Onshore North Perth Basin

SW WESTERN AUSTRALIA, ONSHORE

Reservoir:

Beekeeper Fm/Dongara, High Cliff and Lesueur sandstones

Seal:

Kockatea Shale, Cattamara Coal Measures Cadda Fm

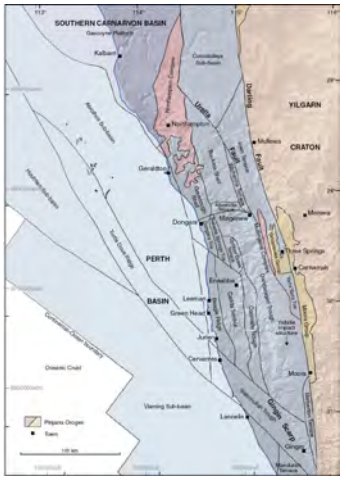
HYDROCARBON POTENTIAL

CATEGORY 1 and 2* (OGRA 2005)

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

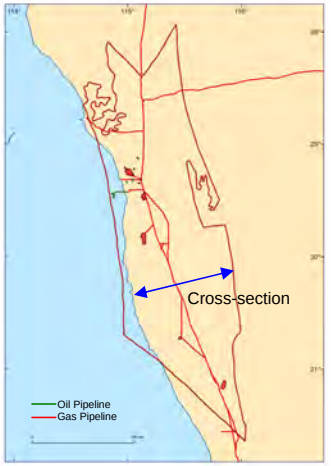
*data from entire basin

STRUCTURAL ELEMENTS



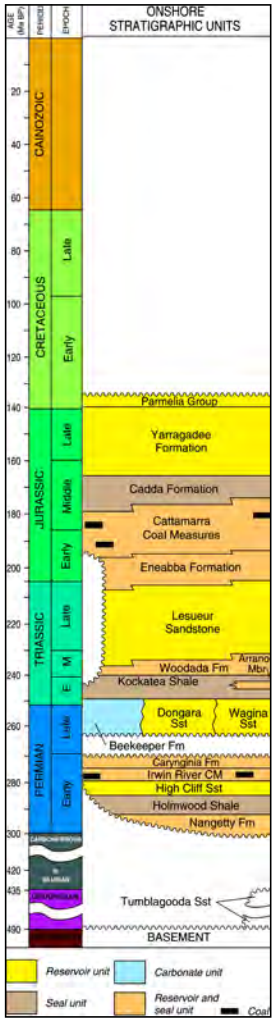
(After Mory et al., 2005)

OIL AND GAS FIELDS

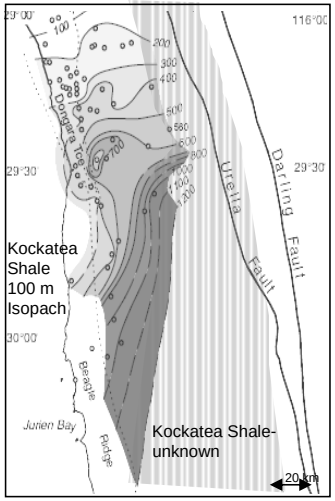


WELLS AND SEISMIC COVERAGE

STRATIGRAPHY

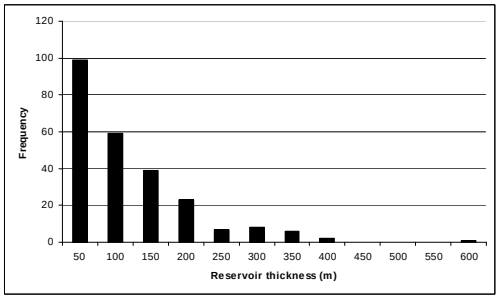


REGIONAL SEAL AREA

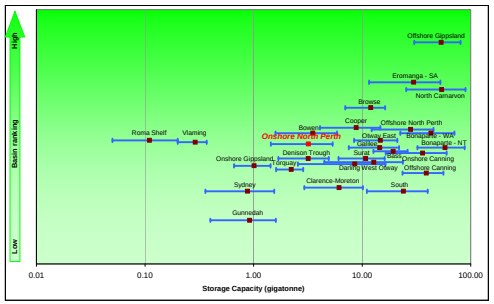


(After Mory and Iasky, 1996)

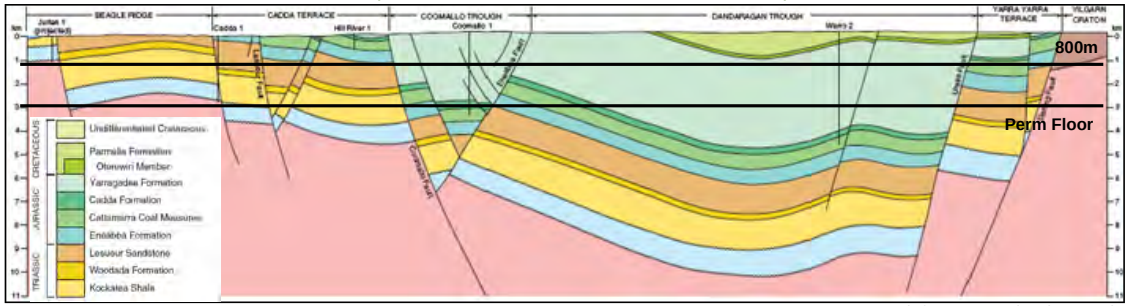
RESERVOIR THICKNESS



BASIN RANKING VS. CAPACITY



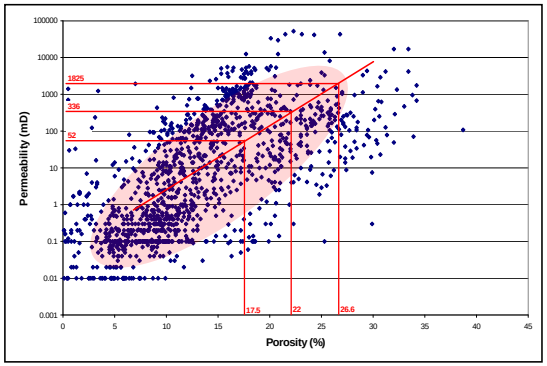
REGIONAL CROSS SECTION (LOCATION IN OIL AND GAS FIELDS MAP)



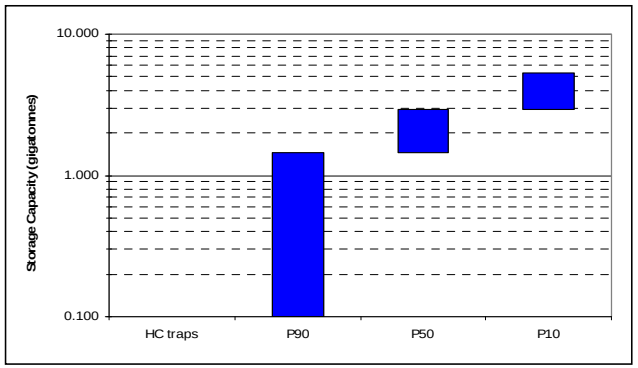
(After Mory and Iasky, 1996)

Onshore North Perth Basin

POROSITY VS. PERMEABILITY *Values from basin-wide dataset



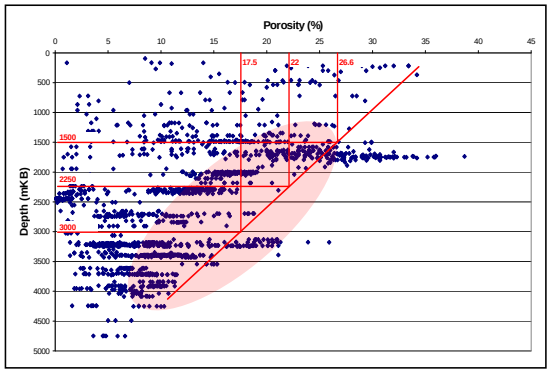
STORAGE CAPACITY



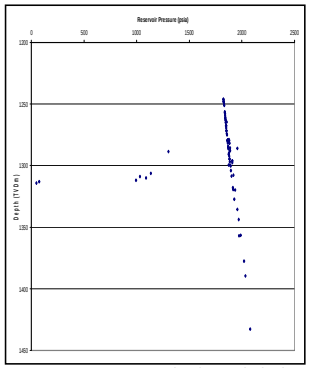
BASIN RANKING

Category	Description	Score	Weighting
Tectonics (Seismicity)	Medium/Low	4	0.00
Size	Large	3	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	Large	4	0.05
Maturity	Mature	4	0.05
Coal and CBM	Deep	3	0.00
Reservoir	Poor	3	0.16
Seal	Good	4	0.18
Reservoir/Seal Pairs	Excellent	4	0.03
Onshore/Offshore	Onshore	3	0.00
Climate	Temperate	5	0.00
Accessibility	Easy	4	0.00
Infrastructure	Extensive	4	0.00
CO_2 sources	Moderate	3	0.00
Knowledge level	Good	3	0.05
Data availability	Excellent	4	0.05
Overall Ranking			**13**

POROSITY VS. DEPTH

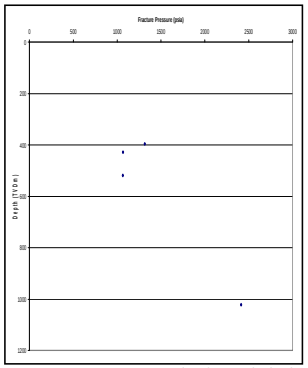


RESERVOIR PRESSURE VS. DEPTH *CSIRO PressurePlot



*data from entire basin

FRACTURE PRESSURE VS. DEPTH *CSIRO PressurePlot

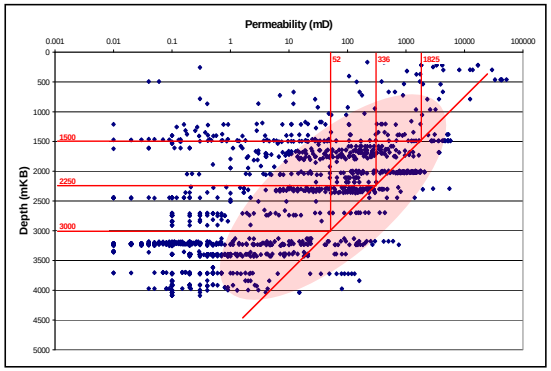


*data from entire basin

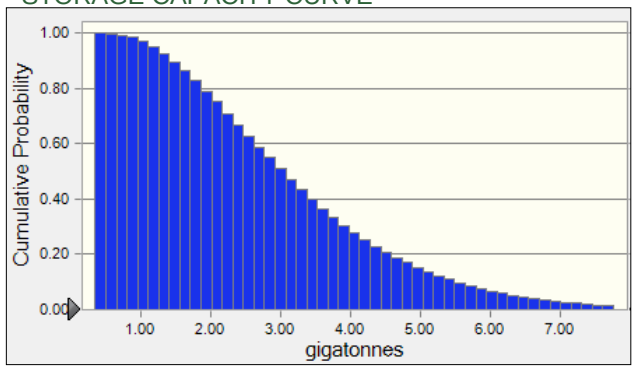
STORAGE CAPACITY ESTIMATE

Parameter	Unit	Score (P90)	Score (P50)	Score (P10)	Distribution
Area of storage region	km^2	1000	4400	11900	Triangular
Gross thickness of saline formation	m	50	100	200	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	1.4	2.9	5.3	

PERMEABILITY VS. DEPTH



STORAGE CAPACITY CURVE



POTENTIAL INJECTION PARAMETERS

Parameter	Unit	Shallow	Mid-Depth	Deep
Depth base seal	m	1450	2125	2800
Formation thickness	m	50	125	200
Injection depth	m	1500	2250	3000
Porosity	%	26.6	22	17.5
Absolute permeability	mD	1825	336	52
Formation pressure	psia	2195	3290	4390
Fracture pressure	psia	3250	4870	6495

Insufficient data for the following items:
- Top Seal Potential
- Fracture Pressure vs. Depth

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

Mory, A. J., Haig, D. W., McLoughlin, S. and Hocking, R. M., 2005. Geology of the northern Perth Basin, Western Australia- a field guide. Western Australia Geological Survey, Record 2005/9, 71pp.

Mory, A.J. and Iasky, R.P., 1996. Stratigraphy and structure of the onshore northern Perth Basin. Geological Survey of Western Australia, Report 46, 781-789.

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