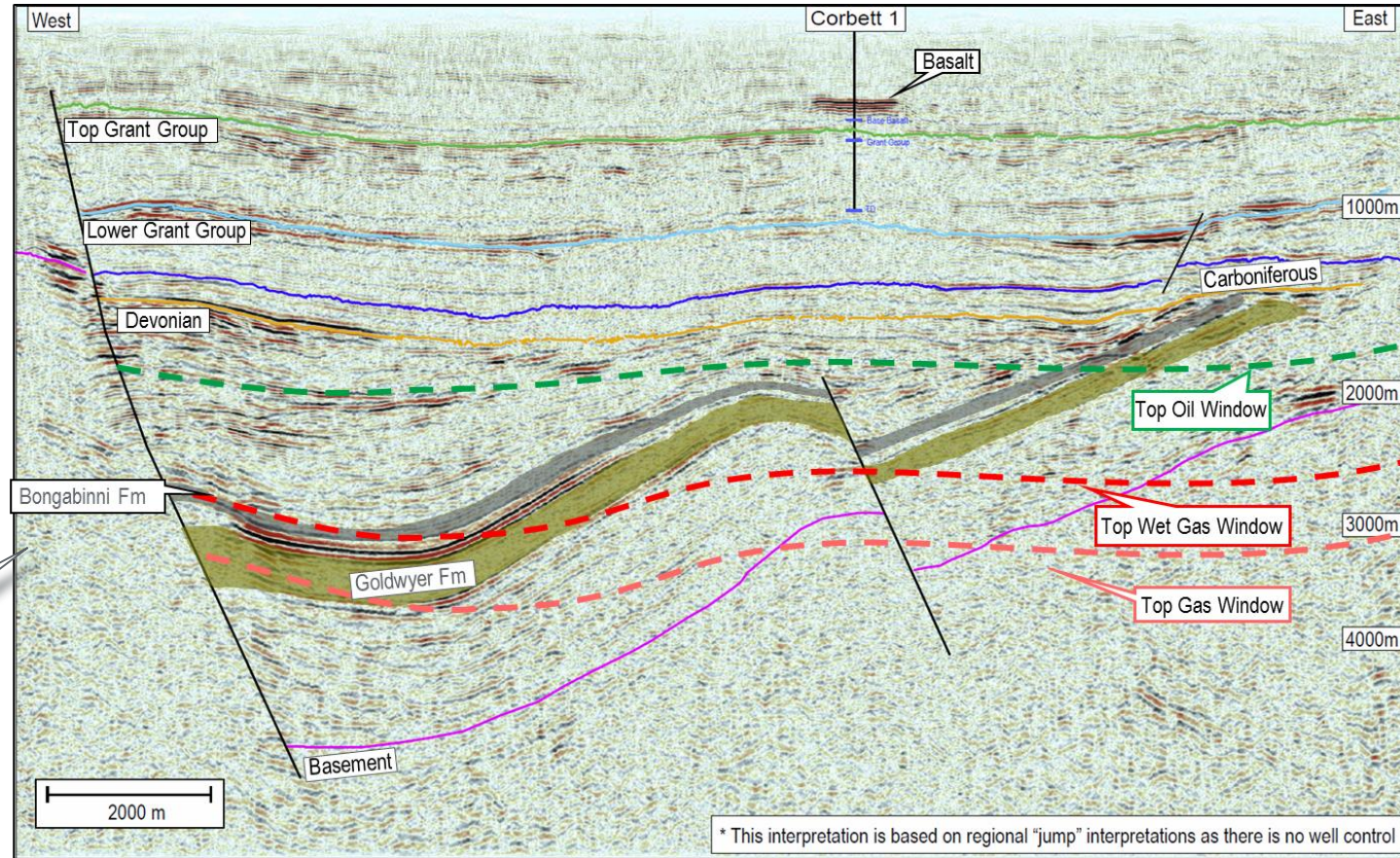
## BASIN MODELLING PROJECT

### Multiple source rocks modelled

- Bongabinni and Goldwyer Formations



Seismic line location



### Sensitivity analysis conducted

- Low, Most Likely and High cases simulated
- All indicate mature source within graben

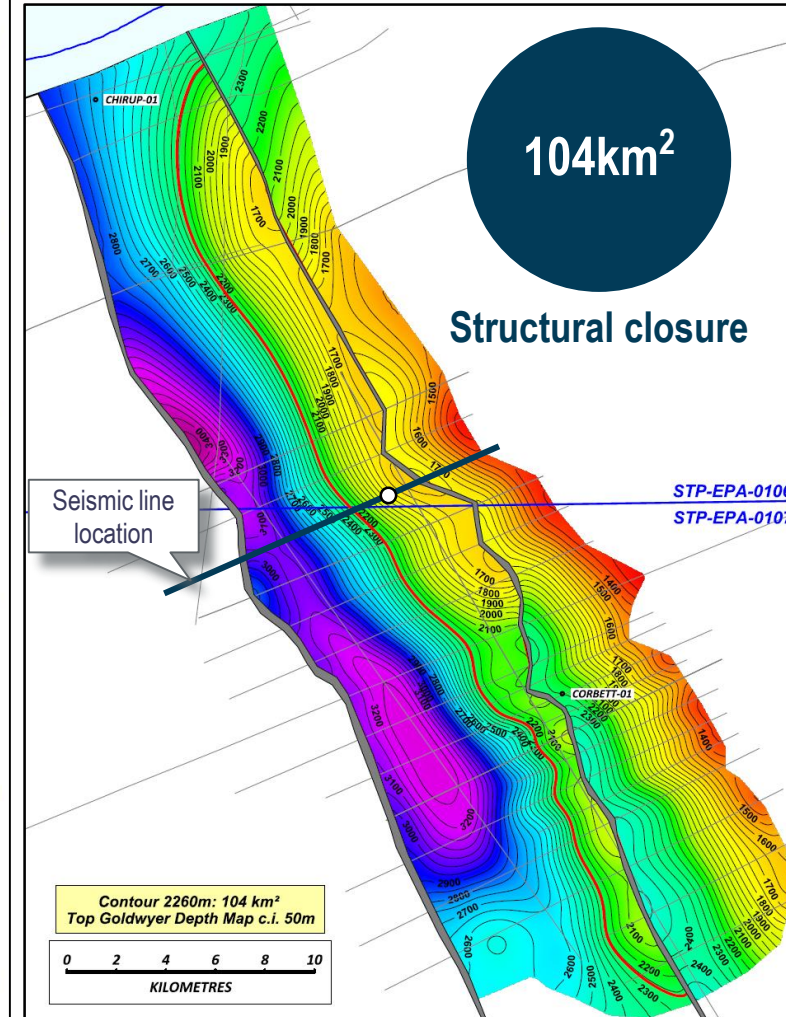
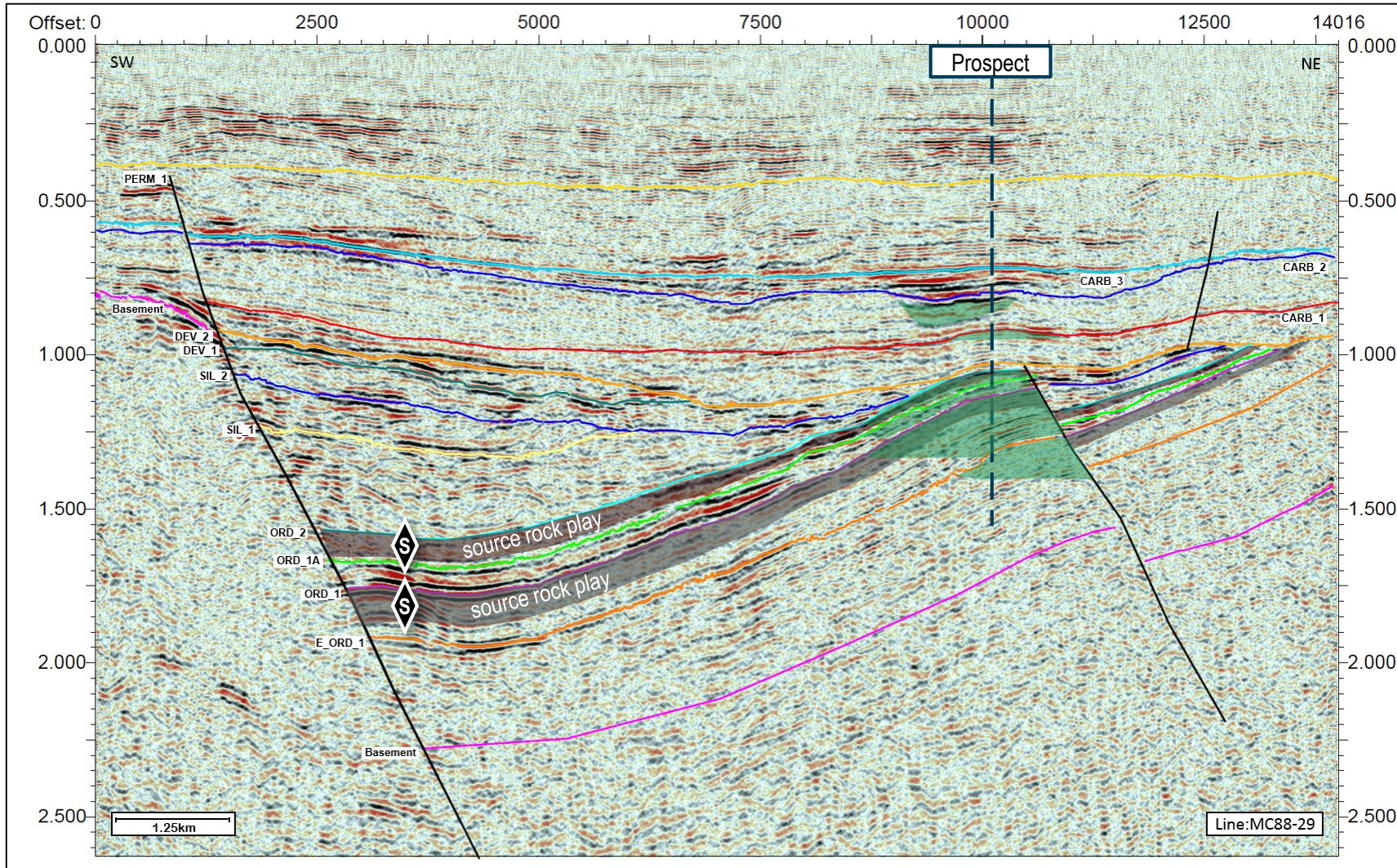
### Potentially significant petroleum system

- Large areas of thick, mature source rocks



# LARGE STRUCTURAL TRAPS

## CLOSURES AT MULTIPLE LEVELS



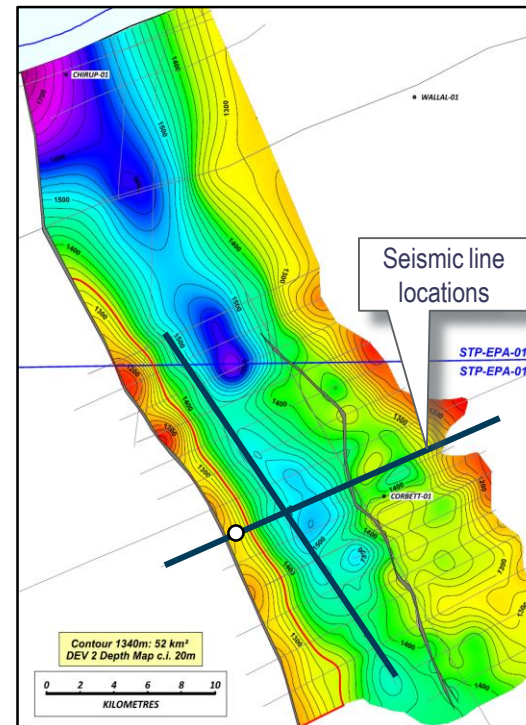
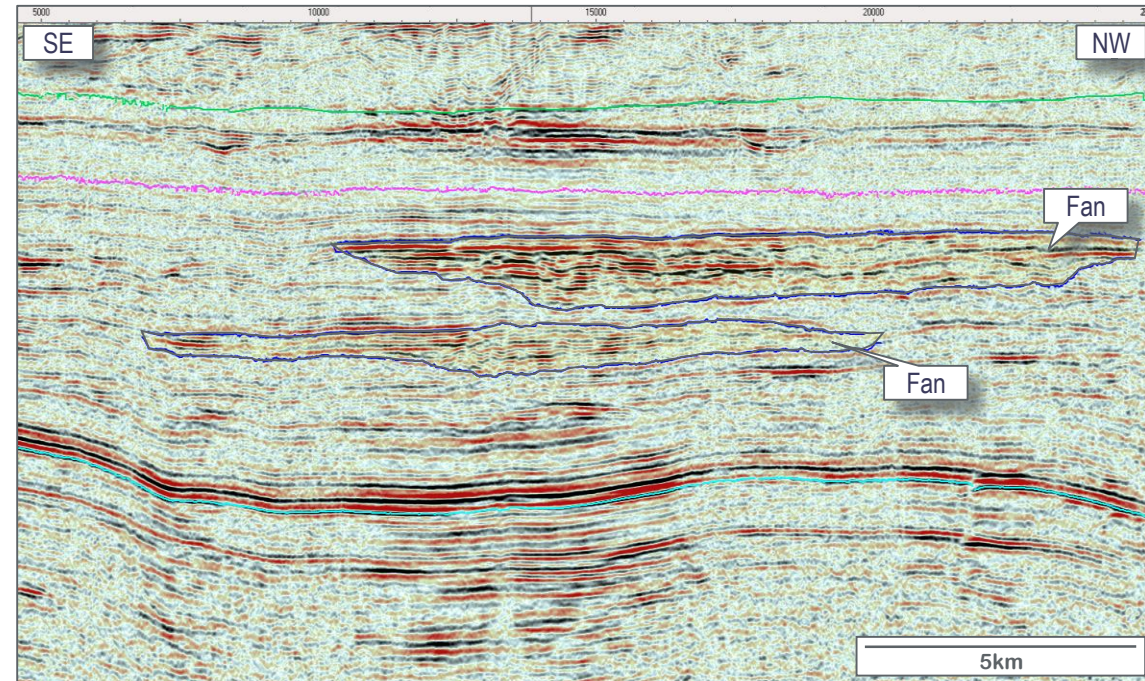
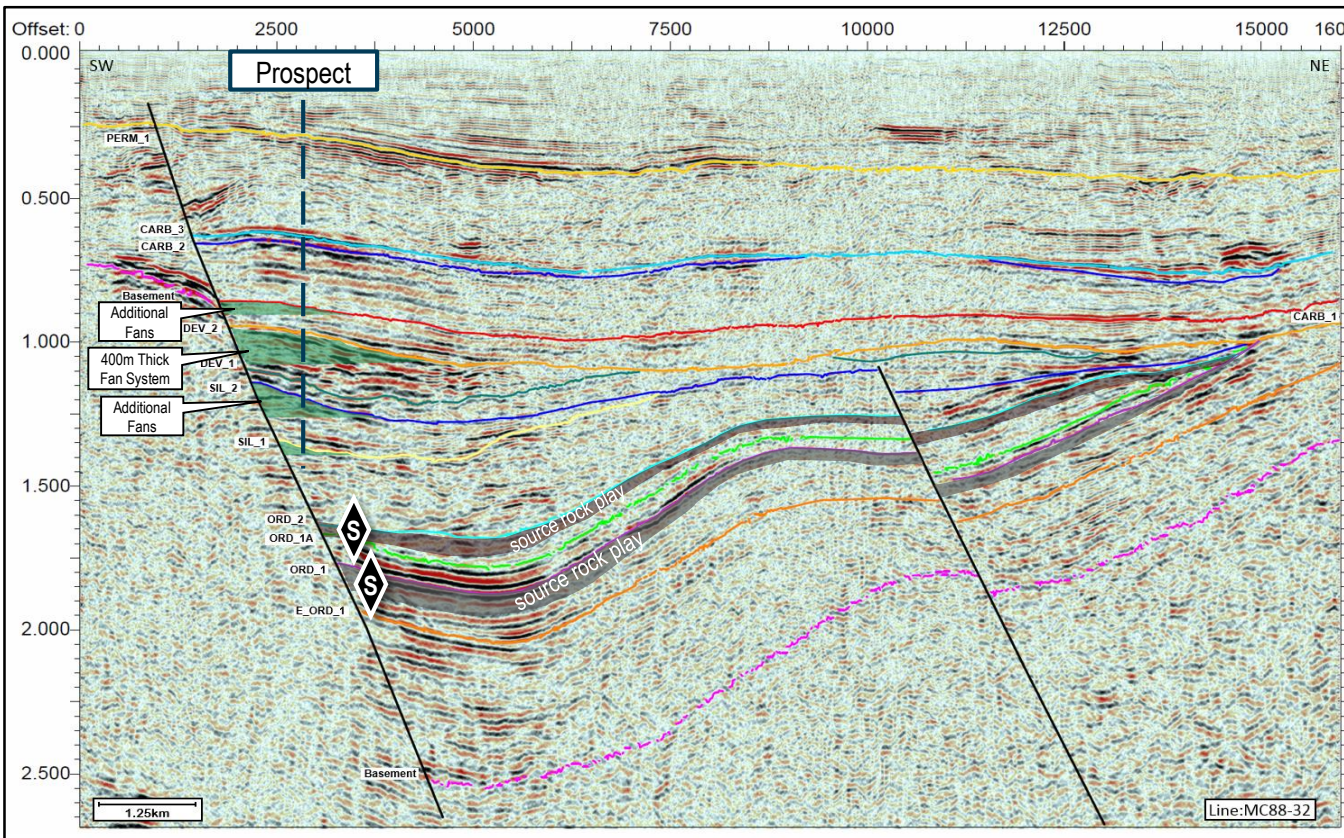


# EXTENSIVE FAN SYSTEMS

CLEARLY-DEFINED & ~400M THICK

## Located along rift-bounding fault system

- Basal incision, differential compaction and internal channel bodies
- 3 way dip-closure against basin margin fault (~20 km long)
- Large stratigraphic upside



400m Single fan thickness

127km<sup>2</sup> Areal extent

Stacked Multiple systems



# EAST AFRICA RIFTS VS WALLAL GRABEN

## ANALOGOUS PLAYTYPES

### Tullow Oil – significant success in East African rifts

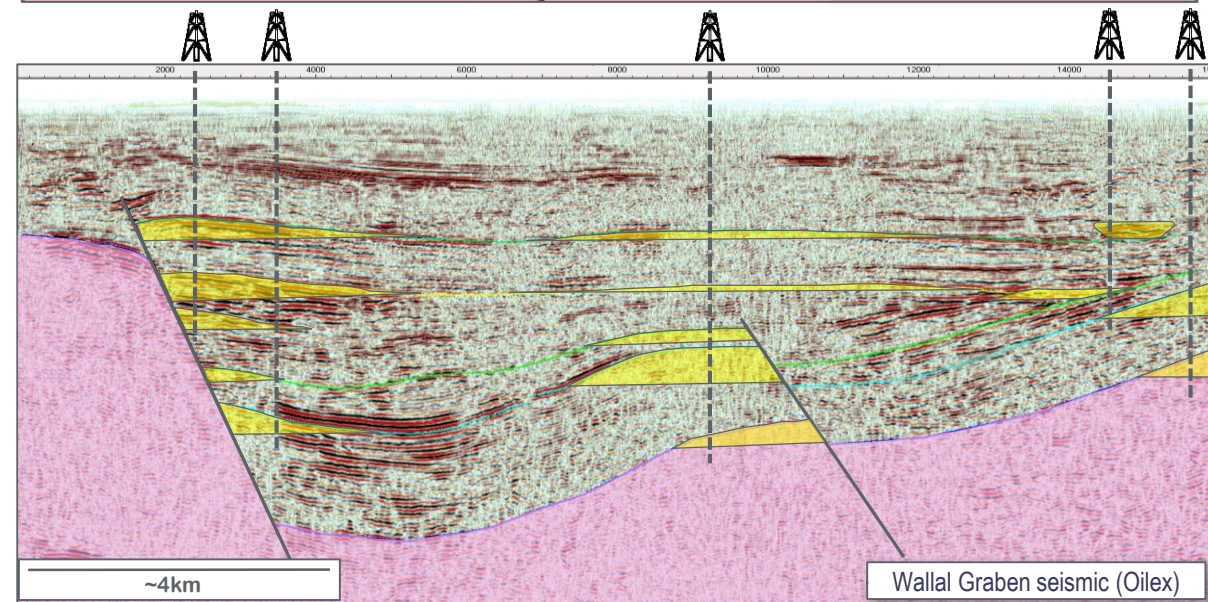
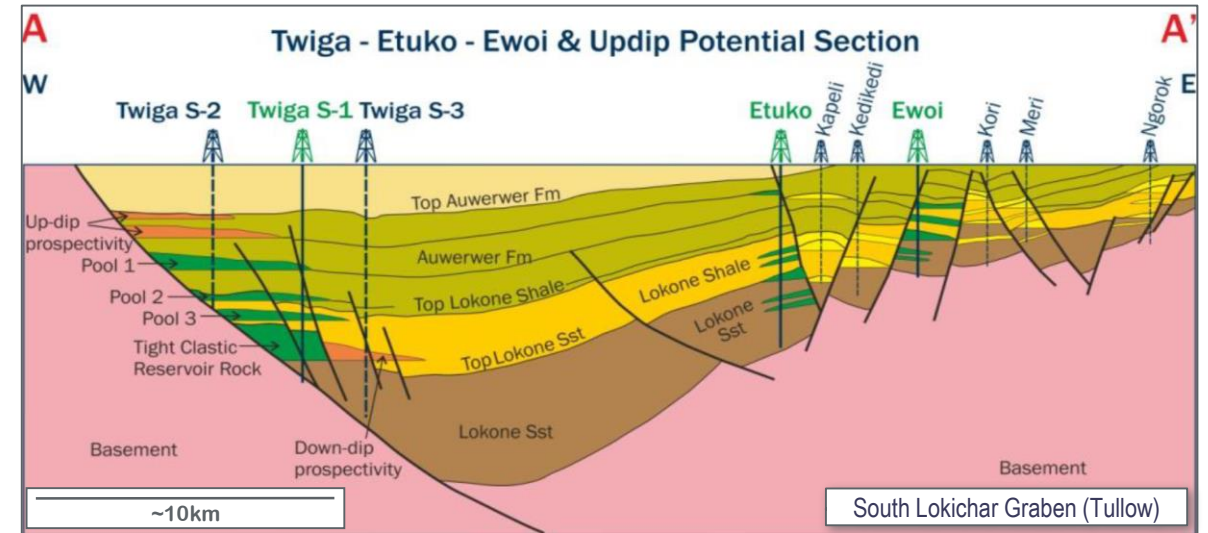
- Lake Albert Rift Basin – Uganda
  - > 1.1 Bbls discovered
- South Lokichar Basin – Kenya
  - 7 wells => 600 MMbbls

### Comparable identified play-types

- Different aged rocks

### Success aided by world’s largest airborne Full Tensor gravity/mag survey

- Similar workflow being implemented





# UNIQUE CANNING BASIN LOCATION

ADJACENT TO GLOBAL RESOURCE CENTRE

## Adjacent to significant activity

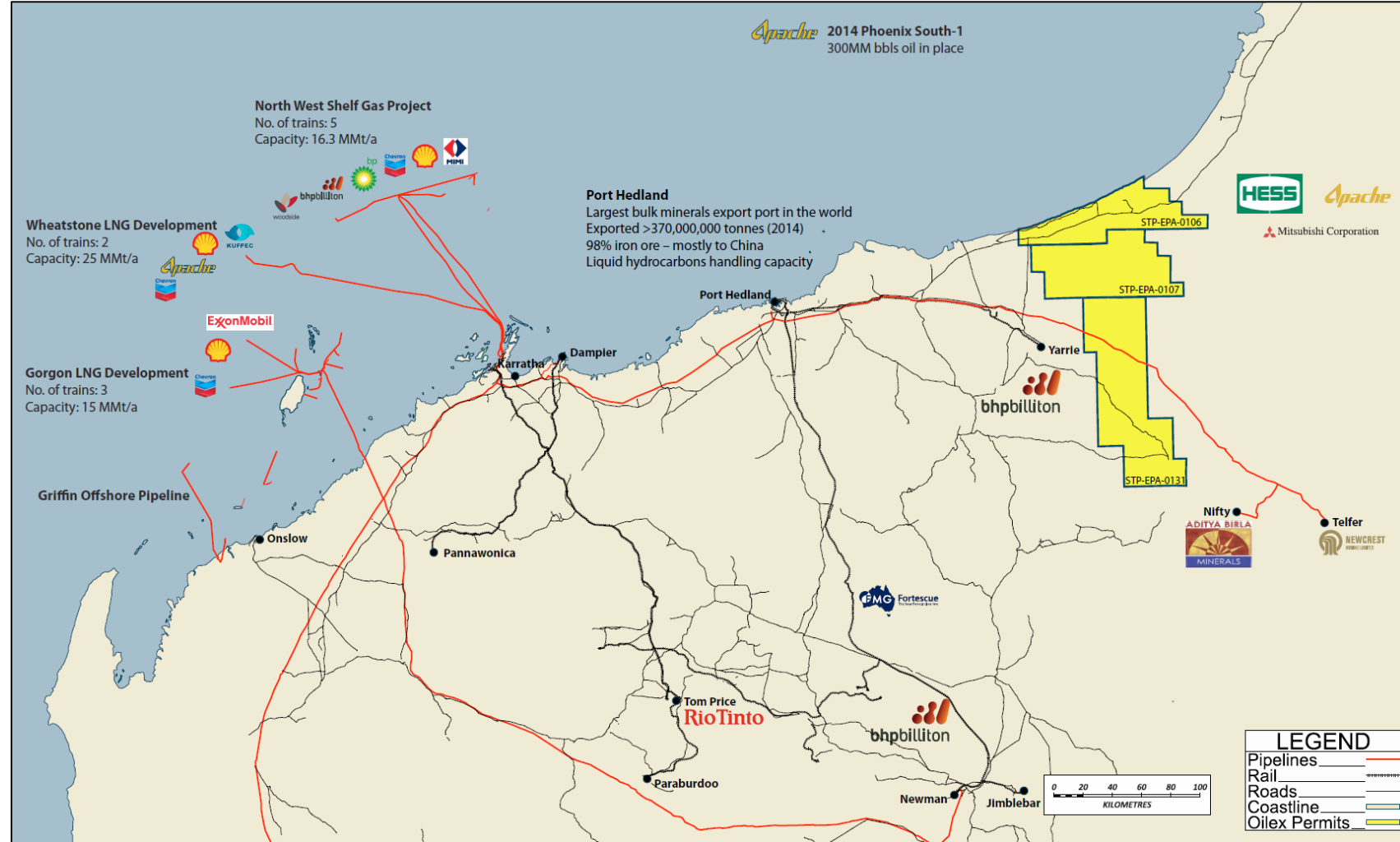
## Access to infrastructure

- Roads
- Pipelines
- Airstrips
- Rail

## Numerous paths to commercialisation

## Access to potential markets

- Surrounded by mining activity
- LNG projects
- Domestic gas obligation offset



# ONSHORE LNG FACILITIES – NW AUSTRALIA

~400KM FROM THE WALLAL GRABEN FAIRWAY



Facilities constructed with provision for additional capacity

## Domestic gas supply obligation

- Requires a proportion of gas to be available for the local market

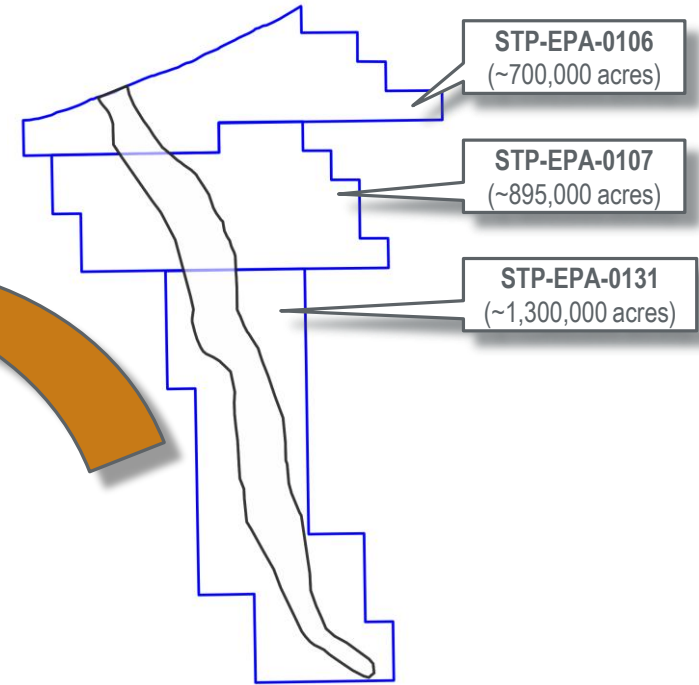
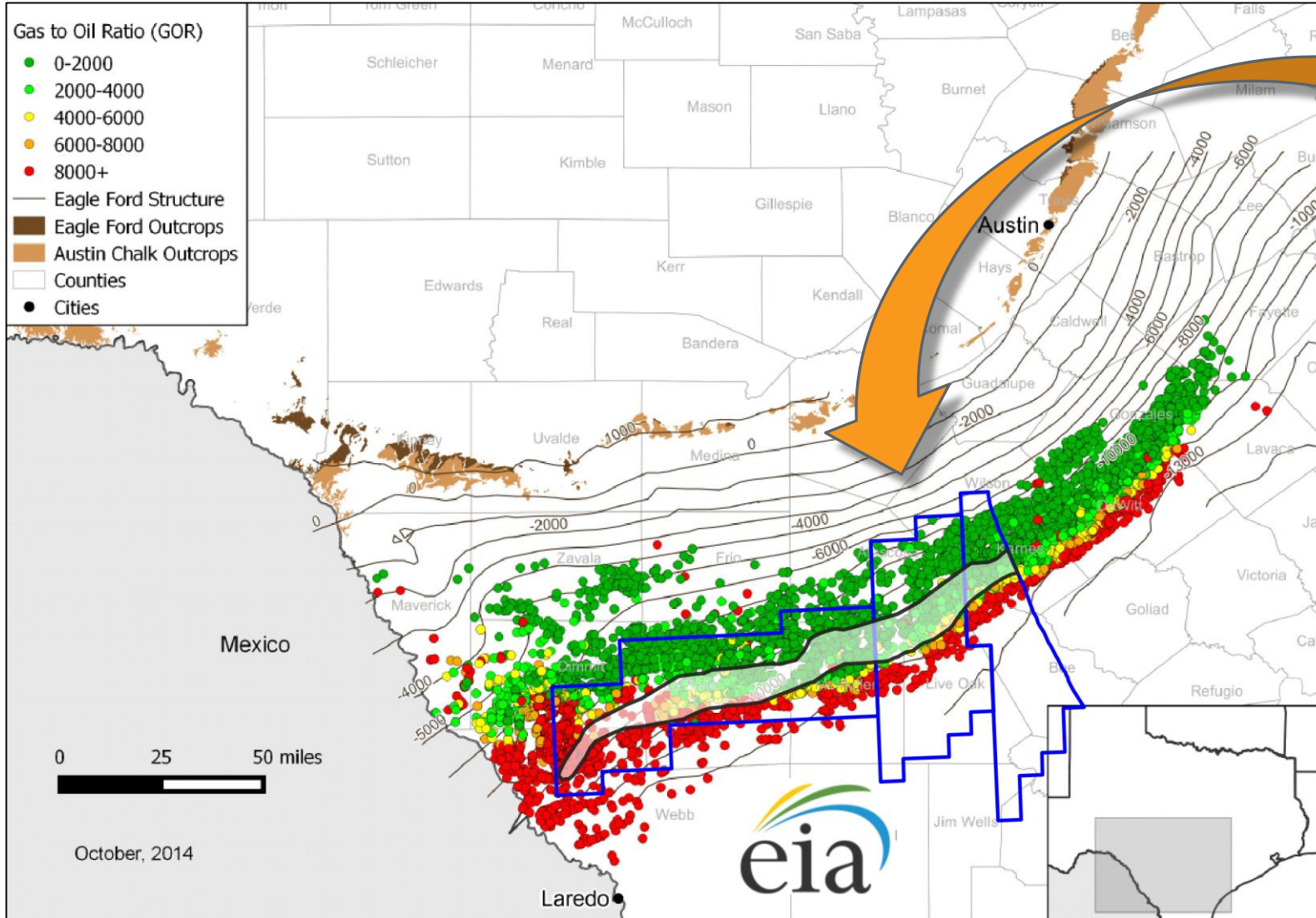


Photo courtesy of Woodside Energy Ltd



# “SHALE SCALE”

ENTIRE PLAY CAPTURED – OVERLAIN ON EAGLE FORD PLAY - TX



## Wallal Graben

- Areal extent covers ~ 25% of EFS liquids-rich play

**~3MM**

**Total acres**

# CANNING BASIN MYTHOLOGIES

SOUTHWEST CANNING HAS IT ALL!

Myth	Reality
“No roads – need to build own access routes”	The Great Northern Hwy passes through STP-EPA-0106 More than 1500 km of sealed and unsealed roads within the acreage
“Need to build pipelines to handle gas”	Telfer Gas Pipeline transects the acreage Future Canning Basin pipelines to the main export terminals would have to pass through the acreage
“Any gas discovery will be stranded”	Surrounded by substantial mining activity - are switching from imported diesel to gas Domestic gas obligation offset for LNG operators
“Drilling costs are too high”	Nearby well costs have more than halved in recent years Increasing drilling activity in the area facilitates synergies
“Source rocks are too diluted”	Narrow (~20km), text-book half-graben Source rocks interpreted to be deposited in a restricted, anoxic environment Analogous to some of the most hydrocarbon prolific rift-basins in the world
“Native Title approval is difficult”	Well understood process Reasonable and respectful negotiations nearing completion



# SUMMARY

## UNIQUE SITUATION IN CANNING BASIN

Large, undrilled half-graben

Entire play fairway captured ~3 million acres

Play-rich

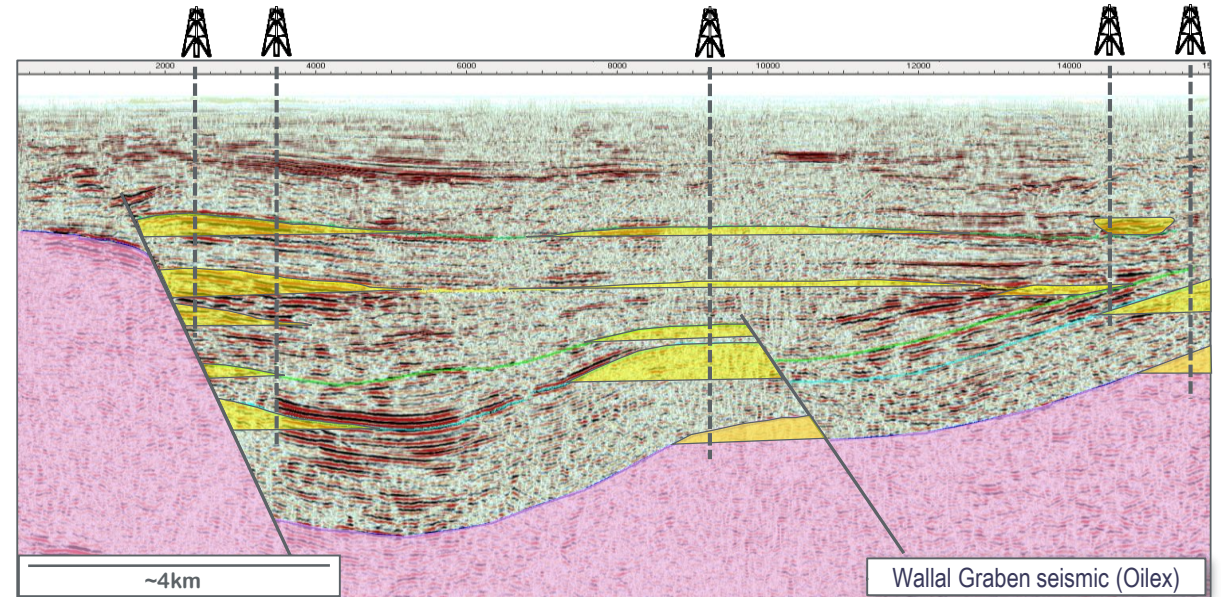
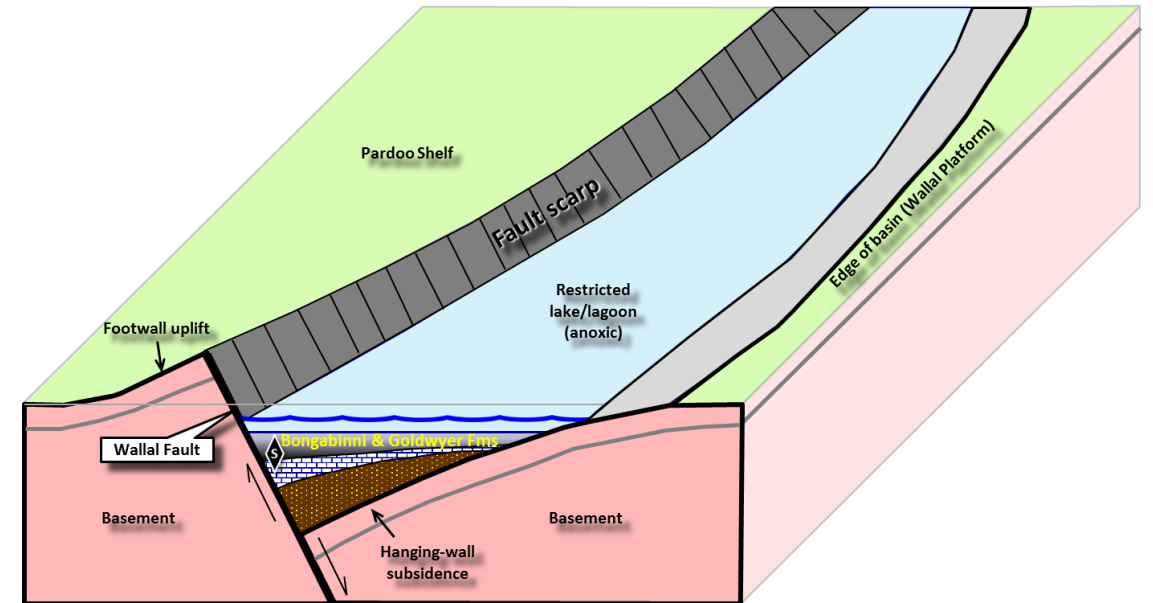
- Deep half-graben, large structures and fan geometries
- Potential for organic-rich, mature source rocks

Conventional and Unconventional plays

Source rocks interpreted to be oil/wet-gas mature

Access to infrastructure and potential markets

Actively pursuing farmout





# THE PROSPECTIVITY OF THE WALLAL GRABEN

A UNIQUE CANNING BASIN OPPORTUNITY

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