



20 May 2021

ASX Limited  
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Sydney NSW 2000

### **COMPANY PRESENTATION**

BPH Executive Chairman and Managing Director, David Breeze, is presenting at the Broker Briefing May 2021 Investor Webinar on Thursday 20 May at 12.20pm EST (10.20am WST).

Attached is a copy of the presentation.

David Breeze (Director) authorised the release of this announcement to the market.



ADVENT ENERGY LIMITED



# BPH Energy Ltd -Company Presentation on Advent PEP11 – Offshore Sydney Basin and Cortical Dynamics

May 2021

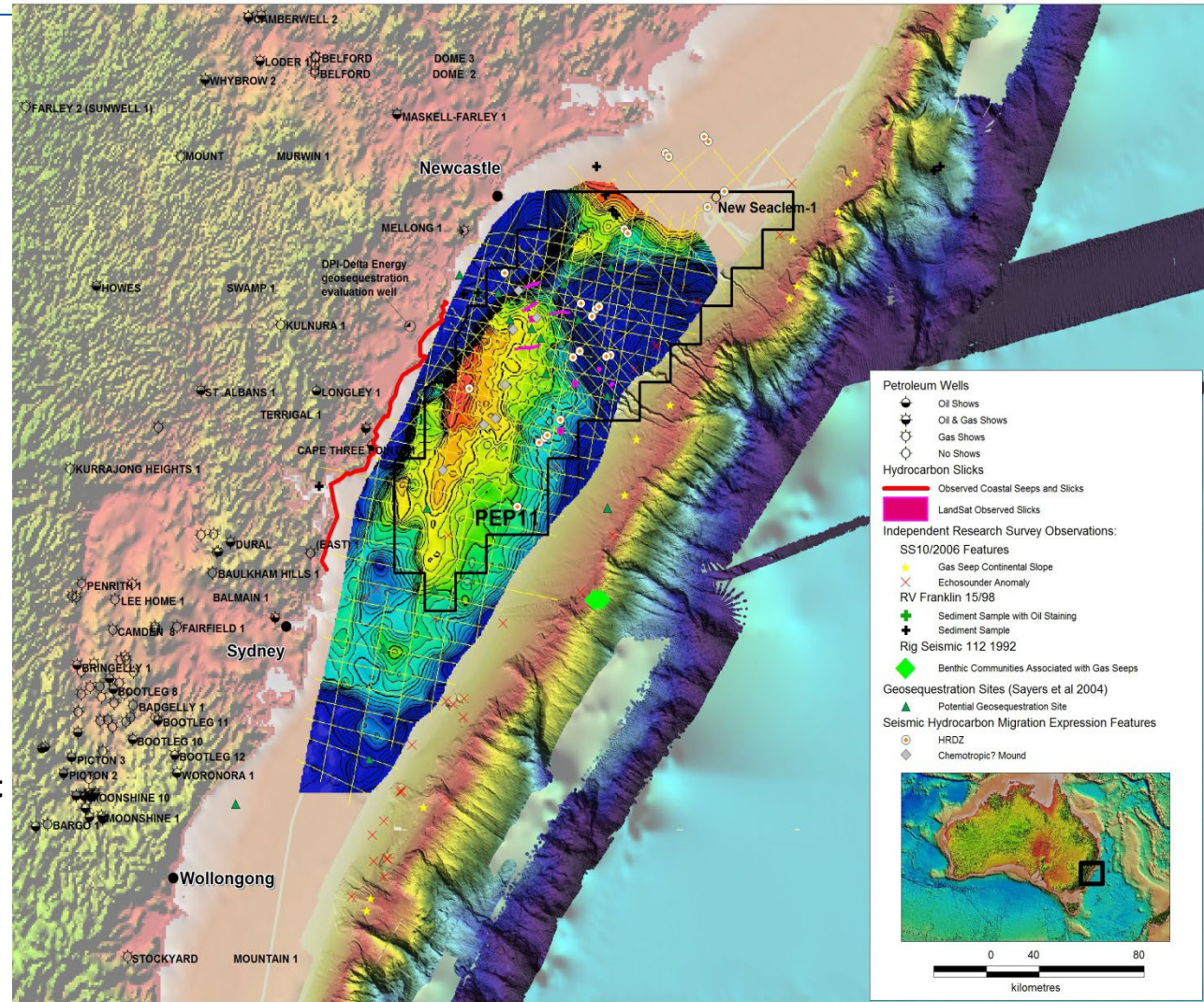




# PEP11-85% Interest

## PEP11- Offshore Sydney Basin:

- The Sydney Basin is a proven hydrocarbon basin with excellent potential for further discovery of natural gas / significant multi-Tcf natural gas project
- PEP11 covers 4,649 km<sup>2</sup> on the doorstep of Sydney-Newcastle & extensive gas infrastructure (<50km).
- Analogues to major discoveries -the offshore Sydney Basin contains all the elements seen in other producing world class petroleum basins, including Prospective Resources of 5.7 Tcf (P50) in structural targets.
- Current application to NOPTA to enable drilling as next step
- Significant interest in the project is driven by the gas market dynamics Shortfall forecast in gas supply east coast
- Two new gas fired power stations for NSW firming generation
- CCS potential (independently verified)
- Key attributes for Hydrogen role
- Significant potential employment driver



PEP 11 Permit Boundary -Black Outline

# BARM™

A NEW AND DIFFERENT EEG MONITOR

1

BARM™ fundamentally differs from other monitors in that its algorithms are based on the physiological processes that produce the electrical activity of the brain, the EEG

2

A bottom-up approach produces measures that relate to the physiology of each individual patient, providing more interpretable and personalised monitoring of their response to anaesthetic agents

3

Specifically, BARM™ produces two measures, cortical state (CCS) and cortical input (CI), which reflect the effects of both sedative and analgesic agents

4

BARM™ is new 3rd generation technology developed to provide more comprehensive and patient-specific measures of sedation and analgesia

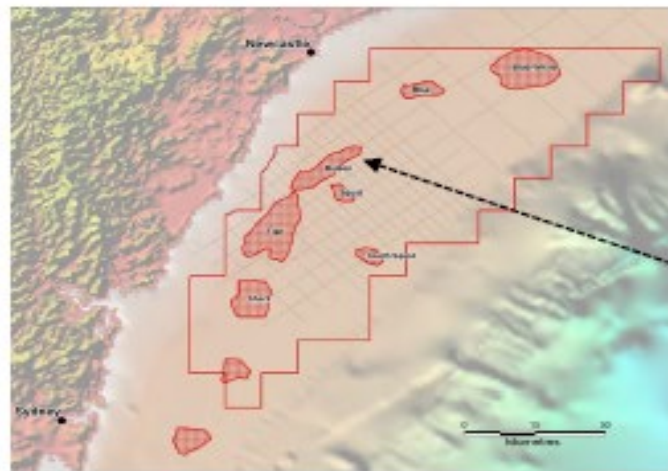
5

BARM™ operates in real time

Cortical  
Dynamics Ltd  
Developer of  
the Brain  
Anaesthesia  
Response  
Monitor BARM™



# PEP11 Project



PEP11 Prospects & Leads



*Illustrative graphic only – actual development plan may differ*





ADVENT ENERGY LIMITED

# PEP11 Permit History & Progress

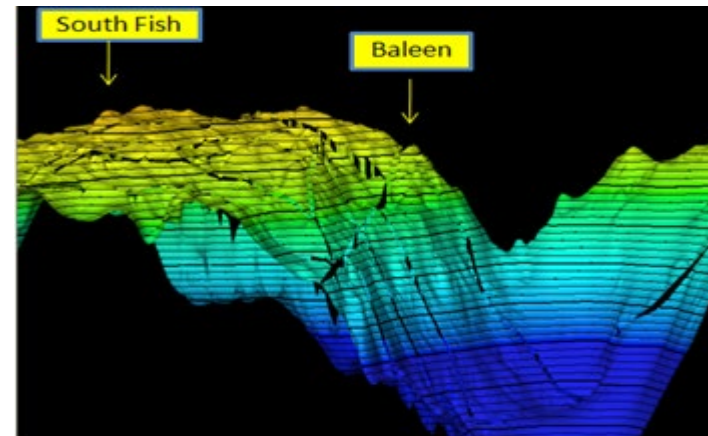
## Historical Ownership of PEP11 Permit

- ▶ During the 1980s, Santos Ltd. shot extensive 2D seismic over PEP11
- ▶ At the time, the prospect was not developed: Gas prices rendered the field uneconomical
- ▶ From 1992, PEP11 was held by small Australian exploration companies without progress being made
- ▶ Santos (1991) identified a total 10 structural leads in the PEP 11 offshore area..."
- ▶ Ampolex (1992) identified the Baleen South Lead as one of their major targets. Unrisked reserves were estimated at 1560 Bcf.



## Progress through involvement of Advent

- ▶ Advent farmed into a 25% interest in 2006 through acquisition of 2004 seismic, and increased interest to 85% following drilling of New Seaclem-1 in 2010
- ▶ Significant geological & geophysical work completed since Advent's farm-in-Fugro Ltd reprocessed 1,460km seismic shot in 2004 & integrated with 2,300km legacy data obtained from Santos
- ▶ Prospective recoverable resource estimates have been independently validated with prospective recoverable resources of 5.7 TCF (P50) in structural targets
- ▶ Reservoir potential sands encountered in Cenozoic and Early Permian sediments. Drilling samples demonstrated the Early Permian sediments to be mature for hydrocarbons.

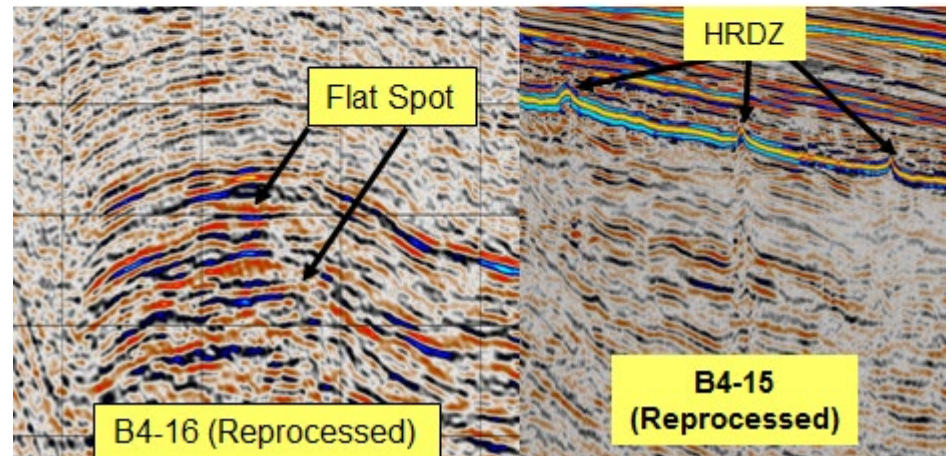
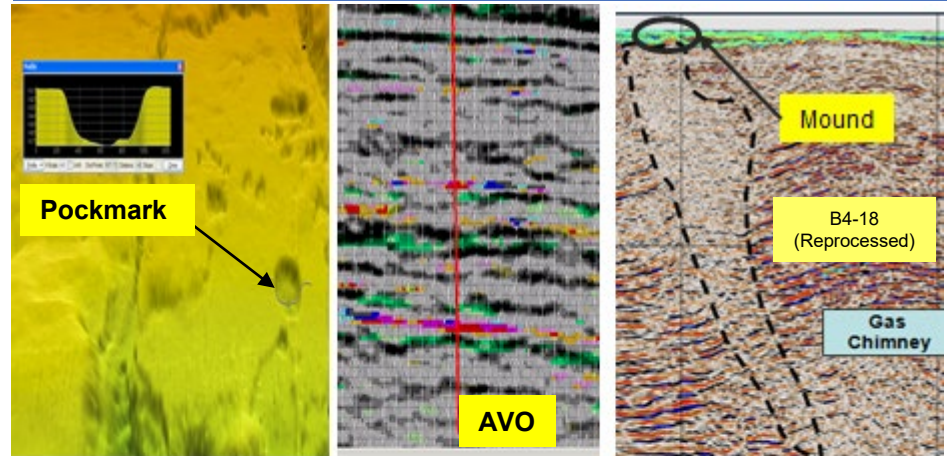


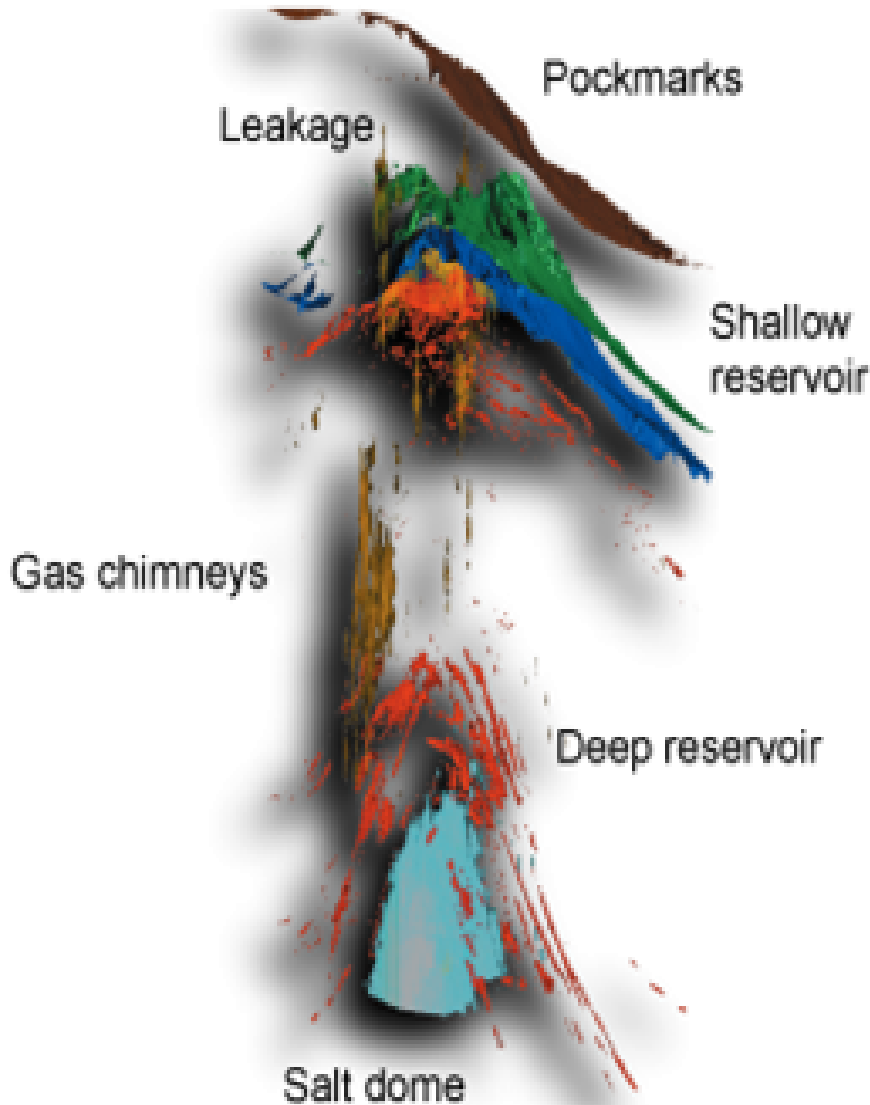


# Significant Hydrocarbon Potential proven by Industry Standards

- ▶ The permit's potential is evident in the significant and complimentary hydrocarbon & migration features observed
- ▶ Direct hydrocarbon indicators identified in seismic data
  - high amplitude bright spot reflections
  - attenuation of high frequencies in instantaneous frequency plots
  - bright spot features in Root Mean Squared amplitude plots
- ▶ Gas chimneys, HRDZs, anomalous AVO, reverse polarity events, flat spots are also present
- ▶ Hydrocarbon seepage has been observed and recorded via Landsat across areas of the permit
- ▶ Echosounder seeps and sizeable pockmarks are observed within the permit area and covering the offshore continental slope
- ▶ Repeated Hydrocarbon seep samples show a thermogenic source with liquid components indicated
- ▶ Independent inshore Hydrocarbon Seep Gas analysis shows high gas content

## Features Observed Across Permit



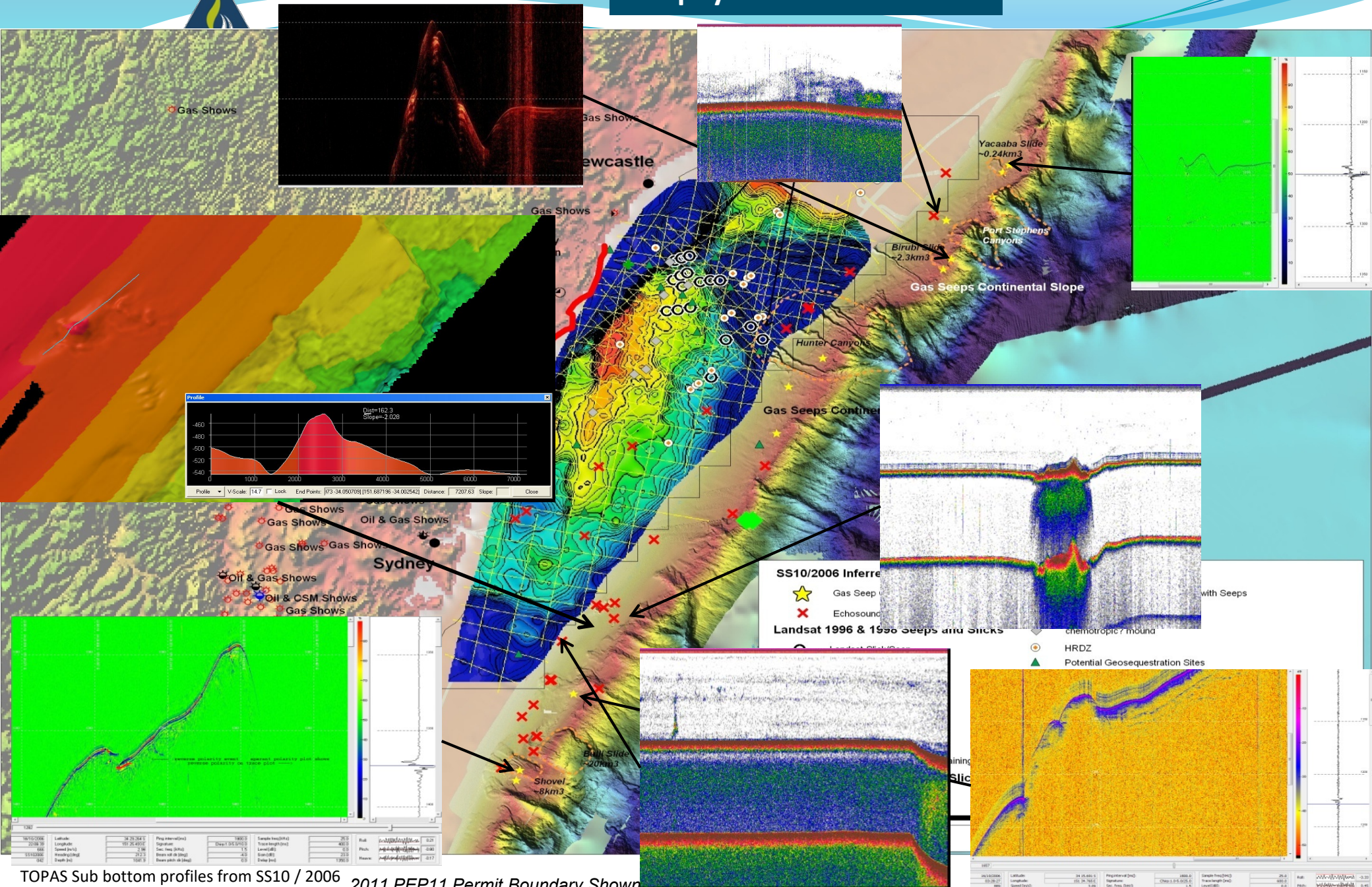


*Chimneys and pock marks indicating focus areas of fluid flow above the top reservoir*

- “seismic chimneys are visible in 90% of all Mesozoic and Tertiary basins.”
- Gas chimneys have been observed to tie in to features associated with gas seepage like pockmarks and ....shallow gas accumulations and faults
- Recent studies have revealed that chimneys can represent a link to deeper hydrocarbon accumulations
- Active seeps and migrated hydrocarbons are a key indicator of ongoing hydrocarbon generation (Abrams M Hydrocarbon migration and its near surface expression: AAPG Memoir 66)
- The mapping of chimneys has significance in geohazards interpretation
- High concentrations of chimneys are observed in areas where discovery wells and oil and gas fields are present
- Schumacher D “A recent review of more than 850 wildcat wells –all drilled after geochemical surveys finds that 79% of wells drilled in positive anomalies resulted in commercial oil and gas discoveries “(Surface geochemical exploration, D. Schumacher, 2000,)



# Geophysical Gas Indications



TOPAS Sub bottom profiles from SS10 / 2006 2011 PEP11 Permit Boundary Shown

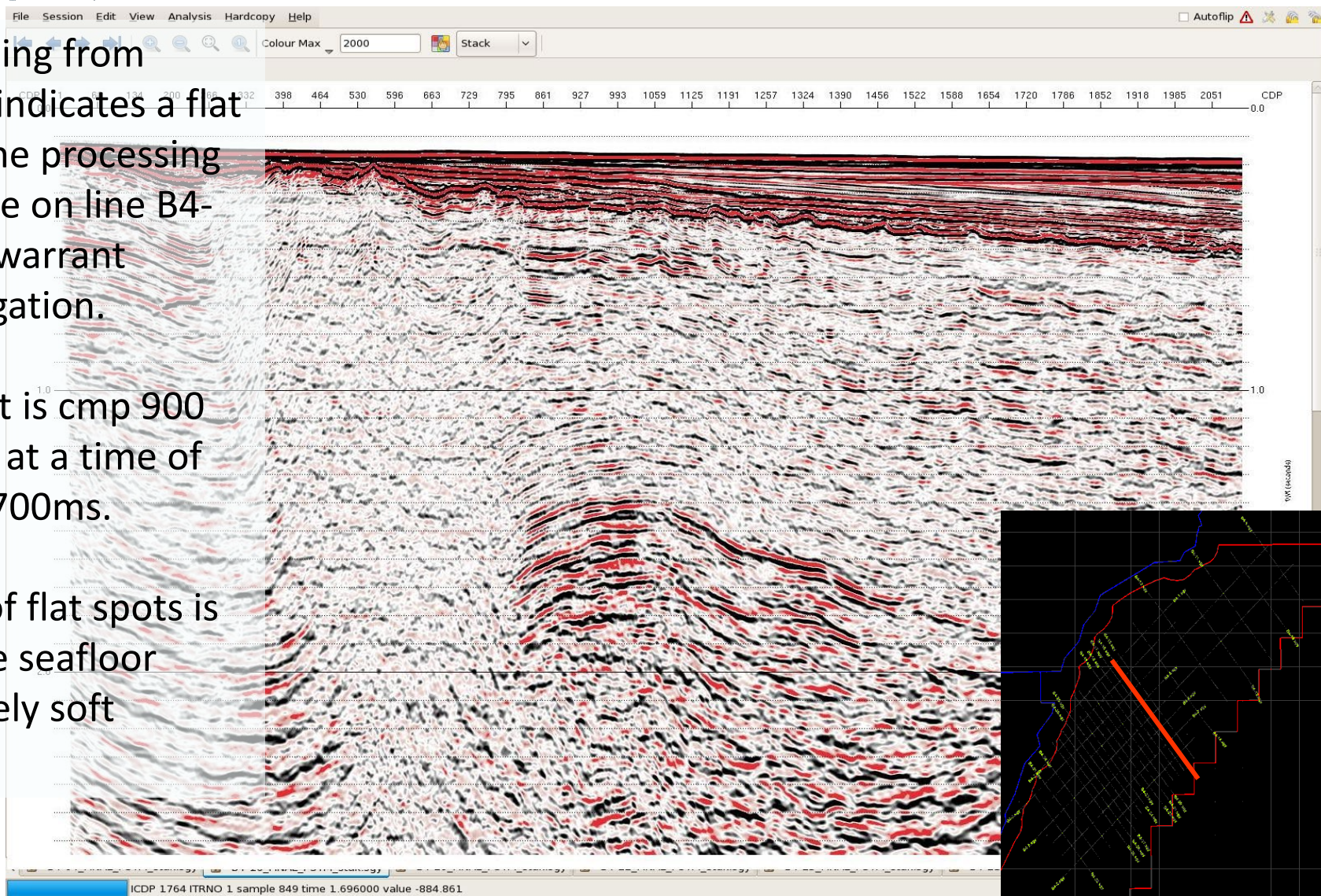


# B4-16 Preliminary Final PSTM (Zoom)

Data reprocessing from phase 2, 2009 indicates a flat spot on the time processing within structure on line B4-16 which may warrant further investigation.

Area of interest is cmp 900 to 1060 (2 km) at a time of 1500ms and 1700ms.

Note polarity of flat spots is opposite to the seafloor indicating a likely soft response.



# Offshore Sydney Basin – Direct Hydrocarbon Indicators PEP11

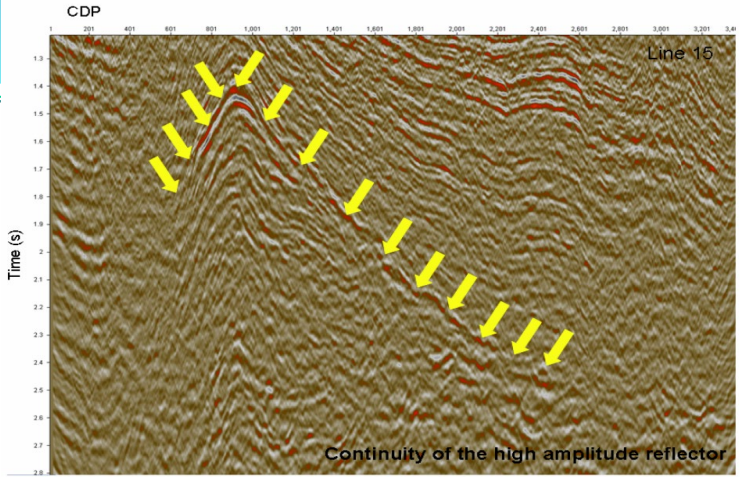


Figure 69: Display of Line B4-15. The continuity of high amplitude reflector has been mapped.

“Strong energy reflections present on seismic section can be associated with major lithologic changes as well as hydrocarbon accumulations.”

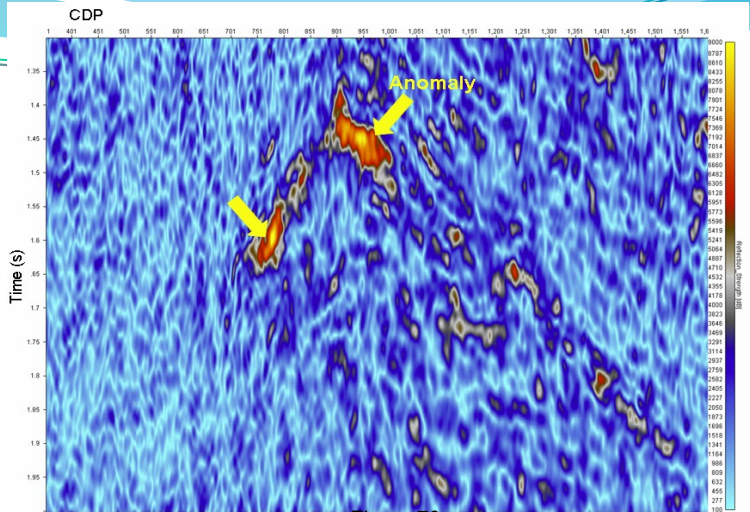


Figure 70: Reflection Strength plot of the high amplitude reflector

“Gas reservoirs, in particular, appear as high amplitude “bright spot” reflections.”

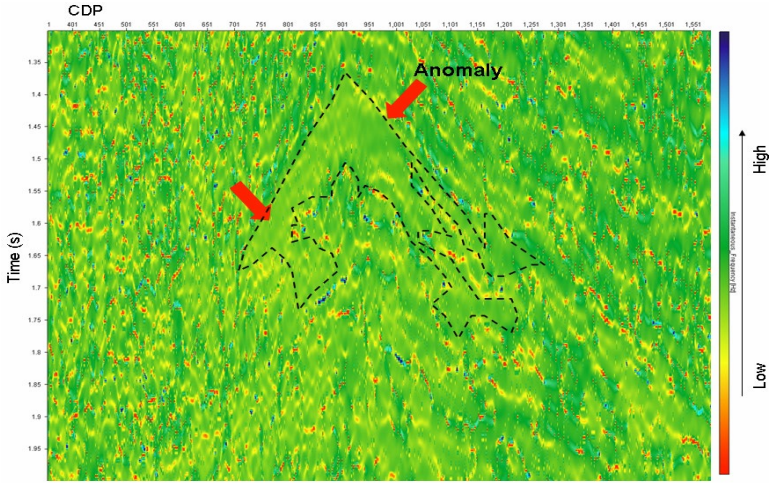


Figure 72: Instantaneous frequency plot for the high amplitude reflector. It is showing low frequency anomaly.

“Instantaneous frequency content is of interest in that high frequencies are attenuated by gas and condensate reservoirs.”

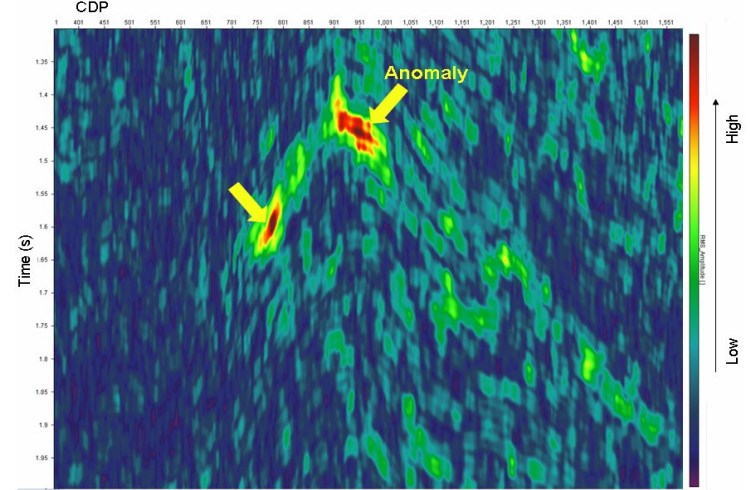
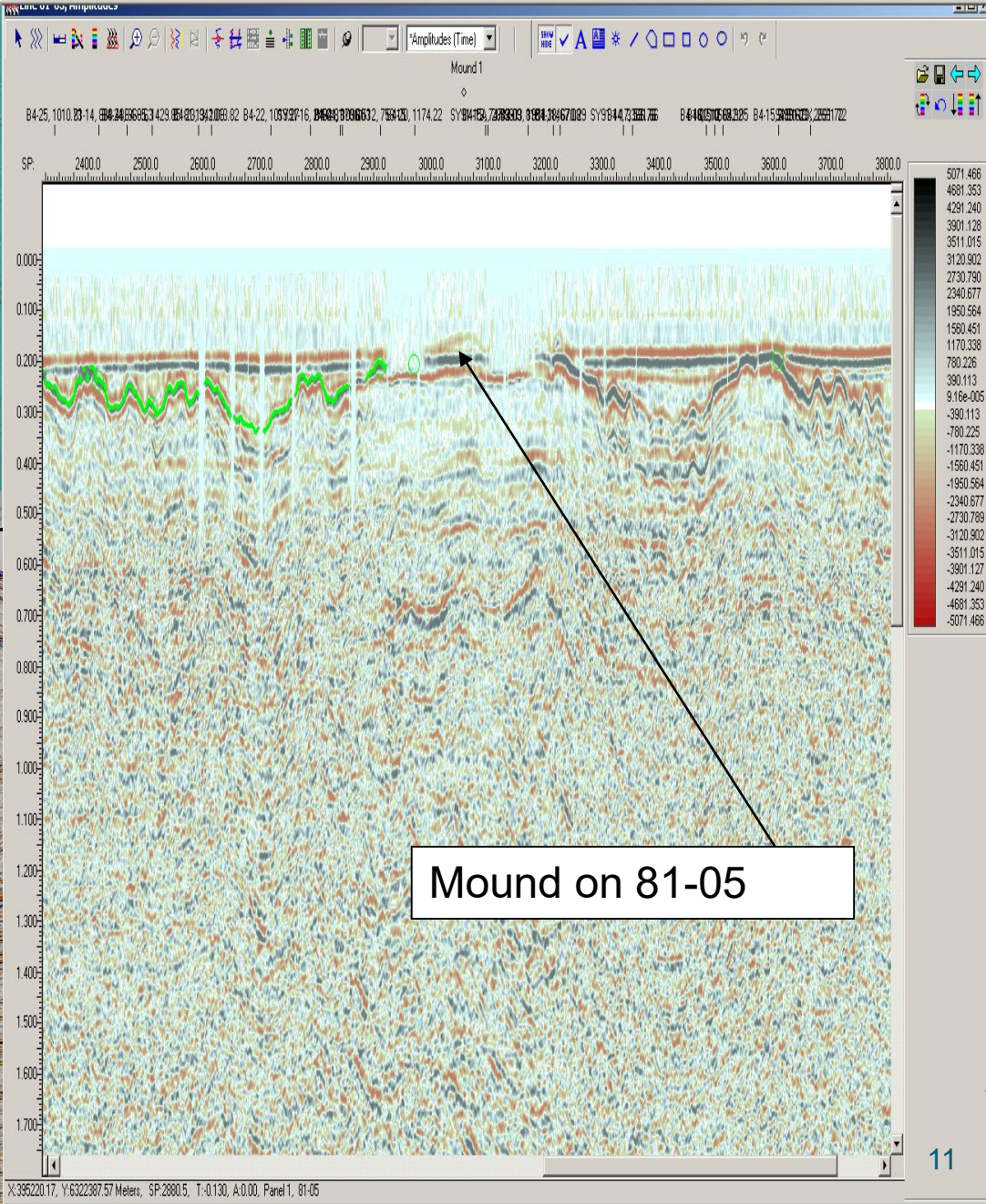
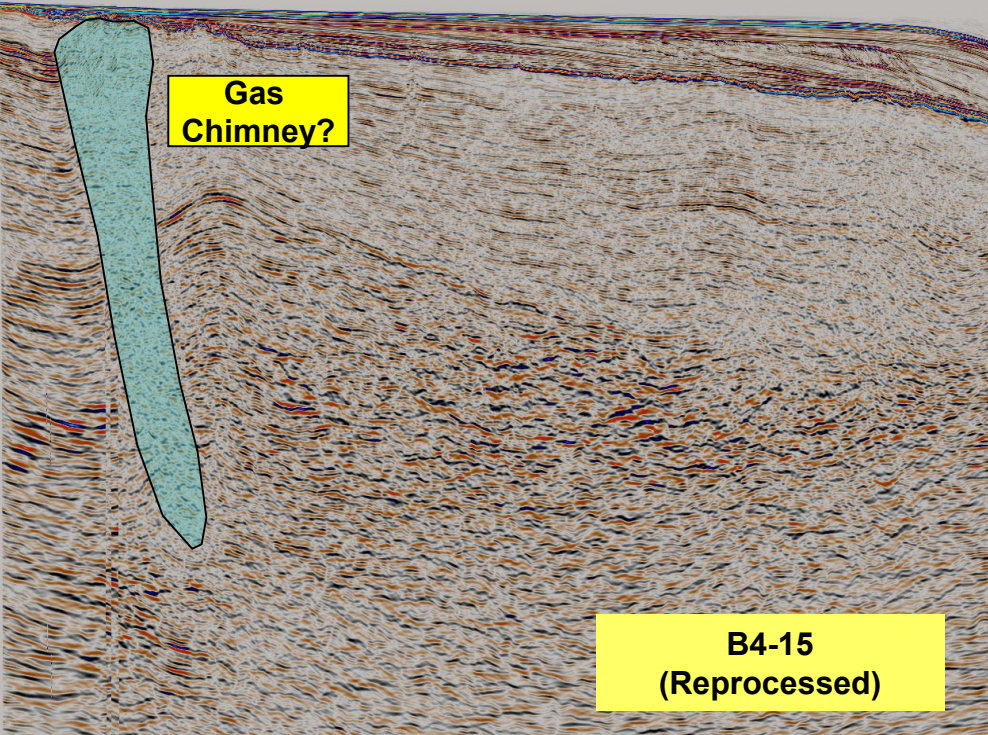
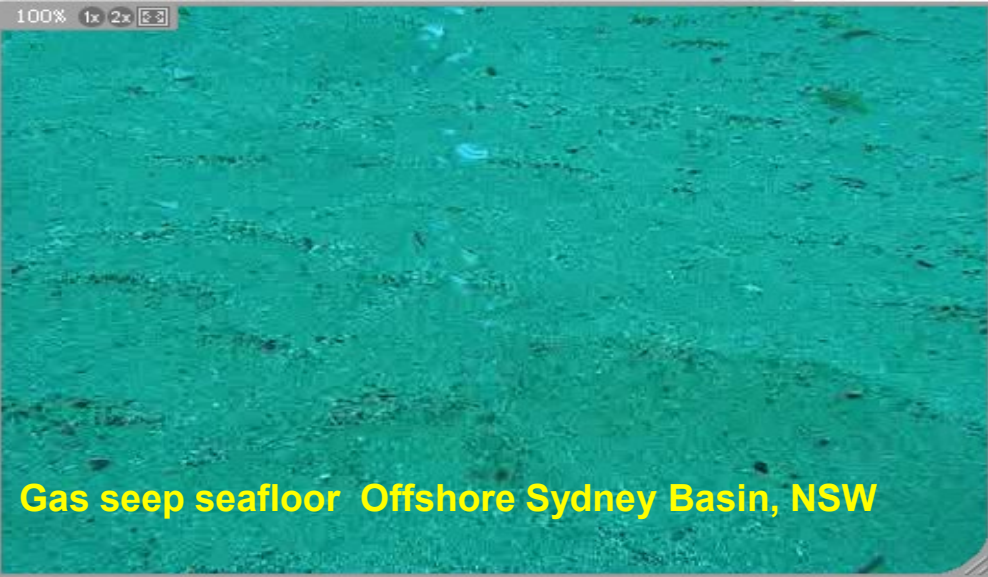


Figure 74: RMS of seismic amplitude over the area of Line B4-15, where high amplitude reflector is mapped.

“The Root Mean Square (RMS) amplitude ... may be used to map direct hydrocarbon indicators in a zone.”

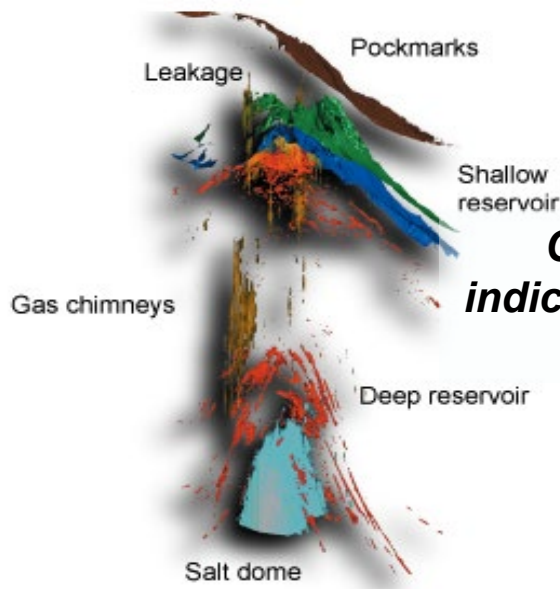
“The RMS of seismic amplitude for the 700ms window have been calculated. This indicates a bright spot like feature, which is a prime indicator for the occurrence of gas.”

# Thermogenic hydrocarbon seepage offshore NSW



## Norway – Gullfaks South Field

Judd and Hovland, 2007. *Seabed Fluid Flow*.



**Chimneys and pock marks indicating focus areas of fluid flow above the top reservoir**

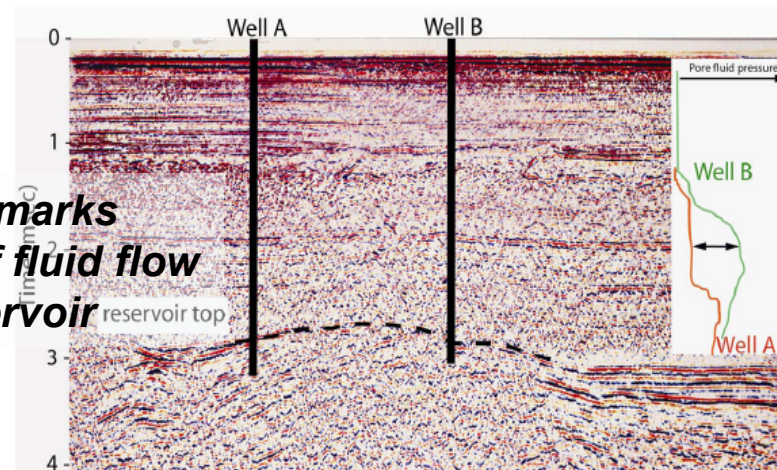
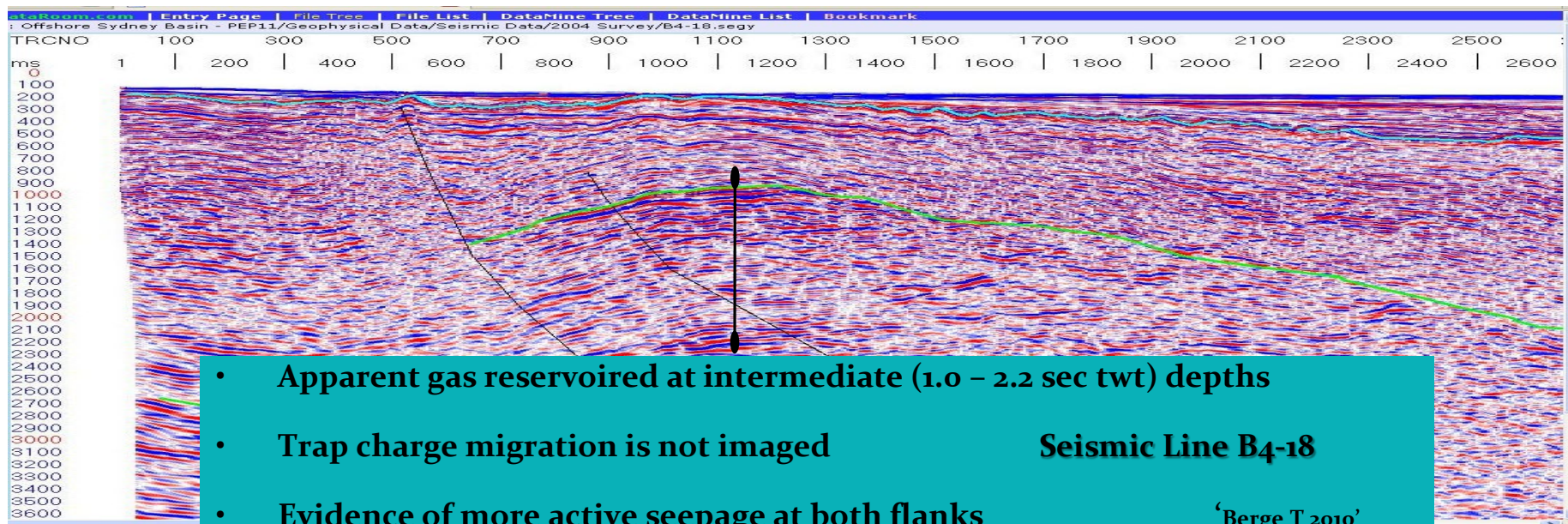


Figure 6.8: Seismic section across the Gullfaks South field (Norwegian North Sea) showing a gas cloud (a zone in which the acoustic layering is obscured by the presence of gas) above the petroleum reservoir. Well A lies outside the gas cloud, Well B passes through it. In Well B mud gas readings were found to be much higher, there were higher hydrocarbon gas components (C2 to C5), more gas shows, and higher pore fluid pressure (see inset) than Well A, outside the chimney; there was a 10.2 MPa pore fluid pressure difference between the two wells at the depth indicated by the two-ended arrow on the inset diagram. N.B. The vertical scale of the seismic section (in seconds, two way time), does not match the vertical scale (depth in km) of the pressure diagram. [Courtesy of Helge Løseth, Statoil.]

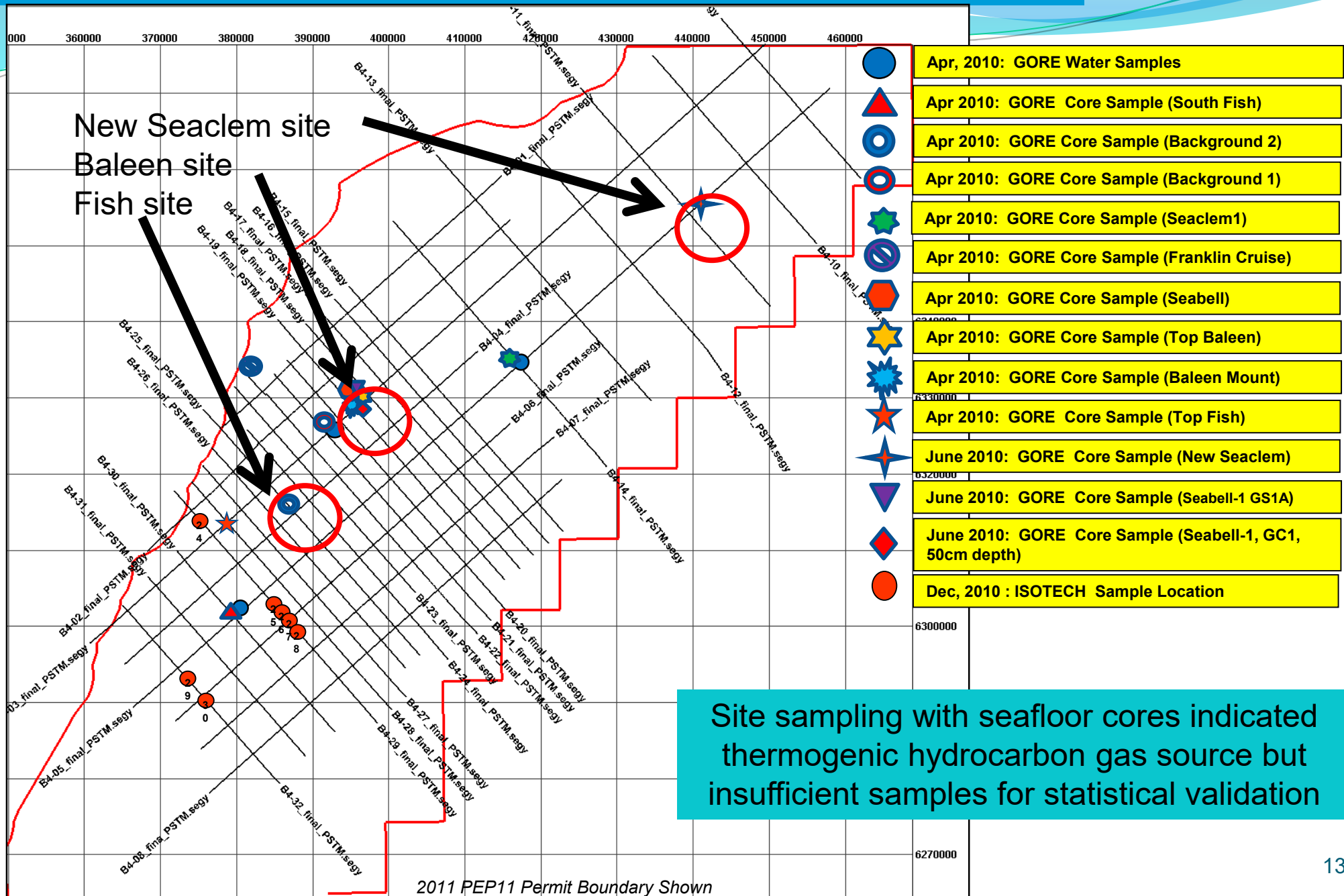


- Apparent gas reservoirs at intermediate (1.0 – 2.2 sec twt) depths
- Trap charge migration is not imaged
- Evidence of more active seepage at both flanks

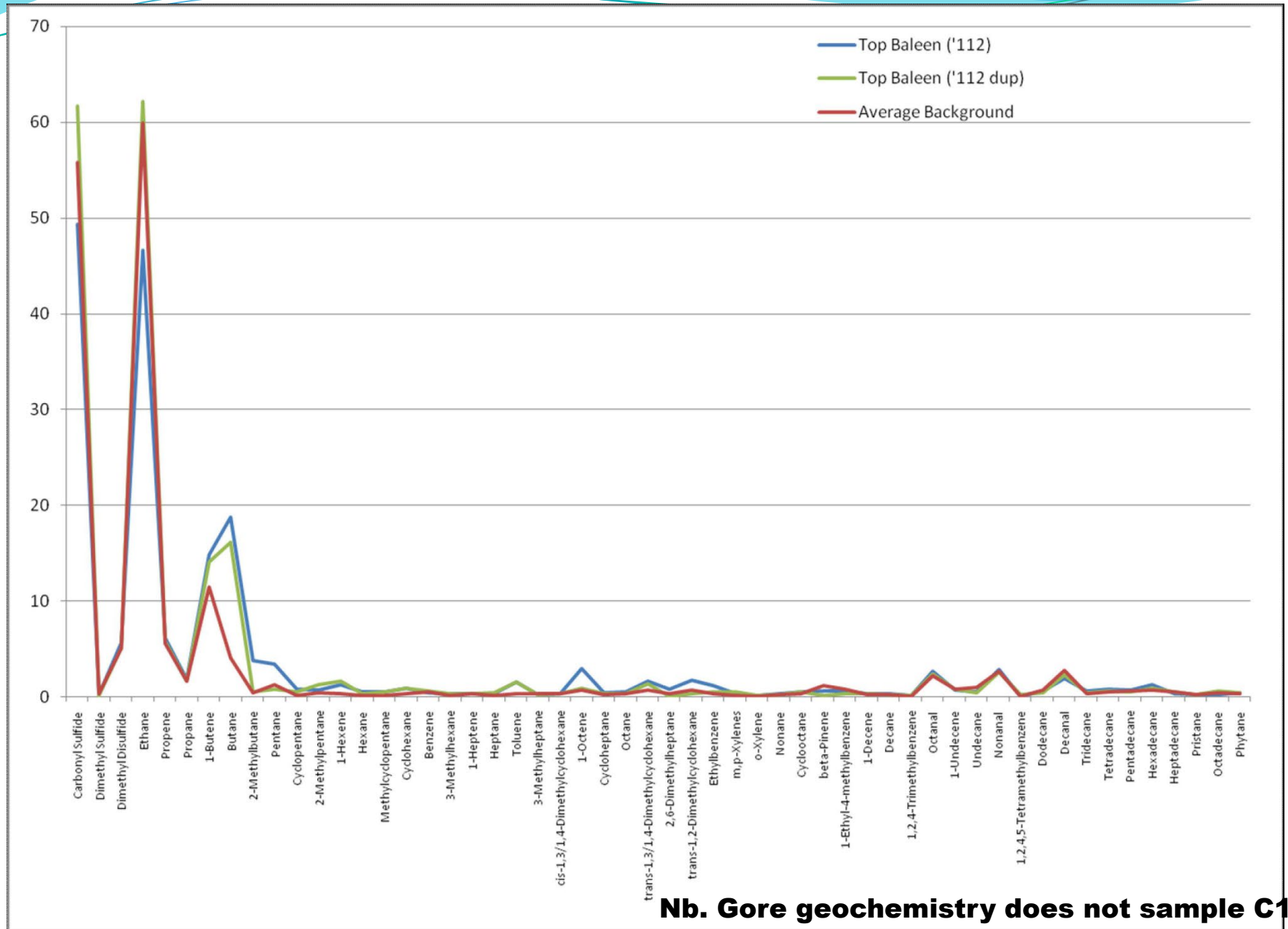
Seismic Line B4-18

'Berge T 2010'

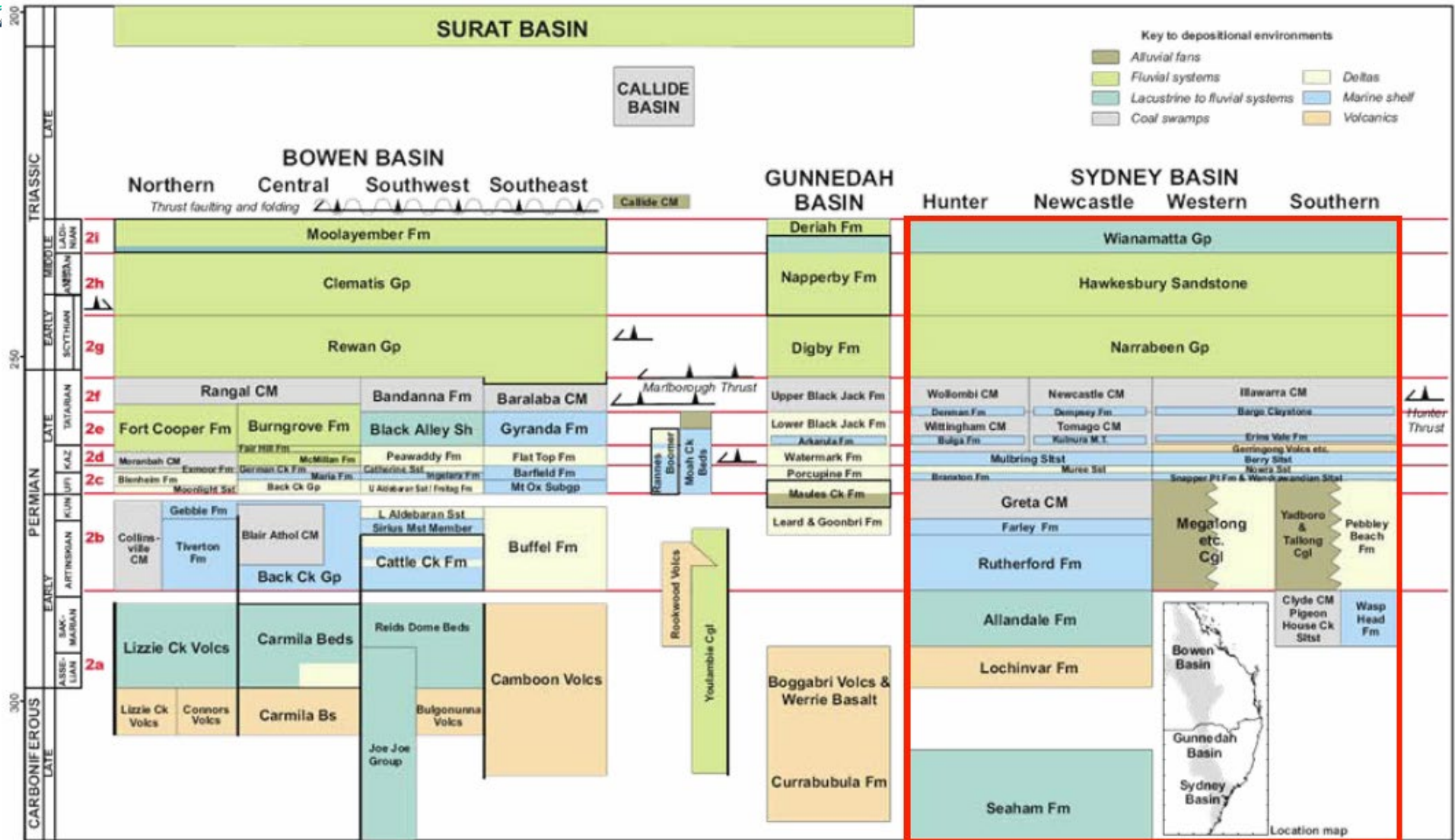
# Thermogenic hydrocarbon seepage analysis points offshore NSW



# Advent Energy: Gore samples exposed to sediments at 'Top Baleen' site



**Nb. Gore geochemistry does not sample C1**

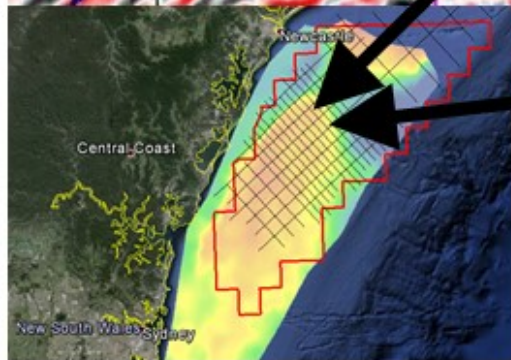
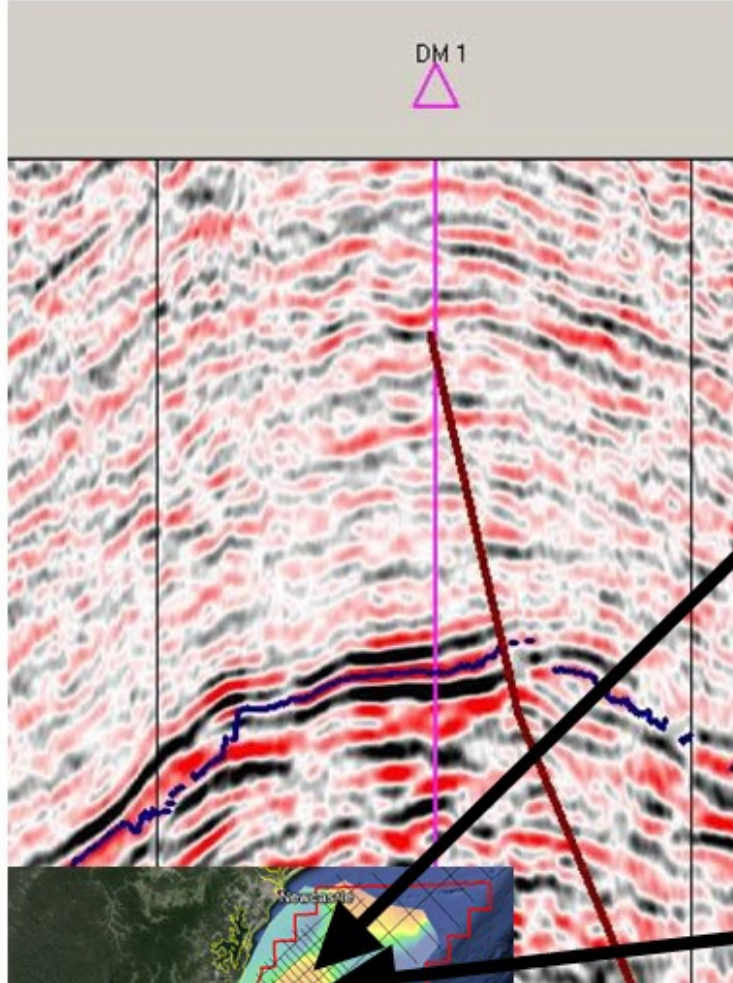


From Blevin et al., 2007, Sydney Basin Reservoir Prediction Study and GIS, Project MR705, Confidential Report to NSW DPI and Macquarie Energy by Frog Tech Pty Ltd



# Near Top Permian / Base Triassic amplitude extraction

Estimate: 6196 acres of estimated amplitude closure

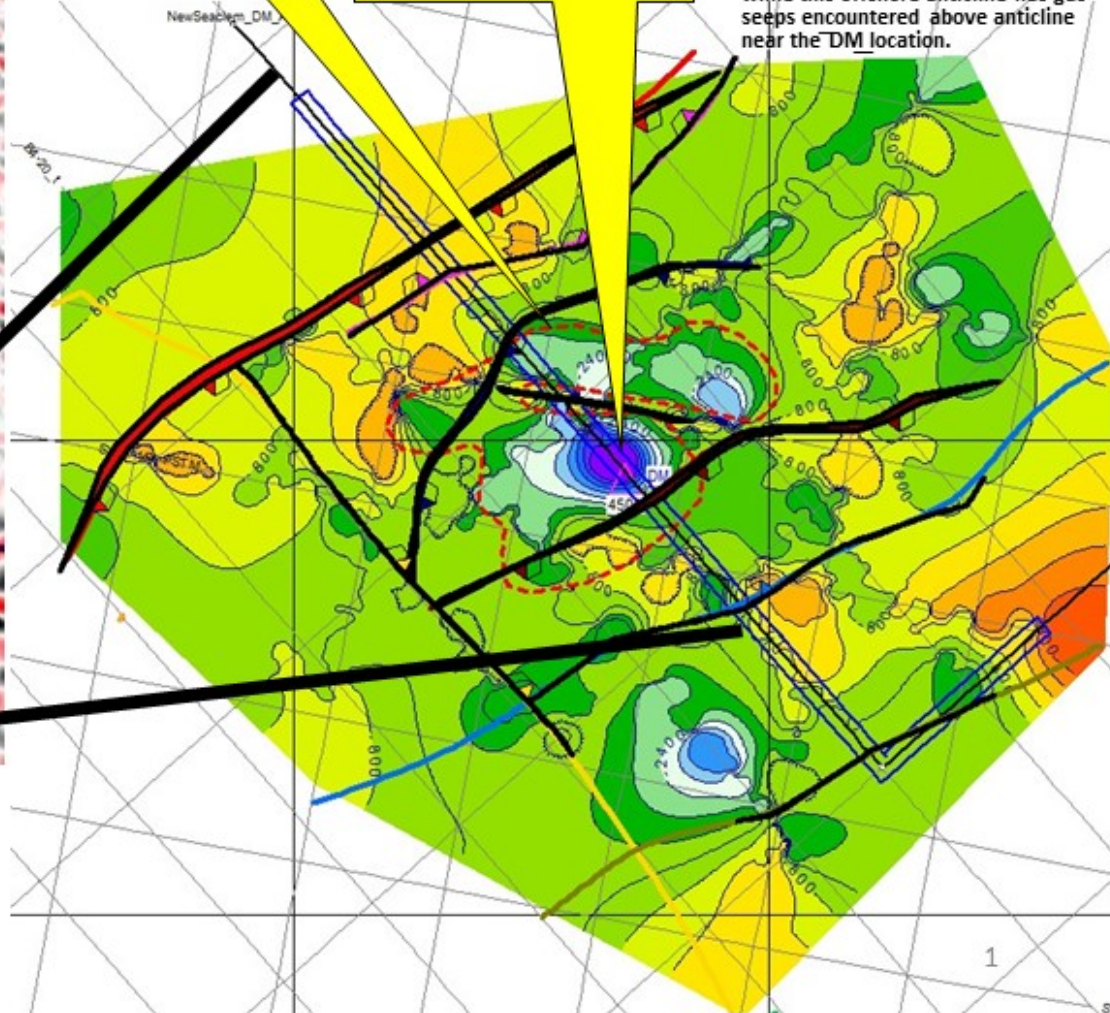


6196 ac  
Amp Area

Suggested  
LOCATION  
398578mE  
6328774mN

Suggested Target: Test 2D seismic line amplitude anomaly at DM1 on North end of ~Late Permian anticline formed on the upper plate of easterly dipping thrusts fault (red).

Onshore Sydney basin Permian provides some coal seam gas (CSG) while this offshore anticline has gas seeps encountered above anticline near the DM location.



(25 sq km)\*



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