

Browse Basin

NW WESTERN AUSTRALIA, OFFSHORE

Reservoir:

Prion/Grebe, Bassett, Plover, Vulcan formations

Seal:

Tertiary Topsets, Echuca Shoals Formation

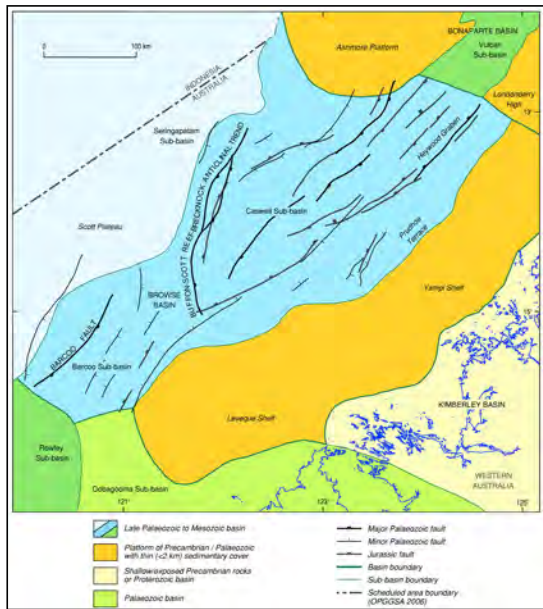
HYDROCARBON POTENTIAL

CATEGORY 2 (OGRA 2005)

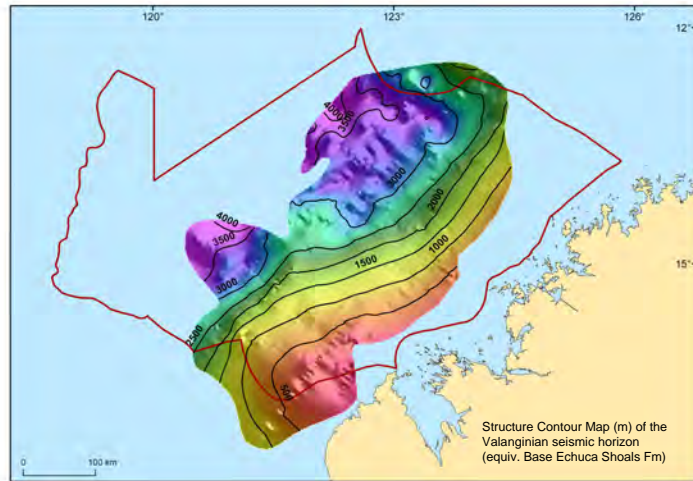
Crude oil	MMBL	13.59
Condensate	MMBL	628.98
LPG	MMBL	438.19
Sales gas	Tcf	29.38



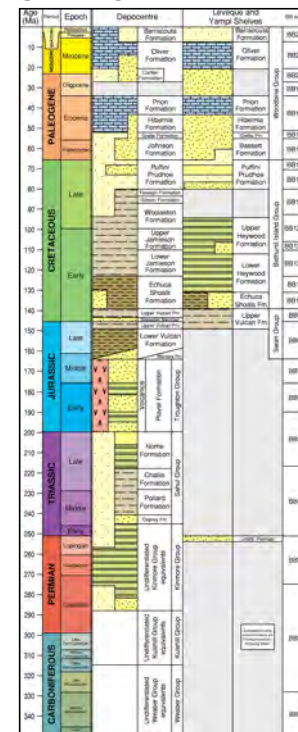
STRUCTURAL ELEMENTS



REGIONAL SEAL AREA

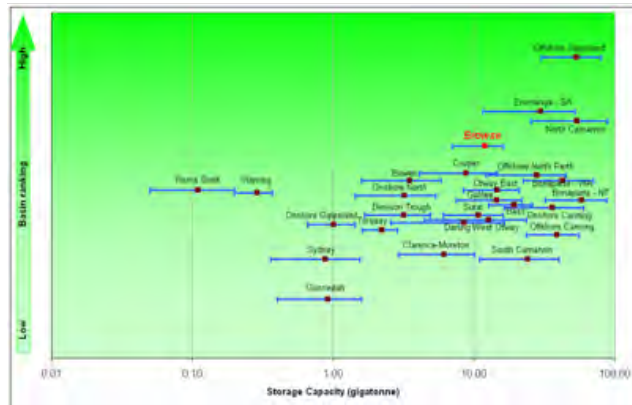


STRATIGRAPHY

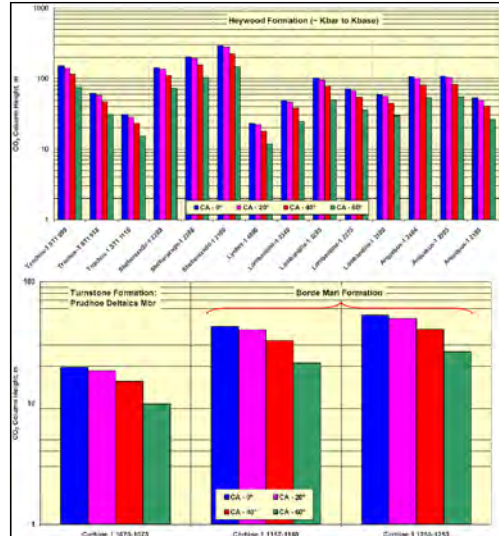


(After Blevin et al., 1997)

Basin Ranking vs. Capacity

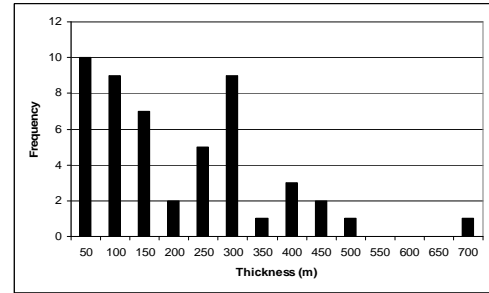


TOP SEAL POTENTIAL

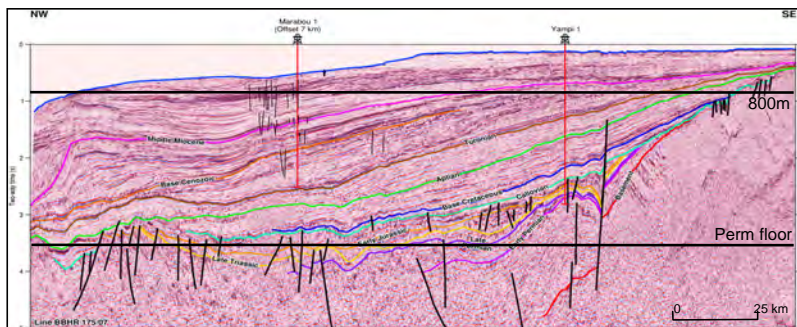


(After Daniel, 2007; 2008)

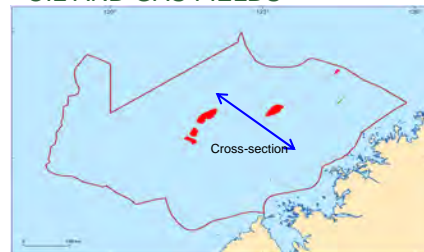
RESERVOIR THICKNESS



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



OIL AND GAS FIELDS

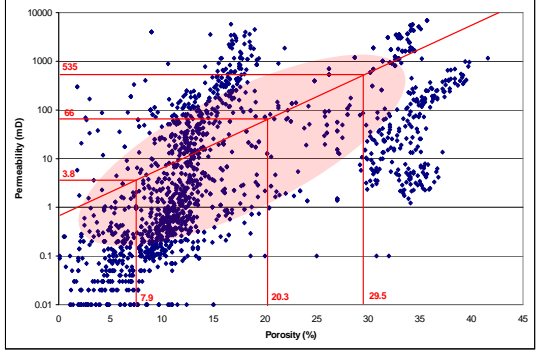


WELLS AND SEISMIC COVERAGE

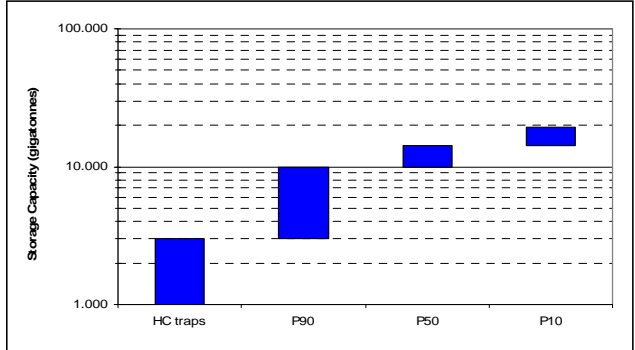


Browse Basin

POROSITY VS. PERMEABILITY *Values from basin-wide dataset



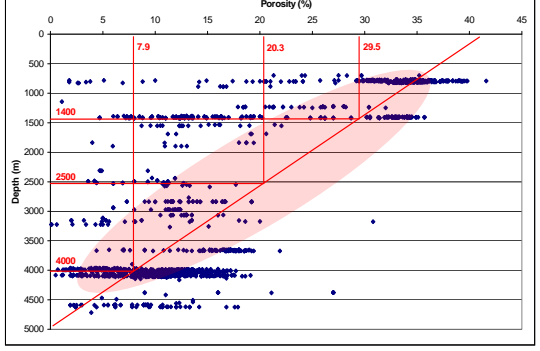
STORAGE CAPACITY



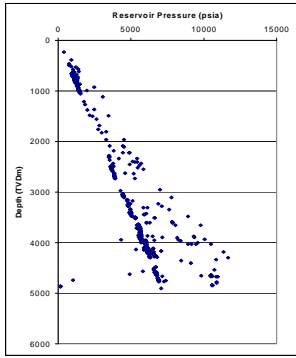
BASIN RANKING

Category	Description	Score	Weighting
Tectonics (Seismicity)	Low	5	0.00
Size	Very Large	4	0.06
Depth	Intermediate	3	0.10
Type	Marine	3	0.04
Faulting intensity	Moderate	2	0.14
Hydrogeology	Poor	1	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	Excellent	5	0.16
Seal	Excellent	5	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	Minor	2	0.00
CO ₂ sources	Moderate	3	0.00
Knowledge level	Moderate	2	0.05
Data availability	Good	3	0.05
Overall Ranking			4

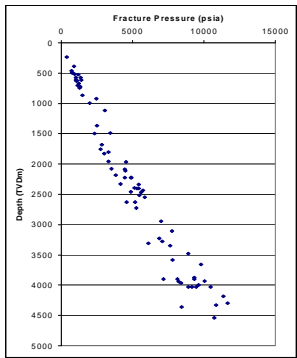
POROSITY VS. DEPTH



RESERVOIR PRESSURE VS. DEPTH *CSIRO PressurePlot



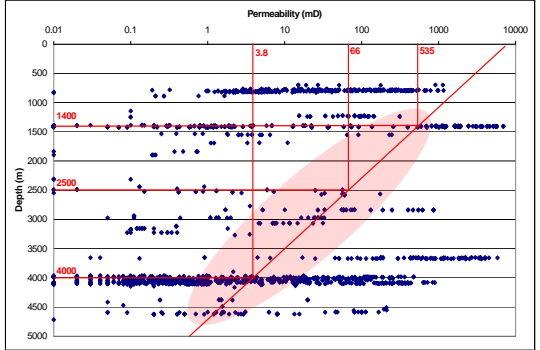
FRACTURE PRESSURE VS. DEPTH *CSIRO PressurePlot



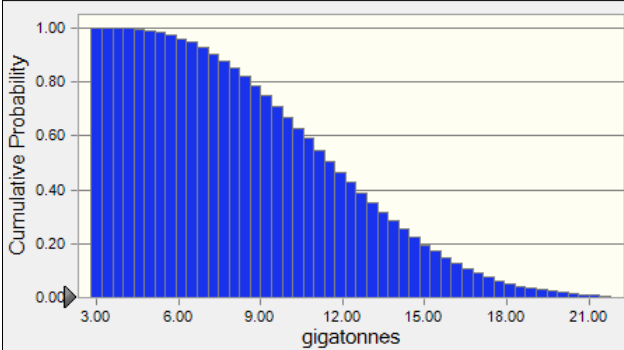
STORAGE CAPACITY ESTIMATE

Parameter	Unit	Score (P90)	Score (P50)	Score (P10)	Distribution
Area of storage region	km ²	9400	28200	28600	Triangular
Gross thickness of saline formation	m	60	120	180	Triangular
Average porosity of saline formation over thickness interval	%	15	18	22	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	7.0	11.3	16.3	

PERMEABILITY VS. DEPTH



STORAGE CAPACITY CURVE



POTENTIAL INJECTION PARAMETERS

Parameter	Unit	Shallow	Mid-Depth	Deep
Depth base seal	m	1100	2000	3800
Formation thickness	m	300	500	200
Injection depth	m	1400	2500	4000
Porosity	%	29.5	20.3	7.9
Absolute permeability	mD	535	66	3.8
Formation pressure	psia	2070	3700	5920
Fracture pressure	psia	2955	5275	8440

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 CO₂ 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 CO₂ 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 CO₂ avoided, calculated using the net present value of cash flows over a 25 year asset life.

REFERENCES

Blevin, J.E., Struckmeyer, H.I.M., Boreham, C.J., Cathro, D.L., Sayers, J. and Totterdell, J.M., 1997. Browse Basin High Resolution Study, Interpretation Report, North West Shelf, Australia. AGSO Record 1997/38.

Daniel, R., 2007. Carbon dioxide seal capacity study, Carbine ESSCI, Browse Basin, Western Australia. Cooperative Research Center for Greenhouse Gas Technologies, Canberra, Australia, CO2CRC Publication Number RPT07-0532. 20pp.

Daniel, R., 2008. Carbon dioxide seal capacity study, Leveque Shelf ESSCI, Browse Basin, Western Australia. Cooperative Research Centre for Greenhouse Gas Technologies, Canberra, Australia, CO2CRC Publication Number RPT07-0531. 51pp.

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