Bonaparte Basin (NT)

NORTHERN TERRITORY, OFFSHORE

Reservoir:

Plover, Elang formations, and Sandpiper Sandstone

Seal:

Frigate Formation and Bathurst Island Group

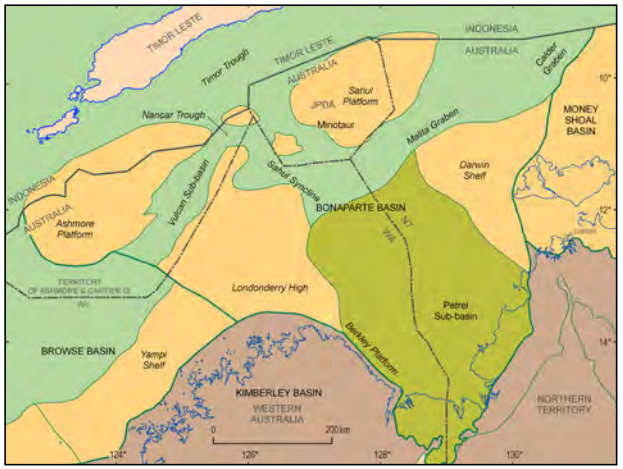
HYDROCARBON POTENTIAL

CATEGORY 1 and 2* (OGRA 2005)

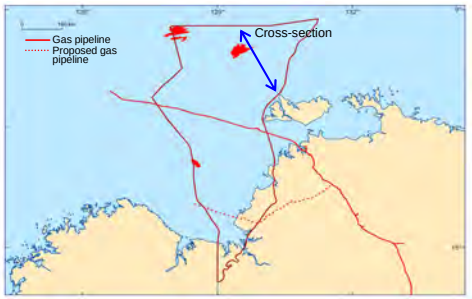
Crude oil	MMBL	134.09
Condensate	MMBL	631.74
LPG	MMBL	365.72
Sales gas	Tcf	27.99

*data from entire basin

STRUCTURAL ELEMENTS

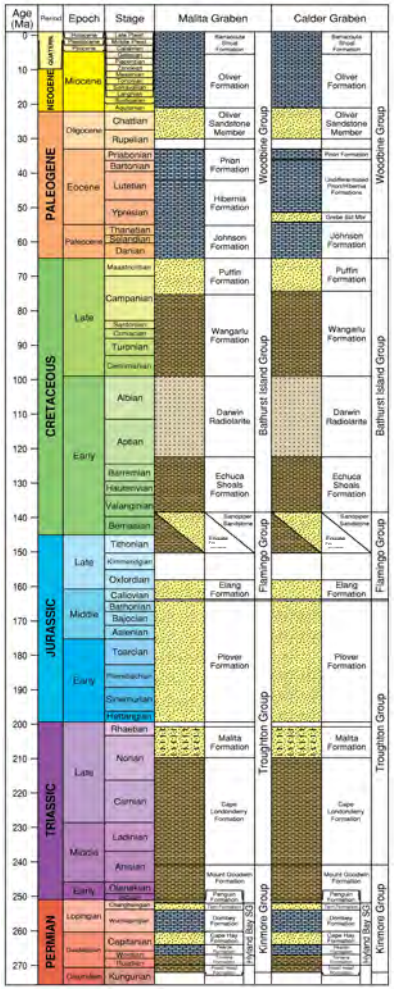


OIL AND GAS FIELDS

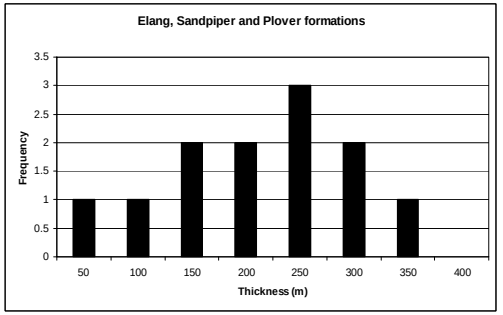


WELLS AND SEISMIC COVERAGE

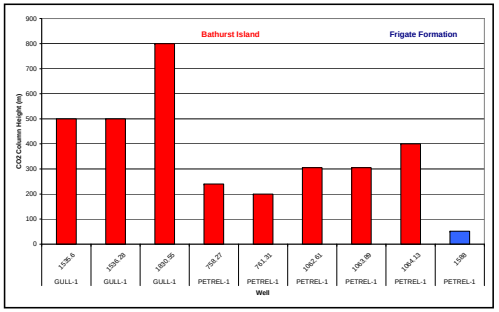
STRATIGRAPHY



RESERVOIR THICKNESS

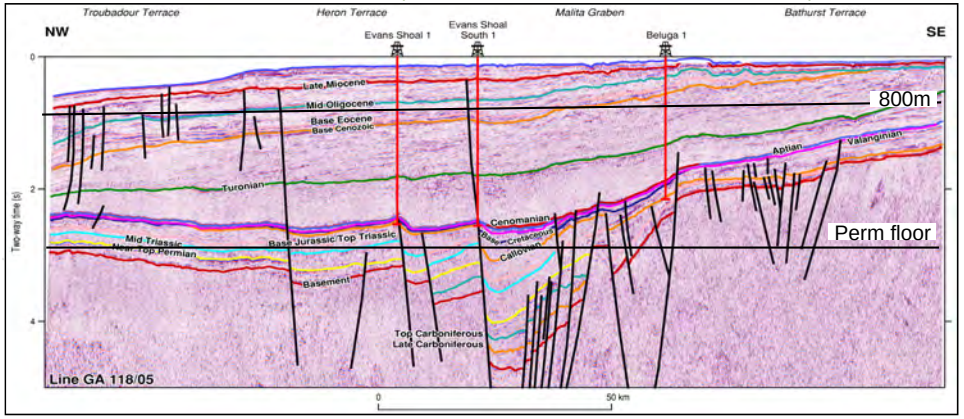


TOP SEAL POTENTIAL

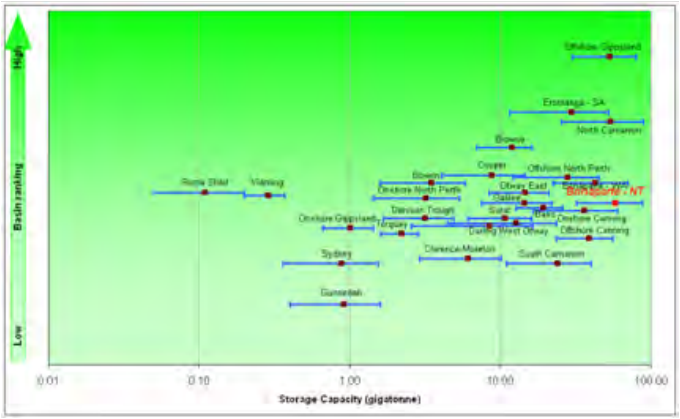


(After Gibson-Poole et al., 2002)

REGIONAL CROSS SECTION (LOCATION IN OIL AND GAS FIELDS MAP)

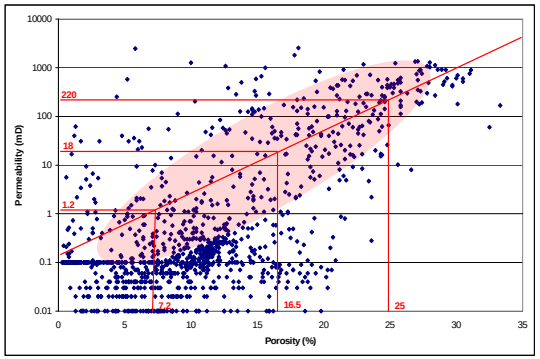


BASIN RANKING VS. CAPACITY

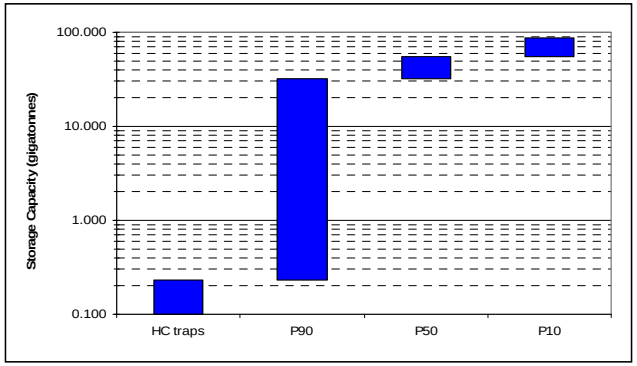


Bonaparte Basin (NT)

POROSITY VS. PERMEABILITY *Values from basin-wide dataset



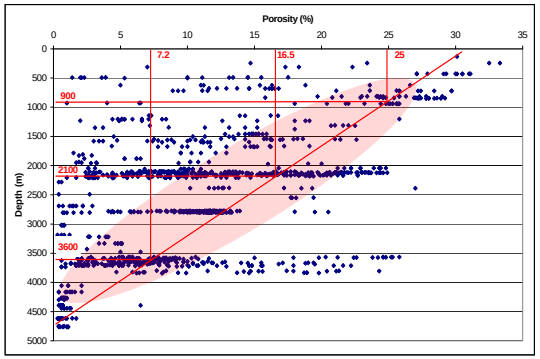
STORAGE CAPACITY



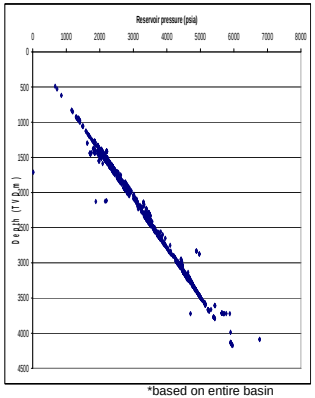
BASIN RANKING

Category	Description	Score	Weighting
Tectonics (Seismicity)	Low	5	0.00
Size	Very Large	4	0.06
Depth	Intermediate	3	0.10
Type	Non-marine and Marine	2	0.04
Faulting intensity	Extensive	1	0.14
Hydrogeology	Good	3	0.04
Geothermal	Moderate	2	0.05
Hydrocarbon potential	Large	4	0.05
Maturity	Developing	3	0.05
Coal and CBM	Deep	3	0.00
Reservoir	Good	4	0.16
Seal	Good	4	0.18
Reservoir/Seal Pairs	Excellent	4	0.03
Onshore/Offshore	Deep Offshore	1	0.00
Climate	Tropical	3	0.00
Accessibility	Difficult	2	0.00
Infrastructure	None	1	0.00
CO_2 sources	Few	2	0.00
Knowledge level	Good	3	0.05
Data availability	Good	3	0.05
Overall Ranking			**15**

POROSITY VS. DEPTH

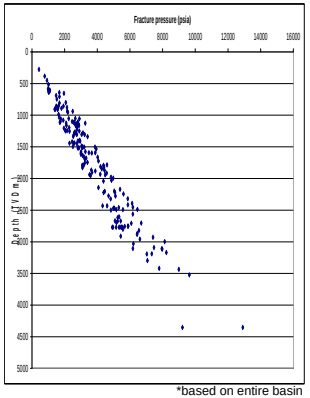


RESERVOIR PRESSURE VS. DEPTH *CSIRO PressurePlot



*based on entire basin

FRACTURE PRESSURE VS. DEPTH *CSIRO PressurePlot



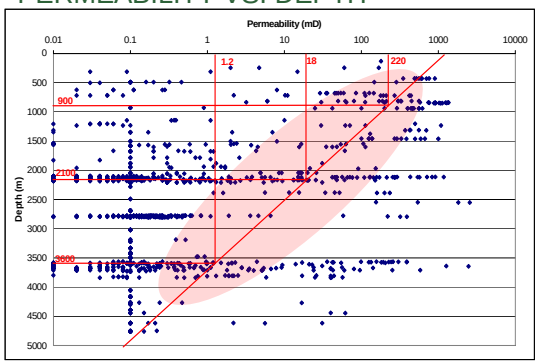
*based on entire basin

STORAGE CAPACITY ESTIMATE

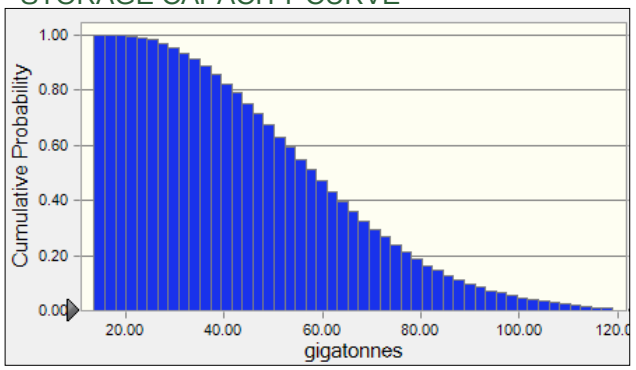
Parameter	Unit	Score (P90)	Score (P50)	Score (P10)	Distribution
Area of storage region	km^2	30000*	65000*	103000	Triangular
Gross thickness of saline formation	m	100	250	400	Triangular
Average porosity of saline formation over thickness interval	%	12	15	18	Triangular
Density of CO_2 at average reservoir conditions	$tonne/m^3$	0.5	0.6	0.7	Triangular
E-storage efficiency factor (% of total pore volume)	%	4	4	4	
Calculated storage potential	gigatonnes	32.2	55.3	88.0	

* including WA

PERMEABILITY VS. DEPTH



STORAGE CAPACITY CURVE



POTENTIAL INJECTION PARAMETERS

Parameter	Unit	Shallow	Mid-Depth	Deep
Depth base seal	m	800	1700	3350
Formation thickness	m	100	400	250
Injection depth	m	900	2100	3600
Porosity	%	25	16.5	7.2
Absolute permeability	mD	220	18	1.2
Formation pressure	psia	1295	3025	5185
Fracture pressure	psia	1905	4445	7620

Insufficient data for the following items:
- Regional Seal Area

DISCLAIMER

The purpose of these montages is to aid a high level evaluation of the geological storage potential of Australia's sedimentary basins for future CO_2 emissions. The evaluations are based on core analysis and other data derived from Geoscience Australia and other sources. However due to time constraints, it has not been possible to carry out the detailed evaluation of the data, which will be required for the next phase of analysis.

In this exercise, we sought to recognise a range of characteristics within each basin by identifying three sets of parameters at different locations and depths in the basin. The intent is to generate an indication of a range of storage capacity and potential injection rates. These capacities and rates are being used in high level reservoir modelling work to generate injection tariffs* and capacity estimates. All of this work feeds into a process that provides indicative, conceptual transport and storage tariffs for CO_2 emissions captured in various parts of Australia.

This 'top down', simplistic approach seeks to describe the magnitude and range of potential costs for transport and storage in Australia, at a 'conceptual' level of accuracy. Clearly, any final investment decision would call on an increased understanding and level of accuracy through the usual project development process.

* Cost per tonne of CO_2 avoided, calculated using the net present value of cash flows over a 25 year asset life.

REFERENCES

Gibson-Poole, C., Lang, S., Streit, J., Kraishan, G. and Hillis, R., 2002. Assessing a basin's potential for geological sequestration of carbon dioxide: An example from the Mesozoic of the Petrel Sub-basin, NW Australia. In: Keep, M. and Moss, S.J. (eds), The Sedimentary Basins of Western Australia 3. Proceedings of the Petroleum Exploration Society of Australia Symposium 2002, Perth, 439-463.

Petroleum and Marine Division, Geoscience Australia, 2007. Oil and Gas Resources of Australia 2005. Geoscience Australia, Canberra.