ORIGIN ENERGY RESOURCES LIMITED

WELL COMPLETION REPORT

DUNBAR 1 DW1

PPL 1

OTWAY BASIN

VICTORIA

March 2002

By: Doug Short and Bronwyn Camac

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WELL DATA CARD DUNBAR 1DW1

Permit	PPL 1	Otway Basin
Location:	Latitude:	38 32' 48.44" S
(Datum: GDA 94)	Longitude:	142 54' 28.04" E
Prospect Type:	elongate fault dependant closure	
Grid Location:		
(UTM: AGM Zone 54)	Easting:	666 254.49
	Northing:	5 731 789.49
	Seismic: Waarre 3D (1993)	Inline: 6470 CDP 2620
Elevations:	G.L.:	77.2 m A.M.S.L.
	R.T..:	81.8 m A.M.S.L.
Total Depth:	Driller:	1636.0 mRT
	Logger:	1636.0 mRT
	TVDRT (D):	1597.4 mTVD
Interest Holders:	Origin Energy Petroleum Ltd. (100% ** - Operator)	

Spud:	1600 hrs, 19 March 2001		
Reached TD.	2300 hrs, 23 March 2001		
Rig Released:	0700 hrs, 26 March 2001		
Rig	ODE Rig 30		
Hole Sizes:	311mm (12 1/4")	Dunbar 1	317.0 mRT
	216mm (8 1/2")	Dunbar 1	1758.0 mRT
	152mm (6")	Dun 1DW1	1636.0 mRT
Casing 1	Surface (Dunbar 1)	Size:	245 mm (9 5/8")
		Shoe:	311.9 mRT (D)
		Type:	36 & 43.5 lb/ft K55
Casing 2	Intermediate (Dunbar 1)	Size:	177.8 mm (7")
		Shoe:	1209.8 mRT (D)
		Type:	23 & 26 lb/ft K55 & N80
Casing 3	Production **(Dunbar 1DW1)**	Size:	73 mm (2 7/8")
		Shoe:	1634.5 mRT (D) 1597.3 mTVD (D)
		Type:	6.5 lb/ft K55 with 300sx G (1% HALAD 322)
Status:	Completed as a gas producer		

STRATIGRAPHY

AGE	FORMATION	ACTUAL DEPTHS (m) MDRT	TVDSS	THICKNESS TVT	PROGNOSED DEPTH (mTVDSS)	TVD (H)IGH	(L)OW
L. Cretaceous	Skull Creek Member	1236.4	-1154.5	167.0	-1152.0	2.5	L
L. Cretaceous	Nullawarre Greensand	**Not penetrated**			Absent ?	**Not penetrated**	
L. Cretaceous	Belfast Mudstone	1415.0	-1321.5	74.7	-1286.0	35.5	L
L. Cretaceous	Waarre Fm. 'C'	1500.0	-1396.2	19.5	-1383.0	13.2	L
L. Cretaceous	Waarre Fm. 'B'	1522.1	-1415.7	31.2			L
L. Cretaceous	Waarre Fm. 'A'	1557.6	-1446.9	12.5	-1436.0	10.9	L
L. Cretaceous	Eumeralla Fm.	1571.8	-1459.4	56.2 +	-1451.6	7.8	L
	Total Depth (L)	1636.0	-1515.6		-1500.0	15.6	L

WIRELINE LOGS

Log Type	Interval	BHT / Time Since Circulation
DLS-MLL-SP-GR-CAL	1210.6 - 1633.0 mRT	58.0 deg C / 6.5 hours since circ. Stopped
PDS-CNS-GR-CAL	1210.6 - 1633.0 mRT	64.0 deg C / 9.67 hours since circ. Stopped

FORMATION TESTS - none undertaken

PERFORATIONS

Interval (mRT)	Formation	Size	Shots per foot	Phase	Weight
1559.0 - 1562.0	Waarre Fm. Unit 'A'	2 1/8"	6	60 deg	6.5 gram
1564.0 - 1569	Waarre Fm. Unit 'A'	2 1/8"	6	60 deg	6.5 gram
1501 - 1505	Waarre Fm. Unit 'C'	2 1/8"	6	60 deg	6.5 gram

FULL HOLE CORES - none taken

SIDEWALL CORES - none taken

COMMENTS

Dunbar-1 DW1 was drilled as a development well in PPL-1, 8 km north north-west of Port Campbell in the onshore Victorian Otway Basin. The primary objective for the well was to develop the updip potential of the upper Cretaceous Waarre Formation (Unit “C & A” sands) of the Sherbrook Group. The well was directionally drilled from immediately below the existing 7" casing shoe in Dunbar-1 which is about 125m to the southeast of the target subsurface Waarre "A" location. Dunbar-1 DW1 penetrated a typical Otway Basin (Port Campbell embayment) stratigraphic sequence. The primary objectives, the Waarre Unit “C & A” sandstones were, intersected 3.8 and 3.4 metres low to prognosis respectively. Dunbar-1 DW1 commenced on 19th March 2001. The cement plug at the 7” casing shoe (1209.8 mRT) in Dunbar-1 was drilled out to 1215 mRT and a 216mm deviated hole was then drilled to a total depth of 1636.0 mRT (driller). Total depth was reached on 23rd March 2001. Both the Waarre Unit C & A sands have very good reservoir quality and significant gas saturation. Logs indicate a gas/water contact in the Unit “C” sand at a true vertical depth of 1490m. (-1408.2m. subsea).

The gas/water contact in the Unit “A” sand was not encountered. After logging and evaluation, the well was cased (73mm) to 1634.5m and the rig released on 26th March 2001. After perforating the well flowed gas on clean-up @ 17.6 Mmcfd with 1132 psi on a 3/4” choke. The well was subsequently completed as a gas producer from the Waarre “A” sand.

Well Site Geologist:	Doug Short	
Author:	Bronwyn Camac	DATE: March 2002

1. SUMMARY

Dunbar 1 DW1 was drilled as a development well in PPL-1, 8 km north north-west of Port Campbell in the onshore Victorian Otway Basin (figure 1). The primary objective for the well was to develop the updip potential of the upper Cretaceous Waarre Formation (Unit “C & A” sands) of the Sherbrook Group. The well was directionally drilled from immediately below the existing 7" casing shoe in Dunbar 1 which is about 125m to the southeast of the target subsurface Waarre "A" location..

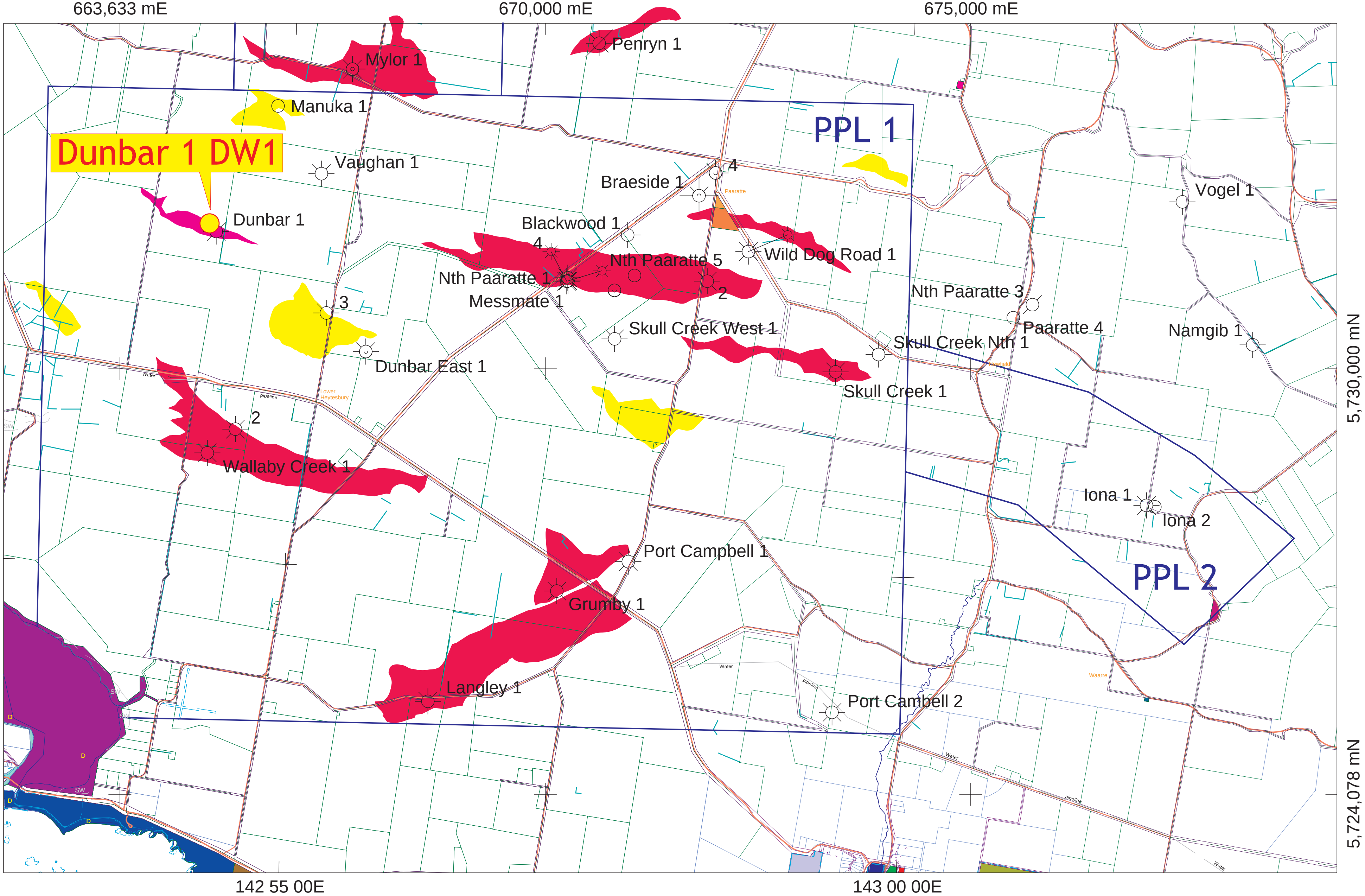
Dunbar 1 DW1 penetrated a typical Otway Basin (Port Campbell embayment) stratigraphic sequence. The primary objectives, the Waarre Unit “C & A” sandstones were, intersected 13.2 and 10.9 metres low to prognosis respectively.

Dunbar 1 DW1 commenced on 19th March 2001. The cement plug at the 7” casing shoe (1209.8m.) in Dunbar 1 was drilled out to 1215m. and a 216mm deviated hole was then drilled to a total depth of 1636.0 mRT (driller). Total depth was reached on 23rd March 2001.

Both the Waarre Unit C & A sands have very good reservoir quality and significant gas saturation. Logs indicate a gas/water contact in the Unit “C” sand at a true vertical depth of 1490.78 mRT (-1408.98 mTVDSS). The gas/water contact in the Unit “A” sand was not encountered.

After logging and evaluation, the well was cased (73mm / 2 7/8”) to 1634.5 mRT and the rig released on 26th March 2001 (7:00 hrs).

The well was subsequently completed as a gas producer from the Waarre “A” sand. After perforating the well flowed gas on clean-up @ 17.6 MMcfd with 1132 psi on a 3/4” choke.



LOCATION MAP - DUNBAR 1 DW1

CPK

16277.032002 Fig.1

Origin energy

2. WELL HISTORY

2.1. General Data

2.1.1 WELL NAME: **DUNBAR 1 DW1**

2.1.2 SURFACE LOCATION (AGD 84):

	Latitude:	38° 32' 53.79" S
	Longitude:	142° 54' 23.11" E
(AMG Zone 54):	Easting:	666 132.24 m
	Northing:	5 731 612.31 m

SURFACE LOCATION (GDA 94):

	Latitude:	38° 32' 48.44" S
	Longitude:	142° 54' 28.04" E
(AMG Zone 54):	Easting:	666 254.49 m
	Northing:	5 731 789.49 m

2.1.3 SUBSURFACE LOCATION (AGD 84):

	Latitude:	38° 32' 49.67" S
	Longitude:	142° 54' 18.88" E
AGD 84 (AMG Zone 54):	Northing:	5 731 741.40 m
	Easting:	666 032.36 m

SUBSURFACE LOCATION (GDA 94):

	Latitude:	38° 32' 44.32" S
	Longitude:	142° 54' 23.81" E
AGD 84 (AMG Zone 54):	Northing:	5 731 918.62 m
	Easting:	666 154.72 m

2.1.4 SEISMIC LOCATION:

Inline: 6470
CDP: 2620
Waarre 3D Seismic Survey (1993)

2.1.5 ELEVATION:

Ground Level: 77.2 m
Rotary Table: 81.8 m

2.1.6 PERMIT:

PPL 1
OTWAY BASIN, VICTORIA

2.1.7 OPERATOR:

ORIGIN ENERGY PETROLEUM PTY. LTD.
A.C.N. 007 845 338
AMP Building
1 King William Street,
ADELAIDE SA 5000
Tel: (08) 8217 5777

2.1.8	**DRILLING MANAGER:**	OIL COMPANY OF AUSTRALIA LIMITED A.C.N. 001 646 331 2nd Floor, North Court, John Oxley Centre, 339 Coronation Drive, MILTON Qld 4064 Tel: (07) 3858 0600
2.1.9	**OTHER PARTICIPANTS:**	Nil
2.1.10	**DATE DRILLING COMMENCED:**	19th March 2001 (16:00 hours)
2.1.11	**DATE DRILLING COMPLETED:**	23rd March 2001(23:00 hours)
2.1.12	**RIG RELEASED:**	26th March 2001(07:00 hours)
2.1.13	**DRILLING TIME TO TD:**	6.62 days
2.1.14	**TOTAL DEPTH:**	1636 m (Driller) 1636 m (Logger) 1597.4 m (TVD) 1515.6 m (TVDSS)
2.1.15	**STATUS:**	Completed Gas Well

3. OPERATIONS

3.1. Rig Data

3.1.1	Drilling Contractor	:	O.D.&E. Pty. Limited 8th Level, 9 Bligh Street, SYDNEY NSW 2000
3.1.2	Rig	:	Number 30 Make - Ideco Rated - 3,350m. / 11,000ft.
3.1.3	Draw Works	:	Type - Ideco Hydrair 725D Drive System - 4 Caterpillar 3412-PCTA Transmission - SCR Drill Line - 28mm/1-1/8” (Diesel- electric SCR Brown Boveri 600 volt - 3 phase 60 Htz)
3.1.4.	Mast	:	Type - Draco -cantilever Height - 38.7 metres/127 ft Capacity - 227,678 kg/510,000 lbs
3.1.5.	Substructure	:	Floor Height - 4.6 metres / 15.1 feet KB Height - 4.9 metres / 16.1 feet
3.1.6.	Rotary Table	:	Type - Oilwell A 20.5”
3.1.7.	Hook Block	:	Type - Crosby McKissock Capacity - 250 tonnes / 250 tons (2240lb)
3.1.8.	Swivel	:	Type - Oilwell PC-300
3.1.9.	Mud Pumps (2)	:	Type - Gardner-Denver PZ-8 Power - EMD Output - 800 hp
3.1.10.	Mud System	:	Tanks - 800-bbl system
3.1.11.	Shale Shaker	:	Type - DFE - SCR01 Linear Motion
3.1.12.	Desander	:	Type - None
3.1.13.	Desilter	:	Type - Harrisburg 12 cone.
3.1.14	Ram Type BOP	:	Type - Shaffer LWS Bore Size - 346mm / 13.625” Rating - 34,475 kpa/5000 psi
3.1.15	Annular Type BOP	:	Type - Hydril Bore Size - 346mm / 13.625” Rating - 21,000 kpa/3000 psi
3.1.16	Accumulator	:	Type - Wagner 130-160 3 BND

3.1.17	Choke Manifold	:	Size - 1 x 5000psi with McEvoy and 1x3" positive & 1 Swaco 3"superchoke
3.1.18	Drill Pipe	:	Size - 4.5" (2750 metres) Weight - 16.6 lb/ft Grade - G Connection - 4.0" IF Size - 4.5" (250 metres) Weight - 16.6 lb/ft Grade - E Connection - 4.0" IF
3.1.19	HW Drill Pipe	:	Size - 4.5" (15 joints) Weight - 45.0 lb/ft Connection - 4.0" IF
3.1.20	Drill Collars	:	Number/Size - 24 x 6 1/4" Connection - 4.0" IF

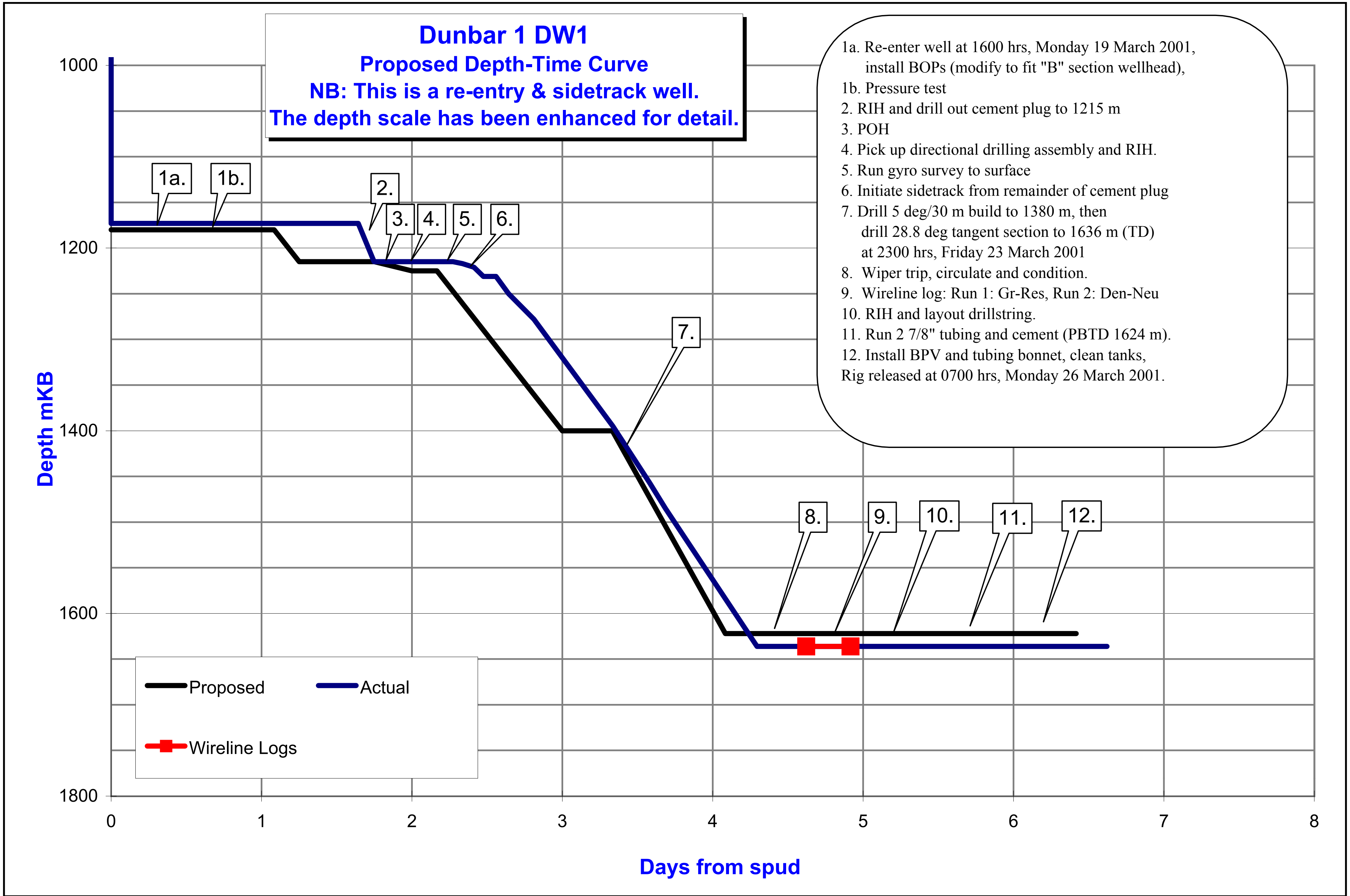
3.2. Drilling Data

The following is the daily operations summary for Dunbar 1 DW1 compiled from the tour sheets and daily drilling reports. Onsite drilling supervision for Oil Company of Australia Limited was by B. Beetson. Further details are provided in the time/depth curve (Figure 2); borehole assembly configuration (Figure 3); borehole assembly report and drilling hydraulics analysis (Tables 1 & 2).

3.2.1 Daily Operations Summary

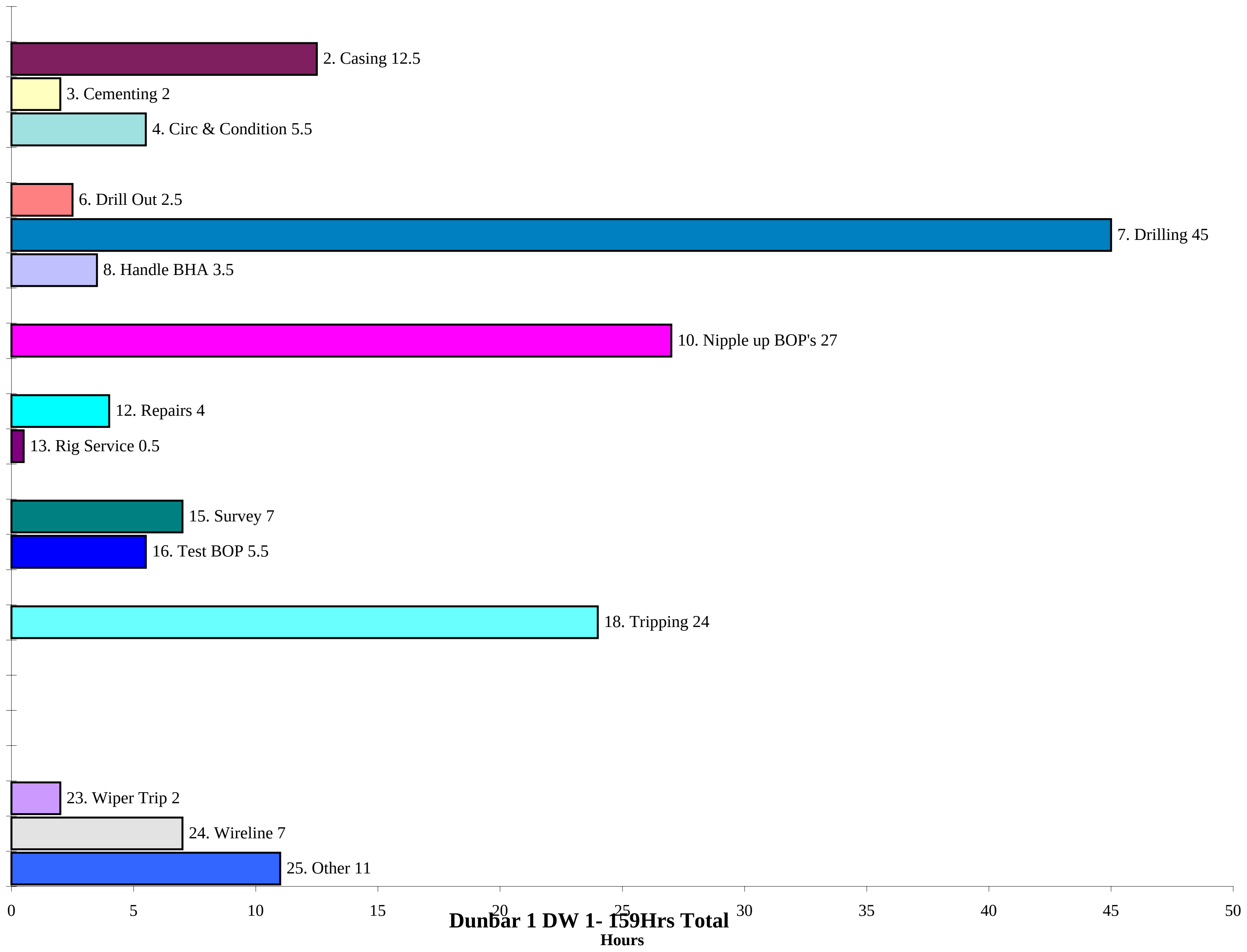
The depths in the following summary are those reached at 2400 hours on each day with the operations given for the previous 24 hour period.

Date	**Depth**	**Operation**
19.03.01	1173.0m	General rigup, drill rathole & mousehole, prespud safety meeting & rig inspection carried out - Nipple down 2-9/16" x 3000psi valve & bonnet, (bonnet stamped 5000psi but appears to be 3000psi)
20.03.01	1173.0m	Nippleup BOP's - Flush BOP's, install & continue modification of flow nipple - Pressure testing blind rams, casing, choke manifold & kill lines to 250psi lo - 2500psi hi - Rig up floor to pickup drill string, install flow line - Rig tong has incorrect size jaw, shut rig down until new



Dunbar 1 DW1
Proposed Depth-Time Curve
NB: This is a re-entry & sidetrack well.
The depth scale has been enhanced for detail.
1a. Re-enter well at 1600 hrs, Monday 19 March 2001, install BOPs (modify to fit "B" section wellhead),
1b. Pressure test
2. RIH and drill out cement plug to 1215 m
3. POH
4. Pick up directional drilling assembly and RIH.
5. Run gyro survey to surface
6. Initiate sidetrack from remainder of cement plug
7. Drill 5 deg/30 m build to 1380 m, then drill 28.8 deg tangent section to 1636 m (TD) at 2300 hrs, Friday 23 March 2001
8. Wiper trip, circulate and condition.
9. Wireline log: Run 1: Gr-Res, Run 2: Den-Neu
10. RIH and layout drillstring.
11. Run 2 7/8" tubing and cement (PBTD 1624 m).
12. Install BPV and tubing bonnet, clean tanks,
Rig released at 0700 hrs, Monday 26 March 2001.
1a.
1b.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
Depth mKB
1000
1200
1400
1600
1800
0
1
2
3
4
5
6
7
8
Days from spud
Proposed
Actual
Wireline Logs

Figure 2



Dunbar 1 DW 1- 159Hrs Total

		jaw sourced & dispatched, modify tong dies to facilitate tong use until correct size jaw arrives - Pickup cleanout string & RIH.
21.03.01	1217.0 m	Pickup cleanout string & RIH - Remove kelly spinner & tighten connections, replace spinner - Tighten bell nipple & dresser sleeve, (fix flow line leaks) - Wash cement contaminated mud to 1159 mRT, & circulate - Pressure test pipe rams, 2 x kill, 2 x HCR, upper & lower kelly cocks to 250psi & 2500psi, - Wash cement contaminated mud to 1173m. top of cement plug - Drill out cement plug to 1215m. - Displace hole to mud, pump slug - POH for kick-off assembly - Pickup steering assembly & test MWD & motor - RIH to 1209 mRT - Layout excess drill pipe in derrick - Safety meeting, rig up gyro & survey & orient tool facing – Kick-off at 1215 mRT & time drill to 1217 mRT
22.03.01	1395.0 m	Directionally drill 6" hole to 1221m - Conduct FIT to 10.0ppg equivalent - Directionally drill 6" hole to 1231 mRT - Run Gyro check shot - Directionally drill to 1250 mRT - Rig down Reeves Logging Sheaves - Directionally drill 6" hole to 1278 mRT - Rig service - Directionally drill 6" hole to 1395 mRT
23.03.01	1636.0 m	Directional drill to 1636m TD - Circulate bottoms up – flow check, pump pill - POH on wiper trip to shoe
24.03.01	1636.0 m	Continue wiper trip, hole intermittently tight on trip out maximum over-pull 20k, RIH, hole OK - Circulate & condition hole - Flow check, pump pill & POH - Break & layout Directional assembly - Safety meeting, logging with Reeves Wireline, ran resistivity & density logs with gamma ray & callipers - Rig down Reeves logging sheaves - Makeup cleanout BHA & RIH - Break circulation & tag bottom, circulate & condition mud – Flow check, pump slug, layout drill string - Service break kelly - Layout drill string.

25.03.01	1636.0 m	Continue to layout drill string - Rig to run 2-7/8" tubing (1 hour + for daylight saving change) - Run tubing, elevators sticking on upset - Repair 2-7/8" elevators - Continue to run 2 7/8" tubing - Circulate & reciprocate tubing, pump 25 bbls SAPP preflush - Break out landing joint collar & install tubing hanger - Headup Howco, safety meeting, test lines to 4000psi, mix & pump 300 sx "G" with 1% Halad 322 - Flush BOP lines, nipple down BOP's
26.03.01	1636.0 m	Nipple down BOP's - Layout kelly & swivel. -Dump & clean tanks - Install Xmas tree & pressure test tubing bonnet to 3500psi, flow & master valves to 3500psi OK Rig released 26th March 2001

sperry-sun
DRILLING SERVICES

BHA Schematic

Origin Energy Resources Ltd

Dunbar #1DW1

BHA ID #: 1

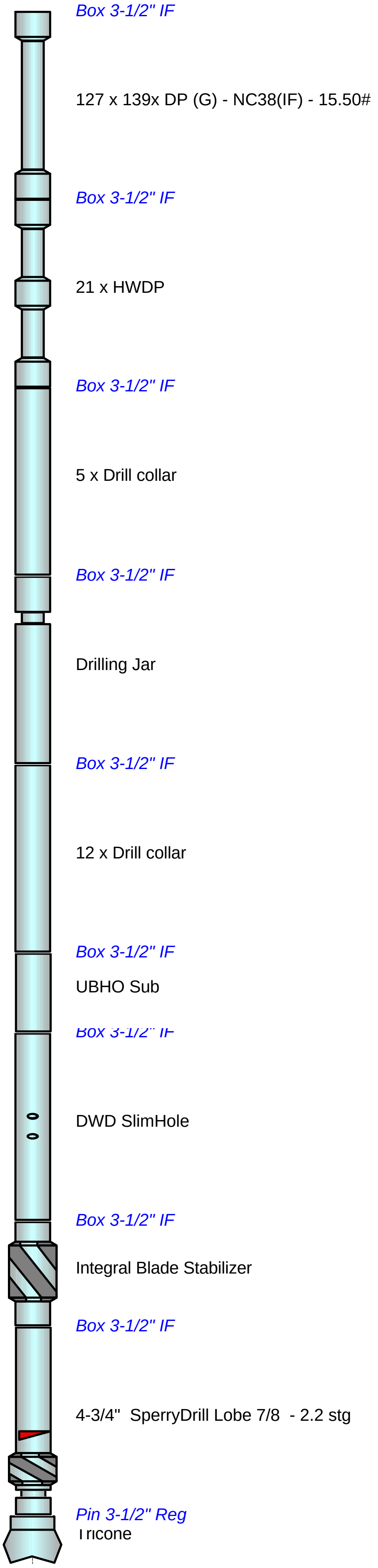
6" Sidetrack/tangent assembly

BHA Configuration

O.D.	Length	Description
6"	0.2m	Tricone
4.75"	5.96m	4-3/4" SperryDrill Lobe 7/8 - 2.2 stg
4.75"	0.8m	Integral Blade Stabilizer
4.75"	9.14m	DWD SlimHole
4.75"	0.8m	UBHO Sub
4.75"	98m	12 x Drill collar
4.75"	9m	Drilling Jar
4.75"	45m	5 x Drill collar
3.5"	189m	21 x HWDP
3.5"	1272m	127 x 139x DP (G) - NC38(IF) - 15.50#

BHA Discussion

Kick off from the existing 9-5/8" shoe at 1215m and build at 5°/30m to tangent angle of 30.9° at 320.6° Azimuth. Hold angle and direction to TD at 1582m TVD, approximately 1622m MD.



sperry-sun
DRILLING SERVICES

BHA Report

Customer : Origin Energy
Well : Dunbar #1DW1
Field : Dunbar #1DW1
Location : Otway Basin Victoria
Rig : ODE rig 30
Job # : AU-DD-20082

BHA# 1 (Proposed)

BHA# 1 :	Date In :	MD In (m) :	TVD In (m) :	Date Out	MD Out (m):	TVD Out (m):

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
1	6.000	Smith	XR15TP				

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs
	4.750	SSDS	SperryDrill		1.15°			

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Tricone		6.000		6.000		P 3-1/2" Reg	0.20	
2	4-3/4" SperryDrill Lobe 7/8 - 2.2 stg		4.750	2.901	5.750	37.87	B 3-1/2" IF	5.96	2.29
3	Integral Blade Stabilizer		4.750	2.250	5.750	46.84	B 3-1/2" IF	0.80	6.86
4	DWD SlimHole		4.750				B 3-1/2" IF	9.14	
5	UBHO Sub		4.750	2.250		46.84	B 3-1/2" IF	0.80	
6	Drill collar		4.750	2.250		47.00	B 3-1/2" IF	98.00	
7	Drilling Jar		4.750	2.250		46.84	B 3-1/2" IF	9.00	
8	5x Drill collar		4.750	2.250		47.00	B 3-1/2" IF	45.00	
9	HWDP		3.500	2.063		25.30	B 3-1/2" IF	189.00	
10	139x DP (G) - NC38(IF) - 15.50#		3.500	2.602		16.88	B 3-1/2" IF	1272.00	
								1629.90	

Parameter	Min	Max	Ave
WOB (klbs) :			
RPM (rpm) :			
Flow (gpm) :			
SPP (psi) :			

Activity	Hrs
Drilling :	
Reaming :	
Circ-Other :	
Total :	0.00

BHA Weight	(lb)
in Air (Total) :	
in Mud (Total) :	
in Air (Bel Jars) :	0
in Mud (Bel Jars) :	0

Drill String	OD(in)	Len (m)

PERFORMANCE

	In	Out
Inclination (deg)		
Azimuth (deg)		

	Distance (m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Oriented :					
Rotated :					
Total :					

COMMENTS

Kick off from the existing 9-5/8" shoe at 1215m and build at 5°/30m to tangent angle of 30.9° at 320.6° Azimuth. Hold angle and direction to TD at 1582m TVD, approximately 1622m MD.

Sperry-Sun Drilling Services
Drilling Hydraulics Analysis

Customer : Origin Energy Resources
Well : Dunbar #1DW1
6" Sidetrack/tangent assembly

Field : Dunbar #1
Location : Otway Basin Victoria
Report : 03-16-2001 17:56:04

Recommendation : Flow Rate : 250 gal/min TFA : 0.331 sq in SPP : 2012 psi

OPERATING PARAMETERS

Bit Depth	1622.00 m
Bit Diameter	6.000 in
Mud Density	1.10 sg
Plastic Vis	10 cp
Yield Point	15.0 lbf/100ft²

BIT HYDRAULICS SUMMARY

Bit PD	434 psi
% of Total PD	22 %
Bit HHP	60 HHP
Bit HHSI	2.13 HHSI
Impact Force	259 lbf
Jet Velocity	229 ft/s

Bit Nozzles : 3 x 12 /32's

SYSTEM PRESSURE LOSSES

Surface (Type 3)	11 psi
Drill String	963 psi
Downhole Motor	360 psi
Other Special	140 psi
Annulus	103 psi
Drill Bit	434 psi
Total	2012 psi

Fluid Model : Power Law

DRILL STRING CONFIGURATION

Description	O.D. in	I.D. in	Length m	Volume gal	P-Drop psi
4-3/4" SperryDrill Lobe 7/8 - 2.2 stg	4.750	2.901	5.96	55	360
Drill Collar	4.750	2.250	0.80	1	1
DWD SlimHole	4.750		9.14	1	140
Drill Collar	4.750	2.250	161.80	110	135
21x HWDP	3.500	2.063	189.00	108	225
159x DP (G) - NC38(IF) - 15.50#	3.500	2.602	1255.30	1118	603

ANNULAR SUMMARY

Section Description	Hole I.D. in	Pipe O.D. in	Section Length m	Depth To m	Annular Volume gal	Critical Velocity ft/min	Annular Velocity ft/min	Pressure Drop psi
Casing	8.660	3.500	1215.00	1215.00	10204	277	98 L	23
Open Hole	6.000	3.500	40.30	1255.30	128	354	258 L	4
Open Hole	6.000	3.500	189.00	1444.30	601	354	258 L	17
Open Hole	6.000	4.750	161.80	1606.10	291	442	456 T	55
Open Hole	6.000	4.750	9.14	1615.24	16	442	456 T	3
Open Hole	6.000	4.750	0.80	1616.04	1	442	456 T	0
Open Hole	6.000	4.750	5.96	1622.00	11	442	456 T	2

DISCUSSION

Hydraulics at TD with 3 x 12 jets. HSI = 2.13

3.2.2 Hole Sizes and Depths :

311mm to 317.0 mRT	Dunbar 1	- Drilled 1995
216mm to 1758.0 mRT	Dunbar 1 (TD)	- Drilled 1995
152mm to 1636.0 mRT	**Dunbar 1 DW1 (TD) - (1597.4m TVD)**	
	(Deviated hole from 1215 mRT in Dunbar 1)	

3.2.3 Casing and Cementing :

<u>Surface (Dunbar 1)</u>

Size -	9-5/8" / 244 mm
Weight -	36 & 43.5 lb/ft (26 joints)
Grade -	K55
Shoe Setting Depth -	311.9 mRT

<u>Intermediate (Dunbar 1)</u>

Size -	7" / 178 mm
Weight -	23 & 26 lb/ft (101 joints)
Grade -	K55 / N80
Shoe Setting Depth -	1209.8 mRT

<u>Production (Dunbar 1 DW1)</u>

Size -	2-7/8" / 73 mm
Weight -	6.5 lb/ft. (170 joints)
Grade -	K55
Shoe Setting Depth -	1634.5 mRT (1597.3 mTVD)
Quantity of Cement -	300 sacks "G" + 1% HALAD 322
Interval Cemented -	TD to 1075 mRT

3.2.4 Deviation Surveys :

Directional surveys are listed in Appendix 9.
Figures 4a to 4d show a graphical representation of the deviated borehole path.

3.2.5 Drilling Fluid :

(a) 1173-1215 m.	Fluid -	Fresh water / PAC
		Additives - PAC
(b) 1215 m - TD	Fluid -	KCl – PHPA
	Additives -	Algecide G, Barite, Caustic Potash, KCl, M-I Gel, PHPA Dry Powder, PAC R, SAPP.

3.2.6 Physical Mud Properties:

Table 3: Physical Mud Properties

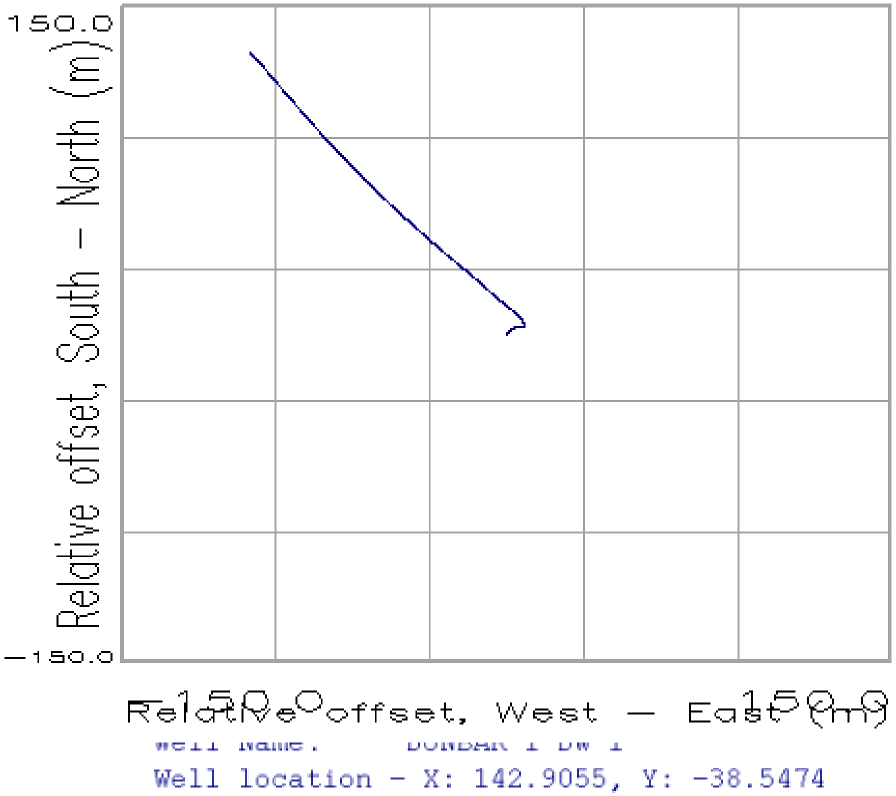
Date	Depth	SG	Vis.	WL	pH	FC	Sand	Solid	K+ (%)	Cl-
20/03		1.02	60	nc	9.5				4.0	
21/3	1217	1.03	50	nc	10.0				4.0	
22/03	1270	1.03	45	nc	10.0		Tr		4.6	22000
22/03	1395	1.05	48	8.0	9.5	1	Tr	1.5	4.1	20000
23/03	1457	1.09	48	7.3	9.5	1	Tr		4.0	19500
23/03	1636	1.09	47	6.5	9.5	1	Tr	3.5	4.0	19000
24/03	1636	1.09	47	6.5	9.5	1	Tr	3.5	4.0	19000
25/03	1636	1.09			10.0				4.0	19000

Table 4: Chemicals Used

Product	Units		Amount	
Algecide	1	Drum	25	litres
Barite	225	Sack	5625	kg
Caustic Potash	12	Drum	60	kg
KCl	43	Sack	5625	kg.
M-I Gel	100	Sack	500	kg
PAC R	197	Sack	475	kg
PHPA Dry Powder	10	Sack	475	kg.
SAPP	6	Sack	150	kg.

WELL PATH

PLAN VIEW



WEST-EAST OFFSET

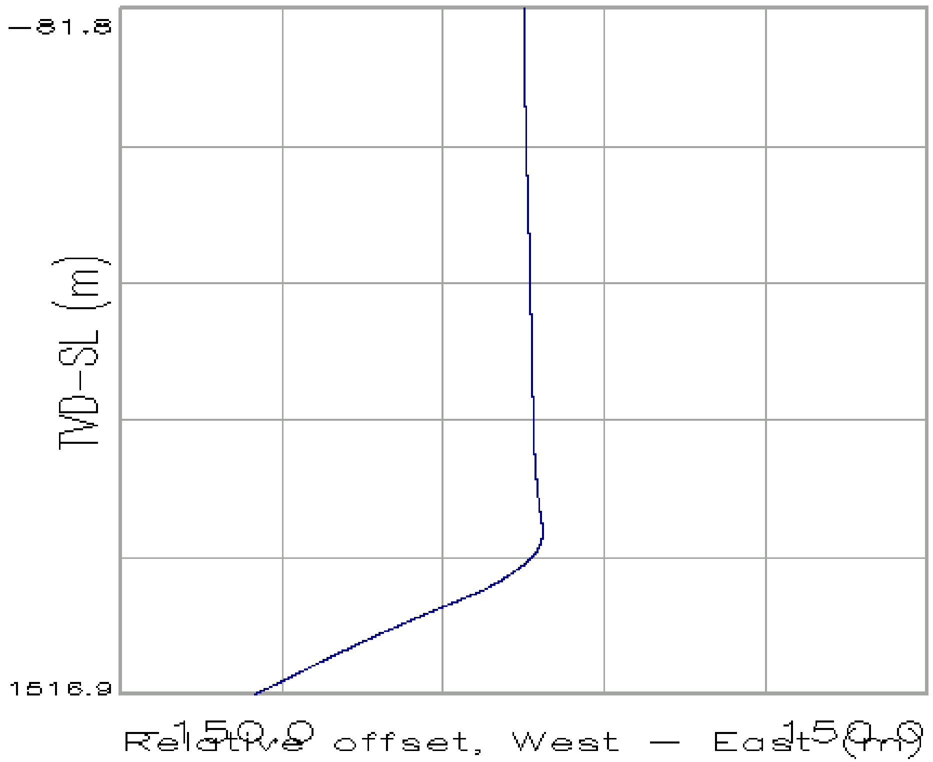


Figure 5

3.2.7 Water Supply :

Water was trucked from a mains supply standpipe.

3.2.8 Perforation Record :

1559.0 - 1562.0 mRT	54 mm (2-1/8")	6 shots per foot	Ø=60°	6.5 gm
1564.0 - 1569.0 mRT	54 mm (2-1/8")	6 shots per foot	Ø=60°	6.5 gm
1501.0 – 1505.0 mRT	54 mm (2-1/8")	6 shots per foot	Ø=60°	6.5 gm

3.2.9 Plugging and Cementing - Dunbar 1 (1995) :

1.	1610 - 1440 mRT	240 sacks "G"	tagged at 1437 mRT
2.	1240 - 1180 mRT		tagged at 1178 mRT

No plugs were set for Dunbar 1DW1

3.3. Logging and Testing

3.3.1 Wellsite Geologist:

D. A. Short

3.3.2 Mudlogging :

Mudlogging services were provided by Geoservices Overseas SA. Cuttings gas was monitored from surface casing shoe to total depth using a hot-wire gas detector and a FID gas chromatograph. A mudlog recording lithology, penetration rate, mud gas and other data was prepared and is an enclosure to this report.

3.3.3 Ditch Cutting Samples :

Cuttings were collected at 10 m intervals from the surface to 1430 mRT and at 3 m intervals to T.D. The cutting samples and sets were:

Sample Type	No. Sets
Unwashed (Origin Energy)	1
Washed (DNRE(2) / Origin Energy (1))	3
Samplex Trays (Origin Energy)	1

3.3.4 Coring : None.

3.3.5 Sidewall Cores : None.

3.3.6 Testing : None

3.3.7 Wireline Logs :

One suite of logs was run by Reeves Wireline

Table 5: Summary of Wireline Log Data

Type Log	Interval (base) mRT	Interval (top) mRT
DLS / MLL / SP / GR / CAL	1633	1210
PDS / CNS / GR / CAL	1633	1210

3.3.8 Temperature Surveys :

The maximum recorded temperature while logging was 64^{o} C from the PDS/CNS logging run, 9.4 hours since circulation stopped. The static bottom hole temperature was calculated at 78 deg C at TD, representing a geothermal gradient of 36.3 deg C/1000m, assuming a surface temperature of 20 deg C (Figure 6).

3.3.9 Velocity Survey :

None.

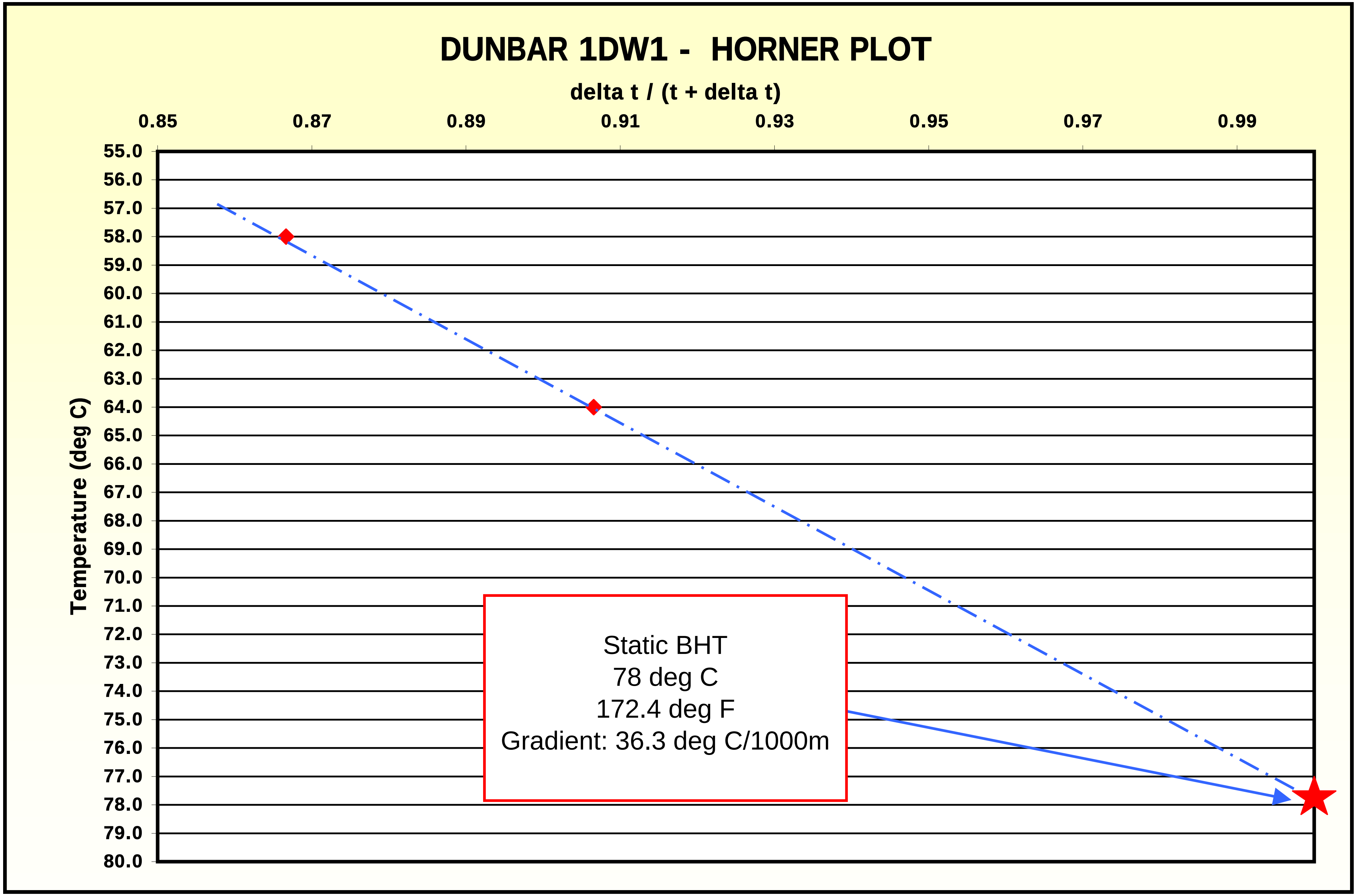

DUNBAR 1DW1 - HORNER PLOT
delta t / (t + delta t)
0.85
0.87
0.89
0.91
0.93
0.95
0.97
0.99
Temperature (deg C)
55.0
56.0
57.0
58.0
59.0
60.0
61.0
62.0
63.0
64.0
65.0
66.0
67.0
68.0
69.0
70.0
71.0
72.0
73.0
74.0
75.0
76.0
77.0
78.0
79.0
80.0
Static BHT
78 deg C
172.4 deg F
Gradient: 36.3 deg C/1000m

FIGURE 6

4. GEOLOGY

4.1. Reasons for Drilling

4.1.1 Introduction

Dunbar 1/DW1 is a development well in PPL-1, onshore Otway Basin, Victoria and was drilled to develop the up-dip potential of the Dunbar structure. The primary objective for the well was the Waarre Sandstone member of the late Cretaceous Sherbrook Group.

The Dunbar structure is located approximately 8 km north-west of Port Campbell in south-eastern Victoria (figure 1) and the well was directionally drilled from immediately below the existing 7" casing shoe in Dunbar 1 which is about 125m to the southeast of the target subsurface Waarre "A" location. The primary target, the Waarre "A" sand, was located on Inline 6470 and CDP 2620 of the Waarre 3D seismic survey approximately 125 metres northwest of the surface location.

4.1.2 Previous Drilling

The Otway Basin has been recognised as a potential petroleum province since the 1860's. Salt Creek-1 in South Australia was the first exploration well in the Otway Basin in 1866 (Sprigg, 1986). Since then, over 200 wells have been drilled in the Otway Basin, both onshore and offshore.

The first hydrocarbon discovery was made in 1959, when Frome-Broken Hill drilled Port Campbell-1 and flowed gas from the Late Cretaceous Waarre Formation at an initial rate of 1.5 MMcfd. However, it was deemed non-commercial as the rate declined rapidly.

Shell initiated drilling offshore in the Victorian section of the Basin in 1967, followed closely by Esso, though there were no significant discoveries.

The first commercial hydrocarbon discovery was in 1979 when North Paaratte-1 well was drilled by Beach Petroleum NL. The well was located on the southern flank of an elongate, east-west trending faulted anticline in the Port Campbell embayment of the Otway Basin and intersected gas in the Waarre

Sandstone member of the Upper Cretaceous Sherbrook Group. Subsequent testing flowed GTS at rates up to 9.5 MMcfd and confirmed a new field discovery. North Paaratte-2 was drilled in 1981 approximately 1.6 km to the east and intersected a similar high-deliverability reservoir in the Waarre Sandstone. North Paaratte-3 was located further to the east but was drilled on a separate structure with no gas column.

Following the North Paaratte gas discovery, the Wallaby Creek and Grumby gas fields were discovered by Beach in 1981 (also Waarre Formation). Subsequent exploration resulted in the discovery, by Beach, of the Iona gas field in 1988, and the Boggy Creek CO_2 field, by GFE Resources, in late 1991.

The first offshore success was with BHP Petroleum's Minerva-1, in 1993, offshore from Port Campbell.

In 1993 the Waarre 3 D seismic survey was acquired and led to the discovery of the Mylor gas and oil field in 1994 by Bridge/GFE, yielding the first recovery of oil from the Waarre Formation. The Langley gas field was also discovered (GFE) in 1994.

Dunbar 1 was drilled in 1995 by GFE and discovered gas in the Waarre Formation. In 1996 Basin Oil discovered the Skull Creek gas field. In 1999 Boral Energy drilled the North Paaratte-4 & 5 and Wild Dog Road-1 Waarre Formation gas wells.

During 2000-01 Santos conducted a drilling programme in the immediate area.

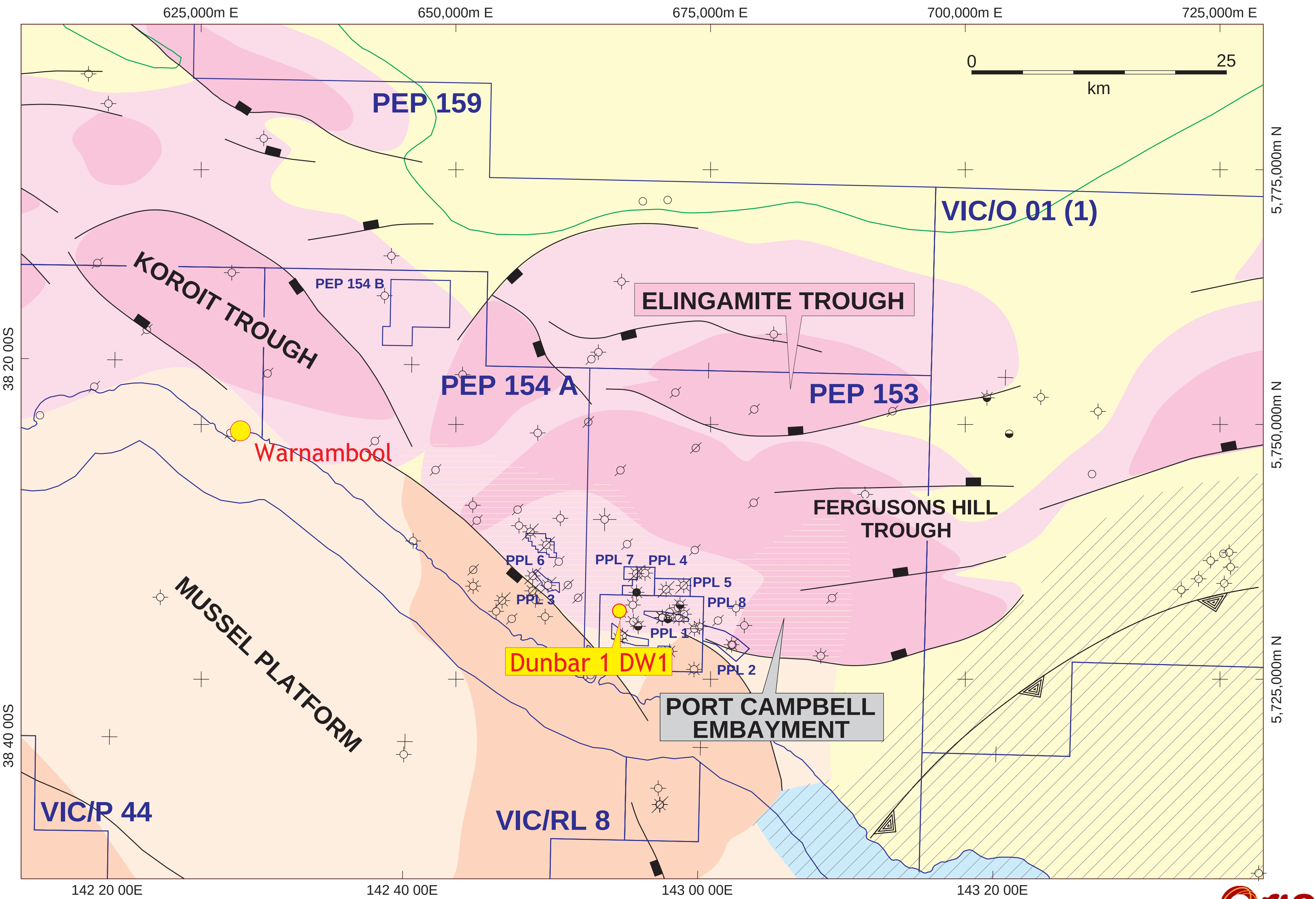
4.1.3 Regional Geology

The Otway Basin is approximately 500km long and extends both onshore and offshore west-northwest from the Victorian Mornington Peninsula in the east to Cape Jaffa, South Australia, in the west. PPL-1 is located in the Victorian portion of the onshore Otway Basin approximately 50km northwest of Cape Otway. PPL1 lies in the Port Campbell embayment, which is bounded to the east by erosion along the emergent Otway Ranges and to the north and west by erosional thinning and pinch-out. Figure 6 illustrates the structural elements of the Victorian Otway Basin.

Formation of the Otway Basin commenced in the late Jurassic with the initiation of rifting between Australia and Antarctica. Depositional growth occurred as superimposed sedimentary sequences were laid down during different phases of the separation of the Antarctic continental landmass from Australia's southern margin. The oldest strata comprise the Early Cretaceous Crayfish subgroup and overlying Eumeralla Formation, the latter comprising lithic-rich, volcanogenic sandstones with generally poor reservoir potential. Following deposition of the Eumeralla Formation widespread uplift and erosion occurred and this has been interpreted to be due to the onset of sea floor spreading. The Sherbrook Group was deposited on the resulting unconformity as a condensed sandstone sequence further onshore, whilst offshore and near the coast it can be subdivided into formations representing the various facies of a delta system. The basal member, the Waarre Formation, comprises sands and shales with marine and shoreface facies. The Waarre Formation has been subdivided into four units and unit 'C' constitutes the objective gas reservoir for the gas fields in PPL-1 and 2. The Waarre Formation is overlain by the Belfast Mudstone, a massive siltstone sequence which is interpreted to represent offshore pro-deltaic facies, and to be the time equivalent Nullawarre Greensand. The Skull Creek Mudstone and Paaratte Formation, an interbedded sand and shale sequence, comprise the upper members of the Sherbrook Group. The general stratigraphy of the Port Campbell Embayment is illustrated in figure 7.

Fault movements during deposition of the Sherbrook Group are apparent in seismic sections but fault throws diminish above the Belfast Mudstone. The eventual large reduction in the number of faults by the top of the Paaratte Formation indicates relative quiescence by the end of the Cretaceous.

The basal Tertiary section is defined by an unconformity with the Cretaceous and consists of sandstones and claystones of the Wangerrip Group probably deposited onshore in a fluvial-deltaic setting. The basal transgressive sandstone unit is the Pebble Point Formation which comprises conglomeratic and commonly ferruginous sands. Pro-delta muds and silts of the Pember Mudstone Member grade into the overlying sands and shales of the Dilwyn Formation which represent a series of stacked transgressive-regressive deltaic cycles.

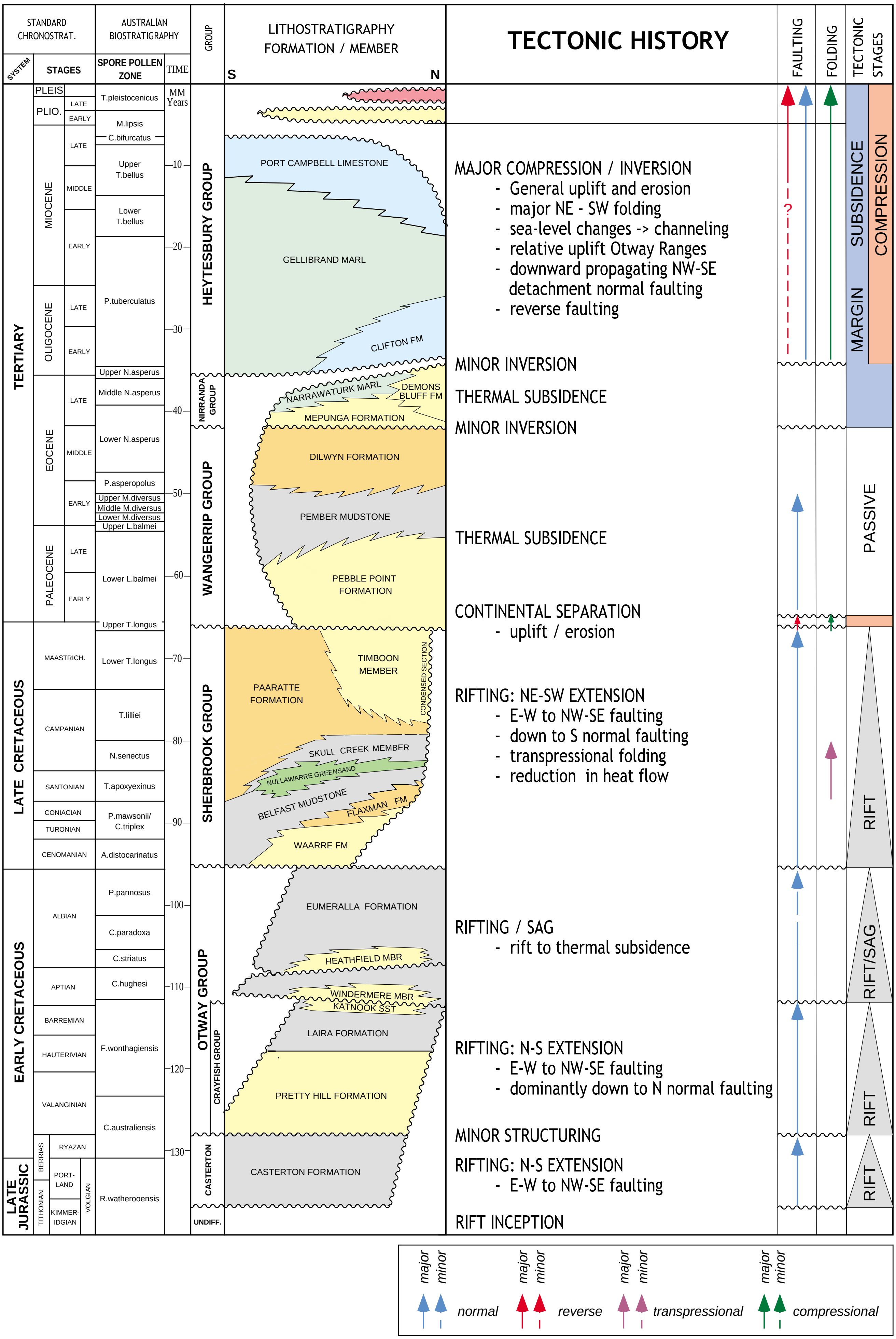


kayc

OTWAY BASIN (VICTORIA) - TECTONIC ELEMENTS

Origin energy

20812.032002 Fig.7



VICTORIAN OTWAY BASIN - STRATIGRAPHIC TABLE

REVISED October 1999 after ABELE et al 1995

16279.072000 Fig.8

The rate of sea floor spreading appears to have increased markedly during the upper Eocene resulting in a major marine transgression in the Otway Basin. The Tertiary sequence unconformably overlying the Dilwyn Formation is dominated by marine marl and limestone as a result of this inundation.

The tectonic framework of the Otway Basin is dominated by extensional processes which produced a series of normal fault blocks. Continued block faulting and subsidence during the Early Cretaceous led to the development of an extensive rift valley system throughout southeast Australia. Pull-apart tectonics continued until the late Cretaceous and faulting, recognised as 'down to the basin' movement, represented reactivation of the initial rift system faults. By the Late Eocene drifting rates increased and a period of out-building occurred; subsidence was slow and tectonic activity became relatively quiet resulting in a relatively undeformed carbonate sequence.

During Late Cretaceous and possibly continuing to Early Tertiary times a right lateral couple was applied resulting in the formation of a series of northeast-trending anticlines (e.g. Port Campbell Anticline). The structural grain generated as a result of this couple produced the combination fault and three-way dip closures targeted by drilling in the Port Campbell Embayment.

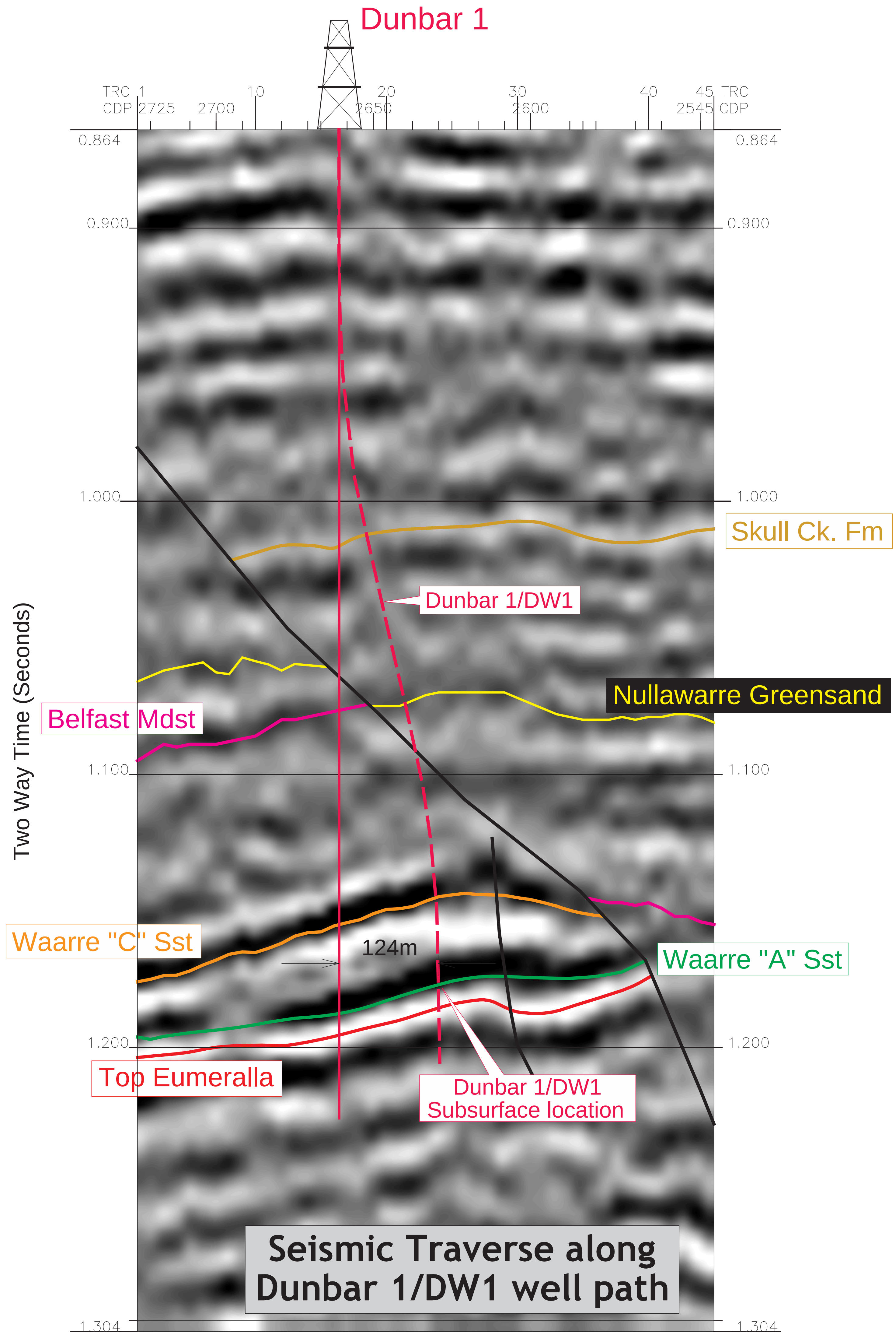
In Middle Eocene, the rate of seafloor spreading south of Australia increased considerably. At this time there was also a strong pulse of northwest-southeast compression, resulting in northeasterly trending folds and faults and reactivation of earlier structures in the Otway Ranges High and nearby areas.

4.1.4 Structure

The Dunbar structure was remapped following the acquisition by Boral Energy of the Cultus interest in PPL 1. The seismic database is the Waarre 3D seismic survey, which was recorded in 1993.

The Dunbar structure is an elongate fault dependent closure. The main northern bounding fault of the prospect throws to the north thus juxtaposing the primary objective, the Waarre Sandstone, against the Belfast Mudstone (sealing formation) on the downthrown side of the fault. The closure to the south, east, and the west is by structural dip. Figures 8 and 9 show the depth structure maps for the Waarre Fm ‘C’ and ‘A’ horizons respectively.

The Dunbar 1 well, which was suspended after failing to run the production casing to TD, was re-entered and sidetracked below the 7" casing shoe, deviating to the northwest to an updip subsurface Waarre “A” location at about 125 m offset from the surface location.



Dunbar 1
TRC 1 10 20 30 40 45 TRC
CDP 2725 2700 2650 2600 2545 CDP
0.864
0.900
1.000
1.100
1.200
1.304
Two Way Time (Seconds)
Skull Ck. Fm
Dunbar 1/DW1
Nullawarre Greensand
Belfast Mdst
Waarre "C" Sst
124m
Waarre "A" Sst
Top Eumeralla
Dunbar 1/DW1
Subsurface location
Seismic Traverse along
Dunbar 1/DW1 well path

4.1.5 Source and Migration

The discovery of gas in Dunbar 1 confirms that generation and migration of hydrocarbons has occurred. The gas is most likely to have been generated deeper in the section, probably from basal coals in the Eumeralla Formation, and migrated along faults and sandstone layers to the Waarre Formation.

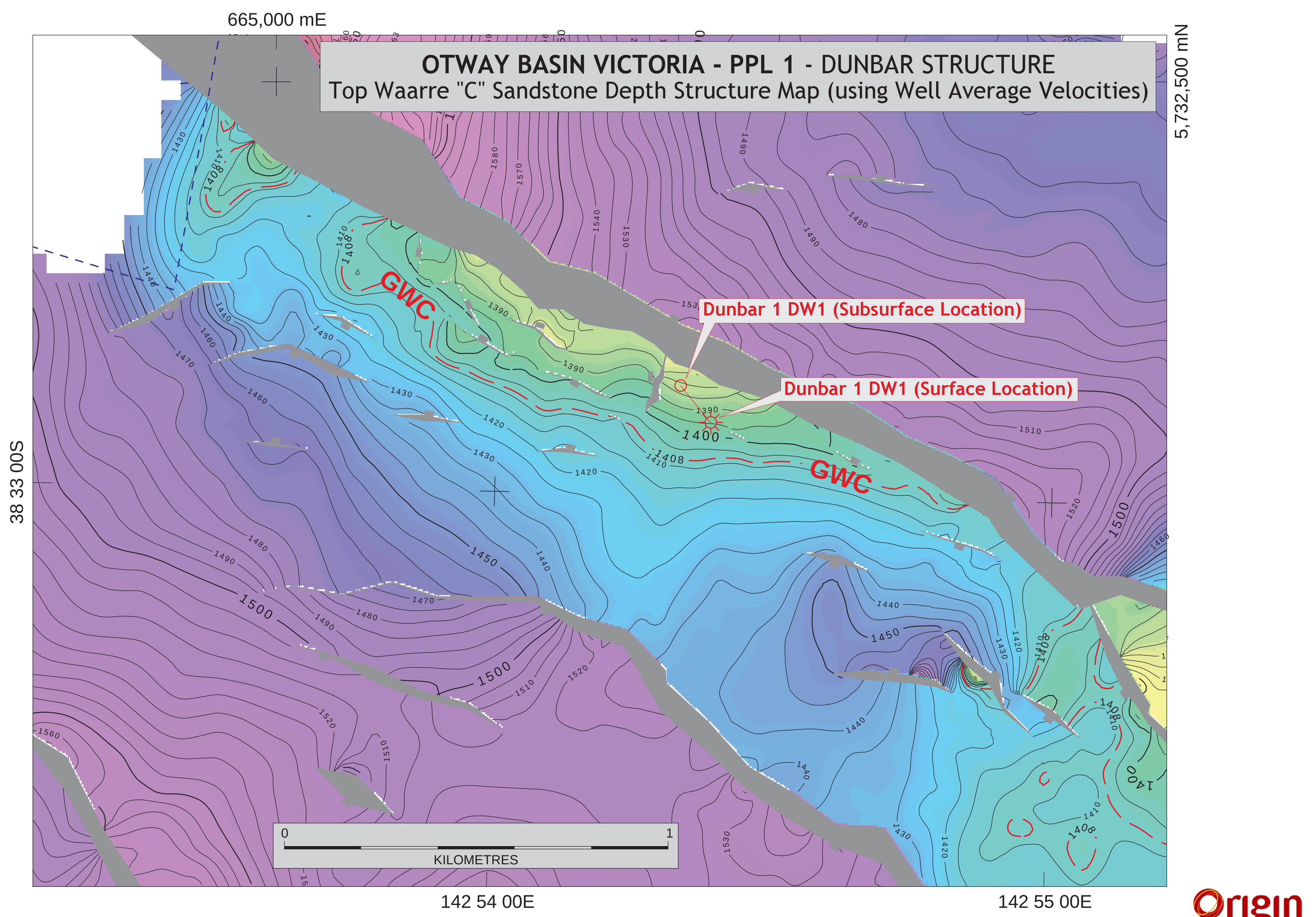
4.1.6 Reservoir and Seal

The Waarre Sandstones are interpreted to be an open marine facies deposited in the highest energy, shallow marine upper to middle shoreface environment and comprise medium to coarse grain size. The sequence of interbedded sand and shale has led to an informal sub-division of the Formation into the A (basal), B, C and D (top) units.

The Belfast Mudstone is a competent seal providing both vertical and cross-fault seal for the Waarre Sandstone reservoir. The juxtaposition of reservoir sands against mudstones across the fault is providing an adequate sealing mechanism.

4.1.7 Objectives

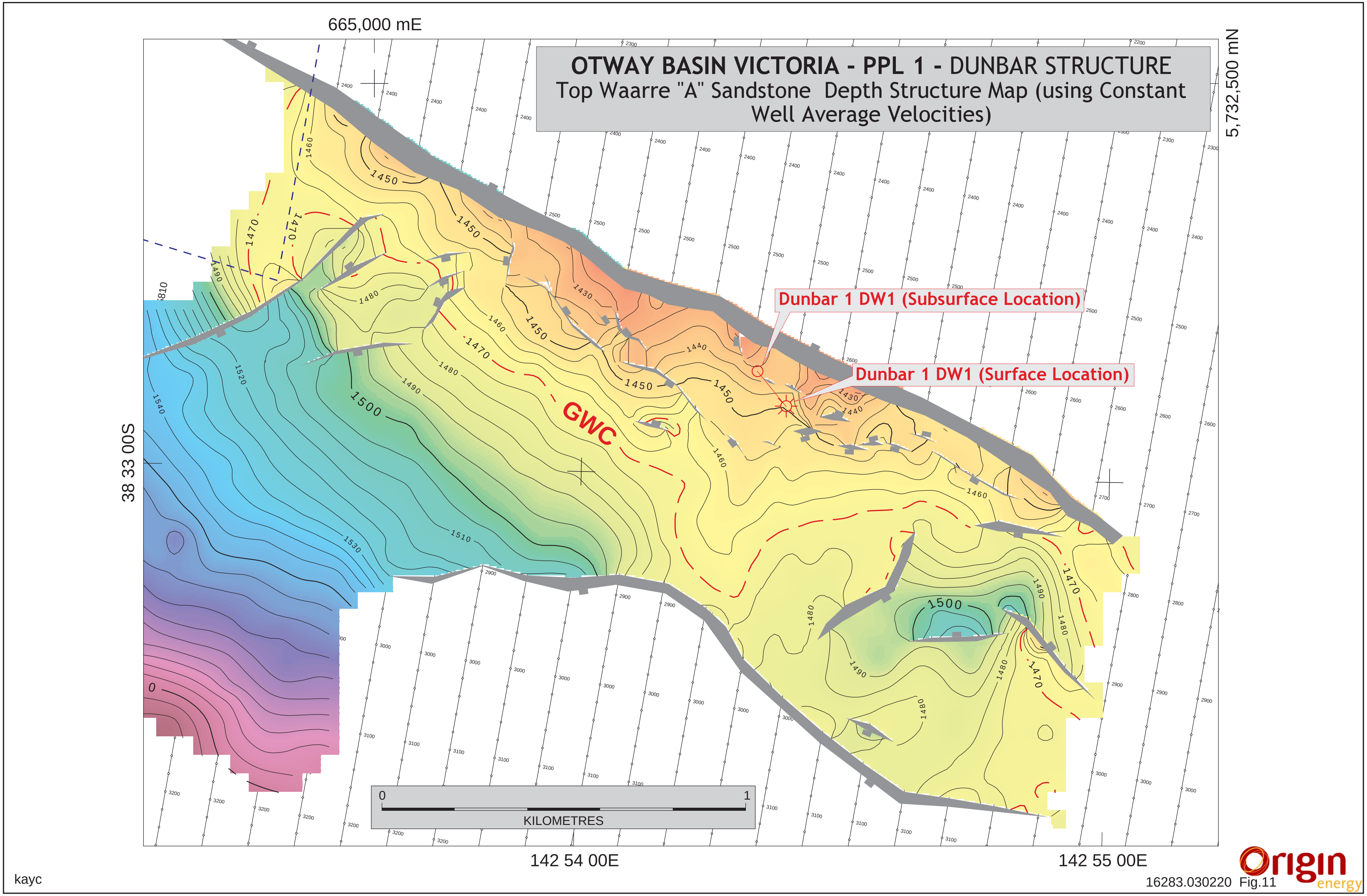
The primary objectives for Dunbar 1 DW1 are unit "A" and unit "C" sandstones of the Waarre Formation. The well was prognosed to penetrate in excess of 31-37 m of Waarre "A" reservoir thickness, and 22-28 m of the Waarre "C" reservoir thickness above the gas water contacts. A proposed TD of –1500 m TVD SS would allow sufficient rathole to perforate the reservoir and junk the perforating subs at the bottom of the hole.



kayc

16282.032002 Fig.10

Origin energy



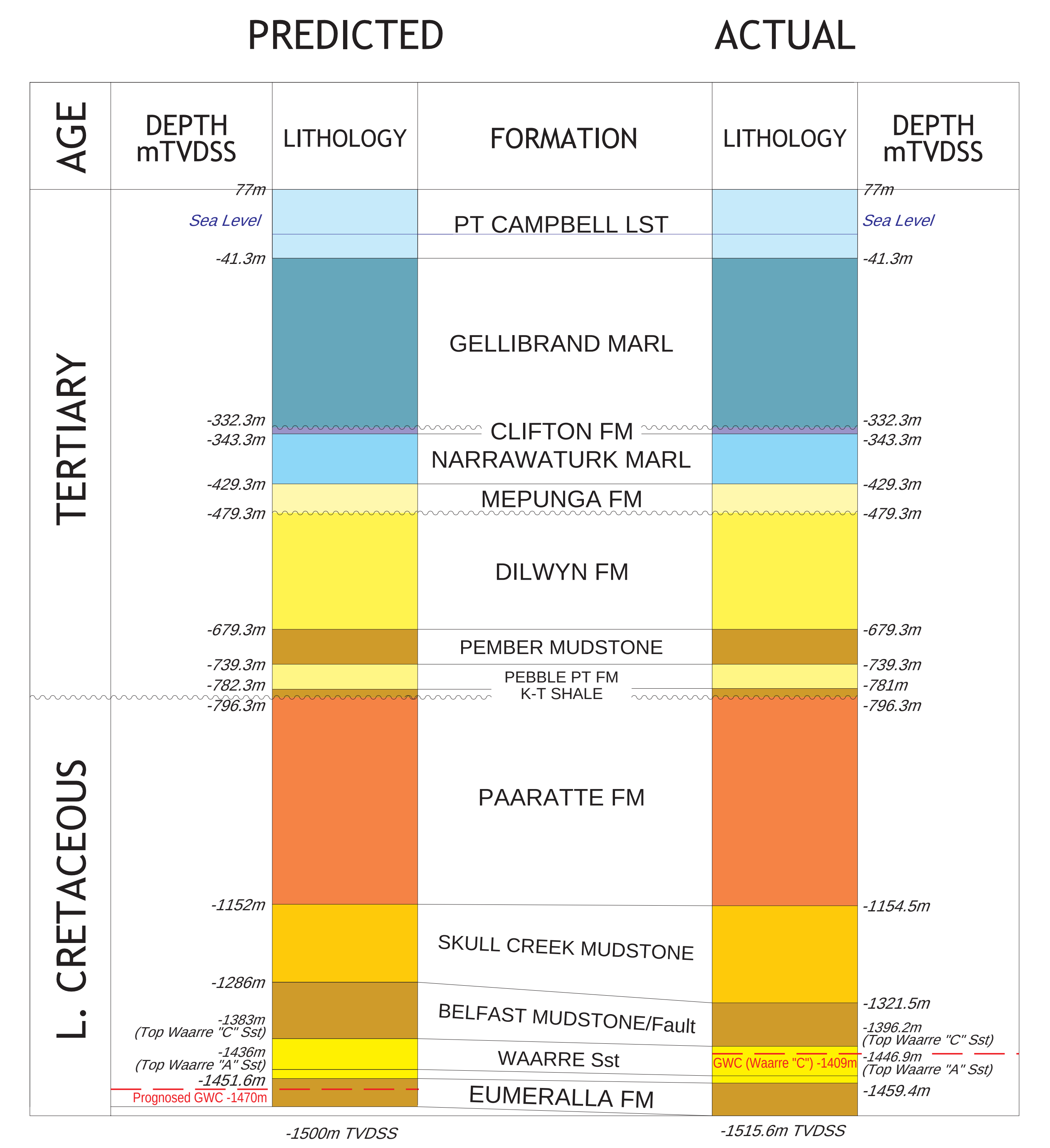
OTWAY BASIN VICTORIA - PPL 1 - DUNBAR STRUCTURE
Top Waarre "A" Sandstone Depth Structure Map (using Constant Well Average Velocities)
665,000 mE
5,732,500 mN
38 33 00S
142 54 00E
142 55 00E
Dunbar 1 DW1 (Subsurface Location)
Dunbar 1 DW1 (Surface Location)
GWC
0
1
KILOMETRES
kayc
16283.030220 Fig.11

4.2 Stratigraphic Prognosis

The depth prognosis for Dunbar 1 DW1 was derived from the Waarre 3D seismic data using Dunbar 1 well velocity data and depth conversion results from the well average velocities. Table 4 below presents and Figure 10 illustrates the difference between the prognosed and actual formation tops intersected in the well.

Table 6: A comparison between prognosed and actual formation tops

FORMATION	Predicted TVD (m subsea)	Actual TVD (m subsea)	Difference (m)
Skull Creek Mbr.	-1152.0	-1154.5	2.5 (L)
Nullawarre Greensand	Absent ?	Not Penetrated	
Belfast Fm.	-1286.0	-1321.5	35.5 (L)
Waarre Fm. (Unit C)	-1383.0	-1396.2	13.2 (L)
Waarre Fm. (Unit A)	-1436.0	-1446.9	10.9 (L)
Eumeralla Fm.	-1451.6	-1459.4	7.8 (L)
T.D. (Logger)	-1500.0	-1515.6	15.6 (L)



OTWAY BASIN VICTORIA - PREDICTED Vs ACTUAL SECTION
DUNBAR 1/DW1

kayc

20892.042002 Fig.12

Origin energy

4.3 Stratigraphy

The following stratigraphic summary describes formations drilled at Dunbar 1 DW1. The thicknesses are true vertical thickness. The stratigraphic section encountered at Dunbar 1 DW1 is displayed graphically in Figure 4.

Table 7: Dunbar 1DW1 Stratigraphic Table

AGE	FORMATION	R.T. Depth	TVD Depth	TVDSS Depth	Thickness
L. Cretaceous	Skull Creek Mbr.	1236.4	1236.3	-1154.5	167.0
L. Cretaceous	Nullawarre Greensand	Not Penetrated			
L. Cretaceous	Belfast Fm.	1415.0	1403.3	-1321.5	74.7
L. Cretaceous	Waarre Fm. (Unit C)	1500.0	1478.0	-1396.2	19.5
L. Cretaceous	Waarre Fm. (Unit B)	1522.1	1497.5	-1415.7	31.2
L. Cretaceous	Waarre Fm. (Unit A)	1557.6	1528.7	-1446.9	12.5
L. Cretaceous	Eumeralla Fm.	1571.8	1541.2	-1459.4	56.2 +
	T.D. (Logger)	1636.0	1597.4	-1515.6	

4.3.1 PAARATTE FORMATION

1210.0 – 1236.4 mRT (1128.2 – 1154.5 mTVD) Thickness : +26.3 metres

1210.0 – 1236.4 mRT SANDSTONE with trace CLAYSTONE.

SANDSTONE, translucent white to very pale grey, fine to coarse, sub-angular to sub-rounded, poor to moderate sorted, crystal faces on some grains, common pyrite crystals encrusted on some quartz grains, trace to moderate clay matrix, minor calcite cement, friable to predominantly loose, good to very good porosity.

CLAYSTONE, moderate to dark grey, soft, silty in part.

4.3.2 SKULL CREEK MEMBER

1236.4 – 1415.0 mRT (1154.5 – 1321.5 mTVDSS) Thickness : 167.0 metres

1236.4 – 1415.0 mRT CLAYSTONE with minor SANDSTONE interbeds and rare LIMESTONE.

CLAYSTONE, light to moderate grey, grey-brown, minor greenish grey to greenish blue, soft, silty and carbonaceous specks in part, trace dolomite, rare greenish lithic grains.

SANDSTONE, white, pale grey, minor pale greenish white, very fine to fine, occasionally medium and rare coarse, sub-angular to sub-rounded, poor to moderate sorted, trace lithics and pyrite, occasional carbonaceous laminae, moderate to abundant clay matrix, calcareous in part, friable to moderately hard, poor to fair porosity.

LIMESTONE, (1406m. MD), white to cream, silty and argillaceous, minor green lithic / glauconite? grains.

4.3.3 NULLAWARRE GREENSAND

Not present.

4.3.4 BELFAST FORMATION

1415.0 - 1500.0 mRT (1321.5 – 1396.2 mTVDSS) Thickness : 74.7 metres

1415.0 -1448.5 mRT	CLAYSTONE, light to moderate grey-brown to brown, soft, silty in part, trace carbonaceous specks.
1448.5 – 1454.5 mRT	Interbedded SANDSTONE and CLAYSTONE. SANDSTONE, white to pale brown, very fine to occasional medium, silty bluish green to grey, very argillaceous, common green lithic (glauconite?) grains, trace carbonaceous material, calcareous in part, grades to arenaceous claystone in part, poor porosity; also clear, loose, fine to medium, sub-rounded quartz grains CLAYSTONE, light to moderate brown to grey-brown, bluish grey.
1454.5 -1500.0 mRT	CLAYSTONE, greenish blue to grey, light brown, soft, glauconitic, occasional silty and sandy lenses.

4.3.5 WAARRE FORMATION (Unit 'C')

1500.0 – 1522.0 mRT (1396.2 – 1415.7 mTVDSS) Thickness : 19.5 metres

1500.0 - 1522.0 mRT	SANDSTONE, clear to translucent, medium to very coarse, angular to sub-rounded, poor to moderate sorted quartz grains, trace clay matrix, friable to loose, very good porosity.

4.3.6 WAARRE FORMATION (Unit 'B')

1522.0 - 1557.6 mRT (1415.7 – 1446.9 mTVDSS) Thickness : 31.2 metres

1522.0 - 1529.5 mRT	SILTSTONE with minor SANDSTONE. SILTSTONE, light grey to light brown, soft, very argillaceous and grades to claystone, minor greenish glauconitic stain, minor glauconite nodules and carbonaceous specks. SANDSTONE, clear to translucent, mostly fine to medium, sub-rounded, moderate sorted, loose quartz grains, poot to fair porosity.

1529.5 - 1542.0 mRT	SANDSTONE, clear to translucent, fine to coarse, predominantly medium to coarse, angular to sub-rounded, moderate sorted, trace clay matrix, loose, good porosity.
1542.0 - 1557.6 mRT	SILTSTONE with rare COAL. SILTSTONE, light to moderate brown, soft, amorphous, very argillaceous and grades to claystone. COAL, (1553m.), dull black, grades to carbonaceous shale in part.

4.3.7 WAARRE FORMATION (Unit 'A')

1557.6 - 1571.8 mRT (1446.9 – 1459.4 mTVDSS) Thickness : 12.5 metres

1557.6 - 1569.5 m	SANDSTONE, very calcareous in part with rare SILTSTONE at top. SANDSTONE, clear to translucent white, very fine to fine at top and becoming coarse to very coarse with depth, sub-angular to sub-rounded, moderate sorted, moderate clay matrix, trace calcite cement, predominantly loose, fair to good porosity. At 1562-63m. SANDSTONE, white to pale grey, fine to medium, occasionally coarse, sub-angular to sub-rounded, moderate sorted, common grey to grey-green lithics, trace carbonaceous material, rare pyrite, minor clay matrix, moderate to strong calcite cement, poor to fair porosity. SILTSTONE, at top of interval, light to moderate grey, moderate to dark grey-brown, soft to firm, sub-fissile to blocky, carbonaceous specks, rare pyrite, argillaceous.
1569.5 - 1571.8 m	Interbedded SILTSTONE and CLAYSTONE. SILTSTONE, moderate brown, minor dark brown to black, soft, very argillaceous and grades to claystone, carbonaceous in part. CLAYSTONE, cream to light brown, hard, silty and carbonaceous in part.

4.3.8 EUMERALLA FORMATION

1571.8 – 1636.0 mRT (1459.4 – 1515.6 mTVDSS) Thickness : +56.2 metres

1571.8 – 1636.0 m	SANDSTONE with interbedded CLAYSTONE. SANDSTONE, white, light to dark green, fine to coarse, sub-angular to sub-rounded, poor to moderate sorted quartz and green to grey-black volcano-lithic grains, abundant dispersive clay matrix, trace pyrite and carbonaceous material, minor calcite and calcite cement, friable, poor inferred porosity. CLAYSTONE, light to dark brown, soft to firm, silty and carbonaceous in part.

4.3.9 TOTAL DEPTH

Driller:	1636.0 mRT	(1515.6 mTVDSS)
Logger:	1636.0 mRT (Extrapolated)	(1515.6 mTVDSS)

4.4 Hydrocarbon Shows

4.4.1 Waarre Unit "C & B"

A good gas show (max. 607 units 95/4/1) was encountered over the interval 1500-1515 mRT (1478-1491 mTVDRT) at the top of the upper Unit "C" sand of the Waarre Formation. The gas readings over the basal 5 m of this sand (1515 –1520 mRT) were significantly lower (130 - 150 units) and log analysis indicates the zone to be water wet.

A sand interval 1530 – 1542 mRT (1504 – 1514 mTVDRT) in the lower Waarre Unit "C" had gas shows to 605 units (95/5/Tr) but log analysis indicates the zone to be water wet. The gas appears to come from the middle of the sand where the gamma ray log indicates the interval to have a slightly "siltier" lithology.

4.4.2 Waarre Unit "A"

An excellent gas show (max. 2063 units 88/8/3/1) was encountered over the interval 1558 – 1570 mRT (1529 – 1540 mTVDRT) in the Unit "C" sand of the Waarre Formation. Log analysis indicates the zone to have significant gas saturation.

4.4.3 Eumeralla Formation

There were no gas peaks in the Eumeralla Formation and readings decreased slowly from 200-300 units at the top to 100 units at the base and appear to represent a steady drop-off in background gas.

5 DISCUSSION AND CONCLUSIONS

The Dunbar 1DW1 exploration well achieved its objective of evaluating and developing the up-dip potential of the Waarre Formation sands in the Dunbar structure.

The top of the Unit "C" sand was 3.8 mRT higher than in Dunbar 1 but 13.2 mRT low to prognosis. The top of the Unit "A" sand was 3.4 mRT higher than in Dunbar 1 but 10.9 mRT low to prognosis.

Both sands have very good reservoir quality and significant gas saturation. Logs indicate a gas/water contact in the Unit "C" sand at a true vertical depth of 1490.78 mTVDRT (-1408.98 mTVDSS). The gas/water contact in the Unit "A" sand was not encountered.

These results highlight the potential for further gas discoveries / development at other prospects in the area.

6 COMPLETION

The completion of Dunbar 1 DW1 as a 2 7/8” monobore Waarre Formation gas producer was carried out between 6th and 21st April 2001. Barry Beetson provided onsite supervision. Downhole installation and well head diagrams can be found in Appendix 7.

6.3 Summary of Operations

6th April 2001 Expertest arrive on location - Conduct onsite safety meeting, rig up elevated work platform by Xmas tree - Crane arrived on location, Rig up wireline equipment, RIH with 2.34” Gauge ring - Tagged bottom at 1619 mRT, POH - RIH with 2.0” x 6 metre Drift, tag bottom, POH - RIH with 2.5” type “A” tubing stop, set at 468 mRT, Rig down wireline equipment - Travel to Santos lease, and load flare line, return to Dunbar 1, rig up flare line and rig surface to swab and perforate – Shut down for night.

7th April 2001 Arrive at location - Hold safety meeting, rig up swabbing equipment - RIH with swab string and commence swabbing operations, Tag fluid at 80 mRT - Pull swab from 150 mRT, swab line parted, POH without swabbing assembly - RIH with lead impression block, tag top of fish at 110 mRT, POH, lead block indicates clean break at socket, RIH with 2.0” SB pulling tool, latch fish and POH slowly - Rig up and recommence swabbing, swab down to 420 mRT in 6 runs, no further problems - Rig down swabbing equipment, rig up slickline - RIH with 2.5” S B pulling tool, latch type “A” tubing stop at 468 mRT, RIH with tubing stop - Set tubing stop at 1584 mRT - POH - RIH with correlation tool, GR-CCL and confirm depth of tubing stop - POH - Downloading data from correlation run - Rig down swab line, pack up swabbing equipment - Prepare manifold for gauges and sampling, stake down flare line and prepare pressure survey for running.

8th April 2001 Arrive at location - Hold onsite safety meeting, discuss wet, slippery conditions, slips, trips and falls - Makeup temperature-pressure tool RIH to obtain parameters for perforating system - Tag tubing stop, POH to 1557 mRT, hang for 15min, POH to 1526 mRT, hand for 15 mins - POH - Download data, rig up 21 m lubricator and pressure test to 2000 psi, OK, attach 2-1/8” SDP-2125-402NTX casing guns loaded 6 spf, 60 degree phasing to perforate - Waarre “A” sand interval 1559.0 – 1562.0 to 1564.0 - 1569.0 mRT with micro

smart programmable firing head - RIH with guns (200'/min max), guns on depth at 1569 mRT - Wait for sampler to open, wait 4 minutes for guns to fire, wait 15 minutes to collect firing data - POH with perforating assembly - All guns fired, 424 psi wellhead pressure - Rig down lubricator and gun assembly - Rig up to flow down flare line - Flow test well thru ¾" choke, final flow pressure 1132psi at 29 deg C - Rig down flow line install tree cap - At 1800hrs SITHP 1800 psi – Shut down for night.
(Final flow rate calculates at 17.6 MMscfd @ 1132 psig.)

9th April 2001 Arrive at location. SITHP = 1806 psi - Hold onsite safety meeting, discuss crane operation of Expertest crane - Rig to pull tubing stop, RIH with 2.5" SB pulling tool, latch type "A" tubing stop and POH - Rig down wireline equipment, rig down, program complete - Crew travel to Adelaide.

7 REFERENCES

Aburas A.N.	Proposal to Drill Dunbar 1/DW1, PPL 1, Otway Basin Victoria, Unpublished report for Origin Energy Petroleum Pty. Ltd., June 2000.
Oil Company of Australia Limited	Drilling Programme : PPL-1 : Dunbar 1/DW1, Unpublished report for Origin Energy Petroleum Pty. Ltd., March 2000.