Origin energy

PEP 152, OTWAY BASIN, VIC

Koroit West-1

WELL PROPOSAL

Origin Energy Resources Limited
ABN 66 007 845 338
Ground Floor, South Court, John Oxley Centre
339 Coronation Drive
MILTON QLD 4064

November 2002

TABLE OF CONTENTS

915133 003

FIGURES

TABLES

APPENDICES

ENCLOSURES

SUMMARY

Koroit West-1 is proposed as a shallow oil exploration well (TD approximately 800 mSS) in the northeastern portion of PEP 152. It is located approximately 10.0 km southeast of Taralea-1, 7 km northwest of Yangery-1 and 3.5 km south of Warrong-5 on the northern flank of the Koroit Trough. The identified prospect represents a fault related structure at top Waarre /Belfast Mudstone level.

The main reservoir target is a potential sandstone layer that is part of the Late Cretaceous Sherbrook Group overlying the regional Eumeralla unconformity. This sandstone unit has been identified and correlated in the neighbouring wells and is referred to as Intra Belfast Sandstone by Origin Energy. Essential Petroleum places the sandstone layer in the underlying Flaxman Formation.

In both classifications, the overlying Belfast Mudstone represents the top seal, whereas the lateral closure of the structure is provided by cross-fault seal and by dip closure. The Belfast Mudstone is a proven seal in the Port Campell area.

Charge is attributed to have resulted from the mature basal coals of the Eumeralla Formation in the Koroit Trough towards the south. The migration of the oil into the potential reservoir sandstone must have initially occurred along faults.

The existing well logs suggest a possible reservoir thickness of approximately 6 to 10 metres for the proposed Koroit West-1 well location. The main risks of the prospect are related to the overall structural definition of the trap and the uncertainties related to thickness variations or the total absence of the reservoir or the Belfast Mudstone at this location.

The overall chance for finding hydrocarbons is estimated at approximately 13%.

Mean recoverable reserves for the Koroit West prospect are estimated by the operator at 3.6 MMSTB for the oil case and 3.4 PJ for the gas case (+ 34.0 MSTB of condensate).

Economic analysis indicates the Koroit West Project has a positive EMV @ 10.5% DF ATAX of 0.7 M$ for the oil case and a negative EMV @ 10.5% DF ATAX of -0.8 M$ for the gas case. These figures are base on a 20% chance for the oil case.

Koroit West-1, if successful, will upgrade the oil potential of the Late Cretaceous Sherbrook Group in this part of the onshore Otway Basin and may encourage further exploration work focussing on similar structures.

In case of a gas discovery, the well would have to be suspended until a larger gas discovery potentially at the deeper Pretty Hill play has been made. Finding hydrocarbons, especially the gas case, would encourage targeting more costly but higher rewarding prospects at deeper structural levels.

1.0 GENERAL INFORMATION

WELL NAME:	Koroit West-1
PERMIT:	PEP 152
BASIN:	Onshore Otway Basin
TYPE OF WELL:	Oil Exploration
PARTICIPATION INTERESTS:	Origin Energy Resources Ltd 50.51% Essential Petroleum Resources Ltd 33.9% Lakes Oil NL 15.59%
LOCATION:	Seismic line oc95-111 at shot point 745 Latitude: 38° 16' 42.17" S Longitude: 142° 17' 53.35" E Datum: GDA 94 Easting: 613 544 Northing: 576 2501 Datum: GDA 94
ELEVATION:	Ground Level: 45.0 m AMSL (approximate) Rotary Table: 47.0 m AMSL (approximate)
PROPOSED T.D:	800 SSm (as deep as 920 m is possible - see text for discussion)
PRIMARY OBJECTIVES:	Intra Belfast Sandstone
SECONDARY OBJECTIVES	Pebble Point Formation, Nullawaare Sandstone, Intra Paaratte Sandstones
MEAN RECOVERABLE RESERVES:	3.6 MMSTB (oil case) 3.4 PJ (gas case)
WELL COST ESTIMATE:	C&S: $600k P&A: $400k

2.0 TECHNICAL JUSTIFICATION

2.1 Permit Summary

PEP 152 comprises 827 square kilometres of onshore area in the Victorian part of the Otway Basin. The permit is in its third year of the current 5-year term, which commenced on 03/02/2001. The current term expires on 02/02/2005. A total of 1342 kilometres of 2D seismic data have been acquired since 1958 including the most recent Spring Creek Seismic Survey in 2000.

8 exploration wells have been drilled in the permit since 1959. Table 1 summarizes the results of these wells.

Year	Well Name	Operator	Well Type	Target	Total Depth (MKB)	Result	Flow Rate/ Recovery
1959	Belfast 4	Vic Mines	Strat.	None	1638	P&A	No test
1960	Yangery 1	Vic Mines	Strat.	None	1320	P&A	No test
1961	Wangoom 1	Vic Mines	Strat.	None	1195	P&A	No test
1962	Eumeralla 1	Frome	Expl.	Crayfish Group	3142	P&A, oil shows	
1987	Windemere 1	Minora	Expl.	Pebble Pt./Eumeralla	1838	P&A, Oil rec. from Heathfield Sst	5 DST's max rec. 20.4bbl oil plus 11.3bbls gas cut oil
1989	Windemere 2	Minora	Expl.	Heathfield/ Windemere/ Crayfish Group	3595	P&A, oil shows in Windemere Sst	3 DST's, rec'd muddy water & oil cut mud
1992	Shaw 1	Minora	Expl.	Pebble Pt./ Eumeralla	960	P&A	No tests
2002	Pt Fairy 1	Origin Energy/ Essential Petroleum	Expl.	Waarre Sst	1550	C&S, strong oil/gas shows in Flaxman and Eumeralla	3 DST's and cased hole-testing, interpretation is pending

Table 1 Wells drilled in PEP 152

The current participants in the PEP 152 permit are:

Origin Energy Resources Ltd	50.51% (Operator)
Essential Petroleum Resources Ltd	33.9%
Lakes Oil NL	15.59%

The proposed well Koroit West-1 will meet the current year 3 well commitment

2.2 Exploration History

PEP 152 in the Onshore Otway Basin region of Victoria can be considered relatively under-explored with only two deep wells reaching the Early Cretaceous Crayfish Group at a depth of about 2300 to 2600 m. These were Eumeralla-1 drilled in 1962 and Windemere-2 drilled in 1989. All other wells targeted reservoirs at shallower levels of approximately 800 to 1500 m associated with the base Tertiary Pebble Point Formation, Late Cretaceous Waarre Formation and the Early Creataceous Upper Eumeralla Formation (see stratigraphic column in Figure 1)

The best quality source rocks in the area are known to be in the basal Crayfish Group Casterton Formation and coals occurring at the base of the Eumeralla Formation, sometimes referred to as the Geltwood Beach Formation or Killara Coals. The Killara Coals have been penetrated in three deep wells in adjacent licence PEP 159, approximately 20 to 25 kilometres northwest of the proposed well location. These wells are Pretty Hill-1, Killara-1 and Taralea-1.

Maturation modelling indicates that the Casterton Formation sediments are over mature in the deeper parts of PEP 152 and that the Base Eumeralla coals are currently mature for hydrocarbon generation.

The main exploration targets in PEP 152 and adjacent PEP 159 comprise the Intra-Crayfish Group sandstones, sandstones of the Late Cretaceous Sherbrook Group overlying the top Eumeralla Unconformity as well as the base Tertiary Pebble Point Formation.

To date no commercial hydrocarbons have been discovered in this part of the onshore Otway Basin. However, well Windemere 1, drilled in 1987 by Minora Resources NL found significant oil shows within the Heathfield Member of the Eumeralla Formation (DST result: 11.3 bbl gas cut oil, 20.4 bbls oil, 20.3 bbls gas cut water and 5.8 bbls mud).

Most recently, Port Fairy-1 in the southern part of PEP 152 encountered strong oil and gas shows in the Late Cretaceous Flaxman Formation. The well is now interpreted as a non-/ to sub-commercial gas condensate and potentially oil discovery.

The nearest producing hydrocarbon discoveries are situated in the Port Campell Embayment approximately 60 kilometres towards the southeast. At this location, gas is produced from the Late Cretaceous Waarre Formation.

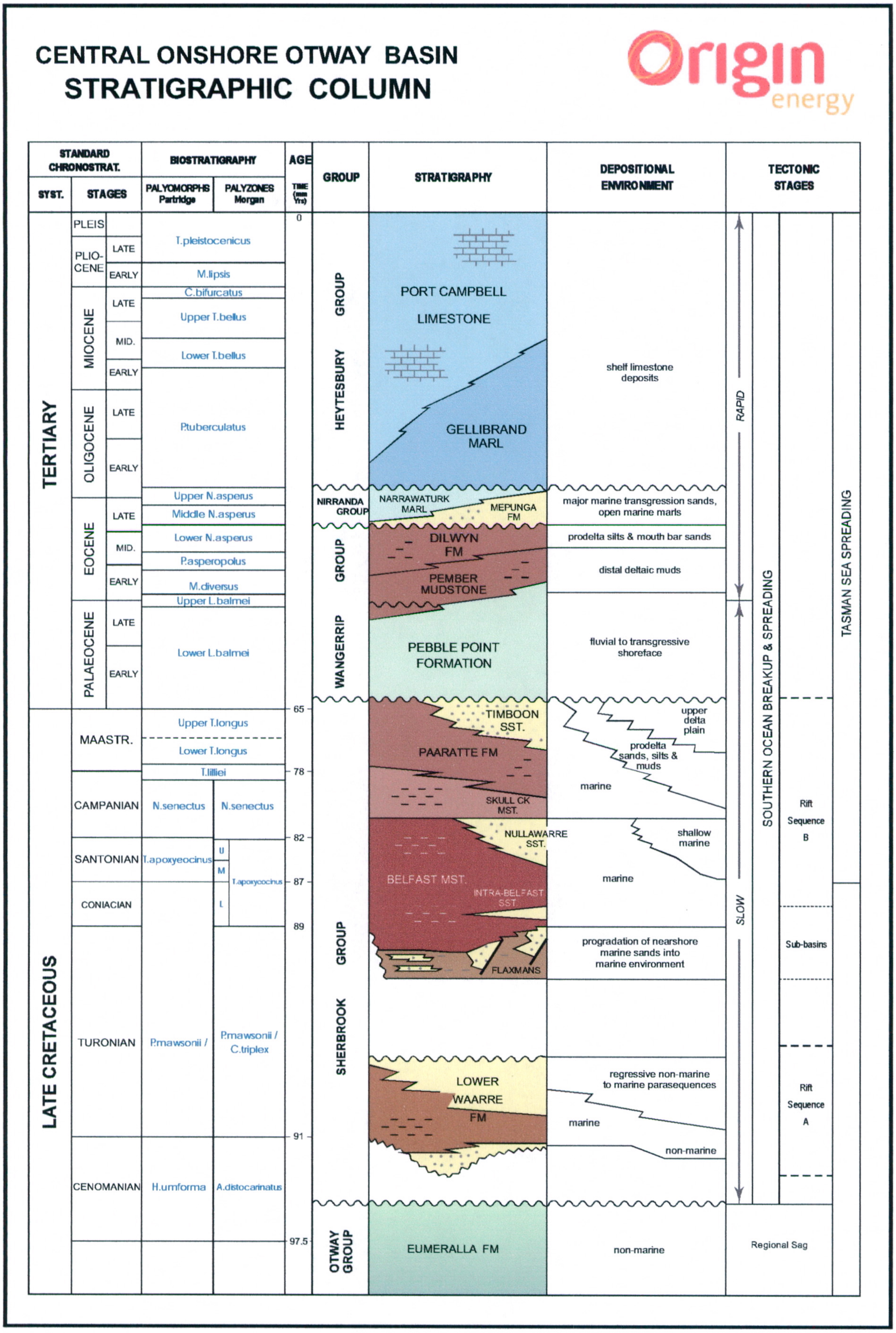


Figure 1. Generalised Stratigraphic column for PEP 152.

2.3 Prospect Description

The Koroit West Prospect is located approximately 10.0 km southeast of the existing hydrocarbon exploration well Taralea-1 in PEP 159. In PEP 152, two stratigraphic water bores (Yangery-1 and Warrong-5) are located 7 km towards the southeast and 3.5 km to the north (Figure 2).

The exploration well Koroit West-1 is designed to test the reservoir potential of a sandstone layer that is now believed to occur within the lower part of the Belfast Mudstone. This intra formational sandstone has been identified and correlated in the nearby wells Taralea-1, Yangery-1, Pretty Hill 1 (distance =16 km) and Warrong-5 and was referred to as "Intra-Belfast Sandstone".

Log data suggest that the sandstone is a 6 to 10 m thick, relatively clean quartz arenite with average porosities ranging from 17 to 22 percent.

The enclosing Belfast Mudstone represents a proven top seal for the underlying Waarre Sandstone in the Port Campell area. It is assumed that the Belfast Mudstone is also sealing the observed intra formational reservoir layer. Based on the mapping presented by Essential Petroleum, the lateral closure is provided by cross-fault seal and by dip closure.

Weak secondary targets may be seen in the Nullawarre Sandstone that may be present above the Belfast Mudstone, possible sandstone layers in the Paaratte Formation and in the base Tertiary Pebble Point Formation. However, the mudstones that overly these sands are presumably much thinner compared to the Belfast Mudstone and cross-fault sealing is less likely to work for these units.

The basal Waarre Formation of the Sherbrook Group which contains potential reservoir sands in the Port Campell area has been found to be of very poor reservoir quality in all nearby wells and is therefore not considered to represent a target at the Koroit West-1 location.

The Koroit West structure itself has been mapped as a triangular shaped fault block with two bounding faults dipping towards the north and northeast and dip closure towards the south (Figure 3). The overlying portion of the Belfast Mudstone forms the top seal of the trap.

The trap requires a working cross-fault seal along the strike of the two bounding faults that juxtaposes the reservoir layer against the overlying mudstones. Seismically, the thin reservoir is not resolved and it is therefore not possible to map out the exact trap geometry and related fault juxtapositions.

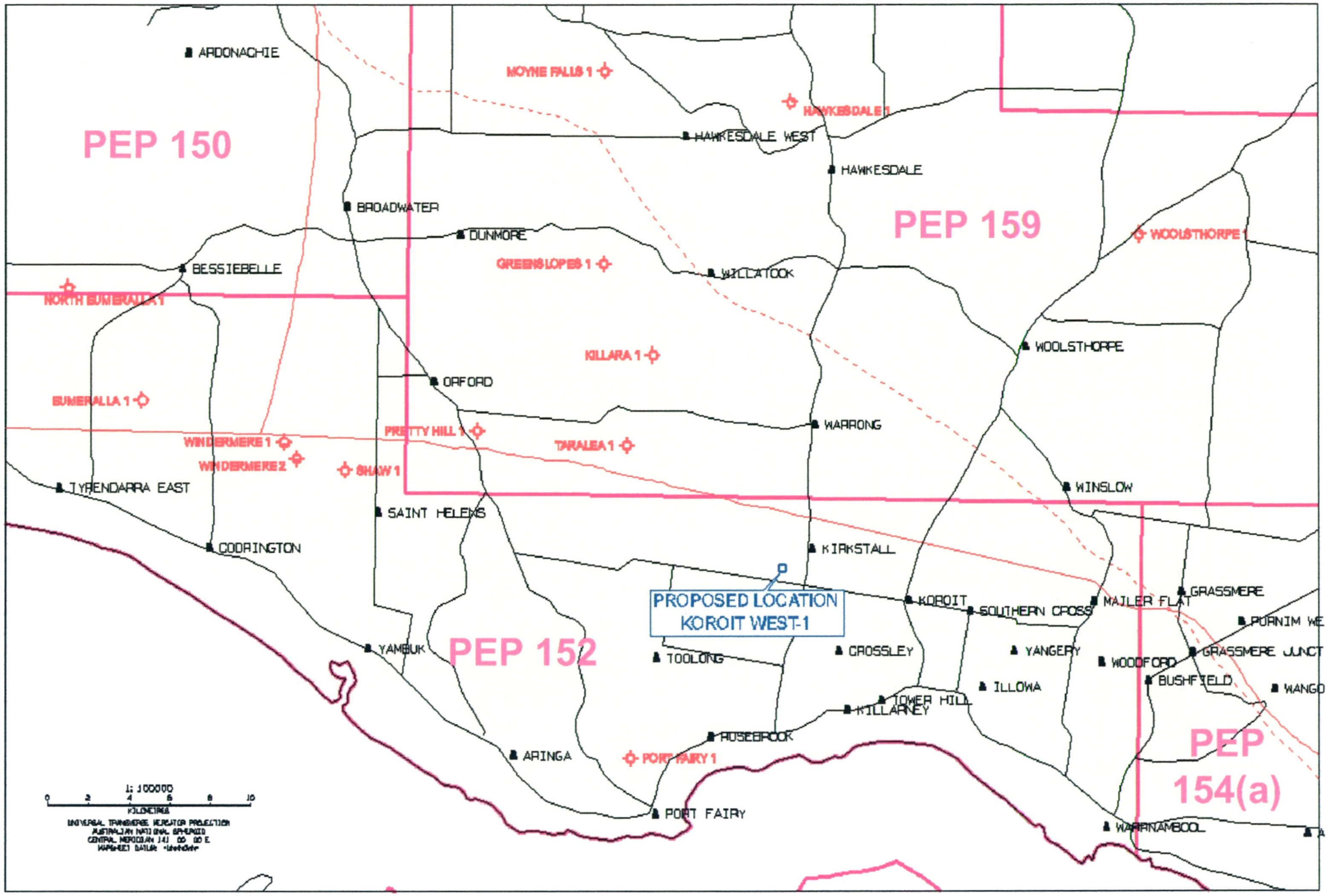


Figure 2. Location Map.

915133 010

2.4 Seismic Mapping

The Koroit West prospect in PEP 152 is covered by a moderate density (approximately 1km x 2km) grid of 2D seismic data. This seismic data is of mixed vintage ranging from 1985 through 1998. The vast majority of the seismic data defining the structure have been reprocessed in 2001 and is therefore of moderate to good quality.

The main uncertainties associated with the mapping of the Koroit West prospect are related to the size of the closure and the correlation of the prospect bounding faults.

Uncertainty also exists for the exact identification of the Top Eumeralla Unconformity and the subsequent mapping and distinction of the individual Formations and Members of the Sherbrook Group above the Eumeralla Formation and below the truncating base Tertiary unconformity. Although the quality of the seismic data is reasonably good, the distinction between the different units is generally not possible.

This well proposal is based on the structural mapping by Essential Petroleum.

The remaining structural uncertainty has been included in the reserve estimates and in resulting economic calculations.

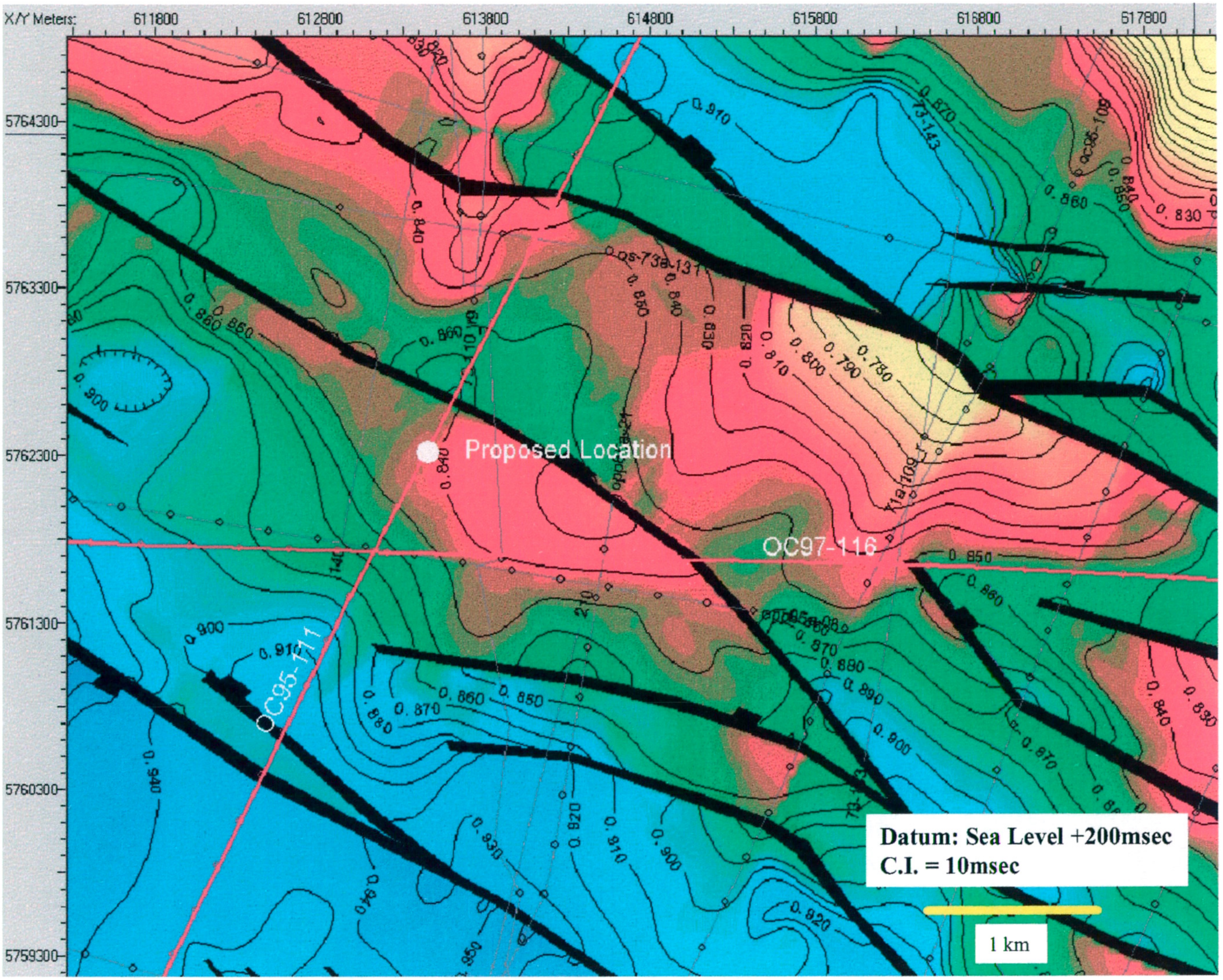


Figure 3. Time Structural Mapping of Near Top Flaxman Formation.

2.5 Well Location and Well Prognosis

The proposed location of Koroit West-1 is situated on reprocessed seismic line oc95-111 at shot point 745 slightly offset, but still proximal to, the structural crest of the prospect.

Coordinates for well Koroit West 1:

Latitude:	38° 16' 42.17'' S
Longitude:	142° 17' 53.35'' E
Datum:	GDA 94

Easting:	613 544
Northing:	576 2501
Datum:	GDA 94

At this location the top of the Intra Belfast Mudstone Sandstone (or Flaxman Formation according to Essential Petroleum) is prognosed to be intersected at approximately 709 m below mean sea level. Ground Elevation is at 45 m above mean sea level.

The well will be a vertical well drilled to 800 mSS TD into the Eumeralla Formation (see discussion for depth prognosis below).

The depth conversion is based on a combined time/depth-curved derived from check-shot data for Taralea-1 and Port Fairy-1. Most uncertainty exists in the prognosis of the Lower Cretaceous Sherbrook Group as has been mentioned in the previous paragraph.

The depth prognosis for the top of the reservoir at 709 mSS and for the Eumeralla Formation at 772 mSS is based on the seismic interpretation presented by Essential Petroleum (Figures 4 and 5).

It must be pointed out that the difficulties in identifying the Eumeralla Unconformity could result in significant errors in the well prognosis. The range of possible seismic picks for the unconformity probably lies within a time window between 700 to 750 ms corresponding to a depth range from 757 to 821 mSS. Taking into account that the accuracy of the applied time/depth-curve lies within 30 to 40 m, the total error may easily add up to more than 100 metres.

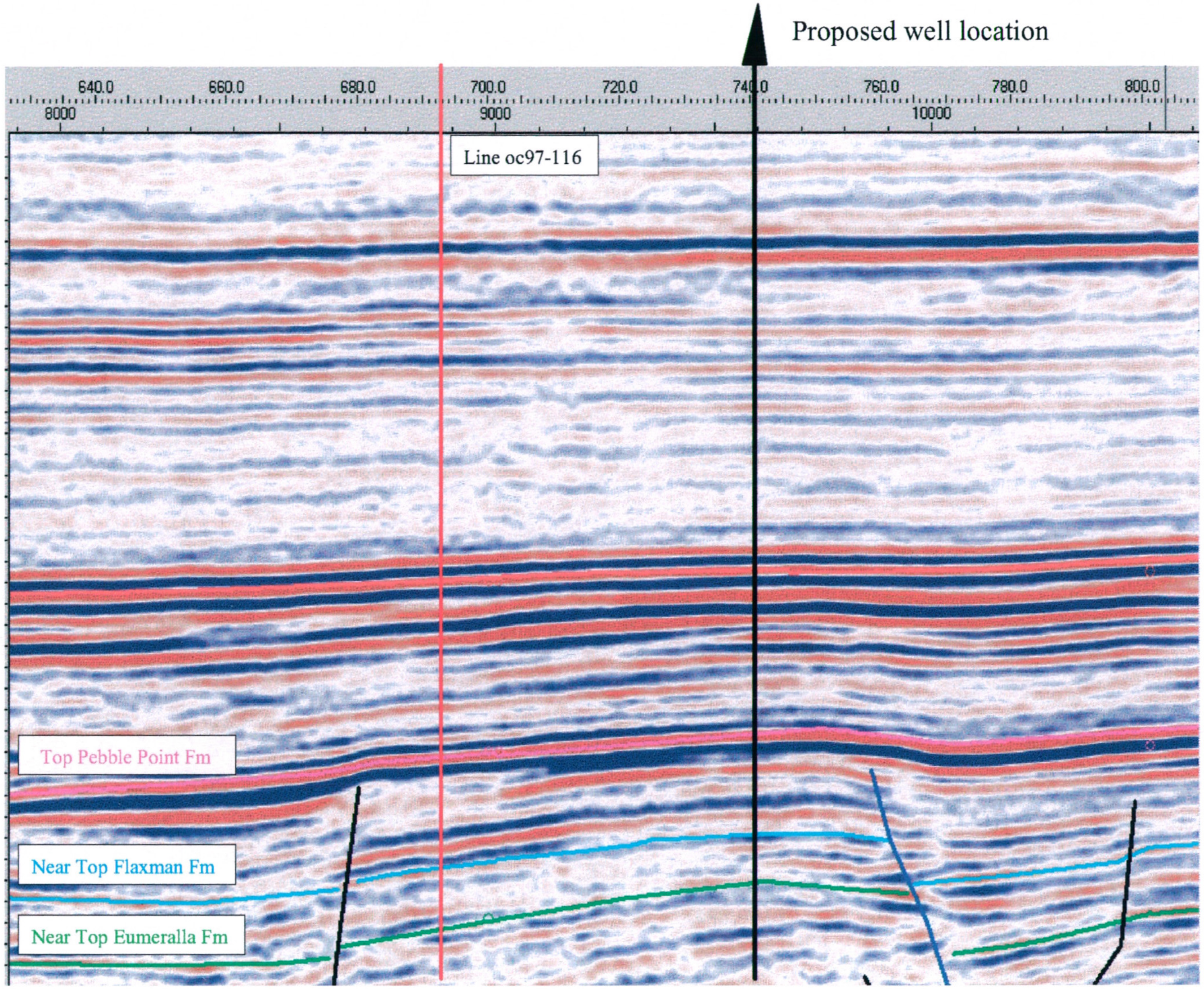


Figure 4. Seismic Interpretation – Line oc95-111.

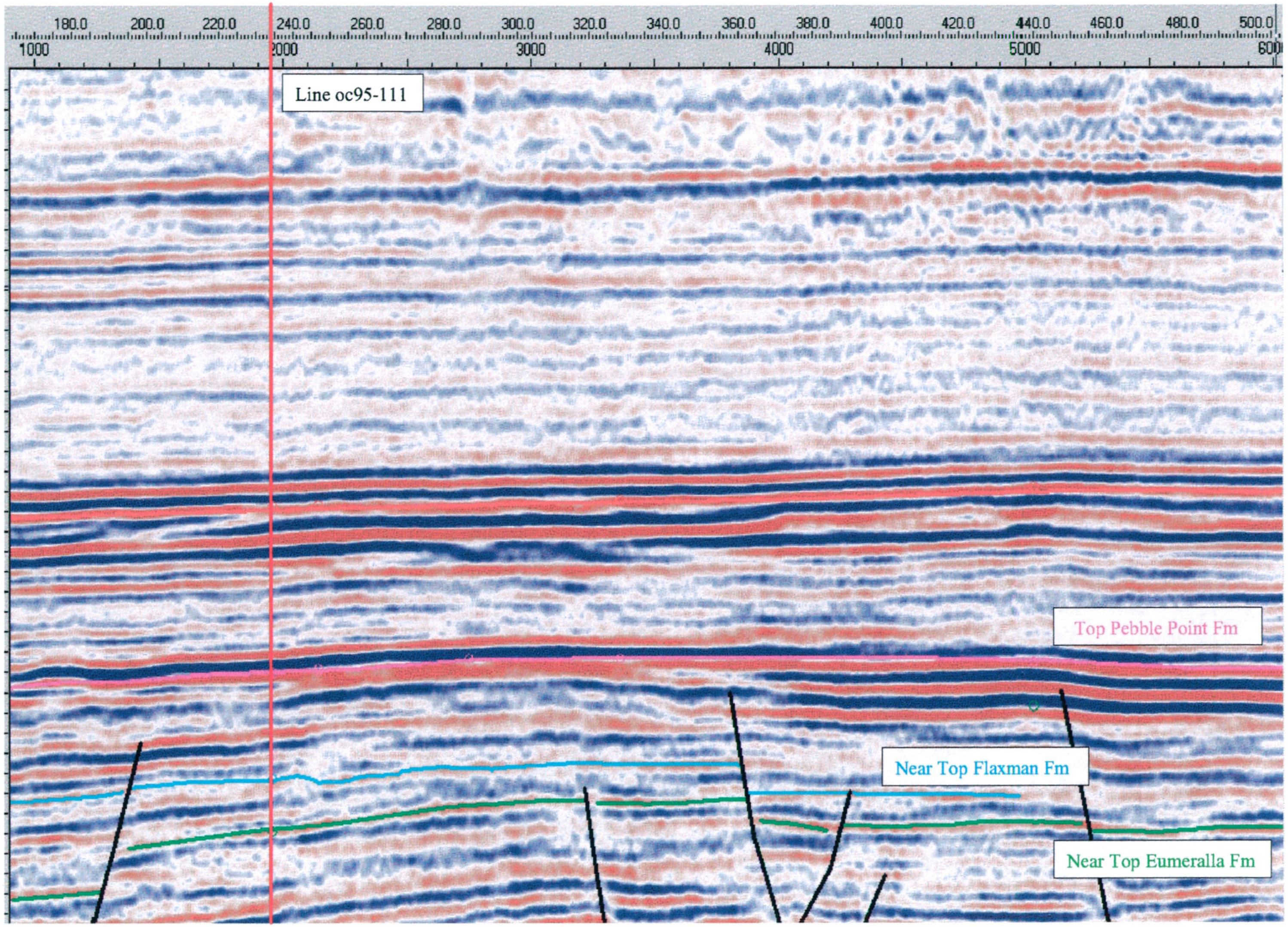


Figure 5. Seismic Interpretation – Line oc95-116.

There is also a small chance that the top of the Eumeralla is even deeper at 812 ms which corresponds to a depth of 902 mSS. The expected reservoir could then be found anywhere between 820 to 850 mSS.

It is also important to note, that the seismic identification and mapping of individual members of the Lower Sherbrook Group is highly speculative. A deeper top of the Eumeralla Formation would favour the presence of a much thicker Belfast Mudstone and would actually reduce the risk of cross-fault seal leakage significantly. A higher Eumeralla Formation would imply that the trap could only be present if the upper part of the Sherbrook Group was actually missing at this location.

The technical well design and drilling operation must include the possibility of drilling to a possible depth of 930 m SS (980 mMD).

Group	Formation	TWT (ms)	Depth SS GL=45	Depth KB=47	*Thickness*
Heytesbury	Port Campbell Limestone		- 45	0	142
	Gellibrand Marl	84	97	144	290
	Clifton Formation	382	387	434	17
Nirranda	Narrawaturk Marl	398	404	451	22
	Mepunga Fm	419	426	473	30
Wangerip	Dilwyn Fm	446	456	503	41
	Pember Mudstone	483	497	544	83
	Pebble Point Fm	555	580	627	18
Sherbrook	Paaratte Formation	570	598	645	19
	Skull Creek Mudstone	586	617	664	48
	Nullawarre Greensand	626	665	712	12
	Belfast Mudstone (above expected reservoir)	636	677	724	32
	Intra Belfast Sandstone (reservoir)	662	709	756	10
	Belfast Mudstone (below expected reservoir)	672	719	766	27
	Waarre Formation	691	746	793	26
Otway Group	Eumeralla Fm	712	772	819	28
	TD		800	847	

Table 2 Prognosis of Formation Tops. See text for discussion of depth prognosis for the Lower Sherbrook Group and the resulting uncertainties.

2.6 Reserves Calculations

Probabilistic reserves calculations have been performed for the Intra Belfast Mudstone Sandstone at the proposed Koroit West-1 location. The reserves calculations are based on the average reservoir parameters that have been estimated from the available well logs Warrong-5, Pretty Hill-1, Taralea-1 and Yangery-1.

The assumed gross reservoir thickness ranges from a minimum of 4 to a maximum thickness of 12 m (compared to 6 to 10 m as actually observed).

Mean porosity values have been varied from 17 to 22 %.

The results of the probabilistic reserves calculations give unrisked oil in place estimates of 3.4, 8.2, 19.3 and 10.1 [MMSTB] for the P90, P50, P10 and mean cases respectively. For a possible gas case the in place estimates are, 1.8, 4.2, 10.2 and 5.4 [BCF] respectively.

A detailed summary of the parameters used for the reserves calculation is contained in Appendix 1.

2.7 Risking

Koroit West-1 has been assigned an overall Chance of Success of 13% (Table 3). The detailed risking parameters are summarized in Appendix 2.

Koroit West PROSPECT	
Chance of success	**%**
Closure	41
Reservoir	68
Charge	81
Source	100
Seal	59
Overall COS	**13**

Table 3 Chance of Success for Koroit West-1

Closure (Pcl)

The chance of adequate closure at the proposed Koroit West-1 location is estimated to be only 41%. Although the structure is covered by re-processed 2D-lines, the difficulties for the mapping of the relevant horizons have been discussed earlier. Seismically, the reservoir horizon is not resolved and the exact thickness of the sealing Belfast Mudstone in relation to the throw on the relevant faults is unknown.

Moreover, uncertainty exists in correlations of faults due to the limited 2D-line spacing. The prospect also depends on a particularly small fault that does not necessarily extend to the neighbouring lines.

Reservoir (Prs)

The chance for the presence of reservoir is considered to be 68%. Reservoir quality is considered of low risk compared to the general possibility of finding a condensed or even missing stratigraphic section above the Eumeralla Unconformity.

Structurally, the proposed well targets a horst block compared to the nearby wells Yangery-1 and Warrong-5 that are located on the downthrown side of mappable faults. Seismic line OC95-111_RO indicates that the prospect bounding faults have at least controlled the distribution of parts of the upper Sherbrook Group below the base Tertiary unconformity.

Since, the individual Sherbrook Group Members are seismically not being resolved or clearly characterized, the proposed presence of a thick Belfast Mudstone including the reservoir sandstone remains uncertain for the up-thrown fault block.

Charge (Pch)

The probability of having had adequate charge is considered about 81%. A small risk results from the fact that the Intra Belfast Mudstone Sandstone is known to be of limited areal extent and may therefore be located within a larger migration shadow. Moreover, the upward migration of hydrocarbons depends on the hydraulic transmissivity of faults that must have connected the Lower Eumeralla source coals with the Intra Belfast Mudstone reservoir sandstone over considerable periods of time.

The presence of many shale layers between source and reservoir may enhance the development of clay smearing and tight faults rather than the presence of open fractures along the entire length of the fault.

On the other hand, the observed hydrocarbon shows in Windemere-1 and Port Fairy-1 demonstrate that hydrocarbon migration must have occurred along existing fault planes in the area.

Source (Psc)

The Koroit Trough is located to the south of the Koroit West Prospect and maturity modelling indicates that the Casterton Formation was mature for hydrocarbon generation during the early Cretaceous. Modelling has also shown the potential for further generation from the Casterton Formation during the late Tertiary.

The Killara coals are believed to having been mature for hydrocarbon generation from the Late Tertiary to present. The probability of adequate source is estimated at 100%. Eumeralla coals can be identified as a seismically distinct event in the deeper Koroit Trough towards the south. Moreover, the presence of hydrocarbon shows at Windemere-1 and Port Fairy-1 strongly indicate the presence of adequate source.

Seal (Psl)

Seal adequacy has been estimated at 59%. The Intra Belfast Mudstone Sandstone lies sandwiched within the sealing Belfast Mudstone itself. The reservoir must be juxtaposed against the overlying Belfast Mudstone along the entire length of the bounding fault. Large uncertainty exists in the expected thickness of the Belfast Mudstone.

There is also a slight risk that the structure may have been breached by faulting postdating the charge.

3.0 ECONOMIC ANALYSIS

3.1 Oil Case

The drilling of Koroit West-1 addresses unrisked mean recoverable oil reserves of 3.6 MMSTB. The mean oil case generates a NPV of $ 39.9M ATAX @ 10.5% discount factor and an EMV (2.6 % chance of success) of $0.7M ATAX @ 10.5% discount factor.

The key project economic assumptions for the economic analysis are summarized as:

Production			
	Total IOIP	10.1	MMSTB
	Total Gas Reserves	0.0	PJ
	Total Recoverable Oil	3.6	MMSTB
	No. of Producers	7	WELLS
	Total Depth	750	mKB
	Distance To Iona Plant	72.0	KM
	Prod. Start Date	1-Jan-04	
Development Cost		$ MM	
	Exploration well P&A	0.400	
	Exploration well C&S	0.600	Cost/well
	Development Well	0.600	Cost/well
	Completion	0.300	Cost/well
	Tie-ins	0.100	Cost/well
	Surface Facility	2.000	
	Subsurface pumps	0.250	Cost/well
	Abandonment cost	0.050	Cost/well
Development Schedule		TIME	
	Exploration well	4Q2002	
	4 Development Wells	3Q 2003	
	Surface Facility	1Q 2003	
	2 Development Wells	2Q 2006	
	Subsurface pumps	2Q 2009	

Table 4 Economic Assumptions Oil Case

A summary of the NPV and the EMV at a variety of different discount rates for the oil case is shown below:

Discount RATE (%)	Before Tax Oper. Income	Before Tax Cap. Investment	Before Tax Cash Flow	After Tax Cash Flow
	$ MM	$ MM	$ MM	$ MM
Undisc.	100.0	12.0	88.1	61.1
8.1	72.9	9.6	63.2	43.7
10.5	66.9	9.1	57.8	39.9
11.6	64.4	8.9	55.5	38.4
12.5	62.5	8.8	53.8	37.1
15.0	57.6	8.3	49.3	34.0
20.0	49.4	7.6	41.7	28.9
			Before Tax	After Tax
	ROR	%	515.1	464.2
	Payout Period	(mo's)	17.2	17.2
	Undisc PIR	$ k/$ k	7.671	5.321
	10.5 Pcnt. PIR	$ k/$ k	6.421	4.438
	11.6 Pcnt. PIR	$ k/$ k	6.305	4.357
	NPV/Vol@10.5	$ k/MMSCF	0	0
	NPV/Vol@11.6	$ k/MMSCF	0	0

Table 5 Net Present Value unrisked Oil Case

COS= 2.6%	Before Tax	After Tax
	EMV	EMV
Discount RATE (%)	$ MM	$ MM
Undisc.	1.90	1.20
8.1	1.26	0.75
10.5	1.12	0.66
11.6	1.06	0.62
12.5	1.02	0.59
15.0	0.91	0.51
20.0	0.72	0.38

Table 6 EMV Results Oil Case

Date	Total Gas Production	Condn/Oil Volume	Gas Price	Total Gas Rev	Condn/Oil Price	Net Condn Revenue	Total Revenue	Total Opcosts	Total Royalty	Total Oper Inc	Total Capital	Total BT Cash	Total Taxes	Total AT Cash
	TJ	MSTB	$/Gj	$k	$/bbl	$k	$k	$k	$k	$k	$k	$k	$k	$k
2003(06)	0	0.0	0.000	0	42.4	0	0	0	0	0	908	-908	0	-908
2004(06)	0	365.3	0.000	0	38.4	14019	14019	2247	1156	10616	6300	4316	0	4316
2005(06)	0	730.5	0.000	0	37.2	27187	27187	4021	2296	20870	0	20870	5715	15155
2006(06)	0	732.9	0.000	0	37.2	27275	27275	4133	2291	20850	2195	18656	9148	9508
2007(06)	0	607.2	0.000	0	37.2	22598	22598	3615	1876	17107	0	17107	5173	11934
2008(06)	0	415.5	0.000	0	37.2	15465	15465	2735	1251	11479	0	11479	3218	8261
2009(06)	0	284.4	0.000	0	37.2	10583	10583	2122	803	7658	2079	5579	2029	3550
2010(06)	0	194.6	0.000	0	37.2	7243	7243	1698	512	5033	0	5033	1173	3860
2011(06)	0	133.2	0.000	0	37.2	4957	4957	1405	312	3239	0	3239	558	2681
2012(06)	0	91.1	0.000	0	37.2	3392	3392	1205	176	2011	0	2011	207	1804
2013(06)	0	62.4	0.000	0	37.2	2321	2321	1071	83	1168	0	1168	-30	1198
2014(06)	0	23.2	0.000	0	37.2	864	864	867	0	-3	0	-3	-186	183
2015(06)	0	0.0	0.000	0	0.0	0	0	0	0	0	476	-476	-29	-448
Total	0	3640.2	0.000	0	0.0	135903	135903	25120	10756	100028	11958	88070	26977	61093

Table 7 Cashflow Calculation Oil Case

915133 022

3.2 Gas Case

The outcome of Koroit West-1 as a gas discovery would result in unrisked mean recoverable gas reserves of 3.4 PJ. The mean gas case generates a NPV of $-4.2M ATAX @ 10.5% discount factor and an EMV (10.4% chance of success) of $-0.8M ATAX @ 10.5% discount factor.

The key project economic assumptions for the economic analysis are summarized as:

Production			
	Total OGIP	5.4	BCF
	Total Gas Reserves	3.4	PJ
	Total Condensate	34.0	MSTB
	No. of Producers	1	WELLS
	Total Depth	750	mKB
	Distance To Iona Plant	72.0	KM
	Prod. Start Date	1-Jan-04	
Development Cost		$ MM	
	Exploration well P&A	0.400	
	Exploration well C&S	0.600	Cost/well
	Completion	0.300	Cost/well
	Pipeline	7.500	
	Tie-ins	0.100	Cost/well
	Surface Facility(assuming use of Iona plant at $0.10/GJ charge)		
	Compressor	1.250	
	Abandorment cost	0.100	Cost/well
Development Schedule		TIME	
	Exploration well	4Q2002	
	Pipeline	3Q 2003	
	Compressor	3Q 2003	

Table 8 Economic Assumptions Gas Case

A summary of the NPV and the EMV at a variety of different discount rates for the gas case is shown below:

Net Present Value (Unrisked)				
Discount RATE	Before Tax	Before Tax	Before Tax	After Tax
(%)	Oper. Income	Cap. Investment	Cash Flow	Cash Flow
	$ MM	$ MM	$ MM	$ MM
Undisc.	7.4	10.1	-2.7	-2.9
8.1	5.6	9.3	-3.8	-4.0
10.5	5.1	9.1	-4.0	-4.2
11.6	5.0	9.0	-4.1	-4.2
12.5	4.8	8.9	-4.2	-4.3
15.0	4.5	8.7	-4.3	-4.4
20.0	3.9	8.4	-4.5	-4.7
			Before Tax	After Tax
	ROR	%	>800.0	>800.0
	Payout Period	(mo's)	0	0
	Undisc PIR	$ k/$ k	-0.269	-0.29
	10.5 Pcnt. PIR	$ k/$ k	-0.442	-0.459
	11.6 Pcnt. PIR	$ k/$ k	-0.456	-0.472
	NPV/Vol@10.5	$ k/MMSCF	-1.167	-1.213
	NPV/Vol@11.6	$ k/MMSCF	-1.194	-1.238

Table 9 Net Present Value unrisked Gas Case

COS=10.4%	Before Tax	After Tax
	EMV	EMV
Discount RATE (%)	$ MM	$ MM
Undisc.	-0.64	-0.66
8.1	-0.75	-0.76
10.5	-0.77	-0.78
11.6	-0.77	-0.79
12.5	-0.78	-0.79
15.0	-0.79	-0.81
20.0	-0.81	-0.83

Table 10 EMV Results Gas Case

915133 025

Date	Total Gas Production	Condn/Oil Volume	Gas Price	Total Gas Rev	Condn/Oil Price	Net Condn Revenue	Total Revenue	Total Opcosts	Total Royalty	Total Oper Inc	Total Capital	Total BT Cash	Total Taxes	Total AT Cash
	TJ	MSTB	$/Gj	$k	$/bbl	$k	$k	$k	$k	$k	$k	$k	$k	$k
2003(06)	0	0.0	2.324	0	0.0	0	0	0	0	0	906	-906	0	-906
2004(06)	437	4.4	2.374	1026	0.0	152	1178	144	12	1022	9101	- 8176	0	- 8176
2005(06)	876	8.8	2.424	2079	0.0	300	2379	294	118	1968	0	1966	0	1966
2006(06)	639	6.4	2.476	1548	0.0	218	1767	272	59	1435	0	1461	222	1239
2007(06)	475	4.7	2.528	1175	0.0	162	1336	244	18	1074	0	1092	58	1034
2008(06)	366	3.7	2.582	925	0.0	125	1050	232	0	817	0	829	-50	879
2009(06)	256	2.6	2.637	660	0.0	87	746	228	0	518	0	531	-16	546
2010(06)	201	2.0	2.693	529	0.0	68	597	215	0	382	0	388	0	388
2011(06)	146	1.5	0.000	393	0.0	49	442	211	0	231	0	238	0	238
2012(06)	0	0.0	0.000	0	0.0	0	0	0	0	0	0	18	0	18
2013(06)	0	0.0	0.000	0	0.0	0	0	0	0	0	130	-130	0	-130
2014(06)	0	0.0	0.000	0	0.0	0	0	0	0	0	0	0	0	0
Total	3394	33.9	0.000	8335	0.0	1161	9496	1841	207	7448	10136	- 2689	214	- 2903

Table 11 Cashflow Calculation Gas Case

915133 026

APPENDIX 1

RESERVE CALCULATIONS
FOR
KOROIT WEST-1

915133 027

Prospect/Field Recoverable Oil

LOCICOM

Country:	**AUSTRALIA**	Name:	**KOROIT WEST**
State:	**VICTORIA**	Segment:	**Belfast Sand**
Block:	**PEP 152**	Classification:	**speculative**

Input Data

Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	lognor	0.343	0.941	2.00	4.25	11.7	1.42
Thickness	m	lognor	3.10	5.33	8.00	12.0	20.7	7.24
Shape factor	%	single	75.0	75.0	75.0	75.0	75.0	75.0
Deg. of fill	%	single	100	100	100	100	100	100
Net-to-gross	%	single	100	100	100	100	100	100
Porosity	%	lognor	16.0	18.2	20.0	22.0	25.0	19.9
Sw	%	lognor	30.4	35.6	40.0	45.0	52.7	39.7
FVF (Bo)	vol/vol	lognor	1.04	1.10	1.15	1.20	1.27	1.15
Oil rec fac	%	lognor	19.4	27.2	35.0	45.0	63.0	33.7

Iterations: **2000**

Risk Factors

Play Chance:	**100**	Prospect Specific Chance:	**100**
Reservoir:	100	Trap:	100
Source:	100	Reservoir:	100
Regional Seal:	100	Seal:	100
		Migration:	100

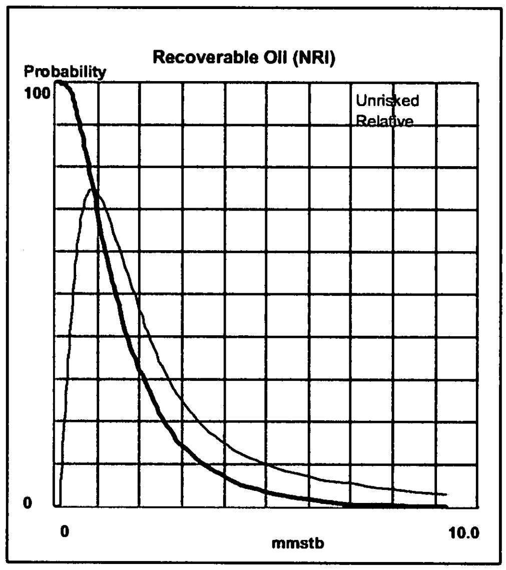
Geological Chance of Success: **100**

Reserves Summary

Unrisked	**Oil-in-Place**	**Recoverable Oil**	
mmstb	100%	100%	NRI
P90:	**3.41**	**1.17**	**0.583**
P50:	**8.21**	**2.89**	**1.45**
P10:	**19.3**	**7.11**	**3.55**
Mean:	**10.1**	**3.64**	**1.82**
P-level at mean:			36.9
Fully risked mean:		**3.64**	**1.82**

Overall chance of success: **100**

Production Working Interest: **50.00**
Exploration Working Interest: **50.00**
Production Working Interest is used to calculate net volumes



min unrisked: 0.0290 max unrisked: 27.4

Comments:

REP file: I:\otway\pep152_&_159\pep 152\rep sheets\koroit west-1 oil case
version: 4.20
Author: BRISBANE
Date: 25/10/02

Prospect/Field Recoverable Gas

LOCICOM

Country:	**AUSTRALIA**	Name:	**KOROIT WEST**
State:	**VICTORIA**	Segment:	**Belfast Sand**
Block:	**PEP 152**	Classification:	**speculative**

Input Data

Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	lognor	0.343	0.941	2.00	4.25	11.7	1.42
Thickness	m	lognor	3.10	5.33	8.00	12.0	20.7	7.24
Shape factor	%	single	75.0	75.0	75.0	75.0	75.0	75.0
Deg. of fill	%	single	100	100	100	100	100	100
Net-to-gross	%	single	100	100	100	100	100	100
Porosity	%	lognor	16.0	18.2	20.0	22.0	25.0	19.9
Sw	%	lognor	30.4	35.6	40.0	45.0	52.7	39.7
FVF (1/Bg)	vol/vol	triang	78.0	80.2	83.0	85.8	88.0	83.0
Gas rec fac	%	triang	65.0	67.2	70.0	72.8	75.0	70.0

Iterations: **2000**

Risk Factors

Play Chance:	**100**	Prospect Specific Chance:	**100**
Reservoir:	100	Trap:	100
Source:	100	Reservoir:	100
Regional Seal:	100	Seal:	100
		Migration:	100

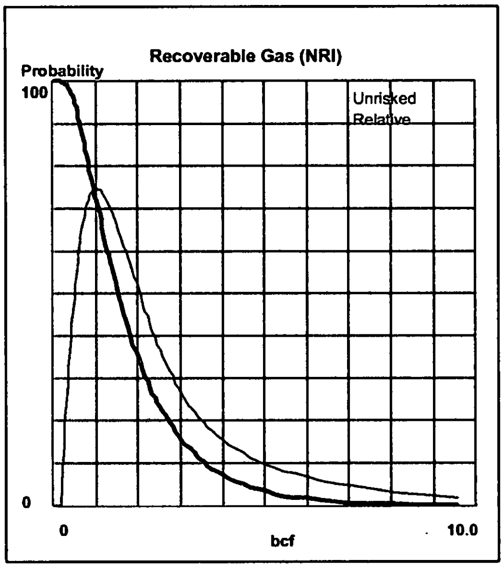
Geological Chance of Success: **100**

Reserves Summary

Unrisked bcf	**Gas-in-Place** 100%	**Recoverable Gas** 100%	NRI
P90:	**1.82**	**1.28**	**0.640**
P50:	**4.42**	**3.10**	**1.55**
P10:	**10.2**	**7.19**	**3.60**
Mean:	**5.41**	**3.79**	**1.90**
P-level at mean:			37.7
Fully risked mean:		**3.79**	**1.90**

Overall chance of success: **100**

Production Working Interest: **50.00**
Exploration Working Interest: **50.00**
Production Working Interest is used to calculate net volumes



min unrisked: 0.0539 max unrisked: 18.9

Comments:

REP file:	l:\otway\pep152_&_159\pep 152\rep sheets\koroit west-1 gas case	Author:	BRISBANE
version:	4.20	Date:	25/10/02

APPENDIX 2

RISK CALCULATIONS
FOR
KOROIT WEST-1

915133 030

Origin Energy

Risk Calculation Overview

Version date : 23 October 2002

Prospect : **Koroit West-1**
Play : Basal Belfast Sand (Hydrocarbon case)

Permit : PEP 152
Basin : Otway

Author : AC, KB
Reviewed : 24/10/2002

**** *Basic Framework for Risking* ****

COMPONENT	KEY ASPECTS
Closure	Structural closure and areal distribution of gross reservoir are within the range of the trap area distribution.
Reservoir	Gross reservoir thickness, vertical net to gross ratio, porosity, hydrocarbon saturation, recovery factor & initial flow rates are within the ranges identified.
Charge	The volume of hydrocarbons that have entered and remain in the trap are within the range of the resource distribution.
Source	Suitable source volume, maturity and macerals exist to expel a volume within the range of the resource distribution.
Seal	Competent seal exists to contain a volume of hydrocarbons within the range of the resource distribution.

**** *Risk Classification* ****

RANGE	DESCRIPTION
0 - 20 %	Possible but very doubtful; Only a slight chance; Very unlikely indeed; Very improbable.
20 - 40 %	Could be true but more probably not; Unlikely; Chances are fairly poor; Two or three times more likely to be untrue than true.
40 - 60 %	Chances are about even, or slightly better than even or slightly less than even.
60 - 75 %	Likely; Probably true; About twice as likely to be true as untrue; Chances are good.
75 - 90 %	Highly probable; Strongly believe; Highly likely.
90 - 100 %	Virtually certain; Convinced.

**** *CHANCE OF ADEQUACY (%)* ****

COMPONENT	0 - 20	20 - 40	40 - 60	60 - 75	75 - 90	90 - 100	SUMMARY COMMENTS
Closure			**41**				
Reservoir				**68**			
Charge					**81**		
Source						**100**	
Seal			**59**				

**** ***OVERALL GEOLOGICAL PROBABILITY (%)*** **** **13.09**

n:/excel/proforma/Risk Calculation, workcopy (REP).xls 1-Nov-2002

915133 031

Origin Energy

Closure Adequacy (P_{cl})

Prospect : **Koroit West-1**

Play : Basal Belfast Sand (Hydrocarbon case)

**** *LEVEL OF KNOWLEDGE / DATA AVAILABILITY (0=know nothing, 3=high)* ****

PARAMETER / DATA	AVAILABLE	CONFIDENCE	COMMENTS / REALITY CHECKS
a. Well control (number & proximity of wells)		2	Yangery-1 7.6 km to ESE, Bootahpool-2 9.7 km to WSW, Warrong-5 3.7 km to NE, Taralea-1 8.8 km to WNW
b. Seismic control (quality, grid spacing, DHIs)		2	All 2D, varying vintage, wide line spacing, somet reprocessed
c. Velocity control (depth conversion methods applied eg. paradigm application)		2	Regional TWT depth curve available based on Taralea-1 and Port Fairy-1. Y-1, W-5 and B-2 are water bores thus no checkshot data.

**** *CHANCE OF ADEQUACY (%)* ****

ISSUE	0 - 20	20 - 40	40 - 60	60 - 75	75 - 90	90 - 100	COMMENTS / REALITY CHECKS
• Control (eg. seismic grid size) is such that structural complexity/simplicity is as mapped, particularly the extent of faulting and the control on the spillpoint				60			Small faults with uncertain lateral / aerally extent. Fault displacement close to seismic resolution. Large line spacing. Possibility structure smaller than mapped.
• Depth conversion of time mapping is sufficiently controlled by velocity model. ie. consider well control, interval velocity variation, isopach variation, isochron variation						95	Not significant issue.
• Interpretation quality is sufficient to adequately define reservoir structure. Consider confidence of horizon picking, sufficient horizons picked, etc.					90		Top Eumeralla, Top Waarre and Top Belfast difficult to pick but good enough to define structure.
• Seismic data is of sufficient quality to ensure trap is adequately defined (eg fault imaging). Consider noise, misties, statics, phase, migration velocity, etc					80		Seismic quality generally good but not fine enough to resolve stratigraphic details or accurately pick faults on some lines.
OVERALL CHANCE			41				

n:/excel/proforma/Risk Calculation, workcopy (REP).xls

1-Nov-2002

Origin Energy

Reservoir Adequacy (P_{rs})

Prospect : **Koroit West-1**

Play : Basal Belfast Sand (Hydrocarbon case)

**** *LEVEL OF KNOWLEDGE / DATA AVAILABILITY (0=know nothing, 3=high)* ****

PARAMETER / DATA	AVAILABLE	CONFIDENCE	COMMENTS / REALITY CHECKS
a. Well control (lithology, cores, ∅, k, DST, etc.)		**2**	No cores or swcs of reservoir, no DST data or measured core plug data
b. Seismic control (amplitude, AVO, forward modelling, DHI, etc.) calibrated against well control		**0**	No modelling done. Reservoir thickness < seismic resolution
c. Burial profile and diagenetic history available		**1**	Sone BasinMod work done in area by AC
d. Reservoir characterisation available (facies architecture, porosity model, etc.)		**0**	No data available

**** *CHANCE OF ADEQUACY (%)* ****

ISSUE	0 - 20	20 - 40	40 - 60	60 - 75	75 - 90	90 - 100	COMMENTS / REALITY CHECKS
• Sequence developed (no consideration of reservoir facies). Consider sequence missing due to non-deposition, &/or erosion.					**75**		Likely to be present based on proximity of Yangery-1 and Warrong-5 to east and north, but absence of sand in Bootahpool-2 to the west raises possibility that it could be absent
• Reservoir facies developed. Consider facies change, thickness, net to gross, areal distribution, etc.						**90**	Highly likely based on Yangery-1, Warrong-5 and Taralea-1 petrophysics, but propsect located basinward of these wells thus chance different facies may be present.
• Modelled reservoir quality is present. Consider depositional influences (eg clay choking), diagenesis (eg. Cementation, secondary ∅, etc), preservation by early hydrocarbon fill, effects of compaction by deeper burial, development of fractures, etc.						**100**	No data but not considered problem. No core or swc samples available. No petrographic data.
• Effective reservoir volume not substantially reduced by waste zone below top seal.						**100**	Good Belfast Mudstone seal on top. Waste zone not a problem.
OVERALL CHANCE				**68**			

n:/excel/proforma/Risk Calculation, workcopy (REP).xls

1-Nov-2002

915133 033

Origin Energy

Hydrocarbon Charge/Preservation Adequacy (P_{ch})

Prospect : **Koroit West-1**

Play : Basal Belfast Sand (Hydrocarbon case)

**** *LEVEL OF KNOWLEDGE / DATA AVAILABILITY (0=know nothing, 3=high)* ****

PARAMETER / DATA	AVAILABLE	CONFIDENCE	COMMENTS / REALITY CHECKS
a. Migration pathways interpreted (seismic and well data, datum well defined and mappable, regional interval & structure maps available, seismic resolution at critical events)		**0**	No data available.
b. Understanding of the tectonic history		**3**	Reasonably well known.
c. Time/burial depth/maturation history profiles available to establish appropriate isochron maps		**2**	Not done.
d. Geotechnical data available to substantiate hydrocarbon alteration in reservoir		**0**	No data available.
e. DHIs identified		**0**	No.

**** *CHANCE OF ADEQUACY (%)* ****

ISSUE	0 - 20	20 - 40	40 - 60	60 - 75	75 - 90	90 - 100	COMMENTS / REALITY CHECKS
• Hydrocarbons were expelled or remigrated post-trap formation. Consider late charge remobilised from palaeo-traps, structural enhancement post-migration						**100**	Trap Late Cretaceous - Early Tertiary in age. No evidence for Late Tertiary inversion. Hydrocarbon generation in area most likely Late Tertiary in age.
• Suitable lateral and vertical conduits (lithology and faults) exist between source and trap					**85**		Charging reliant on migration up faults as reservoir is encased in Belfast and appears to pinch out towards the coast.
• Migration pathways (drainage cell size) at the time of hydrocarbon migration were focused toward the trap. Consider complexity of structuring, tortuosity of path, and distance of migration (migration efficiency)						**100**	No data but not expected to be serious problem based on number of fields in PCE (no migration pathway studies done there to my knowledge).
• Hydrocarbons have been preserved in the reservoir. Consider flushing, water washing, biodegradation, cracking, etc or DHIs						**95**	Not biodegraded in Port Fairy-1 but sand at Koroit West-1 considerably shallower.
OVERALL CHANCE					81		

n:/excel/proforma/Risk Calculation, workcopy (REP).xls

1-Nov-2002

915133 034

Origin Energy

Source Adequacy (P_{sc})

Prospect : **Koroit West-1**

Play : Basal Belfast Sand (Hydrocarbon case)

****** *LEVEL OF KNOWLEDGE / DATA AVAILABILITY (0=know nothing, 3=high)* ******

PARAMETER / DATA	AVAILABLE	CONFIDENCE	COMMENTS / REALITY CHECKS
a. Well control (source intervals intersected, source quality & maturation data available, etc.)		3	Good source rock data available from PCE. Limited sampling done in PEP 152.
b. Seismic control (regional interval & structure maps available, seismic resolution at critical events))		2	see Resource Atlas.
c. Maturation modelling available (burial history, heat flow, kinetics)		3	BasinMod study by AC
d. Maps available to establish source volume		1	No maps available but not considered problem.

****** *CHANCE OF ADEQUACY (%)* ******

ISSUE	0 - 20	20 - 40	40 - 60	60 - 75	75 - 90	90 - 100	COMMENTS / REALITY CHECKS
• Organic matter is of suitable type (consider HI, maceral composition and hydrocarbon type targeted) and richness (Consider TOC, $S_1 + S_2$, etc.)						100	RockEval data indicates Eumeralla Fm coals and carb shales are gas prone with some oil potential. Thus source rocks are suitable if we do not consider volume of oil generated.
• Adequate volume of source rocks present. Consider thickness and drainage area						100	No data but not considered major problem.
• Source rocks have reached a sufficient maturation level for the hydrocarbon type being targeted. Consider biogenic versus thermogenic generation, expulsion efficiency						100	Must have reached sufficent based on recovery of oil in Windermere-1 and condensate in Port Fairy-1.
OVERALL CHANCE						100	

n:/excel/proforma/Risk Calculation, workcopy (REP).xls

1-Nov-2002

915133 035

Origin Energy

Seal Adequacy (P_{sl})

Prospect : **Koroit West-1**

Play : Basal Belfast Sand (Hydrocarbon case)

**** *LEVEL OF KNOWLEDGE / DATA AVAILABILITY (0=know nothing, 3=high)*****

PARAMETER / DATA	AVAILABLE	CONFIDENCE	COMMENTS / REALITY CHECKS
a. Well control or analogue fields		3	Belfast Mudstone excellent seal in PCE.
b. Seismic control for mapping faults (orientation, displacements, highside/lowside lithologies)		2	Poor
c. Fault plane profiling available		1	No.
d. Fault seal analysis available		0	No.
e. Capillary pressure analysis of seals available		0	No.
f. DHIs identified		0	No.

**** *CHANCE OF ADEQUACY (%)* ****

ISSUE	0 - 20	20 - 40	40 - 60	60 - 75	75 - 90	90 - 100	COMMENTS / REALITY CHECKS
• Top seal has sufficient thickness, continuity and quality. Consider DHIs, pore entry pressures,etc.						100	Belfast Mudstone in Yangery-1 and Warrong-5 approx 70 m and 57 m thick respectively. Top seal thickness not considered major problem.
• Lateral seal, where trap is reliant on such seal, is sufficiently impermeable to maintain trap integrity. Consider fault gouge seal, stress regime, thickness of seal across fault, lateral variation of fault throw and closure against fault on juxtaposed side				65			Throw on fault at cresst approx 33 - 47 m. Belfast Mst 30 m thick in Taralea-1 which is also located on palaeohigh. Poss Belfast Mst on down side < throw on fault as Warrong-5 are located in lows. However, seal could be thick enough if Top Eum pick of Essential is deeper (KB+AC have it 90 m deeper).
• Bottom seal, where trap is reliant on such seal, is sufficiently impermeable to maintain trap integrity. Consider pore entry pressures, weathering, etc						100	Not applicable
• Faults &/or fractures in the seal(s) have not been the conduit for leakage since hydrocarbon charge					90		Possibility must be considered.
OVERALL CHANCE			59				

n:/excel/proforma/Risk Calculation, workcopy (REP).xls

1-Nov-2002

APPENDIX 3

LITHOLOGICAL DESCRIPTIONS

FOR
KOROIT WEST-1

HEYTESBURY GROUP

Port Campbell Limestone

Creamy white to very light grey (rarely light yellow), weakly cemented calcisiltite and fine to medium-grained calcarenite, which gradationally overlies the Gellibrand Marl. The formation is moderately well bedded and rich in fossil fragments including bryozoans, molluscs, echinoids and brachiopods. Bioturbated marly and clayey limestone beds up to 9 m thick (typically < 1 m) are common near the base of the formation. The marls are typically medium to light grey in colour, very calcareous and soft, with trace bryozoa, shell fragments, foraminifera, sponge spicules and echinoid spines.

Gellibrand Marl

Grey, calcareous silty clay to clayey silt with minor interbeds of fine to coarse-grained calcarenite. Glauconite is locally abundant. The formation is commonly burrowed and ranges from massive to well bedded in appearance, with bedding often highlighted by irregularly shaped calcareous concretions. The marly facies is typically rich in bryozoans and molluscs, and to a lesser extent, echinoids, brachiopods, corals, crabs and shark teeth.

Clifton Formation

Medium to coarse-grained calcarenite with minor interbeds of marl and mudstone. The calcarenite is composed largely of bryozoan fragments and abraded shells, with quartz making up less than 10% of the unit. It is typically moderately well bedded, with alternating poorly and strongly cemented beds common. Bryozoans, echinoids and molluscs are common.

NIRRANDAGROUP

Narrawaturk Marl

Pale to dark brown marl and calcareous mudstone with minor thin calcarenite beds. The formation is commonly glauconitic (up to 10% glauconite) and rich in fossils.

Mepunga Formation

Fine to coarse-grained, brown, sandstone and dark brown, very soft, silt to silty clay. The sandstones are typically iron-stained, friable and very porous. Poor to excellent visual porosity, interbedded with dark brown, very soft minor claystone. The intervening silts to silty clays are generally carbonaceous and often burrowed. Fossils are rare.

WANGERRIP GROUP

Dilwyn Formation

The Dilwyn Formation is a predominantly sandstone unit with minor siltstone and claystone interbeds. Sandstones are clear to white, light brown, very fine to very coarse, subangular to rounded, poor to moderately sorted, with minor pyrite, trace mica and carbonaceous material, occasional grey quartzite grains, brown dispersive clay matrix. Porosity is fair to excellent. Siltstones are light to moderate brown, soft sandy in part, with trace carbonaceous material and partly argillaceous. Claystones are moderate to dark grey-brown to brown, soft, dispersive, sandy and silty in part, with abundant carbonaceous/coal fragments. Minor coals are dark brown to black, pyritic and lignitic.

Pemper Mudstone

Claystone, light to medium brown, medium grey in part, very soft, amorphous, silty and sandy in part and can include a variety of bioclasts, carbonaceous material, glauconite, mica, pyrite, ferruginous clasts and rock fragments. Commonly burrowed. Unit is less sandy than the overlying Dilwyn Formation.

Pebble Point Formation

The Pebble Point Formation consists of medium to very coarse subangular to subrounded quartz sandstones with a sideritic and limonitic matrix. The unit becomes more silty and shaley with increased depth. Closed framework coarse to medium grained sandstones and gridstones with calcareous and ferruginous cement are common component of the sander portion of the formation.

SHERBROOK GROUP

Paaratte Formation

The Paaratte Formation consists of predominantly sandstones, off-white to light grey, medium to very coarse-grained, occasionally pebbly, subrounded to subangular quartz, interbedded with white to light brown, very fine to medium grained sandstone with glauconite and minor feldspar, in an argillaceous to calcareous matrix, in part strongly dolomitic and or sideritic, tight and highly resistive. Minor siltstone interbeds are light to medium grey, argillaceous, carbonaceous, micaceous dolomitic and calcareous, and in parts grade to silty mudstone and silty dolomite.

Skull Creek Mudstone

The Skull Creek Mudstone, if present and distinguishable, consists of dark grey to black, carbonaceous mudstone with minor interbedded fine-grained sandstones and interlaminated siltstones.

Nullawarre Sandstone

Sandstone, white to light grey to green, very fine to medium, subrounded to subangular quartz, minor to abundant glauconite, trace to abundant white argillaceous matrix poor to moderate visible porosity, oolitic, limonitic cement, very hard in part.

Belfast Mudstone

The Belfast Mudstone is pale grey to black, pyritic, fossiliferous, glauconitic, carbonaceous and micaceous mudstone with fine-grained sandstone and siltstone interbeds. Sandstone interbeds are quartzose, with traces of weathered feldspar, mica, carbonaceous flecks and a green mineral (glauconite or chlorite), and diagenetic siderite, calcite and dolomite cements.

Intra-Belfast Sandstone (Reservoir)

Clean porous quartz arenite

Waare Formation

The lithology of the basal Sherbrook Group Member that rests unconformably on top of the Eumeralla Formation appears to be very heterogeneous in the surrounding wells. It may contain sandstones, siltstones, claystones, and traces of coal. The siltstones are light grey, grey brown quartzose, argillaceous, feldspathic, lithic and partly carbonaceous. The claystones are dark grey to brown carbonaceous, silty and slightly glauconitic. Sandstones, if present are white to light grey and fine to very fine grained grained.

OTWAY GROUP

Eumeralla Formation

The top of the Eumeralla Formation consists dominantly of siltstones and shales. The shales (or claystones) are generally medium grey, medium brown grey, light to medium greenish grey with rare light blue and green-grey; soft to firm, occasionally hard and splintery and partly dispersive. They can be micaceous, carbonaceous and silty with minor sandstone and coal interlaminations. The siltstones are grey and grey green, argillaceous, micaceous, feldspathic, and slightly carbonaceous. The minor sandstones present in the unit are grey green, very fine to fine grained with subrounded quartz, abundant white to brown feldspar, micaceous, lithic, chloritic, with trace orange feldspar in an argillaceous and slightly calcareous matrix.

915133 040

PE613760

This is an enclosure indicator page.
The enclosure PE613760 is enclosed within the container PE915133 at this location in this document.

The enclosure PE613760 has the following characteristics:

ITEM_BARCODE = PE613760
CONTAINER_BARCODE = PE915133
NAME = Windermere-1 to Wangoom-2 Strat. X-sectn
BASIN = OTWAY
ONSHORE? = Y
DATA_TYPE = WELL
DATA_SUB_TYPE = WELL_CORRELATION
DESCRIPTION = Windermere-1 to Wangoom-2 Stratigraphic Cross-section, Enclosure 1 within Well Proposal Report, Koroit West-1, W1374, Origin Energy Resources Limited, October 2002. Also contains: Windermere-2, Shaw-1, Pretty Hill-1, Taralea-1, Warrong-5, Yangery-1.
REMARKS =
DATE_WRITTEN = 31-OCT-2002
DATE_PROCESSED =
DATE_RECEIVED =
RECEIVED_FROM = Origin Energy Resources Limited
WELL_NAME = Windermere-2
CONTRACTOR =
AUTHOR =
ORIGINATOR = Origin Energy Resources Limited
TOP_DEPTH = 550
BOTTOM_DEPTH = 1100
ROW_CREATED_BY = JM00_SW

(Inserted by DNRE - Vic Govt Mines Dept)