

Offshore North Perth Basin

SW WESTERN AUSTRALIA, OFFSHORE

Reservoir:

Cattamara Coal Measures,
Lesueur Sandstone
Wittecarras Sandstone

Seal:

Cadda Formation,
Kockatea Shale

HYDROCARBON POTENTIAL

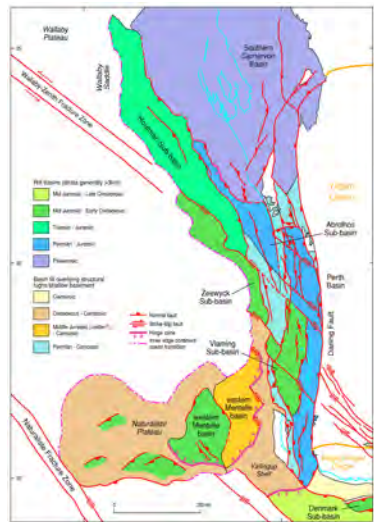
CATEGORY 1 and 2* (OGRA 2005)

Crude oil	MMBL	39.97
Condensate	MMBL	11.24
LPG	MMBL	0.00
Sales gas	Tcf	1.38

*data from entire basin



STRUCTURAL ELEMENTS



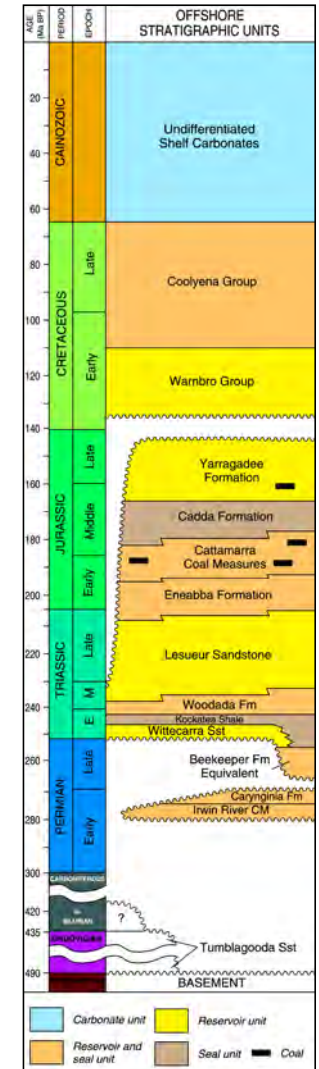
OIL AND GAS FIELDS



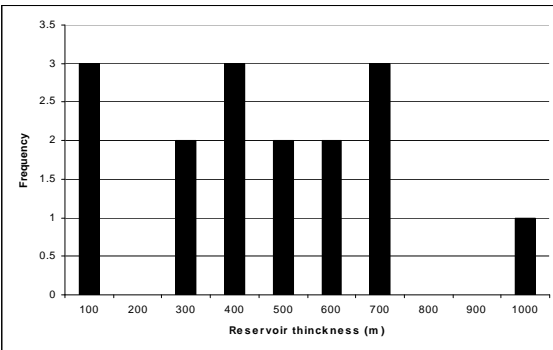
WELLS AND SEISMIC COVERAGE



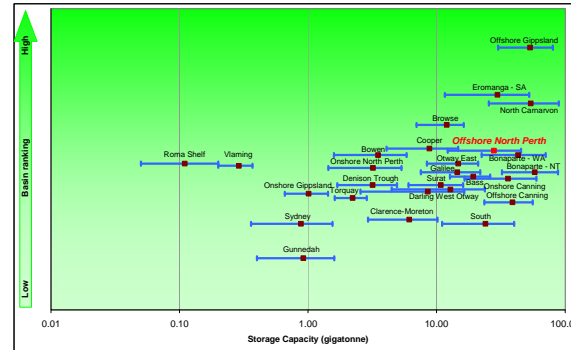
STRATIGRAPHY



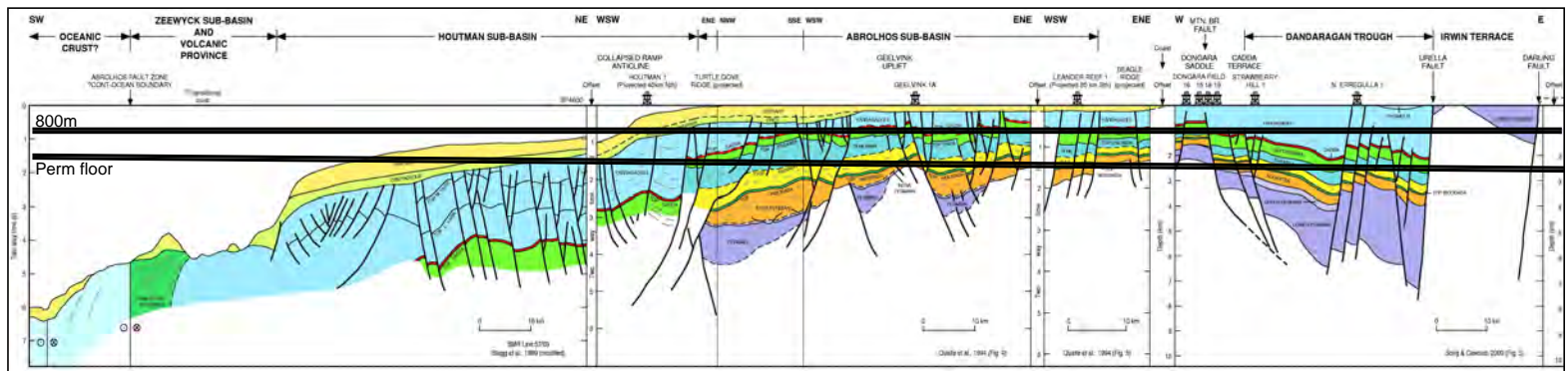
RESERVOIR THICKNESS



BASIN RANKING VS. CAPACITY

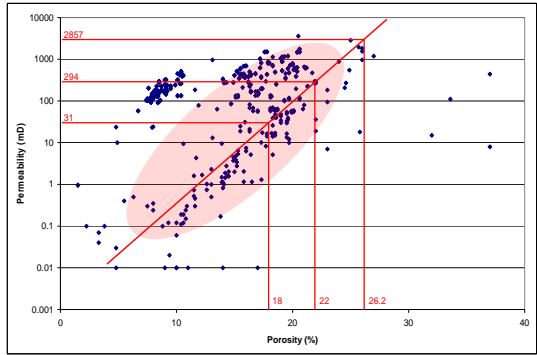


REGIONAL CROSS SECTION (LOCATION IN OIL AND GAS FIELDS MAP)

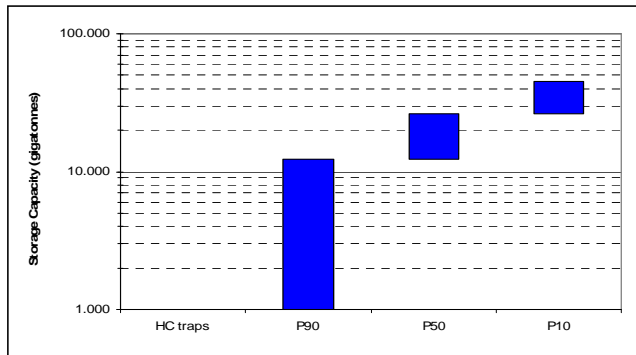


Offshore North Perth Basin

POROSITY VS. PERMEABILITY *Values from basin-wide dataset



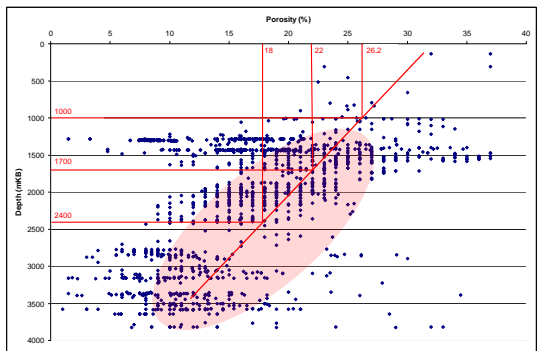
STORAGE CAPACITY



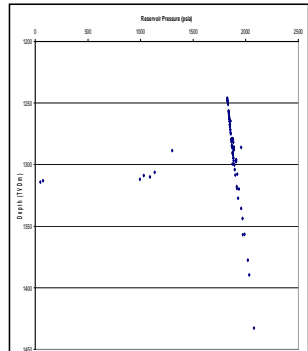
BASIN RANKING

Category	Description	Score	Weighting
Tectonics (Seismicity)	Medium/Low	4	0.00
Size	Very Large	4	0.06
Depth	Intermediate	3	0.10
Type	Non-marine and Marine	2	0.04
Faulting intensity	Moderate	2	0.14
Hydrogeology	Good	3	0.04
Geothermal	Moderate	2	0.05
Hydrocarbon potential	Medium	3	0.05
Maturity	Exploration	2	0.05
Coal and CBM	Deep	3	0.00
Reservoir	Excellent	5	0.16
Seal	Good	4	0.18
Reservoir/Seal Pairs	Excellent	4	0.03
Onshore/Offshore	Deep Offshore	1	0.00
Climate	Temperate	5	0.00
Accessibility	Easy	4	0.00
Infrastructure	Moderate	3	0.00
CO ₂ sources	Moderate	3	0.00
Knowledge level	Moderate	2	0.05
Data availability	Good	3	0.05
Overall Ranking			6

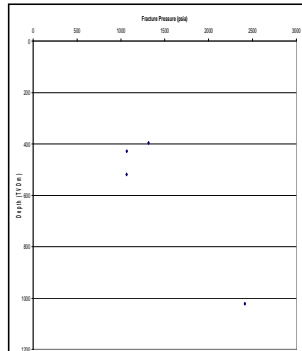
POROSITY VS. DEPTH



RESERVOIR PRESSURE VS. DEPTH *CSIRO PressurePlot



FRACTURE PRESSURE VS. DEPTH *CSIRO PressurePlot



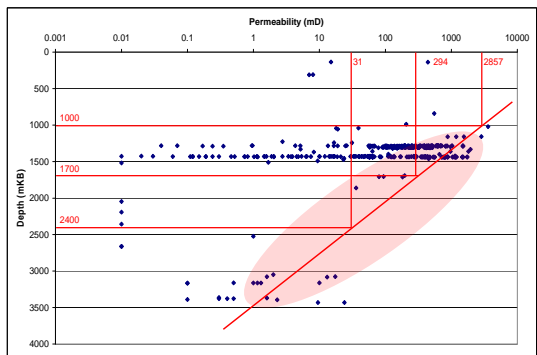
*data from entire basin

*data from entire basin

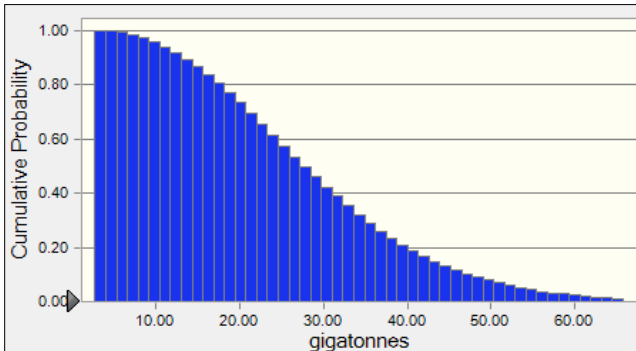
STORAGE CAPACITY ESTIMATE

Parameter	Unit	Score (P90)	Score (P50)	Score (P10)	Distribution
Area of storage region	km ²	5500	15500	30000	Triangular
Gross thickness of saline formation	m	50	400	600	Triangular
Average porosity of saline formation over thickness interval	%	17	20	23	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	12.2	26.4	45.3	

PERMEABILITY VS. DEPTH



STORAGE CAPACITY CURVE



POTENTIAL INJECTION PARAMETERS

Parameter	Unit	Shallow	Mid-Depth	Deep
Depth base seal	m	800	1300	1800
Formation thickness	m	200	400	600
Injection depth	m	1000	1700	2400
Porosity	%	26.2	22	18
Absolute permeability	mD	2857	294	31
Formation pressure	psia	1465	2490	3510
Fracture pressure	psia	2165	3680	5195

Insufficient data for the following items:
 •Regional Seal Area Figure
 •Top Seal Potential

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

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