



ADVENT ENERGY LIMITED

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

August 2021





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The PEP 11 Gas and proposed CCS Project at Baleen (Seablue1 well) in the Offshore Sydney Basin has potential national significance.

It addresses both forecast gas shortages and the objective of Net Zero Emissions (NZE)

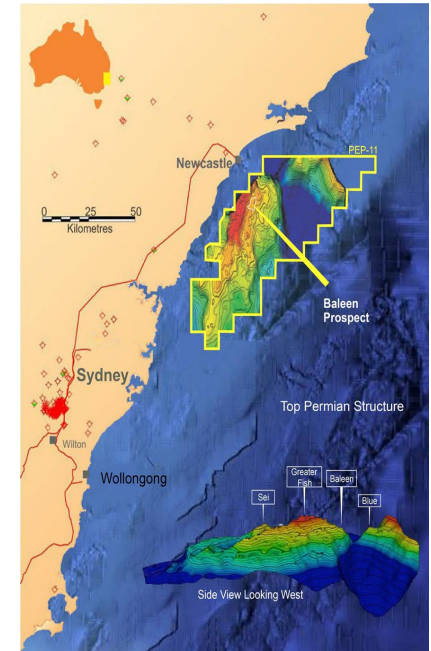
Advent has committed all gas from the project to Australia domestic supply

CCS

- Carbon Capture, Usage and Storage (CCUS) technology is one of the priority technologies in Australia's Technology Investment Roadmap.
- It has been identified by the IEA as the only large-scale mitigation option available that can deliver the additional CO₂ emissions reductions that would be required to meet the climate goals in 2050.
- The PEP11 project is the closest potential carbon storage area to the major Australian carbon sources. which are in the order of 30% of the entire Australian CO₂ output.
- The Wood Mackenzie report (June 2021) "Location, location, location -the key to carbon disposal "notes "Synergies are greatest where industrial point sources are both near each other and a viable storage site."

Gas-Base load power ,Energy costs and employment

- In NSW, an estimated 300,000 jobs rely on gas supply. Gas supplies around 1.3 million households and 33,000 businesses.
- NSW's manufacturing sector, which is approximately 84% of the state's Industrial gas load, employs 253,000 people in 26,127 businesses, adding \$33 billion in industry value. Without addressing NSW's looming gas shortfall these could be at risk.

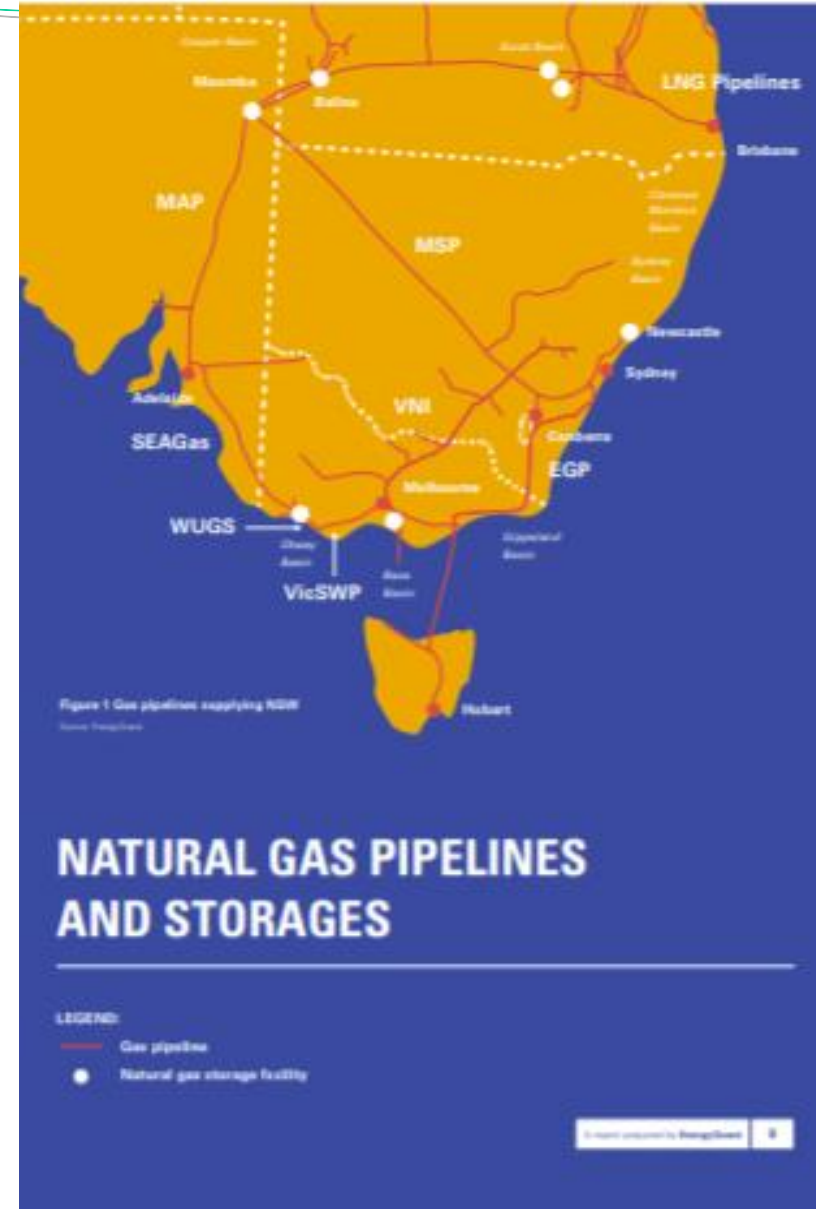




ADVENT ENERGY LIMITED CRUCIAL GAS SUPPLY ISSUES NSW

NSW GAS “Running on empty -NSW Business Chamber”

- NSW imports 98 per cent its gas requirements from other states
- A constrained national gas market will see further price rises for every household and business in NSW
- Inaction on gas and energy security are now holding the future of businesses in NSW to ransom, threatening employment losses and reduced investment
- As the southern (Victoria, Tasmania, NSW and South Australia) fields further decline in the future and if no more southern resources are developed, pipeline constraints (particularly in the pipelines from
- **Victoria “Gas Substitution road map “**
- Gas supply outlook for Victoria For over fifty years, Victoria has had access to low cost, abundant natural gas, extracted from offshore gas fields located in Bass Strait. 1
- Australian Energy Market Operator (AEMO), However, as AEMO has indicated in its 2021 Gas Statement of Opportunities (GSOO), these gas fields are rapidly depleting. AEMO is **forecasting an overall decline in Victoria’s production of 43 per cent from 360 PJ per year in 2021 to 205PJ per year in 2025.**





Recognition of value and need –CCS and Gas

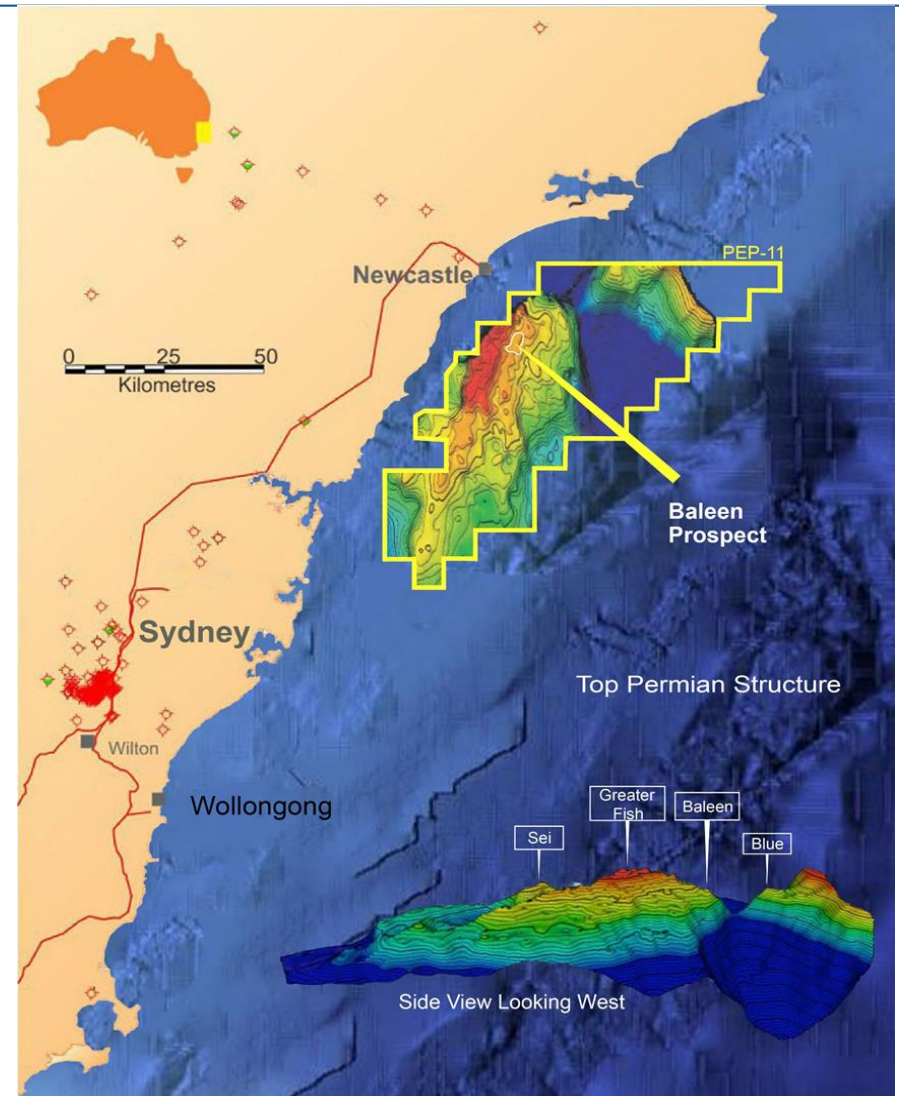
- In January 2020, the NSW and Australian governments signed a MOU to jointly fund \$2 Billion to increase energy supply and reduce emissions in NSW. This includes a specific target to bring an additional 70 PJ/yr. into the NSW market by 2022.
- The NSW Future of Gas statement released July 2021 notes the east coast gas market could face a supply shortage as early as 2023 and simultaneously reduced the area covered by Petroleum exploration Licences by 77%
- The gas price spikes and shortages in the east Australian gas market occur when there is high demand during the Australian winter. This period coincides with summer demand in the northern hemisphere also spiking driven by increased power needs related to summer heatwaves. In the week to 30 07 2021 this sent Japan futures to U.S.\$16 per million British thermal units ('ENB 30 07 2021')
- International energy prices are increasingly setting east coast domestic prices ,increasing the volatility in domestic gas prices .This has forced some manufacturers exposed to spot prices to the brink.(AFR 09 08 21)
- Preventing power blackouts is becoming more difficult as weather dependent renewables replace coal powered generation .This is forcing the energy market regulator (AEMO) to intervene more often **(250 times in 2019 -20 compared to 20 three years earlier.)**and ordering other sources typically gas power to come online. The 2020 report ranked electricity supply security as “critical “ status. (“POWER FIX URGENT AS GRID TEETERS AFR 050121”)



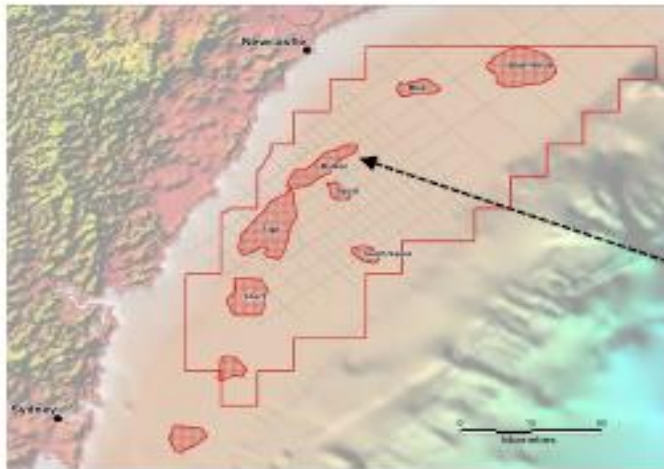
PEP11-85% Interest

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 km² 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



PEP11 Project



PEP11 Prospects & Leads



Illustrative graphic only – actual development plan may differ



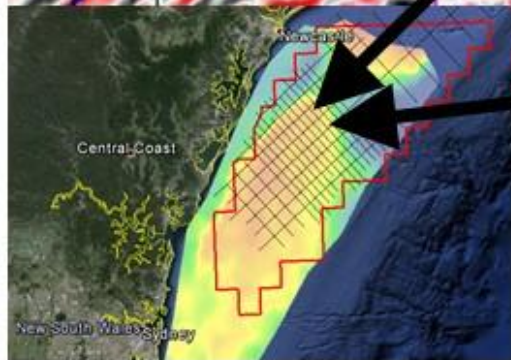
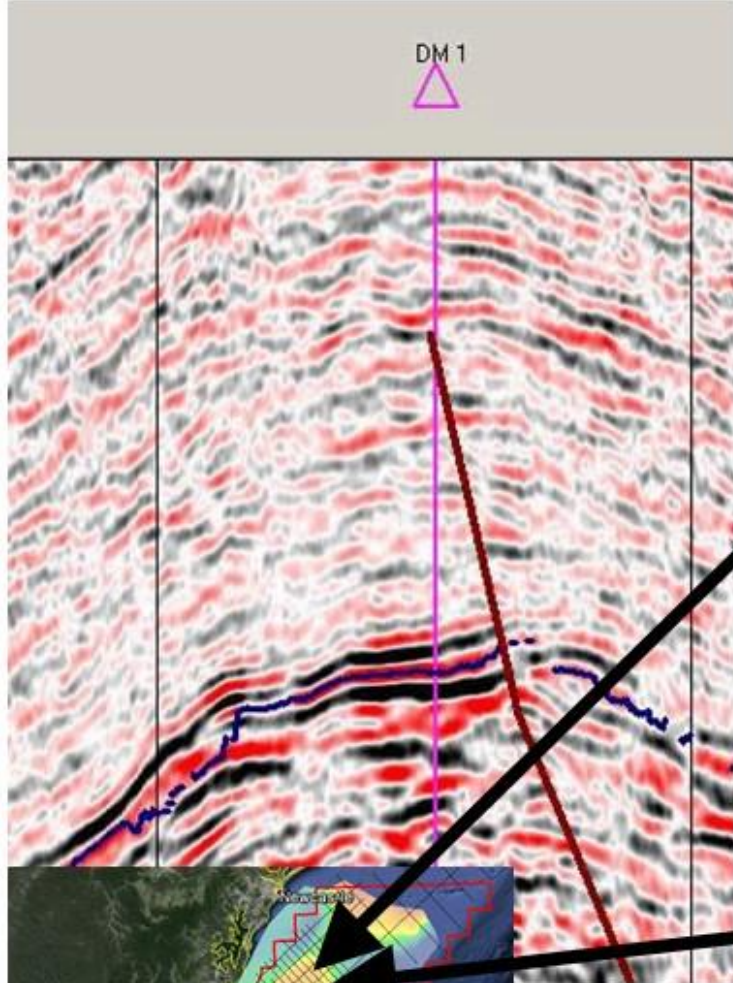
Collongra / Munmorrah Power Plant Precinct;
Prospective Gas Processing Plant Location



Newcastle Port;
Prospective Gas Processing Plant Location

Near Top Permian / Base Triassic amplitude extraction

Estimate: 6196 acres of estimated amplitude closure

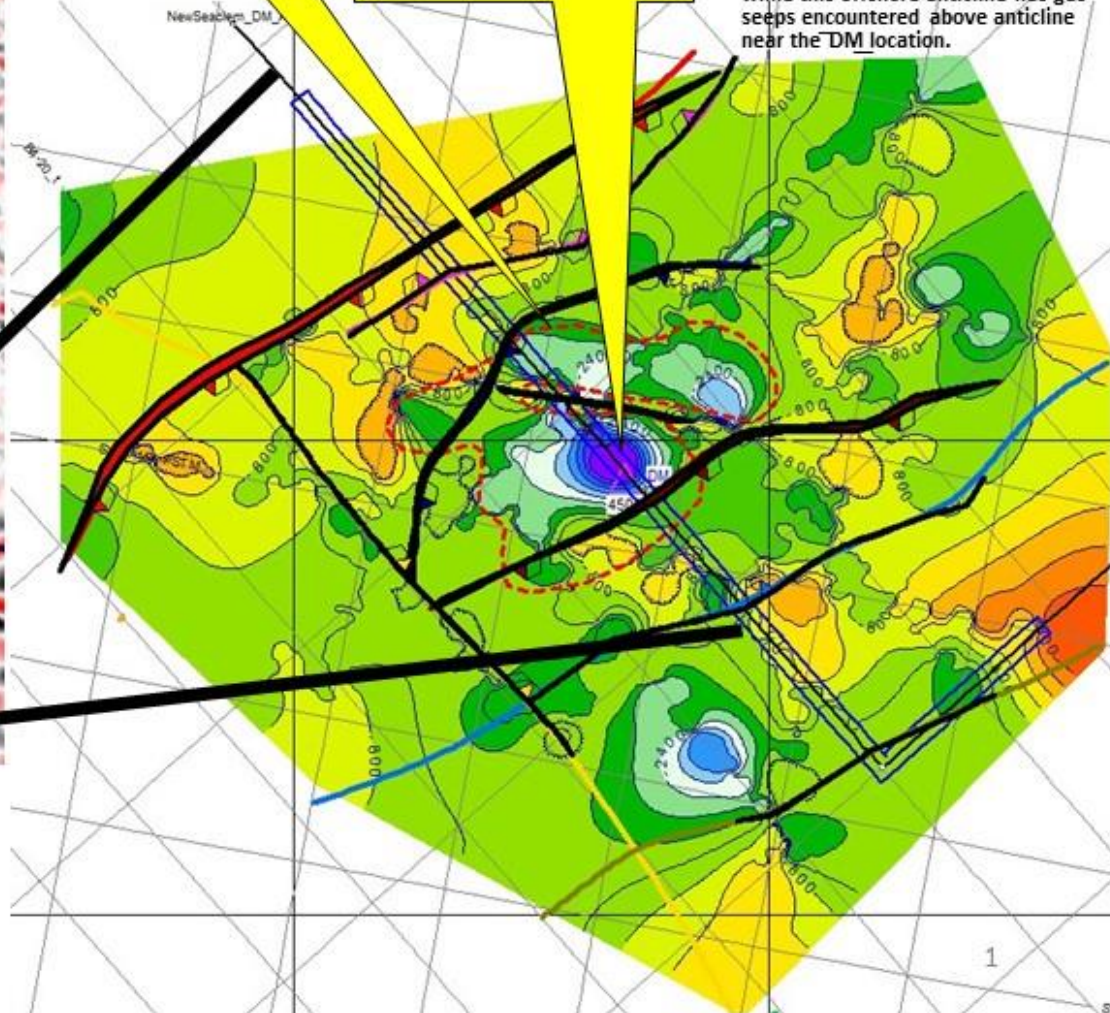


6196 ac
Amp Area

Suggested
LOCATION
398578mE
6328774mN

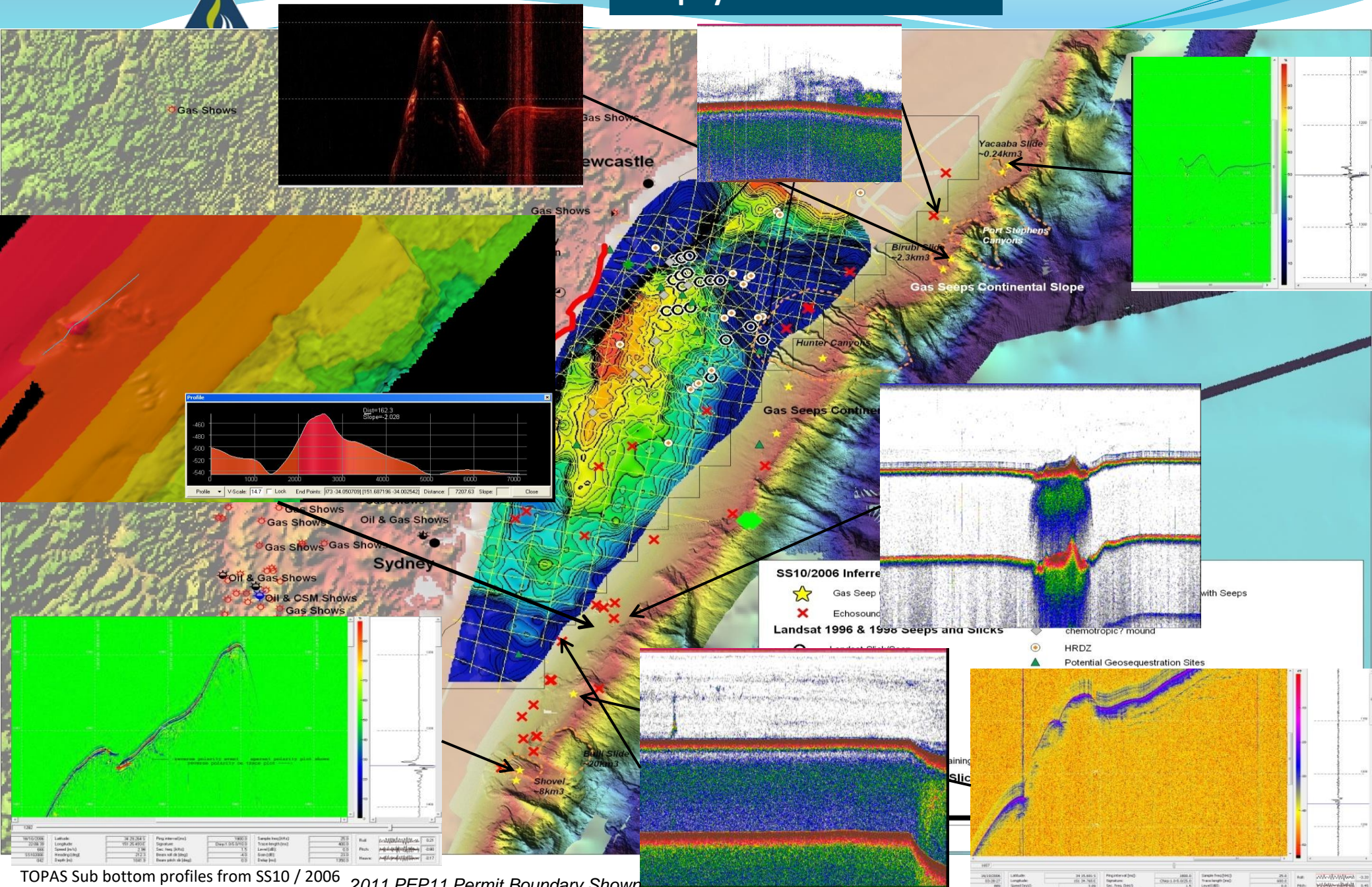
Suggested Target: Test 2D seismic line amplitude anomaly at DM1 on North end of ~Late Permian anticline formed on the upper plate of easterly dipping thrusts fault (red).

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



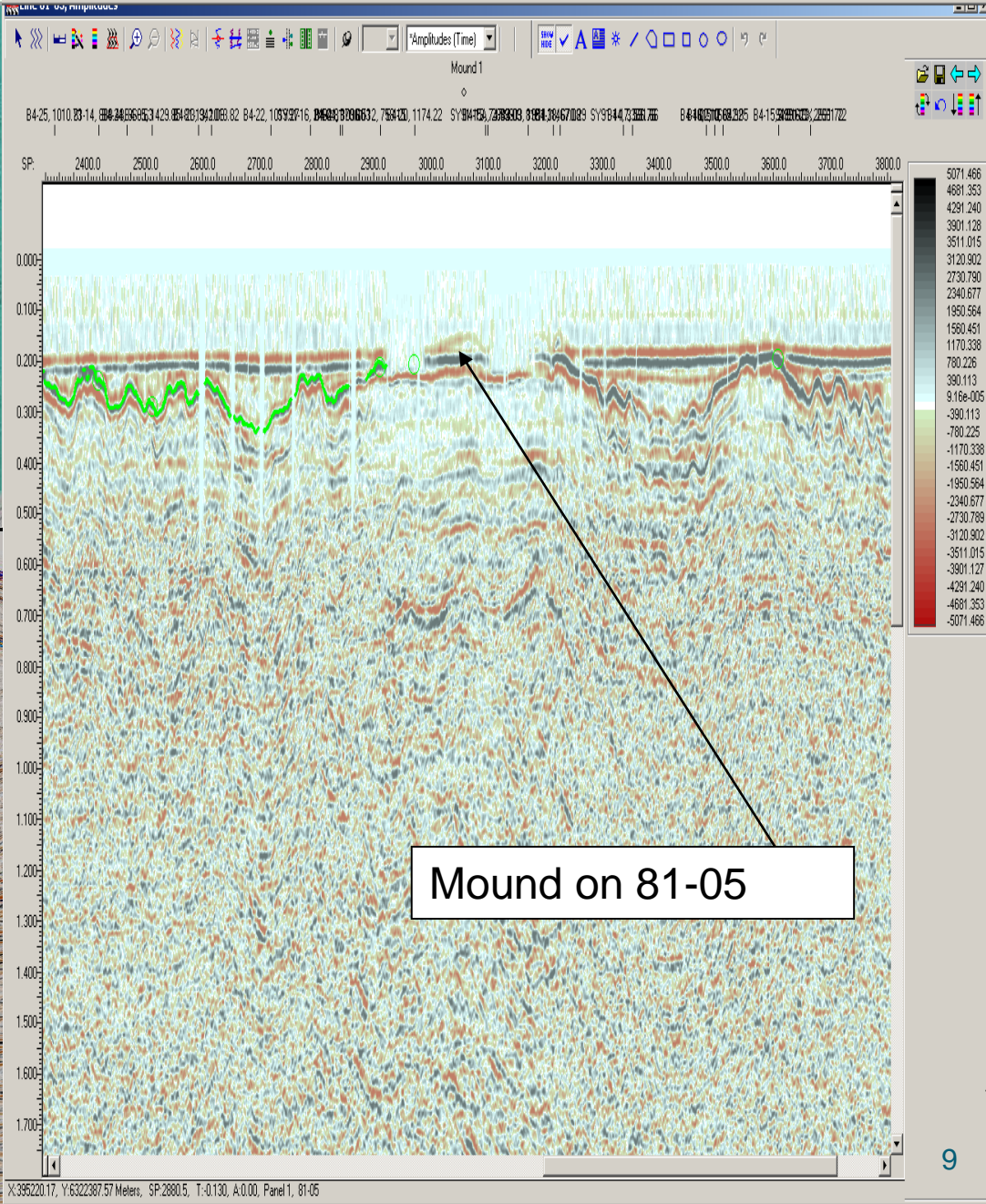
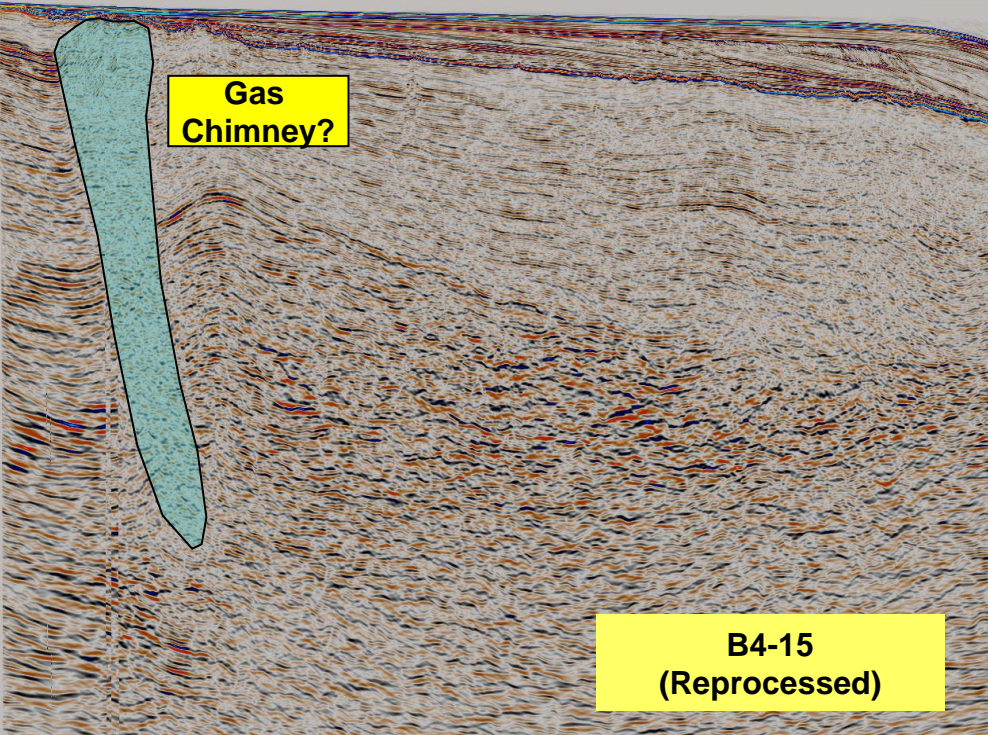
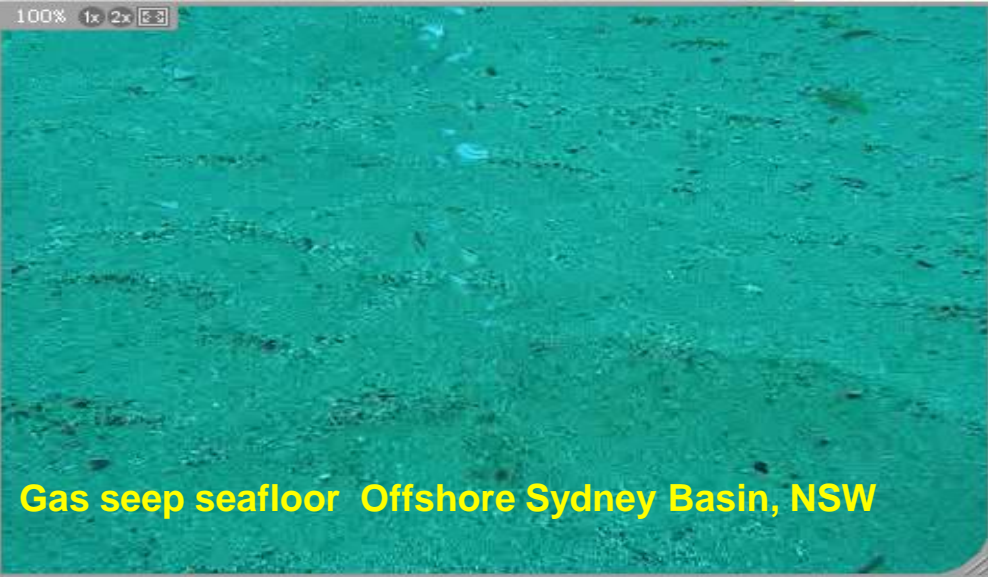
(25 sq km)*

Geophysical Gas Indications



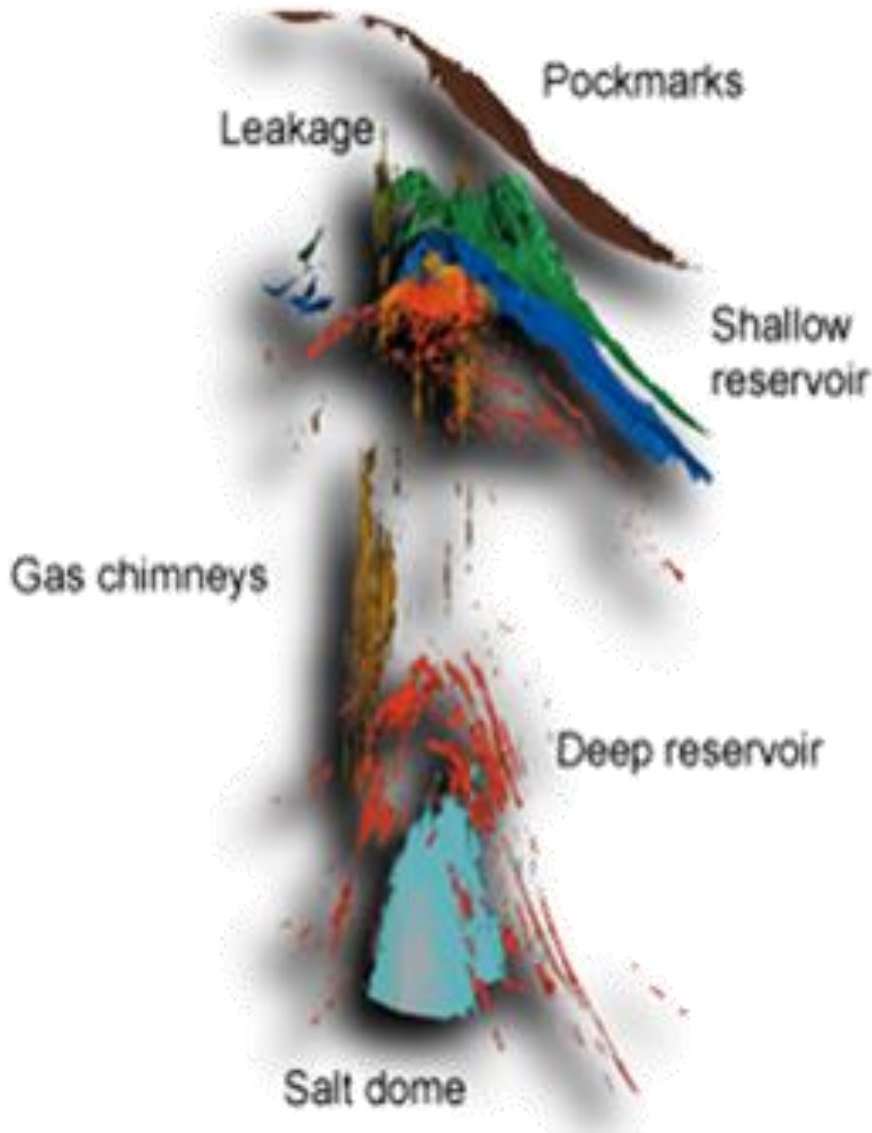
TOPAS Sub bottom profiles from SS10 / 2006 2011 PEP11 Permit Boundary Shown

Thermogenic hydrocarbon seepage offshore NSW





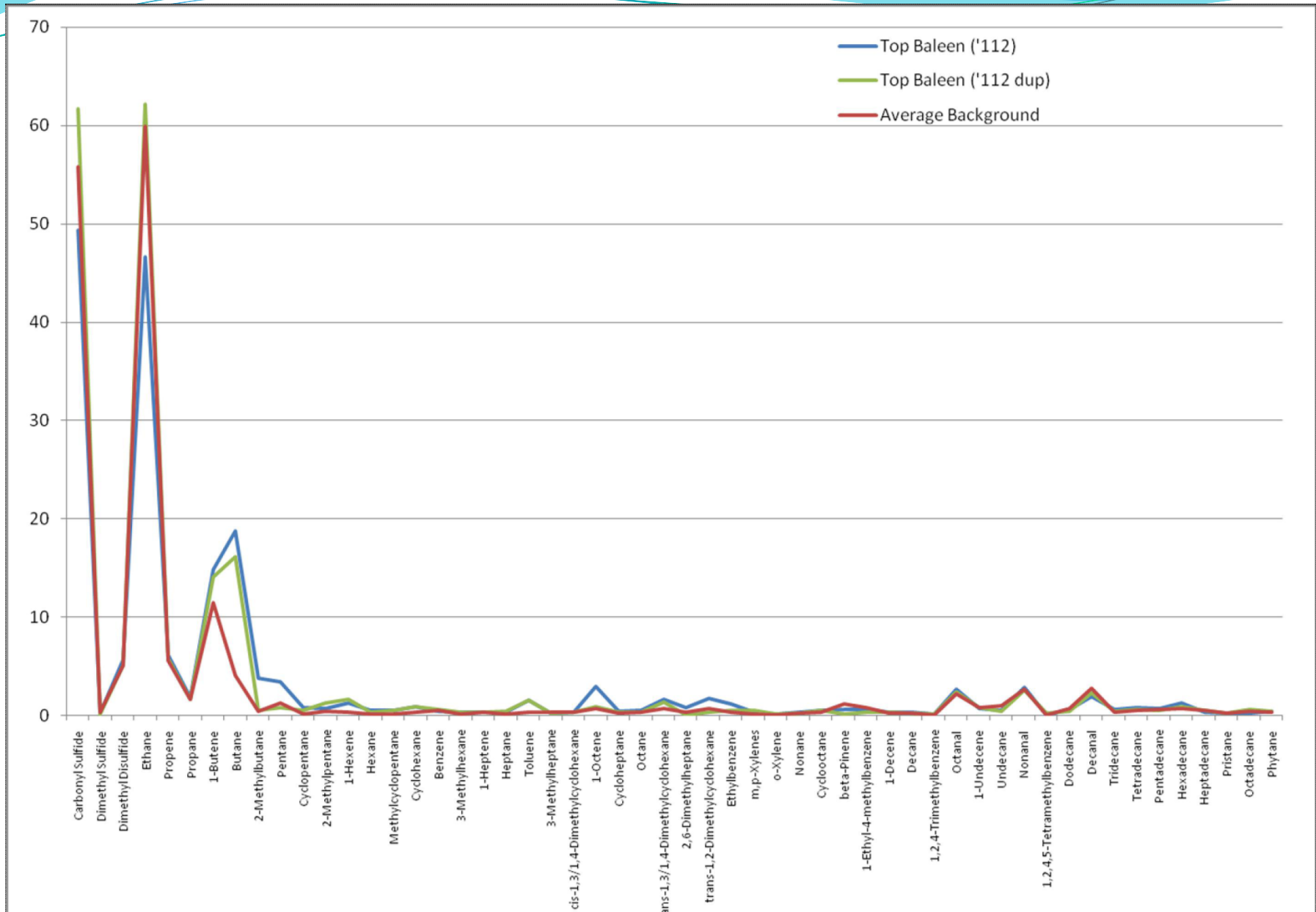
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Chimneys and pock marks indicating focus areas of fluid flow above the top reservoir

- “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 andshallow 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,)

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



Nb. Gore geochemistry does not sample C1

Offshore Sydney Basin – Direct Hydrocarbon Indicators PEP11

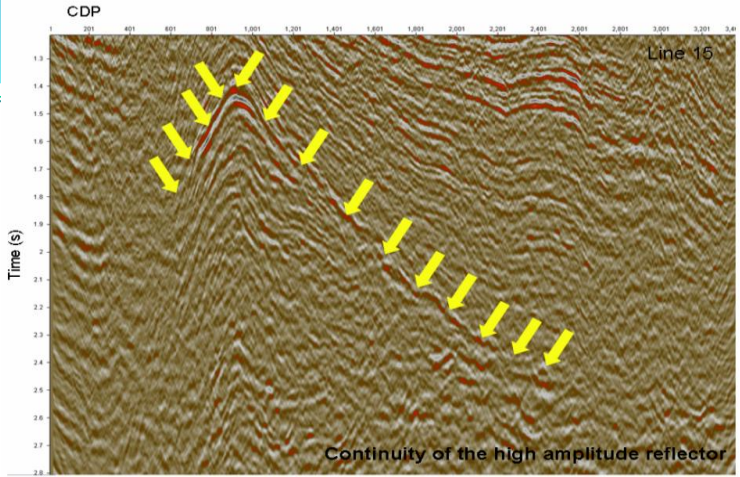


Figure 69: Display of Line B4-15. The continuity of high amplitude reflector has been mapped.

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

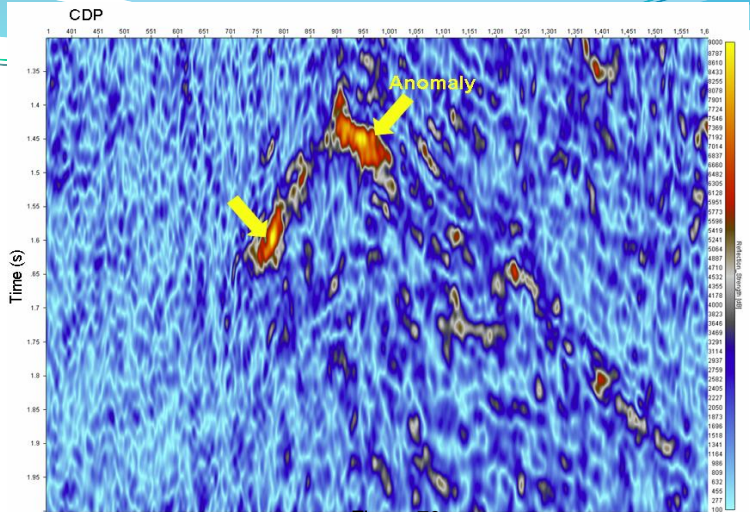


Figure 70: Reflection Strength plot of the high amplitude reflector

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

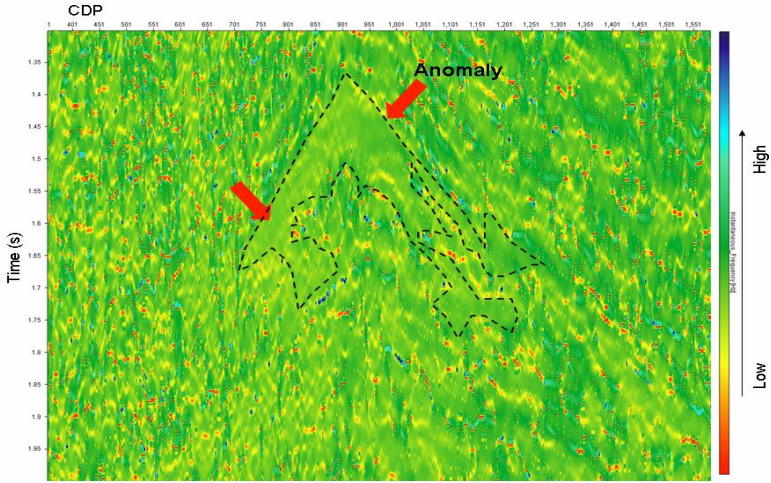


Figure 72: Instantaneous frequency plot for the high amplitude reflector. It is showing low frequency anomaly.

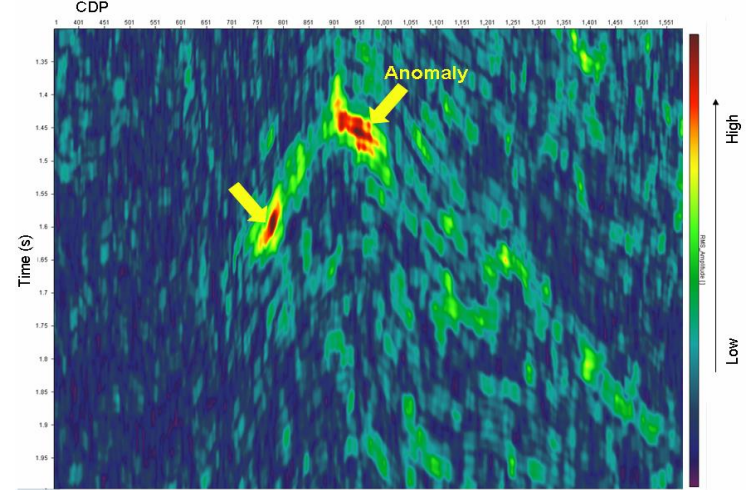
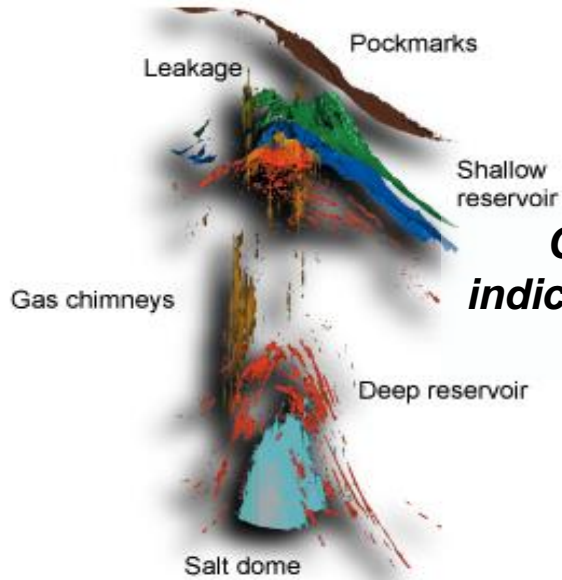


Figure 74: RMS of seismic amplitude over the area of Line B4-15, where high amplitude reflector is mapped.

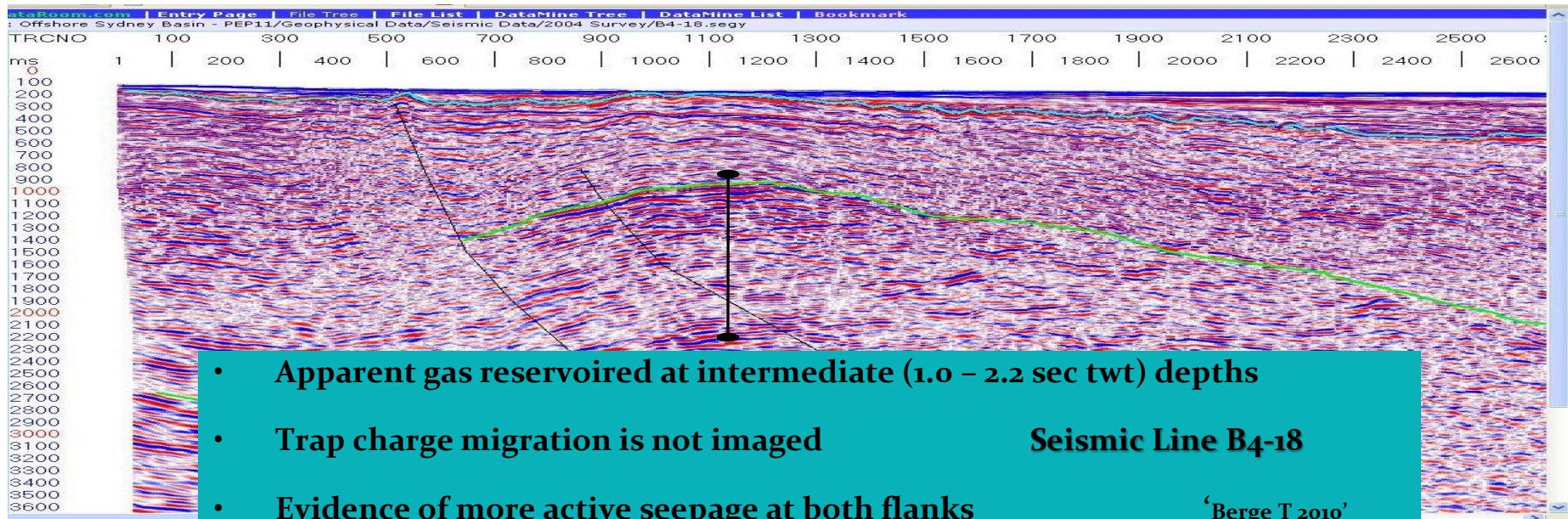
“The Root Mean Square (RMS) amplitude ... may be used to map direct hydrocarbon indicators in a zone.”

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

“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.”



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





IN CONCLUSION

- **Advent Energy proposes to drill a gas exploration well, Sea Blue-1, in the offshore Sydney Basin.**
- **The exploration lease (PEP 11) is located close to the Newcastle-Hunter region - and major emission sources which will need to be cut if NSW is to meet its target of NET Zero by 2050.**
- **CCS is a key technology option to do this - and maintain an industrial base.**
- **There is presently no confirmed onshore geological storage site in NSW**
- **The offshore Sydney Basin has storage potential but has never been definitely evaluated due to lack of well data**
- **Sea Blue- 1 will provide the opportunity to cost-effectively assess CO2 storage potential.**
- **Confirmation of offshore geological storage potential would be a game changer for NSW and its NZE target**



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