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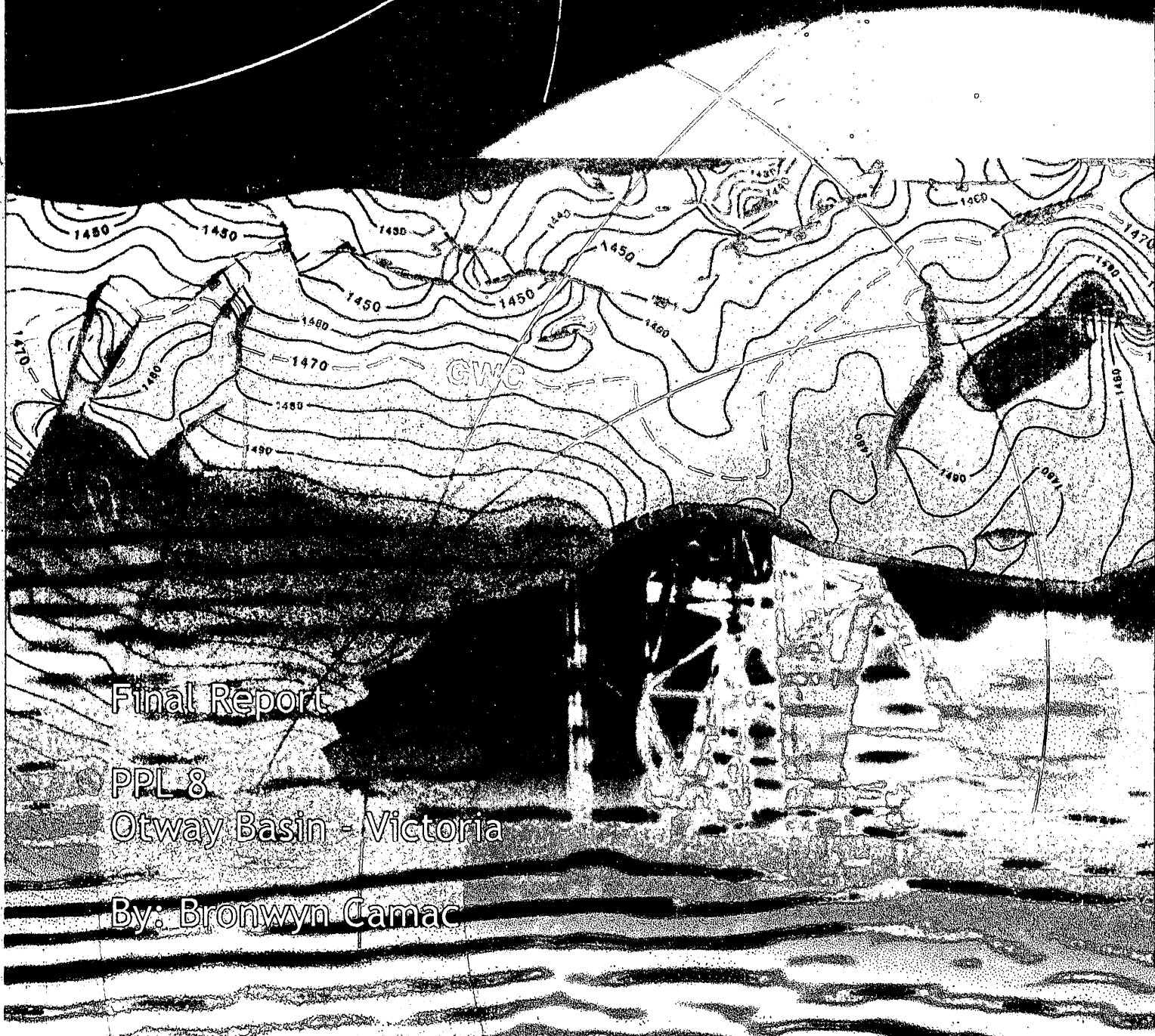
DEPT. NAT. RES & ENV



PE908930

DUNBAR 1/DW1

WELL COMPLETION REPORT



Final Report

PPL 8
Otway Basin - Victoria

By: Bronwyn Camac



ORIGIN ENERGY RESOURCES LIMITED

WELL COMPLETION REPORT

DUNBAR 1 DW1

PPL 1

OTWAY BASIN

VICTORIA

Petroleum Development

7 MAY 2002

March 2002

By: Doug Short and Bronwyn Camac

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WELL DATA CARD

WELL DATA CARD DUNBAR 1DW					
Permit	PPL 1	Otway Basin	Spud:	1600 hrs, 19 March 2001	
Location:	Latitude:	38 32' 48.44" S	Reached TD.	2300 hrs, 23 March 2001	
(Datum: GDA 94)	Longitude:	142 54' 28.04" E	Rig Released:	0700 hrs, 26 March 2001	
Prospect Type:	elongate fault dependant closure				
Grid Location:					
(UTM: AGM Zone 54)	Easting:	666 254.49	Hole Sizes:	311mm (12 1/4") Dunbar 1	317.0 mRT
	Northing:	5 731 789.49		216mm (8 1/2") Dunbar 1	1758.0 mRT
				152mm (6") Dun 1DW1	1636.0 mRT
	Seismic:		Casing 1	Surface (Dunbar 1)	Size: 245 mm (9 5/8")
	Inline:	6470		Shoe:	311.9 mRT (D)
	Waarre 3D (1993)	CDP 2620		Type:	36 & 43.5 lb/ft K55
Elevations:	G.L.:	77.2 m A.M.S.L.			
	R.T.:	81.8 m A.M.S.L.	Casing 2	Intermediate (Dunbar 1)	Size: 177.8 mm (7")
Total Depth:	Driller:	1636.0 mRT		Shoe:	1209.8 mRT (D)
	Logger:	1636.0 mRT		Type:	23 & 26 lb/ft K55 & N80
	TVDRT (D):	1597.4 mTVD			
Interest Holders:	Origin Energy Petroleum Ltd. (100% ** - Operator)		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)			PROGNOSED DEPTH (mTVDSS)	TVD	
		MDRT	TVDSS	THICKNESS TVT		(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 Mmcf/d 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..

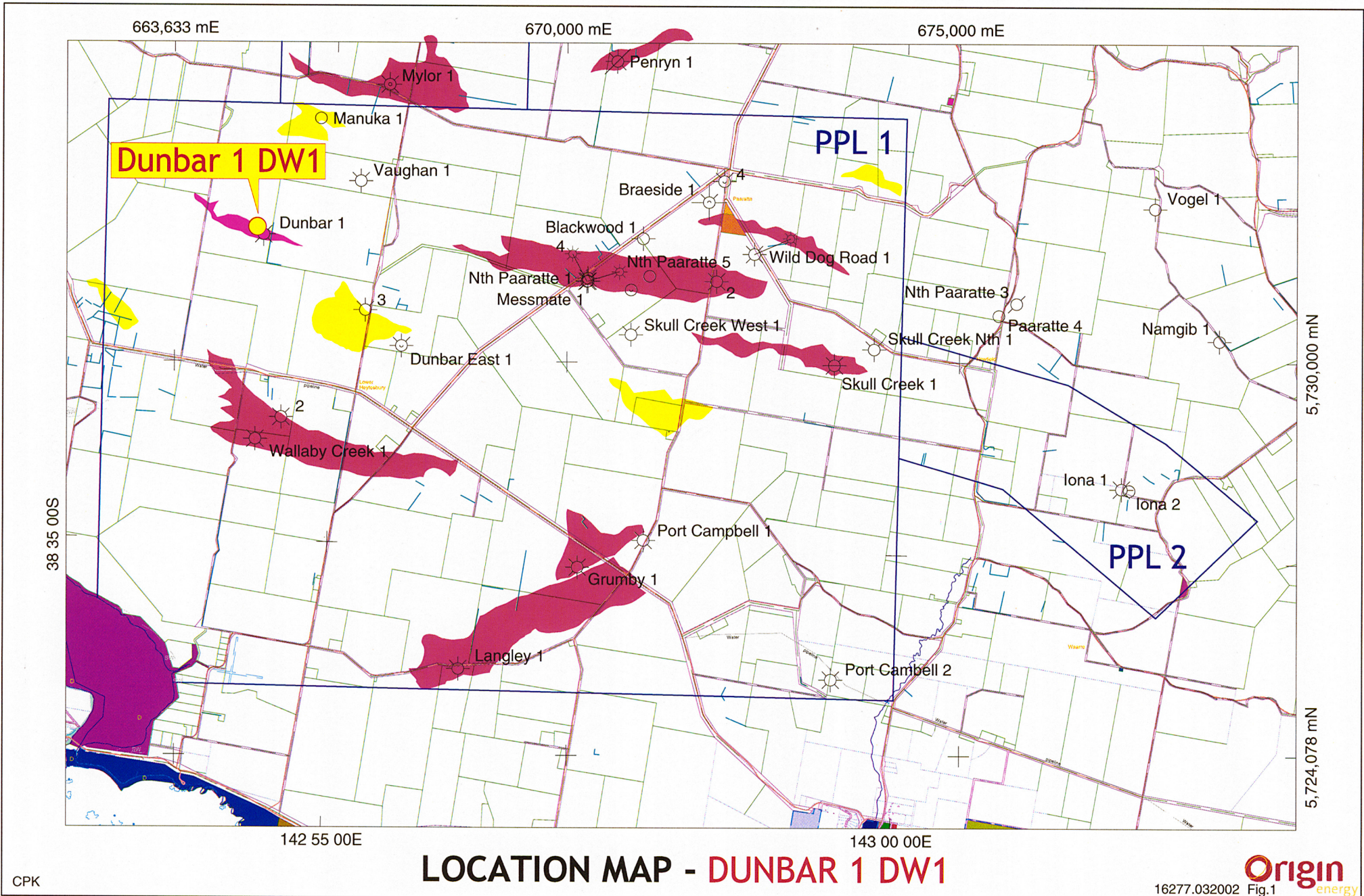
Dunbar 1 DW1 penetrated a typical Otway Basin (Port Campbell embayment) stratigraphic sequence. The primary objectives, the Waarre Unit "C & A" sandstones were, intersected 13.2 and 10.9 metres low to prognosis respectively.

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

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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 8 th 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 - Hydрил 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

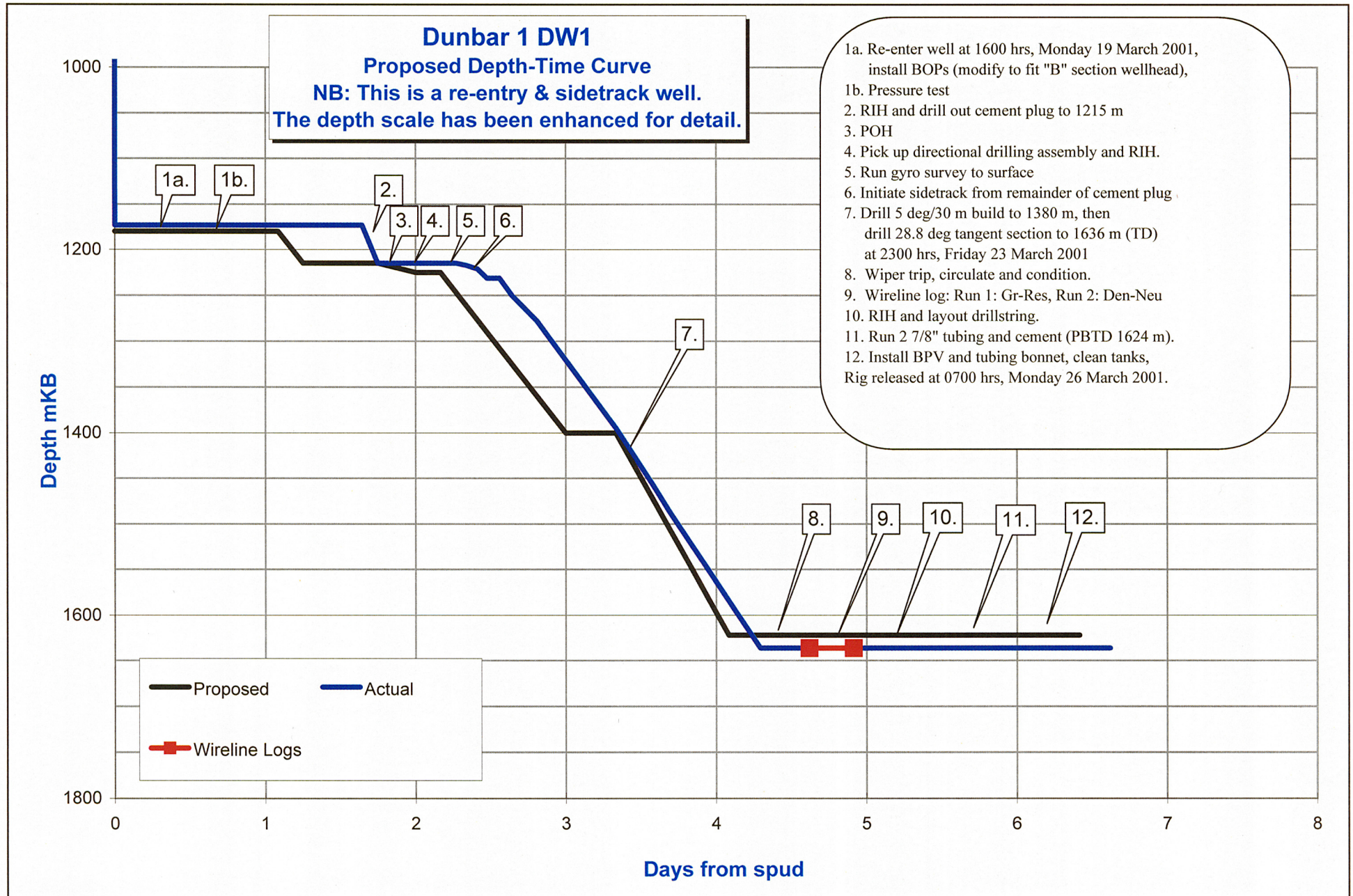
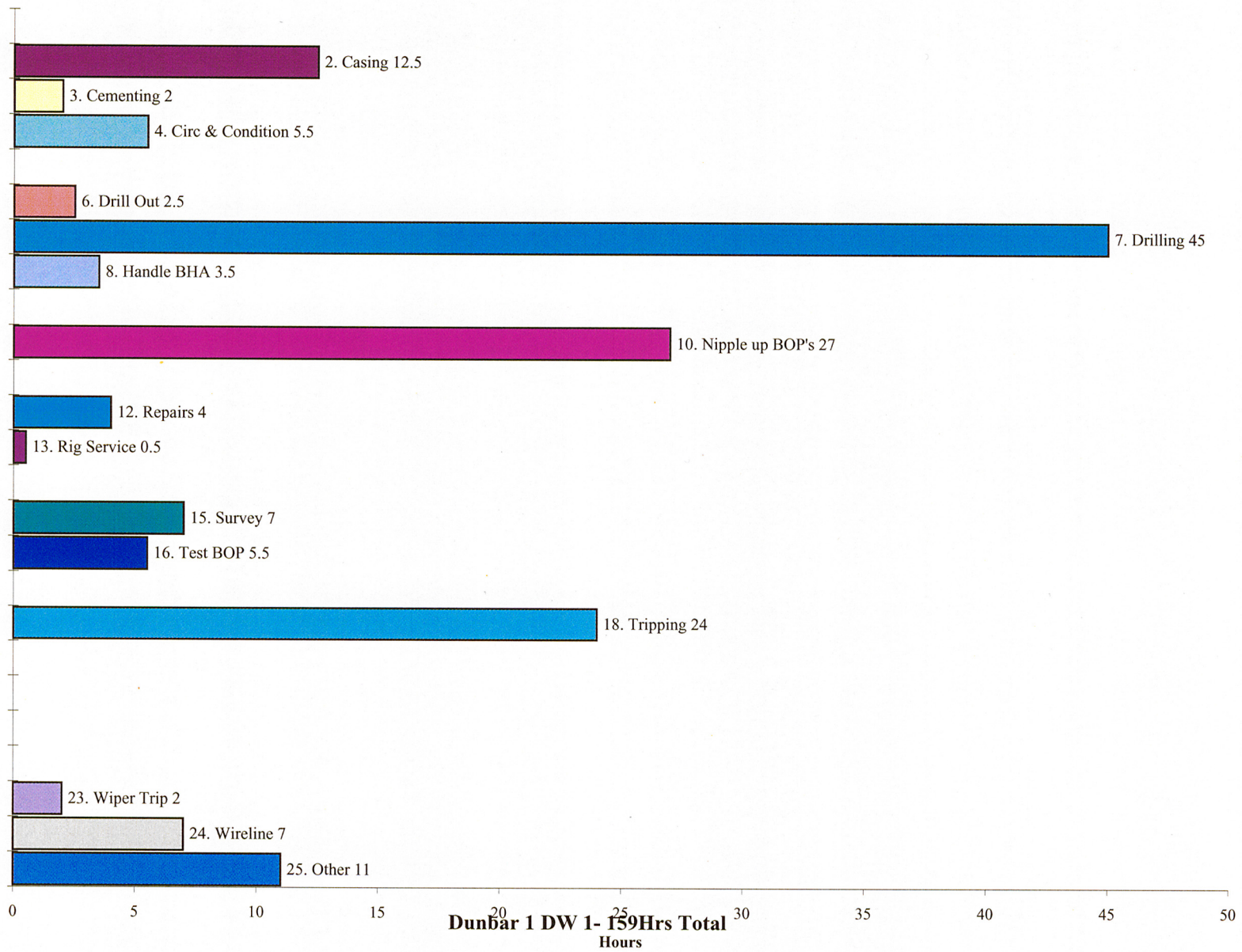


Figure 2



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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

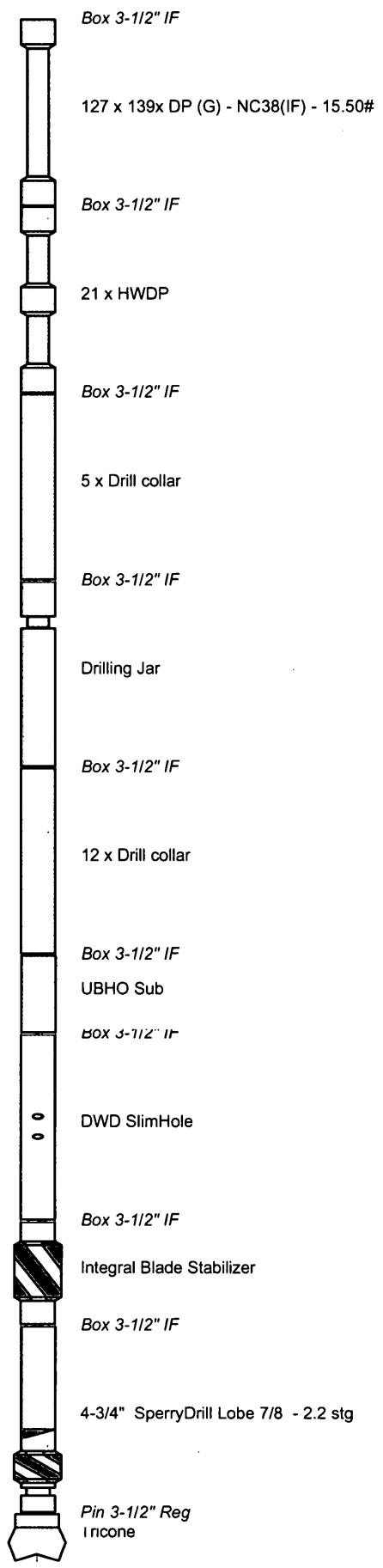
6" Sidetrack/tangent assembly

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 (in ²)	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	Activity	Hrs	BHA Weight (lb)	Drill String	OD(in)	Len (m)
WOB (klbs) :				Drilling :		in Air (Total) :			
RPM (rpm) :				Reaming :		in Mud (Total) :			
Flow (gpm) :				Circ-Other :		in Air (Bel Jars) : 0			
SPP (psi) :				Total : 0.00		in Mud (Bel Jars) : 0			

PERFORMANCE							
	In	Out	Distance (m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Inclination (deg)							
Azimuth (deg)							
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

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

Bit Nozzles : 3 x 12 /32's

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 :Surface (Dunbar 1)

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

Intermediate (Dunbar 1)

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

Production (Dunbar 1 DW1)

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

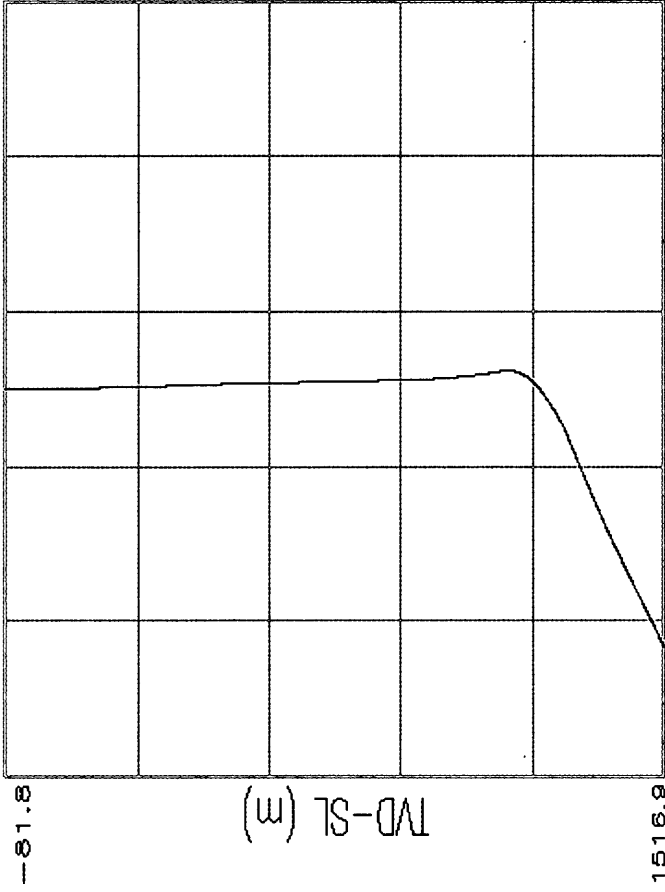
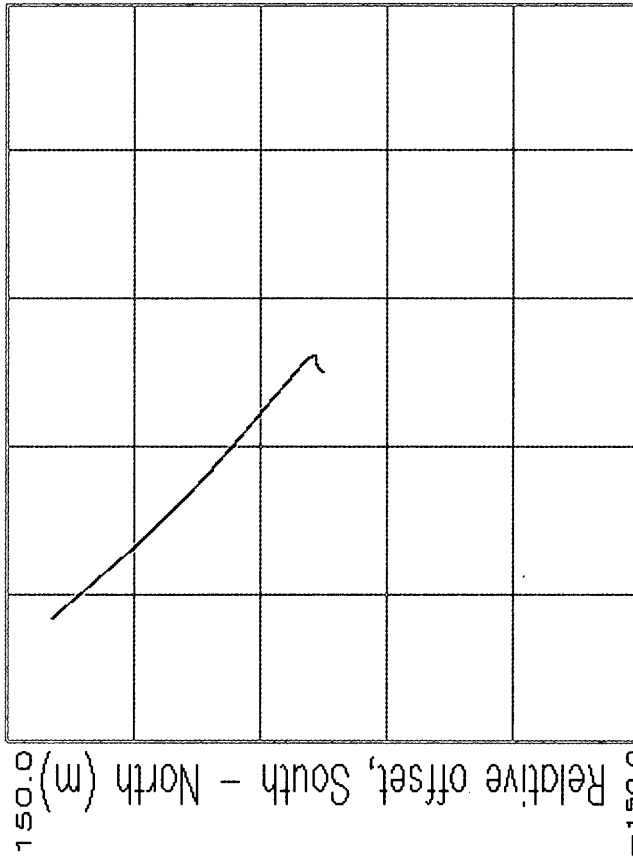
Product	Units		Amount	
	Algecide	1	Drum	25
Barite	225	Sack	5625	kg
Caustic Potash	12	Drum	60	kg
KCl	43	Sack	5625	kg.
M-I Gel	100	Sack	500	kg
PAC R	197	Sack	475	kg
PHPA Dry Powder	10	Sack	475	kg.
SAPP	6	Sack	150	kg.



WELL PATH

PLAN VIEW

WEST-EAST OFFSET



Relative offset, West - East (m)
 WELL NAME: JORDAN 1 LW 1
 Well location - X: 142.9055, Y: -38.5474

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:

<u>Sample Type</u>	<u>No. Sets</u>
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

<u>Type Log</u>	<u>Interval (base)</u> <u>mRT</u>	<u>Interval (top)</u> <u>mRT</u>
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° 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.

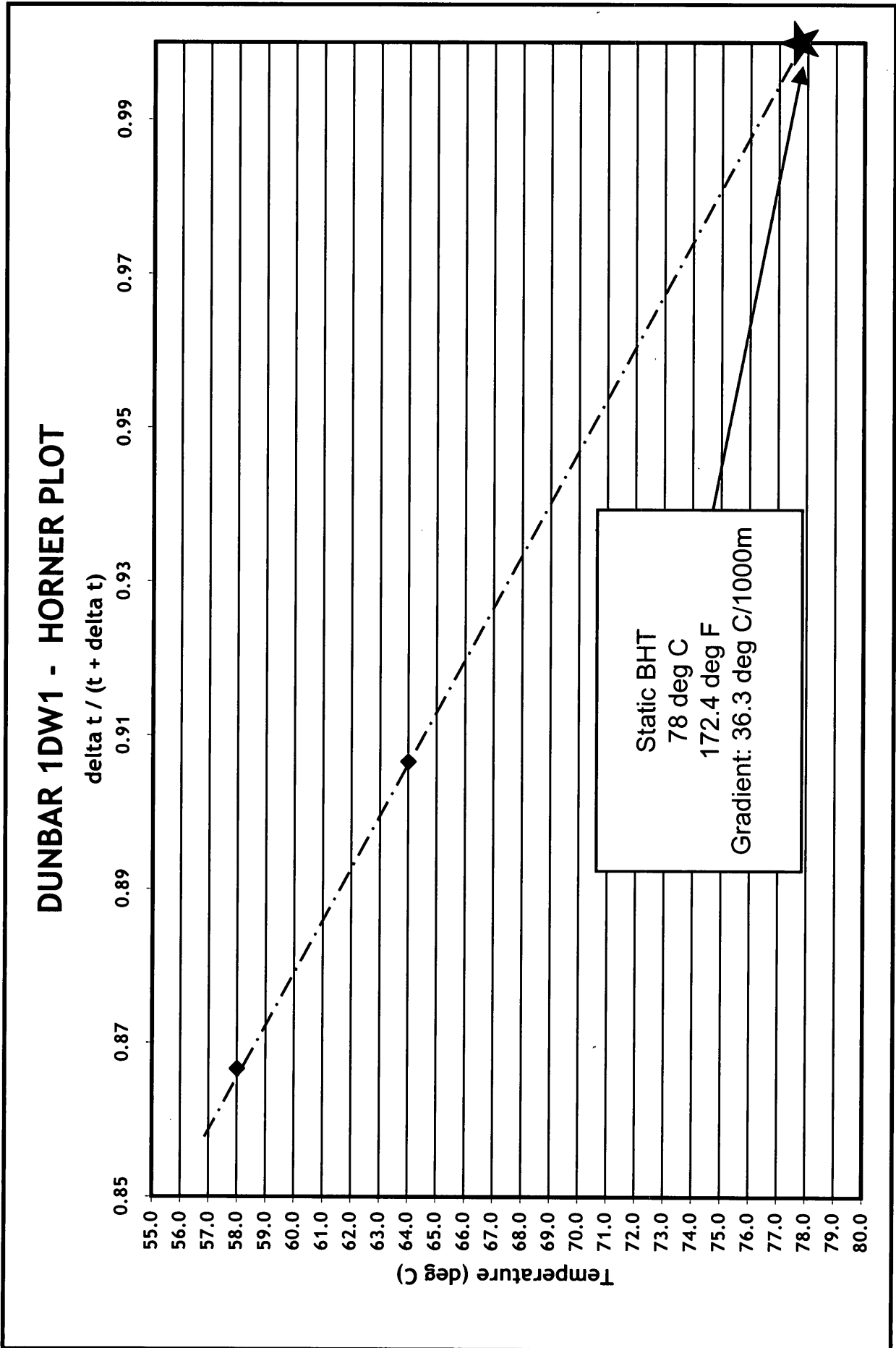


FIGURE 6

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 CO₂ 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.

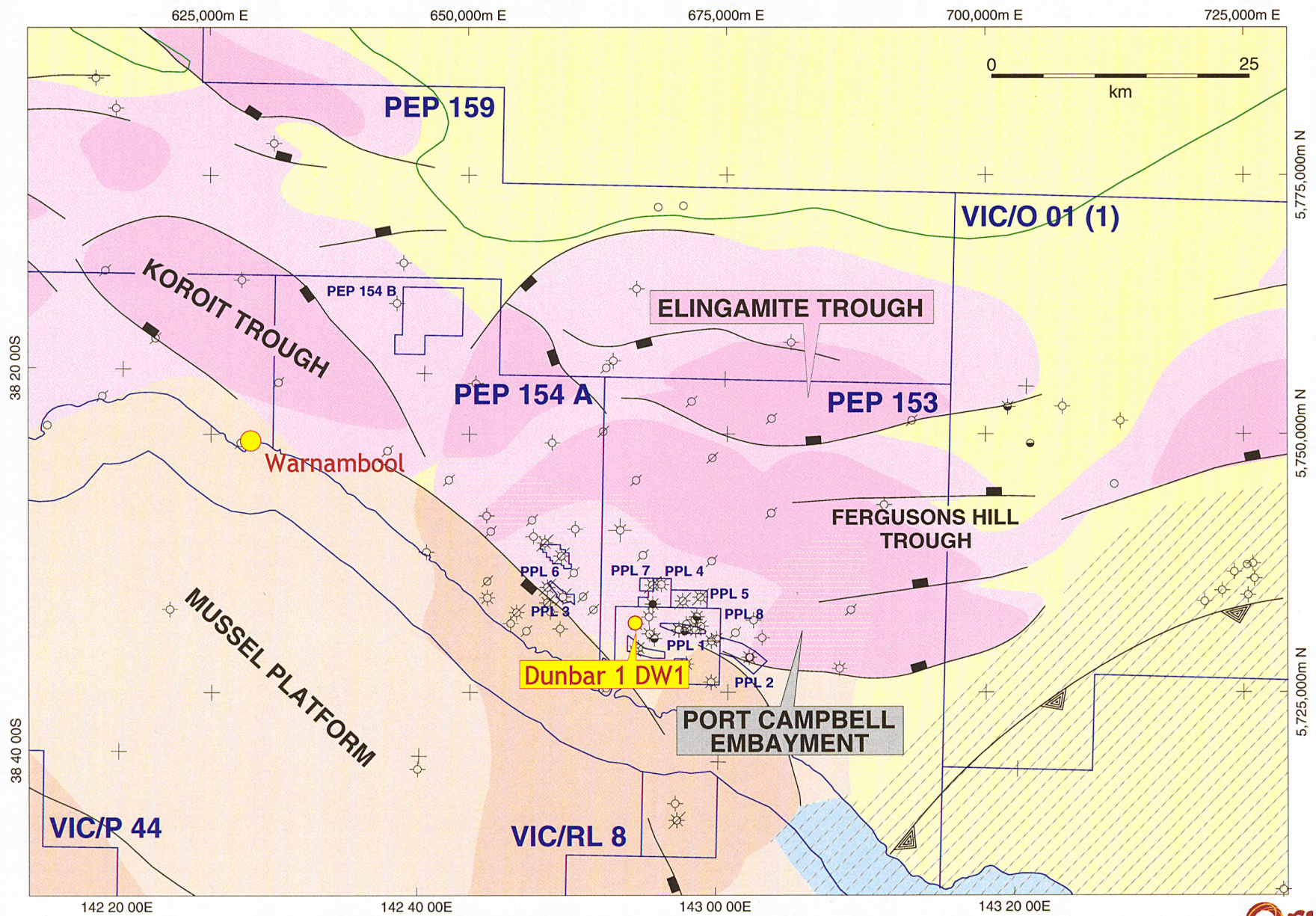
4.1.3 Regional Geology

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.



OTWAY BASIN (VICTORIA) - TECTONIC ELEMENTS

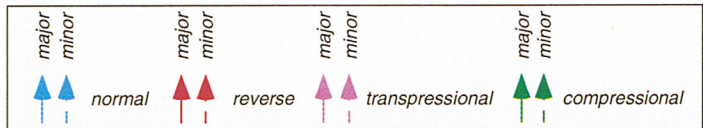
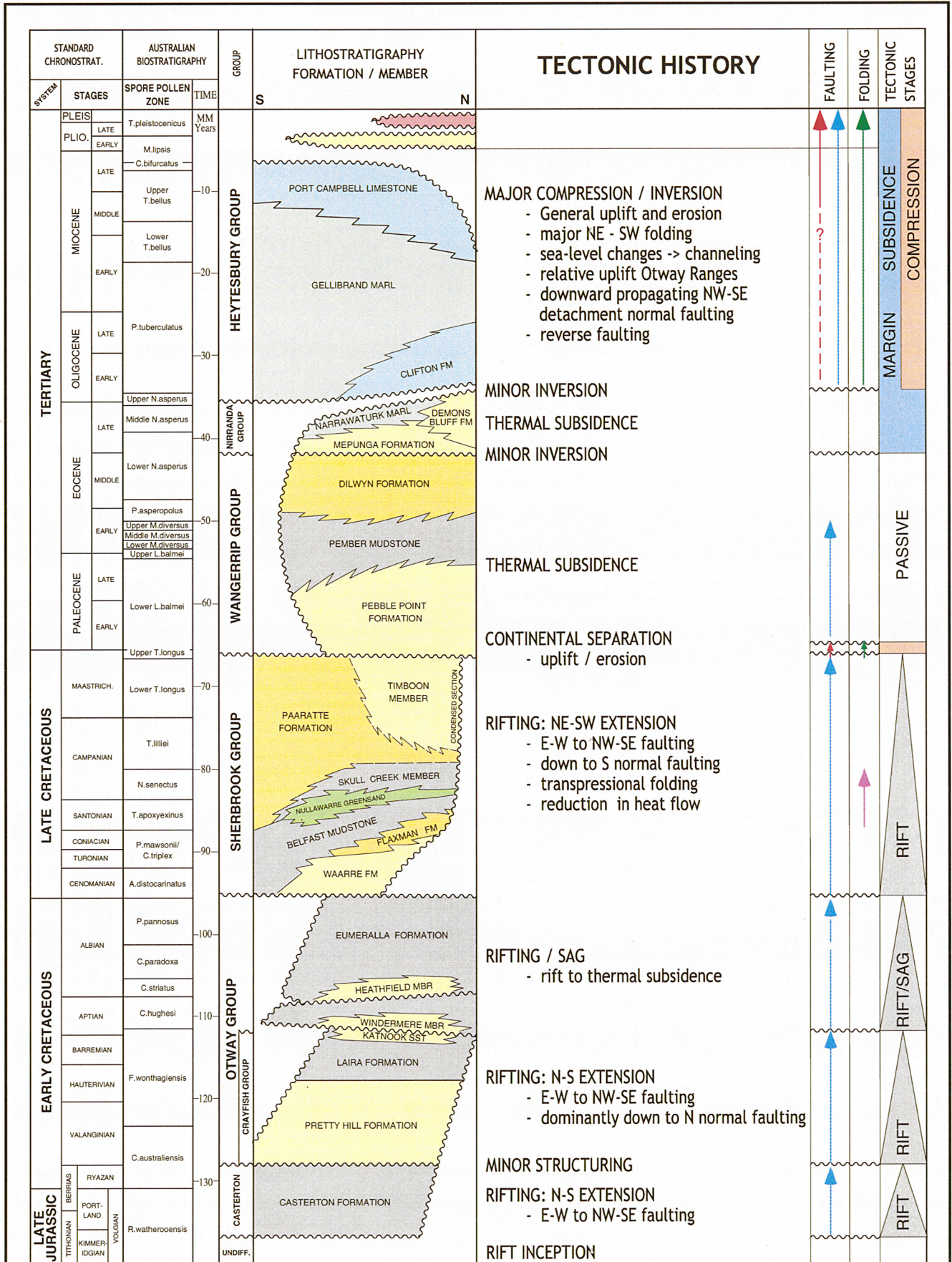


20812.032002 Fig.7

kayc

903930 036

PE908930_color07



VICTORIAN OTWAY BASIN - STRATIGRAPHIC TABLE

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

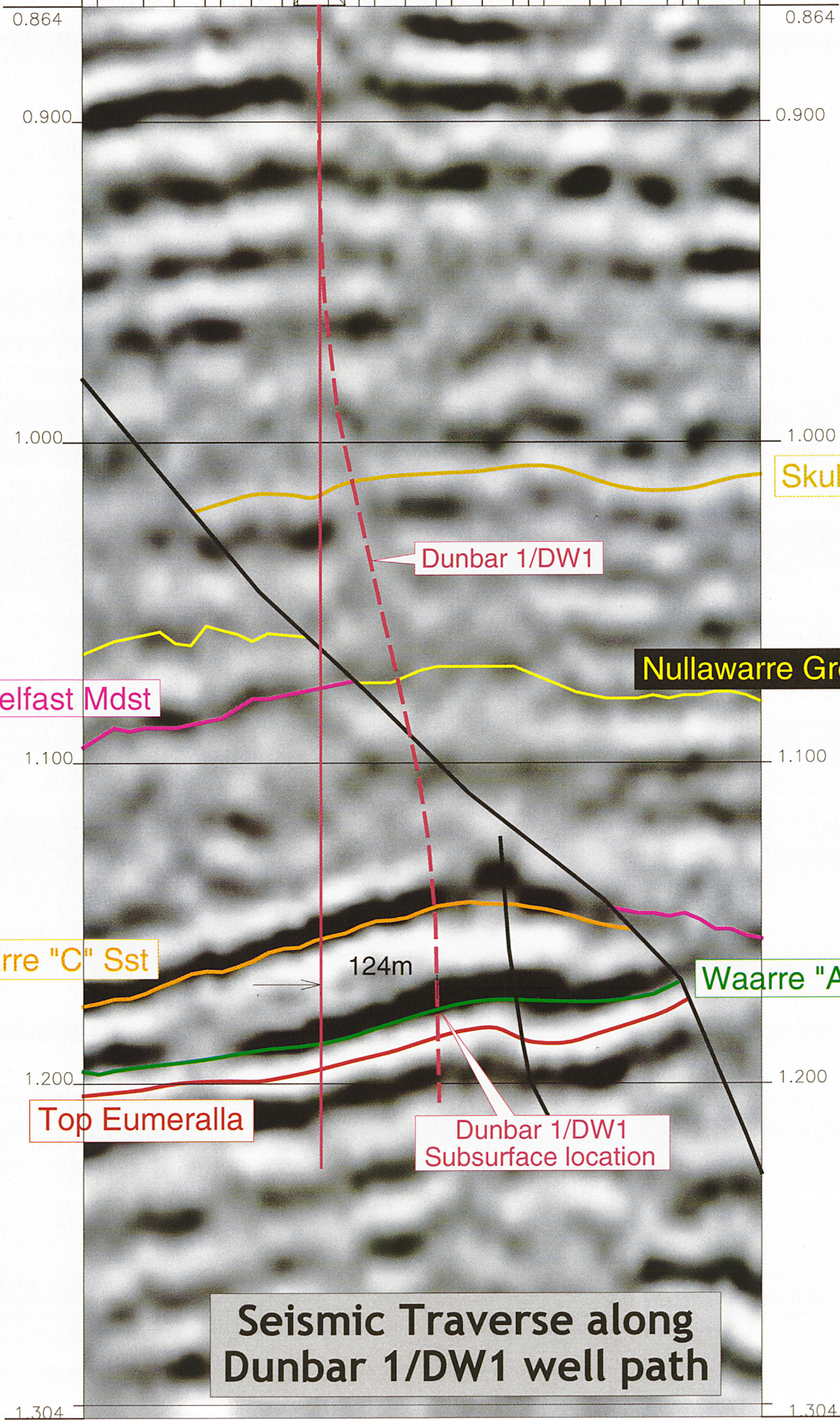
south, east, and the west is by structural dip. Figures 8 and 9 show the depth structure maps for the Waarre Fm 'C' and 'A' horizons respectively.

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 CDP 2725 2700 10 2650 20 2600 30 40 2545 TRC CDP



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 subdivision 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.

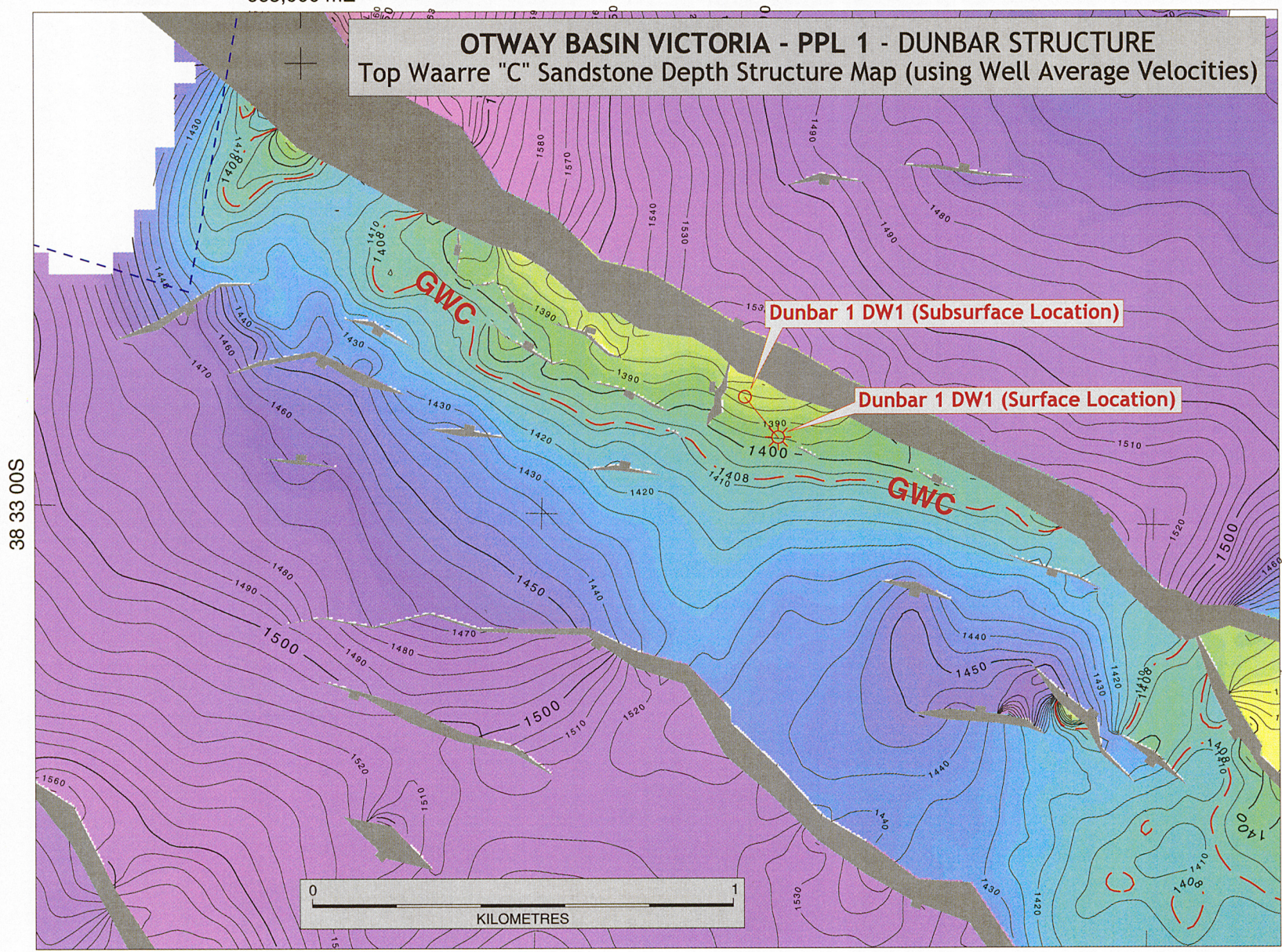
4.1.7 Objectives

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.

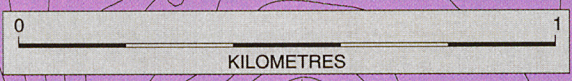
665,000 mE

5,732,500 mN

OTWAY BASIN VICTORIA - PPL 1 - DUNBAR STRUCTURE Top Waarre "C" Sandstone Depth Structure Map (using Well Average Velocities)



38 33 00S



142 54 00E

142 55 00E

kayc

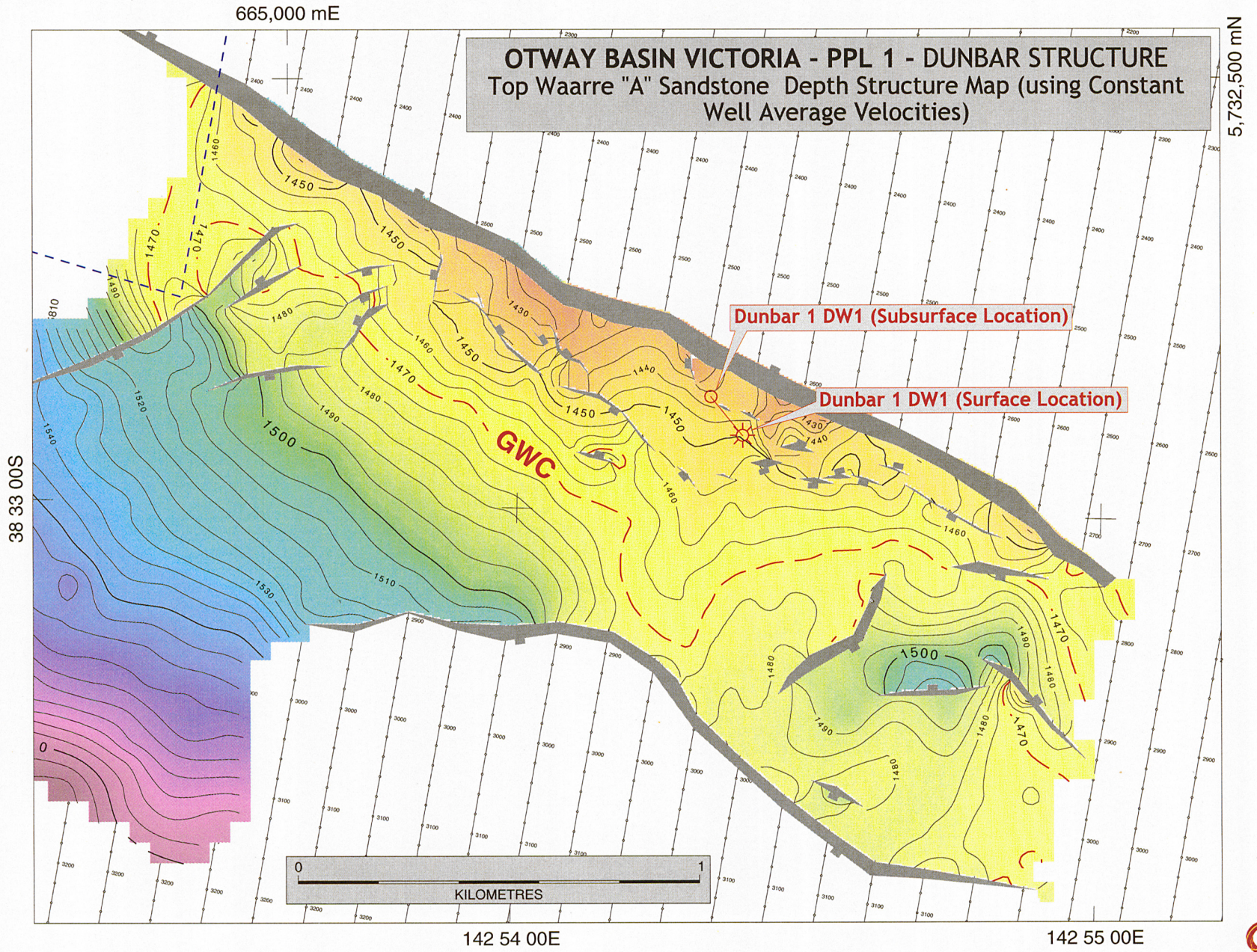
16282.032002 Fig.10



903930 042

PE908930-color010

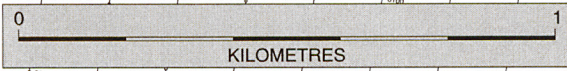
OTWAY BASIN VICTORIA - PPL 1 - DUNBAR STRUCTURE
Top Waarre "A" Sandstone Depth Structure Map (using Constant Well Average Velocities)



Dunbar 1 DW1 (Subsurface Location)

Dunbar 1 DW1 (Surface Location)

GWC

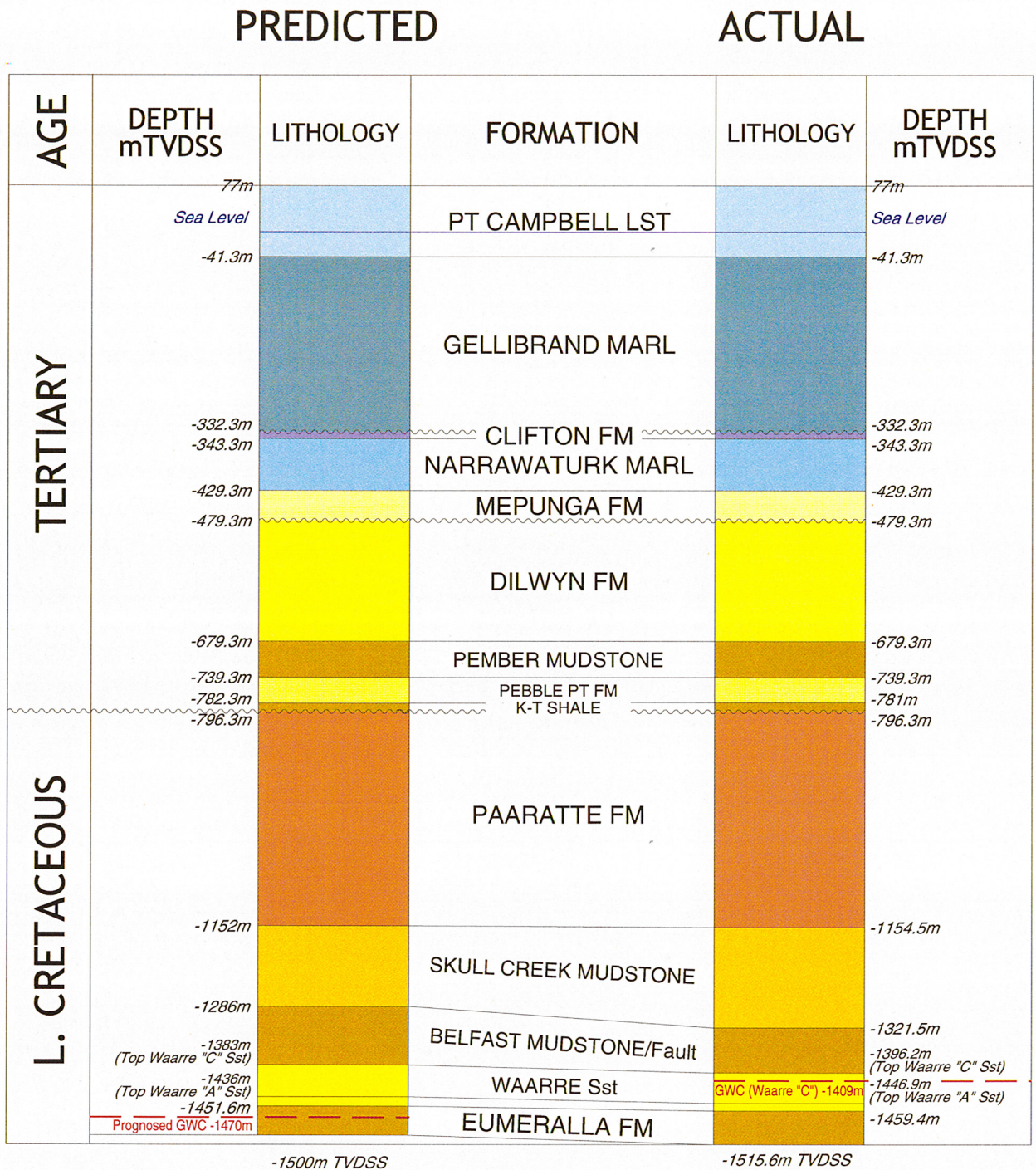


4.2 Stratigraphic Prognosis

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

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, poor 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.

PE908931

This is an enclosure indicator page.
The enclosure PE908931 is enclosed within the
container PE908930 at this location in this
document.

The enclosure PE908931 has the following characteristics:

ITEM_BARCODE = PE908931
CONTAINER_BARCODE = PE908930
NAME = Dunbar-1 DW-1 Composite Well Log
BASIN = OTWAY
ONSHORE? = Y
DATA_TYPE = WELL
DATA_SUB_TYPE = COMPOSITE_LOG
DESCRIPTION = Dunbar-1 DW-1 Composite Well Log Scale
1:500 Enclosure 1
REMARKS =
DATE_WRITTEN =
DATE_PROCESSED =
DATE_RECEIVED = 07-MAY-2002
RECEIVED_FROM = Origin Energy Resources Limited
WELL_NAME = Dunbar-1 DW-1
CONTRACTOR =
AUTHOR =
ORIGINATOR = Origin Energy Resources Limited
TOP_DEPTH = 5.7
BOTTOM_DEPTH = 1636
ROW_CREATED_BY = DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

190 086830

ENCLOSURE 2

PE607417

This is an enclosure indicator page.
The enclosure PE607417 is enclosed within the
container PE908930 at this location in this
document.

The enclosure PE607417 has the following characteristics:

- ITEM_BARCODE = PE607417
- CONTAINER_BARCODE = PE908930
- NAME = Dunbar-1 DW-1 Mud Log Part 1 of 5
- BASIN = OTWAY
- ONSHORE? = Y
- DATA_TYPE = WELL
- DATA_SUB_TYPE = MUD_LOG
- DESCRIPTION = Dunbar-1 DW-1 Formation Evaluation Mud
Log Part 1 of 5 Scale 1:500 Enclosure 2
- REMARKS =
- DATE_WRITTEN =
- DATE_PROCESSED =
- DATE_RECEIVED = 07-MAY-2002
- RECEIVED_FROM = Origin Energy Resources Limited
- WELL_NAME = Dunbar-1 DW-1
- CONTRACTOR = Origin Energy Resources Limited
- AUTHOR =
- ORIGINATOR = Origin Energy Resources Limited
- TOP_DEPTH = 1180
- BOTTOM_DEPTH = 1636
- ROW_CREATED_BY = DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE607418

This is an enclosure indicator page.
The enclosure PE607418 is enclosed within the
container PE908930 at this location in this
document.

The enclosure PE607418 has the following characteristics:

ITEM_BARCODE = PE607418
CONTAINER_BARCODE = PE908930
NAME = Dunbar-1 DW1 Mud Log Part 2 of 5
BASIN = OTWAY
ONSHORE? = Y
DATA_TYPE = WELL
DATA_SUB_TYPE = MUD_LOG
DESCRIPTION = Dunbar-1 DW1 Formation Evaluation Mud
Log Part 2 of 5 Scale 1:500 Enclosure 2
REMARKS =
DATE_WRITTEN =
DATE_PROCESSED =
DATE_RECEIVED = 07-MAY-2002
RECEIVED_FROM = Origin Energy Resources Limited
WELL_NAME = Dunbar-1 DW1
CONTRACTOR = Origin Energy Resources Limited
AUTHOR =
ORIGINATOR = Origin Energy Resources Limited
TOP_DEPTH = 1180
BOTTOM_DEPTH = 1636
ROW_CREATED_BY = DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE607419

This is an enclosure indicator page.
The enclosure PE607419 is enclosed within the
container PE908930 at this location in this
document.

The enclosure PE607419 has the following characteristics:

ITEM_BARCODE = PE607419
CONTAINER_BARCODE = PE908930
NAME = Dunbar-1 DW1 Mud Log Part 3 of 5
BASIN = OTWAY
ONSHORE? = Y
DATA_TYPE = WELL
DATA_SUB_TYPE = MUD_LOG
DESCRIPTION = Dunbar-1 DW1 Formation Evaluation Mud
Log Part 3 of 5 Scale 1:500 Enclosure 2
REMARKS =
DATE_WRITTEN =
DATE_PROCESSED =
DATE_RECEIVED = 07-MAY-2002
RECEIVED_FROM = Origin Energy Resources Limited
WELL_NAME = Dunbar-1 DW1
CONTRACTOR = Origin Energy Resources Limited
AUTHOR =
ORIGINATOR = Origin Energy Resources Limited
TOP_DEPTH = 1180
BOTTOM_DEPTH = 1636
ROW_CREATED_BY = DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE607420

This is an enclosure indicator page.
The enclosure PE607420 is enclosed within the
container PE908930 at this location in this
document.

The enclosure PE607420 has the following characteristics:

ITEM_BARCODE = PE607420
CONTAINER_BARCODE = PE908930
NAME = Dunbar-1 DW1 Mud Log Part 4 of 5
BASIN = OTWAY
ONSHORE? = Y
DATA_TYPE = WELL
DATA_SUB_TYPE = MUD_LOG
DESCRIPTION = Dunbar-1 DW1 Formation Evaluation Mud
Log Part 4 of 5 Scale 1:500 Enclosure 2
REMARKS =
DATE_WRITTEN =
DATE_PROCESSED =
DATE_RECEIVED = 07-MAY-2002
RECEIVED_FROM = Origin Energy Resources Limited
WELL_NAME = Dunbar-1 DW1
CONTRACTOR = Origin Energy Resources Limited
AUTHOR =
ORIGINATOR = Origin Energy Resources Limited
TOP_DEPTH = 1180
BOTTOM_DEPTH = 1636
ROW_CREATED_BY = DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE607421

This is an enclosure indicator page.
The enclosure PE607421 is enclosed within the
container PE908930 at this location in this
document.

The enclosure PE607421 has the following characteristics:

- ITEM_BARCODE = PE607421
- CONTAINER_BARCODE = PE908930
- NAME = Dunbar-1 DW1 Mud Log Part 5 of 5
- BASIN = OTWAY
- ONSHORE? = Y
- DATA_TYPE = WELL
- DATA_SUB_TYPE = MUD_LOG
- DESCRIPTION = Dunbar-1 DW1 Formation Evaluation Mud
Log Part 5 of 5 Scale 1:500 Enclosure 2
- REMARKS =
- DATE_WRITTEN =
- DATE_PROCESSED =
- DATE_RECEIVED = 07-MAY-2002
- RECEIVED_FROM = Origin Energy Resources Limited
- WELL_NAME = Dunbar-1 DW1
- CONTRACTOR = Origin Energy Resources Limited
- AUTHOR =
- ORIGINATOR = Origin Energy Resources Limited
- TOP_DEPTH = 1180
- BOTTOM_DEPTH = 1636
- ROW_CREATED_BY = DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

908930 067

ENCLOSURE 3

PE908932

This is an enclosure indicator page.
The enclosure PE908932 is enclosed within the
container PE908930 at this location in this
document.

The enclosure PE908932 has the following characteristics:

ITEM_BARCODE = PE908932
CONTAINER_BARCODE = PE908930
NAME = Top Waarre C SST Depth Structure Map
BASIN = OTWAY
ONSHORE? = Y
DATA_TYPE = SEISMIC
DATA_SUB_TYPE = HRZN_CONTR_MAP
DESCRIPTION = Dunbar Prospect Top Waarre C SST Depth
Structure Map Scale 1:10000 Enclosure 3
REMARKS =
DATE_WRITTEN = 24-MAY-2000
DATE_PROCESSED =
DATE_RECEIVED = 07-MAY-2002
RECEIVED_FROM = Origin Energy Resources Limited
WELL_NAME =
CONTRACTOR =
AUTHOR =
ORIGINATOR =
TOP_DEPTH =
BOTTOM_DEPTH =
ROW_CREATED_BY = DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

908930 069

ENCLOSURE 4

PE908933

This is an enclosure indicator page.
The enclosure PE908933 is enclosed within the
container PE908930 at this location in this
document.

The enclosure PE908933 has the following characteristics:

ITEM_BARCODE = PE908933
CONTAINER_BARCODE = PE908930
 NAME = Top Waarre A SST Depth Structure Map
 BASIN = OTWAY
 ONSHORE? = Y
 DATA_TYPE = SEISMIC
 DATA_SUB_TYPE = HRZN_CONTR_MAP
 DESCRIPTION = Dunbar Prospect Top Waarre A SST Depth
 Structure Map Scale 1:10000 Enclosure 4
 REMARKS =
 DATE_WRITTEN = 24-MAY-2000
DATE_PROCESSED =
DATE_RECEIVED = 07-MAY-2002
RECEIVED_FROM = Origin Energy Resources Limited
WELL_NAME =
CONTRACTOR =
AUTHOR =
ORIGINATOR =
TOP_DEPTH =
BOTTOM_DEPTH =
ROW_CREATED_BY = DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 1: DAILY DRILLERS REPORTS

DAILY DRILLING REPORT

21/03/01

REPORT # 3

WELL	Dunbar 1 DW 1	24:00 DEPTH	1217m	24 HR PROG	2m	CUM. COSTS	\$450,450
RIG	OD&E # 30	FORMATION	Paaratte	PTD	1622m	DAILY COSTS	\$47,466.17
OP's TO 06:00	Directionally drilling at 1236m						
REMARKS:	Kickoff went OK						
LAST CASING	7 "	SET AT	1209.8m	LOT	10.1ppg	MAASP	300psi
		BOP TEST	20/03/01	TEST DUE	03/04/01		
AFD's: 463	SAFETY	1. Handling tubulars 2. wireline				WEATHER AM	Overcast raining
					PM	Overcast raining	

BIT INFORMATION				BHA # 2		MUD PROPERTIES		OPERATION	HRS	CUM
WOB(kLb)	2	JET V (fps)	204	TOOL	LENGTH	Time	2400	1. Air Rig up		
RPM	105	H S I	1.40	Bit	0.25	Depth (m)	1217	2. Casing		
BIT NUMBER	1			4 3/4" Motor, 1.15 Str	5.96	Temp (° C)		3. Cementing		
Size (in)	6.0			Float Sub	0.76	Mud Type	KCL/PHPA	4. Circ & Condition	2.5	2.5
Make	HTC			5.5" String Stabilizer	1.52	Density (ppg)	8.60	5. Coring		
Type	STR-09D			NonMag Dbl Pin Sub	0.63	ECD (ppg)		6. Drill Out	2.5	2.5
TADC Code	437			Hang Off Collar	9.56	Viscosity (sec)	50	7. Drilling	1.5	1.5
Serial Number	BO9ZW			4 3/4" UBHO Sub	0.59	PV / YP (cp/lb)		8. Handle BHA	2.0	2.0
Nozzles	12,12,12			Pony Flex NMDC	6.19	Gells (s/m)		9. LOT / FIT		
Depth In (m)	1215			27 x HWDP	251.60	API Filt. (cc)		10. Nipple up BOP's		19.5
Depth Out (m)	IN			Dailey Jars	9.09	Cake (/32")		11. P & A		
Total Metres	2			8 x HWDP	73.27	Solids (% Vol)		12. Repairs		2.0
Hours	1.5					Sand (% Vol)		13. Rig Service		
ROP	1.3					MBT		14. Safety		
Condition Out				BHA LENGTH (m)	359.42	pH (strip)	10	15. Survey	4.5	4.5
FLOW DATA				BHA WEIGHT(kLb)	24.4	Chlorides (mg/l)		16. Test BOP	2.0	5.5
CIRC. RATE (gpm)	211			STRING WT (kLb)	65.6	KCL (%)	4	17. Tight hole / Fishing		
AV - DP (fpm)	193			HOOK LOAD (kLb)	70.0	PHPA (ppb)		18. Tripping	7.0	12.0
AV - DC (fpm)	193			WT BELOW JARS (kLb)		ALC - 50 (K)		19. Wait on Cement		
SPP (psi)	1100			DRAG UP (kLb)	1.0	Circ. Vol. (Bbl)	600	20. Wash / Ream		
SPP (calculated)				DRAG DOWN (kLb)	1.0	CHEMICAL USAGE		21. Well Control		
PUMP #1		PUMP #2		TORQUE ON (Amps/Rel.)		Barite	10	22. Well Test		
GDPZ-8		GDPZ-8		TORQUE OFF (Amps/Rel.)		KCL	35	23. Wiper Trip		
RATE	90	RATE		ENVIRONMENTAL DATA		PAC-R	2	24. Wireline		
LINER	5.5"	LINER	5.5"	FUEL ON SITE	19000 Litres	PHPA - DP	4	25. Other	2.0	4.0
STROKE	8.0"	STROKE	8.0"	DAILY USAGE	3500 Litres			TOTALS	24.0	56.0
SURVEYS				CUM. FUEL USED	9500 Litres			DAILY MUD COSTS		\$1,426.17
0.29;38.4° at 300m		1.4;97.1° at 1205.9m		CUM. MUD MIXED	600 Bbls			CUM. MUD COSTS		\$6,743.93
.25;44.78° at 600m				CUM. MUD LOSSES				EST. COST - C&S		\$1,004,235
.5;61.37° at 900m				CUM. GEL				EST. COST - P&A		\$897,635
				CUM. BARITES	250 kg			EST. COST - C&C		

HOURLY OPERATIONS SUMMARY 0000 to 2400

From	To	Description
0:00	2:00	Pickup Cleanout string and RIH
2:00	3:30	Remove kelly spinner and tighten connections, replace spinner
3:30	4:00	Tighten bell nipple and dresser sleeve, (fix flow line leaks)
4:00	5:00	Wash cement contaminated mud to 1159m, and circulate
5:00	7:00	Pressure test pipe rams, 2 x kill, 2 x HCR, Upper and lower kelly cocks to 250psi and 2500psi,
7:00	7:30	Wash cement contaminated mud to 1173m top of cement plug
7:30	10:00	Drill out cement plug to 1215m
10:00	11:00	Displace hole to mud, pump slug
11:00	13:00	POH for Kickoff assembly
13:00	15:00	Pickup steering assembly and test MWD and motor
15:00	17:30	RIH to 1209m
17:30	18:00	Layout excess drillpipe in derrick
18:00	22:30	Safety meeting, rigup gyro and survey and orient tool facing
22:30	0:00	Kickoff at 1215m and time drill to 1217m

SUPERVISOR:	Barry Beetson	GEOLOGIST:	Doug Short	MUD CO:	HALLIBURTON
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Dunbar 1 DW 1 REPORT #3

DAILY DRILLING REPORT

24/03/01

REPORT # 6

WELL	Dunbar 1 DW 1	24:00 DEPTH	1636m	24 HR PROG		CUM. COSTS	\$618,046	
RIG	OD&E # 30	FORMATION	Eumeralla	PTD	1622m	DAILY COSTS	\$68,322.67	
OP's TO 06:00	Running 2 7/8" production tubing							
REMARKS:	Incorrect 2 7/8" elevators on location, awaiting elevators							
LAST CASING	7 "	SET AT	1209.8m	LOT	10.1ppg	MAASP	197psi	
		BOP TEST	20/03/01	TEST DUE	03/04/01			
AFD's: 466	SAFETY	1. Radioactive sources 2. Layout drillstring					WEATHER AM	Overcast, showers
						PM	Fine, cool	

BIT INFORMATION				BHA # 3		MUD PROPERTIES		OPERATION		HRS	CUM
WOB(kLb)		JET V(fps)		TOOL	LENGTH	Time	1730	1. Air Rig up			
RPM		HSI		Bit	0.25	Depth (m)	1636	2. Casing			
BIT NUMBER				Bit Sub		Temp (° C)		3. Cementing			
Size (in)				27 x 3.5" HWDP	251.60	Mud Type	KCL/PHPA	4. Circ & Condition		2.0	5.0
Make				Drilling Jars	9.09	Density (ppg)	9.10	5. Coring			
Type				8 x 3.5" HWDP	73.27	ECD (ppg)		6. Drill Out			2.5
IADC Code						Viscosity (sec)	47	7. Drilling			45.0
Serial Number						PV / YP (cp/lb)	17 / 22	8. Handle BHA		1.5	3.5
Nozzles						Gells (s/m)	2 / 4	9. LOT / FIT			
Depth In (m)						API Filt. (cc)	6.5	10. Nipple up BOP's			19.5
Depth Out (m)						Cake (/32")	1	11. P & A			
Total Metres						Solids (% Vol)	3.5	12. Repairs			2.0
Hours						Sand (% Vol)	tr	13. Rig Service			0.5
ROP						MBT		14. Safety			
Condition Out				BHA LENGTH (m)	335.13	pH (strip)	9.5	15. Survey			7.0
FLOW DATA				BHA WEIGHT(kLb)	21.2	Chlorides (mg/l)	19000	16. Test BOP			5.5
CIRC. RATE (gpm)				STRING WT (kLb)	72.0	KCL (%)	4	17. Tight hole / Fishing			
AV - DP (fpm)				HOOK LOAD (kLb)	83.0	PHPA (ppb)	1.5	18. Tripping		11.0	23.0
AV - DC (fpm)				WT BELOW JARS (kLb)	15.5	ALC - 50 (K)	100	19. Wait on Cement			
SPP (psi)	1200			DRAG UP (kLb)	5.0	Circ. Vol. (Bbl)	545	20. Wash / Ream			
SPP (calculated)				DRAG DOWN (kLb)	5.0	CHEMICAL USAGE		21. Well Control			
PUMP #1		PUMP #2		TORQUE ON (Amps/Rel.)		AQUAGEL	5	22. Well Test			
GD PZ-8		GD PZ-8		TORQUE OFF (Amps/Rel.)		Barite	40	23. Wiper Trip		1.5	2.0
RATE		RATE		ENVIRONMENTAL DATA		PAC-R	1	24. Wireline		7.0	7.0
LINER	5.5"	LINER	5.5"	FUEL ON SITE	10000 Litres			25. Other		1.0	5.5
STROKE	8.0"	STROKE	8.0"	DAILY USAGE	2500 Litres			TOTALS		24.0	128.0
				CUM. FUEL USED	18500 Litres			DAILY MUD COSTS			\$562.67
				CUM. MUD MIXED	685 Bbls			CUM. MUD COSTS			\$10,938.67
				CUM. MUD LOSSES	20 Bbls			EST. COST - C&S			\$1,004,235
				CUM. GEL	500 kg			EST. COST - P&A			\$897,635
				CUM. BARITES	5625 kg			EST. COST - C&C			

HOURLY OPERATIONS SUMMARY 0000 to 2400

From	To	Description
0:00	1:30	Cont wiper trip, hole intermittently tight on trip out max o/pull 20k, RIH, hole OK
1:30	2:30	Circulate and condition hole
2:30	5:30	Flow check, pump pill and POH
5:30	7:00	Break and layout Directional assembly
7:00	13:30	Safety meeting, Logging with Reeves wireline, Ran Resistivity and Density logs with G/ray and Calipers
13:30	14:00	Rig down Reeves Logging Sheaves
14:00	17:00	Makeup cleanout BHA and RIH
17:00	18:00	Break circulation and tag bottom, Circulate and condition mud
18:00	19:30	Flowcheck, pump slug, layout drillstring
19:30	20:30	Service break kelly
20:30	0:00	Layout drill string

SUPERVISOR:	Barry Beetson	GEOLOGIST:	Doug Short	MUD CO:	HALLIBURTON
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DAILY DRILLING REPORT

25/03/01

REPORT # 7

WELL	Dunbar 1 DW 1	24:00 DEPTH	1636m	24 HR PROG		CUM. COSTS	\$684,311
RIG	OD&E # 30	FORMATION		PTD	1622m	DAILY COSTS	\$66,265.23
OP's TO 06:00	Installing xmas tree						
REMARKS:	should be released at 0700hrs, Doug and Ben out 1400hrs Sunday, PBTD at 1624m						
LAST CASING	2 7/8"	SET AT	1634.5m	LOT		MAASP	
				BOP TEST	20/03/01	TEST DUE	03/04/01
AFD's: 467	SAFETY	1. Tubing 2. cementing				WEATHER AM	Overcast, showers
					PM	Fine, cool	

BIT INFORMATION				BHA # 40		MUD PROPERTIES		OPERATION	HRS	CUM		
WOB(kLb)		JET V(fps)	193	TOOL	LENGTH	Time	1600	1. Air Rig up				
RPM		HSI				Depth (m)	1636	2. Casing	12.5	12.5		
BIT NUMBER						Temp (° C)		3. Cementing	2.0	2.0		
Size (in)						Mud Type	KCL/PHPA	4. Circ & Condition	0.5	5.5		
Make						Density (ppg)	9.10	5. Coring				
Type						ECD (ppg)		6. Drill Out		2.5		
IADC Code						Viscosity (sec)	47	7. Drilling		45.0		
Serial Number						PV / YP (cp/lb)	17 / 22	8. Handle BHA		3.5		
Nozzles						Gells (s/m)	2 / 4	9. LOT / FIT				
Depth In (m)						API Filt. (cc)	6.5	10. Nipple up BOP's	5.5	25.0		
Depth Out (m)						Cake (/32")	1	11. P & A				
Total Metres						Solids (% Vol)	3.5	12. Repairs	2.0	4.0		
Hours						Sand (% Vol)	tr	13. Rig Service		0.5		
ROP						MBT		14. Safety				
Condition Out				BHA LENGTH (m)		pH (strip)	10	15. Survey		7.0		
FLOW DATA				BHA WEIGHT(kLb)		Chlorides (mg/l)	19000	16. Test BOP		5.5		
CIRC. RATE (gpm)		199		STRING WT (kLb)		KCL (%)	4	17. Tight hole / Fishing				
AV - DP (fpm)		68		HOOK LOAD (kLb)		PHPA (ppb)	1.5	18. Tripping	1.0	24.0		
AV - DC (fpm)		68		WT BELOW JARS (kLb)		ALC - 50 (K)	100	19. Wait on Cement				
SPP (psi)				DRAG UP (kLb)	40.0	Circ. Vol. (Bbl)	550	20. Wash / Ream				
SPP (calculated)				DRAG DOWN (kLb)	43.0	CHEMICAL USAGE		21. Well Control				
PUMP #1		PUMP #2		TORQUE ON (Amps/Rel.)		Caustic Potash	1	22. Well Test				
GD PZ-8		GD PZ-8		TORQUE OFF (Amps/Rel.)		KCL	25	23. Wiper Trip		2.0		
RATE	85	RATE		ENVIRONMENTAL DATA				SAPP	6	24. Wireline	7.0	
LINER	5.5"	LINER	5.5"	FUEL ON SITE	8000 Litres				25. Other	0.5	6.0	
STROKE	8.0"	STROKE	8.0"	DAILY USAGE	2000 Litres				TOTALS		24.0	152.0
				CUM. FUEL USED	20500 Litres				DAILY MUD COSTS			\$735.23
				CUM. MUD MIXED	685 Bbls				CUM. MUD COSTS			\$11,673.90
				CUM. MUD LOSSES	30 Bbls				EST. COST - C&S			\$1,004,235
				CUM. GEL	500 kg				EST. COST - P&A			\$897,635
				CUM. BARITES	5625 kg				EST. COST - C&C			

HOURLY OPERATIONS SUMMARY 0000 to 2400

From	To	Description
0:00	1:00	Continue to layout drill string
1:00	3:00	Rig to run 2 7/8" tubing(1 hour + for daylight saving change)
3:00	6:00	Run tubing, elevators sticking on upset
6:00	8:00	Repair 2 7/8" elevators
8:00	15:30	Continue to run 2 7/8" tubing
15:30	16:00	Circulate and reciprocate tubing, pump 25Bbls SAPP preflush
16:00	16:30	Break out landing jt collar and install tubing hanger
16:30	18:30	Headup Howco, safety meeting, test lines to 4000psi, mix and pump 300 sx"G" with 1% Halad 322
18:30	0:00	Flush BOP lines, nipple down BOP's

SUPERVISOR:	Barry Beetson	GEOLOGIST:	Doug Short	MUD CO:	HALLIBURTON
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Dunbar 1 DW 1 REPORT #7

APPENDIX 2: DAILY GEOLOGICAL REPORTS

**OIL COMPANY OF AUSTRALIA LIMITED
DAILY GEOLOGICAL REPORT**

DAILY GEOLOGICAL REPORT - ORIGIN ENERGY PETROLEUM PTY. LTD.

WELL: Dunbar-1 DW-1 REPORT No.: 1-3 DAYS FROM SPUD: 03 DATE: 21/03/2001
 0000 hrs Depth: 1217 LAST DEPTH: _____ 24 HR PROGRESS: _____ PTD: 1622
 0600 OPS: 22/03/01 - Drilling at 1236m.

REMARKS:

PRIMARY OBJECTIVES:		SECONDARY OBJECTIVES:	
Waarre "C"	1485(MD) / 1465(TVD)		
Waarre "A"	1547(MD) / 1518(TVD)		
Spud Date: 16:00hrs 19/03/01	Surface Latitude: 38°32'53.79"	T.D. =	Metres R.T.
TD Reached Date:	Surface Longitude: 142°54'23.11"	G.L. = 77.2	Metres R.T.
Rig release Date:	Surface Eastings: 666 133.3	R.T. = 81.8	Metres R.T.
Rig O.D. & E Rig 30	Surface Northings: 5 731 612.3		
Nearby Well / Facility is...	244mm Casing Depth = 311.3	Metres R.T.	
Kick-off from 1215m in Dunbar-1(1995)	178mm Casing Depth = 1209.2	Metres R.T.	

Formation Tops (# Geophysical Picks)	Wellsite (mRT)	Prognosed Depths		Diff	H/L	Sub-Sea Depth Comparisons		
		(mRT)	(mSS)			DW-1	D-1	Diff
Skull Creek Member		1233.8	-1152.0				-1152.0	
Nullawarre Greensand			Absent?				NP	
Belfast Fm.		1373.3	-1286.0				-1323.4	
Waarre Fm. (Unit 'C')		1485.5	-1383.0				-1395.9	
Waarre Fm. (Unit 'A')		1547.2	-1436.0					
Eumeralla Fm.		1565.3	-1451.6				-1466.0	
Total Depth		1621.6	-1500.0				-1675.9	

Interval		ROP (ave)	Lithology Description							
1215	1234	4.0 - 8.0 (5.0)	SANDSTONE with trace CLAYSTONE below 1225m. SANDSTONE, white to very pale grey, fine to predominantly medium, occasionally coarse, sub-angular, moderate sorted, common pyrite crystals encrusted on some quartz grains, trace to moderate clay matrix, moderate calcite cement, friable, good porosity. CLAYSTONE, moderate to dark grey, soft, silty in part.							
Gas		Units: 0	Composition (%):		/	/	/	/	/	
Show Details										

Gas		Units:	Composition (%):		/	/	/	/	
Show Details									

**DAILY GEOLOGICAL REPORT
LTD.**
ORIGIN ENERGY PETROLEUM PTY.
WELL: Dunbar-1 DW-1 **REPORT No.:** 04 **DAYS FROM SPUD:** 04 **DATE:** 22/03/2001

0000 hrs Depth: 1395 **LAST DEPTH:** 1217 **24 HR PROGRESS:** 178 **PTD:** 1622

0600 OPS: 23/03/01 - Drilling at 1457m. Current correlation suggests DW-1 is 3m. higher than Dunbar-1.

REMARKS: Top Belfast Mudstone pick is correlated to Belfast Mudstone top in Dunbar-1 @ 1405.5m.

PRIMARY OBJECTIVES:		SECONDARY OBJECTIVES:	
Waarre "C"	1485(MD) / 1465(TVD)		
Waarre "A"	1547(MD) / 1518(TVD)		
Spud Date: 16:00hrs 19/03/01		Surface Latitude: 38°32'53.79"	T.D. = Metres R.T.
TD Reached Date:		Surface Longitude: 142°54'23.11"	G.L. = 77.2 Metres R.T.
Rig release Date:		Surface Eastings: 666 133.3	R.T. = 81.8 Metres R.T.
Rig O.D. & E Rig 30		Surface Northings: 5 731 612.3	
Nearby Well / Facility is...		244mm Casing Depth = 311.3	Metres R.T.
Kick-off from 1215m in Dunbar-1 (Drilled 1995)		178mm Casing Depth = 1209.2	Metres R.T.

Formation Tops (# Geophysical Picks)	Wellsite (mRT)	Prognosed Depths		Diff	H/L	Sub-Sea Depth Comparisons		
		(mRT)	(mSS)			DW-1	D-1	Diff
Skull Creek Member	1236	1233.8	-1152.0	2.2	low	-1154.2	-1152.0	-2.2
Nullawarre Greensand			Absent?				NP	
Belfast Fm.	1415	1373.3	-1286.0	??		-1321.2	-1323.4	+2.2
Waarre Fm. (Unit 'C')		1485.5	-1383.0				-1395.9	
Waarre Fm. (Unit 'A')		1547.2	-1436.0					
Eumeralla Fm.		1565.3	-1451.6				-1466.0	
Total Depth		1621.6	-1500.0				-1675.9	

Interval		ROP (ave)	Lithology Description						
1234	1236	1.6 - 1.9 (1.7)	SANDSTONE with minor CLAYSTONE. SANDSTONE, white to very pale grey, fine to predominantly medium, occasionally coarse, sub-angular, moderate sorted, common pyrite crystals encrusted on some quartz grains, trace to moderate clay matrix, moderate calcite cement, friable, good porosity. CLAYSTONE, moderate to dark grey, soft, silty in part.						
Gas		Units:	0	Composition (%):			/	/	/
Show Details									
1236	1285	2.0 - 9.4 (5.1)	Interbedded SANDSTONE and CLAYSTONE. SANDSTONE, white to pale grey, very fine, very argillaceous, occasional carbonaceous laminae, trace pyrite and lithics, poor porosity. CLAYSTONE, light to moderate grey, grey-brown, soft, silty & carbonaceous in part, trace dolomite, rare greenish lithic grains.						
Gas		Units:	0	Composition (%):			/	/	/
Show Details									
1285	1299	3.0 - 8.9 (5.1)	CLAYSTONE, moderate brown to grey-brown, soft, silty, carbonaceous in part.						
Gas		Units:	0	Composition (%):			/	/	/
Show Details									
1299	1330	1.0 - 7.8 (3.0)	SANDSTONE with interbedded CLAYSTONE. SANDSTONE, white, very fine to fine, occasionally medium to coarse, sub-angular to sub-rounded, poorly sorted, trace lithics, pyrite and carbonaceous material, moderate to abundant clay matrix, calcareous in part, poor to fair porosity. CLAYSTONE, moderate brown to grey-brown, soft, silty, carbonaceous in part.						
Gas		Units:	0 - 2	Composition (%):			100	/	Tr / / / /
Show Details									

DAILY GEOLOGICAL REPORT
LTD.

ORIGIN ENERGY PETROLEUM PTY.

1330	1415	1.4 - 17.5 (5.0)	CLAYSTONE with rare LIMESTONE. CLAYSTONE, moderate grey-brown to brown, minor greenish blue to grey, soft, silty and carbonaceous in part. LIMESTONE, white to cream, silty and argillaceous, minor green lithic / glauconite? grains.
Gas		Units: 0 - 46	Composition (%): 98 / 2 / Tr / / /
Show Details			

DAILY GEOLOGICAL REPORT - ORIGIN ENERGY PETROLEUM PTY. LTD.

WELL: Dunbar-1 DW-1 REPORT No.: 05 DAYS FROM SPUD: 05 DATE: 23/03/2001
 0000 hrs Depth: 1636 LAST DEPTH: 1395 24 HR PROGRESS: 241 PTD: 1622
 0600 OPS: 24/03/01 - Rig up Reeves for wireline logging.
 REMARKS: Waarre "C&A" in DW-1 are picked from ROP (porosity) and do not necessarily correspond to what is picked (Dunbar-1) or prognosed (DW-1) as the Top Waarre or Waarre "C/A" where these units are not necessarily picked on porosity.

PRIMARY OBJECTIVES:		SECONDARY OBJECTIVES:	
Waarre "C"	1485(MD) / 1465(TVD)		
Waarre "A"	1547(MD) / 1518(TVD)		
Spud Date:	16:00hrs 19/03/01	Surface Latitude:	38°32'53.79" T.D. = Metres R.T.
TD Reached Date:	11:00hrs 23/03/01	Surface Longitude:	142°54'23.11" G.L. = 77.2 Metres R.T.
Rig release Date:		Surface Eastings:	666 133.3 R.T. = 81.8 Metres R.T.
	Rig O.D. & E Rig 30	Surface Northings:	5 731 612.3
	Nearby Well / Facility is...	244mm Casing Depth =	311.3 Metres R.T.
	Kick-off from 1215m in Dunbar-1 (Drilled 1995)	178mm Casing Depth =	1209.2 Metres R.T.

Formation Tops (# Geophysical Picks)	Wellsite (mRT)	Prognosed Depths		Diff	H/L	Sub-Sea Depth Comparisons		
		(mRT)	(mSS)			DW-1	D-1	Diff
Skull Creek Member	1236	1233.8	-1152.0	2.2	low	-1154.2	-1152.0	-2.2
Nullawarre Greensand	-	Absent?					NP	
Belfast Fm.	1415	1373.3	-1286.0	??		-1321.2	-1323.4	+2.2
Waarre Fm. ('C' sand)	1499.5	1485.5	-1383.0	14	Low	-1395.7	-1399.9	+4.2
Waarre Fm. ('A' sand)	1557.5	1547.2	-1436.0	10	Low	-1446.2	-1450.9	+4.7
Eumeralla Fm.	1572.5	1565.3	-1451.6	7	Low	-1460.0	-1465.9	+5.9
Total Depth	1636	1621.6	-1500.0			-1516.8	-1675.9	

Interval	ROP (ave)	Lithology Description									
1415.0	1499.5	4.0 – 12.0 (6.1)	CLAYSTONE, light to moderate grey-brown to brown, greenish blue to grey, soft, silty in part, trace carbonaceous specks, glauconitic, occasional silty and sandy lenses. Very sandy and glauconitic 1452 – 1458m.								
Gas	Units:	23-70	Composition (%):	94	/	5	/	1	/	/	
Show Details											
1499.5	1522.0	1.3 – 5.4 (2.8)	SANDSTONE with trace SILTSTONE. SANDSTONE, clear to translucent, medium to coarse, occasionally very coarse, loose, angular to sub-angular, poor to moderate sorted quartz grains, good porosity. SILTSTONE, dark grey, soft to firm, sub-fissile, carbonaceous.								
Gas	Units:	129-607	Composition (%):	95	/	4	/	1	/	Tr	/
Show Details											
1522.0	1530.5	1.8 – 10.6 (5.4)	SILTSTONE, light grey to light brown, soft, very argillaceous and grades to claystone, trace carbonaceous specks; minor greenish glauconitic stained, minor glauconite nodules, very argillaceous.								
Gas	Units:	115-150	Composition (%):	94	/	5	/	1	/	/	
Show Details											
1530.5	1541.5	1.2 – 4.8 (2.1)	SANDSTONE, clear to translucent, fine to coarse, predominantly medium, sub-angular to sub-rounded, moderate sorted, trace clay matrix, loose, good porosity.								
Gas	Units:	88-605	Composition (%):	95	/	5	/	Tr	/	Tr	/
Show Details											
1541.5	1557.5	3.1 – 8.5 (5.7)	SILTSTONE with rare COAL. SILTSTONE, light to moderate brown, soft, amorphous, very argillaceous and grades to claystone. COAL, dull black, grades to carbonaceous shale in part.								
Gas	Units:	94-573	Composition (%):	91	/	7	/	2	/	Tr	/
Show Details											

DAILY GEOLOGICAL REPORT - ORIGIN ENERGY PETROLEUM PTY. LTD.

1557.5	1569.5	1.7 – 11.1 (2.6)	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 at top, poor to fair porosity at top becoming fair to good at base.
Gas		Units: 2061	Composition (%): 85 / 9 / 4 / 2 / Tr
Show Details		Gas ranged between 1070 and 2061 units.	
1569.5	1572.5	5.5 – 13.2 (7.9)	SILTSTONE, moderate brown, minor dark brown to black, soft, very argillaceous and grades to claystone, carbonaceous in part.
Gas		Units: 123-253	Composition (%): 92 / 6 / 2 / Tr /
Show Details			
1572.5	1636.0	0.9 – 16.0 (3.6)	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 grains, moderate to strong calcite cement in part, friable, poor inferred porosity. CLAYSTONE, light to dark brown, soft to firm, silty and carbonaceous in part.
Gas		Units: 63-315	Composition (%): 95 / 4 / 1 / Tr /
Show Details			

DAILY GEOLOGICAL REPORT
LTD.

ORIGIN ENERGY PETROLEUM PTY.

WELL: Dunbar-1 DW-1 REPORT No.: 06 DAYS FROM SPUD: 06 DATE: 24/03/2001
 0000 hrs Depth: 1636 LAST DEPTH: 1636 24 HR PROGRESS: 0 PTD: 1622
 0600 OPS: 25/03/01 - Preparing to run casing.
 REMARKS: Formation tops below are wellsite log picks.

PRIMARY OBJECTIVES:		SECONDARY OBJECTIVES:	
Waarre "C"	1485(MD) / 1465(TVD)		
Waarre "A"	1547(MD) / 1518(TVD)		
Spud Date:	16:00hrs 19/03/01	Surface Latitude:	38°32'53.79" T.D. = Metres R.T.
TD Reached Date:	11:00hrs 23/03/01	Surface Longitude:	142°54'23.11" G.L. = 77.2 Metres R.T.
Rig release Date:		Surface Eastings:	666 133.3 R.T. = 81.8 Metres R.T.
	Rig O.D. & E Rig 30	Surface Northings:	5 731 612.3
	Nearby Well / Facility is...	244mm Casing Depth =	311.3 Metres R.T.
	<i>Kick-off from 1215m in Dunbar-1 (Drilled 1995)</i>	178mm Casing Depth =	1209.2 Metres R.T.

Formation Tops (# Geophysical Picks)	Log Wellsite (mRT)	Prognosed Depths		Diff	H/L	Sub-Sea Depth Comparisons		
		(mRT)	(mSS)			DW-1	D-1	Diff
Skull Creek Member	1234.6	1233.8	-1152.7	-0.8	low	-1152.7	-1152.0	-0.7
Nullawarre Greensand								
Belfast Fm. ??	1417.5	1373.3	-1323.8	-44.2		-1323.8	-1323.4	-0.4
Waarre Fm. ('C' sand)	1500.0	1485.5	-1396.1	-14.5	Low	-1396.1	-1399.9	+3.8
Waarre Fm. ('A' sand)	1557.5	1547.2	-1447.5	-10.3	Low	-1447.5	-1450.9	+3.4
Eumeralla Fm.	1571.6	1565.3	-1460.0	-6.3	Low	-1460.0	-1465.9	+5.9
Total Depth	1636.0	1621.6	-1516.8	-14.4		-1516.8	-1675.9	

Interval	ROP (ave)	Lithology Description							
Gas	Units:	Composition (%):		/	/	/	/	/	/
Show Details									
Gas	Units:	Composition (%):		/	/	/	/	/	/
Show Details									

APPENDIX 3: CUTTINGS DESCRIPTIONS

ORIGIN ENERGY - DUNBAR-1 DW-1 - PPL-1 - OTWAY BASIN VICTORIA

DEPTH	(%) LITHOLOGICAL DESCRIPTION	GAS
1210	100 CEMENT - Kick-off from 1215m.	
1220 (14.9)	90 SANDSTONE, white to very pale grey, fine to predominantly medium, occasionally coarse, sub-angular, moderate sorted, common pyrite crystals encrusted on some quartz grains, trace to moderate clay matrix, moderate calcite cement, friable, good porosity.	0.0 (-:-:-:-)
	10 CEMENT.	
1230 (9.4)	90 SANDSTONE, a.a. - sub-angular to sub-rounded, moderate sorted, rare pyrite, trace dispersive clay matrix, predominantly loose, very good porosity.	0.0 (-:-:-:-)
	10 CLAYSTONE, moderate to dark grey, soft, silty in part.	
1240 (3.9)	80 SANDSTONE, translucent white, fine to coarse, sub-angular to sub-rounded, poor to moderate sorted, crystal faces on some grains, common pyrite, trace to moderate clay matrix, minor calcite cement, friable, good porosity.	0.0 (-:-:-:-)
	20 CLAYSTONE, a.a.	
1250 (5.8)	50 SANDSTONE, a.a. - very fine to fine, occasionally medium, trace pyrite, moderate to abundant clay matrix, friable to moderately hard, fair to good porosity.	0.0 (-:-:-:-)
	50 CLAYSTONE, a.a.	
1260 (5.6)	10 SANDSTONE, white to pale grey, very fine, very argillaceous, occasional carbonaceous laminae, trace pyrite, poor porosity.	0.0 (-:-:-:-)
	90 CLAYSTONE, light to moderate grey, grey-brown, soft, silty and carbonaceous in part, trace dolomite, rare greenish lithic grains.	
1270 (4.9)	50 SANDSTONE, a.a. - very fine, trace lithics, moderate clay matrix, weak calcite cement, moderately hard, poor porosity.	0.0 (-:-:-:-)
	50 CLAYSTONE, a.a. - silty with minor lithics and carbonaceous specks in part, soft.	
1280 (5.1)	10 SANDSTONE, white to pale greenish white, very fine, very argillaceous, minor greenish black lithics, trace carbonaceous material, calcareous in part, poor porosity.	0.0 (-:-:-:-)
	90 CLAYSTONE, moderate brown to grey-brown, soft, silty, carbonaceous in part.	
1290 (5.0)	10 SANDSTONE, a.a.	0.0 (-:-:-:-)
	90 CLAYSTONE, a.a.	
1300 (5.8)	Tr SANDSTONE, a.a.	0.0 (-:-:-:-)
	100 CLAYSTONE, a.a.	
1310 (3.8)	Tr SANDSTONE, a.a.	0.0 (100:0:0:0)
	100 CLAYSTONE, a.a.	
1320 (2.4)	60 SANDSTONE, white, very fine to fine, occasionally medium to coarse, sub-angular to sub-rounded, poor to moderate sorted, trace lithics and pyrite, moderate to abundant clay matrix, calcareous in part, poor to fair porosity.	0.6 (100:0:0:0)
	40 CLAYSTONE, a.a. - grades to siltstone.	
1330 (2.5)	70 SANDSTONE, a.a. - fine to coarse, poorly sorted, abundant dispersive clay matrix, common pyrite, trace carbonaceous material, calcareous in part, friable, poor to fair porosity.	0.2 (100:0:0:0)
	30 CLAYSTONE, a.a.	
1340 (5.1)	Tr SANDSTONE, white, very fine, very argillaceous, trace carbonaceous material, poor porosity.	0.1 (100:0:0:0)
	100 CLAYSTONE, moderate grey-brown to brown, soft, silty and carbonaceous in part.	
1350 (5.5)	Tr SANDSTONE, a.a.	1.6 (100:0:0:0)
	100 CLAYSTONE, a.a. - grades to siltstone.	
1360 (5.7)	100 CLAYSTONE, a.a. - silty.	4.5 (99:1:0:0)
1370 (6.6)	100 CLAYSTONE, a.a.	5.9 (99:1:0:0)
1380 (5.2)	100 CLAYSTONE, a.a.	7.2 (99:1:0:0)
1390 (4.0)	100 CLAYSTONE, a.a. - minor greenish grey to greenish blue.	11.8 (99:1:0:0)
	Tr LIMESTONE, white to cream, silty and argillaceous, minor green lithic / glauconite? grains.	
1400 (4.6)	100 CLAYSTONE, a.a.	19.2 (98:2:0:0)
1410 (3.6)	100 CLAYSTONE, a.a.	32.6 (97:3:0:0)
1420 (4.9)	100 CLAYSTONE, a.a. - light to moderate brown.	28.5 (95:5:0:0)

ORIGIN ENERGY - DUNBAR-1 DW-1 - PPL-1 - OTWAY BASIN VICTORIA

DEPTH	(%)	LITHOLOGICAL DESCRIPTION	GAS
1430 (5.1)	100	CLAYSTONE, a.a.	32.2 (95:5:0:0:0)
1434 (4.9)	100	CLAYSTONE, light to moderate grey-brown to brown, soft, silty in part, trace carbonaceous specks.	41.2 (96:4:0:0:0)
1437 (4.7)	100	CLAYSTONE, a.a.	40.5 (96:4:0:0:0)
1440 (4.7)	100	CLAYSTONE, a.a.	42.2 (96:4:0:0:0)
1443 (6.1)	100	CLAYSTONE, a.a.	41.0 (96:4:0:0:0)
1446 (5.7)	100	CLAYSTONE, a.a. - minor bluish green to grey.	39.3 (96:4:0:0:0)
1449 (5.7)	10	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.	32.2 (96:4:0:0:0)
	90	CLAYSTONE, a.a. - light to moderate brown to grey-brown, bluish grey.	
1452 (6.9)	10	SANDSTONE, clear, loose, fine to medium, sub-rounded quartz grains; also minor white to pale brown, very fine to medium, lithic, trace carbonaceous material, very argillaceous / silty, very poor porosity.	33.8 (96:4:0:0:0)
	90	CLAYSTONE, a.a.	
1455 (7.0)	20	SANDSTONE, a.a. - clear loose quartz grains; also white to pale brown, green, very fine to medium glauconite grains, lithic, silty, very argillaceous, calcareous in part, very poor porosity.	26.5 (95:5:0:0:0)
	80	CLAYSTONE, a.a.	
1458 (5.0)	Tr	SANDSTONE / GLAUCONITE, very fine to medium, loose, clear quartz and greenish black glauconite grains.	30.0 (95:5:0:0:0)
	100	CLAYSTONE, a.a.	
1461 (4.9)	10	SANDSTONE, a.a.	35.2 (95:5:0:0:0)
	90	CLAYSTONE, a.a.	
1464 (5.6)	Tr	SANDSTONE, a.a.	36.3 (95:5:0:0:0)
	100	CLAYSTONE, a.a.	
1467 (5.2)	100	CLAYSTONE, light to moderate brown, soft, common glauconitic grains.	32.8 (95:5:0:0:0)
1470 (5.4)	100	CLAYSTONE, a.a.	35.8 (95:5:0:0:0)
1473 (5.9)	100	CLAYSTONE, a.a.	40.3 (95:5:0:0:0)
1476 (5.7)	100	CLAYSTONE, a.a.	42.5 (95:5:0:0:0)
1479 (7.4)	100	CLAYSTONE, a.a. - glauconitic.	43.0 (95:5:0:0:0)
1482 (7.3)	100	CLAYSTONE, a.a.	42.7 (95:5:0:0:0)
1485 (7.0)	100	CLAYSTONE, a.a.	40.2 (94:5:1:0:0)
1488 (6.7)	100	CLAYSTONE, a.a. - greenish blue, light brown.	44.7 (94:5:1:0:0)
1491 (8.5)	100	CLAYSTONE, a.a. - trace white, calcareous, glauconitic siltstone.	43.0 (94:5:1:0:0)
1494 (8.4)	100	CLAYSTONE, a.a.	35.3 (93:6:1:0:0)
1497 (7.8)	100	CLAYSTONE, greenish blue to grey, light brown, soft, glauconitic, occasional silty and sandy lenses.	28.2 (94:5:1:0:0)
1500 (9.2)	100	CLAYSTONE, a.a. - silty, sandy, glauconitic lenses, calcareous in part.	96.8 (94:5:1:0:0)
1503 (2.8)	70	SANDSTONE, clear to translucent, medium to coarse, loose, angular to sub-angular, poor to moderate sorted quartz grains, good inferred porosity.	560.7 (95:4:1:0:0)
	10	SILTSTONE, dark grey, soft to firm, sub-fissile, carbonaceous.	
	20	CLAYSTONE, a.a.	
1506 (3.3)	90	SANDSTONE, a.a. - predominantly coarse to very coarse, sub-angular to sub-rounded, moderate sorted, trace clay matrix, friable to loose, very good porosity.	484.0 (95:4:1:0:0)

ORIGIN ENERGY - DUNBAR-1 DW-1 - PPL-1 - OTWAY BASIN VICTORIA

DEPTH	(%) LITHOLOGICAL DESCRIPTION	GAS
	SILTSTONE, a.a.	
	10	
1509 (3.3)	80 SANDSTONE, a.a. - trace to moderate clay matrix, friable to predominantly loose, good porosity. porosity.	395.2 (95:4:1:0:0)
	20 SILTSTONE, a.a.	
1512 (3.2)	80 SANDSTONE, a.a.	437.7
	20 CLAYSTONE, a.a.	(95:4:1:0:0)
1515 (2.5)	70 SANDSTONE, a.a.	340.0
	20 SILTSTONE, a.a.	(95:4:1:0:0)
	10 CLAYSTONE, a.a.	
1518 (2.0)	90 SANDSTONE, a.a. - predominantly coarse to very coarse, sub-rounded to rounded, moderate sorted, trace clay matrix, loose, good porosity.	165.2 (92:6:2:0:0)
1521 (2.4)	40 SANDSTONE, a.a. - mostly fine to medium, sub-rounded, moderate sorted, loose quartz grains, fair porosity.	137.5 (92:6:2:0:0)
	60 SILTSTONE, light grey to light brown, soft, very argillaceous and grades to claystone, trace glauconite and carbonaceous specks.	
1524 (3.4)	30 SANDSTONE, a.a.	140.8
	70 SILTSTONE, a.a.	(95:4:1:0:0)
1527 (6.0)	100 SILTSTONE, a.a. - mostly light to moderate grey-brown, minor greenish glauconitic stain, minor glauconite nodules, very argillaceous.	126.5 (95:5:0:0:0)
1530 (6.4)	100 SILTSTONE, a.a.	122.2 (95:5:0:0:0)
1533 (2.5)	70 SANDSTONE, clear to translucent, fine to coarse, predominantly medium, sub-angular to sub-rounded, moderate sorted, trace clay matrix, loose, good porosity.	222.5 (95:5:0:0:0)
	SILTSTONE, a.a. - trace carbonaceous specks and laminae, very argillaceous and grades to claystone.	
1536 (1.4)	90 SANDSTONE, a.a. - predominantly medium to coarse, angular to sub-angular, moderate sorted, loose, good porosity.	537.3 (96:4:0:0:0)
	10 SILTSTONE, moderate to dark grey, soft to firm, carbonaceous, very argillaceous, grades to claystone in part.	
1539 (2.1)	90 SANDSTONE, a.a.	368.2
	10 SILTSTONE, a.a.	(95:5:0:0:0)
1542 (3.0)	50 SANDSTONE, a.a. - medium to coarse, good porosity.	101.5
	50 SILTSTONE, light to moderate brown, soft, amorphous, very argillaceous and grades to claystone.	(95:5:0:0:0)
1545 (6.0)	100 SILTSTONE, a.a.	99.2 (94:6:0:0:0)
1548 (6.6)	100 SILTSTONE, a.a.	119.3 (93:6:1:0:0)
1551 (5.5)	100 SILTSTONE, a.a. - trace carbonaceous specks, rare pyrite.	147.3 (93:6:1:0:0)
1554 (4.2)	100 SILTSTONE, a.a.	319.5 (92:6:2:0:0)
	Tr COAL, dull black, grades to carbonaceous shale in part.	
1557 (6.3)	100 SILTSTONE, a.a.	137.8 (91:7:2:0:0)
1560 (2.7)	50 SANDSTONE, clear to translucent white, very fine to fine, sub-angular to sub-rounded, moderate sorted, moderate clay matrix, loose, fair to good porosity.	1257.5 (90:7:3:0:0)
	50 SILTSTONE, light to moderate grey, moderate to dark grey-brown, soft to firm, sub-fissile to blocky, carbonaceous specks, rare pyrite, argillaceous.	
1563 (4.3)	90 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.	1521.8 (89:8:3:0:0)
	10 SILTSTONE, a.a.	
1566 (1.8)	90 SANDSTONE, a.a. - fine to coarse, weak calcite cement, friable to loose, fair to good apparent porosity.	1897.2 (88:8:3:1:0)
	10 SILTSTONE, a.a.	
1569 (1.8)	80 SANDSTONE, a.a. - fine to coarse, occasionally very coarse, sub-rounded, minor calcite cement, friable to loose, fair to good apparent porosity.	1930.7 (87:9:3:1:0)
	10 SILTSTONE, a.a.	
	10 CLAYSTONE, cream to light brown, hard, silty and carbonaceous in part.	
1572	20 SANDSTONE, a.a. - mostly very fine to fine, poor to fair porosity.	415.3

ORIGIN ENERGY - DUNBAR-1 DW-1 - PPL-1 - OTWAY BASIN VICTORIA

DEPTH	(%) LITHOLOGICAL DESCRIPTION	GAS
(7.2)	80 SILTSTONE, moderate brown, minor dark brown to black, soft, very argillaceous and grades to claystone, carbonaceous in part.	(90:7:3:0:0)
1575	100 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.	246.7
(3.9)		(93:5:2:0:0)
1578	70 SANDSTONE, a.a.	218.8
(6.8)	30 CLAYSTONE, light to dark brown, soft to firm, silty and carbonaceous in part.	(93:5:2:0:0)
1581	70 SANDSTONE, a.a.	199.7
(4.3)	30 CLAYSTONE, a.a.	(92:6:2:0:0)
1584	80 SANDSTONE, a.a.	183.0
(2.3)	20 CLAYSTONE, a.a.	(94:5:1:0:0)
1587	90 SANDSTONE, a.a. - very calcareous.	148.3
(3.8)	10 CLAYSTONE, a.a.	(94:5:1:0:0)
1590	80 SANDSTONE, a.a. - very calcareous.	135.7
(4.7)	20 CLAYSTONE, a.a.	(93:5:2:0:0)
1593	90 SANDSTONE, a.a.	186.0
(1.7)	10 CLAYSTONE, a.a.	(94:5:1:0:0)
1596	80 SANDSTONE, a.a.	169.2
(2.3)	20 CLAYSTONE, a.a.	(95:4:1:0:0)
1599	90 SANDSTONE, a.a.	193.5
(1.6)	10 CLAYSTONE, a.a.	(95:4:1:0:0)
1602	100 SANDSTONE, a.a.	122.8
(5.1)	Tr CLAYSTONE, a.a.	(95:4:1:0:0)
1605	90 SANDSTONE, a.a.	148.0
(1.5)	10 CLAYSTONE, a.a.	(94:5:1:0:0)
1608	100 SANDSTONE, a.a.	216.3
(1.2)	Tr CLAYSTONE, a.a.	(96:4:0:0:0)
1611	100 SANDSTONE, a.a.	165.2
(2.8)	Tr CLAYSTONE, a.a.	(95:4:1:0:0)
1614	100 SANDSTONE, a.a.	95.5
(7.3)	Tr CLAYSTONE, a.a.	(95:4:1:0:0)
1617	90 SANDSTONE, a.a.	136.8
(2.1)	10 CLAYSTONE, a.a.	(95:4:1:0:0)
1620	90 SANDSTONE, a.a.	109.3
(3.5)	10 CLAYSTONE, a.a.	(95:4:1:0:0)
1623	100 SANDSTONE, a.a.	128.8
(2.3)	Tr CLAYSTONE, a.a.	(95:4:1:0:0)
1626	100 SANDSTONE, a.a.	96.7
(5.6)	Tr CLAYSTONE, a.a.	(95:4:1:0:0)
1629	80 SANDSTONE, a.a. - common pyrite.	97.8
(3.3)	20 CLAYSTONE, dark brown, firm to hard, blocky, argillaceous, grades to siltstone.	(95:4:1:0:0)
1632	90 SANDSTONE, a.a.	97.5
(2.5)	10 CLAYSTONE, a.a.	(97:3:0:0:0)
1635	90 SANDSTONE, a.a.	94.3
(6.5)	10 CLAYSTONE, a.a.	(97:3:0:0:0)

TD of 1636m. @ 23-00 hours 23/03/2001. Rig release 0700hrs 26/03/2001

APPENDIX 4: PETROPHYSICAL ANALYSIS



PETROPHYSICS REPORT
DUNBAR 1 DW1

PPL 1
OTWAY BASIN
VICTORIA

Author:
J A Donley

Origin Energy Resources Limited
1 King William St
ADELAIDE SA 5000

April 2001

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1.0 INTRODUCTION

Dunbar 1 DW1 was spudded at 16:00 hrs on the 19th of March, 2001. Reeves were contracted to run Wireline Logs from TD to the Kick-Off point below the casing shoe. Table 1 gives a summary of the logging program.

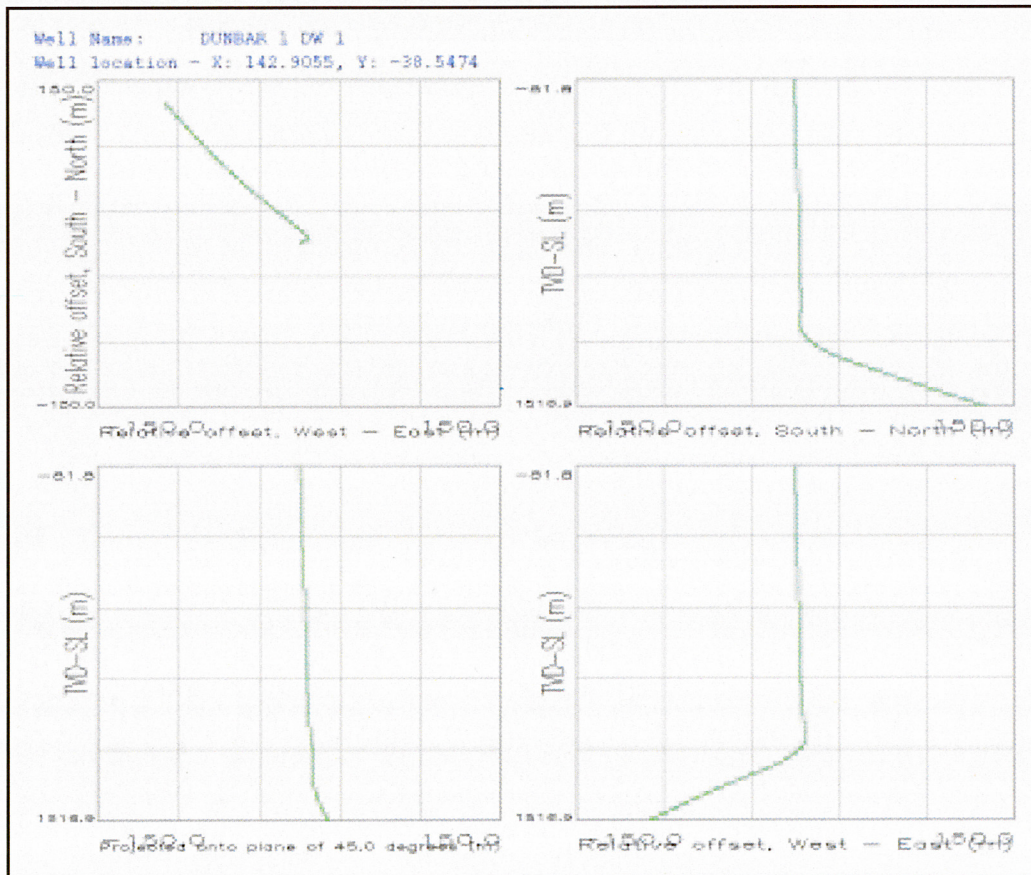
TABLE 1 - DUNBAR 1 DW1 WIRELINE LOGGING									
LOG	Base	Top	BHT	Circ	Rm degC	Rmf degC	Rmc degC		
DLL-SLL-MLL-SP-GR-CAL	1633	1210.6							
PDS-CNS-GR	1633	1210.6	64	9.4	0.222 16.8	0.212 16.4	0.441	18.1	

This petrophysical analysis was performed using Terrastation software.

2.0 TVD

Sperry-sun provided deviation and azimuth data during the drilling of the sidetrack. The well path is plotted in Figure 1.

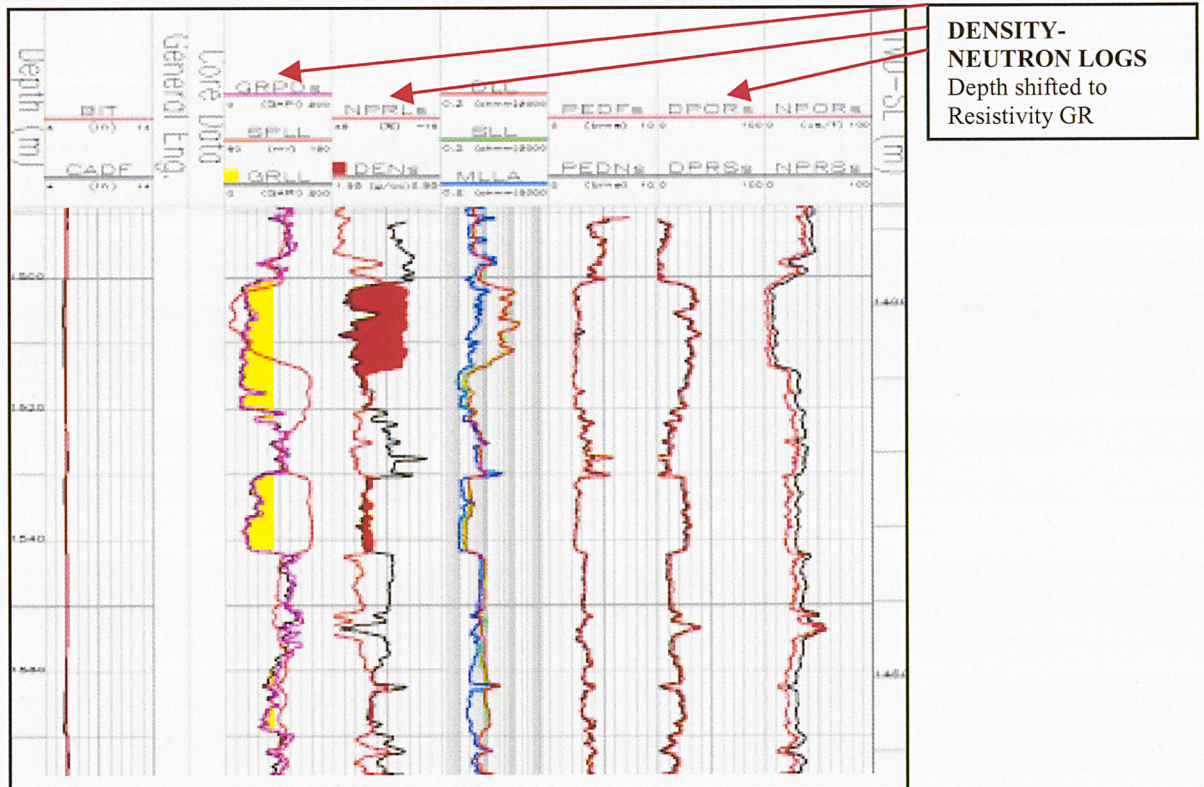
Figure1 - Dunbar 1 DW1 Well Path



3.0 LOG SHIFTING

A small depth discrepancy was noted between the Resistivity and Neutron-Density Logging runs. The PDS-CNS logs were depth matched to the Resistivity GR.

Figure 2 - Depth Shift



4.0 ENVIRONMENTAL CORRECTIONS

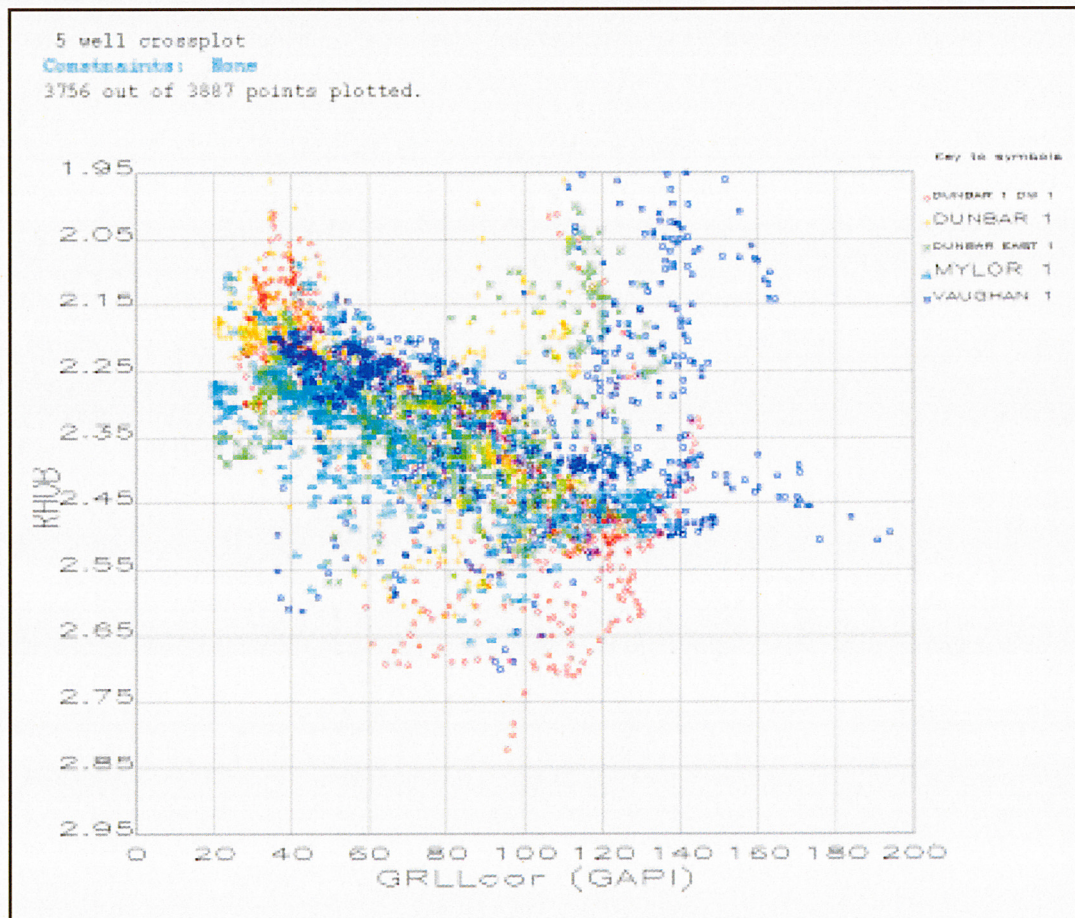
Environmental corrections for the GRLL were done using the Reeves GR correction algorithm within Terrastation. The Neutron Log (NPRL) was corrected for SDST Matrix using the Terrastation Reeves algorithm. Environmental corrections were performed on the DLL-SLL and MLL and DI, Rt and Rxo derived using the Tornado plot.

5.0 NORMALISATION

Logging tools from Dunbar-1 DW1, Dunbar-1, Dunbar East-1, Mylor-1 and Vaughan-1 were crossplotted over the Waarre Formation interval to investigate the presence of anomalous logs. Three crossplots were made, GR vs RHOB, GR vs NPHI and ROB vs DLL. No major shifts were noted and evaluation proceeded without Normalisation

Figure 2 shows a normalisation crossplot of GR vs Density.

Figure 3 - GR vs RHOB Normalisation Crossplot



6.0 Vsh (Volume of Shale)

A composite GR Histogram was plotted for the Waarre Formation interval using the wells Dunbar-1 DW1, Dunbar-1, Dunbar East-1, Mylor-1 and Vaughan-1. GR cutoffs of 30 and 130 gapi were calculated using the 5% and 95% values for the Histogram. Vsh was derived from Clavier Equation.

Figure 4 - Composite GR Histogram

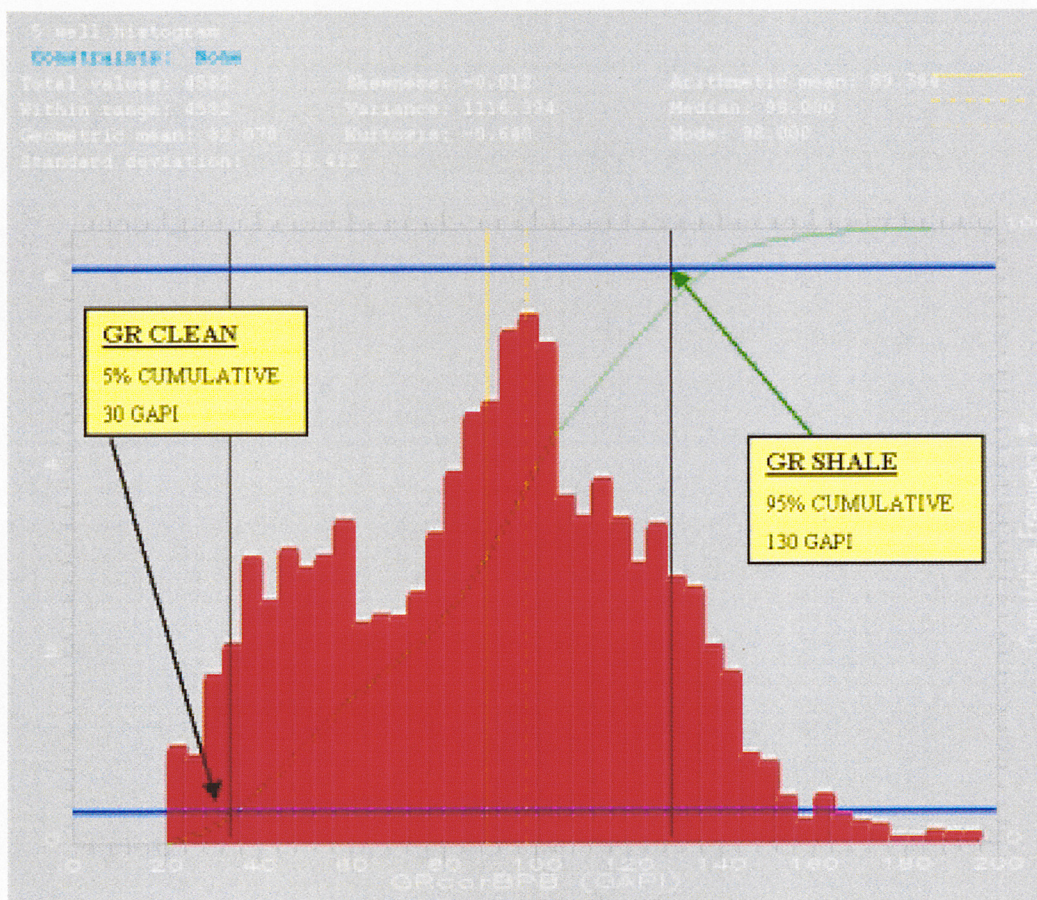
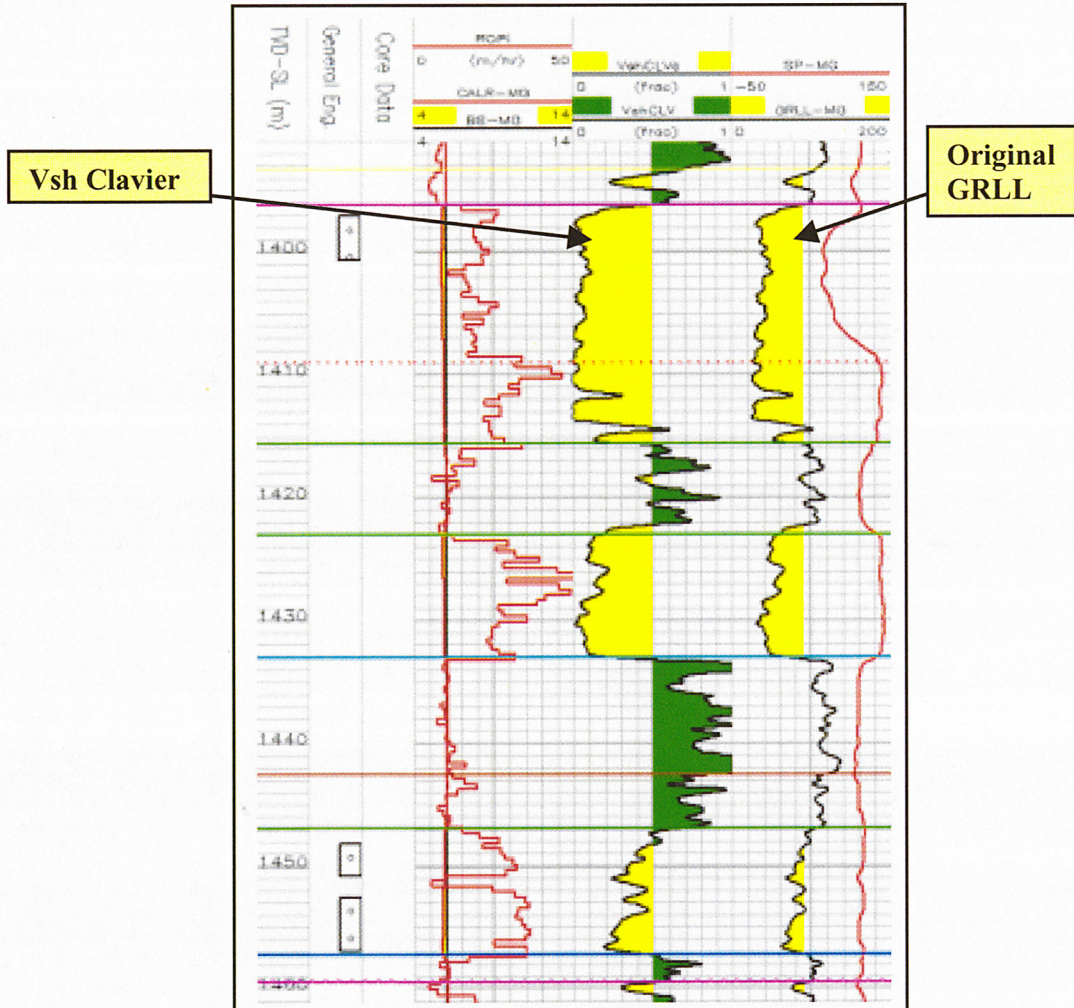


Figure 5 - Vsh Clavier



7.0 POROSITY

7.1 Density Porosity

Density Porosity was derived using a Fluid Density for the gas zone of 0.49 g/cc. This RHO_f was derived from a Core Porosity vs RHO_B crossplot performed at Mylor 1 (Donley, 1999). Grain Density analysis was performed on Waarre Formation core taken from North Paaratte 2, Mylor-1, Skull Creek West-1, Braeside-1 and Wallaby Creek-2. An average grain density of 2.67 g/cc was calculated from these analyses and was used in the density porosity calculation.

7.2 Neutron Porosity

Neutron Porosity (SDST Matrix) was shale corrected using the equation;

$$NPSC = NPHI - Vsh (NPHI_{shale} - DENPOR_{shale})$$

$$NPSC_{DUNBAR1DW1} = NPHI - Vsh (0.45 - 0.044)$$

Values of NPHI shale and RHOB shale were derived from crossplots of Vsh vs NPHI_{sd} and Vsh vs RHOB respectively.

Shale corrected NPHI was calibrated to Density Porosity using the RMA equation derived from crossplotting Density Porosity and Shale corrected NPHI.

Figure 6 - Crossplot to calibrate NPsc to Density Porosity

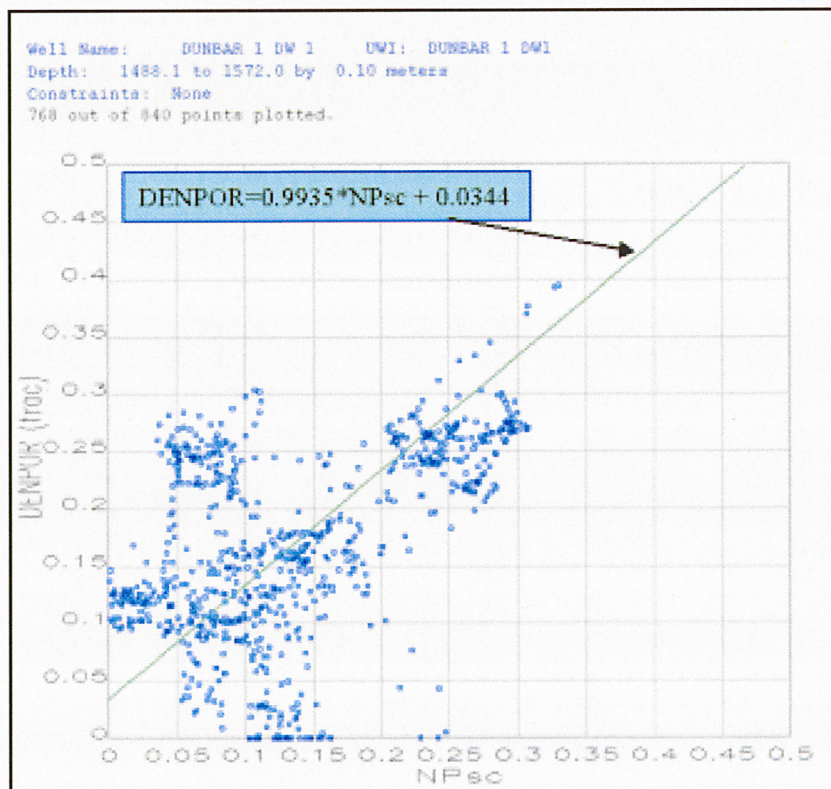
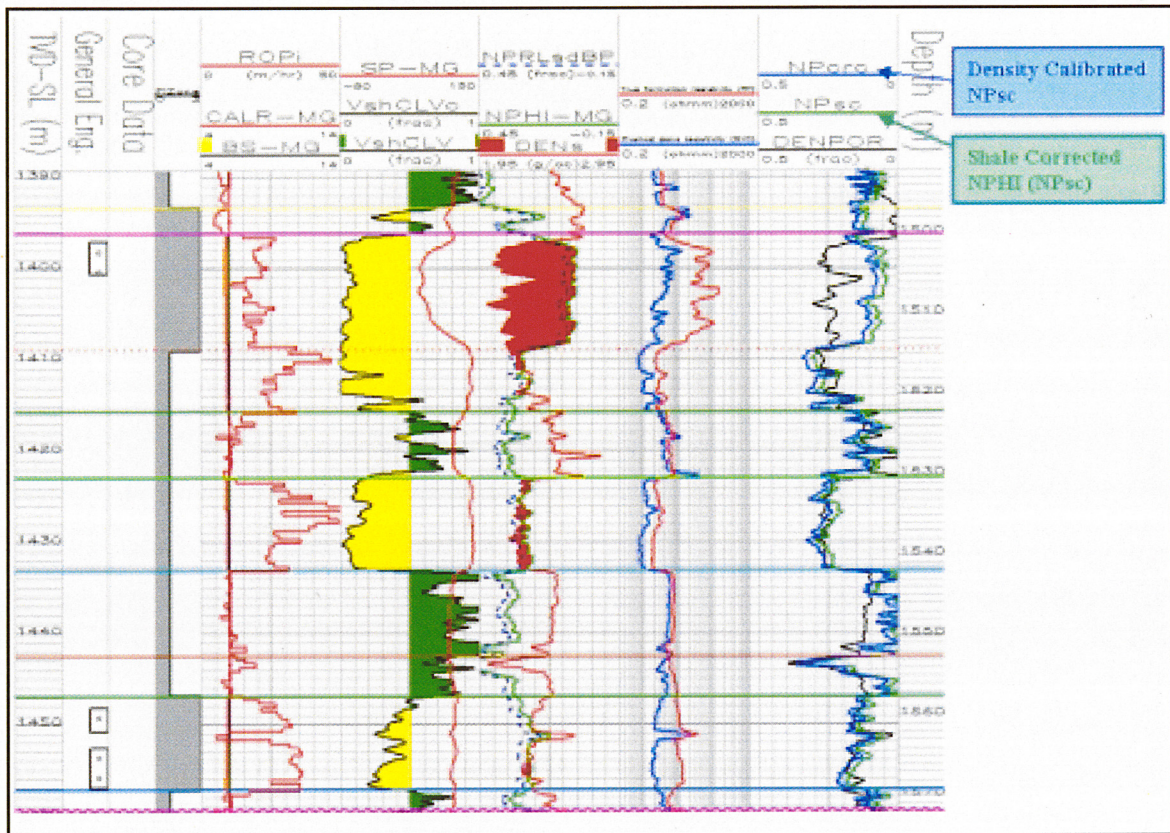


Figure 7 - NPHI Calibration



7.3 Density - Neutron Porosity

Density-Neutron Porosity was calculated using Equation 1;

$$\Phi_{DN} = \sqrt{\frac{\Phi_D^2 + \Phi_N^2}{2}} \quad \text{Equation 1}$$

Where ;

- Φ_{DN} = Density-Neutron Porosity
- Φ_D = Density Porosity
- Φ_N = Shale Corrected, Density calibrated Neutron Porosity

Density-Neutron Porosity was calibrated to overburden core porosity using core from Langley-1. Overburden core porosity at Langley-1 was crossplotted against Density-Neutron Porosity for the gas and water zones. Equations 2 & 3 are the regression derived equations used to calibrate Density-Neutron Porosity.

$$\Phi DN_{GASZONE} = 1.227578 \times \Phi DN$$

Equation 2

$$\Phi DN_{WATERZONE} = 0.887349 \times \Phi DN$$

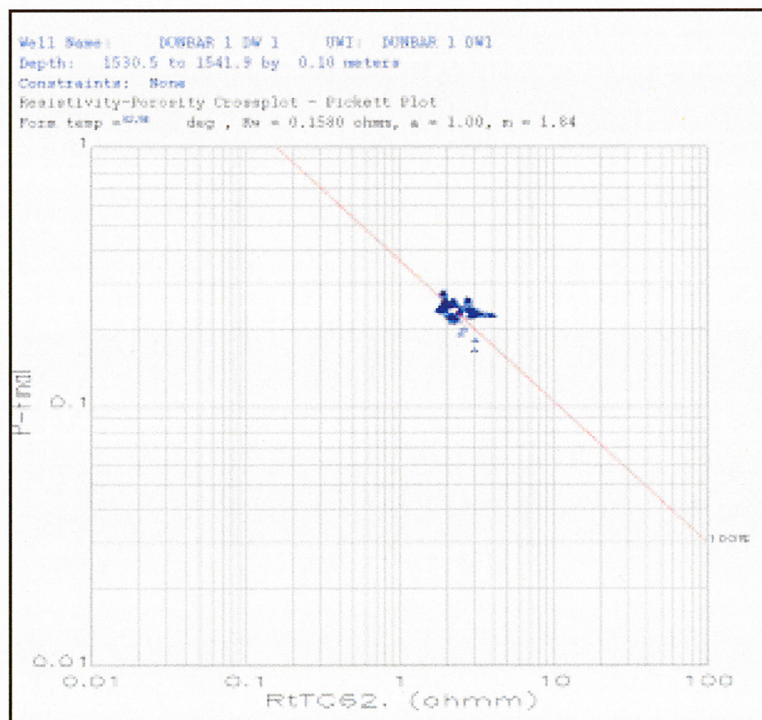
Equation 3

8.0 WATER SATURATION

8.1 Rw

Rw was derived from a Pickett Plot run over the water saturated Waarre B Sand interval. Rt was corrected to a formation temperature of 62.54 degC prior to plotting. An Rw of 0.158 @ 62.5degC (0.286 @25degC) and an m of 1.84 was derived using this method

Figure 8 - Pickett Plot Dunbar 1 DW1 Waarre B Sand



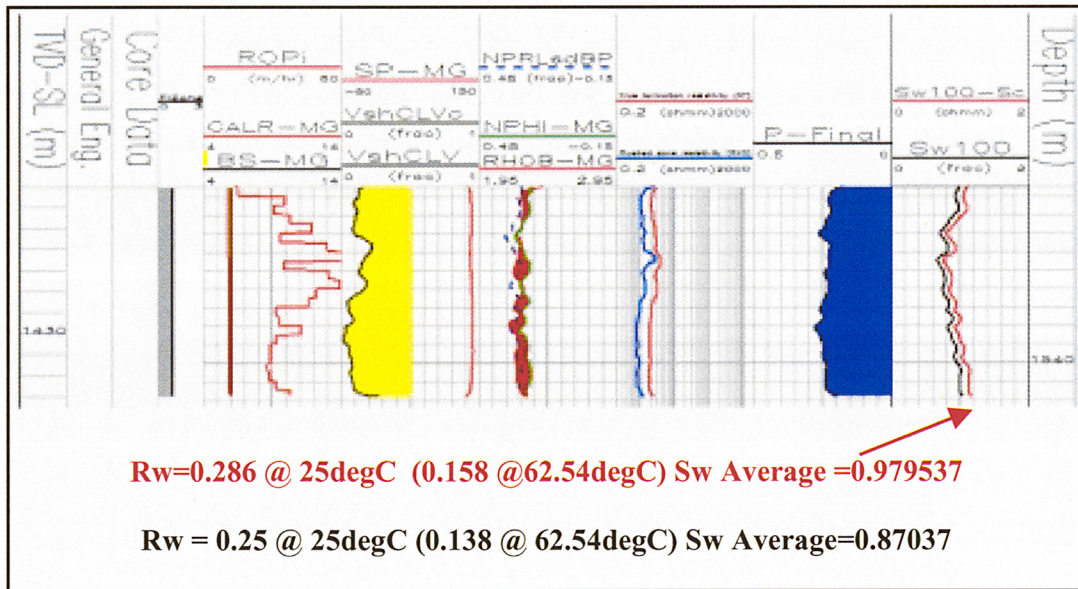
8.2 Saturation Exponent "n"

Special Core analysis at Braeside -1 derived an "n" value of 1.782 (Donley, 1999).

8.3 Sw100

In order to confirm the Archie water saturation parameters of a, R_w , m and n, S_w was calculated for the 100% water saturated Waarre "B Sand". A result of S_w equal to 1 in this zone would confirm that the choice of parameters was correct. Figure 9 shows that a $R_w = 0.158$ at 62.54degC, a =1, m=1.84 and n=1.782 gives an average S_w of 1 in the water saturated "B Sand".

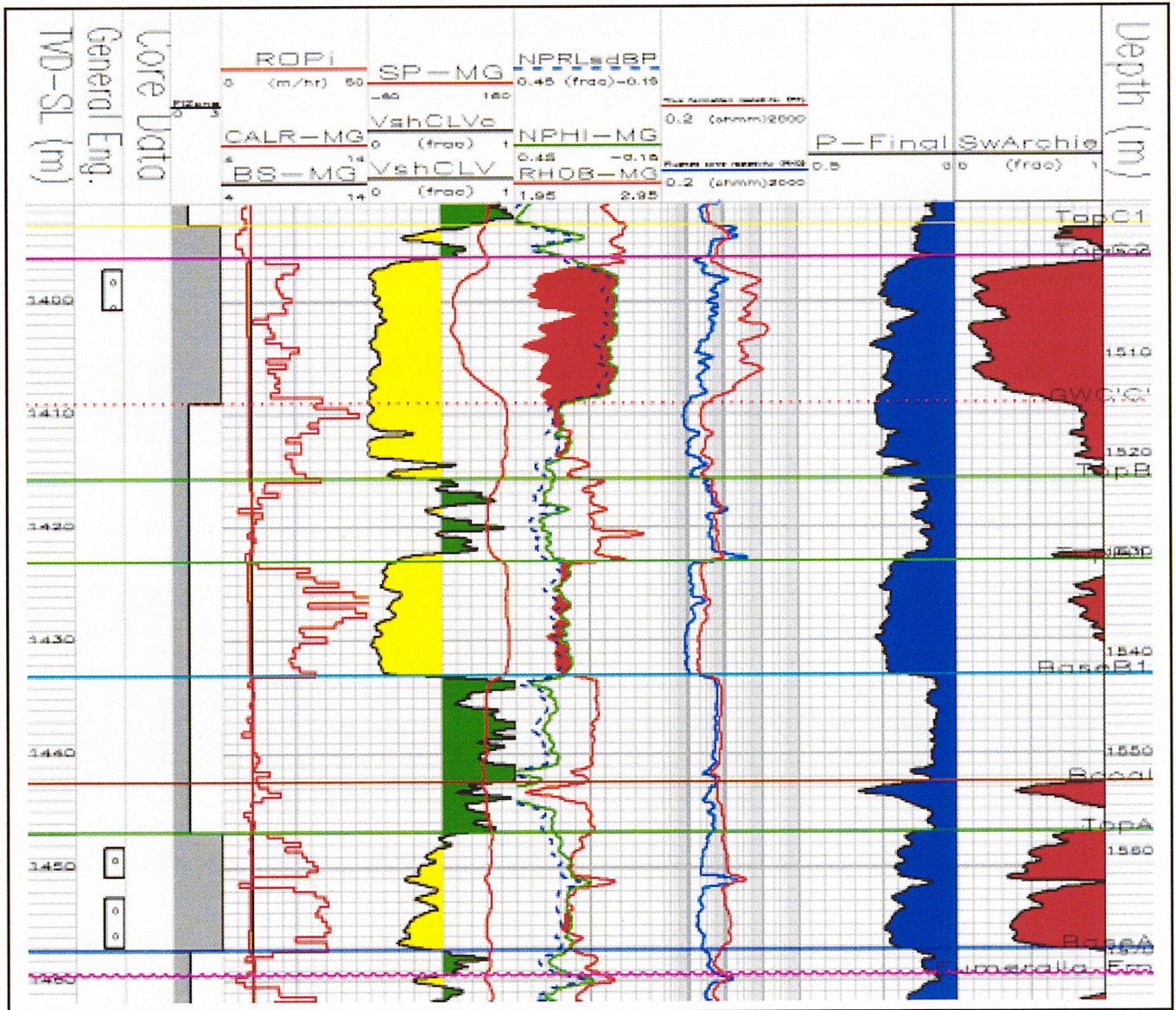
Figure 9 - Sw100 Plot



8.4 Archie Sw

Archie Water Saturation was run over the entire Waarre Sandstone interval using the derived equation parameters. The results are shown in Figure 10.

Figure 10 - Archie Sw



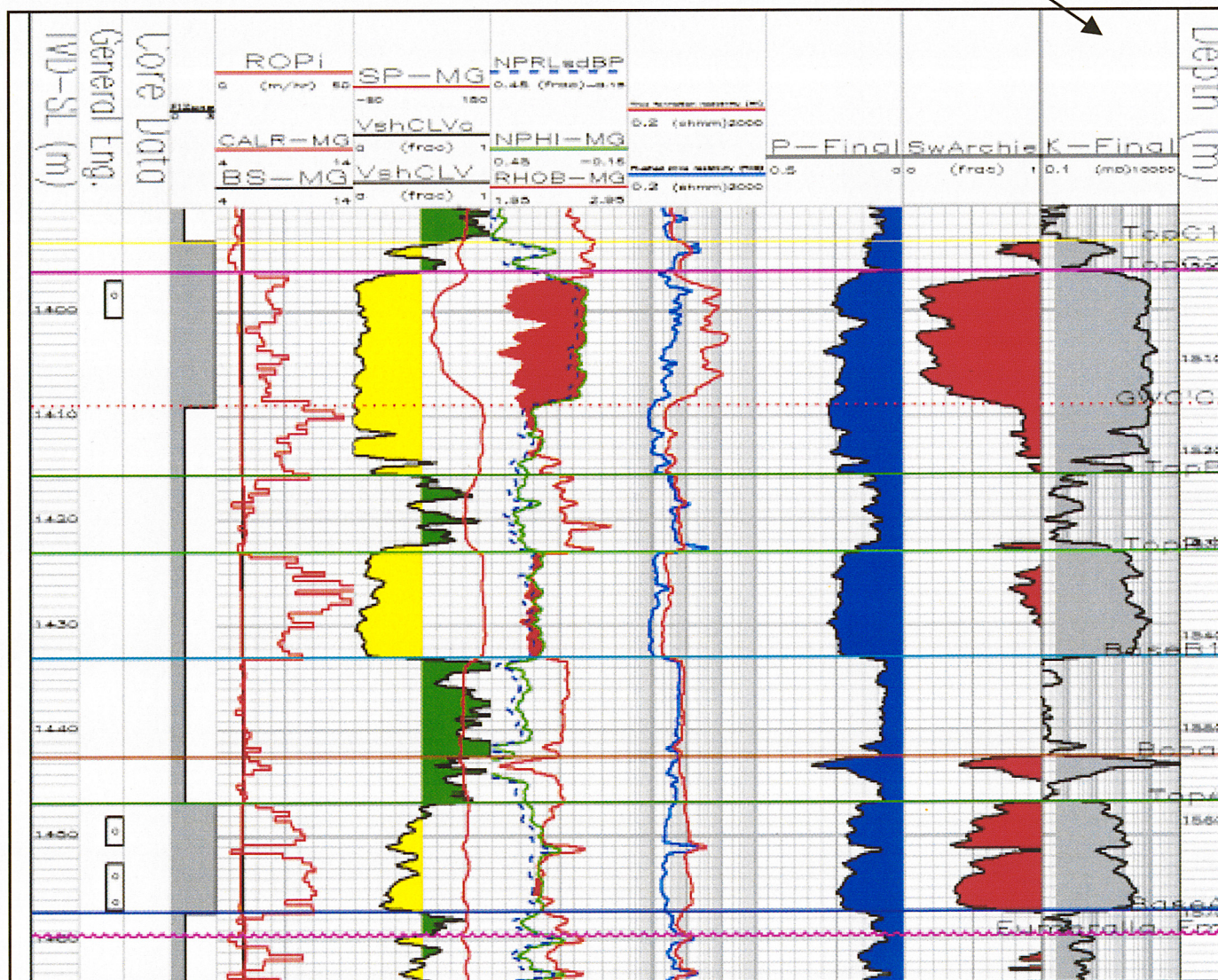
9.0 PERMEABILITY

Core permeability from Braeside 1, Mylor-1, Skull Creek West-1, Wallaby Creek-2, and North Paaratte-2 was cross plotted against log porosity, Sw and Vsh. Permeability was predicted from a weighted average of individual predictions found to influence permeability ie. Porosity, Vsh and Sw. The weighting was determined by the correlation coefficients of the linear regression in each case.

$$K = [0.6 \times fn(\Phi)] + [0.3 \times fn(Vsh)] + [0.1 \times fn(Sw)]$$

Equation 4

Figure 11 - Permeability



10.0 PAY SUMMARY

Table 2 shows a Petrophysical Summary for each defined stratigraphic interval in Dunbar1 DW1 (see Enclosure 1 for intervals). Net Pay was calculated in the hydrocarbon zone (Enclosure 1 - Fluid Zone 3) using a permeability cutoff of 0.3mD in combination with a Vsh cutoff of 50%.

10.1 C Sand

Net Pay of 12.8m is present in the Waarre "C Sand" with an average Sw of 28%. The Reservoir properties of the "C Sand" are excellent with Permeabilities of 700mD and Porosities of 22%.

10.2 A Sand

Net Pay of 10.3m was intersected in the Waarre "A Sand" with an average Sw of 51%. Permeabilities, whilst significantly lower than the "C Sand", are excellent (10mD). The "A Sand" has an average porosity of 20% and a shale content of 35%.

Table 2

DUNBAR 1 DW 1 - PETROPHYSICAL SUMMARY											
INTERVAL	TOP	BASE	TOP	BASE	INCR	PAY INCR	Vsh	Sw	Por	K	M/G
	TVDSS	TVDSS	MDKB	MDKB							
TOP C1-TOPC2	-1393.3	-1396.21	1496.7	1500	2.91	1.15	0.33	0.75	0.13	28.82	0.39
TOP C2.GWC	-1396.21	-1400.90	1500	1514.5	12.77	12.77	0.06	0.28	0.22	709.42	1.00
GWC-TOPB	-1400.90	-1415.65	1514.5	1522.1	6.69	6.43	0.09	0.87	0.24	447.55	0.96
TOPB1-BASEB1	-1423	-1433.02	1530.5	1541.9	10.03	10.03	0.11	0.94	0.24	266.47	1.00
TOPA-BASEA	-1446.9	-1457.25	1557.6	1569.3	10.32	9.44	0.35	0.51	0.20	100.30	0.91

11.0 REFERENCES

DONLEY, J. (1999): "Petrophysics Report, North Paaratte, Wallaby Creek and Grumby Gasfields, PPL1, Otway Basin, Victoria." *Internal Boral Energy Report, (unpublished)*.

DEAKIN, M. (1999): "Integrating Petrophysical Data, Established and Emerging Techniques." *Course Notes (unpublished)*

DUNBAR 1 DW 1																	
INTERVAL	TOP	BASE	TVSS	MDKB	TOP	BASE	MDKB	BASE	MDKB	INCR	PAY INCR	Vsh	Sw	Por	K	N/G	INTERVAL
TOP C1-TOPC2	-1393.3	-1396.21	1496.7	1500						2.91	1.15	0.33	0.75	0.13	28.82	0.39	TOP C1-TOPC2
TOP C2-GWC	-1396.21	-1408.98	1500	1514.5						12.77	12.77	0.06	0.28	0.22	709.42	1.00	TOP C2-GWC
GWC-TOPB	-1408.98	-1415.65	1514.5	1522.1						6.43	6.43	0.09	0.87	0.24	447.55	0.96	GWC-TOPB
TOPB-TOPB1	-1415.65	-1423	1522.1	1530.5						2.29	2.29	0.38	0.93	0.14	10.00	0.31	TOPB-TOPB1
TOPB1-BASEB1	-1423	-1433.02	1530.5	1541.9						10.03	10.03	0.11	0.94	0.24	266.47	1.00	TOPB1-BASEB1
BASEB1-TOPA	-1433.02	-1446.9	1541.9	1557.6						13.33	13.33	0.38	1.00	0.16	7.94	0.01	BASEB1-TOPA
TOPA-BASEA	-1446.9	-1457.25	1557.6	1569.3						10.32	9.44	0.35	0.51	0.20	100.30	0.91	TOPA-BASEA
BASEA-EUM	-1457.25	-1459.44	1569.3	1571.8						2.20	0.09	0.47	0.72	0.18	22.66	0.04	BASEA-EUM

INTERVAL	Depth	TVDSL	Vst_CLV	SwArchie	Sw<1	P-Final	K-Final	PAY	INCR	PAY INCR	Vsh	Sw	Por	K
	1488	1385.623			0			0	0.08825	0				
	1488.1	1385.711			0			0	0.08814	0				
	1488.2	1385.799			0			0	0.08826	0				
	1488.3	1385.888			0			0	0.08813	0				
	1488.4	1385.976			0			0	0.08813	0				
	1488.5	1386.064			0			0	0.08826	0				
	1488.6	1386.152			0			0	0.08814	0				
	1488.7	1386.24			0			0	0.08813	0				
	1488.8	1386.328			0			0	0.08814	0				
	1488.9	1386.417			0			0	0.08825	0				
	1489	1386.505			0			0	0.08826	0				
	1489.1	1386.593			0			0	0.08813	0				
	1489.2	1386.681			0			0	0.08814	0				
	1489.3	1386.769			0			0	0.08826	0				
	1489.4	1386.858			0			0	0.08813	0				
	1489.5	1386.946			0			0	0.08826	0				
	1489.6	1387.034			0			0	0.08813	0				
	1489.7	1387.122			0			0	0.08813	0				
	1489.8	1387.21			0			0	0.08826	0				
	1489.9	1387.299			0			0	0.08813	0				
	1490	1387.387			0			0	0.08826	0				
	1490.1	1387.475	1		0			0	0.08813	0				
	1490.2	1387.563	1		0			0	0.08826	0				
	1490.3	1387.651	1		0			0	0.08813	0				
	1490.4	1387.74	0.99336		0			0	0.08826	0				
	1490.5	1387.828	0.75436		0			0	0.08814	0				
	1490.6	1387.916	0.61071		0			0	0.08838	0				
	1490.7	1388.004	0.48436		0			0	0.08813	0				
	1490.8	1388.093	0.39384		0			0	0.08826	0				
	1490.9	1388.181	0.36116		0			0	0.08813	0				
	1491	1388.269	0.39587		0			0	0.08826	0				
	1491.1	1388.357	0.47163		0			0	0.08813	0				
	1491.2	1388.445	0.55279		0			0	0.08825	0				

1491.3	1388.534	0.61974	1.63764	0	0.10786	0.52445	0	0.08814	0	0	0	0.08826
1491.4	1388.622	0.66362	1.63764	1	0.10919	0.54178	0	0.08826	0	0	0	0.08813
1491.5	1388.71	0.67387	1.6495	1	0.11194	0.59778	0	0.08838	0	0	0	0.08826
1491.6	1388.798	0.67887	1.62915	1	0.10783	0.48576	0	0.08826	0	0	0	0.08813
1491.7	1388.887	0.71788	1.71072	1	0.09917	0.32487	0	0.08826	0	0	0	0.08813
1491.8	1388.975	0.7778	1.89385	1	0.09968	0.32518	0	0.08826	0	0	0	0.08813
1491.9	1389.063	0.81369	1.88828	1	0.10741	0.45025	0	0.08813	0	0	0	0.08838
1492	1389.151	0.81551	1.79923	1	0.11641	0.66074	0	0.08826	0	0	0	0.08813
1492.1	1389.24	0.81426	1.66799	1	0.11971	0.75948	0	0.08826	0	0	0	0.08813
1492.2	1389.328	0.8275	1.63467	1	0.11563	0.63437	0	0.08826	0	0	0	0.08813
1492.3	1389.416	0.85898	1.7076	1	0.10555	0.40858	0	0.08826	0	0	0	0.08826
1492.4	1389.504	0.90734	1.87396	1	0.09136	0.22022	0	0.08826	0	0	0	0.08826
1492.5	1389.592	0.96253	2.14626	1	0.08082	0.13936	0	0.08825	0	0	0	0.08826
1492.6	1389.681	0.99233	2.38751	1	0.07669	0.11685	0	0.08826	0	0	0	0.08826
1492.7	1389.769	0.99095	2.4667	1	0.08374	0.1599	0	0.08826	0	0	0	0.08826
1492.8	1389.857	0.91899	2.21047	1	0.09956	0.32086	0	0.08826	0	0	0	0.08826
1492.9	1389.945	0.83497	1.83044	1	0.11741	0.70057	0	0.08826	0	0	0	0.08826
1493	1390.034	0.76091	1.54868	1	0.12641	1.036	0	0.08826	0	0	0	0.08826
1493.1	1390.122	0.73053	1.45282	1	0.12137	0.82889	0	0.08826	0	0	0	0.08826
1493.2	1390.21	0.75812	1.5365	1	0.10582	0.41921	0	0.08825	0	0	0	0.08826
1493.3	1390.298	0.82877	1.79598	1	0.08545	0.17182	0	0.08826	0	0	0	0.08826
1493.4	1390.387	0.96253	2.25981	1	0.07332	0.10077	0	0.08826	0	0	0	0.08826
1493.5	1390.475	1	2.66346	1	0.0757	0.11167	0	0.08825	0	0	0	0.08826
1493.6	1390.563	1	2.58974	1	0.07881	0.12769	0	0.08826	0	0	0	0.08826
1493.7	1390.651	1	2.42389	1	0.08629	0.1767	0	0.08826	0	0	0	0.08826
1493.8	1390.74	0.97766	2.14447	1	0.10342	0.37343	0	0.08825	0	0	0	0.08826
1493.9	1390.828	0.89313	1.7217	1	0.11602	0.64972	0	0.08826	0	0	0	0.08826
1494	1390.916	0.81504	1.5264	1	0.11663	0.67495	0	0.08838	0	0	0	0.08826
1494.1	1391.005	0.77242	1.46337	1	0.10254	0.37095	0	0.08826	0	0	0	0.08826
1494.2	1391.093	0.78945	1.62627	1	0.08235	0.15604	0	0.08825	0	0	0	0.08826
1494.3	1391.181	0.83862	2.03167	1	0.0692	0.08861	0	0.08826	0	0	0	0.08826
1494.4	1391.269	0.87539	2.47289	1	0.06398	0.07037	0	0.08826	0	0	0	0.08826
1494.5	1391.358	0.89818	2.74959	1	0.06728	0.08014	0	0.08837	0	0	0	0.08826
1494.6	1391.446	0.90853	2.70063	1	0.08066	0.14214	0	0.08825	0	0	0	0.08826
1494.7	1391.534	0.88017	2.27575	1	0.09786	0.2992	0	0.08826	0	0	0	0.08826
1494.8	1391.623	0.83034	1.92454	1	0.09985	0.32533	0	0.08826	0	0	0	0.08826
1494.9	1391.711	0.83068	1.91696	1	0.08705	0.18549	0	0.08825	0	0	0	0.08826
1495.1	1391.799	0.88986	2.23176	1	0.07389	0.10429	0	0.08838	0	0	0	0.08826
1495.2	1391.887	0.94876	2.65629	1	0.07442	0.10668	0	0.08826	0	0	0	0.08826
1495.3	1391.976	0.94753	2.63092	1	0.08041	0.13854	0	0.08825	0	0	0	0.08826
1495.4	1392.064	0.92416	2.40774	1	0.08268	0.15278	0	0.08826	0	0	0	0.08826
1495.5	1392.152	0.92022	2.31386	1	0.07839	0.12648	0	0.08826	0	0	0	0.08826
1495.6	1392.24	0.94427	2.41978	1	0.07342	0.10173	0	0.08838	0	0	0	0.08826
1495.7	1392.329	0.96927	2.5675	1	0.07121	0.09228	0	0.08825	0	0	0	0.08826
1495.8	1392.417	0.98435	2.63521	1	0.06968	0.08609	0	0.08826	0	0	0	0.08826
1495.9	1392.505	1	2.68753	1	0.0751	0.10898	0	0.08826	0	0	0	0.08826
1496	1392.594	0.95003	2.4816	1	0.09107	0.21834	0	0.08825	0	0	0	0.08826
1496.1	1392.682	0.93012	2.02623	1	0.10662	0.43056	0	0.08826	0	0	0	0.08826
1496.2	1392.77	0.86158	1.71294	1	0.10908	0.48103	0	0.08826	0	0	0	0.08826
1496.3	1392.858	0.83447	1.65622	1	0.10722	0.44623	0	0.08826	0	0	0	0.08826
1496.4	1392.947	0.81876	1.66018	1	0.10808	0.46919	0	0.08825	0	0	0	0.08826
1496.5	1393.035	0.78231	1.61904	1	0.10898	0.49926	0	0.08826	0	0	0	0.08826
1496.6	1393.123	0.73893	1.5614	1	0.10437	0.42692	0	0.08838	0	0	0	0.08826
1496.7	1393.212	0.71067	1.54821	1								

1496.7	1393.3	0.69357	1.13543	1	0.13408	2.53746	0	0.08813	0	0.46597	0.73448	0.14452	16.86837
1496.8	1393.388	0.67494	1.13249	1	0.12421	2.24448	0	0.08826	0	0.41524	0.71248	0.1428	20.1875
1496.9	1393.476	0.65041	1.09047	1	0.11851	2.53803	0	0.08826	0	0.37894	0.73304	0.13387	20.14859
1497	1393.564	0.60377	0.97122	0.971	0.12296	4.53738	0	0.08825	0	0.34796	0.77301	0.12438	19.80977
1497.1	1393.653	0.5364	0.82831	0.828	0.13516	9.77846	0	0.08838	0	0.28269	0.76459	0.11872	30.85997
1497.2	1393.741	0.46597	0.73448	0.734	0.14452	16.86837	1	0.08814	0.08814	0.24972	0.71712	0.12416	44.25762
1497.3	1393.829	0.41524	0.71248	0.712	0.1428	20.1875	1	0.08825	0.08825	0.23177	0.6843	0.12971	54.74421
1497.4	1393.917	0.37894	0.73304	0.733	0.13387	20.14859	1	0.08826	0.08826	0.23845	0.68063	0.13214	52.27164
1497.5	1394.006	0.34796	0.77301	0.773	0.12438	19.80977	1	0.08814	0.08814	0.26749	0.68006	0.13212	42.11437
1497.6	1394.094	0.31718	0.79003	0.79	0.11827	22.76749	1	0.08837	0.08837	0.26749	0.68006	0.13212	42.11437
1497.7	1394.182	0.28269	0.76459	0.765	0.11872	30.85997	1	0.08826	0.08826	0.26749	0.68006	0.13212	42.11437
1497.8	1394.27	0.24972	0.71712	0.717	0.12416	44.25762	1	0.08814	0.08814	0.26749	0.68006	0.13212	42.11437
1497.9	1394.359	0.23177	0.6843	0.684	0.12971	54.74421	1	0.08825	0.08825	0.26749	0.68006	0.13212	42.11437
1498	1394.447	0.23845	0.68063	0.681	0.13214	52.27164	1	0.08826	0.08826	0.26749	0.68006	0.13212	42.11437
1498.1	1394.535	0.26749	0.68006	0.68	0.13212	42.11437	1	0.08826	0.08826	0.26749	0.68006	0.13212	42.11437
1498.2	1394.623	0.31424	0.73433	0.734	0.13128	27.06544	1	0.08825	0.08825	0.26749	0.68006	0.13212	42.11437
1498.3	1394.712	0.37768	0.81908	0.819	0.12855	14.8804	1	0.08814	0.08814	0.26749	0.68006	0.13212	42.11437
1498.4	1394.8	0.44718	0.89082	0.891	0.12705	8.72982	1	0.08825	0.08825	0.26749	0.68006	0.13212	42.11437
1498.5	1394.888	0.50638	0.92523	0.925	0.12945	6.59394	0	0.08826	0	0.26749	0.68006	0.13212	42.11437
1498.6	1394.976	0.54737	0.92027	0.92	0.13597	6.52141	0	0.08826	0	0.26749	0.68006	0.13212	42.11437
1498.7	1395.064	0.58673	0.91915	0.919	0.13933	6.45895	0	0.08813	0	0.26749	0.68006	0.13212	42.11437
1498.8	1395.153	0.62568	0.93489	0.935	0.13896	5.87777	0	0.08826	0	0.26749	0.68006	0.13212	42.11437
1498.9	1395.241	0.652	0.9581	0.958	0.13777	5.21225	0	0.08826	0	0.26749	0.68006	0.13212	42.11437
1499	1395.329	0.66675	0.98481	0.985	0.13613	4.56681	0	0.08813	0	0.26749	0.68006	0.13212	42.11437
1499.1	1395.417	0.66621	1.0003	1	0.13524	4.25101	0	0.08826	0	0.26749	0.68006	0.13212	42.11437
1499.2	1395.506	0.6475	0.99206	0.992	0.13704	4.51899	0	0.08826	0	0.26749	0.68006	0.13212	42.11437
1499.3	1395.594	0.61451	0.97174	0.972	0.13965	5.13576	0	0.08813	0	0.26749	0.68006	0.13212	42.11437
1499.4	1395.682	0.58758	0.9918	0.992	0.13623	4.89791	0	0.08826	0	0.26749	0.68006	0.13212	42.11437
1499.5	1395.77	0.58275	1.11183	1	0.12196	2.65665	0	0.08813	0	0.26749	0.68006	0.13212	42.11437
1499.6	1395.859	0.59513	1.34658	1	0.10201	1.05549	0	0.08838	0	0.26749	0.68006	0.13212	42.11437
1499.7	1395.947	0.60327	1.62501	1	0.086	0.54563	0	0.08814	0	0.26749	0.68006	0.13212	42.11437
1499.8	1396.035	0.58769	1.75626	1	0.08142	0.54605	0	0.08813	0	0.26749	0.68006	0.13212	42.11437
1499.9	1396.123	0.54339	1.71921	1	0.08617	0.8804	0	0.08826	0	0.26749	0.68006	0.13212	42.11437
TOP C1-TOPC2													
1500	1396.211	0.47013	1.53434	1	0.10035	2.15679	1	0.08813	0.08813	0.47013	0.747285	0.129813	28.82348
1500.1	1396.299	0.38063	1.31794	1	0.12044	6.56747	1	0.08826	0.08826	0.38063	1	0.12044	6.56747
1500.2	1396.388	0.29488	1.14393	1	0.14146	19.0096	1	0.08826	0.08826	0.29488	1	0.14146	19.0096
1500.3	1396.476	0.22802	1.03167	1	0.1569	43.15185	1	0.08813	0.08813	0.22802	1	0.1569	43.15185
1500.4	1396.564	0.18631	0.95537	0.955	0.1641	71.84336	1	0.08813	0.08813	0.18631	0.95537	0.1641	71.84336
1500.5	1396.652	0.16288	0.89138	0.891	0.16506	95.85529	1	0.08814	0.08814	0.16288	0.89138	0.16506	95.85529
1500.6	1396.74	0.15284	0.83536	0.835	0.16308	109.3113	1	0.08838	0.08838	0.15284	0.83536	0.16308	109.3113
1500.7	1396.829	0.14651	0.76804	0.768	0.16433	121.1694	1	0.08813	0.08813	0.14651	0.76804	0.16433	121.1694
1500.8	1396.917	0.13336	0.68495	0.685	0.17158	148.3441	1	0.08814	0.08814	0.13336	0.68495	0.17158	148.3441
1500.9	1397.005	0.10858	0.60265	0.603	0.18265	208.0024	1	0.08813	0.08813	0.10858	0.60265	0.18265	208.0024
1501	1397.093	0.07848	0.54013	0.54	0.19186	303.3077	1	0.08826	0.08826	0.07848	0.54013	0.19186	303.3077
1501.1	1397.181	0.05504	0.4875	0.488	0.19886	407.9593	1	0.08826	0.08826	0.05504	0.4875	0.19886	407.9593
1501.2	1397.27	0.03988	0.43365	0.434	0.20425	502.4309	1	0.08813	0.08813	0.03988	0.43365	0.20425	502.4309
1501.3	1397.358	0.03067	0.37995	0.38	0.20798	581.6951	1	0.08814	0.08814	0.03067	0.37995	0.20798	581.6951
1501.4	1397.446	0.02396	0.33158	0.332	0.21162	656.6039	1	0.08813	0.08813	0.02396	0.33158	0.21162	656.6039
1501.5	1397.534	0.01899	0.28972	0.29	0.21708	730.0023	1	0.08814	0.08814	0.01899	0.28972	0.21708	730.0023
1501.6	1397.622	0.01379	0.24919	0.249	0.224	819.5186	1	0.08825	0.08825	0.01379	0.24919	0.224	819.5186
1501.7	1397.71	0.00943	0.21404	0.214	0.23076	911.9473	1	0.08826	0.08826	0.00943	0.21404	0.23076	911.9473
1501.8	1397.799	0.00851	0.18404	0.184	0.23484	976.1078	1	0.08813	0.08813	0.00851	0.18404	0.23484	976.1078

1501.9	1397.887	0.01258	0.15863	0.159	0.23631	994.388	1	0.08814	0.08814	0.01258	0.15863	0.23631	994.388
1502	1397.975	0.02084	0.13913	0.139	0.23588	973.3245	1	0.08813	0.08813	0.02084	0.13913	0.23588	973.3245
1502.1	1398.063	0.03082	0.12765	0.128	0.23358	927.9367	1	0.08826	0.08826	0.03082	0.12765	0.23358	927.9367
1502.2	1398.151	0.03994	0.12306	0.123	0.23172	882.2106	1	0.08814	0.08814	0.03994	0.12306	0.23172	882.2106
1502.3	1398.239	0.04572	0.12421	0.124	0.23094	848.4827	1	0.08813	0.08813	0.04572	0.12421	0.23094	848.4827
1502.4	1398.328	0.04757	0.12785	0.128	0.23379	840.3919	1	0.08814	0.08814	0.04757	0.12785	0.23379	840.3919
1502.5	1398.416	0.04588	0.13184	0.132	0.23909	859.388	1	0.08814	0.08814	0.04588	0.13184	0.23909	859.388
1502.6	1398.504	0.0449	0.13718	0.137	0.24501	880.8307	1	0.08826	0.08826	0.0449	0.13718	0.24501	880.8307
1502.7	1398.592	0.04482	0.14712	0.147	0.24771	876.4791	1	0.08813	0.08813	0.04482	0.14712	0.24771	876.4791
1502.8	1398.68	0.04543	0.16201	0.162	0.24748	844.0494	1	0.08814	0.08814	0.04543	0.16201	0.24748	844.0494
1502.9	1398.768	0.04842	0.18106	0.181	0.24503	792.7581	1	0.08813	0.08813	0.04842	0.18106	0.24503	792.7581
1503	1398.856	0.04812	0.20175	0.202	0.24209	738.1613	1	0.08813	0.08813	0.04812	0.20175	0.24209	738.1613
1503.1	1398.945	0.04617	0.21981	0.22	0.24061	715.7179	1	0.08813	0.08813	0.04617	0.21981	0.24061	715.7179
1503.2	1399.033	0.04012	0.22822	0.228	0.24148	738.969	1	0.08813	0.08813	0.04012	0.22822	0.24148	738.969
1503.3	1399.121	0.03479	0.22259	0.223	0.24467	790.372	1	0.08814	0.08814	0.03479	0.22259	0.24467	790.372
1503.4	1399.209	0.03301	0.20406	0.204	0.2499	856.5249	1	0.08813	0.08813	0.03301	0.20406	0.2499	856.5249
1503.5	1399.297	0.03513	0.17687	0.179	0.25543	924.692	1	0.08814	0.08814	0.03513	0.17687	0.25543	924.692
1503.6	1399.385	0.04212	0.15422	0.154	0.25915	965.4029	1	0.08826	0.08826	0.04212	0.15422	0.25915	965.4029
1503.7	1399.473	0.05558	0.13675	0.137	0.25858	932.1371	1	0.08801	0.08801	0.05558	0.13675	0.25858	932.1371
1503.8	1399.562	0.06979	0.12807	0.128	0.25364	852.3873	1	0.08813	0.08813	0.06979	0.12807	0.25364	852.3873
1503.9	1399.65	0.07863	0.1287	0.129	0.24528	766.7533	1	0.08814	0.08814	0.07863	0.1287	0.24528	766.7533
1504	1399.738	0.08164	0.13839	0.138	0.23379	687.8389	1	0.08813	0.08813	0.08164	0.13839	0.23379	687.8389
1504.1	1399.826	0.0783	0.1526	0.153	0.22447	644.9011	1	0.08826	0.08826	0.0783	0.1526	0.22447	644.9011
1504.2	1399.914	0.06856	0.16662	0.167	0.22035	643.9965	1	0.08801	0.08801	0.06856	0.16662	0.22035	643.9965
1504.3	1400.002	0.05564	0.17428	0.174	0.22273	685.9955	1	0.08814	0.08814	0.05564	0.17428	0.22273	685.9955
1504.4	1400.09	0.04578	0.17514	0.175	0.22842	742.4591	1	0.08813	0.08813	0.04578	0.17514	0.22842	742.4591
1504.5	1400.178	0.04315	0.17316	0.173	0.23379	774.2349	1	0.08814	0.08814	0.04315	0.17316	0.23379	774.2349
1504.6	1400.267	0.04861	0.17432	0.174	0.23516	750.6387	1	0.08825	0.08825	0.04861	0.17432	0.23516	750.6387
1504.7	1400.355	0.05845	0.18127	0.181	0.23318	689.5617	1	0.08802	0.08802	0.05845	0.18127	0.23318	689.5617
1504.8	1400.443	0.06941	0.1947	0.195	0.22791	611.4942	1	0.08813	0.08813	0.06941	0.1947	0.22791	611.4942
1504.9	1400.531	0.0829	0.21411	0.214	0.2184	519.6931	1	0.08814	0.08814	0.0829	0.21411	0.2184	519.6931
1505	1400.619	0.09458	0.24239	0.242	0.20352	433.1966	1	0.08801	0.08801	0.09458	0.24239	0.20352	433.1966
1505.1	1400.707	0.09939	0.27964	0.28	0.185	370.9791	1	0.08826	0.08826	0.09939	0.27964	0.185	370.9791
1505.2	1400.795	0.09766	0.31304	0.313	0.16788	341.8555	1	0.08813	0.08813	0.09766	0.31304	0.16788	341.8555
1505.3	1400.883	0.0959	0.33642	0.336	0.15112	326.9503	1	0.08801	0.08801	0.0959	0.33642	0.15112	326.9503
1505.4	1400.972	0.09344	0.34532	0.345	0.13756	326.4669	1	0.08814	0.08814	0.09344	0.34532	0.13756	326.4669
1505.5	1401.06	0.0873	0.33919	0.339	0.13095	347.0482	1	0.08801	0.08801	0.0873	0.33919	0.13095	347.0482
1505.6	1401.148	0.08137	0.32341	0.323	0.132	375.7372	1	0.08826	0.08826	0.08137	0.32341	0.132	375.7372
1505.7	1401.236	0.08077	0.31474	0.315	0.13623	384.3023	1	0.08813	0.08813	0.08077	0.31474	0.13623	384.3023
1505.8	1401.324	0.08559	0.31971	0.32	0.14228	366.4049	1	0.08801	0.08801	0.08559	0.31971	0.14228	366.4049
1505.9	1401.412	0.09562	0.33932	0.339	0.14854	325.4825	1	0.08814	0.08814	0.09562	0.33932	0.14854	325.4825
1506	1401.5	0.10853	0.36146	0.361	0.15542	281.5699	1	0.08801	0.08801	0.10853	0.36146	0.15542	281.5699
1506.1	1401.588	0.11809	0.3725	0.373	0.16309	256.5767	1	0.08826	0.08826	0.11809	0.3725	0.16309	256.5767
1506.2	1401.676	0.12154	0.35718	0.357	0.17249	260.8152	1	0.08801	0.08801	0.12154	0.35718	0.17249	260.8152
1506.3	1401.765	0.11681	0.31266	0.313	0.18303	303.7025	1	0.08814	0.08814	0.11681	0.31266	0.18303	303.7025
1506.4	1401.853	0.10207	0.25452	0.255	0.19463	394.5853	1	0.08801	0.08801	0.10207	0.25452	0.19463	394.5853
1506.5	1401.941	0.08156	0.19788	0.198	0.20622	530.858	1	0.08813	0.08813	0.08156	0.19788	0.20622	530.858
1506.6	1402.029	0.06513	0.15362	0.154	0.21565	674.8612	1	0.08814	0.08814	0.06513	0.15362	0.21565	674.8612
1506.7	1402.117	0.05805	0.124	0.124	0.22185	772.1608	1	0.08813	0.08813	0.05805	0.124	0.22185	772.1608
1506.8	1402.205	0.05679	0.10775	0.108	0.22598	824.2333	1	0.08802	0.08802	0.05679	0.10775	0.22598	824.2333
1506.9	1402.293	0.05671	0.09986	0.1	0.22886	851.4609	1	0.08813	0.08813	0.05671	0.09986	0.22886	851.4609
1507	1402.381	0.05653	0.09671	0.097	0.23007	863.6543	1	0.08801	0.08801	0.05653	0.09671	0.23007	863.6543
1507.1	1402.469	0.05508	0.09685	0.097	0.2292	867.0502	1	0.08826	0.08826	0.05508	0.09685	0.2292	867.0502
1507.2	1402.557	0.05228	0.09867	0.099	0.2273	869.6343	1	0.08801	0.08801	0.05228	0.09867	0.2273	869.6343
1507.3	1402.646	0.05057	0.10209	0.102	0.2234	859.6649	1	0.08814	0.08814	0.05057	0.10209	0.2234	859.6649

1507.4	1402.734	0.05231	0.10685	0.107	0.21845	830.7257	1	0.08801	0.05231	0.10685	0.21845	830.7257
1507.5	1402.822	0.05615	0.1123	0.112	0.21307	792.8048	1	0.08814	0.05615	0.1123	0.21307	792.8048
1507.6	1402.91	0.06007	0.11836	0.118	0.20981	758.4234	1	0.08813	0.06007	0.11836	0.20981	758.4234
1507.7	1402.998	0.06048	0.12639	0.126	0.208	736.6769	1	0.08801	0.06048	0.12639	0.208	736.6769
1507.8	1403.086	0.05717	0.13428	0.134	0.20954	734.8576	1	0.08814	0.05717	0.13428	0.20954	734.8576
1507.9	1403.174	0.04948	0.14195	0.142	0.21552	760.495	1	0.08801	0.04948	0.14195	0.21552	760.495
1508	1403.262	0.03892	0.15169	0.152	0.2257	812.2009	1	0.08801	0.03892	0.15169	0.2257	812.2009
1508.1	1403.35	0.02755	0.16496	0.165	0.23688	885.1497	1	0.08826	0.02755	0.16496	0.23688	885.1497
1508.2	1403.438	0.01822	0.17959	0.18	0.24713	968.731	1	0.08801	0.01822	0.17959	0.24713	968.731
1508.3	1403.526	0.01383	0.19479	0.195	0.25707	1048.563	1	0.08802	0.01383	0.19479	0.25707	1048.563
1508.4	1403.614	0.0147	0.20757	0.208	0.26718	1138.582	1	0.08813	0.0147	0.20757	0.26718	1138.582
1508.5	1403.702	0.01967	0.2154	0.215	0.27652	1255.253	1	0.08801	0.01967	0.2154	0.27652	1255.253
1508.6	1403.791	0.02449	0.21417	0.214	0.28447	1425.77	1	0.08814	0.02449	0.21417	0.28447	1425.77
1508.7	1403.879	0.02523	0.20617	0.206	0.29036	1632.035	1	0.08813	0.02523	0.20617	0.29036	1632.035
1508.8	1403.967	0.02154	0.19865	0.199	0.29014	1657.912	1	0.08801	0.02154	0.19865	0.29014	1657.912
1508.9	1404.055	0.02122	0.19458	0.195	0.28326	1439.647	1	0.08802	0.02122	0.19458	0.28326	1439.647
1509	1404.143	0.02855	0.19748	0.197	0.27167	1132.201	1	0.08813	0.02855	0.19748	0.27167	1132.201
1509.1	1404.231	0.04126	0.2077	0.208	0.25865	877.4741	1	0.08814	0.04126	0.2077	0.25865	877.4741
1509.2	1404.319	0.05316	0.22237	0.222	0.24632	709.006	1	0.08801	0.05316	0.22237	0.24632	709.006
1509.3	1404.407	0.06448	0.23694	0.237	0.23605	597.5529	1	0.08801	0.06448	0.23694	0.23605	597.5529
1509.4	1404.495	0.07186	0.24568	0.246	0.22834	537.4786	1	0.08802	0.07186	0.24568	0.22834	537.4786
1509.5	1404.583	0.07167	0.24427	0.244	0.22296	526.9196	1	0.08813	0.07167	0.24427	0.22296	526.9196
1509.6	1404.671	0.06739	0.23438	0.234	0.2178	544.3058	1	0.08813	0.06739	0.23438	0.2178	544.3058
1509.7	1404.759	0.06787	0.22055	0.221	0.21426	554.575	1	0.08802	0.06787	0.22055	0.21426	554.575
1509.8	1404.847	0.07215	0.21469	0.215	0.21089	542.7966	1	0.08801	0.07215	0.21469	0.21089	542.7966
1509.9	1404.935	0.07358	0.21801	0.218	0.21036	532.8102	1	0.08801	0.07358	0.21801	0.21036	532.8102
1510	1405.023	0.07522	0.22951	0.23	0.21045	512.6863	1	0.08814	0.07522	0.22951	0.21045	512.6863
1510.1	1405.112	0.08057	0.24556	0.246	0.21185	478.1682	1	0.08813	0.08057	0.24556	0.21185	478.1682
1510.2	1405.2	0.08461	0.26286	0.263	0.08461	449.1758	1	0.08801	0.08461	0.26286	0.08461	449.1758
1510.3	1405.288	0.08283	0.26392	0.264	0.21725	459.1523	1	0.08802	0.08283	0.26392	0.21725	459.1523
1510.4	1405.376	0.08008	0.24878	0.249	0.2209	490.1074	1	0.08801	0.08008	0.24878	0.2209	490.1074
1510.5	1405.464	0.07657	0.22632	0.226	0.22338	532.8948	1	0.08801	0.07657	0.22632	0.22338	532.8948
1510.6	1405.552	0.06976	0.20133	0.201	0.22442	592.2122	1	0.08814	0.06976	0.20133	0.22442	592.2122
1510.7	1405.64	0.05928	0.17321	0.173	0.22533	678.2989	1	0.08813	0.05928	0.17321	0.22533	678.2989
1510.8	1405.728	0.0484	0.1495	0.15	0.22579	769.6929	1	0.08802	0.0484	0.1495	0.22579	769.6929
1510.9	1405.816	0.0372	0.13392	0.134	0.22613	858.1144	1	0.08801	0.0372	0.13392	0.22613	858.1144
1511	1405.904	0.02664	0.12386	0.124	0.22697	942.5848	1	0.08801	0.02664	0.12386	0.22697	942.5848
1511.1	1405.992	0.01886	0.11864	0.119	0.22809	1008.369	1	0.08814	0.01886	0.11864	0.22809	1008.369
1511.2	1406.08	0.01638	0.12024	0.12	0.22905	1023.263	1	0.08801	0.01638	0.12024	0.22905	1023.263
1511.3	1406.168	0.01701	0.12808	0.128	0.22981	1003.4	1	0.08801	0.01701	0.12808	0.22981	1003.4
1511.4	1406.256	0.01734	0.13893	0.139	0.22981	978.1564	1	0.08801	0.01734	0.13893	0.22981	978.1564
1511.5	1406.344	0.01581	0.14975	0.15	0.23086	970.1491	1	0.08802	0.01581	0.14975	0.23086	970.1491
1511.6	1406.432	0.01256	0.16002	0.16	0.23257	979.3198	1	0.08813	0.01256	0.16002	0.23257	979.3198
1511.7	1406.52	0.00865	0.16768	0.168	0.23654	1008.458	1	0.08801	0.00865	0.16768	0.23654	1008.458
1511.8	1406.608	0.00464	0.17489	0.175	0.24004	1041.749	1	0.08802	0.00464	0.17489	0.24004	1041.749
1511.9	1406.696	0.00206	0.18108	0.181	0.24427	1072.804	1	0.08801	0.00206	0.18108	0.24427	1072.804
1512	1406.784	0.00198	0.18841	0.188	0.24706	1077.126	1	0.08801	0.00198	0.18841	0.24706	1077.126
1512.1	1406.872	0.00312	0.19908	0.199	0.24734	1053.104	1	0.08814	0.00312	0.19908	0.24734	1053.104
1512.2	1406.96	0.00505	0.21495	0.215	0.24389	996.0338	1	0.08801	0.00505	0.21495	0.24389	996.0338
1512.3	1407.048	0.0091	0.23502	0.235	0.23767	910.8903	1	0.08801	0.0091	0.23502	0.23767	910.8903
1512.4	1407.136	0.01728	0.25974	0.26	0.23011	798.5187	1	0.08801	0.01728	0.25974	0.23011	798.5187
1512.5	1407.224	0.02852	0.28807	0.288	0.22293	681.4379	1	0.08802	0.02852	0.28807	0.22293	681.4379
1512.6	1407.313	0.04246	0.31792	0.318	0.21613	568.2021	1	0.08813	0.04246	0.31792	0.21613	568.2021
1512.7	1407.401	0.0547	0.3417	0.342	0.21136	487.8319	1	0.08801	0.0547	0.3417	0.21136	487.8319
1512.8	1407.489	0.05976	0.35296	0.353	0.21046	458.3806	1	0.0879	0.05976	0.35296	0.21046	458.3806

TOP C2-GWC													
1512.9	1407.577	0.05636	0.35189	0.352	0.21295	476.2078	1	0.08801	0.08801	0.05636	0.35189	0.21295	476.2078
1513	1407.666	0.04778	0.3435	0.344	0.21605	524.1492	1	0.08801	0.08801	0.04778	0.3435	0.21605	524.1492
1513.1	1407.753	0.03726	0.33076	0.331	0.22005	592.2812	1	0.08814	0.08814	0.03726	0.33076	0.22005	592.2812
1513.2	1407.841	0.02619	0.32392	0.324	0.22461	669.9879	1	0.08801	0.08801	0.02619	0.32392	0.22461	669.9879
1513.3	1407.929	0.01747	0.3279	0.328	0.2296	736.2377	1	0.08801	0.08801	0.01747	0.3279	0.2296	736.2377
1513.4	1408.017	0.01269	0.34536	0.345	0.23381	770.8821	1	0.08801	0.08801	0.01269	0.34536	0.23381	770.8821
1513.5	1408.105	0.0109	0.37715	0.377	0.23868	784.8098	1	0.08789	0.08789	0.0109	0.37715	0.23868	784.8098
1513.6	1408.193	0.01012	0.4208	0.421	0.24451	794.6229	1	0.08814	0.08814	0.01012	0.4208	0.24451	794.6229
1513.7	1408.281	0.0107	0.46569	0.466	0.25172	817.5469	1	0.08801	0.08801	0.0107	0.46569	0.25172	817.5469
1513.8	1408.369	0.01269	0.50719	0.507	0.25845	846.5165	1	0.08801	0.08801	0.01269	0.50719	0.25845	846.5165
1513.9	1408.457	0.0138	0.53624	0.536	0.26696	930.2486	1	0.08802	0.08802	0.0138	0.53624	0.26696	930.2486
1514	1408.545	0.01167	0.5742	0.574	0.2642	901.9263	1	0.08789	0.08789	0.01167	0.5742	0.2642	901.9263
1514.1	1408.633	0.00591	0.59295	0.593	0.2656	960.7448	1	0.08813	0.08813	0.00591	0.59295	0.2656	960.7448
1514.2	1408.721	0	0.61138	0.611	0.2671	1027.076	1	0.08802	0.08802	0	0.61138	0.2671	1027.076
1514.3	1408.809	0	0.63914	0.639	0.2671	1023.259	1	0.08801	0.08801	0	0.63914	0.2671	1023.259
1514.4	1408.897	0	0.67071	0.671	0.2671	1019.578	1	0.08801	0.08801	0	0.67071	0.2671	1019.578
			0	0	12.7738	0.059297	0	12.7738	12.7738	0.059297	0.2639197	0.220909	709.4187
1514.5	1408.985	0	0.70517	0.705	0.2671	1016.233	1	0.08801	0.08801	0	0.70517	0.2671	1016.233
1514.6	1409.073	0.00391	0.72444	0.724	0.27393	936.2543	1	0.08802	0.08802	0.00391	0.72444	0.27393	936.2543
1514.7	1409.161	0.0142	0.75977	0.76	0.27431	906.983	1	0.08801	0.08801	0.0142	0.75977	0.27431	906.983
1514.8	1409.249	0.02489	0.79125	0.791	0.27349	849.3726	1	0.08801	0.08801	0.02489	0.79125	0.27349	849.3726
1514.9	1409.337	0.03284	0.81849	0.818	0.272	787.861	1	0.08801	0.08801	0.03284	0.81849	0.272	787.861
1515	1409.425	0.03711	0.84006	0.84	0.27096	751.1024	1	0.08789	0.08789	0.03711	0.84006	0.27096	751.1024
1515.1	1409.513	0.03815	0.85266	0.853	0.27012	729.0182	1	0.08814	0.08814	0.03815	0.85266	0.27012	729.0182
1515.2	1409.601	0.03361	0.85175	0.852	0.27077	756.3855	1	0.08801	0.08801	0.03361	0.85175	0.27077	756.3855
1515.3	1409.689	0.02423	0.84647	0.846	0.2719	811.1859	1	0.08801	0.08801	0.02423	0.84647	0.2719	811.1859
1515.4	1409.777	0.01443	0.84425	0.844	0.27256	860.598	1	0.0879	0.0879	0.01443	0.84425	0.27256	860.598
1515.5	1409.865	0.0056	0.8474	0.847	0.27229	887.2782	1	0.08801	0.08801	0.0056	0.8474	0.27229	887.2782
1515.6	1409.953	0	0.85681	0.857	0.27114	882.6632	1	0.08813	0.08813	0	0.85681	0.27114	882.6632
1515.7	1410.041	0	0.87321	0.873	0.26837	820.9882	1	0.08802	0.08802	0	0.87321	0.26837	820.9882
1515.8	1410.129	0	0.88161	0.882	0.26663	785.9045	1	0.08801	0.08801	0	0.88161	0.26663	785.9045
1515.9	1410.217	0	0.88415	0.884	0.26541	762.6716	1	0.08789	0.08789	0	0.88415	0.26541	762.6716
1516	1410.305	0	0.8796	0.88	0.2658	769.9487	1	0.08801	0.08801	0	0.8796	0.2658	769.9487
1516.1	1410.393	0	0.87225	0.872	0.26666	786.4161	1	0.08814	0.08814	0	0.87225	0.26666	786.4161
1516.2	1410.481	0	0.86416	0.864	0.26736	800.1716	1	0.08801	0.08801	0	0.86416	0.26736	800.1716
1516.3	1410.569	0	0.85942	0.859	0.26767	806.3901	1	0.08801	0.08801	0	0.85942	0.26767	806.3901
1516.4	1410.657	0	0.85937	0.859	0.2675	803.1282	1	0.08801	0.08801	0	0.85937	0.2675	803.1282
1516.5	1410.745	0.00232	0.8589	0.859	0.26748	792.8451	1	0.0879	0.0879	0.00232	0.8589	0.26748	792.8451
1516.6	1410.833	0.01033	0.86061	0.861	0.26665	744.6348	1	0.08813	0.08813	0.01033	0.86061	0.26665	744.6348
1516.7	1410.921	0.01758	0.86037	0.86	0.26614	708.8259	1	0.08801	0.08801	0.01758	0.86037	0.26614	708.8259
1516.8	1411.009	0.02217	0.86287	0.863	0.26419	657.7864	1	0.08802	0.08802	0.02217	0.86287	0.26419	657.7864
1517	1411.195	0.04153	0.8645	0.865	0.25215	438.4592	1	0.08801	0.08801	0.04153	0.8645	0.25215	438.4592
1517.1	1411.273	0.06892	0.86157	0.862	0.24119	289.5605	1	0.08801	0.08801	0.06892	0.86157	0.24119	289.5605
1517.2	1411.361	0.11593	0.86265	0.863	0.22706	158.1609	1	0.08802	0.08802	0.11593	0.86265	0.22706	158.1609
1517.3	1411.449	0.1945	0.87097	0.871	0.21191	74.21542	1	0.08801	0.08801	0.1945	0.87097	0.21191	74.21542
1517.4	1411.537	0.25943	0.8722	0.872	0.19962	36.95426	1	0.08801	0.08801	0.25943	0.8722	0.19962	36.95426
1517.5	1411.625	0.30956	0.80168	0.802	0.19442	26.07106	1	0.08801	0.08801	0.30956	0.80168	0.19442	26.07106
1517.6	1411.713	0.30249	0.77928	0.779	0.19869	30.6445	1	0.08814	0.08814	0.30249	0.77928	0.19869	30.6445
1517.7	1411.801	0.23922	0.79226	0.792	0.21079	55.81688	1	0.08789	0.08789	0.23922	0.79226	0.21079	55.81688
1517.8	1411.889	0.15717	0.77303	0.773	0.22367	115.3678	1	0.08801	0.08801	0.15717	0.77303	0.22367	115.3678
1517.9	1411.977	0.09018	0.78995	0.79	0.23094	202.9728	1	0.08801	0.08801	0.09018	0.78995	0.23094	202.9728
1518	1412.065	0.04711	0.8265	0.827	0.2318	285.1562	1	0.08802	0.08802	0.04711	0.8265	0.2318	285.1562

1518.1	1412.153	0.02241	0.85897	0.859	0.23011	346.8046	1	0.08813	0.08813	0.02241	0.85897	0.23011	346.8046
1518.2	1412.241	0.01014	0.88091	0.881	0.22891	385.0635	1	0.08802	0.08802	0.01014	0.88091	0.22891	385.0635
1518.3	1412.329	0.0038	0.89074	0.891	0.2293	411.5083	1	0.08801	0.08801	0.0038	0.89074	0.2293	411.5083
1518.4	1412.417	0	0.89157	0.892	0.23098	434.0993	1	0.08801	0.08801	0	0.89157	0.23098	434.0993
1518.5	1412.505	0	0.88588	0.886	0.23271	441.5121	1	0.08801	0.08801	0	0.88588	0.23271	441.5121
1518.6	1412.594	0	0.87238	0.872	0.23449	449.732	1	0.08802	0.08802	0	0.87238	0.23449	449.732
1518.7	1412.682	0	0.85862	0.859	0.23595	456.9668	1	0.08801	0.08801	0	0.85862	0.23595	456.9668
1518.8	1412.77	0.00159	0.85178	0.852	0.23638	452.4251	1	0.08801	0.08801	0.00159	0.85178	0.23638	452.4251
1518.9	1412.858	0.00618	0.85578	0.856	0.2358	430.6763	1	0.08801	0.08801	0.00618	0.85578	0.2358	430.6763
1519	1412.946	0.00843	0.86746	0.867	0.23586	422.2006	1	0.08802	0.08802	0.00843	0.86746	0.23586	422.2006
1519.1	1413.034	0.00757	0.88564	0.886	0.23702	431.5748	1	0.08813	0.08813	0.00757	0.88564	0.23702	431.5748
1519.2	1413.122	0.00518	0.90034	0.9	0.23998	457.9551	1	0.08801	0.08801	0.00518	0.90034	0.23998	457.9551
1519.3	1413.21	0.00016	0.90657	0.907	0.24559	517.5153	1	0.08802	0.08802	0.00016	0.90657	0.24559	517.5153
1519.4	1413.298	0	0.91064	0.911	0.25202	575.8651	1	0.08801	0.08801	0	0.91064	0.25202	575.8651
1519.5	1413.386	0	0.89952	0.9	0.25886	657.8214	1	0.08801	0.08801	0	0.89952	0.25886	657.8214
1519.6	1413.474	0	0.8747	0.875	0.2643	742.7308	1	0.08814	0.08814	0	0.8747	0.2643	742.7308
1519.7	1413.562	0	0.84858	0.849	0.26637	780.7252	1	0.08801	0.08801	0	0.84858	0.26637	780.7252
1519.8	1413.65	0.0168	0.82599	0.826	0.26054	616.9983	1	0.08789	0.08789	0.0168	0.82599	0.26054	616.9983
1519.9	1413.738	0.05715	0.81335	0.813	0.24595	346.2864	1	0.08801	0.08801	0.05715	0.81335	0.24595	346.2864
1520	1413.826	0.11015	0.82067	0.821	0.22727	164.8484	1	0.08802	0.08802	0.11015	0.82067	0.22727	164.8484
1520.1	1413.914	0.16748	0.84337	0.843	0.20898	77.16251	1	0.08813	0.08813	0.16748	0.84337	0.20898	77.16251
1520.2	1414.002	0.23173	0.88026	0.88	0.19219	35.61915	1	0.08801	0.08801	0.23173	0.88026	0.19219	35.61915
1520.3	1414.09	0.30361	0.93205	0.932	0.17726	16.44219	1	0.08802	0.08802	0.30361	0.93205	0.17726	16.44219
1520.4	1414.178	0.38276	0.99078	0.991	0.16292	7.58442	1	0.08801	0.08801	0.38276	0.99078	0.16292	7.58442
1520.5	1414.266	0.46703	1.07001	1	0.14849	3.54177	1	0.08801	0.08801	0.46703	1	0.14849	3.54177
1520.6	1414.354	0.55331	1.19942	1	0.13306	1.64916	0	0.08814	0	0.55331	0	0.13306	1.64916
1520.7	1414.442	0.60137	1.30082	1	0.12612	1.15908	0	0.08801	0	0.60137	0	0.12612	1.15908
1520.8	1414.53	0.56444	1.24567	1	0.13652	1.82589	0	0.08801	0	0.56444	0	0.13652	1.82589
1520.9	1414.618	0.46602	1.09873	1	0.16198	5.6452	1	0.08801	0.08801	0.46602	1	0.16198	5.6452
1521	1414.706	0.35843	0.98743	0.987	0.18928	19.08579	1	0.08802	0.08802	0.35843	0.98743	0.18928	19.08579
1521.1	1414.794	0.271	0.91964	0.92	0.21201	52.51321	1	0.08813	0.08813	0.271	0.91964	0.21201	52.51321
1521.2	1414.882	0.20974	0.89777	0.898	0.22624	100.9465	1	0.08801	0.08801	0.20974	0.89777	0.22624	100.9465
1521.3	1414.97	0.17444	0.90552	0.906	0.23295	140.551	1	0.08802	0.08802	0.17444	0.90552	0.23295	140.551
1521.4	1415.058	0.15587	0.9272	0.927	0.23531	161.5625	1	0.08801	0.08801	0.15587	0.9272	0.23531	161.5625
1521.5	1415.146	0.14283	0.94702	0.947	0.23829	185.8865	1	0.08801	0.08801	0.14283	0.94702	0.23829	185.8865
1521.6	1415.235	0.13139	0.95247	0.952	0.24097	210.6457	1	0.08814	0.08814	0.13139	0.95247	0.24097	210.6457
1521.7	1415.323	0.13083	0.93627	0.936	0.24107	211.7109	1	0.08801	0.08801	0.13083	0.93627	0.24107	211.7109
1521.8	1415.411	0.15695	0.94201	0.942	0.23181	144.7918	1	0.08801	0.08801	0.15695	0.94201	0.23181	144.7918
1521.9	1415.499	0.22059	0.9874	0.987	0.2108	60.19743	1	0.08802	0.08802	0.22059	0.9874	0.2108	60.19743
1522	1415.587	0.31378	1.0788	1	0.17994	16.69367	1	0.08801	0.08801	0.31378	1	0.17994	16.69367
1522.1	1415.675	0.41816	1.2279	0	0.14715	4.18208	0	6.6897	6.42554	0.091232	0.8707285	0.239197	447.5518
1522.2	1415.763	0.50221	1.42423	1	0.12026	1.35803	0	0.08813	0.08813	0.41816	1	0.14715	4.18208
1522.3	1415.851	0.54734	1.53577	1	0.1071	0.76682	0	0.08802	0	0.50221	0	0.14715	4.18208
1522.4	1415.939	0.56247	1.53923	1	0.10389	0.65228	0	0.08801	0	0.08801	0	0.14715	4.18208
1522.5	1416.027	0.57808	1.53479	1	0.10288	0.58665	0	0.08801	0	0.08801	0	0.14715	4.18208
1522.6	1416.115	0.59974	1.56237	1	0.10136	0.50935	0	0.08814	0	0.08814	0	0.14715	4.18208
1522.7	1416.203	0.61055	1.54594	1	0.10342	0.51915	0	0.08801	0	0.08801	0	0.14715	4.18208
1522.8	1416.291	0.59115	1.44627	1	0.11186	0.72456	0	0.08801	0	0.08801	0	0.14715	4.18208
1522.9	1416.379	0.53867	1.29222	1	0.12714	1.40785	0	0.08814	0	0.08814	0	0.14715	4.18208
1523	1416.467	0.48502	1.16197	1	0.14371	2.86251	1	0.08801	0.08801	0.48502	1	0.14371	2.86251
1523.1	1416.555	0.45566	1.08197	1	0.15614	4.71845	1	0.08814	0.08814	0.45566	1	0.15614	4.71845
1523.2	1416.643	0.47483	1.08395	1	0.15653	4.55233	1	0.08801	0.08801	0.45566	1	0.15614	4.71845
1523.3	1416.731	0.54064	1.14595	1	0.1451	2.62484	0	0.08801	0	0.47483	1	0.15653	4.55233
1523.4	1416.819	0.6345	1.263	1	0.12614	1.10224	0	0.08801	0	0.08801	0	0.15653	4.55233

1523.5	1416.907	0.72375	1.42465	1	0.10695	0.46612	0	0.08802	0	0.08802	0	1	0.10334	0.46385	1	0.10334	1.11262
1523.6	1416.995	0.77192	1.55298	1	0.09407	0.2653	0	0.08813	0	0.08813	0	1	0.09687	0.44341	1	0.09687	1.51976
1523.7	1417.083	0.76938	1.5308	1	0.09202	0.24498	0	0.08801	0	0.08801	0	1	0.0961	0.4096	1	0.0961	2.17387
1523.8	1417.171	0.75093	1.45336	1	0.09563	0.2885	0	0.08802	0	0.08802	0	1	0.10063	0.39415	1	0.10063	2.64382
1523.9	1417.259	0.74682	1.4245	1	0.09821	0.32103	0	0.08801	0	0.08801	0	1	0.1101	0.39193	1	0.1101	2.87622
1524	1417.347	0.7635	1.46378	1	0.09674	0.29772	0	0.08814	0	0.08814	0	1	0.1219	0.40136	1	0.1219	2.93907
1524.1	1417.436	0.80506	1.56625	1	0.09163	0.23386	0	0.08801	0	0.08801	0	1	0.13205	0.42453	1	0.13205	2.85936
1524.2	1417.524	0.85122	1.67318	1	0.08673	0.18576	0	0.08814	0	0.08814	0	1	0.13903	0.45333	1	0.13903	2.8329
1524.3	1417.612	0.86371	1.6905	1	0.0861	0.17993	0	0.08801	0	0.08801	0	1	0.14555	0.46687	1	0.14555	3.22964
1524.4	1417.7	0.82202	1.57157	1	0.10105	0.35982	0	0.08802	0	0.08802	0	1	0.14878	0.47696	1	0.14878	3.46695
1524.5	1417.788	0.74669	1.38117	1	0.11152	0.60407	0	0.08813	0	0.08813	0	1	0.1478	0.43335	0		
1524.6	1417.876	0.66118	1.20721	1	0.11152	0.60407	0	0.08813	0	0.08813	0	1	0.1478	0.43335	0		
1524.7	1417.964	0.58716	1.11715	1	0.1118	0.94852	0	0.08801	0	0.08801	0	1	0.1478	0.43335	0		
1524.8	1418.052	0.52966	1.09223	1	0.10334	1.11262	1	0.08801	0.08801	0.08801	0	1	0.1478	0.43335	0		
1524.9	1418.14	0.48385	1.13464	1	0.09687	1.51976	1	0.08802	0.08802	0.08802	0	1	0.1478	0.43335	0		
1525	1418.228	0.44341	1.18803	1	0.0961	2.17387	1	0.08813	0.08813	0.08813	0	1	0.1478	0.43335	0		
1525.1	1418.316	0.4096	1.19597	1	0.10063	2.64382	1	0.08801	0.08801	0.08801	0	1	0.1478	0.43335	0		
1525.2	1418.404	0.39415	1.17046	1	0.1101	2.87622	1	0.08802	0.08802	0.08802	0	1	0.1478	0.43335	0		
1525.3	1418.492	0.39193	1.12837	1	0.1219	2.93907	1	0.08801	0.08801	0.08801	0	1	0.1478	0.43335	0		
1525.4	1418.58	0.40136	1.0878	1	0.1219	2.93907	1	0.08801	0.08801	0.08801	0	1	0.1478	0.43335	0		
1525.5	1418.668	0.42453	1.06876	1	0.13205	2.85936	1	0.08801	0.08801	0.08801	0	1	0.1478	0.43335	0		
1525.6	1418.756	0.45333	1.04629	1	0.13903	2.8329	1	0.08814	0.08814	0.08814	0	1	0.1478	0.43335	0		
1525.7	1418.844	0.46687	1.03027	1	0.14555	3.22964	1	0.08801	0.08801	0.08801	0	1	0.1478	0.43335	0		
1525.8	1418.932	0.47696	1.02062	1	0.14878	3.46695	1	0.08813	0.08813	0.08813	0	1	0.1478	0.43335	0		
1525.9	1419.02	0.50229	1.02993	1	0.1478	3.46695	1	0.08802	0	0.08802	0	1	0.1478	0.43335	0		
1526	1419.108	0.54075	1.05691	1	0.14367	2.48767	0	0.08801	0	0.08801	0	1	0.1478	0.43335	0		
1526.1	1419.197	0.58123	1.08781	1	0.13797	1.87611	0	0.08813	0	0.08813	0	1	0.1478	0.43335	0		
1526.2	1419.285	0.62853	1.13865	1	0.12942	1.26288	0	0.08802	0	0.08802	0	1	0.1478	0.43335	0		
1526.3	1419.373	0.67924	1.22741	1	0.11797	0.75798	0	0.08801	0	0.08801	0	1	0.1478	0.43335	0		
1526.4	1419.461	0.69716	1.28861	1	0.11219	0.59062	0	0.08801	0	0.08801	0	1	0.1478	0.43335	0		
1526.5	1419.549	0.68431	1.26082	1	0.1113	0.5789	0	0.08814	0	0.08814	0	1	0.1478	0.43335	0		
1526.6	1419.637	0.68798	1.30867	1	0.1074	0.49517	0	0.08801	0	0.08801	0	1	0.1478	0.43335	0		
1526.7	1419.725	0.73326	1.47523	1	0.09731	0.31471	0	0.08801	0	0.08801	0	1	0.1478	0.43335	0		
1526.8	1419.813	0.79978	1.66778	1	0.08831	0.20503	0	0.08801	0	0.08801	0	1	0.1478	0.43335	0		
1526.9	1419.901	0.87522	1.85288	1	0.08112	0.14524	0	0.08814	0	0.08814	0	1	0.1478	0.43335	0		
1527	1419.989	0.92107	1.9119	1	0.07919	0.13162	0	0.08801	0	0.08801	0	1	0.1478	0.43335	0		
1527.1	1420.077	0.88845	1.91556	1	0.07833	0.12845	0	0.08814	0	0.08814	0	1	0.1478	0.43335	0		
1527.2	1420.165	0.777	1.74562	1	0.08388	0.17604	0	0.08801	0	0.08801	0	1	0.1478	0.43335	0		
1527.3	1420.253	0.64751	1.46233	1	0.09677	0.37034	0	0.08801	0	0.08801	0	1	0.1478	0.43335	0		
1527.4	1420.341	0.54083	1.20077	1	0.11393	0.94514	0	0.08801	0	0.08801	0	1	0.1478	0.43335	0		
1527.5	1420.429	0.47709	1.09636	1	0.12272	1.66574	1	0.08802	0.08802	0.08802	0	1	0.12272	1.66574	1	0.12272	1.66574
1527.6	1420.517	0.45718	1.09915	1	0.12295	1.90662	1	0.08813	0.08813	0.08813	0	1	0.12295	1.90662	1	0.12295	1.90662
1527.7	1420.605	0.47369	1.16823	1	0.11724	1.52029	1	0.08801	0.08801	0.08801	0	1	0.11724	1.52029	1	0.11724	1.52029
1527.8	1420.693	0.50698	1.24656	1	0.11171	1.08511	0	0.08802	0	0.08802	0	1	0.11724	1.52029	1	0.11724	1.52029
1527.9	1420.781	0.556	1.36761	1	0.10397	0.67698	0	0.08801	0	0.08801	0	1	0.11724	1.52029	1	0.11724	1.52029
1528	1420.869	0.61317	1.45294	1	0.10035	0.46807	0	0.08801	0	0.08801	0	1	0.11724	1.52029	1	0.11724	1.52029
1528.1	1420.957	0.66275	1.46756	1	0.09787	0.36747	0	0.08801	0	0.08801	0	1	0.11724	1.52029	1	0.11724	1.52029
1528.2	1421.046	0.68577	1.51513	1	0.09452	0.30857	0	0.08814	0	0.08814	0	1	0.11724	1.52029	1	0.11724	1.52029
1528.3	1421.134	0.69752	1.61068	1	0.08873	0.24479	0	0.08801	0	0.08801	0	1	0.11724	1.52029	1	0.11724	1.52029
1528.4	1421.222	0.69923	1.67108	1	0.08483	0.2133	0	0.08801	0	0.08801	0	1	0.11724	1.52029	1	0.11724	1.52029
1528.5	1421.31	0.67662	1.61443	1	0.08665	0.24301	0	0.08801	0	0.08801	0	1	0.11724	1.52029	1	0.11724	1.52029
1528.6	1421.398	0.6491	1.49751	1	0.09215	0.31815	0	0.08814	0	0.08814	0	1	0.11724	1.52029	1	0.11724	1.52029
1528.7	1421.486	0.63962	1.41155	1	0.09653	0.3773	0	0.08801	0	0.08801	0	1	0.11724	1.52029	1	0.11724	1.52029
1528.8	1421.574	0.6598	1.40887	1	0.09588	0.34634	0	0.08801	0	0.08801	0	1	0.11724	1.52029	1	0.11724	1.52029
1528.9	1421.662	0.66837	1.43517	1	0.09379	0.29889	0	0.08801	0	0.08801	0	1	0.11724	1.52029	1	0.11724	1.52029

1529	1421.75	0.71901	1.49822	1	0.08968	0.24106	0	0.08802	0	0.13757	2.74554	
1529.1	1421.838	0.73741	1.52659	1	0.08741	0.21409	0	0.08813	0	0.15406	6.64911	
1529.2	1421.926	0.75147	1.50133	1	0.08793	0.22087	0	0.08814	0	0.16724	14.6733	
1529.3	1422.014	0.68576	1.36234	1	0.09575	0.32237	0	0.08801	0	0.17458	24.49176	
1529.4	1422.102	0.6154	1.20224	1	0.10744	0.58057	0	0.08801	0	0.17574	30.26974	
1529.5	1422.19	0.53677	1.07513	1	0.12206	1.21162	0	0.08801	0	0.17204	31.38793	
1529.6	1422.278	0.45191	0.91797	0.918	0.13757	2.74554	1	0.08814	0.45191	0.17204	31.38793	
1529.7	1422.366	0.36595	0.78299	0.783	0.15406	6.64911	1	0.08801	0.78299	0.15406	6.64911	
1529.8	1422.454	0.28912	0.69495	0.695	0.16724	14.6733	1	0.08801	0.69495	0.16724	14.6733	
1529.9	1422.542	0.23976	0.65377	0.654	0.17458	24.49176	1	0.08802	0.65377	0.17458	24.49176	
1530	1422.63	0.21734	0.66109	0.661	0.17574	30.26974	1	0.08801	0.66109	0.17574	30.26974	
1530.1	1422.718	0.20908	0.72469	0.725	0.17204	31.38793	1	0.08813	0.72469	0.17204	31.38793	
1530.2	1422.806	0.2034	0.85657	0.857	0.16411	31.05416	1	0.08802	0.85657	0.16411	31.05416	
1530.3	1422.895	0.19614	1.03312	1	0.15719	32.19928	1	0.08813	0.15719	0.15719	32.19928	
1530.4	1422.983	0.17988	1.15475	1	0.16138	39.4456	1	0.08801	0.16138	0.16138	39.4456	
TOPB-TOPB1												
1530.5	1423.071	0.15366	1.11433	0	0.18015	58.94913	0	0.08802	0.15366	0.18015	58.94913	
1530.6	1423.159	0.13264	1.09114	1	0.20046	88.48772	1	0.08813	0.13264	0.20046	88.48772	
1530.7	1423.247	0.12619	1.07054	1	0.2146	115.2052	1	0.08801	0.2146	0.2146	115.2052	
1530.8	1423.335	0.12829	1.06725	1	0.21892	123.011	1	0.08802	0.21892	0.21892	123.011	
1530.9	1423.423	0.12629	1.05972	1	0.22183	132.2909	1	0.08801	0.22183	0.22183	132.2909	
1531	1423.511	0.11964	1.058	1	0.22451	146.1843	1	0.08801	0.22451	0.22451	146.1843	
1531.1	1423.599	0.11139	1.05902	1	0.22666	161.4252	1	0.08814	0.22666	0.22666	161.4252	
1531.2	1423.687	0.10146	1.06458	1	0.22728	174.6419	1	0.08801	0.22728	0.22728	174.6419	
1531.3	1423.775	0.09389	1.0757	1	0.22643	181.1634	1	0.08813	0.22643	0.22643	181.1634	
1531.4	1423.863	0.09248	1.08916	1	0.22483	177.7934	1	0.08802	0.22483	0.22483	177.7934	
1531.5	1423.951	0.09697	1.10118	1	0.22285	166.0064	1	0.08801	0.22285	0.22285	166.0064	
1531.6	1424.039	0.10671	1.11315	1	0.21981	146.2339	1	0.08813	0.21981	0.21981	146.2339	
1531.7	1424.127	0.11747	1.11743	1	0.21681	127.9238	1	0.08802	0.21681	0.21681	127.9238	
1531.8	1424.215	0.12128	1.10272	1	0.21666	123.9817	1	0.08801	0.21666	0.21666	123.9817	
1531.9	1424.303	0.11553	1.06825	1	0.21983	137.001	1	0.08801	0.21983	0.21983	137.001	
1532	1424.391	0.10935	1.02876	1	0.22422	155.6823	1	0.08802	0.22422	0.22422	155.6823	
1532.1	1424.479	0.10588	0.99792	0.998	0.22833	173.8981	1	0.08813	0.22833	0.22833	173.8981	
1532.2	1424.567	0.10235	0.97595	0.976	0.23285	195.7129	1	0.08801	0.23285	0.23285	195.7129	
1532.3	1424.656	0.09988	0.9595	0.96	0.23619	214.6921	1	0.08814	0.23619	0.23619	214.6921	
1532.4	1424.744	0.10194	0.94528	0.945	0.23686	215.7869	1	0.08801	0.23686	0.23686	215.7869	
1532.5	1424.832	0.10078	0.92738	0.927	0.23756	220.9404	1	0.08801	0.23756	0.23756	220.9404	
1532.6	1424.92	0.09158	0.89951	0.9	0.241	253.0024	1	0.08814	0.09158	0.241	253.0024	
1532.7	1425.008	0.08419	0.86821	0.868	0.24586	297.8509	1	0.08801	0.24586	0.24586	297.8509	
1532.8	1425.096	0.08369	0.84039	0.84	0.25143	348.2371	1	0.08801	0.84039	0.25143	348.2371	
1532.9	1425.184	0.08754	0.81701	0.817	0.25801	418.9779	1	0.08802	0.81701	0.25801	418.9779	
1533	1425.272	0.09684	0.80581	0.806	0.26218	467.6055	1	0.08801	0.9684	0.80581	467.6055	
1533.1	1425.36	0.11709	0.81145	0.811	0.26555	419.847	1	0.08813	0.11709	0.26555	419.847	
1533.2	1425.448	0.14549	0.83065	0.831	0.25267	297.156	1	0.08802	0.83065	0.25267	297.156	
1533.3	1425.536	0.17205	0.85438	0.854	0.24251	194.8746	1	0.08813	0.17205	0.85438	194.8746	
1533.4	1425.624	0.19437	0.88076	0.881	0.23287	131.8457	1	0.08801	0.19437	0.88076	131.8457	
1533.5	1425.712	0.2137	0.90786	0.908	0.22529	96.67341	1	0.08802	0.2137	0.90786	96.67341	
1533.6	1425.8	0.22547	0.9276	0.928	0.22162	82.6132	1	0.08813	0.22547	0.9276	82.6132	
1533.7	1425.888	0.2245	0.93693	0.937	0.22202	83.97934	1	0.08801	0.2245	0.93693	83.97934	
1533.8	1425.976	0.21816	0.94233	0.942	0.21816	90.07651	1	0.08802	0.21816	0.21816	90.07651	
1533.9	1426.064	0.21434	0.94074	0.941	0.22398	92.38548	1	0.08801	0.21434	0.94074	92.38548	
1534	1426.152	0.2095	0.91945	0.919	0.22418	94.42857	1	0.08801	0.2095	0.91945	94.42857	
1534.1	1426.24	0.19606	0.87913	0.879	0.22565	103.5243	1	0.08814	0.19606	0.87913	103.5243	
1534.2	1426.328	0.17827	0.83157	0.832	0.22771	117.7549	1	0.08801	0.17827	0.83157	117.7549	
1534.3	1426.416	0.16641	0.78981	0.79	0.22805	126.3306	1	0.08801	0.16641	0.78981	126.3306	

1534.4	1426.505	0.15838	0.76449	0.764	0.22718	126.034	1	0.08814	0.08814	0.15838	0.76449	0.22718	126.034
1534.5	1426.593	0.15205	0.75796	0.758	0.22591	125.5269	1	0.08801	0.08814	0.15205	0.75796	0.22591	125.5269
1534.6	1426.681	0.14806	0.77654	0.777	0.22515	125.6451	1	0.08813	0.08813	0.14806	0.77654	0.22515	125.6451
1534.7	1426.769	0.14876	0.79505	0.795	0.22538	125.9173	1	0.08802	0.08802	0.14876	0.79505	0.22538	125.9173
1534.8	1426.857	0.14483	0.81171	0.812	0.22826	139.3085	1	0.08801	0.08801	0.14483	0.81171	0.22826	139.3085
1534.9	1426.945	0.13425	0.82512	0.825	0.2329	165.0372	1	0.08801	0.08801	0.13425	0.82512	0.2329	165.0372
1535	1427.033	0.83902	0.839	0.839	0.23722	191.8061	1	0.08801	0.08801	0.83902	0.839	0.23722	191.8061
1535.1	1427.121	0.13157	0.85763	0.858	0.23669	196.6867	1	0.08814	0.08814	0.13157	0.85763	0.23669	196.6867
1535.2	1427.209	0.13923	0.87052	0.871	0.2389	191.9746	1	0.08801	0.08801	0.13923	0.87052	0.2389	191.9746
1535.3	1427.297	0.14749	0.88183	0.882	0.23732	177.2905	1	0.08802	0.08802	0.14749	0.88183	0.23732	177.2905
1535.4	1427.385	0.16077	0.88746	0.887	0.23508	157.6222	1	0.08801	0.08801	0.16077	0.88746	0.23508	157.6222
1535.5	1427.473	0.17764	0.89055	0.891	0.23168	133.5261	1	0.08801	0.08801	0.17764	0.89055	0.23168	133.5261
1535.6	1427.561	0.18698	0.88348	0.883	0.22948	120.6128	1	0.08801	0.08801	0.18698	0.88348	0.22948	120.6128
1535.7	1427.649	0.18595	0.87233	0.872	0.22826	117.2771	1	0.08802	0.08802	0.18595	0.87233	0.22826	117.2771
1535.8	1427.737	0.17933	0.86051	0.861	0.22783	117.7045	1	0.08801	0.08801	0.17933	0.86051	0.22783	117.7045
1535.9	1427.825	0.17051	0.85162	0.852	0.22743	120.4006	1	0.08801	0.08801	0.17051	0.85162	0.22743	120.4006
1536	1427.913	0.15756	0.84441	0.844	0.22821	131.2301	1	0.08801	0.08801	0.15756	0.84441	0.22821	131.2301
1536.1	1428.001	0.14173	0.84588	0.846	0.2298	146.4635	1	0.08814	0.08814	0.14173	0.84588	0.2298	146.4635
1536.2	1428.089	0.12503	0.85496	0.855	0.23171	167.5443	1	0.08801	0.08801	0.12503	0.85496	0.23171	167.5443
1536.3	1428.177	0.10623	0.86569	0.866	0.23457	199.2563	1	0.08801	0.08801	0.10623	0.86569	0.23457	199.2563
1536.4	1428.265	0.08509	0.88153	0.882	0.23799	244.1032	1	0.08802	0.08802	0.08509	0.88153	0.23799	244.1032
1536.5	1428.353	0.06425	0.90292	0.903	0.24139	299.4987	1	0.08801	0.08801	0.06425	0.90292	0.24139	299.4987
1536.6	1428.441	0.0495	0.9281	0.928	0.24404	348.5956	1	0.08813	0.08813	0.0495	0.9281	0.24404	348.5956
1536.7	1428.529	0.04399	0.94752	0.948	0.24674	382.4491	1	0.08802	0.08802	0.04399	0.94752	0.24674	382.4491
1536.8	1428.617	0.047	0.95592	0.956	0.24983	402.26	1	0.08801	0.08801	0.047	0.95592	0.24983	402.26
1536.9	1428.705	0.05261	0.94897	0.949	0.25365	428.3309	1	0.08801	0.08801	0.05261	0.94897	0.25365	428.3309
1537	1428.793	0.05471	0.93602	0.936	0.25665	459.0823	1	0.08801	0.08801	0.05471	0.93602	0.25665	459.0823
1537.1	1428.881	0.05417	0.92029	0.92	0.25903	491.8572	1	0.08802	0.08802	0.05417	0.92029	0.25903	491.8572
1537.2	1428.969	0.0554	0.92233	0.922	0.25789	473.6333	1	0.08801	0.08801	0.0554	0.92233	0.25789	473.6333
1537.3	1429.057	0.06065	0.94292	0.943	0.2536	410.8561	1	0.08801	0.08801	0.06065	0.94292	0.2536	410.8561
1537.4	1429.145	0.07198	0.97663	0.977	0.24788	334.0198	1	0.08802	0.08802	0.07198	0.97663	0.24788	334.0198
1537.5	1429.232	0.08526	1.00819	0.982	0.24438	284.997	1	0.08801	0.08801	0.08526	1.00819	0.24438	284.997
1537.6	1429.32	0.09362	1.02152	1	0.24525	280.0233	1	0.08813	0.08813	0.09362	1	0.24525	280.0233
1537.7	1429.409	0.08776	1.00837	1	0.25144	342.4157	1	0.08789	0.08789	0.08776	1	0.25144	342.4157
1537.8	1429.497	0.07054	0.98178	0.982	0.26063	482.9248	1	0.08802	0.08802	0.07054	0.98178	0.26063	482.9248
1537.9	1429.585	0.05033	0.95418	0.954	0.26997	695.7987	1	0.08801	0.08801	0.05033	0.95418	0.26997	695.7987
1538	1429.673	0.03643	0.93721	0.937	0.2758	879.1462	1	0.08801	0.08801	0.03643	0.93721	0.2758	879.1462
1538.1	1429.762	0.03055	0.93247	0.932	0.27703	932.4682	1	0.08814	0.08814	0.03055	0.93247	0.27703	932.4682
1538.2	1429.85	0.03157	0.94081	0.941	0.27399	842.5529	1	0.08801	0.08801	0.03157	0.94081	0.27399	842.5529
1538.3	1429.938	0.03318	0.95693	0.957	0.26869	711.209	1	0.08789	0.08789	0.03318	0.95693	0.26869	711.209
1538.4	1430.026	0.02996	0.97624	0.976	0.26285	611.1238	1	0.08801	0.08801	0.02996	0.97624	0.26285	611.1238
1538.5	1430.114	0.02216	0.98885	0.989	0.25854	570.4186	1	0.08802	0.08802	0.02216	0.98885	0.25854	570.4186
1538.6	1430.202	0.01338	0.99358	0.994	0.25611	569.1154	1	0.08813	0.08813	0.01338	0.99358	0.25611	569.1154
1538.7	1430.29	0.01054	0.99726	0.997	0.25474	563.2438	1	0.08789	0.08789	0.01054	0.99726	0.25474	563.2438
1538.8	1430.378	0.01649	1.00851	1	0.25232	515.1019	1	0.08801	0.08801	0.01649	1	0.25232	515.1019
1538.9	1430.466	0.0287	1.02261	1	0.24913	444.5845	1	0.08802	0.08802	0.0287	1	0.24913	444.5845
1539	1430.554	0.03989	1.03822	1	0.24603	387.1455	1	0.08801	0.08801	0.03989	1	0.24603	387.1455
1539.1	1430.642	0.04934	1.05571	1	0.24365	346.1533	1	0.08813	0.08813	0.04934	1	0.24365	346.1533
1539.2	1430.73	0.05595	1.06994	1	0.2426	324.1819	1	0.08789	0.08789	0.05595	1	0.2426	324.1819
1539.3	1430.818	0.05908	1.06772	1	0.24437	330.2436	1	0.08802	0.08802	0.05908	1	0.24437	330.2436
1539.4	1430.906	0.05982	1.06086	1	0.2468	347.664	1	0.08801	0.08801	0.05982	1	0.2468	347.664
1539.5	1430.994	0.06065	1.04758	1	0.24891	364.1113	1	0.08801	0.08801	0.06065	1	0.24891	364.1113
1539.6	1431.082	0.0642	1.03809	1	0.2492	359.856	1	0.08802	0.08802	0.0642	1	0.2492	359.856
1539.7	1431.17	0.06826	1.02848	1	0.24815	342.9787	1	0.08801	0.08801	0.06826	1	0.24815	342.9787
1539.8	1431.258	0.07265	1.03402	1	0.24472	307.5006	1	0.08801	0.08801	0.07265	1	0.24472	307.5006

1539.9	1431.346	0.07749	1.05119	1	0.24059	271.1933	0.08789	0.08789	0.08789	0.07749	1	0.24059	271.1933
1540	1431.434	0.0819	1.07724	1	0.23629	239.7191	0.08801	0.08801	0.08801	0.0819	1	0.23629	239.7191
1540.1	1431.522	0.08228	1.10304	1	0.2342	228.7691	0.08814	0.08814	0.08814	0.08228	1	0.2342	228.7691
1540.2	1431.61	0.07835	1.12607	1	0.23383	233.1549	0.08789	0.08789	0.08789	0.07835	1	0.23383	233.1549
1540.3	1431.698	0.07246	1.13777	1	0.23492	248.1246	0.08801	0.08801	0.08801	0.07246	1	0.23492	248.1246
1540.4	1431.786	0.06674	1.13924	1	0.2367	267.3345	0.08801	0.08801	0.08801	0.06674	1	0.2367	267.3345
1540.5	1431.874	0.06542	1.1388	1	0.23737	275.0565	0.0879	0.0879	0.0879	0.06542	1	0.23737	275.0565
1540.6	1431.962	0.06788	1.13731	1	0.23673	265.4027	0.08813	0.08813	0.08813	0.06788	1	0.23673	265.4027
1540.7	1432.05	0.0714	1.13187	1	0.23604	255.5661	0.08801	0.08801	0.08801	0.0714	1	0.23604	255.5661
1540.8	1432.138	0.07506	1.12401	1	0.23616	249.9448	0.08789	0.08789	0.08789	0.07506	1	0.23616	249.9448
1540.9	1432.226	0.07993	1.12455	1	0.23546	238.5226	0.08802	0.08802	0.08802	0.07993	1	0.23546	238.5226
1541	1432.314	0.08606	1.12882	1	0.23504	227.2286	0.08801	0.08801	0.08801	0.08606	1	0.23504	227.2286
1541.1	1432.402	0.08917	1.13239	1	0.23536	224.4288	0.08801	0.08801	0.08801	0.08917	1	0.23536	224.4288
1541.2	1432.49	0.08877	1.12907	1	0.23663	231.4692	0.08801	0.08801	0.08801	0.08877	1	0.23663	231.4692
1541.3	1432.578	0.08859	1.12879	1	0.23675	232.3553	0.08789	0.08789	0.08789	0.08859	1	0.23675	232.3553
1541.4	1432.666	0.09127	1.13267	1	0.23557	222.5849	0.08802	0.08802	0.08802	0.09127	1	0.23557	222.5849
1541.5	1432.754	0.10277	1.13542	1	0.23149	189.3271	0.08801	0.08801	0.08801	0.10277	1	0.23149	189.3271
1541.6	1432.842	0.13103	1.12747	1	0.22439	135.7825	0.08801	0.08801	0.08801	0.13103	1	0.22439	135.7825
1541.7	1432.93	0.18464	1.13812	1	0.21145	73.33549	0.08802	0.08802	0.08802	0.18464	1	0.21145	73.33549
1541.8	1433.017	0.26907	1.18477	1	0.19085	27.81293	0.08789	0.08789	0.08789	0.26907	1	0.19085	27.81293
TOPB1-BASEB1					10.03492	10.03492	10.03492	10.03492	10.03492	0.105852	0.940779	0.237259	266.4719
1541.9	1433.105	0.38383	1.22874	1	0.1647	7.9429	0.08801	0.08801	0.08801	0.38383	1	0.1647	7.9429
1542	1433.193	0.51775	1.30531	1	0.13588	1.9959	0.08801	0.08801	0.08801	0	0	0	0
1542.1	1433.281	0.65934	1.46091	1	0.10907	0.55277	0.08801	0.08801	0.08801	0	0	0	0
1542.2	1433.37	0.7999	1.69289	1	0.08609	0.1874	0.08802	0.08802	0.08802	0	0	0	0
1542.3	1433.457	0.91775	1.9105	1	0.07111	0.09366	0.08789	0.08789	0.08789	0	0	0	0
1542.4	1433.545	0.99981	2.02616	1	0.06531	0.07148	0.08801	0.08801	0.08801	0	0	0	0
1542.5	1433.633	1	1.86355	1	0.07035	0.08871	0.08789	0.08789	0.08789	0	0	0	0
1542.6	1433.721	1	1.78535	1	0.07414	0.10441	0.08814	0.08814	0.08814	0	0	0	0
1542.7	1433.809	1	1.76363	1	0.07431	0.10519	0.08789	0.08789	0.08789	0	0	0	0
1542.8	1433.897	1	1.77242	1	0.07276	0.09839	0.08801	0.08801	0.08801	0	0	0	0
1542.9	1433.985	1	1.83435	1	0.06916	0.08428	0.08789	0.08789	0.08789	0	0	0	0
1543	1434.073	1	1.88022	1	0.06638	0.0748	0.08801	0.08801	0.08801	0	0	0	0
1543.1	1434.161	0.99623	1.94813	1	0.06331	0.06566	0.08801	0.08801	0.08801	0	0	0	0
1543.2	1434.249	0.91151	1.86698	1	0.0656	0.0746	0.08802	0.08802	0.08802	0	0	0	0
1543.3	1434.337	0.83046	1.75924	1	0.06937	0.09324	0.08789	0.08789	0.08789	0	0	0	0
1543.4	1434.425	0.76093	1.58829	1	0.07644	0.13657	0.08801	0.08801	0.08801	0	0	0	0
1543.5	1434.513	0.71585	1.47197	1	0.08223	0.18642	0.08801	0.08801	0.08801	0	0	0	0
1543.6	1434.601	0.69125	1.37462	1	0.08789	0.24185	0.08802	0.08802	0.08802	0	0	0	0
1543.7	1434.689	0.67541	1.30138	1	0.09273	0.29791	0.08789	0.08789	0.08789	0	0	0	0
1543.8	1434.777	0.66558	1.23807	1	0.0974	0.35886	0.08801	0.08801	0.08801	0	0	0	0
1543.9	1434.865	0.67274	1.23571	1	0.09762	0.35515	0.08801	0.08801	0.08801	0	0	0	0
1544	1434.953	0.68824	1.27519	1	0.09467	0.3084	0.08789	0.08789	0.08789	0	0	0	0
1544.1	1435.041	0.6851	1.29412	1	0.09332	0.29625	0.08814	0.08814	0.08814	0	0	0	0
1544.2	1435.129	0.6591	1.27155	1	0.09499	0.33698	0.08789	0.08789	0.08789	0	0	0	0
1544.3	1435.217	0.62913	1.24016	1	0.09738	0.40231	0.08801	0.08801	0.08801	0	0	0	0
1544.4	1435.305	0.60483	1.21165	1	0.09961	0.4739	0.08789	0.08789	0.08789	0	0	0	0
1544.5	1435.393	0.59079	1.20011	1	0.1006	0.51906	0.08801	0.08801	0.08801	0	0	0	0
1544.6	1435.481	0.58545	1.19581	1	0.10108	0.53936	0.08814	0.08814	0.08814	0	0	0	0
1544.7	1435.569	0.59766	1.21986	1	0.0993	0.48501	0.08789	0.08789	0.08789	0	0	0	0
1544.8	1435.657	0.62732	1.29203	1	0.09409	0.36728	0.08801	0.08801	0.08801	0	0	0	0
1544.9	1435.745	0.6626	1.4042	1	0.08703	0.25854	0.08802	0.08802	0.08802	0	0	0	0
1545	1435.833	0.69717	1.53402	1	0.08017	0.18441	0.08789	0.08789	0.08789	0	0	0	0
1545.1	1435.921	0.7471	1.70341	1	0.07276	0.12395	0.08813	0.08813	0.08813	0	0	0	0
1545.2	1436.009	0.81585	1.88467	1	0.06627	0.08455	0.08801	0.08801	0.08801	0	0	0	0

1545.3	1436.097	0.86902	1.96585	1	0.06389	0.07185	0	0.08789	0
1545.4	1436.185	0.87745	2.02344	1	0.06242	0.06716	0	0.08802	0
1545.5	1436.273	0.84824	2.02507	1	0.06265	0.07009	0	0.08801	0
1545.6	1436.361	0.82635	1.94511	1	0.06527	0.08002	0	0.08801	0
1545.7	1436.449	0.82193	1.87668	1	0.06761	0.08813	0	0.08801	0
1545.8	1436.537	0.83012	1.88231	1	0.06771	0.08742	0	0.08802	0
1545.9	1436.625	0.84824	1.91715	1	0.06675	0.08233	0	0.08801	0
1546	1436.713	0.85991	1.93266	1	0.06646	0.08047	0	0.08801	0
1546.1	1436.801	0.85784	1.89908	1	0.06797	0.08558	0	0.08802	0
1546.2	1436.889	0.8539	1.84041	1	0.07044	0.09487	0	0.08801	0
1546.3	1436.977	0.87085	1.79815	1	0.07237	0.10123	0	0.08801	0
1546.4	1437.065	0.92209	1.78835	1	0.073	0.10123	0	0.08801	0
1546.5	1437.153	1	1.73708	1	0.07535	0.10997	0	0.08802	0
1546.6	1437.241	1	1.70393	1	0.07706	0.1184	0	0.08813	0
1546.7	1437.329	1	1.70124	1	0.0774	0.12014	0	0.08801	0
1546.8	1437.417	1	1.73998	1	0.07591	0.11268	0	0.08789	0
1546.9	1437.505	1	1.78044	1	0.07441	0.10564	0	0.08802	0
1547	1437.593	1	1.81975	1	0.07292	0.09905	0	0.08801	0
1547.1	1437.681	0.98741	1.81176	1	0.07307	0.0999	0	0.08813	0
1547.2	1437.769	0.92408	1.7128	1	0.07677	0.11869	0	0.08802	0
1547.3	1437.857	0.87782	1.58082	1	0.08243	0.15326	0	0.08801	0
1547.4	1437.945	0.85142	1.46901	1	0.08786	0.19476	0	0.08801	0
1547.5	1438.033	0.84297	1.4287	1	0.08959	0.2102	0	0.08802	0
1547.6	1438.121	0.84297	1.44147	1	0.08818	0.19816	0	0.08813	0
1547.7	1438.209	0.85784	1.50215	1	0.08436	0.16768	0	0.08801	0
1547.8	1438.297	0.90263	1.59493	1	0.07949	0.13414	0	0.08802	0
1547.9	1438.386	0.97567	1.65274	1	0.0768	0.11746	0	0.08801	0
1548	1438.474	1	1.68912	1	0.07525	0.10952	0	0.08801	0
1548.1	1438.562	0.98841	1.72945	1	0.07369	0.1026	0	0.08814	0
1548.2	1438.65	0.89438	1.70794	1	0.0747	0.10998	0	0.08801	0
1548.3	1438.738	0.80517	1.53778	1	0.08257	0.16184	0	0.08801	0
1548.4	1438.826	0.75322	1.4353	1	0.08803	0.21364	0	0.08814	0
1548.5	1438.914	0.74135	1.41539	1	0.08894	0.22534	0	0.08801	0
1548.6	1439.002	0.76842	1.48661	1	0.08452	0.18259	0	0.08813	0
1548.7	1439.09	0.81855	1.59511	1	0.0787	0.13678	0	0.08802	0
1548.8	1439.178	0.87525	1.69074	1	0.07434	0.10949	0	0.08801	0
1548.9	1439.266	0.91502	1.69337	1	0.07439	0.10766	0	0.08801	0
1549	1439.354	0.9217	1.70009	1	0.07441	0.10746	0	0.08801	0
1549.1	1439.442	0.89266	1.67985	1	0.0756	0.11434	0	0.08826	0
1549.2	1439.53	0.85282	1.64595	1	0.0774	0.12607	0	0.08801	0
1549.3	1439.618	0.82256	1.57297	1	0.0812	0.15074	0	0.08802	0
1549.4	1439.706	0.7998	1.53697	1	0.08346	0.16866	0	0.08801	0
1549.5	1439.794	0.78295	1.52382	1	0.08467	0.18027	0	0.08813	0
1549.6	1439.883	0.76961	1.55639	1	0.08347	0.17505	0	0.08814	0
1549.7	1439.971	0.75747	1.57872	1	0.08288	0.17449	0	0.08801	0
1549.8	1440.059	0.75164	1.61318	1	0.08167	0.16848	0	0.08801	0
1549.9	1440.147	0.75309	1.60252	1	0.08231	0.17209	0	0.08814	0
1550	1440.235	0.74862	1.56505	1	0.08384	0.18366	0	0.08801	0
1550.1	1440.323	0.74856	1.51604	1	0.0859	0.19845	0	0.08814	0
1550.2	1440.411	0.7669	1.51369	1	0.08542	0.18948	0	0.08801	0
1550.3	1440.499	0.78875	1.51426	1	0.08472	0.17943	0	0.08813	0
1550.4	1440.587	0.79424	1.54496	1	0.08248	0.16315	0	0.08802	0
1550.5	1440.675	0.79914	1.59166	1	0.08011	0.14777	0	0.08813	0
1550.6	1440.763	0.83654	1.69968	1	0.07629	0.12205	0	0.08814	0
1550.7	1440.851	0.88613	1.76703	1	0.07552	0.1143	0	0.08801	0

1550.8	1440.939	0.92258	1.79899	1	0.07672	0.1185	0	0.08813
1550.9	1441.027	0.99401	1.76013	1	0.08135	0.14253	0	0.08802
1551	1441.116	1	1.72068	1	0.08643	0.17744	0	0.08813
1551.1	1441.204	1	1.59208	1	0.09612	0.26979	0	0.08814
1551.2	1441.292	1	1.42264	1	0.11051	0.50365	0	0.08801
1551.3	1441.38	1	1.27248	1	0.12764	1.05946	0	0.08813
1551.4	1441.468	1	1.1658	1	0.14349	2.10968	0	0.08802
1551.5	1441.556	1	1.10795	1	0.15444	3.39595	0	0.08813
1551.6	1441.644	1	1.10337	1	0.15688	3.77678	0	0.08814
1551.7	1441.732	1	1.13929	1	0.14915	2.6988	0	0.08813
1551.8	1441.82	1	1.19874	1	0.1348	1.4459	0	0.08801
1551.9	1441.908	1	1.28806	1	0.11831	0.70639	0	0.08814
1552	1441.997	1	1.38509	1	0.10395	0.37879	0	0.08813
1552.1	1442.085	1	1.45491	1	0.09439	0.25034	0	0.08814
1552.2	1442.173	1	1.48597	1	0.09032	0.20996	0	0.08813
1552.3	1442.261	1	1.54002	1	0.08772	0.18759	0	0.08801
1552.4	1442.349	1	1.58579	1	0.08684	0.18057	0	0.08814
1552.5	1442.437	0.97269	1.56399	1	0.08918	0.20023	0	0.08801
1552.6	1442.525	0.83068	1.20513	1	0.11561	0.63645	0	0.08826
1552.7	1442.613	0.72702	0.91756	0.918	0.15152	3.02489	0	0.08813
1552.8	1442.701	0.68488	0.732	0.732	0.18955	15.68931	0	0.08802
1552.9	1442.79	0.69104	0.62714	0.627	0.22127	62.14321	0	0.08813
1553	1442.878	0.72525	0.56035	0.56	0.2476	195.1682	0	0.08814
1553.1	1442.966	0.75719	0.53115	0.531	0.26095	348.686	0	0.08813
1553.2	1443.054	0.75074	0.50235	0.502	0.27517	647.3131	0	0.08814
1553.3	1443.142	0.69441	0.47053	0.471	0.29201	1346.487	0	0.08801
1553.4	1443.23	0.62571	0.42715	0.427	0.31793	4155.871	0	0.08813
1553.5	1443.318	0.58872	0.40165	0.402	0.33397	8500.197	0	0.08814
1553.6	1443.406	0.61387	0.39883	0.399	0.33581	9042.727	0	0.08825
1553.7	1443.495	0.70079	0.42832	0.428	0.31491	3644.928	0	0.08802
1553.8	1443.583	0.80663	0.48149	0.481	0.28209	874.665	0	0.08813
1553.9	1443.671	0.89749	0.56503	0.565	0.24275	158.0069	0	0.08814
1554	1443.759	0.95369	0.65716	0.657	0.21226	41.96216	0	0.08813
1554.1	1443.847	0.96135	0.71258	0.713	0.198	22.56992	0	0.08814
1554.2	1443.935	0.92178	0.72333	0.723	0.19425	19.17325	0	0.08813
1554.3	1444.023	0.86105	0.72589	0.726	0.19173	17.1885	0	0.08814
1554.4	1444.111	0.80416	0.75024	0.75	0.1834	11.97529	0	0.08813
1554.5	1444.199	0.75052	0.76687	0.767	0.17669	8.95863	0	0.08801
1554.6	1444.288	0.69808	0.77788	0.778	0.17087	6.98518	0	0.08826
1554.7	1444.376	0.66323	0.78544	0.785	0.16523	5.50353	0	0.08813
1554.8	1444.464	0.65239	0.80883	0.809	0.15665	3.82608	0	0.08814
1554.9	1444.552	0.65904	0.84565	0.846	0.14642	2.47633	0	0.08813
1555	1444.64	0.66616	0.89787	0.898	0.1357	1.57714	0	0.08802
1555.1	1444.728	0.66576	0.95053	0.951	0.12698	1.1029	0	0.08825
1555.2	1444.817	0.6655	1.00024	1	0.12018	0.84011	0	0.08814
1555.3	1444.905	0.68161	1.07129	1	0.11245	0.60783	0	0.08813
1555.4	1444.993	0.71851	1.18316	1	0.10235	0.39055	0	0.08814
1555.5	1445.081	0.75763	1.29887	1	0.09362	0.26438	0	0.08813
1555.6	1445.169	0.7868	1.40356	1	0.08666	0.19382	0	0.08814
1555.7	1445.257	0.80552	1.45514	1	0.08325	0.1663	0	0.08813
1555.8	1445.345	0.81327	1.47082	1	0.08171	0.15511	0	0.08814
1555.9	1445.433	0.81027	1.42848	1	0.08308	0.16443	0	0.08813
1556	1445.522	0.8086	1.37374	1	0.08529	0.18006	0	0.08814
1556.1	1445.61	0.81177	1.32331	1	0.08777	0.19863	0	0.08825
1556.2	1445.698	0.80262	1.27975	1	0.09018	0.22073	0	0.08814

1567.2	1455.398	0.23802	0.36095	0.361	0.24582	268.3483	1	0.08814	0.08814	0.23802	0.36095	0.24582	268.3483
1567.3	1455.486	0.23001	0.36319	0.363	0.24772	281.537	1	0.08814	0.08814	0.23001	0.36319	0.24772	281.537
1567.4	1455.574	0.23058	0.36978	0.37	0.24607	267.8653	1	0.08826	0.08826	0.23058	0.36978	0.24607	267.8653
1567.5	1455.662	0.24097	0.38244	0.382	0.24003	226.6234	1	0.08813	0.08813	0.24097	0.38244	0.24003	226.6234
1567.6	1455.751	0.25461	0.39438	0.394	0.23402	192.5975	1	0.08826	0.08826	0.25461	0.39438	0.23402	192.5975
1567.7	1455.839	0.26478	0.40175	0.402	0.22891	170.5403	1	0.08826	0.08826	0.26478	0.40175	0.22891	170.5403
1567.8	1455.927	0.27188	0.40329	0.403	0.22503	158.2663	1	0.08813	0.08813	0.27188	0.40329	0.22503	158.2663
1567.9	1456.015	0.27753	0.40379	0.404	0.22089	148.0176	1	0.08814	0.08814	0.27753	0.40379	0.22089	148.0176
1568	1456.103	0.27738	0.39982	0.4	0.21934	148.0826	1	0.08825	0.08825	0.27738	0.39982	0.21934	148.0826
1568.1	1456.192	0.26025	0.39334	0.393	0.21998	156.3714	1	0.08826	0.08826	0.26025	0.39334	0.21998	156.3714
1568.2	1456.28	0.24087	0.3866	0.387	0.2221	170.819	1	0.08814	0.08814	0.24087	0.3866	0.2221	170.819
1568.3	1456.368	0.21857	0.3814	0.381	0.2253	190.8309	1	0.08813	0.08813	0.21857	0.3814	0.2253	190.8309
1568.4	1456.456	0.19881	0.38082	0.381	0.22919	212.8965	1	0.08826	0.08826	0.19881	0.38082	0.22919	212.8965
1568.5	1456.544	0.1894	0.38793	0.388	0.23203	224.2432	1	0.08813	0.08813	0.1894	0.38793	0.23203	224.2432
1568.6	1456.633	0.19472	0.4032	0.403	0.23213	212.9991	1	0.08826	0.08826	0.19472	0.4032	0.23213	212.9991
1568.7	1456.721	0.20709	0.42405	0.424	0.23109	192.223	1	0.08826	0.08826	0.20709	0.42405	0.23109	192.223
1568.8	1456.809	0.22583	0.45467	0.455	0.22768	160.6727	1	0.08813	0.08813	0.22583	0.45467	0.22768	160.6727
1568.9	1456.897	0.25575	0.49247	0.492	0.22235	124.3124	1	0.08813	0.08813	0.25575	0.49247	0.22235	124.3124
1569	1456.985	0.30053	0.54023	0.54	0.21304	85.40741	1	0.08826	0.08826	0.30053	0.54023	0.21304	85.40741
1569.1	1457.074	0.35612	0.59695	0.597	0.20146	54.91531	1	0.08826	0.08826	0.35612	0.59695	0.20146	54.91531
1569.2	1457.162	0.41568	0.66154	0.662	0.18837	34.18517	1	0.08813	0.08813	0.41568	0.66154	0.18837	34.18517
TOPA-BASEA													
1569.3	1457.25	0.4718	0.7206	0.721	0.17704	22.66011	1	0.08814	0.08814	0.4718	0.7206	0.17704	22.66011
1569.4	1457.338	0.51486	0.89035	0.89	0.14572	2.82645	0	0.08825	0	0.51486	0.89035	0.14572	2.82645
1569.5	1457.426	0.53902	0.94038	0.94	0.13883	2.09273	0	0.08814	0	0.53902	0.94038	0.13883	2.09273
1569.6	1457.515	0.54042	0.98731	0.987	0.13325	1.71511	0	0.08826	0	0.54042	0.98731	0.13325	1.71511
1569.7	1457.603	0.55144	1.06609	1	0.12584	1.28261	0	0.08825	0	0.55144	1.06609	0.12584	1.28261
1569.8	1457.691	0.56895	1.20846	1	0.11384	0.77783	0	0.08814	0	0.56895	1.20846	0.11384	0.77783
1569.9	1457.779	0.58493	1.42178	1	0.10015	0.41241	0	0.08813	0	0.58493	1.42178	0.10015	0.41241
1570	1457.867	0.71772	1.69283	1	0.08719	0.22089	0	0.08826	0	0.71772	1.69283	0.08719	0.22089
1570.1	1457.956	0.78077	1.94449	1	0.07815	0.1404	0	0.08826	0	0.78077	1.94449	0.07815	0.1404
1570.2	1458.044	0.79825	2.0389	1	0.07588	0.12539	0	0.08813	0	0.79825	2.0389	0.07588	0.12539
1570.3	1458.132	0.73832	1.77567	1	0.08759	0.21519	0	0.08814	0	0.73832	1.77567	0.08759	0.21519
1570.4	1458.22	0.65082	1.47421	1	0.10542	0.49272	0	0.08825	0	0.65082	1.47421	0.10542	0.49272
1570.5	1458.308	0.59104	1.30372	1	0.11918	0.92457	0	0.08814	0	0.59104	1.30372	0.11918	0.92457
1570.6	1458.396	0.57464	1.26793	1	0.1232	1.0882	0	0.08825	0	0.57464	1.26793	0.1232	1.0882
1570.7	1458.485	0.59225	1.28808	1	0.12214	1.02209	0	0.08826	0	0.59225	1.28808	0.12214	1.02209
1570.8	1458.573	0.63326	1.34992	1	0.1169	0.77595	0	0.08814	0	0.63326	1.34992	0.1169	0.77595
1570.9	1458.661	0.66611	1.35722	1	0.11543	0.69647	0	0.08813	0	0.66611	1.35722	0.11543	0.69647
1571	1458.749	0.6583	1.31456	1	0.11746	0.76164	0	0.08826	0	0.6583	1.31456	0.11746	0.76164
1571.1	1458.838	0.62017	1.24519	1	0.1213	0.93614	0	0.08825	0	0.62017	1.24519	0.1213	0.93614
1571.2	1458.926	0.58449	1.22148	1	0.12029	0.97722	0	0.08814	0	0.58449	1.22148	0.12029	0.97722
1571.3	1459.014	0.56824	1.22903	1	0.11576	0.88749	0	0.08813	0	0.56824	1.22903	0.11576	0.88749
1571.4	1459.102	0.57751	1.28711	1	0.10629	0.64598	0	0.08826	0	0.57751	1.28711	0.10629	0.64598
1571.5	1459.19	0.59569	1.37852	1	0.09482	0.43486	0	0.08814	0	0.59569	1.37852	0.09482	0.43486
1571.6	1459.278	0.59593	1.46557	1	0.08487	0.34514	0	0.08825	0	0.59593	1.46557	0.08487	0.34514
1571.7	1459.367	0.564	1.48866	1	0.07905	0.39805	0	0.08826	0	0.564	1.48866	0.07905	0.39805
BASEA-EUM													
1571.8	1459.455	0.51307	1.44178	1	0.07657	0.6294	0	0.08813	0	0.51307	1.44178	0.07657	0.6294
1571.9	1459.543	0.45453	1.37205	1	0.07485	1.18572	1	0.08814	0.08814	0.45453	1.37205	0.07485	1.18572
1572	1459.631	0.39388	1.29497	1	0.07388	2.42671	1	0.08826	0.08826	0.39388	1.29497	0.07388	2.42671
1572.1	1459.719	0.34399	1.3554	1	0.07141	4.46213	1	0.08825	0.08825	0.34399	1.3554	0.07141	4.46213
1572.2	1459.808	0.31431	1.463	1	0.06664	6.43628	1	0.08814	0.08814	0.31431	1.463	0.06664	6.43628
1572.3	1459.896	0.30173	1.67458	1	0.06124	7.5184	1	0.08825	0.08825	0.30173	1.67458	0.06124	7.5184
1572.4	1459.984	0.30128	1.8955	1	0.05912	7.55584	1	0.08814	0.08814	0.30128	1.8955	0.05912	7.55584
BASEA-EUM													
TOPA-BASEA													
BASEA-EUM													

1572.5	1460.072	0.31322	2.0112	1	0.06194	6.51113	0.08813	0.08813	0.31322	1	0.06194	6.51113
1572.6	1460.16	0.33734	1.82357	1	0.07203	4.84811	0.08826	0.08826	0.33734	1	0.07203	4.84811
1572.7	1460.249	0.37778	1.6007	1	0.08615	3.02424	0.08814	0.08814	0.37778	1	0.08615	3.02424
1572.8	1460.337	0.42593	1.41198	1	0.10083	1.87949	0.08825	0.08825	0.42593	1	0.10083	1.87949
1572.9	1460.425	0.47891	1.30004	1	0.11173	1.32268	0.08814	0.08814	0.47891	1	0.11173	1.32268
1573.0	1460.513	0.52474	1.26091	0	0.11738	1.12132	0	0	0	0	0	0
1573.1	1460.601	0.56301	1.26364	0	0.11968	1.02215	0	0	0	0	0	0
1573.2	1460.69	0.59398	1.28724	0	0.12046	0.95945	0	0	0	0	0	0
1573.3	1460.778	0.61731	1.31191	0	0.12147	0.94694	0	0	0	0	0	0
1573.4	1460.866	0.62838	1.31778	0	0.12409	1.02673	0	0	0	0	0	0
1573.5	1460.954	0.62863	1.28217	0	0.12993	1.28833	0	0	0	0	0	0
1573.6	1461.042	0.61575	1.21687	0	0.13799	1.80066	0	0	0	0	0	0
1573.7	1461.13	0.5912	1.13884	0	0.14733	2.68375	0	0	0	0	0	0
1573.8	1461.219	0.56735	1.0628	0	0.15661	3.99015	0	0	0	0	0	0
1573.9	1461.307	0.5492	1.00137	0	0.16396	5.46216	0	0	0	0	0	0
1574.0	1461.395	0.54473	0.96638	0.966	0.16698	6.20044	0	0	0	0	0	0
1574.1	1461.483	0.53562	0.93796	0.938	0.16769	6.42831	0	0	0	0	0	0
1574.2	1461.571	0.51184	0.90291	0.903	0.16848	6.77512	0	0	0	0	0	0
1574.3	1461.659	0.47485	0.86796	0.868	0.16903	7.2385	0.08813	0.08813	0.47485	0.86796	0.16903	7.2385
1574.4	1461.748	0.43996	0.84204	0.842	0.16724	7.22079	0.08826	0.08826	0.43996	0.84204	0.16724	7.22079
1574.5	1461.836	0.41743	0.82991	0.83	0.16319	6.69281	0.08814	0.08814	0.41743	0.82991	0.16319	6.69281
1574.6	1461.924	0.41821	0.8498	0.85	0.15631	5.39129	0.08825	0.08825	0.41821	0.8498	0.15631	5.39129
1574.7	1462.012	0.43931	0.90294	0.903	0.14708	3.77385	0.08814	0.08814	0.43931	0.90294	0.14708	3.77385
1574.8	1462.1	0.4776	0.98636	0.986	0.13586	2.31918	0.08813	0.08813	0.4776	0.98636	0.13586	2.31918
1574.9	1462.188	0.50695	1.0616	1	0.12903	1.69026	0	0	0	0	0	0
1575.0	1462.277	0.51586	1.11455	1	0.12718	1.53414	0	0	0	0	0	0
1575.1	1462.365	0.50867	1.11818	1	0.1304	1.73746	0	0	0	0	0	0
1575.2	1462.453	0.49155	1.07678	1	0.13601	2.19861	0.08813	0.08813	0.49155	1	0.13601	2.19861
1575.3	1462.541	0.47321	0.99603	0.996	0.14303	2.91914	0.08814	0.08814	0.47321	0.99603	0.14303	2.91914
1575.4	1462.629	0.45115	0.89914	0.899	0.14736	3.62113	0.08813	0.08813	0.45115	0.89914	0.14736	3.62113
1575.5	1462.717	0.4325	0.8076	0.808	0.14415	3.59623	0.08814	0.08814	0.4325	0.8076	0.14415	3.59623
1575.6	1462.806	0.41756	0.76013	0.76	0.13011	2.90134	0.08813	0.08813	0.41756	0.76013	0.13011	2.90134
1575.7	1462.894	0.40074	0.77078	0.771	0.10944	2.61123	0.08814	0.08814	0.40074	0.77078	0.10944	2.61123
1575.8	1462.982	0.37209	0.87555	0.876	0.08825	3.25362	0.08813	0.08813	0.37209	0.87555	0.08825	3.25362
1575.9	1463.07	0.34528	1.20231	1	0.07029	4.38668	0.08814	0.08814	0.34528	1	0.07029	4.38668
1576.0	1463.158	0.33699	1.62824	1	0.0567	4.82303	0.08813	0.08813	0.33699	1	0.0567	4.82303
1576.1	1463.246	0.35062	2.11913	1	0.05047	4.05539	0.08826	0.08826	0.35062	1	0.05047	4.05539
1576.2	1463.334	0.37419	2.15891	1	0.05838	3.03446	0.08813	0.08813	0.37419	1	0.05838	3.03446
1576.3	1463.423	0.39743	1.88567	1	0.07738	2.34158	0.08814	0.08814	0.39743	1	0.07738	2.34158
1576.4	1463.511	0.42536	1.59755	1	0.10042	1.88496	0.08813	0.08813	0.42536	1	0.10042	1.88496
1576.5	1463.599	0.45367	1.36424	1	0.1214	1.89782	0.08801	0.08801	0.45367	1	0.1214	1.89782
1576.6	1463.687	0.48191	1.22475	1	0.13769	2.40154	0.08826	0.08826	0.48191	1	0.13769	2.40154
1576.7	1463.775	0.51137	1.13911	1	0.14704	2.98656	0	0	0	0	0	0
1576.8	1463.863	0.53736	1.07901	1	0.14987	3.1609	0	0	0	0	0	0
1576.9	1463.951	0.5504	1.03548	1	0.1475	2.83139	0	0	0	0	0	0
1577.0	1464.039	0.53998	0.98841	0.988	0.1433	2.48596	0	0	0	0	0	0
1577.1	1464.128	0.48821	0.93	0.93	0.13869	2.41594	0.08826	0.08826	0.48821	0.93	0.13869	2.41594
1577.2	1464.216	0.4465	0.89193	0.892	0.1309	2.41425	0.08813	0.08813	0.4465	0.89193	0.1309	2.41425
1577.3	1464.304	0.43291	0.92766	0.928	0.11586	2.05302	0.08801	0.08801	0.43291	0.92766	0.11586	2.05302
1577.4	1464.392	0.44225	1.05254	1	0.09646	1.53331	0.08814	0.08814	0.44225	1	0.09646	1.53331
1577.5	1464.48	0.45669	1.27063	1	0.07807	1.17273	0.08813	0.08813	0.45669	1	0.07807	1.17273
1577.6	1464.568	0.46497	1.52636	1	0.06619	1.01879	0.08826	0.08826	0.46497	1	0.06619	1.01879
1577.7	1464.656	0.4672	1.75105	1	0.06085	0.97736	0.08801	0.08801	0.4672	1	0.06085	0.97736
1577.8	1464.745	0.45587	1.77891	1	0.06438	1.12867	0.08814	0.08814	0.45587	1	0.06438	1.12867
1577.9	1464.833	0.44463	1.72127	1	0.07225	1.31835	0.08813	0.08813	0.44463	1	0.07225	1.31835

1578	1464.921	0.45508	1.65291	0.0817	1.21519	0.0817	1.21519
1578.1	1465.009	0.48189	1.58909	1	0.97958	0.09111	0.97958
1578.2	1465.097	0.50508	1.46984	1	0.94036	0	
1578.3	1465.185	0.51952	1.33177	0	1.16843	0	
1578.4	1465.273	0.53427	1.21097	0	1.67532	0	
1578.5	1465.361	0.54935	1.12056	0	2.42178	0	
1578.6	1465.449	0.56474	1.05917	0	3.24168	0	
1578.7	1465.537	0.57472	1.03251	0	3.84186	0	
1578.8	1465.626	0.58217	1.03365	0	4.06733	0	
1578.9	1465.714	0.57114	1.03287	0	4.49864	0	
1579	1465.802	0.53608	1.01047	0	5.79225	0	
1579.1	1465.89	0.499	0.97854	0.97854	7.92323	0.17207	7.92323
1579.2	1465.978	0.47056	0.93737	0.93737	10.40754	0.17817	10.40754
1579.3	1466.066	0.44583	0.87255	0.87255	13.04614	0.18317	13.04614
1579.4	1466.154	0.41522	0.79277	0.79277	15.79695	0.18705	15.79695
1579.5	1466.242	0.39067	0.73147	0.73147	18.503	0.18503	18.503
1579.6	1466.33	0.37408	0.69696	0.69696	21.26307	0.17562	21.26307
1579.7	1466.418	0.36533	0.71339	0.71339	24.07107	0.15752	24.07107
1579.8	1466.506	0.3656	0.75647	0.75647	26.9288	0.13288	26.9288
1579.9	1466.595	0.37882	0.90956	0.90956	31.8762	0.10379	31.8762
1580	1466.683	0.38815	1.16884	1	2.63626	0.08058	2.63626
1580.1	1466.771	0.37882	1.39276	1	2.89754	0.07017	2.89754
1580.2	1466.859	0.36491	1.46156	1	3.44815	0.07204	3.44815
1580.3	1466.947	0.36613	1.43875	1	3.44719	0.08187	3.44719
1580.4	1467.035	0.38419	1.33193	1	2.92484	0.09841	2.92484
1580.5	1467.123	0.40574	1.1845	1	2.71458	0.11858	2.71458
1580.6	1467.211	0.42361	1.00426	1	3.32083	0.13887	3.32083
1580.7	1467.299	0.42975	0.89891	0.89891	5.60626	0.15881	5.60626
1580.8	1467.387	0.41962	0.80984	0.80984	11.24109	0.17825	11.24109
1580.9	1467.475	0.3967	0.73407	0.73407	23.70599	0.19684	23.70599
1581	1467.563	0.37652	0.68896	0.68896	39.99053	0.20942	39.99053
1581.1	1467.652	0.36928	0.67493	0.67493	48.41214	0.21325	48.41214
1581.2	1467.74	0.36892	0.6792	0.6792	47.00191	0.21325	47.00191
1581.3	1467.828	0.36195	0.6838	0.6838	44.86147	0.21194	44.86147
1581.4	1467.916	0.34705	0.68214	0.68214	44.37449	0.21126	44.37449
1581.5	1468.004	0.32898	0.68235	0.68235	42.48896	0.20949	42.48896
1581.6	1468.092	0.32097	0.69845	0.69845	34.28287	0.20331	34.28287
1581.7	1468.18	0.33005	0.73954	0.73954	21.92303	0.19109	21.92303
1581.8	1468.268	0.35762	0.80311	0.80311	12.30168	0.17588	12.30168
1581.9	1468.356	0.39844	0.88886	0.88886	6.63338	0.16061	6.63338
1582	1468.444	0.43717	0.95756	0.95756	4.33716	0.15154	4.33716
1582.1	1468.532	0.45932	0.96517	0.96517	4.00466	0.15151	4.00466
1582.2	1468.62	0.46154	0.90795	0.90795	5.37448	0.16033	5.37448
1582.3	1468.708	0.44658	0.82922	0.82922	8.58578	0.17233	8.58578
1582.4	1468.796	0.41951	0.7482	0.7482	13.88625	0.18386	13.88625
1582.5	1468.884	0.39862	0.6964	0.6964	16.99017	0.1883	16.99017
1582.6	1468.972	0.39133	0.68726	0.68726	14.74359	0.18412	14.74359
1582.7	1469.06	0.40304	0.73321	0.73321	8.86735	0.1704	8.86735
1582.8	1469.148	0.4233	0.83339	0.83339	4.52063	0.15096	4.52063
1582.9	1469.236	0.44539	0.99237	0.99237	2.39873	0.13028	2.39873
1583	1469.324	0.45667	1.16303	1	1.71002	0.11677	1.71002
1583.1	1469.413	0.45064	1.25533	1	1.14448	0.11448	1.14448
1583.2	1469.501	0.4307	1.2373	1	0.4307	0.12373	0.4307
1583.3	1469.589	0.41531	1.13555	1	0.138	0.138	0.138
1583.4	1469.677	0.42556	1.06217	1	0.15264	0.15264	0.15264

1583.5	1469.765	0.4662	1.02884	1	0.16054	5.35653	0.08789	0.08789	0.4662	1	0.16054	5.35653
1583.6	1469.853	0.52429	1.01285	0	0.1635	5.47972	0.08813	0.08789	0.4662	1	0.16054	5.35653
1583.7	1469.941	0.56993	1.01025	0	0.16369	5.32719	0.08801	0	0.4662	0	0.16054	5.35653
1583.8	1470.029	0.56664	0.99788	0	0.16539	5.66759	0.08802	0	0.4662	0	0.16054	5.35653
1583.9	1470.117	0.56791	0.97572	0	0.16893	6.63112	0.08801	0	0.4662	0	0.16054	5.35653
1584	1470.205	0.53459	0.95004	0	0.17297	7.99322	0.08789	0	0.4662	0	0.16054	5.35653
1584.1	1470.293	0.51299	0.93215	0	0.17418	8.52629	0.08813	0	0.4662	0	0.16054	5.35653
1584.2	1470.381	0.51341	0.9238	0	0.17135	7.59603	0.08802	0	0.4662	0	0.16054	5.35653
1584.3	1470.469	0.51996	0.92206	0	0.16611	6.11047	0.08789	0	0.4662	0	0.16054	5.35653
1584.4	1470.557	0.50564	0.90346	0	0.1628	5.44798	0.08801	0	0.4662	0	0.16054	5.35653
1584.5	1470.645	0.46632	0.85908	0.85908	0.1628	5.81356	0.08801	0.85908	0.4662	0.85908	0.1628	5.81356
1584.6	1470.733	0.4112	0.80593	0.806	0.16529	7.30939	0.08802	0.806	0.4112	0.80593	0.16529	7.30939
1584.7	1470.821	0.36077	0.76385	0.784	0.16766	9.56843	0.08801	0.784	0.36077	0.78385	0.16766	9.56843
1584.8	1470.909	0.33063	0.77197	0.772	0.16759	11.18891	0.08789	0.772	0.33063	0.77197	0.16759	11.18891
1584.9	1470.997	0.32248	0.7792	0.779	0.16521	11.16088	0.08801	0.779	0.32248	0.7792	0.16521	11.16088
1585	1471.084	0.33097	0.80833	0.808	0.16111	9.68985	0.08789	0.808	0.33097	0.80833	0.16111	9.68985
1585.1	1471.173	0.34224	0.85838	0.858	0.15636	8.15877	0.08814	0.858	0.34224	0.85838	0.15636	8.15877
1585.2	1471.261	0.34422	0.90079	0.901	0.1524	7.46501	0.08789	0.901	0.34422	0.90079	0.1524	7.46501
1585.3	1471.348	0.33767	0.94911	0.949	0.14995	7.52687	0.08789	0.949	0.33767	0.94911	0.14995	7.52687
1585.4	1471.436	0.34274	1.01451	1	0.14611	6.8032	0.08801	1	0.34274	1.01451	0.14611	6.8032
1585.5	1471.524	0.36522	1.0912	1	0.14148	5.27291	0.08789	1	0.36522	1.0912	0.14148	5.27291
1585.6	1471.612	0.3987	1.13799	1	0.13922	3.93889	0.08814	1	0.3987	1.13799	0.13922	3.93889
1585.7	1471.7	0.43609	1.14647	1	0.1398	3.1588	0.08789	1	0.43609	1.14647	0.1398	3.1588
1585.8	1471.788	0.47822	1.13645	1	0.14137	2.72279	0.08789	1	0.47822	1.13645	0.14137	2.72279
1585.9	1471.876	0.50894	1.11484	1	0.14302	2.60792	0.08801	1	0.50894	1.11484	0.14302	2.60792
1586	1471.964	0.51297	1.07156	1	0.14658	2.92744	0.08789	1	0.51297	1.07156	0.14658	2.92744
1586.1	1472.052	0.49927	1.04136	1	0.14978	3.38515	0.08801	1	0.49927	1.04136	0.14978	3.38515
1586.2	1472.14	0.48084	1.02863	1	0.15279	3.93286	0.08789	1	0.48084	1.02863	0.15279	3.93286
1586.3	1472.228	0.45597	1.00362	1	0.15809	5.03802	0.0879	1	0.45597	1.00362	0.15809	5.03802
1586.4	1472.316	0.42533	0.94953	0.95	0.16781	7.6335	0.08801	0.95	0.42533	0.94953	0.16781	7.6335
1586.5	1472.404	0.39964	0.88804	0.888	0.17809	11.65673	0.08789	0.888	0.39964	0.88804	0.17809	11.65673
1586.6	1472.492	0.3735	0.82891	0.829	0.18529	15.99721	0.08801	0.829	0.3735	0.82891	0.18529	15.99721
1586.7	1472.58	0.34316	0.7777	0.778	0.18702	18.4194	0.08789	0.778	0.34316	0.7777	0.18702	18.4194
1586.8	1472.668	0.31056	0.73896	0.739	0.18169	17.77788	0.08789	0.739	0.31056	0.73896	0.18169	17.77788
1586.9	1472.755	0.28451	0.7168	0.717	0.16896	15.6583	0.08789	0.717	0.28451	0.7168	0.16896	15.6583
1587	1472.843	0.26857	0.72227	0.722	0.1499	14.13583	0.08789	0.722	0.26857	0.72227	0.1499	14.13583
1587.1	1472.931	0.26193	0.76189	0.762	0.12831	13.43211	0.08802	0.762	0.26193	0.76189	0.12831	13.43211
1587.2	1473.019	0.25993	0.82054	0.821	0.10806	13.11004	0.08789	0.821	0.25993	0.82054	0.10806	13.11004
1587.3	1473.107	0.25744	0.90135	0.901	0.09242	13.29333	0.08789	0.901	0.25744	0.90135	0.09242	13.29333
1587.4	1473.195	0.25708	1.02147	1	0.08102	13.26407	0.08789	1	0.25708	1.02147	0.08102	13.26407
1587.5	1473.283	0.26002	1.16518	1	0.07409	12.74802	0.08789	1	0.26002	1.16518	0.07409	12.74802
1587.6	1473.371	0.27076	1.31087	1	0.07072	11.1269	0.08801	1	0.27076	1.31087	0.07072	11.1269
1587.7	1473.459	0.2891	1.4046	1	0.07155	8.8446	0.08789	1	0.2891	1.4046	0.07155	8.8446
1587.8	1473.547	0.31193	1.44381	1	0.07639	6.67032	0.08789	1	0.31193	1.44381	0.07639	6.67032
1587.9	1473.635	0.32591	-999	-999			0.08789	0				
1588	1473.722	0.32607	-999	-999			0.08777	0				
1588.1	1473.81	0.32673	-999	-999			0.08801	0				
1588.2	1473.898	0.33652	-999	-999			0.0879	0				
1588.3	1473.986	0.35485	-999	-999			0.08789	0				
1588.4	1474.074	0.37374	-999	-999			0.08776	0				
1588.5	1474.162	0.39215	-999	-999			0.0879	0				
1588.6	1474.25	0.40945	-999	-999			0.08801	0				
1588.7	1474.338	0.42789	-999	-999			0.08777	0				
1588.8	1474.426	0.44076	-999	-999			0.08789	0				
1588.9	1474.513	0.43903	-999	-999			0.08789	0				

1589	1474.601	0.41684	-999	0.08777	0	0	0
1589.1	1474.689	0.38298	-999	0.08801	0	0	0
1589.2	1474.777	0.35427	-999	0.08777	0	0	0
1589.3	1474.865	0.34244	-999	0.08789	0	0	0
1589.4	1474.953	0.35865	-999	0.08777	0	0	0
1589.5	1475.041	0.40143	-999	0.08789	0	0	0
1589.6	1475.128	0.46161	-999	0.08789	0	0	0
1589.7	1475.216	0.51769	-999	0.08789	0	0	0
1589.8	1475.304	0.55709	-999	0.08777	0	0	0
1589.9	1475.392	0.58016	-999	0.08789	0	0	0
1590	1475.48	0.58424	-999	0.08777	0	0	0
1590.1	1475.568	0.56244	-999	0.08789	0	0	0
1590.2	1475.656	0.5105	-999	0.08789	0	0	0
1590.3	1475.743	0.44763	-999	0.08777	0	0	0
1590.4	1475.831	0.39652	-999	0.08776	0	0	0
1590.5	1475.919	0.37142	-999	0.08777	0	0	0
1590.6	1476.007	0.37231	-999	0.08802	0	0	0
1590.7	1476.095	0.39269	-999	0.08776	0	0	0
1590.8	1476.182	0.41676	-999	0.08777	0	0	0
1590.9	1476.27	0.42453	-999	0.08777	0	0	0
1591	1476.358	0.41525	-999	0.08777	0	0	0
1591.1	1476.446	0.39215	-999	0.08789	0	0	0
1591.2	1476.534	0.36488	-999	0.08777	0	0	0
1591.3	1476.621	0.35252	-999	0.08789	0	0	0
1591.4	1476.709	0.36995	-999	0.08777	0	0	0
1591.5	1476.797	0.41011	-999	0.08789	0	0	0
1591.6	1476.885	0.45415	-999	0.08789	0	0	0
1591.7	1476.973	0.4914	-999	0.08777	0	0	0
1591.8	1477.06	0.5226	-999	0.08776	0	0	0
1591.9	1477.148	0.52923	-999	0.08777	0	0	0
1592	1477.236	0.50866	-999	0.08765	0	0	0
1592.1	1477.324	0.47786	-999	0.08777	0	0	0
1592.2	1477.412	0.45594	-999	0.08777	0	0	0
1592.3	1477.499	0.44584	-999	0.08777	0	0	0
1592.4	1477.587	0.45017	-999	0.08777	0	0	0
1592.5	1477.675	0.46681	-999	0.08776	0	0	0
1592.6	1477.763	0.47786	-999	0.08777	0	0	0
1592.7	1477.85	0.47436	-999	0.08777	0	0	0
1592.8	1477.938	0.45236	-999	0.08777	0	0	0
1592.9	1478.026	0.42187	-999	0.08777	0	0	0
1593	1478.114	0.38876	-999	0.08765	0	0	0
1593.1	1478.201	0.36639	-999	0.08789	0	0	0
1593.2	1478.289	0.35952	-999	0.08764	0	0	0
1593.3	1478.377	0.36096	-999	0.08777	0	0	0
1593.4	1478.465	0.36292	-999	0.08777	0	0	0
1593.5	1478.552	0.36761	-999	0.08765	0	0	0
1593.6	1478.64	0.36412	-999	0.08765	0	0	0
1593.7	1478.728	0.40588	-999	0.08764	0	0	0
1593.8	1478.816	0.42756	-999	0.08777	0	0	0
1593.9	1478.903	0.44949	-999	0.08789	0	0	0
1594	1478.991	0.46489	-999	0.08777	0	0	0
1594.1	1479.079	0.46919	-999	0.08777	0	0	0
1594.2	1479.167	0.46595	-999	0.08776	0	0	0
1594.3	1479.254	0.46899	-999	0.08765	0	0	0
1594.4	1479.342	0.48585	-999	0.08765	0	0	0

1594.5	1479.43	0.5105	-999	0.08777	0
1594.6	1479.517	0.52768	-999	0.08776	0
1594.7	1479.605	0.52791	-999	0.08765	0
1594.8	1479.693	0.51221	-999	0.08777	0
1594.9	1479.78	0.4871	-999	0.08765	0
1595	1479.868	0.45531	-999	0.08764	0
1595.1	1479.956	0.43286	-999	0.08777	0
1595.2	1480.043	0.43159	-999	0.08765	0
1595.3	1480.131	0.43786	-999	0.08777	0
1595.4	1480.219	0.43054	-999	0.08764	0
1595.5	1480.307	0.43256	-999	0.08765	0
1595.6	1480.394	0.45936	-999	0.08777	0
1595.7	1480.482	0.49028	-999	0.08764	0
1595.8	1480.57	0.50279	-999	0.08765	0
1595.9	1480.657	0.50459	-999	0.08764	0
1596	1480.745	0.4991	-999	0.08777	0
1596.1	1480.833	0.46675	-999	0.08764	0
1596.2	1480.92	0.42865	-999	0.08765	0
1596.3	1481.008	0.41693	-999	0.08764	0
1596.4	1481.096	0.43459	-999	0.08765	0
1596.5	1481.183	0.46173	-999	0.08765	0
1596.6	1481.271	0.49126	-999	0.08764	0
1596.7	1481.359	0.5201	-999	0.08765	0
1596.8	1481.446	0.53332	-999	0.08765	0
1596.9	1481.534	0.53266	-999	0.08764	0
1597	1481.621	0.53421	-999	0.08765	0
1597.1	1481.709	0.55225	-999	0.08765	0
1597.2	1481.797	0.58355	-999	0.08764	0
1597.3	1481.884	0.62283	-999	0.08765	0
1597.4	1481.972	0.64827	-999	0.08765	0
1597.5	1482.06	0.64567	-999	0.08752	0
1597.6	1482.147	0.61529	-999	0.08777	0
1597.7	1482.235	0.57902	-999	0.08752	0
1597.8	1482.323	0.5589	-999	0.08765	0
1597.9	1482.41	0.564	-999	0.08752	0
1598	1482.498	0.58044	-999	0.08765	0
1598.1	1482.585	0.58738	-999	0.08777	0
1598.2	1482.673	0.57382	-999	0.08752	0
1598.3	1482.761	0.5446	-999	0.08765	0
1598.4	1482.848	0.50347	-999	0.08752	0
1598.5	1482.936	0.45977	-999	0.08765	0
1598.6	1483.023	0.43545	-999	0.08765	0
1598.7	1483.111	0.42911	-999	0.08752	0
1598.8	1483.199	0.4263	-999	0.08765	0
1598.9	1483.286	0.41783	-999	0.08752	0
1599	1483.374	0.41054	-999	0.08753	0
1599.1	1483.461	0.39936	-999	0.08777	0
1599.2	1483.549	0.38338	-999	0.08752	0
1599.3	1483.636	0.36624	-999	0.08752	0
1599.4	1483.724	0.36281	-999	0.08753	0
1599.5	1483.812	0.37183	-999	0.08765	0
1599.6	1483.899	0.3901	-999	0.08764	0
1599.7	1483.987	0.41859	-999	0.08753	0
1599.8	1484.074	0.44329	-999	0.08752	0
1599.9	1484.162	0.44641	-999	0.08753	0

| 1600 | 1484.249 | 0.42029 | -999 | -999 | | 0 | 0.08752 | 0 | | | | |

PE908934

This is an enclosure indicator page.
The enclosure PE908934 is enclosed within the
container PE908930 at this location in this
document.

The enclosure PE908934 has the following characteristics:

ITEM_BARCODE = PE908934
CONTAINER_BARCODE = PE908930
NAME = Dunbar-1 DW-1 Petrophysics Log
BASIN = OTWAY
ONSHORE? = Y
DATA_TYPE = WELL
DATA_SUB_TYPE = MONTAGE_LOG
DESCRIPTION = Dunbar-1 DW-1 Petrophysics Log
Enclosure of Appendix 4: Petrophysics
Report
REMARKS =
DATE_WRITTEN =
DATE_PROCESSED =
DATE_RECEIVED = 07-MAY-2002
RECEIVED_FROM = Origin Energy Resources Limited
WELL_NAME = Dunbar-1 DW-1
CONTRACTOR =
AUTHOR =
ORIGINATOR = Origin Energy Resources Limited
TOP_DEPTH =
BOTTOM_DEPTH =
ROW_CREATED_BY = DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 5: BIT RECORD

**ORIGIN ENERGY RESOURCES LTD.
BIT RECORD**

Well : <u>Dunbar 1 DW 1</u>		Basin / Area : <u>OTWAY BASIN</u>		Permit : <u>PPL1</u>		Field : _____		Re entry																	
Location : <u>Latitude : 38° 32' 53.79" S</u>		<u>Longitude : 142° 54' 23.11" N</u>		G.L. <u>77.20 metres</u>		Spud Date: <u>19-Mar-01</u>																			
Contractor : <u>OD&E</u>		Well Site Supervisor: <u>Barry Beetson</u>		K.B. <u>81.40 metres</u>		T.D. Date: <u>23-Mar-01</u>																			
		Rig #: <u>30</u>		Proposed TD: _____		Rig Released Date: _____																			
PUMPS																									
No.	Type	Stroke (in)	Liner (in)	Output (gps)	Section	Dev	Interval	Type	Wt																
1	GD PZ-8 Triplex	8.00	5.50	2.34	Surface	28.3;323.7	0m to 1636m	KCL/PHPA	9.10																
2	GD PZ-8 Triplex	8.00	5.50	2.34	Main	28.3;323.7	1636m to 1636m	KCL/PHPA	9.10																
MUD TYPE																									
Bit No.	Run No.	Size (in)	Make	Type	IADC Code	Serial No.	Nozzles	Motor Y / N	Shock-Sub Serial No.	Depth Out	Metres	Hours	ROP (m/hr)	Accum Hours	Bit Grading I O D L B G O R	WOB Mn Mx	RPM Mn Mx	Press (psi)	Pump (gpm)						
0																									
1	1	6.0	HTC	STR-09D	437	B09ZW	12 12 12	n		1209	1209	0	0.0	0	4	WT	A	E 1 ER TD	2	15	125	185	2150	250	
2	1	6.0	HTC	STR-09D	437	B09ZW	12 12 12	n		1636	427	45	9.5	45	3	4	WT	A	E 1 ER TD	2	15	125	185	2150	250

Comments : _____

IADC DULL BIT GRADING

CUTTING STRUCTURE				BEARINGS / SEALS	GAGE	OTHER DULL CHAR.	REASON PULLED
INNER	OUTER	DULL CHAR.	LOCATION				
①	②	③	④	⑤	⑥	⑦	⑧

① INNER CUTTING STRUCTURE (All inner rows)

② OUTER CUTTING STRUCTURE (Gage row only)

In columns 1 and 2 a linear scale from 0 to 8 is used to describe the condition of the cutting structure according to the following:

STEEL TOOTH BITS	INSERT BITS	FIXED CUTTER BITS
A measure of lost tooth height due to abrasion and / or damage	A measure of total cutting structure reduction due to lost, worn and / or broken inserts	A measure of lost, worn and / or broken cutting structure
0 - NO LOSS OF TOOTH HEIGHT	0 - NO LOST, WORN AND/OR BROKEN INSERTS	0 - NO LOST, WORN AND/OR BROKEN CUTTING STRUCTURE
8 - TOTAL LOSS OF TOOTH HEIGHT	8 - ALL INSERTS LOST, WORN AND/OR BROKEN	8 - ALL OF CUTTING STRUCTURE LOST, WORN AND/OR BROKEN

③ DULL CHARACTERISTICS (Use only cutting structure related codes.)

BC *	BROKEN CONE	FC	FLAT CRESTED WEAR	RG	ROUNDED GAGE
BF	BOND FAILURE	HC	HEAT CHECKING	RO	RING OUT
BT	BROKEN TEETH / CUTTERS	JD	JUNK DAMAGE	SD	SHIRT-TAIL DAMAGE
BU	BALLED UP BIT	LC *	LOST CONE	SS	SELF-SHARPENING WEAR
CC *	CRACKED CONE	LN	LOST NOZZLE	TR	TRACKING
CD *	CONE DRAGGED	LT	LOST TEETH / CUTTERS	WO	WASHED OUT BIT
CI	CONE INTERFERENCE	OC	OFF-CENTRE WEAR	WT	WORN TEETH / CUTTERS
CR	CORED	PB	PINCHED BIT	NO	NO DULL CHARACTERISTICS
CT	CHIPPED TEETH / CUTTERS	PN	PLUGGED NOZZLE / FLOW PASSAGE	* Show Cone # or #'s under location ④	
ER	EROSION				

④ LOCATION

ROLLER CONE		
N	NOSE ROW	CONE #
M	MIDDLE ROW	1
G	GAGE ROW	2
A	ALL ROWS	3

FIXED CUTTER			
C	CONE	S	SHOULDER
N	NOSE	G	GAGE
T	TAPER	A	ALL AREAS

⑤ BEARINGS / SEALS

NON-SEALED BEARINGS	
A linear scale estimating bearing life used.	
0	No life used
8	All life used (No bearing life left.)

SEALED BEARINGS			
E	SEALS EFFECTIVE	X	FIXED CUTTER (BEARINGLESS)
F	SEALS FAILED		
N	NOT ABLE TO GRADE		

⑥ GAGE (Measure in sixteenths of an inch)

0	1	2	4
-	1/16"	1/8"	1/4"
IN GAGE	OUT OF GAGE	OUT OF GAGE	OUT OF GAGE

⑦ OTHER DULL CHARACTERISTIC (Refer to column ③ codes)

⑧ REASON PULLED OR RUN TERMINATED

BHA	CHANGE BOTTOM HOLE ASSEMBLY	LIH	LEFT IN HOLE	HR	HOURS ON BIT
DMF	DOWNHOLE MOTOR FAILURE	RIG	RIG REPAIR	PP	PUMP PRESSURE
DTF	DOWNHOLE TOOL FAILURE	CM	CONDITION MUD	PR	PENETRATION RATE
DSF	DRILL STRING FAILURE	CP	CORE POINT	TD	TOTAL DEPTH / CASING DEPTH
DST	DRILL STEM TEST	DP	DRILL PLUG	TQ	TORQUE
LOG	RUN LOGS	FM	FORMATION CHANGE	TW	TWIST OFF
		HP	HOLE PROBLEMS	WC	WEATHER CONDITIONS

APPENDIX 6: CASING AND CEMENT REPORTS

CASING TALLY SHEET

WELL: Dunbar 1 DW 1 CONDUCTOR SIZE (") 14 WT (ppf) 36 DEPTH 8.0 DATE: 25/06/2000
 CASING SIZE (") 9 5/8 WEIGHT (ppf) 36 GRADE: K-55 MAKE UP TORQUE (ft/lbs) 4890

Joint No.	Length	Cum Tally	Joint No.	Length	Cum Tally	Joint No.	Length	Cum Tally	Joint No.	Length	Cum Tally	Joint No.	Length	Cum Tally
1	11.76	11.76	61		306.02	121		306.02	181		306.02	241		306.02
2	11.29	23.05	62		306.02	122		306.02	182		306.02	242		306.02
3	11.80	34.85	63		306.02	123		306.02	183		306.02	243		306.02
4	11.83	46.68	64		306.02	124		306.02	184		306.02	244		306.02
5	11.72	58.40	65		306.02	125		306.02	185		306.02	245		306.02
6	11.77	70.17	66		306.02	126		306.02	186		306.02	246		306.02
7	12.23	82.40	67		306.02	127		306.02	187		306.02	247		306.02
8	11.74	94.14	68		306.02	128		306.02	188		306.02	248		306.02
9	11.48	105.62	69		306.02	129		306.02	189		306.02	249		306.02
10	11.66	117.28	70		306.02	130		306.02	190		306.02	250		306.02
11	12.13	129.41	71		306.02	131		306.02	191		306.02	251		306.02
12	12.35	141.76	72		306.02	132		306.02	192		306.02	252		306.02
13	12.25	154.01	73		306.02	133		306.02	193		306.02	253		306.02
14	11.50	165.51	74		306.02	134		306.02	194		306.02	254		306.02
15	11.53	177.04	75		306.02	135		306.02	195		306.02	255		306.02
16	11.29	188.33	76		306.02	136		306.02	196		306.02	256		306.02
17	11.55	199.88	77		306.02	137		306.02	197		306.02	257		306.02
18	11.74	211.62	78		306.02	138		306.02	198		306.02	258		306.02
19	11.81	223.43	79		306.02	139		306.02	199		306.02	259		306.02
20	11.87	235.30	80		306.02	140		306.02	200		306.02	260		306.02
21	11.81	247.11	81		306.02	141		306.02	201		306.02	261		306.02
22	11.87	258.98	82		306.02	142		306.02	202		306.02	262		306.02
23	11.81	270.79	83		306.02	143		306.02	203		306.02	263		306.02
24	11.87	282.66	84		306.02	144		306.02	204		306.02	264		306.02
25	11.71	294.37	85		306.02	145		306.02	205		306.02	265		306.02
26	11.65	306.02	86		306.02	146		306.02	206		306.02	266		306.02
27		306.02	87		306.02	147		306.02	207		306.02	267		306.02
28		306.02	88		306.02	148		306.02	208		306.02	268		306.02
29		306.02	89		306.02	149		306.02	209		306.02	269		306.02
30		306.02	90		306.02	150		306.02	210		306.02	270		306.02
31		306.02	91		306.02	151		306.02	211		306.02	271		306.02
32		306.02	92		306.02	152		306.02	212		306.02	272		306.02
33		306.02	93		306.02	153		306.02	213		306.02	273		306.02
34		306.02	94		306.02	154		306.02	214		306.02	274		306.02
35		306.02	95		306.02	155		306.02	215		306.02	275		306.02
36		306.02	96		306.02	156		306.02	216		306.02	276		306.02
37		306.02	97		306.02	157		306.02	217		306.02	277		306.02
38		306.02	98		306.02	158		306.02	218		306.02	278		306.02
39		306.02	99		306.02	159		306.02	219		306.02	279		306.02
40		306.02	100		306.02	160		306.02	220		306.02	280		306.02
41		306.02	101		306.02	161		306.02	221		306.02	281		306.02
42		306.02	102		306.02	162		306.02	222		306.02	282		306.02
43		306.02	103		306.02	163		306.02	223		306.02	283		306.02
44		306.02	104		306.02	164		306.02	224		306.02	284		306.02
45		306.02	105		306.02	165		306.02	225		306.02	285		306.02
46		306.02	106		306.02	166		306.02	226		306.02	286		306.02
47		306.02	107		306.02	167		306.02	227		306.02	287		306.02
48		306.02	108		306.02	168		306.02	228		306.02	288		306.02
49		306.02	109		306.02	169		306.02	229		306.02	289		306.02
50		306.02	110		306.02	170		306.02	230		306.02	290		306.02
51		306.02	111		306.02	171		306.02	231		306.02	291		306.02
52		306.02	112		306.02	172		306.02	232		306.02	292		306.02
53		306.02	113		306.02	173		306.02	233		306.02	293		306.02
54		306.02	114		306.02	174		306.02	234		306.02	294		306.02
55		306.02	115		306.02	175		306.02	235		306.02	295		306.02
56		306.02	116		306.02	176		306.02	236		306.02	296		306.02
57		306.02	117		306.02	177		306.02	237		306.02	297		306.02
58		306.02	118		306.02	178		306.02	238		306.02	298		306.02
59		306.02	119		306.02	179		306.02	239		306.02	299		306.02
60		306.02	120		306.02	180		306.02	240		306.02	300		306.02
Column Total		306.02	Column Total			Column Total			Column Total			Column Total		

GUIDE SHOE : 0.30 m FLOAT COLLAR : 0.33 m TOTAL 26 Joints : 306.02 m
 LANDING JOINT IN : 5.25 m TOTAL LENGTH : 306.65 m DEPTH SHOE SET : 311.90 m RT

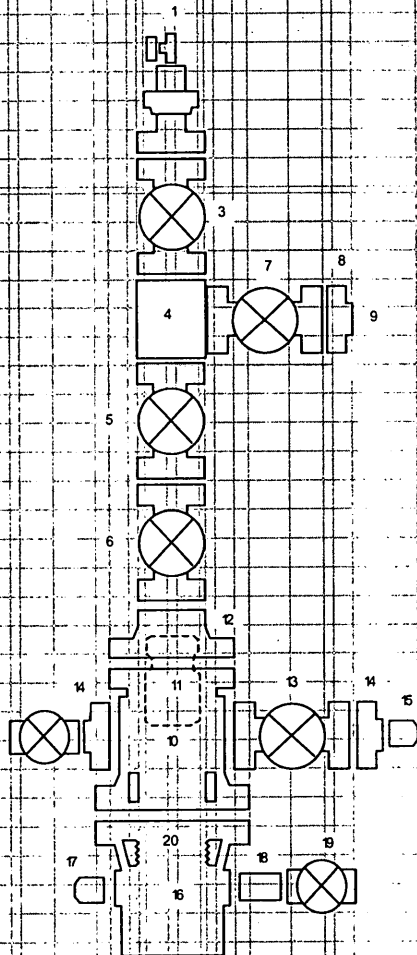
APPENDIX 7: DOWNHOLE INSTALLATION & COMPLETION DIAGRAMS

Origin <small>energy</small>		Downhole Installation Diagram				Well:	Dunbar 1 DW1	
Item No.	Description	Length (m)	Depth (m RT)		MD	Min ID		
1								
2	1 RT to top of tubing spool flange	4.20						
	2 Hanger, CIW FBB-EN 6" x 2-7/8" EUE w/ 2.5" Type 'H' BPV thread prep.	0.30	4.20					
			4.50					
3	158 joints 2-7/8" EUE J55 6.5 ppf tubing	1521.41	4.50					
4	6' x 2-7/8" EUE tubing pup joint - 'marker'	1.90	1525.91					
5	10 joints 2-7/8" EUE J55 6.5 ppf tubing	96.29	1527.81					
6	2-7/8" EUE TOPCO float collar	0.36	1624.10					
7	1 joint 2-7/8" EUE J55 6.5 ppf tubing	9.62	1624.46					
8	2-7/8" EUE TOPCO float shoe	0.38	1634.08					
	End of Tubing		1634.46					
A	Actual TOC @		1067.00					
B	Kick off point		~1215					
	Max dog leg 7 degrees/30 metres							
	Max inclination 28.8 degrees							
PERFORATIONS		Gun		Charges				
Formation	Interval (m RT)	Size	Type	SPF	Type	Ph	gm	
Waarre 'A'	1559-1562 & 1564-1569	2.1/8"	HSD	6	NTX	60	6.4	
Well perforated March 09, 2001								
5	Surface casing	9-5/8" / 36-43.5 ppf / N80 / BTC shoe at 312 m KB						
	Intermediate casing	7" / 23-26 ppf / J55-N80 / LTC shoe at 1210 m KB						
6	Production casing	2-7/8" / 6.5 ppf / J55 / EUE shoe at 1624 m RT						
	Cementing Details	300 sacks class G + 1% Halad 322						
	Remarks	2-7/8" tubing cemented to create mono bore						
7	String Weight Calculated	Actual						
	Wellsite Supervisor	B Beetson		Not to Scale				
8	Date of Installation	25/03/2001		Proposed				
PBDT: 1622 m RT		Drafted by	BB	Date:	25/03/20	Re-Completion		
		Checked by	<i>RAW</i>	Date:	11/04/01	Completion	X	



Wellhead Diagram

Well: DUNBAR 1 DW1



C - Section

1	Needle valve, 1/2"NPT with 1/2" x 1" bush
2	Tree cap 5 1/2" Bowen union with 2 7/8" EUE
3	Gate valve, 2 9/16" 5M flanged, WGPC
4	Tee, 2 9/16" 5M x 2 1/16" 5M
5	Gate valve, 2 9/16" 5M flanged, WGPC
6	Gate valve, 2 9/16" 5M flanged, CIW
7	Gate valve, 2 1/16" 5M flanged, WGPC
8	Companion flange 2 1/16" 5M x 2" NPT
9	Bull plug 2" NPT

B - Section

10	Tubing spool, 7-1/16" 5M x 11" 3M
11	CIW, FBB; EN Tubing hanger, 2-7/8" EUE
12	Bonnet, 7-1/16" 5M x 2-9/16"
13	Gate valve 2 1/16" 5m flanged
14	2 1/16" Companion flange, 5M x 2" NPT
15	Bull plug 2" NPT

A - Section

16	Casing head 11" 3M x 9-5/8" with 2 x 2" npt outlets
17	2" NPT bull plug
18	2" NPT nipple
19	2" NPT ball valve
20	Slip and seal assembly 11" x 7"

Well Details	Surface	Intermediate	Production
Size (inches)	9-5/8"	7"	2-7/8"
Weight (ppf)	36 - 43.5	23 - 26	6.5
Grade	K55	K55 - N80	J55
Shoe (m KB)	312	1210	1634

Rig Supervisor	B Beeton		
Date Installed	26/03/01		
Drafted by	BB	Date	26/03/01
Checked by	RAN	Date	27/03/01

APPENDIX 8: DRILLING FLUID SUMMARY REPORT



RACEDANE PTY LTD
DRILLING FLUID CONSULTANTS

908930 149

WELL : DUNBAR 1 DW1 LOCATION : PPL 1, VIC. DATE : 20th MAR., 01
 OPERATOR : ORIGIN ENERGY ENGINEER : E. TRETOWAN REPORT No. : 1-2
 REPORT FOR : B. Beelson / E. Tretowan RIG No. : OD&E # 30 TIME : 24.00
 OPERATION : Pick up 3-1/2" drill pipe and RIH DEPTH : _____

MUD DATA		
Time		24:00
Depth	m	
Density	PPG	8.5
Viscosity	cp/pt	60
PV	cp	
YP	lb/100ft ²	
Gels	lb/100ft ²	
API Filtrate	ccs	
Cake	cm	
Sand	% Vol	
Chloride	ppm	
Oil/Water	ppm	
nH		0.5
Bit Filtrate	ccs	
Chloride	ppm	
Total Hard	ppm	
KCl	%	4.0
Rf / @ °F		
Sulphite	mg/L	
Flowline Temp.	°C	
at C-50		

RIT DATA		
No.	1	
Size	6.0	
Type	STR090	
Jets	12,12,12	
Out (m)	IN	
Metres		
Hours		
Metres/Hr		
WOB k lbs		
RPM		
Dev		
T.R.C		

MATERIAL USAGE	
KCl	140
PAC R	10
PHPA Dry Powder	12
CAUSTIC POTASH	1

DAILY COST	€	5317.76
CUMUL COST	€	5317.76

PIUMP		
Time	GD 07 R	?
Linear	55	
Stroke	80	
Bbls/Sik	0.0559	
Eff (%)	95	
SPM		
Bbls/Min		
Gal/Min		
Draw (in)		
SCR		

EQUIPMENT		
	Size	Hours
Shaker	3 x 110	
Shaker	3 x 110	
Desander		
Desilter	12 x 5'	

Bbls Made-24 Hrs	480
Bbls Made-Cumul.	480

SYSTEM VOLUMES									
ANNULUS					DRILL STRING				
Size	inch	70CSG	60OH	60OH	Size	inch	3.5 DP	3.5 HWDP	4.75 DC
Hole ID	inch	6.276	6.0	6.0	Pipe ID	inch	2.60	2.06	2.25
Pipe OD	inch	3.5	3.5	4.75	Capacity	bbblm	0.0215	0.0136	0.0161
Ann. Vol	bbblm	0.0865	0.0757	0.0428	Section Length	m			
Section Length	m				Section Volume	bbbls			
Section Vol	bbbls				Flow Type				
Ann. Vel.	m/min				Pressure Drop	psi			
Crit Vel.	m/min				Theoretical Lag				mins
Flow Type					Carbide Lag				stks
Pressure Drop	psi				Est. Average I.D.				ins
Total Annular Volume	bbbls				Total String Volume	bbbls			
Surface Volume	480	bbbls	Total Circulating Volume	bbbls	Mud Volume in Hole	bbbls	Total Circulation Time	mins	

SYSTEM HYDRAULICS	
SYSTEM PRESSURE DROPS	
Surface	psi
Drill String	psi
Bit Jets	psi
Annulus	psi
Hydrostatic Head	psi
Equip. Circulating Dens.	SG
Jet Velocity	m/sec
Jet Impact Force	lbs
Bit HHP	
System HHP	
% HHP at Bit	
HHP/sq. in	
F.I.T. at Casing Shoe	SG

ACTIVITY
PH 4 - Bit Bit Sub 30 x 3.5" HWDP - 280 GPM
19th MAR. : Drill rat hole and mouse hole with PAC - fresh water mud.
Nipple up to existing B Section
20th MAR. : Complete nipple up. Pressure test BOPs. Mu NB # 1 and RIH picking up 3.5" drill string
Mixed 480 bbl 4% KCl / PHPA mud



RACEDANE PTY LTD
DRILLING FLUID CONSULTANTS

908930 150

WELL : DUNBAR 1 DW1 LOCATION : PPL 1, VIC. DATE : 21st MAR., 01
 OPERATOR : ORIGIN ENERGY ENGINEER : E. TRETHOWAN REPORT No. : 3
 REPORT FOR : B. Beelson / E. Trethowan RIG No. : OD&E # 30 TIME : 24.00
 OPERATION : Time drill with down hole motor to initiate side track DEPTH : 1217 m

MUD DATA		
Time		24:00
Depth	m	1217
Density	PPG	8.6
Viscosity	spc/st	50
PV	cp	
YP	lb/100ft ²	
Gels	lb/100ft ²	
API Filtrate	ccs	
Cake	cm	
Sand	% Vol	
Clay	% Vol	
Chloride	ppm	10
API Filtrate	ccs	
Chloride	ppm	
Total Hard	ppm	
KCl	%	4
Rf / @ °F		
Sulphite	ppm	
Flowline Temp.	°C	
At C-50		

RIT DATA		
Size		6.0
Type		STR090
Jets		12 12 12
Out (m)		IN
Metres		2
Hours		1.5
Metres/Hr		1.3
WOB k lbs		1-3
RPM		DHM-105
Dev		
T.R.C		

MATERIAL USAGE		
KCl		15
PAC R		2
PHPA Dry Powder		4
CAUSTIC POTASH		
BARITE		10

DAILY COST	€	1426.17
CUMUL COST	€	6743.93

PIUMP		
Time		GN D7 R
Linear		55
Stroke		8.0
Bbls/Sik		0.0559
Eff (%)		95
SPM		90
Bbls/Min		5.03
Rot/Min		211
Drum (min)		1100
SCR		

EQUIPMENT		
	Size	Hours
Shaker	3 x 110	4
Shaker	3 x 110	4
Desander		
Desilter	12 x 5'	

Bbls Made-24 Hrs		120
Bbls Made-Cumul.		600

SYSTEM VOLUMES						
ANNULUS				DRILL STRING		
Size	inch	70CSG	60CH	60CH	Size	inch
Hole ID	inch	6.276	6.0	6.0	3.5 DP	3.5 HWDP
Pipe OD	inch	3.5	3.5	4.75	2.06	2.25
Ann. Vol	bm ³ /m	0.0865	0.0757	0.0428	Capacity	bm ³ /m
Section Length	m	1209		8	0.0215	0.0136
Section Vol	bbls	104.6		0.3	Section Length	m
Ann. Vol.	m ³ /m	58		116	Section Volume	bbls
Crit Vol	m ³ /m				18.6	4.4
Flow Type					Flow Type	
Pressure Drop	psi				Pressure Drop	psi
					Theoretical Len	1478
					Carbide Len	stks
					Est. Average I.D.	ins

Total Annular Volume	105	bbls	Total String Volume	22	bbls	Mud Volume in Hole	128	bbls
Surface Volume	470	bbls	Total Circulating Volume	598	bbls	Total Circulation Time	119	mins

SYSTEM HYDRAULICS	
SYSTEM PRESSURE DROPS	
Surface	psi
Drill String	psi
Bit Jets	psi
Annulus	psi
Hydrostatic Head	psi
Equiv. Circulating Dens.	SG
Jet Velocity	m/sec
Jet Impact Force	lbs
Bit HHP	
System HHP	
% HHP at Bit	
HHP/sq. in	
F.J.T. at Casing Shoe	SG

ACTIVITY

BHA - Bit Motor Float Sub. Sub. Sub. Hoses OR Collar 11800 NMDG - 25.46m, 27 x 3.5' HWDP, Jars, 8 x 3.5' HWDP - 333.96M

21st MAR : Cont. RIH, picking up drill string. Tag cement at 1173 m.

Drill cement, using water, to 1215 m. Circulate and displace hole to KCl - PHPA mud. Slug pipe and POH. Pick up directional BHA. RIH. Circ.

Rig up and run motor orientation with gyro. Time drill to 1217 m.

Mix 120 bbl premix to rebuild pit volume after displacing hole.

Slight pH increase from drilling off cement

Note - 7' shoe depth at 1209.23 m



RACEDANE PTY LTD
DRILLING FLUID CONSULTANTS

908930 151

WELL : DUNBAR 1 DW1 LOCATION : PPL 1, VIC. DATE : 22nd MAR., 01
 OPERATOR : ORIGIN ENERGY ENGINEER : E. TRETLOWAN REPORT No. : 4
 REPORT FOR : B. Beetson / E. Trethowan RIG No. : OD&E # 30 TIME : 24.00
 OPERATION : Drilling at 1395 m in rotary - inclination 28.8 deg TVD 1386 m DEPTH : 1395 m

MUD DATA		
Time	KPI - OMDA	
Time	10:30	24:00
Depth	m	1270 1395
Density	PPG	8.6 8.7+
Viscosity	sec/stk	45 48
PV	cp	13 15
YP	lb/100ft ²	14 20
Gels	lb/100ft ²	2/3 2/4
API Filtrate	ccs	NC 8.0
Cake	cm	- 1
Sand	% Vol	Tr Tr
Solids	% Vol	1.5
Oil/Water	ml	1 / 0.5
nH	ml	10 0.5
API Filtrate	ccs	0.2 / 0.6 0.2 / 0.4
Chloride	ppm	20000 20000
Total Hard	ppm	120 140
KCl	%	4.6 4.1
Rf / @ °F		
Sulphite	mg/L	
Flowline Temp.	°C	
at C.S.D	100K	100K

RIT DATA	
Size	6.0
Type	STR09D
Jets	12,12,12
Out (m)	IN
Metres	180
Hours	22
Metres/Hr	8.2
WOB k lbs	15
RPM	60-M-123
Dev	28.8
T.R.C	NDI.C

MATERIAL USAGE	
PAC R	5
PHPA Dry Powder	
CAUSTIC POTASH	
BARITE	
MI GEL	15

DAILY COST	€	1072.05
CUMUL COST	€	7768.88

PIUMP		
Time	1	2
Linear	5.5	
Stroke	8.0	
Bbls/Sk	0.0559	
Eff (%)	95	
SPM	105	
Bbls/Min	5.86	
CalAnn	245	
Drain (min)	2000	
SCR		

EQUIPMENT		
	Size	Hours
Shaker	3 x 110	24
Shaker	3 x 110	24
Desander		
Desilter	12 x 5"	

Bbls Made 24 Hrs	25
Bbls Made-Cumul.	625

SYSTEM VOLUMES									
	ANNULUS			DRILL STRING					
Size	inch	70CSG	60CH	60CH	Size	inch	3.5 DP	3.5 HWDP	4.75 DC
Hole ID	inch	6.276	6.0	6.0	Pipe ID	inch	2.60	2.06	2.25
Pipe OD	inch	3.5	3.5	4.75	Capacity	bbbl/m	0.0215	0.0136	0.0161
Ann. Vol	bbbl/m	0.0865	0.0757	0.0428	Section Length	m	1045.5	324	25.5
Section Length	m	1209	160.5	25.5	Section Volume	bbbls	22.5	4.4	0.4
Section Vol	bbbls	104.6	12.1	1.1	Flow Type				
Ann. Vel.	m/min	68	77	137	Pressure Drop	psi			
Cost Vol	m ³				Theoretical Loss		2111		ml/m
Flow Type					Carbide Lag				stks
Pressure Drop	psi	109	19	12	Est. Average I.D.				ins

Total Annular Volume	118	bbbls	Total String Volume	27	bbbls	Mud Volume in Hole	145	bbbls
Surface Volume	400	bbbls	Total Circulating Volume	545	bbbls	Total Circulation Time	119	mins

SYSTEM HYDRAULICS	
SYSTEM PRESSURE DROPS	
Surface	psi
Drill String	psi
Bit Jets	psi
Annulus	psi
Hydrostatic Head	psi
Equiv. Circulating Dens.	SG
Jet Velocity	m/sec
Jet Impact Force	lbs
Bit HHP	
System HHP	
% HHP at Bit	
HHP/sq. in	
F.I.T. at Casing Shoe	PPG

ACTIVITY

RWD - Bit Motor Final Sub. Stk. Sub. Hoses Off Casing HWDG MWDG - 25.46m, 27 x 3.5" HWDP, Jars, 8 x 3.5" HWDP - 333.96M

22nd MAR : Cont. time drilling to establish kick off. Slide and rotary drill to build inclination and correct azimuth. Drill to 1395 m.

Add premix for volume. Filtrate test had high spurt loss due to lack of solids to build filter cake. Add 1.5 ppb prehydrated gel and 0.5 ppb PAC - reduced filtrate to 8 ccs.

Mud density constant at 8.7 - 8.8 ppg. Plan to add barite to raise density to 9.1 ppg prior to top Waarre sand.



WELL : DUNBAR 1 DW1 LOCATION : PPL 1, VIC. DATE : 23rd MAR, 01
 OPERATOR : ORIGIN ENERGY ENGINEER : E. TRETOWAN REPORT No. : 5
 REPORT FOR : B. Beetson / E. Trethowan RIG No. : OD&E # 30 TIME : 24.00
 OPERATION : Wiper trip at 1636 m -TD. Final inclination 29.5 deg TVD 1597 m(approx.) DEPTH : 1636 m

MUD DATA		
Time	VCI - DHDs	
Time	06:00	23:00
Depth	m	1457 1636
Density	PPG	9.1 9.1
Viscosity	cp/ft	48 47
PV	cc	18 17
YP	t/1000ft ²	23 22
Gels	t/1000ft ²	31.4 21.4
API Filtrate	ccs	7.3 6.5
Cake	cm	1 1
Sand	% Vol	Tr Tr
Solids	% Vol	3.5 3.5
Oil/Water	% Vol	1 / 0.5
nH	cc	0.5 0.5
Chloride	ppm	0.1 / 0.3 0.2 / 0.4
Total Hard	ppm	10500 10000
KCl	%	4.0 4.0
Rf / @ °F		
Sulphite	mg/L	
Flowline Temp.	°C	
Δt C-50	100K	100K

BIT DATA	
Size	6.0
Type	STR09D
Jets	12,12,12
Out (m)	IN
Metres	421
Hours	45
Metres/hr	9.35
WOB k lbs	15
RPM	60-M-123
Dev	28.8
T.R.C	IN

MATERIAL USAGE	
VCI	25
PAC R	1
PHPA Dry Powder	3
CAUSTIC POTASH	1
BARITE	175
ALDECID G	1

DAILY COST	€	2600.12
CUMUL COST	€	10376.00

PIUMP		
Time	1	2
Linear	5.5	
Stroke	8.0	
Bbls/Strk	0.0559	
Eff (%)	95	
SPM	105	
Bbls/Min	5.86	
Cal Min	2.65	
Draw (psi)	2150	
SCR		

EQUIPMENT		
	Size	Hours
Shaker	3 x 110	24
Shaker	3 x 110	24
Desander		
Desiller	12 x 5'	

Bbls Made 24 Hrs	60
Bbls Made-Cumul.	685

ANNULUS				DRILL STRING					
Size	inch	70CSG	60CH	60CH	Size	inch	3.5 DP	3.5 HWDP	4.75 DC
Hole ID	inch	6.276	6.0	6.0	Pipe ID	inch	2.60	2.06	2.25
Pipe OD	inch	3.5	3.5	4.75	Capacity	bbl/m	0.0215	0.0136	0.0161
Ann. Vol	bbl/m	0.0865	0.0757	0.0428	Section Length	m	1286.5	324	25.5
Section Length	m	1209	401.5	25.5	Section Volume	bbls	27.6	4.4	0.4
Section Vol	bbls	104.6	30.4	1.1	Flow Type				
Ann. Vel	m/min	68	77	137	Pressure Drop	psi			
Cost Vol					Theoretical Ton		2424		
Flow Type					Carbide Lag				silks
Pressure Drop	psi	109	19	12	Est. Average I.D.				ins

Total Annular Volume	136	bbls	Total String Volume	27	bbls	Total Volume in Hole	163	bbls
Surface Volume	380	bbls	Total Circulating Volume	548	bbls	Total Circulation Time	93	mins

SYSTEM HYDRAULICS	
SYSTEM PRESSURE DROPS	
Surface	1.9
Drill String	1.9
Bit Jets	462
Annulus	183
Hydrostatic Head	2479 (1597m TVD)
Equiv. Circulating Dens.	9.7
Jet Velocity	73
Jet Impact Force	265
Bit HHP	66
System HHP	309
% HHP at Bit	21.5
HHP/sq. in	2.35
F.I.T. at Casing Shoe	10.0

ACTIVITY
RHA - Bit Meter Final Sub. Sub. Mann Off. Collar. UPRD. MMDV
- 25.46m, 27 x 3.5" HWDP, Jars, 8 x 3.5" HWDP - 333.96M
23rd MAR : Cont. drilling directionally. Mud density remained at 8.7+ ppg to 1440 m. Added Barite to raise density to 9.1 ppg prior to top Waare C sand. Flow check through target sands - no flow. Maintained volume with premix. Added biocide to control bacteria. Drilled to 1636 m - TD at 23:00 hrs. Circulate clean. Wiper trip to shoe.
Note - Barite addition - 17 ppb



RACEDANE PTY LTD
DRILLING FLUID CONSULTANTS

908930 153

WELL : DUNBAR 1 DW1 LOCATION : PPL 1, VIC. DATE : 24th MAR., 01
 OPERATOR : ORIGIN ENERGY ENGINEER : E. TRETHOWAN REPORT No. : 6
 REPORT FOR : B. Beelson / E. Trethowan RIG No. : OD&E # 30 TIME : 24.00
 OPERATION : POH - lay out drill string DEPTH : 1636 m

MUD DATA		
Time		VOL. DATA
Depth	m	23.00
Density	PPG	9.1
Viscosity	cp/100	47
PV	cp	17
YP	lb/100ft ²	22
Gels	lb/100ft ²	2/4
API Filtrate	ccs	6.5
Cake	cm	1
Sand	% Vol	Tr
Solids	% Vol	3.5
Oil/Water	% Vol	1 / 0.5
PH		9.5
Alk. Filtrate	meq/l	0.2 / 0.4
Chloride	meq/l	10000
Total Hard	meq/l	120
KCl	%	4.0
Rf / @ °F		
Sulphite	mg/l	
Flowline Temp.	°C	
Bit C.S.N		1000K

BIT DATA		
No.	1	100
Size	6.0	6.0
Type	STR09D	STR09D
Jets	12.12.12	OPEN
Out (m)	1636	
Metres	421	
Hours	45	
Metres/Hr	9.35	
WOB k lbs	15	
RPM	60-M-123	
Dev	29.5	
T.R.C	2E.1	

MATERIAL USAGE	
VOL	
PACR	1
PHPA Dry Powder	
CAUSTIC POTASH	
BARITE	40
ALDECIDE G	
MI GEL	5

DAILY COST	€	529.67
CUMUL COST	€	10238.67

PUMP		
Time	CONDTA	
Linear	5.5	
Stroke	8.0	
Bbls/Stk	0.0559	
Eff (%)	95	
SPM	105	
Bbls/Min	5.86	
Gal/Min	246	
Draw (meq)	1100	
SCR		

EQUIPMENT		
	Size	Hours
Shaker	3 x 110	24
Shaker	3 x 110	24
Desander		
Desilter	12 x 5'	

Bbls Made-24 Hrs	-
Bbls Made-Cumul.	685

SYSTEM VOLUMES									
ANNULUS					DRILL STRING				
Size	inch	70CSG	60OH	60OH	Size	inch	3.5 DP	3.5 HWDP	4.75 DC
Hole ID	inch	6.276	6.0	6.0	Pipe ID	inch	2.60	2.06	2.25
Pipe OD	inch	3.5	3.5	4.75	Capacity	bbbl/m	0.0215	0.0136	0.0161
Ann. Vol	bbbl/m	0.0865	0.0757	0.0428	Section Length	m	1311	325	-
Section Length	m	1209	426	-	Section Volume	bbbls	28.2	4.4	-
Section Vol	bbbls	104.6	32.2	-	Flow Type				
Ann. Vel.	m/min	68	77		Pressure Drop	psi			
Crit Vel.	m/min				Theoretical Loss		2451		etc
Flow Type					Carbide Lag				stks
Pressure Drop	psi	109	19	12	Est. Average I.D.				ins

Total Annulus Volume	137	bbbls	Total String Volume	33	bbbls	Fluid Volume in Hole	170	bbbls
Surface Volume	350	bbbls	Total Circulating Volume	520	bbbls	Total Circulation Time	89	mins

SYSTEM HYDRAULICS		
SYSTEM PRESSURE DROPS		
Surface	psi	
Drill String	psi	
Bit Jets	psi	
Annulus	psi	
Hydrostatic Head	psi	
Equiv. Circulating Dens.	SG	
Jet Velocity	ft/sec	
Jet Impact Force	lbs	
Bit HHP		
System HHP		
% HHP at Bit		
HHP/sq. in		
F.I.T. at Casing Shoe	PPG	
		10.0

ACTIVITY
24th MAR : Slug pipe wiper trip to shoe - work through tight hole. Run in and circulate clean. Slug pipe. POH. Hole good. Rig up and run wireline logs. Loggers TD - 1334 m. Hole caliper near gauge throughout. RIH with RR Bit. Wash to bottom. Circulate clean. Pump slug. POH. Lay down drill string.



RACEDANE PTY LTD
DRILLING FLUID CONSULTANTS

WELL : DUNBAR 1 DW1 LOCATION : PPL 1, VIC. DATE : 25th MAR., 01
 OPERATOR : ORIGIN ENERGY ENGINEER : E. TRETOWAN REPORT No. : 7
 REPORT FOR : B. Beelson / E. Trelhowan RIG No. : OD&E # 30 TIME : 24.00
 OPERATION : Tubing cemented. Prepare to rig release. DEPTH : 1636 m

MUD DATA		
Time		17:00
Depth	m	1636
Density	PPG	9.1
Viscosity	sec/100	
PV	cp	
YP	lb/100sq	
Gels	lb/100sq	
API Filtrate	ccs	
Cake	30yd	
Sand	% Vol	
Solids	% Vol	
Oil/Water		
pH		10
Alk Filtrate	ccs	
Chloride	ppm	10000
Total Hard	ppm	
KCl	%	4.0
Sulphite	mg/L	
Flowline Temp.	°C	
At 1000		100K

RIT DATA		
Ma	100	
Size	6.0	
Type	STR09D	
Jets	OPEN	
Out (m)		
Metres		
Hours		
Metres/Hr		
WOB k lbs		
RPM		
Dev		
T.R.G		

MATERIAL USAGE	
KCl	75
PACR	
PHPA Dry Powder	
CAUSTIC POTASH	1
BARITE	
ALDECIDE G	
MI GEL	
SAPP	6

DAILY COST	€	735.21
CUMUL COST	€	11673.00

PIUMP		
Time	COND R	
Linear	6.5	
Stroke	8.0	
Bbls/Stk	0.0559	
Eff (%)	95	
SPM		
Bbls/Min		
Gal/Min		
Draw (psi)		
SCR		

EQUIPMENT		
	Size	Hours
Shaker	3 x 110	
Shaker	3 x 110	
Desander		
Desilter	12 x 5'	

Bbls Made-24 Hrs	
Bbls Made-Cumul.	685

SYSTEM VOLUMES									
ANNULUS					DRILL STRING				
Size	inch	70CSG	60CH	60OH	Size	inch	3.5 DP	3.5 HWDP	4.75 DC
Hole ID	inch	6.276	6.0	6.0	Pipe ID	inch	2.60	2.06	2.25
Pipe OD	inch	3.5	3.5	4.75	Capacity	bbbl/m	0.0215	0.0136	0.0161
Ann. Vol	bbbl/m	0.0865	0.0757	0.0428	Section Length	m			
Section Length	m				Section Volume	bbbls			
Section Vol	bbbls				Flow Type				
Ann. Vel.	m/min				Pressure Drop	psi			
Cost Mat					Theoretical Len				mins
Flow Type					Carbide Lag				stks
Pressure Drop	psi				Est. Average I.D.				ins

Total Annular Volume	137	bbbls	Total String Volume	21	bbbls	Mud Volume in Hole	170	bbbls
Surface Volume	350	bbbls	Total Circulating Volume	520	bbbls	Total Circulation Time		mins

SYSTEM HYDRAULICS		
SYSTEM PRESSURE DROPS		
Surface	psi	
Drill String	psi	
Bit Jets	psi	
Annulus	psi	
Hydrostatic Head	psi	2479 (1597m TVD)
Equiv. Circulating Dens.	SG	
Jet Velocity	m/sec	
Jet Impact Force	lbs	
Bit HHP		
System HHP		
% HHP at Bit		
HHP/sq. in		
F.I.T. at Casing Shoe	PPG	10.0

ACTIVITY
25th MAR : Cont. lay out drill string. Rig up and run 2-7/8" tubing. Circ. tubing, add Caustic to last circulated mud to raise pH to 10. Mix and pump 25 bbl of 6 kg/bbl SAPP weighteed to 9.1 ppg with KCl. Cement tubing with Class G cement. Displace with water.

APPENDIX 9: DIRECTIONAL DRILLING END OF WELL REPORT

Well: Dunbar-1 DW-1
 Company: Origin Energy Ltd
 Co-ordinates: 38 deg 32 min 53.790 sec South
 142 deg 54 min 23.117 sec East
 Total Correction: 12.060
 Dip Angle: -69.813
 North Reference: Grid
 Logging Dates: 21/03/01 - 23/03/01
 Version of Data: 1
 Contractor: Sperry-Sun
 Survey Type: MWD
 Creation Date: 23-03-01

Warranty:

Sperry-Sun Drilling Services will use its best efforts to provide customers with accurate information and interpretation that are part of, and incidental to, the services provided. However, Sperry-Sun Drilling services cannot and does not warrant the accuracy or correctness of such information and interpretation. Under no circumstances should any such information or interpretation. Under no circumstances should any such information or interpretation be relied upon as the sole basis for any drilling, completion and production procedures, and all other activities related to drilling, completion, production, or financial decision or any procedure involving any risk to the safety of any drilling venture, drilling rig, its crew or any third party. The customer has full responsibility for all drilling, completion and production procedures, and all other activities relating to drilling, completion, or production operation. Sperry-Sun Drilling Services makes no warranties, either express or implied, including but not limited to the implied warranty of merchantability or fitness for a particular purpose, with respect to the services rendered. In no way shall Sperry-Sun Drilling Services be liable for any damages, resulting from the use of any information or interpretation provided by Sperry-Sun Drilling Services.

Depth (m)	Inc (deg)	Azimuth	TVD (m)	N/S Departure (m)	E/W Departure (m)	Vertical Sec (m)	DogLeg Severity (dptm)
0	0.00	360.00	0.00	0.00	0.00	0.00	0.00
60	0.14	45.66	60.00	0.05	0.05	0.01	0.07
90	0.19	43.10	90.00	0.11	0.11	0.02	0.05
120	0.28	42.44	120.00	0.20	0.20	0.03	0.09
150	0.29	43.05	150.00	0.31	0.30	0.05	0.01
180	0.25	42.75	180.00	0.42	0.39	0.07	0.04
210	0.23	48.53	210.00	0.50	0.48	0.08	0.03
240	0.17	49.50	240.00	0.57	0.56	0.09	0.06
270	0.19	45.93	270.00	0.64	0.63	0.09	0.02
300	0.29	38.40	300.00	0.73	0.71	0.11	0.10
330	0.53	39.66	330.00	0.90	0.85	0.15	0.24
360	0.51	54.37	360.00	1.08	1.05	0.17	0.13
390	0.53	39.38	389.99	1.27	1.24	0.19	0.14
420	0.57	35.14	419.99	1.50	1.42	0.26	0.06
450	0.50	38.99	449.99	1.72	1.59	0.32	0.08
480	0.34	44.18	479.99	1.89	1.73	0.36	0.16
510	0.48	33.76	509.99	2.05	1.86	0.41	0.16
540	0.42	46.18	539.99	2.23	2.01	0.45	0.11
570	0.24	50.21	569.99	2.35	2.14	0.46	0.18
600	0.25	44.78	599.99	2.44	2.23	0.47	0.03
630	0.33	50.79	629.99	2.54	2.35	0.47	0.09
660	0.27	47.66	659.99	2.64	2.47	0.48	0.06
690	0.29	29.86	689.99	2.75	2.56	0.51	0.09
720	0.21	37.81	719.99	2.86	2.63	0.55	0.09
750	0.20	38.22	749.99	2.95	2.69	0.57	0.01
780	0.23	50.06	779.99	3.03	2.77	0.58	0.05
810	0.20	45.11	809.99	3.10	2.86	0.59	0.04
840	0.25	61.05	839.99	3.17	2.95	0.58	0.08
870	0.37	53.64	869.99	3.26	3.08	0.57	0.13
900	0.50	61.37	899.99	3.38	3.28	0.54	0.14
930	0.37	54.49	929.98	3.50	3.47	0.51	0.14
960	0.20	75.68	959.98	3.57	3.60	0.48	0.20
990	0.32	67.99	989.98	3.61	3.73	0.43	0.12
1020	0.31	69.90	1019.98	3.67	3.88	0.38	0.01
1050	0.58	87.54	1049.98	3.71	4.11	0.26	0.30
1080	0.77	90.36	1079.98	3.71	4.46	0.04	0.19
1110	0.88	90.79	1109.98	3.71	4.90	-0.24	0.11
1140	1.04	94.50	1139.97	3.68	5.40	-0.57	0.17
1170	1.34	93.71	1169.97	3.64	6.02	-1.00	0.30
1186	1.41	94.61	1185.96	3.61	6.40	-1.27	0.14
1205.5	1.41	97.10	1205.46	3.56	6.88	-1.61	0.09

1224.9	2.69	346.02	1224.85	3.98	7.01	-1.37	5.35
1244.2	6.42	334.79	1244.08	5.39	6.44	0.09	5.92
1253.1	8.17	327.76	1252.91	6.38	5.89	1.20	6.63
1262.9	9.49	323.54	1262.60	7.62	5.04	2.70	4.49
1272.6	11.51	318.97	1272.13	8.99	3.93	4.46	6.76
1282.2	13.01	315.99	1281.51	10.49	2.55	6.50	5.07
1291.9	15.03	315.11	1290.92	12.17	0.90	8.84	6.29
1301.7	16.79	315.11	1300.35	14.07	-1.00	11.51	5.38
1311.4	17.58	314.23	1309.62	16.08	-3.03	14.36	2.57
1321	18.63	315.11	1318.74	18.18	-5.16	17.33	3.40
1330.7	19.78	316.69	1327.90	20.47	-7.37	20.51	3.88
1340.5	21.27	317.22	1337.08	22.98	-9.72	23.94	4.61
1350.2	23.47	315.81	1346.05	25.66	-12.26	27.62	6.99
1359.9	25.65	314.39	1354.87	28.51	-15.11	31.63	6.99
1369.7	27.98	313.61	1363.62	31.58	-18.29	36.02	7.22
1379.4	28.61	314.40	1372.16	34.78	-21.60	40.59	2.28
1388.4	28.83	314.73	1380.05	37.81	-24.68	44.89	0.90
1398.1	28.76	315.45	1388.55	41.12	-27.98	49.54	1.09
1407.7	28.81	315.60	1396.96	44.42	-31.21	54.14	0.28
1417.4	28.89	316.01	1405.46	47.78	-34.48	58.80	0.66
1446.7	28.75	317.95	1431.13	58.10	-44.11	72.90	0.97
1455.9	28.79	317.75	1439.20	61.38	-47.08	77.32	0.35
1465.7	28.56	318.62	1447.79	64.89	-50.22	82.02	1.46
1475.4	28.30	318.80	1456.32	68.36	-53.27	86.63	0.86
1484.9	28.22	319.87	1464.69	71.77	-56.20	91.13	1.62
1494.9	28.01	320.57	1473.51	75.39	-59.21	95.84	1.18
1504.5	28.21	320.38	1481.98	78.88	-62.09	100.37	0.69
1514.3	28.35	320.66	1490.61	82.46	-65.04	105.01	0.59
1524	28.30	321.61	1499.15	86.05	-67.93	109.61	1.40
1533.7	28.30	322.84	1507.69	89.68	-70.75	114.21	1.80
1543.4	28.39	323.02	1516.23	93.36	-73.52	118.81	0.37
1553.1	28.21	323.19	1524.77	97.03	-76.28	123.40	0.60
1562.9	28.12	323.02	1533.41	100.73	-79.06	128.03	0.37
1572.6	28.12	323.19	1541.96	104.39	-81.81	132.59	0.26
1582.3	28.30	323.72	1550.51	108.07	-84.54	137.17	0.94
1619.4	29.53	323.54	1582.98	122.52	-95.17	155.09	1.00

GyroSvyDunbar01DW1

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Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii»
°          SCIENTIFIC DRILLING INTERNATIONAL                      °
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii%

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Outrun
Survey Data

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Ascii file for : Origin Energy Resources Ltd.
Well Name      : Dunbar-1 DW 1
Location       : Otway Basin, Victoria
Survey date    : 21-MAR-01
SDC Job No.    : 87K0301019
Referenced to  : Grid North
Units of Depth : Metres
Survey Type    : KEEPER
of the         : 7" Casing surveyed inside 3 1/2" DP.

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Meas'rd Depth	Inc Deg	Azimuth Deg
0.00	0.00	360.00
60.00	0.14	45.66
90.00	0.19	43.10
120.00	0.28	42.44
150.00	0.29	43.05
180.00	0.25	42.75
210.00	0.23	48.53
240.00	0.17	49.50
270.00	0.19	45.93
300.00	0.29	38.40
330.00	0.53	39.66
360.00	0.51	54.37
390.00	0.53	39.38
420.00	0.57	35.14
450.00	0.50	38.99
480.00	0.34	44.18
510.00	0.48	33.76
540.00	0.42	46.18
570.00	0.24	50.21
600.00	0.25	44.78
630.00	0.33	50.79
660.00	0.27	47.66
690.00	0.29	29.86
720.00	0.21	37.81
750.00	0.20	38.22
780.00	0.23	50.06
810.00	0.20	45.11
840.00	0.25	61.05
870.00	0.37	53.64
900.00	0.50	61.37
930.00	0.37	54.49
960.00	0.20	75.68
990.00	0.32	67.99
1020.00	0.31	69.90
1050.00	0.58	87.54
1080.00	0.77	90.36
1110.00	0.88	90.79
1140.00	1.04	94.50
1170.00	1.34	93.71
1186.00	1.41	94.61

