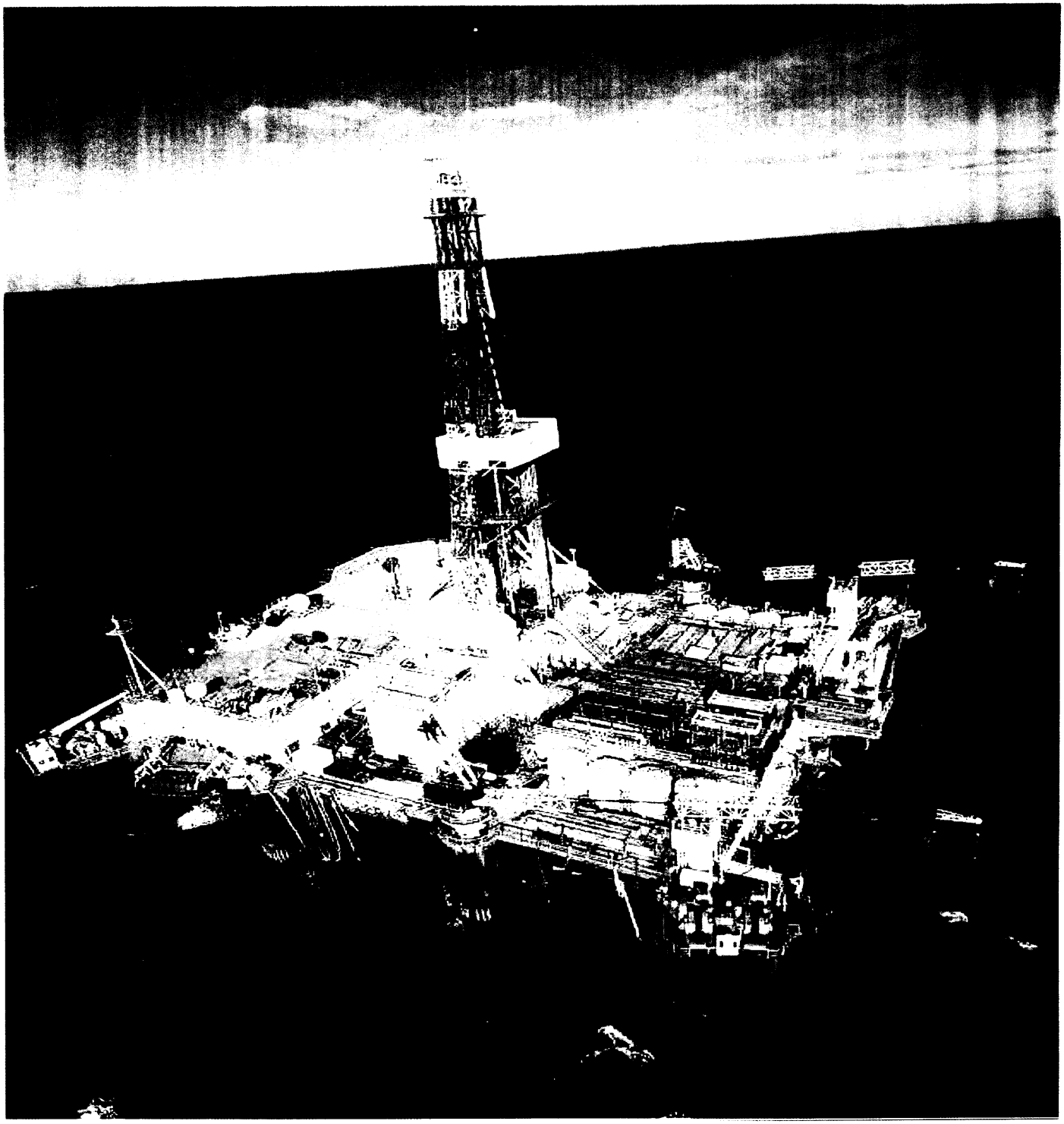
Esso Australia Pty Ltd

WELL COMPLETION REPORT
SCALLOP-1
VOLUME 1
BASIC DATA
August 2003

Petroleum Development



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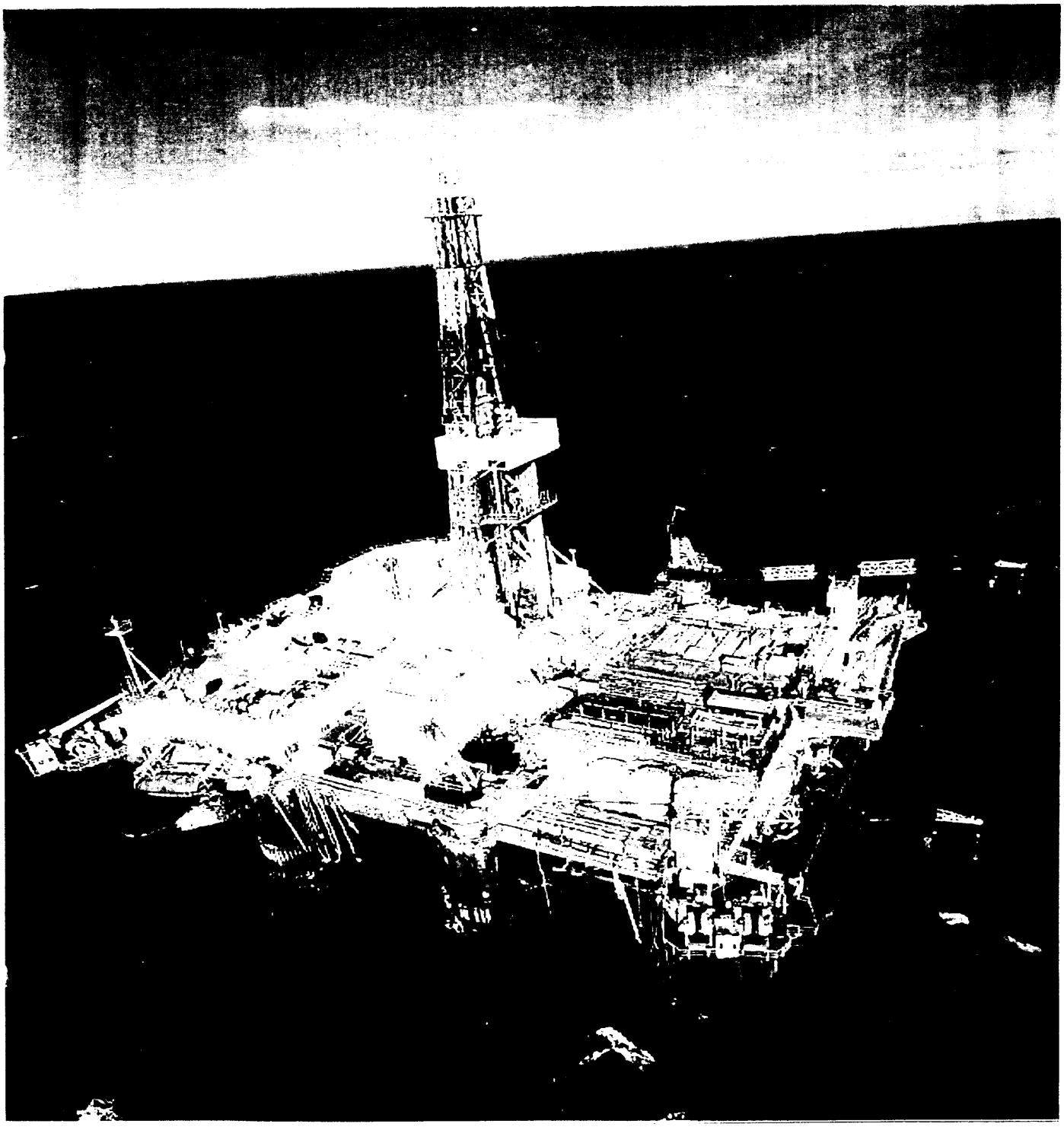

WELL COMPLETION REPORT

SCALLOP-1

VOLUME 1
BASIC DATA

GIPPSLAND BASIN
VICTORIA

ESSO AUSTRALIA PTY LTD

Compiled by Jon Reeve, Gordon Wakelin-King, *Sheryl Sazenis*
August 2003

WELL COMPLETION REPORT
SCALLOP-1

VOLUME 1:

BASIC DATA

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WELL COMPLETION REPORT
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I. WELL DATA RECORD

LOCATION	:	Latitude : 38° 12' 48.615" S Longitude : 148° 35' 28.879" E X= 639,314.95 East Y= 5,769,298.84 North Map Projection: (GDA94), (GRS80) UTM Zone 55 / AMG Zone 55 (S) Central Meridian 147° East Geographical Location: Victoria, Australia.
FIELD :		Gippsland Basin, Victoria
PERMIT	:	Vic / RL2
ELEVATION	:	25.9m MD
WATER DEPTH	:	109.6m MD
TOTAL DEPTH	:	3174.0mMD(Driller) 3177.5mMD(Logger)
REASONS FOR PLUGGING BACK	:	Plugged and abandoned
MOVE IN	:	1ST February 2003
SPUDDED	:	2nd February 2003
REACHED TD	:	22nd February 2003
RIG RELEASED	:	4th March 2003
OPERATOR	:	Esso Australia Resources Pty Ltd.
PERMITTEE OR LICENCEE	:	Esso Australia Resources Pty Ltd
ESSO INTEREST	:	25%
OTHER INTEREST	:	BHP Billiton Petroleum Vic Pty Ltd 25% Santos Group 20% Woodside Group 30%
CONTRACTOR	:	Transocean Sedco Forex
RIG NAME	:	Sedco 702
EQUIPMENT TYPE	:	Semi-Submersible
TOTAL RIG DAYS	:	35 days
DRILLING AFE NO	:	L.0201C001
TYPE COMPLETION	:	Plugged and Abandoned
WELL CLASSIFICATION	:	Wildcat

II. OPERATIONS SUMMARY

1. MOVING/PLUG AND ABANDON

The Sedco 702 was released by BHP Billiton to Esso and simultaneously commenced its tow to the Scallop location at 23:00Hrs on January 29th 2003. The Sedco arrived at location on February 1st 2003 at 04:45hrs. Anchors were run without incident.

2. DRILLING OPERATIONS

36" Hole.

The 36" hole section was drilled to 179m MD.

The 36" hole was drilled riserless using a 26" Reed Y11 bit (bit run1) with 36" hole-opener. The sea floor was tagged (firm) at 135.5m MDRT, Scallop-1 was spudded at 12:00 hrs on February 2nd 2003. The 36" hole section was drilled with seawater and 500bbls hi-vis pre-hydrated gel (PHG) sweeps, pumped every 15m. At section TD (179m MD) the hole was swept clean with 50 bbl hi-vis pill and displaced with 350 bbls of (PHG) mud. Two surveys were obtained at 148m & 163m (0 degrees) via an Anderdrift tool, but no further surveys were obtained due to tool failure. Bit 1 was graded as 1,1,1,In with one plugged nozzle. The 36" hole opener had a seized cone and a broken nozzle.

30" Casing

Four joints of 30" casing were made up and landed off the PGB on moon-pool beams. The cement stinger and running tools were engaged on to the 30" casing and the whole assembly, including PGB, run on 5" DP. The casing was stabbed into the hole and landed at 179m MD, after washing through 1m of fill. After testing the cementing lines to 2000psi for 10 minutes 190 bbls of fluid were circulated at 6bpm. 20 bbls of Seawater pre-flush were pumped ahead of a single cement slurry composed of 141 bbls of mixwater, 1149 sacks Class G cement and 20 sacks of calcium chloride (yield 240 bbls @ 15.9ppg). After displacing the cement with 35 bbls of seawater, cement returns were noted at the seabed with the ROV. The floats held and an inspection with the ROV of both bulls eye indicators on the PGB showed balls at 0 degrees. Finally the running tools released and laid out.

17½" Hole was drilled from 179m to 917m MDRT.

The 17½" hole section was drilled riserless with a Hycalog DS34 HF+GN fixed cutter (PDC) bit (bit run 2), made up to a packed drilling assembly. Top of cement was tagged at 173m, and the shoe drilled out at 179m. The hole section was drilled with seawater and hi-vis sweeps, 25bbl hi-vis sweeps mid stand and 50bbls hi-vis sweeps at connections. Surveys were taken every 30m from 506m with Anderdrift survey tool. (all were less than 1 degrees) At the section TD (917m MD), the hole was cleaned with 100bbls hi-vis pill and 2000 bbls of seawater, and then displaced with 800bbls of PHG mud. The hole was wiped three times before coming out to run casing due to the string hanging up in numerous places, between 237m & 692m,

II. OPERATIONS SUMMARY (cont'd)

when tripping to bottom. A 150bbl hi-vis sweep and 1500bbl of seawater were pumped before displacing with 1200bbls of 12ppg mud. A gyro was dropped prior to pulling out of the hole. The bit was graded 1-1, X, In.

13 3/8" Casing

The 13 3/8" casing string consisted of 70 joints of 68ppf L-80 Buttress casing, with 2 centralisers on each of the lower 11 joints. The casing was run in on 5" drill pipe and landed at 900.8m MD. All cement lines were pressure tested prior to cementing the casing with a lead slurry consisting of 420bbls seawater, 1358 sacks Class G cement, 614 gals Econolite, 11 gals NF-5 and 84 gals of retarder, (yield 535bbls @ 12.5ppg) and tail slurry consisting of 726 sacks of class G cement mixed with 89 bbls of fresh water, plus 5 gal of NF-5, (yield 150bbls @ 15.8ppg). The dart was dropped, but not observed to latch with the plug, but displacement was continued with 340bbls of seawater, during which a pressure increase was observed from 200psi to 650psi. The plug was not bumped, but good cement returns were observed at the wellhead with the ROV. The floats held, the running tool was backed out and pulled out of the hole

12¼" Hole was drilled from 917m to 3174m MD (3173.5m TVDRT

Prior to drilling the 12¼" hole section the riser and BOP stack were run and function tested.

The 12¼" hole section was drilled with 3 bit runs. Anderdrift tools were used to monitor directional control to 2933m when MWD tools were added to the BHA for the last bit run in the hole. KCl/PHPA/Polymer/Glycol mud was used to drill the 12¼" hole section, with an initial mud weight of 9.0ppg.

A PDC drillbit (MA89PXX) was used from the 13 3/8" shoe to a depth of 2618.4m within the top of the volcanics. Mud weight was increased to 9.6ppg prior to drilling through the Lakes Entrance Formation and progressively increased up to 10.3ppg prior to drilling through the volcanics. Maximum well deviation as recorded by the Anderdrift was 2.0 degrees. Weight on bit was kept below 10klbs to minimise hole deviation. The PDC bit (NB 3) drilled the interval 917 - 2618mRT in 127.8 hrs for an average ROP of 13.3m/hr The PDC bit graded as 2/4,CT,S,X,I,BT,PR.

NB 4 (Hughes MX20DDT), a tricone bit, was used to drill the volcanics and the top of the S1 reservoir from 2618.4 - 2933 m. Hole deviation was monitored using the Anderdrift tool every stand. A gyro survey was dropped prior to pulling out of the hole with the trip out not experiencing any problems except for the 6th and 7th stands, which pulled tight. The bit drilled the section in 74.6 hrs for an average ROP 4.6 m/hr with a mud weight of 10.2+ - 10.3 ppg. The bit was graded as 4/7,BT,S,E,1,WT,TQ.

The final section of the hole was drilled with a tricone bit (NB 5 Hughes MX20DX) with a MWD/LWD BHA assembly. The bit drilled the section 2933 - 3174mRT (TD) in 77.9 hrs at an average

II. OPERATIONS SUMMARY (cont'd)

ROP of 5m/hr. The bit was graded as 3/7,BT,S,E,2,RG,TD. This section encountered volcanics, altered volcanics and an interbedded sequence of sandstones and claystones. The maximum gas detected while drilling was 0.25% with a background level of

0.02-0.06%. The well total depth of 3174m was reached at 09:45 hrs on 22 February and terminated in interbedded sandstones and claystones. Upon reaching total depth, the hole was circulated clean and a wiper trip conducted back to the shoe. A 100bbl hi-vis pill was circulated and bottoms up circulated twice before pulling out of hole to log.

Prior to logging a function test on the BOP stack was conducted. During testing operations, a leak was detected in the kill line at the junction between the riser and the top of the stack. Approval was granted to continue with logging operations.

Schlumberger were rigged up and logging operations were undertaken. A total of 5 logging runs were conducted as follows:

Run 1: PEX-HALS-HNGS-LEHQT
Run 2: MDT-GR-LEHQT
Run 3: FMI-DSI-GR-LEQHT
Run 4: DUAL CSAT-VSP
Run 5: CST-GR

Based on the final well results and log interpretation, it was decided to plug and abandon the well. The abandonment programme was as follows:

Plug 1a: 3174-3014 m
Plug 1b: 3014-2857 m
Plug 1c: 2857-2710 m
Plug 1d: 2710-2560 m
Plug 1e: 2560-2403.7 m
Plug 2a: 930-895 m (ESZV Bridge Plug set above plug)
Plug 2b: 895-850 m
Plug 3: 200-155 m

The rig was released from operations on 4 March 2003, after 35 days on location.

III. CASING DATA

Type	Size (inches)	Weight (ppf)	Grade	Thread	Depth (mMDRT)
Conductor	30/20"	457/310	X52	HD90/SF60	179.0
Surface	$13^{3}/_{8}$"	72/68	L80	BTC	900.8

IV. CEMENTING DATA

String Cemented	Cement Type	Dry Cmt Vol (sx)	Cement Additives	Mix Water (bbls)	Slurry Vol (bbls)	Slurry Density (ppg)	Cement to/from (mMDRT)	Csg Test Pressure (psi)
Conductor	G	1149	1% CaCl by weight, 0.003gal/sk NF-5.	141	240	15.9	180.32-135.5 (seafloor)	N/a
Surface (lead)	G	1358	0.0452 gal/sk econolite, 0.06 gal/sk HR-6L,	420	535	12.5	135.5 (seafloor)	
Surface (tail)	G	726	0.003 gal/sk NF-5	89	150	15.8	900.8 - 135.5	2225

ABANDONMENT PLUGS

	Cement Type	Dry Cmt Vol (sx)	Cement Additives	Mix Water	Slurry Vol (bbls)	Slurry Density (ppg)	Cement to/from (mMDRT)	Csg Test Pressure (psi)
Plug #1A	HTB Silica Flour	373	0.3 gpb SCR-100L,3.2 gpb Halad 413 L and 0.025 gpb NF-5	fresh		15.83	3174-3014	

IV. CEMENTING DATA (cont'd)

ABANDONMENT PLUGS (continued)

	Cement Type	Dry Cmt Vol (sx)	Cement Additives	Mix Water	Slurry Vol (bbls)	Slurry Density (ppg)	Cement to/from (mMDRT)	Csg Test Pressure (psi)
Plug #1B	HTB Silica Flour	373	0.3 gpb SCR-100L,3.2 gpb Halad 413 L and 0.025 gpb NF-5	fresh		15.8	3014-2857	
Plug #1C	HTB Silica Flour	356	0.3 gpb SCR-100L,3.2 gpb Halad 413 L and 0.025 gpb NF-5	fresh		15.8	2857-2710	
Plug #1D	HTB Silica Flour	363	0.3 gpb SCR-100L,3.2 gpb Halad 413 L and 0.025 gpb NF-5	fresh		15.8	2710-2560	
Plug #1E	HTB Silica Flour	373	0.1 gpb SCR-100L,3.2 gpb Halad 413 L and 0.025 gpb NF-5	fresh		15.8	2560-2403.7	2000
Plug 2A	Class G	93		fresh	50	15.8	930-895	
Plug 2B	Class G	109		fresh	30.1	15.8	895-850	
Plug 3	Class G	109		fresh	30.1	15.8	200-155	1000

V. SAMPLES, SIDEWALL CORES

Cuttings Samples

Interval (m)	Type
917 - 1660m @ 10m intervals	1 of 200g lightly washed and air dried 6 of 100g washed and dried
1660 - 3174mTD @ 5m intervals	1 of 200g lightly washed and air dried

Conventional Cores

No conventional cores were cut at Scallop –1.

Sidewall Cores

2 guns of sidewall cores (60 bullets) were taken from 3165 m to 1717 m.
Of the 60 cores taken, 52 cores were recovered with 7 missing and 1 empty.
A detailed description of the sidewall cores is contained in Appendix 2.

SCALLOP-1 CST

Core Number	Depth (m MDRT)	Core Length (mm)	Lithology
1	3165	2.0	Silty sandstone
2	3162	Nil	Lost
3	3157	2.0	Sandstone
4	3155.5	Nil	Lost
5	3151.5	Nil	Lost
6	3149.5	2.5	Claystone
7	3146.4		Sandstone
8	3144	1.5	Sandstone
9	3141.4	Nil	Lost
10	3130.5	2.0	Claystone
11	3129.1	2.0	Sandstone

V. SAMPLES, SIDEWALL CORES (cont'd)

SCALLOP-1 CST (cont'd)

Core Number	Depth (m MDRT)	Core Length (mm)	Lithology
12	3122	1.5	Sandstone
13	3120.5	1.5	Sandstone
14	3110.5	1.5	Silty claystone
15	3107.5	Nil	Lost
16	3105.5	1.0	Sandstone
17	3103.9	2.0	Claystone
18	3101.1	1.0	Sandstone
19	3097.2	1.5	Argill. Siltstone
20	3059	1.5	Sandstone
21	3052.5	1.0	Siltstone
22	3050.5	1.5	Silty claystone
23	3031.5	1.5	Sandstone
24	3030	1.5	Sandstone
25	3022.5	2.0	Carb. shale
26	3013	1.5	Siltstone
27	2991.5	2.0	Carb. Shale
28	2983.5	2.0	Sandstone
29	2976.5	1.5	Silty claystone
30	2941	1.5	Sandstone
31	2913.9	Nil	
32	2898.5	1.5	Sandstone
33	2898.0	1.0	Sandstone
34	2889.5	1.0	Sandstone
35	2886	1.5	Claystone
36	2870.2	2.0	Silty claystone

V. SAMPLES, SIDEWALL CORES (cont'd)

SCALLOP-1 CST (cont'd)			
Core Number	Depth (m MD RT)	Core Length (mm)	Lithology
37	2840.9	1.0	Sandstone
38	2839.5	1.5	Sandstone
39	2758	1.5	Silty claystone
40	2750	1.5	Claystone
41	2735.5	2.0	Altered volcanics
42	2635.2	1.5	Sandstone
43	2630.5	2.0	Sandstone
44	2627.5	3.0	Altered volcanic
45	2601.5	2.0	Siltstone
46	2586.7	2.0	Claystone
47	2529.5	2.5	Claystone
48	2402.5	2.0	Claystone
49	2304	2.0	Carb. shale
50	2204.5	3.0	Sandstone (greensand)
51	2192.7	1.5	Siltstone
52	2090	2.0	Claystone
53	2029.5	Nil	Lost
54	1936.5	2.2	Claystone
55	1837.8	2.4	Claystone, carbonaceous
56	1770	3.0	Claystone
57	1762	3.0	Claystone
58	1745	2.0	Claystone
59	1725	3.0	Claystone
60	1717	Nil	Lost

V. SAMPLES, SIDEWALL CORES (cont'd)

CST CORES

See APPENDIX 2 for Sidewall Core Descriptions.

VI. WIRELINE LOGS AND SURVEYS

Survey /Log	Company	Top (m MDRT)	Bottom (mMDRT)
Multishot Survey	SDI	0	907.8
Multishot Survey	SDI	907.8	2923.0
MWD/LWD	Schlumberger/ Anadrill	2923.0	3138.3
Suite1 Logs at 3174 m			
PEX-HALS-HNGT-LEHQT	Schlumberger	900.2	3177.5
MDT-GR-LEHQT	Schlumberger	1780.0	3162.0
FMI-DSI-LEHQT	Schlumberger	135.0	3177.5
DUAL CSAT-VSP-GR	Schlumberger	173.6	3171.0
CST-GR	Schlumberger	1717.0	3165.0

VII. SUMMARY OF FORMATION TEST PROGRAMME

SUITE	TYPE OF LOG	FROM	TO	RPT. SECT. /SUMMARY.	Time Since Last Circ / BHT
1	MDT-GR-LEHQT	3162	1780	--	39.0 hrs/ 115.5°C @ 3162.0m

VIII. TEMPERATURE RECORD

SUITE 1

LABEL	TYPE OF LOG	FROM	TO	RPT. SECT. /SUMMARY.	Time Since Last Circ / BHT
1	PEX-HALS-HNGT-LEHQT	3177.5	900.2	3170-3073	25.4 hrs/110°C @ 3177.5m
2	MDT-GR-LEHQT	3162	1780	--	39.0 hrs/ 115.5°C @ 3162.0m
3	FMI-DSI-GR-	3177.5	135.0	3160-3052	68.20hrs/ 120°C @ 3177.5m
4	DUAL CSAT-VSP-GR	3171	173.6	---	82.20hrs/ 122.2°C @3171.0
5	CST-GR	3165.0	1717.0	---	---

VIIII. LWD/MWD RUN SUMMARY

WELL LOCATION DATA

Well Name:	Scallop-1	**Licence Number:**	Vic/RL2
Field:	Wildcat	**Primary Objective:**	S-1
Well Type:	Wildcat Exploration	**Water Depth:**	110
AMG co-ords (m):	X = 639,314.95 m E Y = 5,769,298.84 m N	**RT Elevation:**	25.6
Local co-ords:	38° 12' 48.615" S 148° 35' 28.879" E	**Total Depth MDRT**	3174 MDRT

GENERAL WELL DATA

Date In / Out:	2/18/03	**Run #:**	BHA #5/LWD #1
Service Company:	Schlumberger – D&M	**Hole Size (in):**	12.25
LWD Engineers	L. Bon, K. Handley	**Inclination:**	1.52
Esso Geologist:	G. Wakelin-King, G. Smith	**Av. Azimuth:**	333.59

MUD DATA

Mud Type:	KL/PHPA/Glycol	**Chlorides (mg/l):**	38,500
Mud Weight (ppg)	10.35	**KCL (ppb):**	5.8 %
Viscosity (s/qt):	55	**O/W/S:**	0/88.2/0.15
PV: (cp):	24	**Rmf (ohmm):**	0.0914@21°C
YP: (lbs/100 sq ft)	39	**Rmc (ohmm):**	0.3090@21°C
API Filtrate (cc)	2.9	**Rm (ohmm):**	0.1089@24.3°C

DRILLING DATA

Mtrs Drilled:	241	**RPM:**	100
Av. ROP: (m/hr):	3.5	**Flow Rate (gpm):**	820
Av. WOB (K lbs):	50	**SPM:**	230
Av. Torq (K ft/lbs):	5	**Pressure (psi):**	3600

BIT DATA

Bit Make:	HTC		**From**	**To**	**Dist.**
Bit Type:	TCI	**Drilled Interval:**	2933 m	3174 m	241 m
Num Jets:	3	**Reamed Interval:**	2920 m	2933 m	13 m
Size (32 nds):	18				

TIME DATA

Date pick up tools:	18-Feb-2003	**Drilling Time:**	69.09	Hrs
Time pick up tools:	19:45	**Pump Hours:**	77.9	Hrs
Date laid down Tools:	23-Feb-2003	**RT Trans Hours:**	77.9	Hrs
Time laid down tools:	7:30	**LWD Ream Hours:**	0.25	Hrs
Time below RT (hr):	107.75	**Down Time:**	0	Hrs

TOOL DATA

Tool Name:	PowerPulse*	RAB8
Tool S / Number:	M805	010
Tool OD (in.):	8.25	8.375
Bit/Sec./Carrier:	6.4 bps/16 Hz	GR – 19.4
Distance to bit (m)	D&I – 26.53	Ring – 19.66

VIIII. LWD/MWD RUN SUMMARY (cont'd)

RUN SUMMARY

Good MWD/LWD Run.

BHA DATA

Element	Size OD	Length (m)	Serial #
TCI Bit	12-1/4	0.33	W42DV
NB Stabiliser	12-1/4	2.45	GU2191
Pony DC	8	2.92	502A7
IB Stabiliser	12-1/4	1.44	207A31
Drill Collar	8-1/4	9.33	93081
IB Stabiliser	12-1/4	1.80	207A190
XO		0.31	
RAB8	8-1/4	3.82	010
PowerPulse	8-1/4	8.44	M805
12 x DC	8-1/4	109.23	
XO		0.61	MSO275
2 x HWDP	5	18.51	
Dailey Jar	6-1/2	9.77	14161590

FIGURES

FIGURES

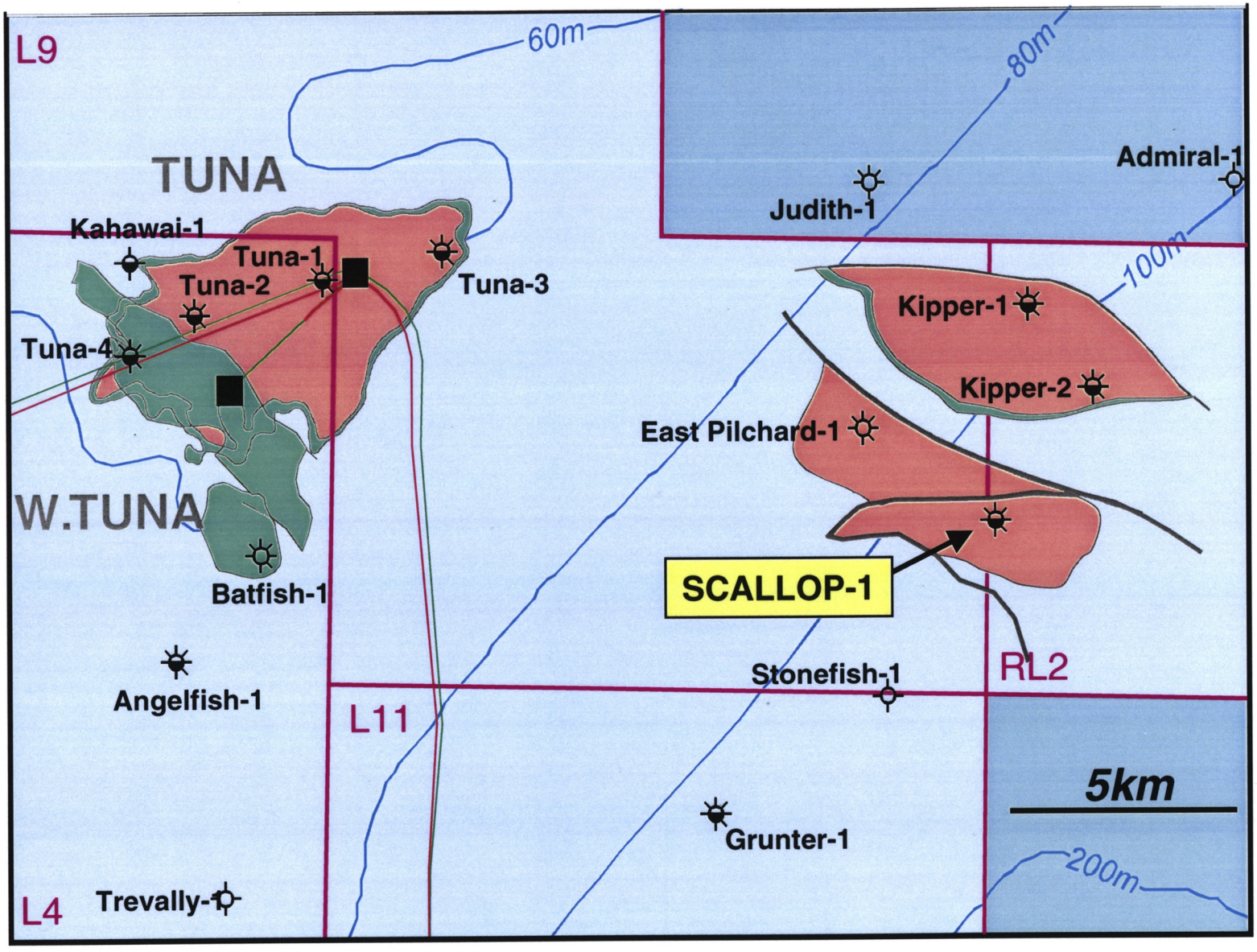
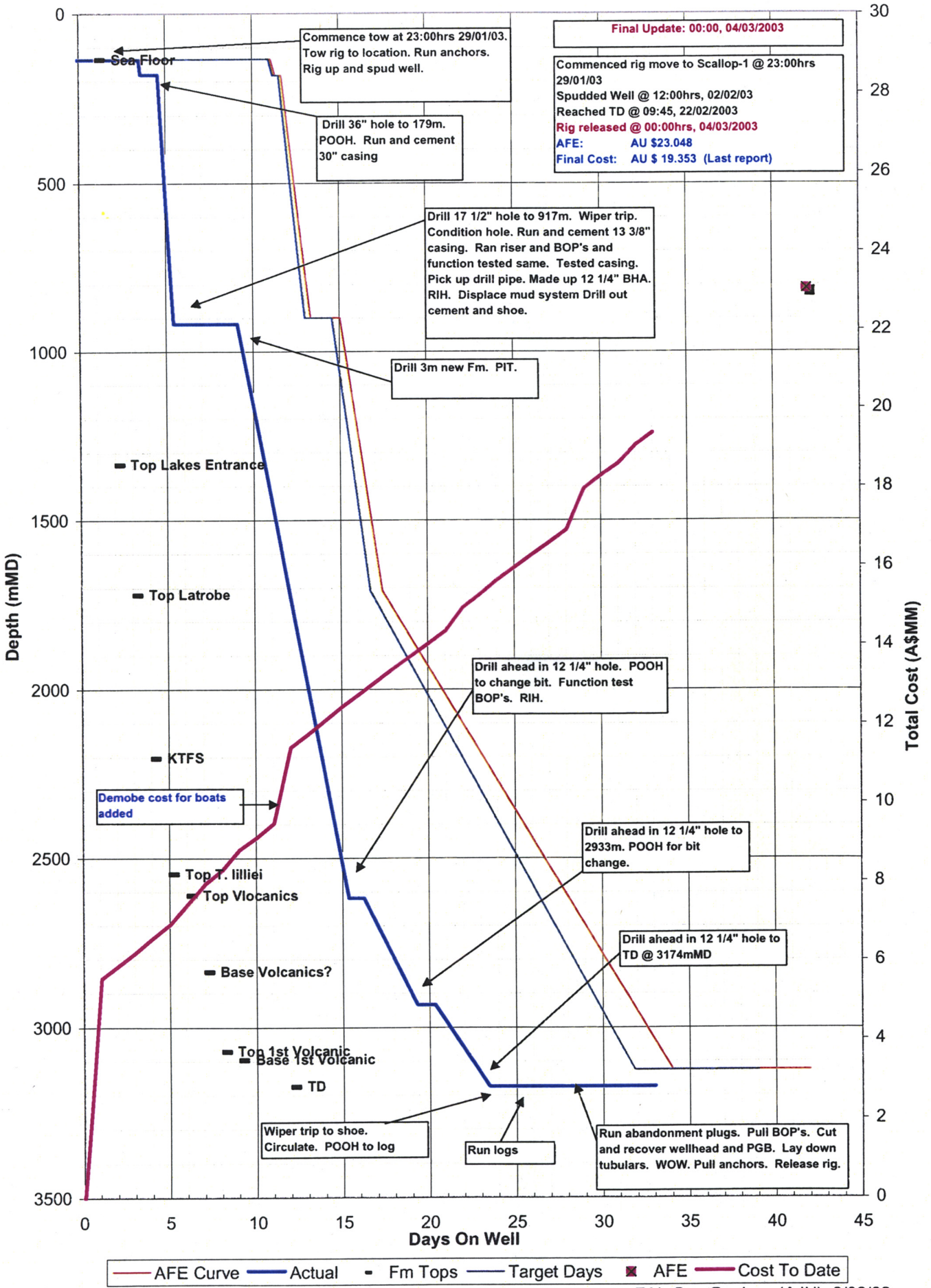


Figure 1: Location Map

Scallop-1 Time vs Depth Curve



EAL Ops Geology (AJH): 8/08/03

FIGURE 2

PLANNED vs ACTUAL WELLBORE SCHEMATIC

TRANSOCEAN "SEDCO 702"

SCALLOP-1

All Depths In Meters From Rotary Table (MD=TVD), Referenced to Mean Sea Leve (MSL)

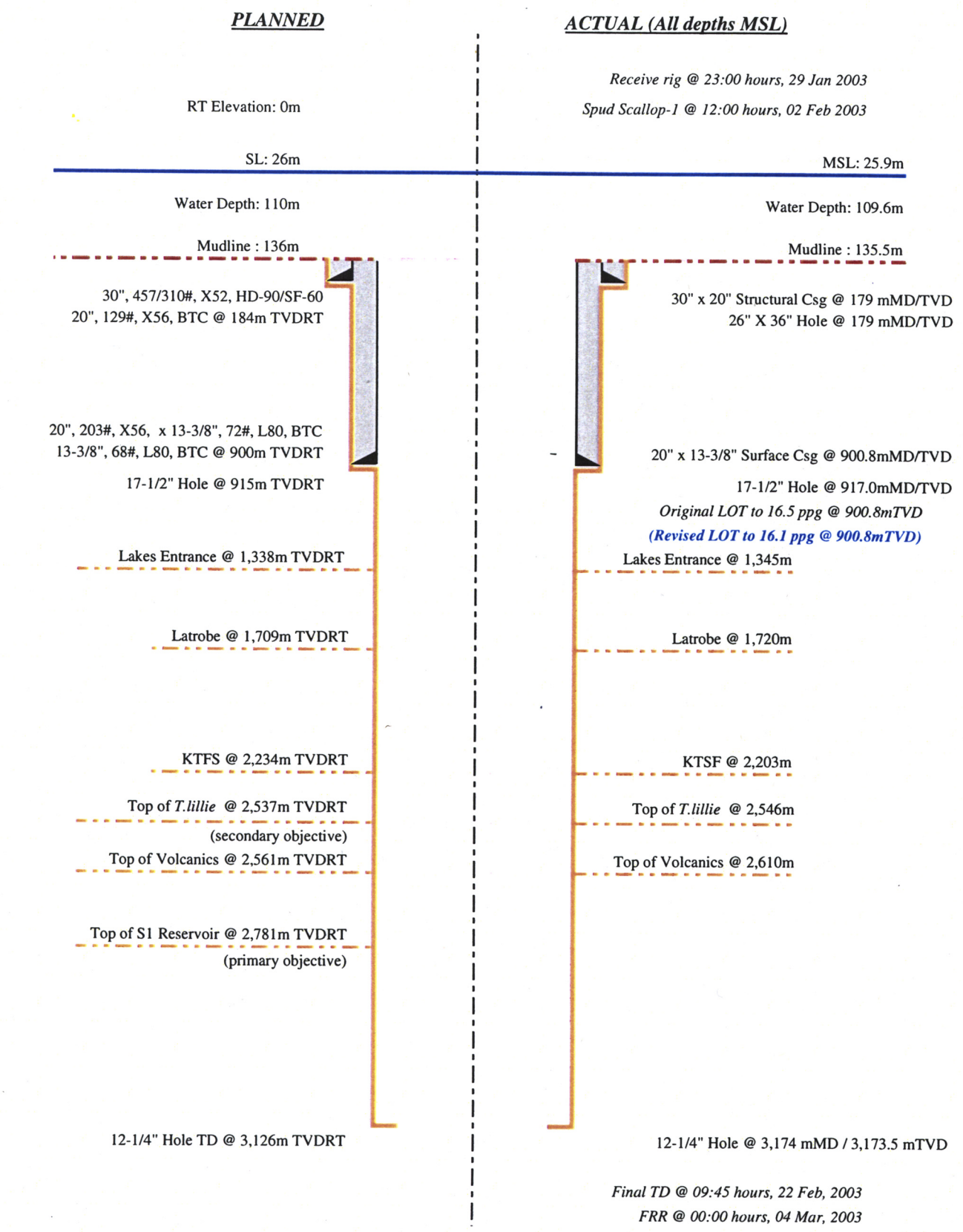


FIGURE 3

File Location: Scallop-1_Wellbore_Schematics_Final.xls
Tab Reference: Plan vs Act Wellbore Schematic

ACTUAL PLUG & ABANDONMENT WELLBORE SCHEMATIC
TRANSOCEAN "SEDCO 702"
SCALLOP-1

Final Location: GDA 1994. Latitude 38° 12' 48.615" S, Longitude 148° 35' 28.879" E.
MGA 94 Zone 55 CM 147deg E, Easting 639,314.95m, Northing 5,769,298.84m

All Depths In Meters From Rotary Table (MD=TVD), Referenced to Mean Sea Leve (MSL)

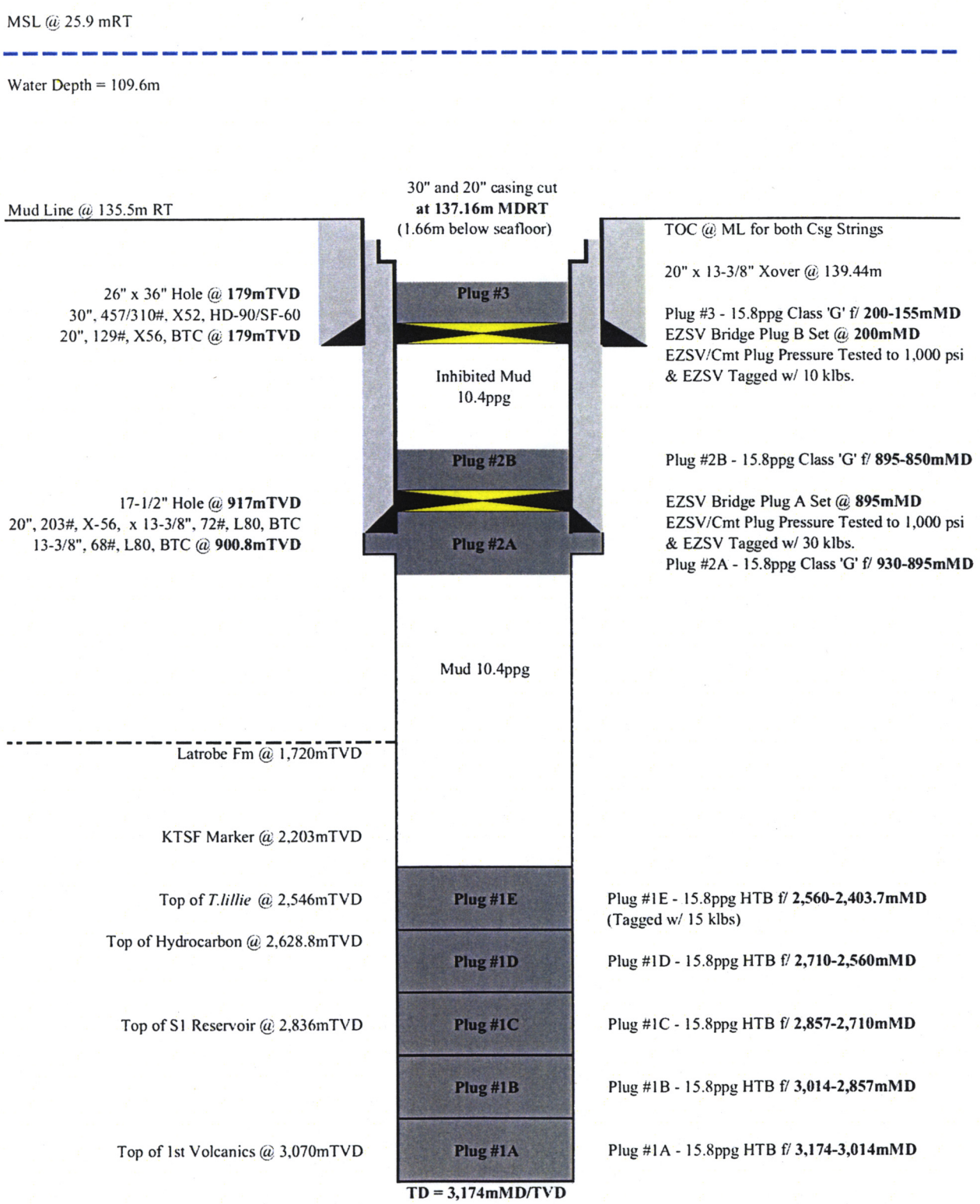


FIGURE 4

File Reference: Scallop-1_Wellbore_Schematics_Final.xls
Tab Reference: Actual P&A Schematic

HORNER PLOT

Run No.	Type of Log	From	To	Temp (°C)	tL	log(tc+tL)/tL
1	PEX-HALS-HNGS-LEHQT	3177.5	900.2	110	25.67	0.02864158
2	MDT-GR-LEHQT	3162.0	1780.0	115.5	39.0	0.01906301
3	FMI-DSI-GR-LEHQT	3177.5	135.0	120	68.33	0.01098267
4	DUAL CSAT-VSP	3171.0	173.6	122.2	82.33	0.00913459
5	CST-GR	3165.0	1717.0		97.17	

Note: Time circulated on bottom = 3hrs 30 mins *(hrs:mins)*

T = measured temp
t_L = time since circ stopped
Tt_c = time circulated on bottom

GEOTHERMAL GRADIENT (°C / 100 m)

Sea Floor Temperature: **4.0** (°C)
Extrapolated BHT: **127.2** (°C)
Geothermal Gradient: **3.9** (°C / 100 m)

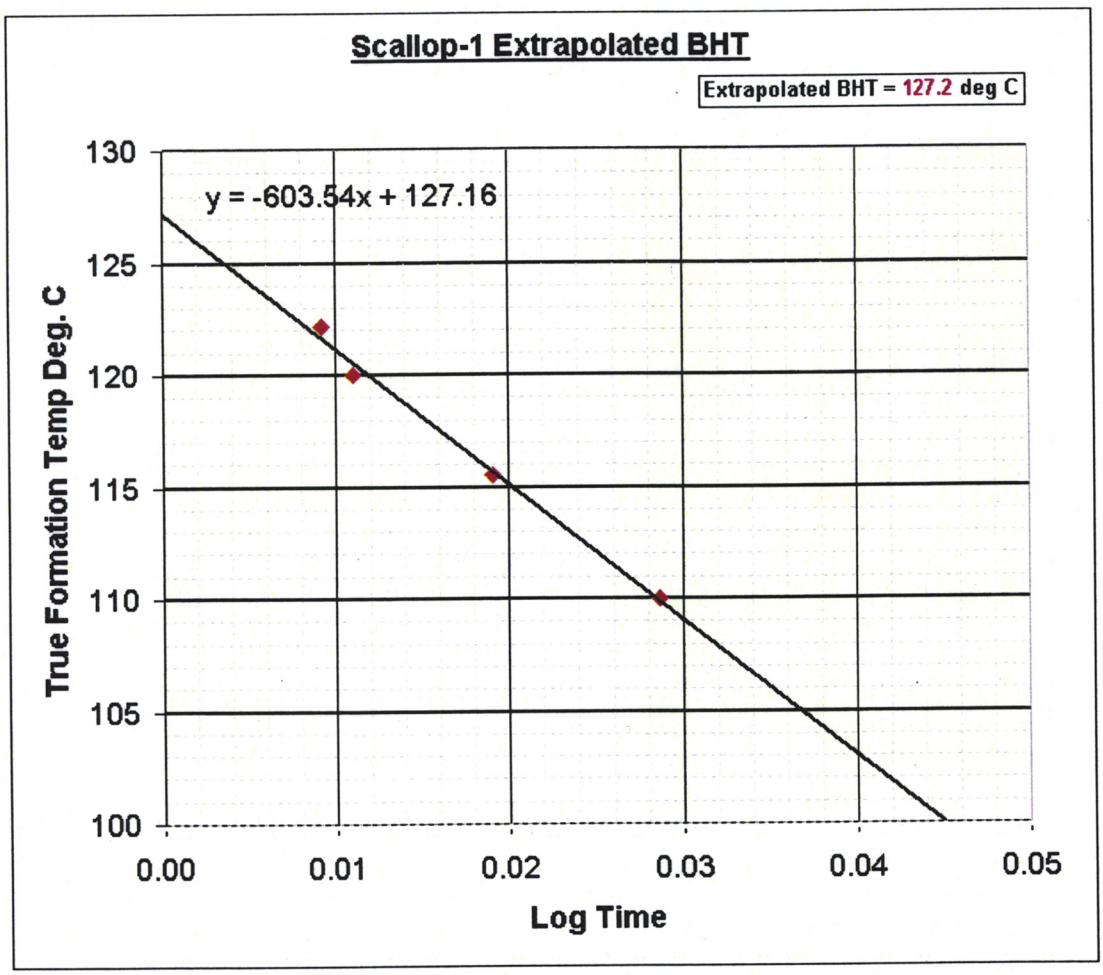


FIGURE 5

APPENDICIES

APPENDIX 1

LITHOLOGICAL DESCRIPTIONS

Scallop-1 Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
			From mudline to 917m, well drilled without riser, all returns to the seafloor. All depths are MDRT unless otherwise specified. Hole Diameter 12 1/4", Smith MA89PXX Bit, 6% KCl/ PHPA / Glycol
917	930	10	Cement
		90	**CALCILUTITE**: medium grey when hydrated, light olive grey, very soft, dispersive, sub blocky to amorphous, moderately argillaceous, trace carbonaceous specks, rare trace micro-fossils (forams),
930	960	100	**CALCILUTITE**: medium to very light grey as above.
960	990	100	**CALCILUTITE**: medium to light olive grey, firm, blocky, moderately argillaceous, trace carbonaceous specks, trace Forams.
990	1020	100	**CALCILUTITE**: medium to light olive grey, as above.
1020	1050	100	**CALCILUTITE**: medium to light olive grey, as above.
1050	1080	100	**CALCILUTITE**: medium to light olive grey, as above.
1080	1110	100	**CALCILUTITE**: medium to light olive grey, as above.
1110	1140	100	**CALCILUTITE**: medium to light olive grey, soft to moderately firm, trace forams, slight trace carbonaceous specks, homogenous, as above.
1140	1170	100	**CALCILUTITE**: medium to light olive grey as above, clay content increasing to 20%
1170	1200	100	**CALCILUTITE**: occasionally calcilsiltite, light to medium grey to olive grey, argillaceous (10% clay), soft, friable,
1216	Spot	100	**Slow drilling, CALCILUTITE**, as above, trace calcisiltite, rare grains of dolomitic calcilutite, hard. ? very thin stringer dolomite cemented calcilutite, argillaceous.
1200	1230	100	**CALCILUTITE**: as above, rare dolomitic calcilutite as above
1230	1260	100	**CALCILUTITE**: light to medium olive grey, trace carbonaceous specks, soft, argillaceous (5-10% clay)
1260	1290	100	**CALCILUTITE**: light to medium grey, soft, with very rare hard spherical concretions, argillaceous, rare pyrite nodules, trace clear very finely crystalline calcite as loose grains, trace glauconite and black lithic grains.
1290	1320	100	**CALCILUTITE**: light to medium grey as above, no pyrite or glauconite.
1320	1350	100	**CALCILUTITE**: as above, very argillaceous, trace very fine to fine quartz sand, trace pyrite, grades to
		Tr	**MARL**: very light grey, dispersive to very soft.
1350	1380	90	**CALCILUTITE**: light to medium grey, very argillaceous, soft to firm, grades to
		10	**MARL**: very light grey, very soft -dispersive
1380	1410	80	**CALCILUTITE**: as above, very argillaceous, trace forams and fossil fragments,
		20	**MARL**: light grey very soft to dispersive, amorphous, with minor small pyritic nodules, trace quartz grains.
1410	1440	100	**MARL**: trace very fine quartz, and orange and black lithic grains, loose and as occasional very fine laminations in marl.
1440	1470	100	**MARL**: medium grey to olive grey, firm, appearing light grey & very soft to dispersive when hydrated, occasional laminations of very fine sand & silt sized quartz, orange & black lithic grains, trace pyrite nodules, common planktonic forams, trace benthic forams.
1470	1500	100	**MARL**: as above.
1500	1510	40	**MARL**: as above.
		60	**CALCILUTITE**: light to medium grey, soft, moderately argillaceous, rare pyrite nodules, trace glauconite and common planktonic forams,
1510	1520	60	**MARL**: as above.
		40	**CALCILUTITE**: as above.

Interval (m) From	To	%	Lithology / Show Description
1520	1530	70	**MARL:** as above.
		30	**CALCILUTITE**: as above.
1530	1540	90	**MARL:** as above, general absence of sand & silt.
		10	**CALCILUTITE**: as above.
1540	1550	80	**MARL:** as above.
		20	**CALCILUTITE**: as above.
1550	1560	80	**MARL:** as above.
		20	**CALCILUTITE**: as above.
1560	1570	70	**MARL:** as above.
		30	**CALCILUTITE**: as above.
1570	1580	70	**MARL:** generally as above, medium grey to olive grey, firm, appearing light grey & very soft to dispersive when hydrated, occasional laminations of very fine sand & silt sized quartz & black lithic grains, trace disseminated and nodular pyrite, common planktonic forams, trace benthic forams.
		30	**CALCILUTITE**: as above grading to Calcisiltite
1580	1590	90	**MARL:** as above.
		10	**CALCILUTITE**: as above.
		Tr	**LIMESTONE**: Dark tan, firm, slightly argillaceous
1590	1600	90	**MARL:** as above.
		10	**CALCILUTITE**: as above.
1600	1610	90	**MARL:** as above.
		10	**CALCILUTITE**: as above.
1610	1620	90	**MARL:** as above.
		10	**CALCILUTITE**: as above.
1620	1630	100	**MARL:** generally as above, medium grey to olive grey, firm, blocky to sub-blocky, appearing light grey & very soft to dispersive when hydrated, trace very fine glauconite grains, trace disseminated and nodular pyrite, common planktonic forams, trace benthic forams.
1630	1640	100	**MARL:** as above.
1640	1650	90	**MARL:** as above.
		10	**SANDSTONE:** Moderate brown, very fine to fine dis-aggregated colourless & orange quartz & coloured lithic grains, subrounded to rounded, low to high sphericity, well sorted, fair to good inferred porosity. No Show
1650	1660	100	**MARL:** as above.
1660	1665	100	**Commenced adding Baracarb (sized calcium carbonate) to mud system, Samples have up to 60% Baracarb contamination.** **MARL:** as above.
1665	1670	100	**MARL:** as above.
1670	1675	100	**MARL:** as above.
1675	1680	100	**MARL:** as above.
1680	1685	100	**MARL:** as above.
1685	1690	100	**MARL:** as above.
1690	1695	100	**MARL:** as above.
1695	1700	90	**MARL:** as above, becoming more argillaceous.
		10	**LIMESTONE:** white to green grey, firm, lutitic, but maybe as a result of PDC bit, common medium sized green glauconite grains, trace forams.
1700	1705	100	**MARL:** as above.
		Tr	**LIMESTONE:** as above.
1705	1710	80	**MARL:** as above.
		20	**LIMESTONE:** as above, glauconite abundant in part, grading to calcareous greensand.

Interval (m) From	To	%	Lithology / Show Description
1710	1715	100	**MARL:** as above.
		Tr	**LIMESTONE:** as above.
1715	1720	90	**MARL:** as above.
		10	**LIMESTONE:** as above.
1720	1725	100	**CLAYSTONE:** brownish grey, occasionally yellowish brown, soft, dispersive, commonly laminated, micromicaceous, silty in part, common to abundant relic glauconite grains oxidised to limonite.
1725	1730	80	**CLAYSTONE:** as above, with occasional carbonaceous laminae. Commonly
		20	interlaminated with **SILTSTONE:** light to light brownish grey, soft, laminated, very argillaceous, very white to pale yellow fluorescence, no cut.
1730	1735	100	**CLAYSTONE:** generally as above, light to medium brownish grey, soft, dispersive, commonly laminated, micromicaceous, silty in part, with occasional carbonaceous and sandy laminae, non calcareous.
1735	1740	100	**CLAYSTONE:** as above, with trace disseminated pyrite
1740	1745	100	**CLAYSTONE:** as above, with large clots of disseminated pyrite
1745	1750	100	**CLAYSTONE:** greyish brown laminated and mottled with very light grey, very finely micromicaceous, trace fine disseminated pyrite and carbonaceous material, very soft.
1750	1755	100	**CLAYSTONE:** as above, occasional isolated very coarse quartz grain inclusions.
1755	1760	100	**CLAYSTONE:** as above with trace very fine quartz sand.
1760	1765	70	**CLAYSTONE:** laminated as above, becoming silty, pale laminations are sandy w/ very fine quartz , trace pyrite as above, grades to
		30	**ARGILLACEOUS SANDSTONE:** very light grey, very fine grained, abundant kaolinitic matrix, soft, plastic, visual porosity nil, **SHOWS: 30% of sample,** moderate pale straw yellow direct fluorescence, nil solvent fluorescence and strong straw yellow crush solvent fluorescence. Fluorescence associated with very dense argillaceous aggregates.
1765	1770	90	**CLAYSTONE:** as above
		10	**ARGILLACEOUS SANDSTONE:** as above, **SHOWS:** trace pale straw yellow fluorescence as above associated with dense argillaceous/ kaolinitic aggregates.
spot	1770	35	**CARBONACEOUS SHALE**: very dark brown, subfissile firm, grades to
		5	**COAL:** black, brittle
		40	**CLAYSTONE:** as above
		20	**SANDSTONE:** translucent to very light grey, very fine to medium predominantly medium grained, moderately sorted, subangular to subrounded, predominantly clean, in part very argillaceous, visual porosity nil to fair. **SHOWS:** trace associated with argillaceous sandstone aggregates.
1770	1775	30	**SANDSTONE:** clear to translucent, fine to occasionally very coarse grained, subangular, poorly sorted, dispersive white silty clay matrix
		55	**CLAYSTONE:** as above, grades to and interlaminated with
		5	**CARBONACEOUS SHALE:** as above
1775	1780	80	**SANDSTONE:** translucent, very fine to very coarse grained, subangular to subrounded, poorly sorted, quartzose, variable nil to dense kaolinitic matrix, visual porosity poor to good, no shows.
		20	**CLAYSTONE:** light greyish brown to very pale grey, mottled and interlaminated, sandy in part. Soft.
1780	1785	80	**SANDSTONE:** as above no shows.
		20	**CLAYSTONE:** as above.
1785	1790	90	**CLAYSTONE:** interlaminated pale to light greyish brown, silty soft, trace carbonaceous material, and white to very pale grey, kaolinitic, sandy, very soft,
		10	**SANDSTONE:** clear, translucent as above, washing out of claystone? No shows

Interval (m) From	To	%	Lithology / Show Description
spot	1792	80	(Slow drilling) **SANDSTONE:** clear translucent, fine to very coarse grained, poorly sorted, subangular to subrounded, loose, ? white clay matrix washing out? Visible
		20	porosity moderately. No shows. **CLAYSTONE:** white to very light grey, silty.
1790	1795	70	**ARGILLACEOUS SANDSTONE:** very light grey, very fine to occasionally coarse grained, poorly sorted, subangular, ?kaolinitic, quartzose, abundant clay matrix
		30	washing out, **CLAYSTONE:** as above, predominantly sandy, soft to very soft. **SHOWS:** 20% of sample, dull yellowish white direct fluorescence, slow moderate blooming solvent fluorescence, moderate greenish yellow ring residue.
Spot	1796	20	**CLAYSTONE:** medium brown to medium grey to very light grey, occasionally yellowish brown, grades to
		80	**SANDSTONE:** (1) white to very light grey, very fine to fine grained, poorly sorted, dense kaolinitic matrix, trace carbonaceous grains, visual porosity very poor - nil. (2): translucent, fine to coarse grained, moderately sorted, subrounded, predominantly loose with ? slight white clay matrix washing out, quartzose, **SHOWS:** 10%of sample, dull to moderate yellow direct fluorescence, very slow very faint diffuse solvent fluorescence on cleaner sand grains and slow moderate crush solvent fluorescence associated with dense argillaceous aggregates. Moderate ring residue.
1795	1800	90	**CLAYSTONE:** light greyish brown to yellowish brown, silty, occasionally smooth, homogenous, and light grey sandy as above, sandy claystone grades to
		10	**SANDSTONE:** white to pale brown, very argillaceous, very fine to fine grained occasionally with isolated medium to very coarse grains, soft to very soft. **SHOWS:** Trace bright gold direct fluorescence associated w/ argillaceous sandstone aggregates, slow diffuse crush solvent fluorescence with thin yellow ring residue.
1800	1805	50	**SANDSTONE:** translucent, medium to very coarse, well sorted, subrounded, clean, visual porosity very good. No shows.
		45	**SANDY CLAYSTONE:** interlaminated, pale brown to light grey, very soft, common carbonaceous material, common fine quartz sand washing out.
		5	**CARBONACEOUS SHALE:** as above.
1805	1810	90	**CLAYSTONE:** brownish grey to light brownish grey, mottled in part, predominantly smooth, occasionally sandy with very fine sand grains, soft, blocky.
		10	**SANDSTONE:** as loose grains, very fine to fine grained, quartzose ? washing out of claystone.
1810	1815	90	**CLAYSTONE:** brownish grey to light brownish grey, mottled in part,
		10	predominantly smooth, occasionally sandy with very fine sand grains, soft, blocky. **SANDSTONE:** as loose grains, very fine to fine grained, quartzose ? washing out of claystone
1815	1820	80	**CLAYSTONE:** light greyish brown to very light grey, silty, sandy in part with very fine to fine quartz grains washing out, kaolinitic in part, trace pyrite, grades to
		10	**ARGILLACEOUS SANDSTONE:** white, very fine to fine grained, poorly sorted, kaolinitic, trace carbonaceous material, visual porosity nil. No shows.
		10	**SANDSTONE:** translucent, fine to medium grained, loose grains, no shows.
1820	1825	70	**CLAYSTONE:** as above .
		20	**ARGILLACEOUS SANDSTONE:** as above.
		10	**SANDSTONE:** as above .

Interval (m) From	To	%	Lithology / Show Description
1825	1830	90	**CLAYSTONE:** light to medium greyish brown, occasionally very pale yellowish brown, occasionally very dark brown/carbonaceous, in part sandy, predominantly smooth, blocky, soft.
		10	**SANDSTONE:** translucent very fine to medium grained, quartzose washing out of sandy claystone? No shows
1830	1835	80	**CLAYSTONE:** (1)medium to dark grey to greyish brown, subfissile, non-sandy, firm. (2) pale greyish to yellowish brown, occasionally white, sandy, soft to very
		20	soft, dispersive. **SANDSTONE:** ?very argillaceous, fine to medium sand grains washing out of kaolinitic matrix. No shows.
1835	1840	80	**CLAYSTONE:** as above, predominantly type (2), grades to
		20	**ARGILLACEOUS SANDSTONE:** white to very pale grey, very fine to very coarse grains, abundant clean very coarse grains ?washing out, visible porosity poor to occasionally good. No shows
1840	1845	90	**CLAYSTONE:** very pale greyish brown, occasionally off -white silty and very finely sandy, occasionally dark grey, subfissile.
		10	**SANDSTONE:** as above. no shows.
1845	1850	90	**CLAYSTONE:** light greyish brown, mottled in part, silty, very finely sandy soft to
		10	very soft dispersive. **SANDSTONE:** as loose very fine grains, ? washing out of clay
1850	1855	90	**CLAYSTONE:** as above
		10	**SANDSTONE:** as above
1855	1860	40	**SANDSTONE:** clear translucent, fine to very coarse, poorly sorted, subangular, predominantly loose with trace clay matrix adhering, quartzose, visual porosity good. no shows.
		60	**CLAYSTONE:** sandy in part, as above
1860	1865	70	**SANDSTONE:** clear translucent, fine to very coarse, poorly sorted, subangular,
		30	predominantly loose with trace clay matrix adhering, quartzose, visual porosity good. no shows. **SANDY CLAYSTONE:** light brown to very light grey, soft, very finely quartz sandy
1865	1870	90	**SANDSTONE:** as above becoming predominantly coarse to very coarse grained.
		10	Visual porosity very good. no shows.
1870	1875	70	**SANDSTONE:** clear translucent, very pale brown, very fine to occasionally very coarse grained, predominantly very fine. Moderately sorted, subangular to subrounded, predominantly lose with ?argillaceous matrix washing out. Quartzose. Visual porosity poor. no shows.
		30	**SANDY CLAYSTONE:** as above
		Tr	**CARBONACEOUS SHALE:** very dark brown, firm to hard
1875	1880	60	**SANDSTONE:** as above, fine to very coarse grained, poorly sorted, nil to
		20	common clay matrix, visual porosity poor to fair. no shows.
		20	**CLAYSTONE:** medium to dark greyish brown, subfissile **SANDY CLAYSTONE:** off-white to pale greyish brown, trace carbonaceous material, abundant very fine And fine quartz grains washing out.
1880	1885	90	**SANDSTONE:** as above, very fine to very coarse predominantly medium, poorly
		10	sorted, predominantly clean, visual porosity very good, no shows. **SANDY CALYSTONE:** as above
1885	1890	60	**SANDSTONE:** as above
		40	**SANDY CLAYSTONE:** as above
1890	1895	30	**SANDSTONE:** as above
		70	**SANDY CLAYSTONE,** medium brownish grey, speckled w/ very fine carbonaceous material as above

Interval (m) From	To	%	Lithology / Show Description
1895	1900	30	**SANDSTONE:** as above
		Tr	**CARBONACEOUS SHALE:** as above
		70	**SANDY CLAYSTONE,** as above
1900	1905	60	**SANDSTONE:** as above
		30	**SANDY CLAYSTONE,** as above,
1905	1910	20	**SANDSTONE:** as above, predominantly very fine to medium grained
		80	**CLAYSTONE:** sandy in part, medium brownish grey, micromicaceous, common fine carbonaceous material, blocky, in part very light brown to mottled white, very sandy, grades to sandstone, abundant clay matrix washing out.
1910	1920	30	**SANDSTONE:** as above, predominantly very fine to fine grained, trace grey lithic grains.
		60	**CLAYSTONE:** as above
		10	**CARBONACEOUS SHALE:** very dark brown, blocky, firm to hard.
1920	1925	80	**CLAYSTONE:** light grey, greyish brown, mottled white in part, soft - dispersive to occasionally firm, finely sandy in part, grades to
		20	**SANDSTONE:** as above, very fine to very coarse, quartzose with common grey lithic grains.
		5	**CARBONACEOUS SHALE:** as above
1925	1930	60	**SANDY CLAYSTONE:** as above.
		40	**SANDSTONE:** as above, common very coarse grains
1930	1935	60	**SANDY CLAYSTONE:** as above.
		40	**SANDSTONE:** as above, common very coarse grains
1935	1940	30	**CLAYSTONE:** medium greyish brown, blocky, soft to firm,
		60	**SANDY CLAYSTONE:** as above, trace pyrite,
		40	**SANDSTONE:** as above, predominantly fine grained,
1940	1945	80	**CLAYSTONE:** interlaminated, light grey, medium to dark greyish brown, mottled white, sandy in part, carbonaceous in part, soft to firm.
		20	**SANDSTONE:** clear translucent to very light brown, very fine to very coarse grained, poorly sorted, subrounded, argillaceous, visual porosity nil
1945	1950	20	**CLAYSTONE:** as above, non carbonaceous, predominantly mottled white, sandy, kaolinitic
		80	**SANDSTONE:** clear translucent, very fine to very coarse bimodal, moderately sorted, subangular, quartzose, slight clay matrix washing out, loose predominantly clean, visual porosity fair to good.
1950	1955	20	**CLAYSTONE:** dark greyish brown, silty, blocky, soft to very soft, trace disseminated and nodular pyrite.
		80	**SANDSTONE:** as above, becoming clean, visual porosity good.
1955	1960	50	**CLAYSTONE:** as above become very silty, speckled and laminated with carbonaceous material, ?feldspathic, soft.
		50	**SANDSTONE:** translucent, very coarse grained, well sorted, subangular, loose, predominantly clean, occasionally with white clay matrix adhering. Visual porosity good.
			SHOWS: trace dull yellow spotty direct fluorescence, slow bleeding white solvent fluorescence.
1960	1965	90	**CLAYSTONE:** brownish grey, occasionally mottled white, finely sandy, trace carbonaceous flakes and specks, soft.
		10	**SANDSTONE:** as above.
1965	1970	80	**CLAYSTONE:** as above.
		20	**SANDSTONE:** as above.
1970	1975	90	**CLAYSTONE:** as above, micromicaceous
		10	**SANDSTONE:** as above

Interval (m) From	To	%	Lithology / Show Description
1975	1980	90	**CLAYSTONE:** generally as above, brownish grey, occasionally olive grey, firm, becoming soft & dispersive when water wet, laminated & speckled, micromicaceous, frequent carbonaceous specks and laminae, rare pyrite nodules.
		10	**SANDSTONE:** as above, very coarse to 3mm granules.
1980	1985	90	**CLAYSTONE:** as above.
		10	**SANDSTONE:** generally as above, translucent, to transparent, occasionally milky white & pale orange, disaggregated, medium to 3mm granules, subangular to well rounded generally with increasing grain size, low to high sphericity, grains commonly rimmed with traces of pyrite & clay. Poor to fair inferred porosity.
		Tr	**COAL:** brown black, soft, blocky, lignitic, trace pyrite.
1986	Spot	100	**CONGLOMERATE:** 3-5mm disaggregated quartz granules, rounded, high to moderate sphericity, occasionally with clay matrix adhering.
1985	1990	60	**CLAYSTONE:** as above, becoming dark grey and fissile in part.
		40	**CONGLOMERATE:** as above.
1990	1995	90	**CLAYSTONE:** two types; Type 1, brownish grey & dark grey, fissile in part as above, Type 2, off white to light grey, soft, dispersive, laminated, kaolinitic, micromicaceous, silty with altered feldspar grains, trace carbonaceous specks.
		10	**CONGLOMERATE:** as above.
1995	2000	80	**CLAYSTONE:** as above.
		20	**SANDSTONE:** translucent to transparent, disaggregated, fine to medium grained, subangular to well rounded, low to high sphericity, moderate to well sorted, grains commonly rimmed with traces of clay. Poor to fair inferred porosity.
		Tr	**COAL:** brown black, soft, blocky, lignitic, trace pyrite.
2000	2005	90	**CLAYSTONE:** as above.
		10	**SANDSTONE:** generally as above, predominantly fine grained. No fluorescence.
		Tr	**COAL:** brown black, firm to hard, blocky, lignitic, trace pyrite.
2005	2010	80	**CLAYSTONE:** as above, predominantly Type 2.
		10	**SANDSTONE:** generally as above, predominantly fine grained. No fluorescence.
		10	**COAL:** brown black, firm to hard, blocky, lignitic, trace pyrite, grades to carbonaceous claystone.
2010	2015	70	**CLAYSTONE:** predominantly Type 1 brownish grey to dark brownish grey, soft to firm, dispersive, laminated & speckled, micromicaceous, slightly carbonaceous, slightly silty in part.
		30	**SANDSTONE:** generally as above, predominantly fine grained. No fluorescence.
2019	Spot		**CONGLOMERATE:** translucent to transparent fine to very coarse quartz grains and milky white to grey 3-5mm disaggregated quartz granules, subangular to rounded with increasing grain size, high to moderate sphericity, occasionally with clay matrix adhering, common broken quartz grains, rare aggregates with strong pyritic cement. Poor inferred porosity, no fluorescence.
2019.5	Spot		**CONGLOMERATE:** as above.
2015	2020	80	**CLAYSTONE:** predominantly Type 2 as above.
		20	**CONGLOMERATE:** as above.
2020	2025	80	**CLAYSTONE:** predominantly Type 2 as above, medium light grey to brownish grey, soft to firm, dispersive, laminated, subfissile, micromicaceous, kaolinitic in part, silty in part.
		20	**CONGLOMERATE:** as above, common broken grains with relic texture outlined by pyrite rims.
		Tr	**COAL:** brown black, firm to hard, blocky, lignitic, grades to Carbonaceous Claystone.
2025	2030	100	**CLAYSTONE:** predominantly Type 2 as above with occasional carbonaceous laminae.

Interval (m) From	To	%	Lithology / Show Description
2030	2035	100	**CLAYSTONE:** brownish grey to dark brownish grey, soft to firm, dispersive, laminated, micromicaceous, moderately carbonaceous in part, occasional silty laminae.
		Tr	**COAL:** brown black to black, dull to sub-vitreous, firm to hard, blocky, trace pyrite.
2035	2040	100	**CLAYSTONE:** as above.
		Tr	**COAL:** as above.
2040	2045	30	**CLAYSTONE: type 1** as above.
		40	**CLAYSTONE:** as type 2 above, medium light grey to brownish grey, soft to firm, dispersive, laminated, subfissile, micromicaceous, kaolinitic in part, silty in part.
		20	**SILTSTONE:** medium light grey to brownish grey, off white, soft, dispersive with abundant white kaolinitic clay matrix, common very fine to fine disseminated quartz grains.
		10	**CARBONACEOUS CLAYSTONE:** very dark brown to brownish black, firm, subfissile, very carbonaceous, grades to **CLAYSTONE**
2045	2050	100	**CLAYSTONE: type 1** as above, non calcareous.
2050	2055	90	**CLAYSTONE:** predominantly Type 2 as above, medium light grey to brownish grey, soft to firm, dispersive, laminated, subfissile, micromicaceous, kaolinitic in part, silty in part, carbonaceous specks & laminae.
		10	**SILTSTONE:** as above.
		Tr	**CARBONACEOUS CLAYSTONE:** as above.
2055	2060	85	**CLAYSTONE:** as type 2 above, medium light grey to brownish grey, soft to firm, dispersive, laminated, subfissile, micromicaceous, kaolinitic in part, commonly silty.
		15	**SILTSTONE:** medium light grey to brownish grey, off white, soft, dispersive with abundant white kaolinitic clay matrix, common very fine to fine disseminated quartz grains.
		Tr	**CARBONACEOUS CLAYSTONE:** very dark brown to brownish black, firm, subfissile, very carbonaceous, grades to **CLAYSTONE.**
		Tr	**CONGLOMERATE:** as above,
2060	2065	100	**SILTY CLAYSTONE:** medium brownish grey, predominantly soft dispersive & hydrated, very silty, very micromicaceous, trace carbonaceous specks, grades to **ARGILLACEOUS SILTONE**
2065	2070	70	**SILTY CLAYSTONE:** as above.
		20	**SILTY SANDSTONE:** off white to medium brown, grey, silt to very fine grained translucent quartz, friable, abundant argillaceous matrix, trace calcareous cement, poor visual porosity, no show.
		10	**CARBONACEOUS CLAYSTONE:** as above, grading to **COAL** in part.
2070	2075	80	**CLAYSTONE:** light olive grey, subfissile, soft, dispersive, rare carbonaceous specks, micromicaceous, occasional very silty laminations.
		10	**SILTSTONE:** as above.
		10	**CARBONACEOUS CLAYSTONE:** very dark brown to brownish black, firm, subfissile, very carbonaceous, grades to **CLAYSTONE.**
2075	2080	100	**CLAYSTONE:** as above.
2080	2085	100	**CLAYSTONE:** 2 types (1) mottled white, kaolinitic, very soft, plastic to friable, silty and very finely sandy, (2): medium greyish brown, silty, trace to common carbonaceous flakes, grades in part to: **CARBONACEOUS SHALE:** as above
2085	2090	100	**CLAYSTONE:** as above becoming very light grey.
		Tr	**CARBONACEOUS SHALE:** as above

Interval (m) From	To	%	Lithology / Show Description
2090	2095	70	**CLAYSTONE:** as above, silty, very finely sandy, kaolinitic in part..
		20	**COAL:** black blocky to subfissile, shaley grades to
		10	**CARBONACEOUS SHALE:** very dark brown, firm
2095	2100	100	**CLAYSTONE:** 2 types (1) mottled white, kaolinitic, very soft, plastic to friable, silty and very finely sandy, (2): medium greyish brown, silty, trace to common carbonaceous flakes, grades in part to:
		Tr	**CARBONACEOUS SHALE:** as above
2100	2105	95	**CLAYSTONE:** 2 types as above, type 1 finely sandy, with quartz, grey lithic and carbonaceous grains.
		5	**CARBONACEOUS SHALE:** as above
2105	2110	95	**CLAYSTONE:** as above, finely sand content increasing
		5	**CARBONACEOUS SHALE:**
2110	2115	30	**ARGILLACEOUS SANDSTONE:** very light grey to greyish brown, very fine to occasional medium grained, subangular, poorly sorted, dense kaolinitic clay matrix washing out, visual porosity poor. no shows.
		70	**CLAYSTONE:** two types as above
2115	2120	20	**ARGILLACEOUS SANDSTONE:** as above
		70	**CLAYSTONE:** as above
		10	**COAL:** black, splintery, shaley, subfissile
2120	2125	10	**ARGILLACEOUS SANDSTONE:** as above grades to
		70	**SANDY CLAYSTONE:** very light grey, very soft, friable to plastic
		30	**SILTY CLAYSTONE:** medium greyish brown, homogeneous, trace carbonaceous material.
2125	2130	90	**SILTY CLAYSTONE:** medium greyish brown, finely sandy, soft, plastic when hydrated, micromicaceous, blocky to occasionally subfissile, homogenous
		10	**ARGILLACEOUS SANDSTONE:** as above
		Tr	**COAL:** as above
2130	2135	10	**SANDY CLAYSTONE:** distinctive white, yellowish white, blocky, soft friable to plastic, fine to occasional very coarse quartz grains,
		50	**ARGILLACEOUS SANDSTONE:** very fine to coarse as above.
		40	**SILTY CLAYSTONE:** as above
2135	2140	60	**SANDSTONE:** argillaceous in part, in part clean, fine to very coarse, loose, trace silica cement adhering to grains, visual porosity very good, no shows.
		10	**SANDY CLAYSTONE:** white as above
		30	**SILTY CLAYSTONE:** medium greyish brown as above
2140	2145	100	**SANDSTONE:** clear, milky, very fine to coarse grained, poorly sorted, angular to subangular, quartzose, predominantly loose, clean, trace smoky quartz and grey cherty lithic grains, occasional aggregates with silica cement, visual porosity good. no shows.
2145	2150	100	**SANDSTONE:** as above, becoming fine to coarse grained. No shows.
2150	2155	100	**SANDSTONE:** as above fine to very coarse predominantly medium grained.
2155	2160	100	**SANDSTONE:** as above trace pyrite
2160	2165	95	**SANDSTONE:** as above, predominantly fine grained? Blinding shaker screens, poor sample.
		5	**CLAYSTONE:** two types as above: ?cavings
2165	2170	100	**SANDSTONE:** translucent to light grey, very fine to coarse predominantly fine grained, moderately sorted, angular to subangular, quartzose, silica cement, predominantly loose with common fractured grains, common smoky quartz and grey lithic grains. Visual porosity fair. no shows

Interval (m) From	To	%	Lithology / Show Description
2170	2175	80	**CLAYSTONE:** mottled white to greyish brown, finely sandy, soft to dispersive, kaolinitic, carbonaceous specks and lithic grains,
		20	**SANDSTONE:** translucent to light grey, very fine to fine grained, moderately sorted, subangular, predominantly loose grains ? washing out of dense clay matrix, visible porosity poor.
2175	2180	30	**CLAYSTONE:** mottled as above
		70	**SANDSTONE:** as above, with very coarse grains, occasional hard pyrite cemented aggregates, becoming less argillaceous, visual porosity fair. no shows.
2180	2185	50	**SANDSTONE:** translucent to off light grey, very fine to medium, predominantly fine, angular to subrounded, predominantly subangular, very friable to predominantly loose quartz, occasional pyrite cemented aggregates, common white kaolinitic argillaceous matrix, common smoky quartz and grey lithic grains. Visual porosity fair. no shows
		50	**CLAYSTONE:** off white to light grey, frequent grey laminations, soft, dispersive, kaolinitic common very fine quartz 'floating' within clay, commonly silty, non calcareous.
2185	2190	20	**SANDSTONE:** as above.
		80	**CLAYSTONE:** dark grey to dark brownish grey, soft to firm, dispersive, subfissile, micromicaceous, trace black carbonaceous specks, occasional silty laminae, non calcareous.
2190	2195	90	**CLAYSTONE:** as above, with trace green 'glauconite' grains
		10	**SANDSTONE:** as above.
2195	2200	100	**CLAYSTONE:** as above, with common green 'glauconite' grains.
2203	Spot	100	**CLAYSTONE:** generally as above, mottled dark green & dark grey, firm, very glauconitic, abundant disseminated pyrite, trace dolomitic concretions, trace pyrite nodules with quartz grains.
2200	2205	100	**CLAYSTONE:** as above.
spot	2208.5	50	**CLAYSTONE:** as above.
		50	**SANDSTONE:** grey, translucent quartz, very fine to very coarse, poorly sorted, angular to subrounded, common broken grains, weak siliceous? cement, occasional strong pyritic cement, trace argillaceous matrix, poor visual porosity, no shows.
2205	2210	60	**SANDSTONE:** as above, predominantly fine grained, moderately sorted.
		40	**CLAYSTONE:** as above.
2210	2215	50	**SANDSTONE:** as above.
		50	**CLAYSTONE:** dark grey, soft, dispersive, laminated, subfissile, micromicaceous, trace carbonaceous specks, occasional silty laminae.
2215	2220	60	**SANDSTONE:** light to medium grey, translucent quartz, very fine to very coarse, predominantly fine to coarse, poorly sorted, angular to rounded, predominantly subangular, weak to moderately siliceous cement, trace strong pyritic cement, abundant kaolinitic matrix in part, poor visual porosity, no show.
		40	**CLAYSTONE:** as above.
2220	2225	80	**CLAYSTONE:** as above with occasional coaly laminations.
		20	**SANDSTONE:** as above.
2225	2230	90	**CLAYSTONE:** as above becoming brownish grey.
		10	**SANDSTONE:** as above, trace dolomitic concretions or lithic grains.
		Tr	**COAL:** brown black, dull, firm to soft, blocky, commonly argillaceous.

Interval (m) From	To	%	Lithology / Show Description
2230	2235	90	**SANDSTONE:** light to medium grey, translucent quartz, friable to commonly disaggregated, very fine to very coarse, predominantly fine to medium grained, rounded to predominantly subangular, moderately sorted, weak siliceous cement, occasional strong pyrite cemented aggregates, locally abundant kaolinitic matrix, trace grey cherty lithic grains, poor visual porosity, no show.
		10	**CLAYSTONE:** as above.
2235	2240	100	**SANDSTONE:** light grey, translucent quartz, very fine to granules, predominantly medium grained, very poorly sorted, angular to subangular, moderate sphericity, common quartz overgrowths, weak siliceous cement, trace strongly cemented pyrite aggregates, trace white kaolinitic matrix, poor visual porosity, no show.
2240	2245	70	**SANDSTONE:** as above.
		30	**CLAYSTONE:** medium grey, firm to soft, laminated, commonly sticky, very silty in part, common carbonaceous & coaly specks, occasional silty laminae.
2245	2250	80	**SANDSTONE:** as above, very fine to 3mm granules, very poor sorted, predominantly coarse to very coarse, fair inferred porosity, no show.
		10	**CLAYSTONE:** as above.
		10	**CARBONACEOUS SHALE:** brown black to black, dull, fissile.
2250	2255	80	**CLAYSTONE:** medium to dark brownish grey, firm, becoming soft and dispersive when wet, laminated, common carbonaceous specks.
		20	**SANDSTONE:** as above.
2255	2260	100	**CLAYSTONE:** as above, light to dark brownish grey.
2260	2265	90	**CLAYSTONE:** as above, light to dark brownish grey, occasionally off white & kaolinitic.
		10	**CARBONACEOUS SHALE:** brown black to black, dull, fissile.
2265	2270	90	**CLAYSTONE:** as above
		10	**CARBONACEOUS SHALE:** as above
2270	2275	100	**CLAYSTONE:** light to dark brown, and white kaolinitic, sandy, as above.
		Tr	**COAL:** black, conchoidal fracture, firm to hard.
2275	2280	90	**CLAYSTONE:** as above
		10	**CARBONACEOUS SHALE:** as above interlaminated.
Spot	2281	100	**Slow CLAYSTONE:** predominantly medium greyish brown, silty, trace carbonaceous matter, soft, in part white, kaolinitic, sandy, in part green, glauconitic
2280	2285	10	**SANDSTONE:** translucent very fine to fine grained, poorly sorted, subrounded, very argillaceous with silty and kaolinitic matrix. Visual porosity poor nil.
		90	**CLAYSTONE:** silty, sandy in part, two types interlaminated white/kaolinitic sandy with occasional coarse grains, predominantly medium to dark brown, common carbonaceous flakes and grains, sandy, silty in part.
2285	2290	100	**CLAYSTONE:** predominantly white to very light grey, mottled, kaolinitic, finely quartz sandy, very soft, friable, occasionally with fine carbonaceous flakes
Spot	2292	100	**Fast drilling CLAYSTONE:** two types as above,
2290	2295	90	**SANDSTONE:** translucent, very fine to fine grained, predominantly very fine grained. Moderately sorted, subangular, quartzose, slight white clay matrix washing out.
		10	**CLAYSTONE:** as above.
2295	2300	80	**SANDSTONE:** translucent, very fine to occasionally medium grained, predominantly fine, moderately sorted, subangular, quartzose, predominately loose clean grains, clay matrix in part. Visual porosity poor to fair. no shows.
		20	**CLAYSTONE:** mottled white to greyish brown as above
2300	2305	60	**SILTY SANDSTONE:** light greyish brown, very fine grained, argillaceous matrix,
		40	visual porosity nil. grades to **CLAYSTONE:** medium greyish brown, silty, sandy, trace carbonaceous material, occasional kaolinite patches.

Interval (m) From	To	Lithology / Show Description %	
2305	2310	90	**CLAYSTONE:** two types, white sandy, kaolinitic, and greyish brown, silty,
		10	carbonaceous in part.
2310	2315	100	**CLAYSTONE:** two types interlaminated, (1) off white, mottled, finely sandy and with occasional medium and coarse quartz grains, soft, friable, occasional carbonaceous flakes, (2) dominant, medium greyish brown, homogenous to speckled, occasional fine carbonaceous material, silty, very soft to firm.
Spot	2319.5	100	**CLAYSTONE:** as above, trace **CARBONACEOUS SHALE**
2315	2320	100	**CLAYSTONE:** as above, trace pyrite, trace very coarse quartz grains, trace **CARBONACEOUS SHALE**
2320	2325	100	**CLAYSTONE:** mottled light grey, greyish brown to white, very silty & finely sandy, common fine and medium grained pyrite aggregates.
2325	2330	100	**CLAYSTONE:** sandy and silty as above
2330	2335	90	**CLAYSTONE:** as above.
		10	**SANDSTONE:** light grey, translucent, transparent quartz, very fine to coarse grained, predominantly fine grained, subangular, friable, abundant white kaolinitic argillaceous matrix, trace pyrite nodules, poor porosity, no show.
2335	2340	70	**CLAYSTONE:** as above, becoming predominantly brownish grey with common carbonaceous specks and laminae, trace micromicaceous.
		30	**SANDSTONE:** as above.
2340	2345	100	**CLAYSTONE:** as above, predominantly off white & silty.
2345	2350	100	**CLAYSTONE:** as above, predominantly brownish grey, laminated, silty in part, common carbonaceous specks.
		Tr	**CARBONACEOUS SHALE:** brownish black, firm, dull, earthy, trace pyrite.
2350	2355	100	**CLAYSTONE:** as above.
2355	2360	90	**CLAYSTONE:** as above.
		10	**SANDSTONE:** as above.
2360	2365	100	**CLAYSTONE:** as above, predominantly brownish grey, laminated, silty in part, common carbonaceous specks.
2365	2370	80	**CLAYSTONE:** dark brownish grey, lighter in parts, occasionally light grey, laminated, silty in part, common carbonaceous specks.
		20	**SANDSTONE:** light grey, translucent, transparent quartz, very fine to coarse grained, predominantly fine to medium grained, subangular, friable, abundant white kaolinitic argillaceous matrix, trace pyrite nodules, poor porosity, no show.
2370	2375	100	**CLAYSTONE:** brownish black, firm, subfissile, laminated in part, common carbonaceous specks and coaly streaks.
2375	2380	70	**CLAYSTONE:** light grey to off white, soft, dispersive, kaolinitic, silty with common very fine quartz grains, trace carbonaceous specks and pyrite nodules.
		30	**SANDSTONE:** translucent to transparent quartz, off white to light grey, friable to predominantly disaggregated grains, very fine to coarse, predominantly medium, abundant kaolinitic matrix, trace carbonaceous specks and pyrite nodules.
2380	2385	80	**CLAYSTONE:** as above.
		20	**SANDSTONE:** as above.
2385	2390	100	**CLAYSTONE:** brownish black, firm, subfissile, laminated in part, common carbonaceous specks and coaly streaks, occasionally off white to light grey and silty.
2390	2395	100	**CLAYSTONE:** light grey to off white, soft, dispersive, kaolinitic, silty, common carbonaceous specks.
2395	2400	100	**CLAYSTONE:** brownish black, soft and dispersive, laminated in part, common carbonaceous specks and coaly streaks, occasionally off white to light grey and silty.
2400	2405	100	**CLAYSTONE:** as above.

Interval (m) From	To	%	Lithology / Show Description
2405	2410	100	**CLAYSTONE:** generally as above, brownish grey, soft, plastic, common laminations, common carbonaceous specks, slightly micromicaceous, occasional silty laminae.
2410	2415	90	**CLAYSTONE:** predominantly as above, also off white to light grey in part.
		10	**SANDSTONE:** light grey, very friable, very fine to medium grained, subangular, moderately sorted, trace siliceous and pyrite cement, abundant kaolinitic matrix, poor visible porosity. No show.
2415	2420	90	**CLAYSTONE:** as above, commonly off white.
		10	**SANDSTONE:** as above.
2420	2425	90	**CLAYSTONE:** as above, commonly off white.
		10	**SANDSTONE:** as above.
2425	2430	90	**CLAYSTONE:** as above.
		10	**SANDSTONE:** light grey, very friable, very fine to granular, abundant broken grains, subangular to subrounded, poorly sorted, trace siliceous and pyrite cement, abundant kaolinitic matrix, poor visible porosity. No show.
2430	2435	80	**CLAYSTONE:** two types, predominantly greyish brown to brown, silty, homogenous to occasionally carbonaceous, in part off-white, kaolinitic, sandy.
		20	**SANDSTONE:** as above
2435	2440	90	**CLAYSTONE:** predominantly as above, also off white to light grey in part.
		10	**SANDSTONE:** light grey, very friable, very fine to medium grained, subangular, moderately sorted, trace siliceous and pyrite cement, abundant kaolinitic matrix, poor visible porosity. No show.
2440	2445	70	**CLAYSTONE:** two types equal amounts, (1) mottled white, to very light brown, kaolinitic, sandy, carbonaceous in part, loose fine to coarse quartz grains washing out, (2)light to medium greyish brown, silty, soft, carbonaceous laminae in part.
		30	**SANDSTONE:** light grey, very friable, very fine to granular, abundant loose broken grains, angular to subrounded, poorly sorted, trace siliceous cement, abundant kaolinitic matrix, poor visible porosity. No shows.
2445	2450	70	**CLAYSTONE:** as above
		30	**SANDSTONE:** as above ?fluorescent lubricating oil scum on mud from shaker lubrication, no show in sample.
2450	2455	20	**SANDSTONE:** light grey, very friable, very fine to granular, abundant loose broken grains, angular to subrounded, poorly sorted, trace siliceous cement, occasional pyritic gags abundant kaolinitic matrix, poor visible porosity.
		80	**CLAYSTONE:** two types, mottled white, to very light brown, kaolinitic, sandy, carbonaceous in part, loose quartz grains washing out, light to medium greyish brown, silty, soft, carbonaceous laminae in part.
2455	2460	100	**CLAYSTONE:** as above, predominantly, medium greyish brown, silty, homogenous, trace carbonaceous material, 20% white mottled, kaolinitic.
2460	2465	100	**CLAYSTONE: as above,** predominantly greyish brown, silty, very finely sandy in part, grades to
		Tr	**CARBONACEOUS SHALE and trace COAL**
2465	2470	70	**CLAYSTONE:** medium greyish brown, soft, carbonaceous in part,
		30	**ARGILLACEOUS SANDSTONE:** white, very fine to coarse grained, poorly sorted, subangular, kaolinitic, visual porosity nil, no show.
2470	2475	90	**CLAYSTONE:** predominantly light to medium greyish brown as above, silty, grades in part to siltstone, 10% mottled white, sandy as above, trace pyrite nodules, occasional very coarse quartz grains and grey siliceous lithic grains.
		10	**SILTSTONE:** light grey, firm, friable, micromicaceous
2475	2480	85	**CLAYSTONE:** as above
		10	**SANDSTONE:** very fine to medium grained as above.
		5	**SILTSTONE:** as above

Interval (m) From	To	%	Lithology / Show Description
Spot	2482	20	Fast drilling, **SANDSTONE:** light grey, translucent, fine to very coarse grained, predominantly loose, abundant white clay matrix
		60	**CLAYSTONE:** as above
		20	**CARBONACEOUS SHALE,** grades to trace **COAL**
2480	2485		
2485	2490	80	**CLAYSTONE:** as above.
		20	**SILTSTONE:** light grey, firm to hard, siliceous, micromicaceous.
		Tr	**CARBONACEOUS SHALE:** very dark brown to brownish black firm.
2490	2495	70	**CLAYSTONE:** dark to medium brownish grey, soft to firm, subfissile, common carbonaceous specks & micro laminations, occasionally silty.
		20	**SANDSTONE:** off white to light grey, very fine to very coarse grained, predominantly fine grained, poorly sorted, angular to subrounded, moderately sphericity, trace strong pyrite cement, abundant white kaolinitic matrix, very poor visual porosity, no show.
		10	**SILTSTONE:** light grey and brownish grey, firm, blocky to friable, argillaceous.
2495	2500	80	**CLAYSTONE:** as above, very carbonaceous in part, grading to **CARBONACEOUS SHALE.**
		10	**SANDSTONE:** as above.
		10	**SILTSTONE:** as above.
2500	2505	60	**CLAYSTONE:** as above, very carbonaceous in part with abundant carbonaceous laminae, grading to **CARBONACEOUS SHALE** and earthy **COAL**
		40	**SANDSTONE:** as above.
2509	Spot	100	Gas peak, 0.08%. **CLAYSTONE:** light brownish grey, firm to soft, micromicaceous in part, common carbonaceous specks, silty in part, trace pyrite nodules.
2505	2510	90	**CLAYSTONE:** as above.
		10	**CARBONACEOUS SHALE:** brownish black, to greyish black, firm, extremely carbonaceous in part, grades to trace earthy **COAL**
2510	2515	40	**CLAYSTONE:** as above.
		60	**SANDSTONE:** off white to light grey, translucent quartz, friable, very fine to coarse, occasional very coarse grains, predominantly fine grained, subrounded, moderately sorted, trace pyrite cement, abundant white kaolinitic matrix, poor visual porosity, no show.
2515	2520	90	**CLAYSTONE:** predominantly dark brownish grey as above.
		10	**SANDSTONE:** as above.
2520	2525	60	**CLAYSTONE:** predominantly dark brownish grey as above.
		30	**SANDSTONE:** as above.
		10	**SILTSTONE:** grey, firm, micromicaceous, argillaceous matrix.
2525	2530	90	**CLAYSTONE:** light brownish grey, firm to soft, micromicaceous in part, common carbonaceous specks, silty in part, trace pyrite nodules.
		10	**SANDSTONE:** as above.
2530	2535	90	**CLAYSTONE:** as above, common hard pyrite nodules.
		10	**SANDSTONE:** as above.
2535	2540	90	**CLAYSTONE:** as above, common hard pyrite nodules. Also dark brownish grey in part.
		10	**SANDSTONE:** as above.

Interval (m) From	To	%	Lithology / Show Description
2540	2545	40	**CLAYSTONE:** light grey brown to light grey, soft, dispersive, laminated, common carbonaceous and coaly specks, silty in part, micromicaceous in part, trace hard pyrite nodules.
		60	**SANDSTONE:** grey to off white, very fine to fine grained, subrounded, moderately to well sorted, abundant white kaolinitic matrix, trace carbonaceous specks, very poor porosity visual porosity, no show, grades to arenaceous **CLAYSTONE.**
2545	2550	30	**CLAYSTONE:** as above, common hard pyrite nodules.
		70	**SANDSTONE:** as above.
2550	2555	70	**CLAYSTONE:** as above.
		20	**SANDSTONE:** as above, trace pyrite cemented aggregates.
		10	**SILTSTONE:** grey, firm, micromicaceous, argillaceous matrix.
2555	2560	20	**CLAYSTONE:** as above, common carbonaceous specks.
		80	**SANDSTONE:** light grey, very fine to granular, predominantly fine translucent quartz, friable, subangular - subrounded, moderately to high sphericity, occasional aggregates well cemented by pyrite, abundant kaolinitic matrix, trace dark grey lithic grains, poor inferred porosity, no show.
2560	2565	20	**CLAYSTONE:** as above.
		80	**SANDSTONE:** as above.
2568	Spot	100	Slower drilling. **CLAYSTONE:** dark brownish grey to brownish black, firm, dispersive, common carbonaceous specks and laminations.
2565	2570	70	**CLAYSTONE:** as above.
		30	**SANDSTONE:** as above, common broken quartz grains and pyrite cemented aggregates..
2570	2575	80	**CLAYSTONE:** pale yellowish brown to light brownish grey, smooth to silty, trace carbonaceous material, soft.
		20	**SANDSTONE:** translucent to light brown, very fine to predominantly fine grained, moderately sorted, quartzose, with trace carbonaceous grains, predominantly loose, clay matrix washing out.
2575	2580	70	**CLAYSTONE:** very distinct two-tone colour in sample tray, (1) white, kaolinitic, sandy grades to argillaceous sandstone, (2) medium brownish grey to moderate yellowish brown, silty, grades to siltstone.
		10	**ARGILLACEOUS SANDSTONE.** Kaolinitic fine to occasional very coarse grained.
		20	**SILTSTONE:** light to medium grey to occasionally greyish brown.
2583	spot	80	**CLAYSTONE:** two types as above.
		10	Carbonate cemented **SANDSTONE:** translucent to light grey, fine to medium grained, moderately sorted, dense silica cement, hard,
		10	**SANDSTONE:** translucent, loose grains washing out of claystone.
		Tr	**COAL:** black, small fragments,
2580	2585	100	**CLAYSTONE:** 100% moderate yellowish brown, smooth to slightly silty, blocky,
2585	2590	70	**CLAYSTONE:** two types, yellowish brown as above, and white/ kaolinitic, grades to
		20	**ARGILLACEOUS SANDSTONE:** white, very fine to occasionally medium grained, poorly sorted, very hard/siliceous in part visual porosity poor.
		10	**SILTSTONE:** light grey, soft to firm, friable.
spot	2591.5	80	Fast drilling **CLAYSTONE:** two types, medium brownish grey, silty, soft, and white sandy, kaolinitic, grades to
		20	**ARGILLACEOUS SANDSTONE:** as above fine grained, well sorted, loose grains washing out, occasionally ?clean, visual porosity fair.

Interval (m) From	To	%	Lithology / Show Description
spot	2594.4	80	Very slow drilling, mixed **claystone** lithologies as above and,
		Tr	**SILICIFIED CLAYSTONE** ?tuffaceous, very light grey to very light greenish/bluish grey, splintery, very hard.
		10	**SILICEOUS SANDSTONE:** light grey, very fine to medium grained, pyritic cement in part, visual porosity nil, interlaminated with
		10	**SILTSTONE:** light to medium grey, hard to very hard, siliceous.
		Tr	?**BASALT:** black, very hard, aphanitic, splintery, trace biotite.
spot	2594.6		Slow drilling, mixed **CLAYSTONE** and **ARGILLACEOUS SANDSTONE** lithologies as above with 5% **silicified** lithologies as for previous spot sample.
2590	2595	70	**Minimal sample SANDSTONE:** translucent to white, very fine to fine grained, moderately sorted, subrounded, in part clean, in part very argillaceous/ kaolinitic with disseminated pyrite, visual porosity fair to nil.
		30	**CLAYSTONE:** two types, kaolinitic and yellowish brown as above
spot	2595.3	70	**Slow drilling, Well cemented ARGILLACEOUS SANDSTONE:** mottled white to light grey, fine to coarse grained, poorly sorted, abundant white kaolinitic and occasional very dense calci-dolomitic cement, trace very fine carbonaceous material and occasional disseminated, pyrite, visual porosity nil. Grades to
		10	**SANDY CLAYSTONE,** white, kaolinitic.
		20	**SILTSTONE:** medium to dark grey, soft/argillaceous to occasionally very hard/silicified,
spot	2599	90	**CLAYSTONE:** two types, (1) sandy kaolinitic, pyritic, grades to kaolinitic sandstone (2) dominant, moderate yellow brown, silty, occasional fine to coarse carbonaceous flakes,
		10	**ARGILLACEOUS SANDSTONE:** mottled white as above.
2595	2600	70	**CLAYSTONE:** two types as above.
		30	**SANDSTONE:** very light grey, very fine to occasionally fine grained, white kaolinitic matrix and siliceous cement, occasionally dense pyritic cement. Visual
		Tr	porosity nil.
			SILTSTONE: light grey, siliceous
2600	2605	90	**CLAYSTONE:** moderate to very light brown, smooth to silty, occasional large carbonaceous flakes, firm, soft/amorphous when hydrated.
		10	**ARGILLACEOUS SANDSTONE:** off white to very light yellowish grey, very fine to medium grained,
2605	2610	90	**CLAYSTONE:** 70% moderate to light yellowish brown, silty in part, occasional fine to coarse grained carbonaceous flakes, 30%: light brown to off-white, finely
		10	sandy,
			SILTSTONE: light grey as above,
			Trace pyrite nodules.
2610	2615	90	**ALTERED VOLCANICS:** light grey, mottled and speckled white, red, black, brown and rarely green, soft to firm, predominantly argillaceous alteration products of basic volcanics, occasional remnant partially altered feldspars, slightly
		10	calcareous.
			CLAYSTONE: as above.
2615	2618.4	100	**ALTERED VOLCANICS:** as above.
		Tr	**BASALT:** grey black to black, very hard, micro-crystalline,
2618.4	2620		Bottoms up sample after bit trip. Predominantly **VOLCANICS** as above, with abundant cavings.
2620	2625	100	**ALTERED VOLCANICS:** generally as above, but less altered and hard in part

Interval (m) From	To	%	Lithology / Show Description
2628.4	Spot	30	**SANDSTONE:** white to light grey, fine to medium grained, subrounded to subangular, moderately sorted, friable, variably cemented with carbonate cement, abundant kaolinitic matrix, poor visual porosity.
		50	**CLAYSTONE:** cream to light grey, soft to firm, kaolinitic, probably altered volcanics.
		20	**ALTERED VOLCANICS:** as above, predominantly cream to light grey with relic crystalline texture. **SHOW:** 80% moderately bright white **fluorescence** with very bright spots, very slow blooming white cut using isopropyl alcohol, leaving a thin ring residue. **NOTE carbonate cement also exhibits pale orange mineral fluorescence.**
2625	2630	70	**SANDSTONE:** as above, predominantly as disaggregated quartz grains. 90% fluorescence as above..
		20	**CLAYSTONE:** as above.
		10	**ALTERED VOLCANICS:** as above, predominantly cream to light grey with relic crystalline texture.
2630	2635	60	**SANDSTONE:** as above, strong pyrite & sideritic cements in part. 20% dull white spotty fluorescence, no visible cut, and trace ring residue, common pale orange mineral fluorescence.
		30	**ALTERED VOLCANICS:** as above, commonly green & red brown.
		10	**CLAYSTONE:** greyish brown, soft, plastic, silty in part, trace to common carbonaceous specs and laminations.
2635	2640	30	**SANDSTONE:** as above.
		70	**ALTERED VOLCANICS:** very light grey, slightly greenish in part, soft to firm, predominantly kaolinitic alteration products of basic volcanics, trace relic crystal texture, slightly calcareous in part.
2640	2645	100	**ALTERED BASALT:** greenish grey, mottled green, black & white, firm to hard, sub-blocky, common relic euhedral crystal texture, trace to common white kaolin from altered feldspars.
2645	2650	60	**ALTERED BASALT & VOLCANICS:** generally as above, but abundantly off white.
		40	**SANDSTONE:** white to light grey, fine to medium grained, subangular, moderately sorted, friable to hard, variably cemented with strong sideritic and pyritic cements. carbonate cement, abundant kaolinitic matrix, poor visual porosity. Common dull orange mineral fluorescence.
2650	2655	100	**VOLCANICS (ALTERED):** light grey to greenish grey, soft to firm, predominantly kaolinitic alteration products of basic volcanics, trace relic crystal texture, slightly calcareous in part, common flinty white siliceous spheroids broken into shards & fragments (pseudomorphs after amygdales) **VOLCANICS (Slightly ALTERED BASALT):** black to greenish black, hard to very hard, micro crystalline to cryptocrystalline, occasional white halos around feldspar grains.
2655	2660	90	**VOLCANICS (ALTERED):** as above with minor slightly **ALTERED BASALT.**
		10	**SANDSTONE:** as above.
2660	2665	100	**ALTERED VOLCANICS:** very light grey, frequently greenish, mottled red brown, white & black in part, soft to firm, occasionally hard, predominantly kaolinitic alteration products of basic volcanics, trace relic crystal texture, slightly calcareous in part, common flinty white siliceous spheroids broken into shards & fragments (pseudomorphs after amygdales), trace drusy siderite crystals, with pinky orange mineral fluorescence.
2665	2670	100	**ALTERED VOLCANICS:** as above
2670	2675	100	**ALTERED VOLCANICS:** as above

Interval (m) From	To	%	Lithology / Show Description
2675	2680	95	**ALTERED VOLCANICS:** as above
		Tr	**SANDSTONE:** light grey, very fine to fine grained,
2680	2685	95	**ALTERED VOLCANICS:** as above, light grey to black with translucent to clear
		5	green mineral, coarsely crystalline, acicular in part, soft (hardness ~2).
2685	2690	95	**ALTERED VOLCANICS:** light grey and greenish grey to black, crypto to
		5	microcrystalline, common spherical and fractured amygdales filled with white to moderate green mineral.
2690	2695	100	**ALTERED VOLCANICS:** light grey to black, friable firm to hard, also mottled white kaolinitic, with occasional green carbonate inclusions, soft, friable. Trace dull pink mineral fluorescence.
2695	2700	100	**ALTERED VOLCANICS:** predominantly very light greenish to pinkish grey, kaolinitic, aphanitic ?tuffaceous, calcareous in part, in part light to moderate brown/sideritic.
2700	2705	100	**ALTERED VOLCANICS:** 50% black to dark green, microcrystalline, friable to very hard, 50% light coloured, tuffaceous.
2705	2710	100	**ALTERED VOLCANICS:** as above, predominantly light grey to greyish green, rarely pink, kaolinitic in part, calcareous partly dolomitic, dark grey microcrystalline, friable in part.
2710	2715	70	**CLAYSTONE:** ?tuffaceous, light to moderate brown, silty & finely sandy in part, soft to firm, fine carbonaceous flakes and trace white and pale green mineral
		10	grains. Grades to **SILTSTONE**
		20	**ALTERED VOLCANICS:** light /kaolinitic calcareous, and dark as above,
		Tr	**SANDSTONE:** **?volcaniclastic** medium grey, mottled, very fine to coarse grained, poorly sorted, multicoloured lithic grains and quartz fully cemented with argillaceous matrix and variable siliceous dolomitic calcareous and pyritic cements.
2715	2720	50	**CLAYSTONE:** as above becoming pale greyish orange, occasionally light to moderate brown as above grades to
		40	**SILTSTONE:** light brownish grey, soft to firm, friable, abundant argillaceous
		10	matrix.
		Tr	**ALTERED VOLCANICS:** kaolinitic and black/hard as above.
			SANDSTONE: as above
2720	2725	50	**ALTERED VOLCANICS:** off white to light bluish grey, soft to firm, plastic, argillaceous, probably kaolinitic, trace relic quartz grains, slightly calcareous, common siliceous spheroids, pseudomorphs after amygdales?.
		10	**VOLCANICS:** **unaltered?** black to greenish black, micro-crystalline, hard, brittle.
		20	**CLAYSTONE:** light to moderate brown as above.
		Tr	**SILTSTONE:** as above.
		20	**SANDSTONE:** light grey, translucent quartz, very fine to very coarse, predominantly fine to medium, poorly sorted, angular to rounded, predominantly subangular, friable to predominantly loose quartz grains, moderately siliceous & pyrite cemented aggregates, trace to common white argillaceous matrix in part, poor porosity, no show.
		Tr	**DOLOMITE:** grey brown with dark grey spots, very hard, cryptocrystalline, angular shards, brittle.
2725	2730	80	**ALTERED VOLCANICS:** as above, soapy waxy texture in part, possibly tuffaceous.
		10	**CLAYSTONE:** light to moderate brown as above.
		10	**SANDSTONE:** as above.
2730	2735	80	**ALTERED VOLCANICS:** as above.
		20	**CLAYSTONE:** as above.

Interval (m) From	To	%	Lithology / Show Description
2735	2740	40	**ALTERED VOLCANICS:** as above, slightly calcareous.
		40	**SANDSTONE:** light grey, translucent quartz, very fine to coarse, predominantly medium grained, moderately sorted, friable to predominantly loose quartz, subangular, occasional hard aggregates cemented by pyrite and silica, common to abundant argillaceous matrix, possibly tuffaceous, poor porosity, no show.
		20	**CLAYSTONE:** light to moderate brown as above.
2740	2745	60	**ALTERED VOLCANICS:** pale greenish grey to bluish grey, predominantly argillaceous, soft to firm, dispersive in part, common relic crystal texture, relic glassy grains, slightly calcareous, common siliceous spheroids, pseudomorphs after amygdales?.
		30	**CLAYSTONE:** moderate to dark brownish grey, firm, blocky, common black carbonaceous specks and streaks, occasionally silty.
		10	**SANDSTONE:** light grey, as above.
		Tr	**VOLCANICS: unaltered?** black to greenish black, micro-crystalline, hard, brittle.
2745	2750	20	**ALTERED VOLCANICS:** as above.
		30	**CLAYSTONE:** as above.
		10	**SILTSTONE**: moderate brownish grey, firm to generally soft, argillaceous, trace carbonaceous specks, tuffaceous in part.
		40	**SANDSTONE:** off white to light grey, quartzose, very fine to medium, moderately to poorly sorted, rounded to subangular, friable, occasionally very hard with strong pyrite cement, common white argillaceous/tuffaceous matrix, common lithic grains, poor visual porosity, no show.
2750	2755	20	**ALTERED VOLCANICS:** as above.
		50	**CLAYSTONE:** off white to light grey, soft, plastic, common silt to fine grained sized quartz, possibly altered volcaniclastics.
		10	**CLAYSTONE:** moderate to dark brownish grey as above.
		20	**SANDSTONE:** as above.
2755	2760	80	**SANDSTONE:** light grey, translucent quartz, very fine to granular, predominantly fine to medium, angular to subangular, moderately to poorly sorted, predominantly loose disaggregated & broken quartz grains, trace strong siliceous & dolomitic cement, trace hard well cemented pyrite aggregates, common grey & black cherty lithic grains, fair inferred porosity, no show.
		10	**CLAYSTONE:** off white as above
		10	**CLAYSTONE:** moderate to dark brownish grey as above.
2760	2765	60	**CLAYSTONE:** brownish grey, firm, sticky, common carbonaceous specks, arenaceous, grading to argillaceous **SILTSTONE** & **SANDSTONE**
		30	**SANDSTONE:** as above.
		10	**ALTERED VOLCANICS:** as above.
2765	2770	80	**CLAYSTONE:** as above, very silty, grading to argillaceous **SILTSTONE** in part.
		10	**SANDSTONE:** as above.
		10	**ALTERED VOLCANICS:** as above.
2770	2775	70	**ALTERED VOLCANICS:** light bluish grey, speckled white and occasionally black, green & orange, firm, non sticky, common relic texture, slightly ferro calcitic (moderate effervescence and dull pinkish mineral fluorescence).
		20	**SANDSTONE:** as above, predominantly coarse to granules with many angular broken shards.
		10	**CLAYSTONE:** as above.

Interval (m) From	To	%	Lithology / Show Description
2775	2780	50	**ALTERED VOLCANICS:** as above.
		30	**SANDSTONE:** light grey, very fine to fine grained, occasionally medium & coarse, moderately sorted, subrounded, disaggregated, weak calcareous cement, common very hard pyrite cemented aggregates, white argillaceous matrix in part, common grey lithic grains, poor porosity, no show.
		10	**VOLCANICS:** Very dark grey speckled white, frequently greenish black, very hard, brittle, microcrystalline.
		10	**CLAYSTONE:** as above, with occasional dolomitic concretions.
		Tr	**COAL:** black, subvitreous, sub-conchoidal fracture, hard, brittle.
2780	2785	70	**ALTERED VOLCANICS:** as above.
		20	**SANDSTONE:** as above, common pyrite nodules.
		10	**VOLCANICS:** Very dark grey speckled white, frequently greenish black, very hard, brittle, microcrystalline.
2785	2790	100	**VOLCANICS:** when fresh, black to greenish black & very dark grey, crypto to finely microcrystalline, very hard, occasionally tuffaceous pale green and light grey, soapy textured. When weathered/altered pale to dark brown, pale green, soft to firm friable to plastic, calcareous, common amygdales of green mineral, common fine loose quartz ?washing out
2790	2795	90	**VOLCANICS:** as above
		10	**SILTSTONE:** pale brown, blocky, soft.
2795	2800	100	**ALTERED VOLCANICS:** as above
2800	2805	100	**ALTERED VOLCANICS:** as above
2805	2810	100	**ALTERED VOLCANICS:** as above
2810	2815	100	**VOLCANICS:** altered in part. Predominantly light to moderate brown, very light grey, mottled with pale green and greyish green, rare flow structures ?volcaniclastic in part, calcareous, occasionally fresh volcanics, very dark grey to dark greyish green, microcrystalline, quartz, feldspar & dark minerals, with large irregular to spherical amygdales filled with soft pale green mineral. ? flow top?
2815	2820	100	**ALTERED VOLCANICS:** as above
2820	2825	100	**ALTERED VOLCANICS:** multicoloured white to black, very pale to dark brown, pale to dark green, very finely to medium crystal size, fresh/black to weathered/pale/amorphous.
2825	2830	100	**ALTERED VOLCANICS:** ?weathered, very pale brown, very soft, amorphous,
		Tr	common quartz silt and fine sand washing out, occasional subspherical amygdales of green mineral washing out.
2830	2835	100	**ALTERED VOLCANICS:** as above, becoming very clay rich/dispersive, very fine quartz washing out.
2836	2838	40	**ALTERED VOLCANICS:** ?highly weathered, very pale brown, argillaceous, very soft to dispersive.
		60	**SANDSTONE:** translucent to very light brown, very to fine grained, moderately sorted, subangular, quartzose, ?volcaniclastic and feldspathic grains, argillaceous matrix with loose grains washing out, visual porosity poor. **SHOW:** 50% of tray, patchy bright to dull pinpoint white fluorescence, very faint instant solvent fluorescence followed by very slow moderate blooming solvent fluorescence with yellow fluorescence remaining on some grains, strong irregular yellowish white residual ring,
2835	2840	10	**ALTERED VOLCANICS: as above, trace ?serpentinite, trace chert?**
		80	**CLAYSTONE:** moderate brown, smooth to occasionally silty, common large carbonaceous flakes & wisps, soft to firm.
		10	**SANDSTONE:** as above, **SHOW:** 5% of tray as above.

Interval (m) From	To	%	Lithology / Show Description
2840	2845	50	**CLAYSTONE:** as above, grades to
		30	**SILTSTONE:** moderate brown, firm, argillaceous. Carbonaceous in part.
		20	**SANDSTONE:** as loose grains, clear to light brown, very fine to medium predominantly fine grained, subangular, moderately sorted, argillaceous matrix, poor to fair inferred porosity, no show.
		Tr	**COAL:** black to brownish black, dull, firm to hard, platey to blocky, argillaceous in part.
2845	2850	70	**ALTERED VOLCANICS:** ?tuffaceous, white, very pale green, very pale grey, relict ash structure and occasional amygdales filled with clear quartz,
		30	**CLAYSTONE:** brown, carbonaceous as above.
2850	2855	90	**ALTERED VOLCANICS:** as above, hard, glassy and cherty in part.
		10	**CLAYSTONE:** as above.
2855	2860	70	**ALTERED VOLCANICS:** as above
		20	**SANDSTONE:** as above.
		10	**COAL:** as above, very argillaceous and earthy, grading to **CARBONACEOUS SHALE.**
2860	2865	50	**ALTERED VOLCANICS:** as above.
		40	**CLAYSTONE:** moderate to dark brownish grey, soft to firm, dispersive, common carbonaceous & coaly streaks & specks, common matrix supported quartz grains.
		10	**CARBONACEOUS SHALE:** Very dark brown to brownish black, firm, subfissile.
2865	2870	20	**VOLCANICS:** light grey, off white, bluish to greenish hues, soft and dispersive, occasionally firm and waxy. Also off white, cream, blue and greenish hues, greenish black, glassy to microcrystalline, hard to very hard, brittle, common tuffaceous fabrics, but darker grains basaltic.
		80	**CLAYSTONE:** as above with occasional white tuffaceous? streaks and laminations.
2870	2875	10	**VOLCANICS:** as above.
		90	**CLAYSTONE:** as above.
2875	2880	90	**ALTERED VOLCANICS:** predominantly light grey, off white, bluish to greenish
		10	hues, soft and dispersive, occasionally firm and waxy. Also off white, cream, blue and greenish hues, occasionally greenish black, glassy to microcrystalline, hard to very hard, brittle, common tuffaceous fabrics.
			CLAYSTONE: as above, very carbonaceous in part.
2880	2885	10	**SANDSTONE:** loose grains, light grey, fine grained, well sorted, densely cemented with dolomite and occasionally pyrite.
		80	**SILTY CLAYSTONE:** brown, rarely carbonaceous as above, in part grey, waxy, subfissile.
		10	**VOLCANICS,** altered as above, and tuffaceous, hard, dolomite cemented.
2885	2890	50	**SILTY CLAYSTONE:** brown as above.
		30	**SANDSTONE:**
		20	**VOLCANICS:** light grey, off white, bluish to greenish hues, soft and dispersive, occasionally firm and waxy. Also off white, cream, blue and greenish hues, greenish black, glassy to microcrystalline, hard to very hard, brittle, common tuffaceous fabrics, but darker grains basaltic.
2888.2	spot	30	**SANDSTONE:** as loose grains, clear translucent, fine to medium grained, well sorted, angular, quartzose, trace volcanic lithic grains, clean to kaolinitic, visual
		40	porosity poor to fair. **SHOW**: trace dull yellow, spotty, slow bleeding cut,
		40	moderate ring residue, associated with tight sandstone aggregates.
			ALTERED VOLCANICS: as above
			SILTY CLAYSTONE: as above
			Trace pyrite nodules and loose green mineral filled amygdales.

Interval (m) From	To	%	Lithology / Show Description
2890	2895	80	**SILTY CLAYSTONE:** buff to very light brown, sandy in part with occasional isolated medium quartz grains, rarely carbonaceous as above, in part grey, waxy, subfissile.
		20	**ALTERED VOLCANICS:** as above, highly weathered/altered, very soft dispersive.
2895	2900	90	**SILTY CLAYSTONE:** pale to dark brown, common coaly wisps and laminae, soft-firm, subfissile,
		10	**SANDSTONE:** as loose grains, translucent, fine grained, well sorted, quartzose, trace volcaniclastic grains, visual porosity fair. no shows.
2900	2905	80	**SILTY CLAYSTONE:** brown as above
		20	**ALTERED VOLCANICS:** white speckled, relic feldspar kaolinitic, grades to trace sandstone, fine quartz grains washing out.
2905	2910	40	**SILTY CLAYSTONE:** as above
		30	**ALTERED VOLCANICS:** as above
		30	**SANDSTONE:** loose grains as above becoming very fine grained ?partially washing out of volcanics.
Spot	2912		Hi torque. lithologies as above: plus thin stringer **SANDSTONE:** fine to occasionally medium grained, well sorted, very angular fractured grains, clean, visible porosity fair to good
2910	2915	30	**ALTERED VOLCANICS:** as above speckled to mottled white, common clear
		70	quartz with irregular crystal faces, relict textures after ?feldspar.
		Tr	Trace fractured milky vein quartz.
2915	2920	40	**SANDSTONE:** as loose grains as above, very fine to fine grained, angular, quartzose, volcaniclastic grains, matrix washing out? occasional pyrite cement, visual porosity very poor
		50	**SILTY CLAYSTONE:** as above, occasional fine and medium quartz grains, grades to siltstone.
		10	**ALTERED VOLCANICS:** as above
			Trace large fractured microcrystalline pyrite aggregates.
2920	2925	20	**ALTERED VOLCANICS:** as above, white kaolinitic and dark grey, hard microcrystalline.
		20	**SANDSTONE:** as above, clay matrix washing out.
		60	**SILTY CLAYSTONE:** as above, very soft to dispersive.
2925	2930	10	**ALTERED VOLCANICS:** as above.
		40	**SANDSTONE:** as above.
		10	**SILTY CLAYSTONE:** as above.
2930	2933	10	**ALTERED VOLCANICS:** as above.
		20	**SANDSTONE:** as above.
		70	**SILTY CLAYSTONE:** as above. Common carbonaceous and coaly fragments & laminations.
2933	2935	40	**VOLCANICS:** variably altered from slightly to extensively, dark green to greenish
		50	black microcrystalline basic volcanics, pale green to bluish white, soft to very hard,
		10	commonly tuffaceous with fine grained fabric, waxy in part, feldspars commonly altered to kaolinitic clays.
			SILTY CLAYSTONE: as above.
			SANDSTONE: as above.
2935	2940	90	**CLAYSTONE:** dark brownish grey, firm, blocky, common carbonaceous laminations in part, common 'floating' fine-very coarse quartz grains, occasionally grading to Carbonaceous Shale.
		10	**VOLCANICS:** as above.

Interval (m) From	To	%	Lithology / Show Description
2941	Spot	100	**SANDSTONE:** loose medium-coarse subangular grains, moderately well sorted, clear to translucent quartz, volcaniclastic and feldspathic grains, some microcrystalline pyrite, minor muscovite and chert
2940	2945	100	**SANDSTONE:** light grey translucent quartz, fine to very coarse, predominantly medium, angular to subangular, common broken grains, common quartz overgrowths with moderate siliceous/dolomite/siderite cement, trace strong pyrite cement & nodules, trace white interstitial clay, abundant grey cherty lithic grains, poor porosity, abundant dull pinkish yellow mineral fluorescence.
		Tr	**COAL:** black, vitreous lustre, angular.
2945	2950	100	**SANDSTONE:** as above.
2950	2955	80	**SANDSTONE:** as above, with common green cherty lithic (volcanic?) grains.
		10	**CLAYSTONE:** off white to light brownish grey, soft to firm, dispersive, micro-laminated, common carbonaceous specks & wispy laminations, common silty laminations.
		10	**VOLCANOCLASTICS:** off white to light brown to greenish white, friable to very hard, abundant tuffaceous fragments and quartz in an altered groundmass.
2955	2960	60	**SANDSTONE:** generally as above, very fine to 2mm granules, poorly sorted, angular to subrounded, moderate dolomitic cement in part, friable in part, strong pyrite cemented aggregates, common volcanic lithic grains. Poor porosity, no show.
		20	**SILTY CLAYSTONE:** light grey to brownish grey, soft to firm, abundant carbonaceous & coaly specks and fragments, 'floating' coarse quartz grains, generally as
		20	**CLAYSTONE** as above. Trace dolomitic concretions.
		Tr	**VOLCANOCLASTICS:** generally as above.
2960	2965	60	**SILTY CLAYSTONE:** as above.
		30	**SANDSTONE:** as above.
		10	**COAL:** brownish black to black, earthy to vitreous lustre, firm to hard, uneven to sub-conchoidal fracture, argillaceous in part.
2965	2970	20	**SANDSTONE:** Clear to translucent, predominantly fine to medium grained, well sorted, subrounded to subangular, quartzose, moderate silica cement, trace pyrite, visual porosity poor, no shows.
		80	**SILTY CLAYSTONE:** brownish grey to light grey, very soft, blocky, common carbonaceous specks, occasional matrix supported fine grained quartz grains.
		Tr	**VOLCANICS:** Basaltic, same as above.
		Tr	**COAL:** same as above
2970	2975	95	**CLAYSTONE:** Predominantly brownish grey, very soft to dispersive, blocky, common carbonaceous specks.
		5	**SANDSTONE:** as above
2975	2980	50	**CLAYSTONE:** same as above.
		50	**SANDSTONE:** Clear to translucent, loose disaggregated quartz, very fine to medium, predominantly fine grained, well sorted, subrounded to subangular, quartzose, slight to moderate silica cement, common white argillaceous matrix, rare carbonaceous specks, visual porosity poor, no shows.
2980	2985	95	**CLAYSTONE:** same as above
		5	**SANDSTONE:** Clear to translucent, predominantly fine to medium grained, well sorted, subrounded to subangular, quartzose, slight to moderate silica cement, visual porosity poor, no shows.
		Tr	**QUARTZ:** loose medium to coarse grained, subangular quartz grains.
		Tr	**COAL:** Black, friable

Interval (m) From	To	%	Lithology / Show Description
2985	2990	100	**CLAYSTONE:** Predominantly white to light grey and brownish grey, very soft, blocky, common carbonaceous specks in brown claystone, rare in white to light grey claystone, possibly weathered tuff.
		Tr	**COAL:** same as above.
		Tr	**QUARTZ:** Fractured with pyrite.
		Tr	**PYRITE:**
Spot	2993	20	**SANDSTONE:** as loose grains, clear to white, very fine to coarse, poorly sorted, sub-angular, quartzose, rarely clean, predominantly with siliceous and dolomitic cement and in part with soft white calcareous/clay matrix, visual porosity poor to ?fair. **SHOW:** Trace moderate yellow-white fluorescence, slow faint yellow blooming cut, moderate green-yellow crush cut, moderate green yellow ring residue. Fluorescence associated with low-porosity sand aggregates.
		80	**CLAYSTONE:** as above
2990	2995	15	**SANDSTONE::** as loose grains, clear to translucent, fine-medium grained, well sorted, subrounded to subangular, quartzose, some calcareous/clay matrix, occasional fine quartz aggregates.
		85	**CLAYSTONE:** white or light grey-brown to dark brown, very soft and dispersive with common dark carbonaceous flecks in brown claystone, white claystone slightly dolomitic
2995	3000	100	**CLAYSTONE:** white or light grey-medium brown, white claystone very soft and dispersive, darker claystone harder with common black carbonaceous fragments.
		Tr	**SANDSTONE:** as fine grained quartz aggregates in white, calcite cement with fine disseminated pyrite.
3000	3005	90	**CLAYSTONE:** white or light brown, mainly very soft and dispersive, some harder dark blocky fragments, occasional carbonaceous fragments in brown claystones, white soft clays partly calcareous.
		10	**SANDSTONE:** as loose grains, clear to translucent and fine grained, well sorted and subrounded, quartzose and generally clean, occasional very fine quartz aggregates in partially calcareous matrix, poor porosity, no show.
3005	3010	40	**CLAYSTONE:** as above.
		60	**SANDSTONE:** translucent, light brown grey, loose disaggregated quartz, very fine to fine, well sorted, subangular, moderately cemented, trace argillaceous matrix, poor to fair inferred porosity, no show.
3010	3015	90	**CLAYSTONE:** medium to dark brownish grey, soft to firm, plastic, laminae with common carbonaceous specks and wisps, silty in part, slightly dolomitic.
		10	**SANDSTONE:** as above, medium to coarse grained in part.
3015	3020	100	**CLAYSTONE:** as above. Trace dolomitic concretions.
		Tr	**COAL:** brownish black to black, dull & earthy lustre, platey, grading to carbonaceous shale.
3020	3025	90	**CLAYSTONE:** as above, in part grading to CARBONACEOUS SHALE.
		10	**SILTSTONE:** brownish grey, soft to firm, argillaceous and carbonaceous, laminated, trace altered feldspars.
3026	Spot	100	**SANDSTONE:** off white to light grey, very fine to very coarse, predominantly fine to medium grained, poorly to moderately sorted, subangular, predominantly loose quartz, but common to abundant very fine grained white argillaceous aggregates, weak dolomitic cement, trace pyrite cement, common white kaolinitic matrix & interstitial clay, common carbonaceous & coaly specs and laminations, poor to fair inferred porosity, **SHOW:** 70% moderately bright white to yellow white uniform fluorescence with brilliant yellow spots, very slow blooming white cut, thin ring residue, colourless in white light.

Interval (m) From	To	%	Lithology / Show Description
3025	3030	70	**CLAYSTONE:** Light to dark brownish grey, soft to firm, common carbonaceous specks, silty in part.
		30	**SANDSTONE:** Predominantly as loose grains, clear to translucent, fine to coarse grained, subrounded, quartzose and generally clean, occasional very fine quartz aggregates in partially calcareous matrix, poor porosity, no show.
3030	3035	50	**SANDSTONE:** Predominantly as loose grains, clear to translucent, very fine to coarse grained, angular to subangular, common to abundant very fine grained white argillaceous aggregates, common white kaolinitic matrix, occasional very fine quartz aggregates in partially calcareous matrix, poor to fair porosity, 70% moderately bright white to yellow white uniform fluorescence with brilliant yellow spots, slow to moderate blooming white cut with isopropyl alcohol, thin ring residue, colourless in white light, predominantly associated with kaolinitic aggregates.
		50	**CLAYSTONE:** medium to dark brownish grey, soft to firm, plastic, occasional carbonaceous specks, silty in part.
		Tr	**PYRITE**
3035	3040	60	**CLAYSTONE:** medium to dark brownish grey, soft to firm, plastic, common carbonaceous laminae, silty in part.
		40	**SANDSTONE:** as loose grains, clear to translucent, predominantly very fine to fine grained, well sorted, angular to subangular, occasional white argillaceous aggregates, 5-10% bright yellow white fluorescence associated with kaolinitic aggregates.
		Tr	**COAL:** brownish black to black, dull & earthy lustre, platey.
3040	3045	95	**CLAYSTONE:** medium to dark brownish grey, very soft, common carbonaceous laminae and specks.
		5	**SANDSTONE:** as loose grains, clear to translucent, very fine to coarse grained, poorly sorted, angular to subangular, occasional white argillaceous aggregates, poor porosity, no shows.
		Tr	**COAL:** as above.
3045	3050	90	**CLAYSTONE:** Light to medium brownish grey, very soft, common carbonaceous specks.
		10	**SANDSTONE:** off white to light grey, very fine grained, well sorted, subangular, common to abundant loose quartz grains, common to abundant very fine grained white argillaceous aggregates, common white kaolinitic matrix & interstitial clay, common carbonaceous & coaly specs and laminations, poor to fair porosity, no shows.
		Tr	**COAL:** as above.
3050	3055	95	**CLAYSTONE** as above
		5	**SANDSTONE:** off white to light grey, very fine, well sorted, subangular, common loose quartz grains, common to abundant very fine grained white argillaceous aggregates, common white kaolinitic matrix & interstitial clay, common carbonaceous & coaly specs, poor to fair porosity, no shows.
		Tr	**COAL:** as above
3055	3060	100	**CLAYSTONE:** Light to medium brownish grey, very soft, common carbonaceous specks, silty in part, occasional 'floating' very fine grained quartz grains in white to light brownish grey claystones.
		Tr	**SILTSTONE:** Dark brown, very fine grained, soft to firm.
		Tr	**COAL:** as above
		Tr	**QUARTZ:** Fractured coarse to very coarse grained, angular to subangular grains.

Interval (m) From	To	%	Lithology / Show Description
3060	3065	80	**CLAYSTONE:** as above
		20	**SANDSTONE:** as loose grains, very fine to coarse grained, predominantly very fine to fine grained, common quartz aggregates with silica cement, poor visual porosity, no shows.
		Tr	**SILTSTONE:** as above
3065	3070	100	**CLAYSTONE/ALTERED VOLCANICS:** predominantly white to light grey and blue green, soft to dispersive, occasional to common 'floating' quartz grains in white to light grey claystone, ?tuffaceous, occasional green, very fine to medium grained, hard fragments in blue green claystone ?basaltic, occasional glassy shards in light bluey green claystone.
		Tr	**SANDSTONE:** predominantly quartz aggregates, clear to translucent, very fine to fine grained quartz grains, well sorted with calcareous cement, friable to hard.
3070	3075	100	**ALTERED VOLCANICS:** predominantly white to light grey, occasional to common blue green and pale pink, soft to dispersive, occasional to common 'floating' quartz grains in white to light grey claystone, ?tuffaceous, occasional green, very fine to medium grained, hard fragments in blue green claystone ?basaltic, trace dark grey/black mafic minerals altered to chlorite in part, occasional glassy shards in light bluey green claystone.
		Tr	**SILTSTONE:** Dark brown, very fine-grained, soft to firm, occasional carbonaceous specks.
		Tr	**SANDSTONE:** as above.
3075	3080	100	**VOLCANICS:** mottled light-dark grey, pink, orange and some green, hard blocky quartz-rich, fine to granular, grading to acidic volcanics, clear-light brown quartz often as loose, rounded-subrounded, very fine-fine grains, occasional green glassy shards.
3080	3085	100	**VOLCANICS:** very mottled grey, pink, and white hard granular volcanic with quartz rich bands, loose grains of quartz clear to milky white, subangular and fine grained.
3085	3090	90	**VOLCANICS:** as above becoming softer, kaolinitic, quartz grains washing out
		10	**SANDSTONE:** clear, frosted, very fine to fine grained, moderately sorted, angular quartz and volcanic lithic grains, slight siliceous cement and white kaolinitic matrix washing out. Few grain very dull yellow spotty fluorescence associated with loose sand grains, slow diffuse very faint white solvent fluorescence cut.
3090	3095	50	**CLAYSTONE:** medium greyish brown to very dark brown, silty in part, soft to firm, blocky to subfissile, in part laminated with ?tuffaceous claystone.
		50	**VOLCANICS:** as above (possible cavings)
		Tr	**SANDSTONE:** mottled green, pink, orange, very fine grained, volcanilithic and quartzose, dense silica cement, very hard, visual porosity nil.
spot	3097		Fast drilling
		20	**SANDSTONE:** clear to light brown, very light grey, speckled, very fine to fine rarely medium grained, moderately sorted, angular, loose to moderately cemented with silica and dolomite, occasionally calcareous, and with dense kaolinitic matrix in part, quartzose, volcanolithic, firm to friable, visible porosity poor. grades to
		40	**SANDY CLAYSTONE:** ?tuffaceous, mottled white, kaolinitic, very finely quartz sandy, soft, sticky to friable.
		40	**CLAYSTONE:** medium to dark brown as above.
			SHOW: 60% very dull yellow to brown fluorescence associated with white sandy claystone and kaolinitic sandstone aggregates very slow blooming faint milky white solvent fluorescence, strong crush cut and bright spotty white residual ring fluorescence, nil ring in white light. Clean sandstone has no show.

Interval (m) From	To	%	Lithology / Show Description
spot	3098		Fast drilling, gas background rise,
		20	**SANDSTONE:** as above, predominantly very fine, quartzose loose to densely kaolinitic aggregates, grains ?washing out of matrix in part, visual porosity nil to occasionally fair, grades in part to:
		70	**SANDY CLAYSTONE:** as above, kaolinitic
			Fast drilling, gas background rise, **Show as above.** 70% of tray associated with white sandy claystone/kaolinitic sandstone aggregates.
		10	**CLAYSTONE:** as above
3095	3100	20	**SANDSTONE:** as above, predominantly loose. **SHOWS:** 10 % very dull fluorescence as above
		70	**CLAYSTONE:** moderate brown, as above, predominantly homogeneous, non
		10	silty
			SANDY CLAYSTONE: as above.
Spot	3102		Fast drilling
		20	**SANDSTONE:** as above, predominantly loose, but commonly with cemented and kaolinitic aggregates, grades to
		50	**SANDY CLAYSTONE:** tuffaceous, as above.
		30	**CLAYSTONE:** brown as above
			SHOW: 70% dull yellow-brown fluorescence associated with kaolinitic aggregates, very slow blooming faint milky white solvent fluorescence, strong crush cut and bright spotty white residual ring fluorescence, nil ring in white light.
Spot	3103.7	60	**CLAYSTONE:** brown as above
		35	**SANDY CLAYSTONE:** white kaolinitic as above.
		5	**SANDSTONE:** as loose grains, very fine as above.
			SHOW: 40 % very dull yellow fluorescence as above
3100	3105		**Show:** 70% very dull fluorescence as above, flu associated with kaolinitic very fine SANDSTONE: aggregates. Loose cleaner sandstone has no shows.
3105	3110	40	**SANDSTONE:** very fine as above,
		50	**CLAYSTONE:** brown as above.
		10	**SANDY CLAYSTONE:** tuffaceous as above.
			SHOWS: 5% bright to 50% very dull spotty fluorescence as above, very dull spotty flu associated with loose quartz grains, bright flu associated with kaolinitic aggregates.
3110	3115	95	**CLAYSTONE:** predominantly light to medium brown, occasionally white, very soft to firm, occasionally plastic, common carbonaceous specks in brown claystone, silty in part, occasional 'floating' very fine grained quartz in white claystone, ?tuffaceous.
		5	**SANDSTONE:** predominantly as loose grains, very fine to coarse grained, predominantly very fine to fine grained, common quartz aggregates with silica cement, poor visual porosity, no shows.
		Tr	**SILTSTONE:** Medium to dark brown, very fine grained, soft to firm, common to abundant carbonaceous laminae and specks.
			No shows
3115	3120	40	**SANDY CLAYSTONE:** ?tuffaceous, mottled white, kaolinitic, very finely quartz sandy, soft, sticky to friable.
		40	**CLAYSTONE:** medium to dark brown as above.
		20	**SANDSTONE:** predominantly as loose grains, very fine to
			SHOWS: 60% very dull yellow fluorescence associated with kaolinitic aggregates and sandy claystone, very slow very weak diffuse cut, moderate crush cut, faint ring residue.

Interval (m) From	To	%	Lithology / Show Description
3120	3125	40	**CLAYSTONE:** medium to dark brown as above.
		35	**SANDSTONE:** predominantly as loose grains, very fine to medium grained, subangular to subrounded, occasional quartz aggregates with trace to minor calcareous cement.
		25	**SANDY CLAYSTONE:** as above.
			SHOWS: 20% very dull white fluorescence as above associated with kaolinitic aggregates.
3125	3130	100	**CLAYSTONE:** predominantly light to medium brown, occasionally white, very soft to soft, common carbonaceous specks in brown claystone, occasional 'floating' very fine grained quartz in white claystone, ?tuffaceous.
		Tr	**SILTSTONE:** Light brownish grey and medium to dark brown, very fine grained, soft to firm, common to abundant carbonaceous laminae and specks.
		Tr	**SANDSTONE:** as above.
			SHOWS: Nil to 5%, very weak pale yellow white fluorescence with a trace cut, moderately fast crush cut and moderately bright yellow ring residue, associated with kaolinitic aggregates.
3130	3135	100	**CLAYSTONE:** light to medium brown and white to light brownish grey, very soft to soft, occasionally plastic, common carbonaceous specks and wisps in brown claystone.
		Tr	**SILTSTONE:** medium to dark brown, as above
spot	3137.3	80	**CLAYSTONE:** predominantly white to light brownish grey, commonly light to medium brown, very soft to soft, occasionally plastic, common carbonaceous specks and wisps in brown claystone.
		20	**SANDSTONE:** predominantly as loose grains, very fine to medium grained, occasional coarse grained, subangular to subrounded, occasional quartz aggregate.
		Tr	**SILTSTONE:** as above.
			SHOW: 60% very dull yellow white, patchy, very weak and diffuse cut and moderately fast yellow white crush cut and moderate yellow ring residue. Fluorescence predominantly associated with kaolinitic aggregates.
3135	3140	60	**SANDY CLAYSTONE:** mottled white, kaolinitic, very finely quartz sandy, soft, sticky to friable.
		30	**SANDSTONE:** predominantly as loose grains, very fine to medium grained, occasionally coarse to very coarse grained, subangular to subrounded, occasional quartz aggregates with trace to minor calcareous cement.
		10	**CLAYSTONE:** Light to medium brown, very soft to soft, common carbonaceous specks and wisps in brown claystone.
		Tr	**SILTSTONE:** as above.
			SHOW: 20% predominantly very dull yellow, occasional spotty blue white fluorescence, very weak and diffuse cut, slow to moderate yellow crush cut with weak yellow ring residue. Fluorescence predominantly associated with kaolinitic aggregates.

Interval (m) From	To	%	Lithology / Show Description
3140	3145	30	**SANDSTONE:** predominantly as loose grains, very fine to medium grained, occasionally coarse to very coarse grained, subangular to subrounded, occasional quartz aggregates with trace to minor calcareous cement, occasional light to medium greenish grey sandstone, very fine grained, well sorted, firm to hard with silica cement, occasional dark green, very fine grained, angular to subangular, hard fragments, ?basaltic.
		40	**CLAYSTONE:** Light to medium brown, very soft to soft, common carbonaceous specks and wisps in brown claystone.
		30	**SANDY CLAYSTONE:** mottled white, kaolinitic, very finely quartz, soft, sticky to friable.
		Tr	**SILTSTONE:** medium greenish grey, very fine grained, firm.
			SHOW: 5-10% predominantly spotty, bright, blue white solvent fluorescence, slow to moderate blooming cut, moderately fast crush cut, colourless ring residue.
3145	3150	30	**SANDSTONE:** loose hard grains, clear to milky-white, very fine grained, subrounded to subangular, occasional quartz aggregates with calcareous cement, well sorted.
		70	**CLAYSTONE:** as above
			SHOW: 5-10% predominantly dull with some spotty blue-white fluorescence, very slow blooming cut with weak ring fluorescence, colourless ring residue.
3150	3155	20	**SANDSTONE:** as loose grains, clear to milky-white, very fine grained, well sorted, subangular grains, rare soft quartz aggregates with kaolinitic matrix.
		10	**SANDY CLAYSTONE:** mottled white, fine quartz in soft sticky to friable matrix.
		70	**CLAYSTONE:** Light to medium brown, very soft to soft, common carbonaceous specks and wisps in brown claystone, occasional soft white dispersive claystones with carbonaceous specks.
			SHOW: 70% very dull yellow fluorescence, spotty on loose grains, patchy on aggregates, nil cut, very faint crush cut, stronger on kaolinitic aggregates, thin spotty white ring residue.
3155	3160	80	**SANDSTONE:** two types, (1) light brown, loose grains, very fine to occasionally fine grained, angular, white kaolinitic matrix adhering to grains, slightly calcareous in part, visual porosity poor, (2) clear/translucent, fine to occasionally medium grained, very angular, well sorted, totally cemented with dolomite, aggregates fracture across grains, slight kaolinitic matrix adhering to grains.
		10	**CLAYSTONE:** pale to dark brownish grey rarely black, coaly in part, soft to firm,
		10	**SANDY CLAYSTONE:** mottled white as above white, friable, trace to abundant fine to medium quartz grains.
			SHOW: 50% fluorescence as above, trace yellow mineral fluorescence.
3160	3165	40	**SANDSTONE:** two types, (1) light brown, loose grains, very fine to occasionally
		60	fine grained, angular, white kaolinitic matrix adhering to grains, slightly calcareous in part, visual porosity poor, (2) clear/translucent, fine to occasionally medium grained, very angular, well sorted, totally cemented with dolomite, aggregates fracture across grains, slight kaolinitic matrix adhering to grains.
			CLAYSTONE: pale to dark brownish grey rarely black, coaly in part, soft to firm,
			SHOW: 10% fluorescence as above.
3165	3170	20	**SANDSTONE:** light brown, clear/translucent, very fine to fine grained, moderately
		10	sorted, angular, predominantly loose, occasionally with dense calcareous cement occasional aggregates with dense kaolinitic matrix, visual porosity poor.
		70	**SANDY CLAYSTONE:** white, friable, trace to abundant fine to medium quartz grains.
			CLAYSTONE: medium brown ,brownish grey, as above.
			no shows.

Interval (m) From	To	%	Lithology / Show Description
3170	3174 TD	30	**SANDSTONE:** very fine grained, angular to rarely subrounded, calcareous and kaolinitic as above, trace pyrite cement, common brown quartz grains, common volcanolithic grains, visual porosity poor to nil.
		30	**SANDY CLAYSTONE,** white as above
		40	**CLAYSTONE:** pale grey to pale brown, very silty, soft to firm.
			TRACE SHOW: few grains very dull yellow uniform to pinpoint fluorescence, associated with kaolinitic and cemented aggregates, nil cut, very faint crush cut.

APPENDIX 2

SIDEWALL CORE DESCRIPTIONS

ESSO AUSTRALIA PTY LTD
WELL- SCALLOP-1
SIDEWALL CST DESCRIPTION

GEOLOGIST:	JOB #/RUN #:	BIT DIAMETER:	CORES SHOT:	RECOVERED:	MISFIRED:	EMPTY:	LOST:	RECOVERY %:	GUN TYPE(S):	DATE:
G. WAKELIN-KING / G. SMITH	1-5	$12^1/_4$"	60	52	0	1	7	86.6%	CST-D	27/02/03

#	DEPTH	REC	ROCK	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT FLUOR		CR .CUT FLUOR		R. RES	SHOW	Post WI Analysis	Cu
	mRKB	cm	TYPE	(clr, hdness, texture, mineralogy, modifiers, cmt)		DIST	COLOR	DIST	INTEN	COLOR	INTEN	COLOR	INTEN	COLOR	COLOR	QUAL		
1	3165	2.0	Silty sandstone	Light brown and mottled light grey, very fine to fine grained, hard, predominately quartzose with common lithic grains, densely cemented with silica and dolomite, clay matrix.	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil		Nil	Nil		
2	3162	Nil	Lost	No recovery.														
3	3157	2.0	Sandstone	Core shattered, light grey to light brown mottled with black specks, very fine to medium grained, moderately sorted subangular, quartzose with common lithic grains and trace carbonaceous specks, 5mm quartz vein.	Poor	Nil	Nil	30% Spotty	Mod	Yellow	Faint- slow mod	White	Mod	White	Very thin spotty yellow	Very poor		
4	3155.5	Nil	Lost	No recovery														
5	3151.5	Nil	Lost	No recovery														
6	3149.5	2.5	Claystone	Medium brown-grey, silty, with very fine carbonaceous specks, firm.														
7	3146.4		Sandstone	Very light greyish-brown, friable, very fine to fine grained, occasional very coarse quartz grains, moderately sorted, quartzose with common lithic grains and carbonaceous specks, moderate silica cement and moderate dense white clay matrix.	Poor	Nil	Nil	80% patchy	Mod	Yellow-white	Faint immed., mod-slow bloom	White	Mod	White	Thin spotty yellow-white	Poor		
8	3144	1.5	Sandstone	Very light grey-brown, soft, very fine to fine grained, well sorted, angular, trace carbonaceous specks, abundant white clay matrix, trace silica cement.	Very poor	Trace	Red-brown	95% 5%	Uniform dull. Bright spots.	Yellow-white	Very faint immed., mod-very slow bloom	Green-white	Mod	Green -white	Patchy mod. green-white	Fair		
9	3141.4	Nil	Lost	No recovery														
10	3130.5	2.0	Claystone	Dark brown-grey, silty, slightly carbonaceous, firm.														
11	3129.1	2.0	Sandstone	Very light brown, very fine silty sandstone, angular and well sorted, quartzose, trace carbonaceous specks, common clay matrix and dolomite cement.	Trace	Trace	Red-brown	Trace	Dull	Gold	Nil	Nil	V.v faint, v.slow	Yellow	Very faint yellow	Trace		
12	3122	1.5	Sandstone	Pale yellow-grey, very fine-fine grained, moderately sorted angular, quartzose, trace lithic grains, trace carbonaceous grains, moderate white clay matrix, dolomitic cement.	Trace	Nil	Nil	30% spotty	Dull (Tr. gun residue)	Yellow	Nil	Nil	Very faint	Green - yellow	Thin very dull yellow	Poor		
13	3120.5	1.5	Sandstone	Very light grey-brown, friable, fine to occasionally medium grained, angular to rounded, well sorted, quartzose, common grey lithic grains, trace carbonaceous specks, moderate silica cement. Patchy white clay matrix, fluorescence improves in clay matrix.	Fair	Nil	Nil	70% patchy	Dull-mod	Yellow-white	Nil immediate, faint very slow bloom,	Yellow-white	Faint	Yellow-white	Faint, thin, uniform ,yellow	Poor		
14	3110.5	1.5	Silty claystone	Medium brown-grey, hard, trace carbonaceous laminations, trace amber, dark red-brown, vitreous, conchoidal fracture, moderate orange fluorescence.														

SIDEWALL CST DESCRIPTION

GEOLOGIST:	JOB #/RUN #:	BIT DIAMETER:	CORES SHOT:	RECOVERED:	MISFIRED:	EMPTY:	LOST:	RECOVERY %:	GUN TYPE(S):	DATE:
G. WAKELIN-KING / G. SMITH	1-5	$12^{1}/_{4}$"	60	52	0	1	7	86.6%	CST-D	27/02/03

#	DEPTH	REC	ROCK	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT FLUOR		CR .CUT FLUOR		R. RES	SHOW	Post WI Analysis	Cu
	mRKB	cm	TYPE	(clr, hdness, texture, mineralogy, modifiers, cmt)		DIST	COLOR	DIST	INTEN	COLOR	INTEN	COLOR	INTEN	COLOR	COLOR	QUAL		
15	3107.5	Nil	Lost	No recovery														
16	3105.5	1.0	Sandstone	Very light brown, very fine grained, silty, moderately sorted, angular, quartzose, grey lithic grains, trace carbonaceous specks, trace dolomitic cement, abundant patchy white clay matrix, trace silica cement..	Trace	Nil	Nil	60%	Mod Patchy	Green-white	Faint instant, moderate blooming	Green-white	Mod	Green-white	Yellow, thin, moderately bright	Poor		
17	3103.9	2.0	Claystone	Dark grey, slightly silty, trace carbonaceous specks.														
18	3101.1	1.0	Sandstone	Very light greyish-yellow, very fine to fine grained, occasionally medium grained, moderately sorted, trace lithic and carbonaceous grains, silica cement, trace quartz overgrowths, trace clay matrix adhering to grains. Bright patchy fluorescence is in disaggregated part of core, inner core (undisturbed) dull and uniform.	Poor	Nil	Nil	80%	Dull to patchy bright	Green-white	Faint instant, moderate blooming	Yellow-white	Mod-dull	Yellow-white	Bright, moderately thick, yellow white	Fair		
19	3097.2	1.5	Argill. Siltstone	Light brown-grey, 40% clay interlaminated at mm scale with silty claystone.														
20	3059	1.5	Sandstone	Light grey, firm-friable, very fine to medium grained, predominately very fine, moderately sorted, subrounded to angular, quartzose, anundant grey lithic and carbonaceous grains, trace weathered feldspar, moderate silica cement, trace dolomitic cement..	Poor	Nil	Nil	80% spotty. Some patches.	Dull Bright	Yellow-white	Slow streaming (from brighter yellow patches)	Yellow-white	Mod	Yellow-white	Mod, thin, uniform, yellow-white	Fair		
21	3052.5	1.0	Siltstone	Light grey-brown speckled, common very fine carbonaceous , quartz and feldspathic grains. 30% clay matrix, firm.														
22	3050.5	1.5	Silty claystone	Medium greyish-brown, 30% silt, homogenous.														
23	3031.5	1.5	Sandstone	Pale yellowish-grey, faint yellowish-brown oil stain, firm, very fine to fine grained, predominately very fine grained, moderately sorted, subangular, quartzose, trace lithic and carbonaceous grains, moderate patchy kaolin matrix, trace dolomitic cement.	Fair	patchy	Yellow-brown	Patchy	100% Mod. to bright	Yellowish white	Mod instant, foll by slow blooming bright, mod crush	Blu-white	Mod blooming	Bluish white	Bright mod thick white ring	Good		
24	3030	1.5	Sandstone	Pale yellowish-grey, faint yellowish-brown oil stain, firm, very fine to fine grained, predominately very fine grained, rare coarse grains, moderately sorted, subangular, quartzose, trace lithic and carbonaceous grains, dense white kaolin matrix, trace patchy pyritic cement.	Trace	Patchy	Yellow-brown	100%	100% Mod to bright	Yellow-white	Faint instant yellow cut, slow blooming, slow streaming.	Blue-white	Mod crush	Blue-white	Thick bright yellow white	Good		
25	3022.5	2.0	Carb. shale	Dark greyish-brown, slightly carbonaceous claystone, thin coal laminae, sub-fissile.														

SIDEWALL CST DESCRIPTION

GEOLOGIST:	JOB #/RUN #:	BIT DIAMETER:	CORES SHOT:	RECOVERED:	MISFIRED:	EMPTY:	LOST:	RECOVERY %:	GUN TYPE(S):	DATE:
G. WAKELIN-KING / G. SMITH	1-5	12¼"	60	52	0	1	7	86.6%	CST-D	27/02/03

#	DEPTH	REC	ROCK	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT FLUOR		CR .CUT FLUOR		R. RES	SHOW	Post WI Analysis	Cu
	mRKB	cm	TYPE	(clr, hdness, texture, mineralogy, modifiers, cmt)		DIST	COLOR	DIST	INTEN	COLOR	INTEN	COLOR	INTEN	COLOR	COLOR	QUAL		
26	3013	1.5	Siltstone	Pale greyish-brown speckled, very hard siltstone, trace mica, trace carbonaceous specks, silica cement..														
27	2991.5	2.0	Carb. Shale	Very dark brownish-black, splintery, firm to hard.														
28	2983.5	2.0	Sandstone	Laminated siltstone and very fine sandstone, silty, poorly sorted, angular grains, patchy kaolinitic matrix, calcareous cement.	Trace	Nil	Nil	30%	Dull (in sst)	Yellow	Very slow blooming	Yellow	Faint	Yellow-white	Thin faint yellow, dim, spotty	Poor		
29	2976.5	1.5	Silty claystone	Medium brownish-grey, homogenous, firm to hard.														
30	2941	1.5	Sandstone	Light grey speckled, very fine to very coarse, very coarse intraformational claystone clast, poorly sorted, firm friable, quartzose with common dark grey lithic grains, moderate patchy silica cement.	Fair-good	Nil	Nil	30%	Dull	Gold	Very slow blooming, diffuse.	Green	Faint	Green	Mod, thin, yellow	Poor		
31	2913.9	Nil		No recovery														
32	2898.5	1.5	Sandstone	Very light brown, speckled, very fine to fine grained, predominantly very fine, poorly sorted, angular to rounded, quartzose, abundant grey lithic grains, patchy silty matrix.	Fair	Trace	Brown	30%	Dull on edges and bright in middle of core	Yellow-white	Faint instant with strong streaming	Blue-white	Mod	Blue-white	Thick white	Good		
33	2898	1.0	Sandstone with carb. laminae	Pale yellowish-grey, firm and friable, very fine grained, silty, angular to sub-rounded, quartzose, grey lithic grains, very patchy white kaolinitic matrix. Brighter fluorescence associated with carb. laminae.	Fair	Trace	Brown	20%	Dull, patchy	Yellow	Very weak instant. Moderate streaming.	Yellow Blue-white	Mod	Blue-white	Dull yellow, thin	Fair		
34	2889.5	1.0	Sandstone	Very light grey speckled black, common carbonaceous grains, firm to hard, very fine to fine grained, moderately sorted, angular to subrounded, common white patchy kaolinitic matrix, dolomitic cement.	Trace	Nil	Nil	70%	Dull to patchy	Yellow	Very faint instant diffuse,	Yellow	Faint	Yellow	Faint, dull yellow	Poor		
35	2886	1.5	Claystone	Light brownish-grey, trace carbonaceous specks, soft, 10% silt, homogeneous.														
36	2870.2	2.0	Silty claystone	Medium greyish-brown with white patches, intraformational clasts of kaolinitic sandstone, occasional very coast matrix supported quartz grains, ?debris flow.														

ESSO AUSTRALIA PTY LTD
WELL- SCALLOP-1
SIDEWALL CST DESCRIPTION

GEOLOGIST:	JOB #/RUN #:	BIT DIAMETER:	CORES SHOT:	RECOVERED:	MISFIRED:	EMPTY:	LOST:	RECOVERY %:	GUN TYPE(S):	DATE:
G. WAKELIN-KING / G. SMITH	1-5	$12^1/_4$"	60	52	0	1	7	86.6%	CST-D	27/02/03

#	DEPTH	REC	ROCK	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT FLUOR		CR .CUT FLUOR		R. RES	SHOW	Post WI Analysis	Cu
	mRKB	cm	TYPE	(clr, hdness, texture, mineralogy, modifiers, cmt)		DIST	COLOR	DIST	INTEN	COLOR	INTEN	COLOR	INTEN	COLOR	COLOR	QUAL		
37	2840.9	1.0	Sandstone	Very light brown, spotted grey, firm, friable, very fine to coarse grained, poorly sorted, angular to subrounded, dense white clay matrix, trace quartz silt matrix.	Poor	Trace patchy	Brown	100%	Patchy, bright	Yellow-white	Moderate instant, moderate slow streaming	Yellow-white	Mod to strong	Blue-white	Thick white	Good		
38	2839.5	1.5	Sandstone	As for previous sample, left undisturbed.														
39	2758	1.5	Silty claystone	Speckled light greyish-brown, trace matrix supported quartz grains, firm, trace carbonaceous wisps, trace fine iron staining,														
40	2750	1.5	Claystone	Medium grey, 30% quartz silt, homogeneous, firm to hard.														
41	2735.5	2.0	Altered volcanics	Very pale grey, firm, relic vesicles?, aphanitic.														
42	2635.2	1.5	Sandstone	Light grey, very fine to coarse grained, poorly sorted, abundant white matrix. Left undisturbed.	Poor	Nil	Nil	80%	Dull to bright patchy	Yellow-white	Faint instant, faint blooming	Yellow-white	Faint	Yellow-white	Bright thin yellow-white	Fair		
43	2630.5	2.0	Sandstone	Core crushed, very light brown, very fine to fine grained, well sorted, angular, quartzose, trace grey lithic grains, trace pyrite, trace silica cement, moderate clay matrix adhering to grains.	Fair	Nil	Nil	100%	Bright	Yellow-white	Faint instant, strong, slow blooming	Blue-white	Mod	Blue-white	Bright moderately thick white	Good		
44	2627.5	3.0	Altered volcanic	Dark greenish-grey, firm, microcrystalline with vesicles filled with chlorite.														
45	2601.5	2.0	Siltstone	Medium to brownish-grey, 20% clay, 10% fine and medium quartz grains.														
46	2586.7	2.0	Claystone	Light to medium grey, homogeneous, non-silty.														
47	2529.5	2.5	Claystone	Medium greyish-brown, coaly wisps and lenses, filter-cake injected along fractures.														
48	2402.5	2.0	Claystone	Medium grey, 10% silt, micro-micaceous, laminated with quartz silt,														
49	2304	2.0	Carb. shale	Brownish-black, coaly laminations, firm, pyritic.														
50	2204.5	3.0	Sandstone (greensand)	Dark greyish-green, glauconite sand, very fine grained, soft, abundant pyritic cement, dark grey matrix, trace mica, nil quartz.														
51	2192.7	1.5	Siltstone	Medium brownish-grey, 40% clay, occasional medium quartz grains, micro-micaceous.														
52	2090	2.0	Claystone	Light grey, homogeneous, 10% silt.														
53	2029.5	Nil	Lost	No recovery														

ESSO AUSTRALIA PTY LTD
WELL- SCALLOP-1
SIDEWALL CST DESCRIPTION

GEOLOGIST:	JOB #/RUN #:	BIT DIAMETER:	CORES SHOT:	RECOVERED:	MISFIRED:	EMPTY:	LOST:	RECOVERY %:	GUN TYPE(S):	DATE:
G. WAKELIN-KING / G. SMITH	1-5	12 1/4"	60	52	0	1	7	86.6%	CST-D	27/02/03

#	DEPTH	REC	ROCK	LITHOLOGY DESCRIPTION and COMMENTS	POR	STAIN		FLUOR			CUT FLUOR		CR .CUT FLUOR		R. RES	SHOW	Post WI Analysis	Cu
	mRKB	cm	TYPE	(clr, hdness, texture, mineralogy, modifiers, cmt)		DIST	COLOR	DIST	INTEN	COLOR	INTEN	COLOR	INTEN	COLOR	COLOR	QUAL		
54	1936.5	2.2	Claystone	Medium grey, homogeneous, firm, trace quartz siltstone intraformational clasts.														
55	1837.8	2.4	Claystone, carbonaceous	Dark olive-black, pyritic, abundant matrix supported medium to very coarse subangular quartz grains.														
56	1770	3.0	Claystone	Dark brown, soapy texture, non silty.														
57	1762	3.0	Claystone	Dark yellowish-grey, 20% silt, dolomitic, homogeneous, hard.														
58	1745	2.0	Claystone	Dark yellowish-grey, 30% silt, slightly dolomitic.														
59	1725	3.0	Claystone	Medium to dark greyish-brown, mottled green, 20% quartz silt, trace of very fine quartz sand, 10% glauconite, calcareous.														
60	1717	Nil	Lost	No recovery														

APPENDIX 3

MDT RESULTS

WELL:	SCALLOP 1	BIT DIAMETER (in):	12.25"
PERMANENT DATUM (m AMSL):	0	DATE:	25-Feb-03
DF ELEVATION (m AMSL):	25.9	GEOLOGISTS:	Glen Smith / Gordon Wakelin-King
TOOL STRING CONFIGURATION:	MRPS-MRHY-OFA-PO-SC(1gal)-MRMS-MRMS-MRDP		

RUN	TEST	DEPTH (m)		PRE-TEST DATA (CQG)				HYDROSTATIC PRESSURE (CQG)			TEMP	COMMENT
		MDBDF	TVDSS	VOL cc	SIP psia	EMW ppge	md/cp	BEFORE	AFTER	EMW ppge	°C	
1	1	1780.0	1754.01	20	2491.50	8.33	6242.4	3167.40	3173.00	10.43	80.9	Good Pretest
1	2	1860.0	1833.99	20	2620.20	8.37	8429.2	3312.92	3309.10	10.44	81.6	Good Pretest
1	3	1950.0	1923.96	20	2747.84	8.37	633.0	3467.68	3466.60	10.42	83.0	Good Pretest
1	4	2140.0	2113.90	20	3018.25	8.37	6014.4	3801.15	3800.60	10.41	85.8	Good Pretest
1	5	2180.0	2153.89	20	3074.66	8.37	920.4	3871.10	3870.70	10.41	87.0	Good Pretest
1	6	2300.0	2273.86	20	3242.71	8.36	383.4	4081.62	4081.50	10.40	89.5	Good Pretest
1	7	3162.0	3135.63	20	4610.41	8.62	41.3	5591.20	5591.51	10.37	114.9	Good Pretest
1	8	3157.0	3130.63	20	4604.12	8.62	13.3	5582.80	5560.70	10.37	115.7	Good Pretest
1	9	3155.5	3129.13	20	4603.02	8.62	25.9	5580.50	5580.40	10.37	116.1	SIPq minimum 4603.00
1	10	3146.0	3119.64	20	4600.01	8.64	4.8	5563.88	5563.90	10.37	116.3	too tight to pump
1	11	3146.5	3120.14	20								Seal failure and reset
1	12	3146.5	3120.14	20	4598.77	8.64	39.1	5565.00	5564.50	10.37	117.9	Good Pretest samples 1 and 2 taken
1	13	3143.5	3117.14	20	4597.32	8.64	4.2	5559.14	5559.16	10.37	117.3	Good Pretest
1	14	3140.0	3113.64	20	4596.72	8.65	2.9	5553.31	5553.31	10.37	117.9	Good Pretest
1	15	3144.0	3117.64	19.8	4597.79	8.64	11.8	5560.28	5560.40	10.37	117.4	Good Pretest
1	16	3141.2	3114.84	20	4596.86	8.65	2.6	5555.51	5555.50	10.37	117.8	Good Pretest
1	17	3129.5	3103.14	19.8	4645.81	8.78	10.7	5535.17	5534.90	10.37	117.1	Good Pretest - possible super charge
1	18	3124.5	3098.14	20	4570.80	8.65	0.8	5526.32	5526.30	10.37	117.0	Good Pretest-lost seal at end of test.
1	19	3124.0	3097.64	20				5507.10	5507.00	10.33	116.9	Tight no test
1	20	3123.0	3096.64	19.8				5523.80	5523.77	10.37	117.0	Tight no test
1	21	3120.5	3094.14	19.8	4562.37	8.64	2396.8	5519.34	5519.34	10.37	117.1	Good pretest samples 3 and 4 taken
1	22	3109.0	3082.65	19.9	4541.34	8.63	879.4	5500.00	5499.56	10.37	116.7	Good pretest samples 5 and 6 taken
1	23	3105.5	3079.15	19.9				5493.70	5493.67	10.37	116.6	Tight no test
1	24	3106.0	3079.65	19.9	4543.89	8.65	2.9	5494.68	5494.62	10.37	116.5	Poor to fair test slightly tight
1	25	3101.5	3075.15	19.9	4540.16	8.65	32.4	5487.45	5487.40	10.37	116.8	Good Pretest
1	26	3063.5	3037.17	20				5420.67	5420.85	10.37	116.1	Tight no test
1	27	3063.2	3036.87	20				5420.40	5420.42	10.37	115.8	Tight no test
1	28	3059.5	3033.17	20	4449.99	8.60	3.2	5413.88	5414.34	10.37	116.1	Good pretest - pump out - water
1	29	3046.5	3020.17	20	4406.59	8.55	7.5	5391.71	5391.80	10.37	115.3	Good Pretest
1	30	3031.5	3005.18	20	4396.76	8.58	21.6	5365.60	5365.48	10.38	115.1	Good Pretest
1	31	3029.5	3003.18	20	4400.33	8.59	2.9	5362.00	5361.78	10.38	114.6	Fair Pretest
1	32	2987.0	2960.69	20				5287.77	5287.84	10.38	114.1	Tight no test
1	33	2986.8	2960.49	20				5287.4	5287.46	10.38	113.7	Tight no test
1	34	2984.0	2957.69	20				5282.6	5282.65	10.38	113.5	Tight no test
1	35	2983.2	2956.89	20	4297.31	8.52	6.5	5281.3	5280.91	10.38	113.7	Fair Pretest
1	36	2981.0	2954.70	20	4290.66	8.51	2.7	5277.3	5277.21	10.38	112.6	Good Pretest
1	37	2955.0	2928.70	20				5231.8	5231.80	10.38	112.7	Tight no test
1	38	2948.0	2921.71	20	4237.05	8.50	607.3	5219.6	5219.61	10.38	112.4	Good Pretest
1	39	2944.0	2917.71	20	4231.58	8.50	77.6	5212.6	5213.63	10.38	112.1	Good Pretest
1	40	2941.0	2914.71	20	4227.47	8.50	353.0	5207.5	5207.61	10.38	111.9	Good Pretest
1	41	2930.5	2904.21	20	4212.98	8.50	101.4	5189.5	5189.16	10.38	111.3	Good Pretest
1	42	2923.0	2896.71	20	4202.84	8.50	2.3	5176.2	5176.16	10.38	111.1	Fair Pretest
1	43	2918.0	2891.71	20	4194.99	8.50	283.7	5167.5	5167.63	10.38	111.4	Good Pretest
1	44	2914.0	2887.71	20	4190.72	8.51	161.8	5160.5	5160.44	10.38	111.3	Good Pretest
1	45	2898.5	2872.22	20	4184.83	8.54	0.4	5133.5	5133.47	10.38	110.9	Poor to fair test slightly tight
1	46	2891.0	2864.72	20	4172.19	8.54	0.9	5120.5	5120.63	10.38	110.0	Tight Test
1	47	2840.0	2813.73	20	4093.00	8.53	131.1	5031.5	5030.84	10.39	107.9	Good Pretest
1	48	2840.0	2813.73	20	4093.07	8.53	33.5	5030.4	5029.68	10.38	107.3	Good test, taken after 70min pumping for 1 gal sample
1	49	2767.5	2741.25	20	3957.07	8.46	15.4	4904.3	4904.33	10.39	106.7	Good Pretest
1	50	2764.5	2738.25	20	3952.85	8.46	132.1	4898.7	4898.94	10.39	106.2	Good Pretest
1	51	2760.0	2733.75	20	3946.63	8.46	230.8	4891.1	4891.10	10.39	105.8	Good Pretest
1	52	2754.5	2728.25	20	3941.41	8.47	521.8	4881.3	4881.54	10.39	106.0	Good Pretest
1	53	2740.5	2714.25	20	3922.22	8.47	408.8	4856.9	4857.00	10.39	105.4	Good Pretest
1	54	2715.0	2688.75	20	3888.33	8.48	3.7	4812.5	4812.24	10.39	105.2	Good Pretest
1	55	2635.5	2609.27	20	3675.28	8.26	952.5	4673.3	4673.27	10.39	104.3	Good Pretest
1	56	2630.0	2603.77	20	3671.70	8.27	1.9	4663.2	4663.10	10.39	102.6	Pressure did not stabilise
1	57	2630.2	2603.97	20	3668.26	8.26	150.4	4663.5	4662.68	10.39	102.7	Good Pretest
1	58	2595.0	2568.78	20	3641.65	8.31	28.2	4601.2	4601.41	10.39	102.4	Good Pretest
1	59	2564.0	2537.78	20	3593.41	8.30	1402.7	4546.9	4547.16	10.40	101.7	Good Pretest
1	60	2555.0	2528.78	20	3580.89	8.30	495.3	4531.2	4531.40	10.40	101.3	Good Pretest
1	61	2450.0	2423.81	20								Tight Test - aborted
1	62	2427.0	2400.82									Tight Test - aborted
1	63	2426.5	2400.32	20	3371.69	8.23	576.2	4305.5	4305.60	10.40	99	Good Pretest
1	64	2180.0	2153.89	20	3075.19	8.37	2157.1	3872.0	3871.89	10.41	96	Good Pretest
1	65	1950.0	1923.96	20	2748.78	8.37	496.3	3467.0	3466.90	10.42	92	Good Pretest
1	66	1780.0	1754.01	20	2492.72	8.33	6139.6	3167.6	3167.62	10.43	88	Good Pretest

WELL:			SCALLOP 1		BIT DIAMETER (in):				12.25"			
PERMANENT DATUM (m AMSL):			0			DATE:	25-Feb-03					
DF ELEVATION (m AMSL):			25.9			GEOLOGISTS:	Glen Smith / Gordon Wakefin-King					
TOOL STRING CONFIGURATION:			MRPS-MRHY-OFA-PO-SC(1gal)-MRMS-MRMS-MRDP									
RUN	TEST	DEPTH (m)		PRE-TEST DATA (STRAIN GAUGE)				HYDROSTATIC PRESSURE (STRAIN GAUGE)			TEMP	COMMENT
		MDBDF	TVDSS	VOL cc	SIP psig	EMW ppge	md/cp	BEFORE	AFTER	EMW ppge	°F	
1	1	1780.0	1754.0	20.0	2486.0	8.31	6242.4	3151.6	3151.9	10.43	80.9	Good Pretest
1	2	1860.0	1834.0	20.0	2613.0	8.35	8429.2	3290.0	3290.1	10.44	81.6	Good Pretest
1	3	1950.0	1924.0	20.0	2739.1	8.34	633.0	3445.6	3445.7	10.42	83.0	Good Pretest
1	4	2140.0	2113.9	20.0	3005.8	8.33	6014.4	3773.7	3774.4	10.41	85.8	Good Pretest
1	5	2180.0	2153.9	20.0	3062.8	8.33	920.4	3844.5	3845.7	10.41	87.0	Good Pretest
	6	2300.0	2273.9	20.0	3229.4	8.32	383.4	4053.2	4054.3	10.40	89.5	Good Pretest
1	7	3162.0	3135.6	20.0	4596.2	8.59	41.3	5567.3	5568.4	10.37	114.9	Good Pretest
1	8	3157.0	3130.6	20.0	4590.9	8.60	13.3	5560.1	5561.0	10.37	115.7	Good Pretest
1	9	3155.5	3129.1	20.0	4590.4	8.60	25.9	5558.8	5559.2	10.37	116.1	SIPq minimum 4603.00
1	10	3146.0	3119.6	20.0	4588.1	8.62	4.8	5543.7	5543.6	10.37	116.3	too tight to pump
1	11	3146.5	3120.1	20.0								Seal failure and reset
1	12	3146.5	3120.1	20.0	4587.4	8.62	39.1	5545.1	5543.6	10.37	117.9	Good Pretest samples 1 and 2 taken
1	13	3143.5	3117.1	20.0	4584.6	8.62	4.2	5538.4	5538.4	10.37	117.3	Good Pretest
1	14	3140.0	3113.6	20.0	4584.3	8.63	2.9	5532.9	5532.9	10.37	117.9	Good Pretest
1	15	3144.0	3117.6	19.8	4586.0	8.62	11.8	5540.3	5540.5	10.37	117.4	Good Pretest
1	16	3141.2	3114.8	20.0	4585.5	8.63	2.6	5536.2	5536.1	10.37	117.8	Good Pretest
1	17	3129.5	3103.1	19.8	4634.9	8.75	10.7	5516.6	5516.3	10.37	117.1	Good Pretest - possible super charge
1	18	3124.5	3098.1	20.0	4560.3	8.63	0.8	5507.8	5507.5	10.37	117.0	Good Pretest-lost seal at end of test.
1	19	3124.0	3097.6	20.0				5525.5	5525.5	10.33	116.9	tight no test
1	20	3123.0	3096.6	19.8				5505.6	5505.4	10.37	117.0	Tight no test
1	21	3120.5	3094.1	19.8	4552.6	8.62	2396.8	5501.4	5501.5	10.37	117.1	Good pretest samples 3 and 4 taken
1	22	3109.0	3082.6	19.9	4531.2	8.62	879.4	5481.6	5479.5	10.37	116.7	Good pretest samples 5 and 6 taken
1	23	3105.5	3079.2	19.9				5473.8	5474.2	10.37	116.6	Tight no test
1	24	3106.0	3079.7	19.9	4532.7	8.63	2.9	5475.4	5475.2	10.37	116.5	Poor to fair test slightly tight
1	25	3101.5	3075.2	19.9	4529.8	8.63	32.4	5468.9	5468.9	10.37	116.8	Good Pretest
1	26	3063.5	3037.2	20.0				5403.2	5403.5	10.37	116.1	Tight no test
1	27	3063.2	3036.9	20.0				5404.2	5402.3	10.37	115.8	Tight no test
1	28	3059.5	3033.2	20.0	4440.5	8.58	3.2	5395.9	5395.5	10.37	116.1	Good pretest - pump out - water
1	29	3046.5	3020.2	20.0	4398.2	8.54	7.5	5374.5	5374.5	10.37	115.3	Good Pretest
1	30	3031.5	3005.2	20.0	4388.7	8.56	21.6	5348.7	5348.5	10.38	115.1	Good Pretest
1	31	3029.5	3003.2	20.0	4392.0	8.57	2.9	5345.2	5344.3	10.38	114.6	Fair Pretest
1	32	2987.0	2960.7	20.0				5271.4	5271.4	10.38	114.1	Tight no test
1	33	2986.8	2960.5	20.0				5271.0	5271.0	10.38	113.7	Tight no test
1	34	2984.0	2957.7	20.0				5266.1	5266.1	10.38	113.5	Tight no test
1	35	2983.2	2956.9	20.0	4290.3	8.50	6.5	5264.6	5262.8	10.38	113.7	Fair Pretest
1	36	2981.0	2954.7	20.0	4283.4	8.50	2.7	5259.8	5259.9	10.38	112.6	Good Pretest
1	37	2955.0	2928.7	20.0				5215.5	5215.7	10.38	112.7	Tight no test
1	38	2948.0	2921.7	20.0	4231.2	8.49	607.3	5203.8	5203.8	10.38	112.4	Good Pretest
1	39	2944.0	2917.7	20.0	4226.2	8.49	77.6	5197.0	5197.0	10.38	112.1	Good Pretest
1	40	2941.0	2914.7	20.0	4222.3	8.49	353.0	5192.1	5192.1	10.38	111.9	Good Pretest
1	41	2930.5	2904.2	20.0	4208.0	8.49	101.4	5174.2	5174.0	10.38	111.3	Good Pretest
1	42	2923.0	2896.7	20.0	4198.0	8.49	2.3	5161.1	5160.9	10.38	111.1	Fair Pretest
1	43	2918.0	2891.7	20.0	4190.7	8.49	283.7	5152.7	5152.7	10.38	111.4	Good Pretest
1	44	2914.0	2887.7	20.0	4186.7	8.50	161.8	5146.1	5146.1	10.38	111.3	Good Pretest
1	45	2898.5	2872.2	20.0	4180.8	8.53	0.4	5119.5	5119.7	10.38	110.9	Poor to fair test slightly tight
1	46	2891.0	2864.7	20.0	4167.8	8.53	0.9	5106.1	5105.4	10.38	110.0	Tight Test
1	47	2840.0	2813.7	20.0	4088.9	8.52	131.1	5017.9	5012.2	10.39	107.9	Good Pretest
1	48	2840.0	2813.7	20.0	4087.2	8.51	33.5	5013.1	5010.4	10.38	107.3	Good test, taken after 70min pumping for 1 gal sample
1	49	2767.5	2741.2	20.0	3950.9	8.45	15.4	4886.7	4886.6	10.39	106.7	Good Pretest
1	50	2764.5	2738.2	20.0	3947.2	8.45	132.1	4881.6	4881.4	10.39	106.2	Good Pretest
1	51	2760.0	2733.7	20.0	3941.1	8.45	230.8	4873.9	4873.6	10.39	105.8	Good Pretest
1	52	2754.5	2728.2	20.0	3936.1	8.46	521.8	4864.4	4864.4	10.39	106.0	Good Pretest
1	53	2740.5	2714.3	20.0	3917.6	8.46	408.8	4840.5	4840.5	10.39	105.4	Good Pretest
1	54	2715.0	2688.8	20.0	3884.3	8.47	3.7	4797.0	4796.4	10.39	105.2	Good Pretest
1	55	2635.5	2609.3	20.0	3674.0	8.25	952.5	4659.6	4659.2	10.39	104.3	Good Pretest
1	56	2630.0	2603.8	20.0	3670.1	8.26	1.9	4649.1	4648.3	10.39	102.6	Pressure did not stabilise
1	57	2630.2	2604.0	20.0	3667.3	8.25	150.4	4649.1	4646.5	10.39	102.7	Good Pretest
1	58	2595.0	2568.8	20.0	3639.8	8.31	28.2	4586.4	4586.6	10.39	102.4	Good Pretest
1	59	2564.0	2537.8	20.0	3592.5	8.30	1402.7	4533.2	4533.1	10.40	101.7	Good Pretest
1	60	2555.0	2528.8	20.0	3580.1	8.30	495.3	4517.5	4517.3	10.40	101.3	Good Pretest
1	61	2450.0	2423.8	20.0								Tight Test - aborted
1	62	2427.0	2400.8									Tight Test - aborted
1	63	2426.5	2400.3	20.0	3373.6	8.24	576.2	4294.3	4294.2	10.40	99.0	Good Pretest
1	64	2180.0	2153.9	20.0	3081.3	8.38	2157.1	3867.3	3867.1	10.41	96.4	Good Pretest
1	65	1950.0	1924.0	20.0	2757.7	8.40	496.3	3467.0	3466.3	10.42	92	Good Pretest
1	66	1780.0	1754.0	20.0	2504.0	8.37	6139.6	3176.8	3170.1	10.43	87.9	Gobd Pretest

WELL:			**SCALLOP 1**			BIT DIAMETER (in):		12.25"						
PERMANENT DATUM (m AMSL):			0.0			DATE:		25-Feb-03						
DF ELEVATION (m AMSL):			25.9			GEOLOGISTS:		Glen Smith / Gordon Wakelin-King						
TOOL STRING CONFIGURATION			MRPS-MRHY-OFA-PO-SC(1gal)-MRMS-MRMS-MRDP											
RUN	Sample	DEPTH (m)		PRE-TEST DATA			PUMP-OUT DATA			SAMPLE DATA				COMMENTS
	#	MDBDF	TVDSS	SIP psia	EMW ppge	md/cp	VOL cc	TIME min	DD psia*	VOL cc	TIME min	DD psia*	°C	
1	1	3146.5	3120.14	4598.77	8.64	39.1	18135	39.9	3970	450	1.9	3540	117.9	chamber# MPSR-1591 OFA gas/water
1	2	3146.5	3120.14	4598.77	8.64	39.1		40.0	3970	450	1.8	3950		Duplicate sample: chamber# MPSR-1584 OFA:- gas/water
1	3	3120.5	3094.14	4562.37	8.64	2396.8	17100	15.2	4532	450	1.5	4540	117.4	chamber# MPSR-1590 OFA:- gas
1	4	3120.5	3094.14	4562.37	8.64	2396.8		15.2	4532	450	1.5	4540		dupicate chamber# MPSR-1583 OFA = gas
1	5	3109.0	3082.65	4541.34	8.63	879.4	26910	36.0	4493	450	2.1	4523	118.5	chamber# MPSR-1581 OFA = gas
1	6	3109.0	3082.65	4541.34	8.63			36.0	4493	450	1.9	4522		chamber# MPSR-1582 OFA = gas
1	*	3059.5	3033.2	4449.99	8.60	3.2	5850	35.7	1936.7				116.2	pump out to ID fliuds- OFA = water?
1	*	2983.2	2956.89	4297.31	8.52	6.5	4880	29.4	2280.66				113.7	pump out for id fluid (filtrate 0.031ohmm)
1	7	2840.0	2813.7	4092.69	8.53	131.1	29755	29.1	3967.85	3785	10.5	4045	107.9	1 gallon chamber # MRSC-036, oil, ?plus gas
1	8	2840.0	2813.7	4093.00	8.53	33.5	19890	40.2	2860	450	2.0	2900	108.1	Oil, 10% gas, +/- filtrate chamber # MPSR-186
1	9	2840.0	2813.7	4093.07	8.53	33.5	2950	5.5	2870	450	2.0	2895	107.9	Oil, 10% gas, clean sample, chamber # MPSR-316
1	10	2630.2	2604.0	3668.26	8.26	150.4	47000	57.0	3415	450	1.2	3660	102.8	OFA results, 60%oil, 30%gas, 10% water, Res 0.20, Chambe # MPSR-477
1	11	2630.2	2604.0	3668.26	8.26	150.4	3510	5	3435	450	1	3661	102.7	OFA as above, res 0.23, FSIP 3665.1, building slowly, Chamber # MPSR-501
REMARKS:		**All chambers were over-pressured to 3900 psi above hydrostatic.**												
		*** depths were pump-outs only to identify formation fluid type. No sample taken.**												

WELL:		**SCALLOP 1**			BIT DIAMETER (in):	12.25"			MUD TYPE:	KCl/PHPA/polymer/Glycol				
PERMANENT DATUM (m AMSL):		0.0			DATE:	25-Feb-03								
DF ELEVATION (m AMSL):		25.9			GEOLOGISTS:	Glen Smith / Gordon Wakelin-King								
TOOL STRING CONFIGURATION:		MRPS-MRHY-OFA-PO-SC(1gal)-MRMS-MRMS-MRDP												

RUN	SAMPLE No.	DEPTH (m)		CHAMBER	SAMPLE*	FLUID RECOVERY DATA*								COMMENTS
		MDBDF	TVDSS	VOL cc	VOL cc	GAS scf	OIL cc	API**	GOR	CONT wt%	H2O cc	RES@25oC	Cl ppm	(include chamber number)
1	1	3146.5	3120.14	450	100						250			Chamber serial number: #MPSR1591
1	2	3146.5	3120.14	450	100						300			Chamber serial number: #MPSR1584
1	3	3120.5	3094.14	450	350						Tr			Chamber serial number: #MPSR1590
1	4	3120.5	3094.14	450	350						Tr			Chamber serial number: #MPSR1583
1	5	3109.0	3082.65	450	380						Tr			Chamber serial number: #MPSR1581
1	6	3109.0	3082.65	450	390						Tr			Chamber serial number: #MPSR1582
1	7	2840.0	2813.7	1 gallon	3600						V Clean			Chamber serial number: #MRSC036
1	8	2840.0	2813.7	450	410			40.7	1705.0		Tr			Chamber serial number: #MPSR186
1	9	2840.0	2813.7	450	420									Chamber serial number: #MPSR316
1	10	2630.2	2604.0	450	395			40.0	1174.0		Tr			Chamber serial number: #MPSR477
1	11	2630.2	2604.0	450	420									Chamber serial number: #MPSR501

* Sample volumes refer to pressurised sample transfers. Fluid recovery data from bleed down of MDT tool following sample transfer. Complete final PVT and water analyses may be presented in separate reports.

RUN	TEST	DEPTH (m)		CHAMBER	SAMPLE	GAS RECOVERY DATA								COMMENTS
		MDBDF	TVDSS	VOL cc	VOL cc	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm	H_2S ppm	
1	1a	3146.5	3120.14	450	100	76.56	7.10	2.66	0.53	0.94	0.28	0.30	0.00	H_2S by Draeger Measurement
1	1b	3146.5	3120.14	450	100	76.66	7.04	2.65	0.52	0.92	0.27	0.29	0.00	
1	3a	3120.5	3094.14	450	350	67.44	6.22	2.63	0.76	0.91	0.40	0.42	0.00	
1	3b	3120.5	3094.14	450	350	67.80	6.45	2.96	0.48	0.62	0.25	0.27	0.00	
1	5a	3109.0	3082.65	450	380	68.87	6.31	2.64	0.48	0.92	0.25	0.27	0.00	
1	5b	3109.0	3082.65	450	380	69.81	6.18	2.35	0.61	0.72	0.32	0.34	0.00	

APPENDIX 4

MUDLOGGING REPORT

END OF WELL REPORT

ESSO AUSTRALIA PTY LTD

SCALLOP - 1

FEBRUARY 2003

by

BAKER HUGHES INTEQ

Esso Australia Pty Ltd: Scallop-1

End of Well Report

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- 1-1 Introduction
- 1-2 Well and rig information

Section 2 **Drilling and Engineering**
- 2-1 Bit Run Summaries
- 2-2 Casing and Cement Summaries

Section 3 **Geology and Shows**
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Section 1

Operations Summary

1. Operations Summary

1.1 Introduction

Baker Hughes INTEQ Mudlogging provided formation evaluation, drill monitoring and pressure evaluation services for Scallop-1 from 261m until suspension. Data was processed and stored using Drillbyte V.2.3.1 software. All depths in this report unless otherwise stated refer to mMDRT - measured distance in metres from the rig's rotary table and are not tide corrected

Scallop-1 was planned as a 3126m MDRT vertical hole to test the sub-volcanic hydrocarbon potential of the Golden Beach Group, expected to be composed of good quality braided fluvial to upper deltaic sands.

The well was spudded at 12:00 Hrs on the 2nd February 2003, drilling the 36" hole with a 26" bit and a 36" hole opener, without a riser, from the seabed at 135.5m to 179m using seawater and with all returns to the seabed.

The 17.5" hole was drilled with penetration rates averaging 56m/hr, using seawater and hi-vis sweeps mid stand and at every connection to the section TD of 917m. The 13.375" casing was run smoothly with the shoe set at 900.8m. The BOPs and riser were then landed and tested as per programme.

With a 12.25" drilling assembly, the float collar was drilled using seawater and hi-vis sweeps. Before drilling out the casing shoe, the hole was displaced to 9.0 ppg KCl polymer mud and the Leak Off Test (LOT) conducted to 16.5 ppg EMW. The 12.25" hole was drilled initially with a PDC bit, drilling from 917m to 2618m with penetration rates ranging from 0.5 to 105.1m/hr. The MW was increased to 10.3ppg until the bit was pulled due to poor penetration rates within the volcanic formations. A tricone bit was then used to drill volcanics, and inter-bedded claystones and sandstones to a depth of 2933m with penetration rates averaging 4.6m/hr. The bit was pulled due to erratic torque readings. With the same 12.25 drilling" assembly but with an LWD tool, another tricone bit run produced penetration rates of 4.6m/hr through the same formations. Several flow checks were conducted on all drill breaks, all with static hole results. The original target depth of 3126m was extended another 48m to 3174m due to formation tops appearing deeper than prognosis. The maximum gas readings whilst drilling the reservoir sections was 0.25% over a background of 0.02-0.06%. After a wiper trip to the shoe, the hole was circulated clean before running E-logs. After more than three(3) days of running electric logs, it was decided to plug and abandon the hole without the need to run the 9 5/8" casing.

1.2 Well and Rig Information

Well Name:	Scallop-1	
Well Type:	Wildcat Exploration	
Operator:	ESSO Australia Pty Ltd.	
Location:	Gippsland Basin, Offshore Victoria, Australia	
Block:	VIC/RL2	
Final Coordinates:	Latitude Longitude	038° 12' 48.615" S 148° 35' 28.879" E
Rig:	Transocean Sedco 702	
Type:	Semi-submersible	
Rig Floor - Seabed:	135.5 mRT	
Rig Floor - MSL	25.9 m	
Spud Date:	02 February 2003	
Total Depth:	3174 mMDRT	
Status:	Plugged and Abandoned	
Baker Hughes INTEQ:	Data Engineers:	Matt de Leon Matt Goode
	Logging Geologists:	Trent Liang Peter Morris
	Trainee Logging Geologists:	Dan Walding Ryan Burns

Section 2

Drilling and Engineering

2.1 Bit Run Summaries

914mm (36") Hole Section
02nd February 2003

Bit Run No. 1 Summary

Bit No.	NB1
Bit Size	660mm (26")
W/	914mm (36") H/O
Bit Type	Reed Y11
Serial Number	660478
Jets	1 x20, 3x18 H.O. - 4 x 20
Depth In	135.5m
Depth Out	179m
Metres Drilled	43.5m
Drill Hours	2.0 hrs
Total Bit Revolutions	10.8 krevs
Circulating Hours	2.5 hrs
ROP min-max / avg	*NA - NA / 21.8
Bit Grading	1/1/PN/A/1/I/RR/TD

Drilling Parameters *(Rig drilling data)

WOB	2 klbs
RPM	90
Torque	3 kft-lbs
Pump Pressure	2800 psi
Flow In	1204 gpm

Mud

Sea Water 1.03 sg
High viscosity gel sweeps

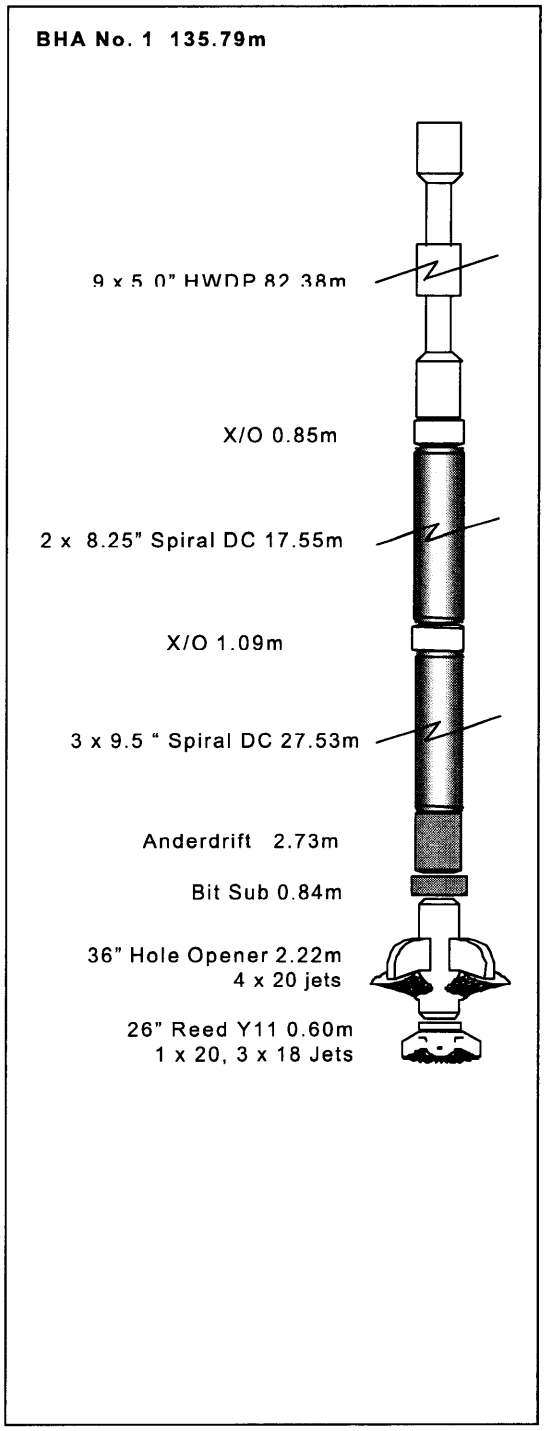
Lithology

Returns to seabed

Drilling Summary

RR1 was made up on a rotary BHA, with a 914mm (36") hole opener and run in the hole, tagging the seabed at 135.5m. Scallop-1 was spudded at 1200hrs on 2nd February 2003. The 914mm (36") hole was drilled riserless to a TD for of 179m with seawater. At 185m the Anderdrift tool indicated an inclination of 0.37°. The bit was then pulled out of the hole in preparation for running the 762mm (30") casing. The PGB and 762mm (30") casing was run with 5" drillpipe running tool, stabbing into the 914mm (36") hole with the assistance of the ROV(No mudlogging services in this section).

*BHI SLS not required for monitoring this section.



444mm (17.5") Hole Section
03rd- 04th February 2003

Bit Run No. 2 Summary

Bit No.	NB2
Bit Size	444mm (17.5")
Bit Type	Hycalog DS34HF
Serial Number	24400Z
Jets	8 x 14
Depth In	179m
Depth Out	917m
Metres Drilled	738m
Drill Hours	14.1 hrs
Total Bit Revolutions	118.8 krevs
Circulating Hours	22.1 hrs
ROP min-max / avg	8.5 – 361.7 / 52.3 m/hr
Bit Grading	1/1ER/T/X/1/NO/TD

Drilling Parameters

WOB	0.5 – 13.2 klbs
RPM	54 - 152
Torque	1.5 – 11.6 kft-lbs
Pump Pressure	1585 - 2840 psi
Flow In	1090 - 1233 gpm

Mud

Sea Water 1.03 sg

High viscosity gel sweeps

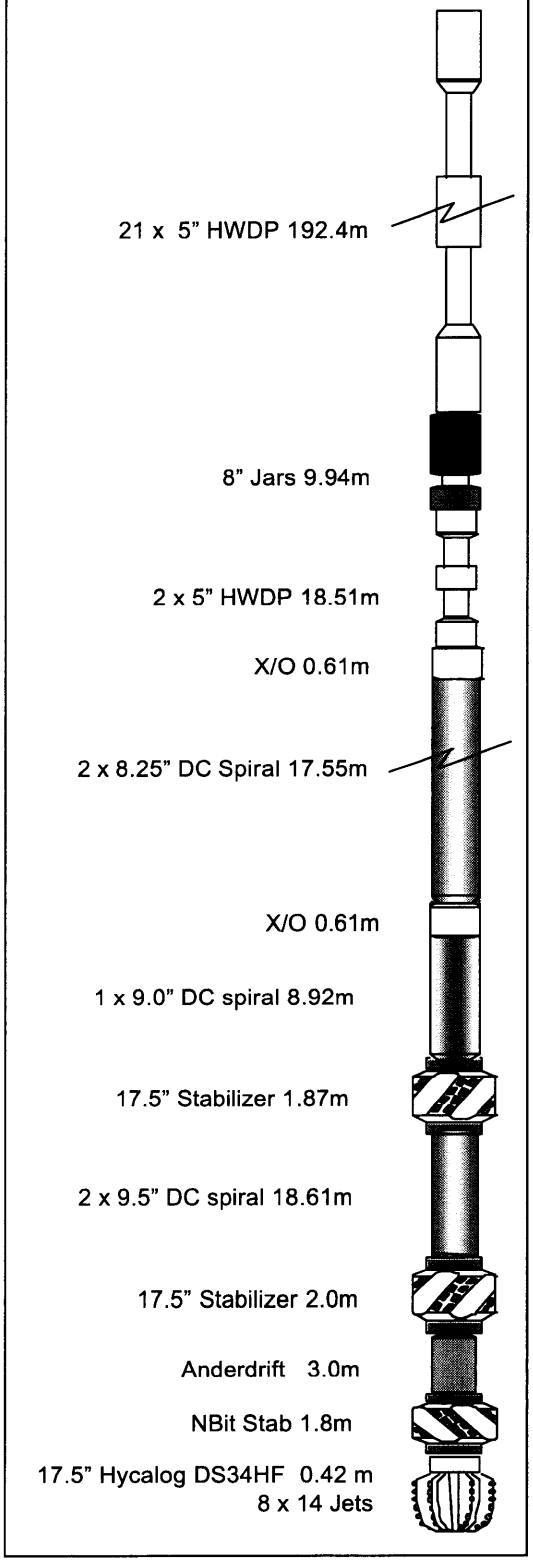
Lithology

Returns to seabed

Drilling Summary

NB2 bit was run in the hole with the same rotary assembly as NB1 minus the hole opener. Tagged and drilled out cement. Drilled new formation with seawater from 179m to 261m without problems. Mudlogging data collection commenced from 261m. Continued drilling from 261m to 917 with seawater, pumping 40-50 bbls of hi-vis sweeps at mid-stand and prior to connections. Upon reaching 917mTD, circulated the hole clean and made a few wiper trips before finally pumping 120 bbls of hi-vis sweep displaced by seawater. Pumped 1200 bbls of 12 ppg prehydrated Bentonite prior to POOH. At 907.8m, the Gyro tool indicated an inclination of 0.39 deg. The bit was pulled out of the hole without problems.

BHA No. 2 276.72m



311mm (12.25") Hole Section
08th – 14th February 2003

Bit Run No. 3 Summary

Bit No.	NB3
Bit Size	311mm (12.25")
Bit Type	Smith MA89PX
Serial Number	JT0152
Jets	7 x 14
Depth In	917m
Depth Out	2618m
Metres Drilled	1701m
Drill Hours	127.8 hrs
Total Bit Revolutions	859.7 krevs
Circulating Hours	141.1 hrs
ROP min-max / avg	0.5 – 105.1 / 13.3 m/hr
Bit Grading	2/4/CT/S/X/0/BT/PR

Drilling Parameters

WOB	3.8 - 20 klbs
RPM	23 - 148
Torque	1.6 – 12.7 kftlbs
Pump Pressure	1000 - 3408 psi
Flow In	800 - 1014 gpm

Mud

KCl Polymer/Glycol 1.08 - 1.23 sg

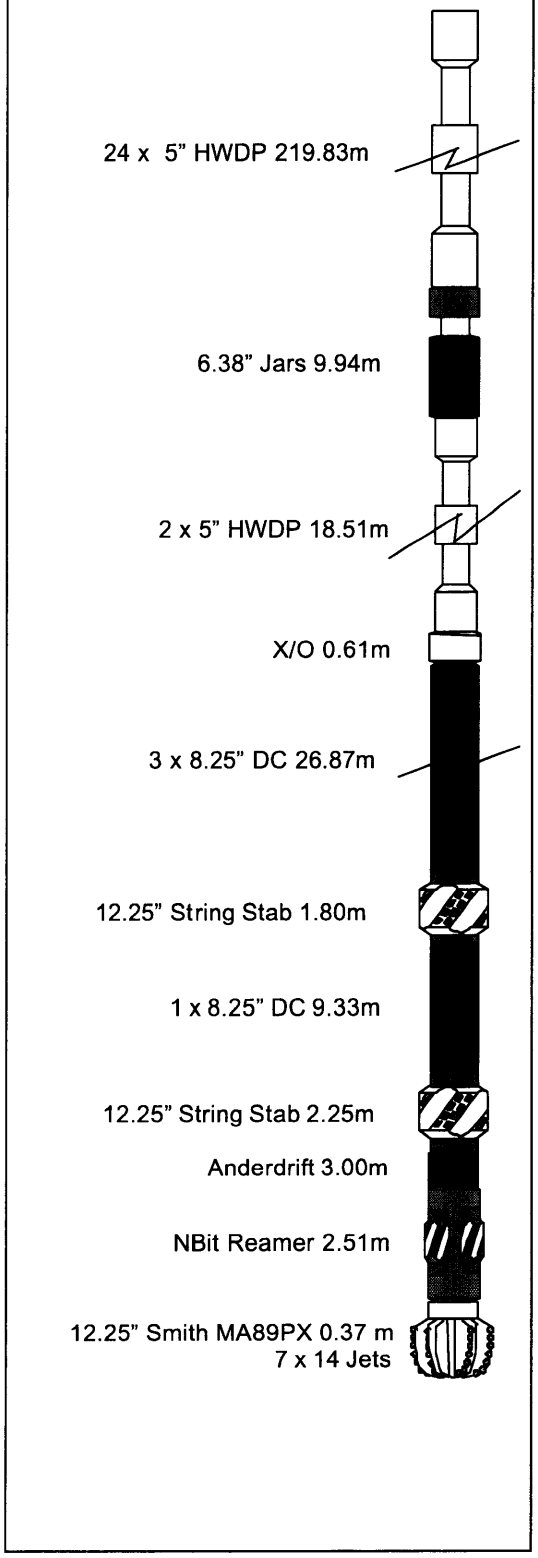
Lithology

Limestone, Claystone, Siltstone, Sandstone, Altered Volcanics

Drilling Summary

NB3, a Smith 12 ¼" PDC bit was made up with a rotary assembly and an Anderdrift survey tool. The bit was run in the hole and tagged cement at 843.6m. The cement and the float collar were drilled with seawater and hi-vis sweeps. Before drilling out the casing shoe, displaced the hole with 9.0 ppg(1.08sg) KCl Polymer mud. After the mud displacement, drilled out the casing shoe and rat hole from 900m to 917m. Drilled out three(3) meters of formation to 920m. CBU and conditioned mud to 9.0 ppg prior to conducting the Leak-Off Test(LOT) to 16.5 ppg EMW(1.98sg). Drilled ahead from 920m to 2145m without problems, increasing the mud weights to 9.6 to 9.7+ ppg(1.16-1.17sg). Drilled ahead without problems from 2145m to 2500m where the mud weight was increased to 10.2-10.3 ppg(1.22-1.23 sg) in anticipation of drilling thru the volcanics. Drilled down to 2618m after drilling thru the volcanics, CBU and pumped slug prior to POOH for bit change. POOH pumping out stands of DPs without problems.

BHA No. 3 295.02m



311mm (12.25") Hole Section
15th February- 18th February 2003

Bit Run No. 4 Summary

Bit No.	NB4
Bit Size	311mm (12.25")
Bit Type	Hughes MX20DDT
Serial Number	6007902
Jets	3 x 20
Depth In	2618m
Depth Out	2933m
Metres Drilled	315m
Drill Hours	69.1 hrs
Total Bit Revolutions	403.9 krevs
Circulating Hours	74.6 hrs
ROP min-max / avg	1.7 – 16.1 / 4.6 m/hr
Bit Grading	4/7/BT/S/E/1/WT/TQ

Drilling Parameters

WOB	11 - 54 klbs
RPM	77 - 138
Torque	5 – 6 kftlb
Pump Pressure	2605 - 3000 psi
Flow In	820 - 830 gpm

Mud

KCl/PHPA/Polymer/Glycol 1.22 - 1.23+ sg

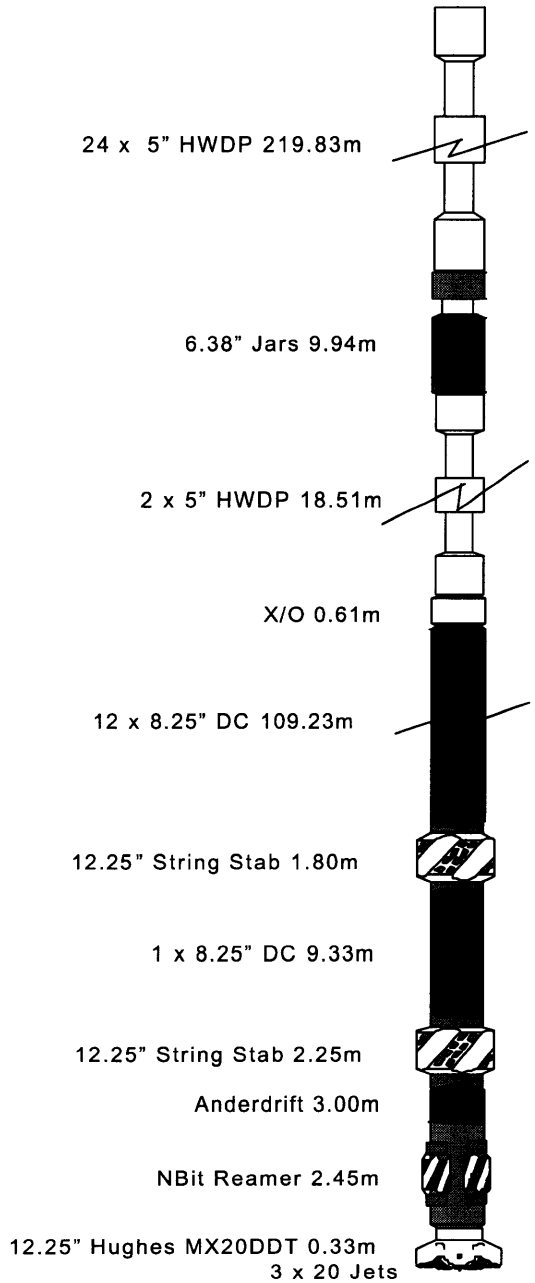
Lithology

Altered Volcanics, Sandstone,Claystone

Drilling Summary

A 12 ¼" tri-cone bit was made up with a rotary assembly, without the MWD/LWD tool. Ran in hole and washed/reamed from 2578m down to 2618m. Drilled ahead from 2618m to 2933m using 10.2+ to 10.3 ppg mud(1.23 sg), maximizing penetration rates while monitoring the hole deviation every stand drilled using the Anderdrift tool. Flow checks were conducted at the driller's discretion whenever significant change in the drilling parameters was observed, especially rates of penetration. CBU at 2933m, then boosted the riser. A flow check was performed before pumping down the Gyro survey tool. Pulled out the first five(5) stands without problems, but the sixth(6th) AND 7TH stand were tight. Continued pulling out slowly without overpulls to surface for bit change.

BHA No. 4 377.28m



311mm (12.25") Hole Section
19th February- 22nd February 2003

Bit Run No. 5 Summary

Bit No.	NB5
Bit Size	311mm (12.25")
Bit Type	Hughes MX20DX
Serial Number	W42DV
Jets	3 x 18
Depth In	2933m
Depth Out	3174m
Metres Drilled	241m
Drill Hours	69.3 hrs
Total Bit Revolutions	404.3 krevs
Circulating	77.9 hrs
ROP min – max / ave	1.4-15.7 / 3.5
Bit Grading	3/7/BT/S/E/2/RG/TD

Drilling Parameters

WOB	32 - 55 klbs
RPM	75 - 133
Torque	5 - 7 kftlb
Pump Pressure	3400 - 3500 psi
Flow In	750 - 850 gpm

Mud

KCl/PHPA/Polymer/Glycol 1.22+ - 1.23 sg

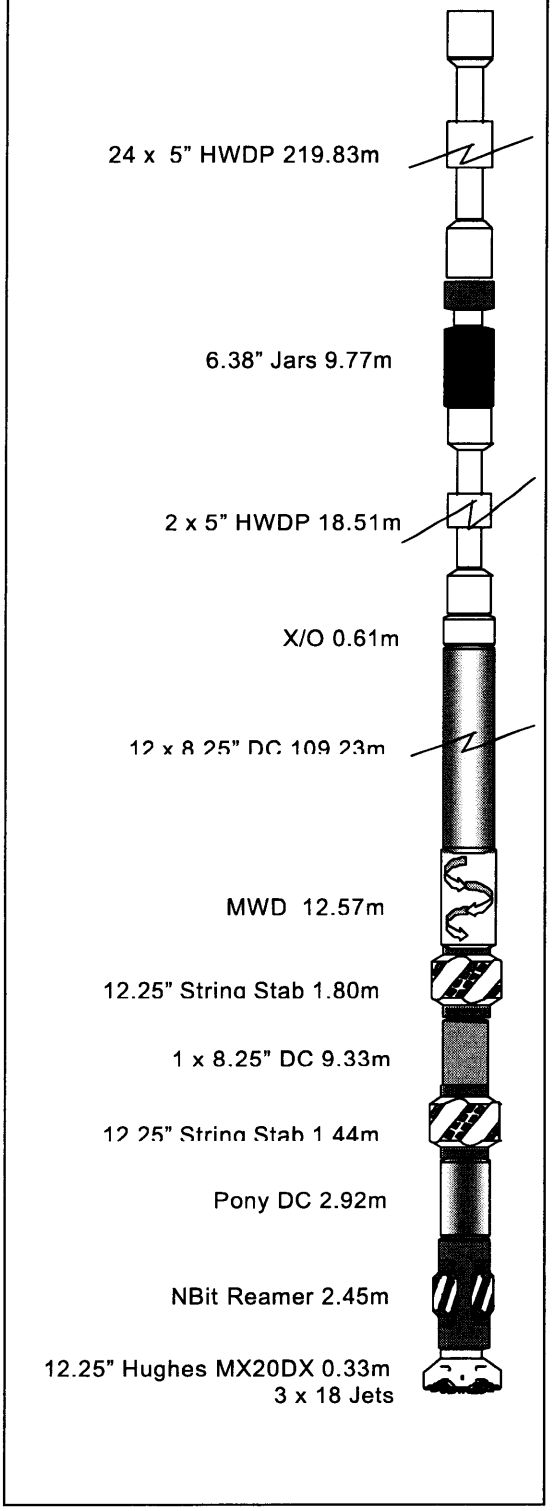
Lithology

Claystone, Sandstone, Altered Volcanics

Drilling Summary

NB5 was made up on a rotary assembly and LWD tool. Ran in hole and washed/reamed a stand from 2933m. Drilled ahead from 2933m to 3174m (hole TD) without problems, drilling thru the altered volcanics, the interbedded Claystone and Sandstone. Reached the hole TD 09:45 hrs 22 February. The maximum gas detected while drilling was 0.25%, with a background gas of 0.02-0.06%. CBU at 3174m, then pulled out to the casing shoe for a wiper trip. Ran back to bottom, pumped 100 bbls of hi-vis pill, then circulated bottoms up twice until the hole was clean. Pulled out twenty (20) stands, pumped slug, then pulled out of hole for BOP test and electric logging.

BHA No. 5 388.79m



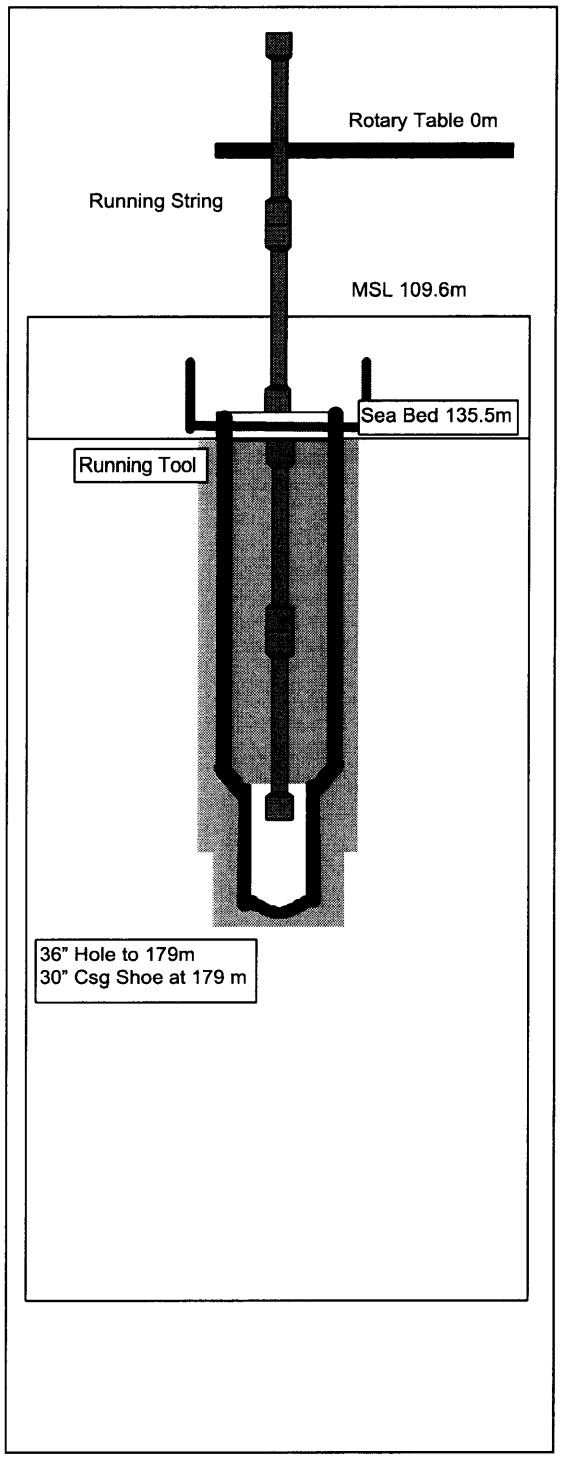
2.2 Casing and Cementing Summaries

914mm (30") Casing
02nd February 2003

HOLE: SIZE: 914mm (36")
HOLE DEPTH: 179.0m
SEABED: 109.6
(RKB to seabed = 135.5m)

Casing Details
OD 762 mm (30")
Grade / Weight: X 52 / 457 and 310 ppf.
Joints: 1 shoe joint / 1 INT
04 casing joints
SHOE: 179.0m

LEAD CEMENT:
TYPE: Class G
SACKS: 1149 sx
WEIGHT: 15.9 ppg
MIX FLUID: Mix with seawater
1%BWOC CACL
11 GAL NF-5



Summary
A total of 4 joints of 762 mm (30") casing were run, including the shoe track, without problems. The casing shoe was landed at 179.0m and landed in place using the inner string. Dowell mixed and pumped 240 bbls of lead cement slurry (15.9 ppg). Dowell pumped 35 bbls seawater. Changed to rig pumps and continued displacement. Floats held.

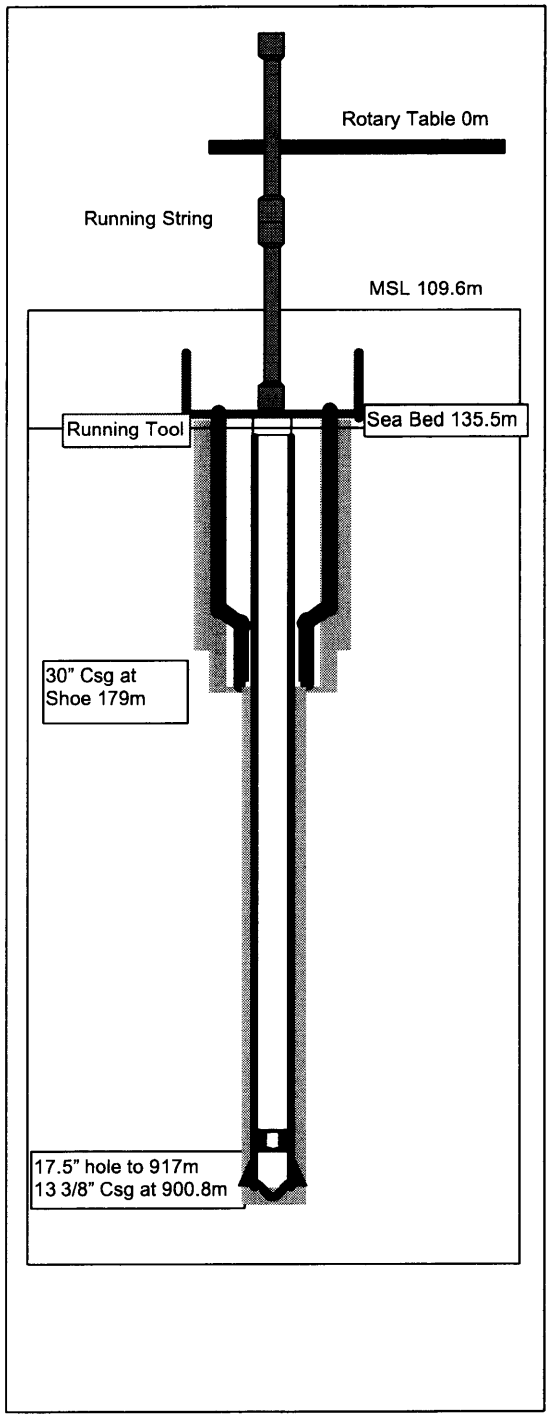
340 mm (13 3/8") Casing
05th February 2003

HOLE: SIZE: 444 mm (17.5")
DEPTH: 917m

Casing Details
OD 340 mm (13 3/8")
Grade / Weight: L 80 / 68 ppf.
Joints: 1 shoe joint / 1 INT
1 float collar joint
58 casing joints
SHOE: 900.8m

Cement Details
LEAD CEMENT:
TYPE: Class G
SACKS: 1358 sx
WEIGHT: 12.5 ppg
MIX FLUID: Mix with seawater
420 bbls of total mix fluid
614 gals Econolite
11 gals of NF-5
84 gals of retarder

TAIL CEMENT:
TYPE: Class G
SACKS: 89 sx
WEIGHT: 15.8 ppg
MIXFLUID: Mix with Fresh water
89 bbls of total mix fluid
5 gals of NF-5



Summary
A total of 60 joints of 340 mm (13 3/8") casing were run, including the shoe track, without problems. The casing shoe was landed at 900.7m off the 20" wellhead. Mixed and pumped 535 bbls of lead cement slurry (12.5 ppg), followed by 150 bbls of tail cement slurry (15.8 ppg). Drop dart, Dowell pumped 25 bbls seawater, no latch on plug observed. Changed to rig pump and continued displacement with 340 bbls of seawater at 10BPM. Did not bump plug.

Plug and Abandonment
26th - 01st March 2003

HOLE: SIZE: 12.5" Open hole
DEPTH: 3174m

Casing Details
Open Hole stacked cement plug arrangement.

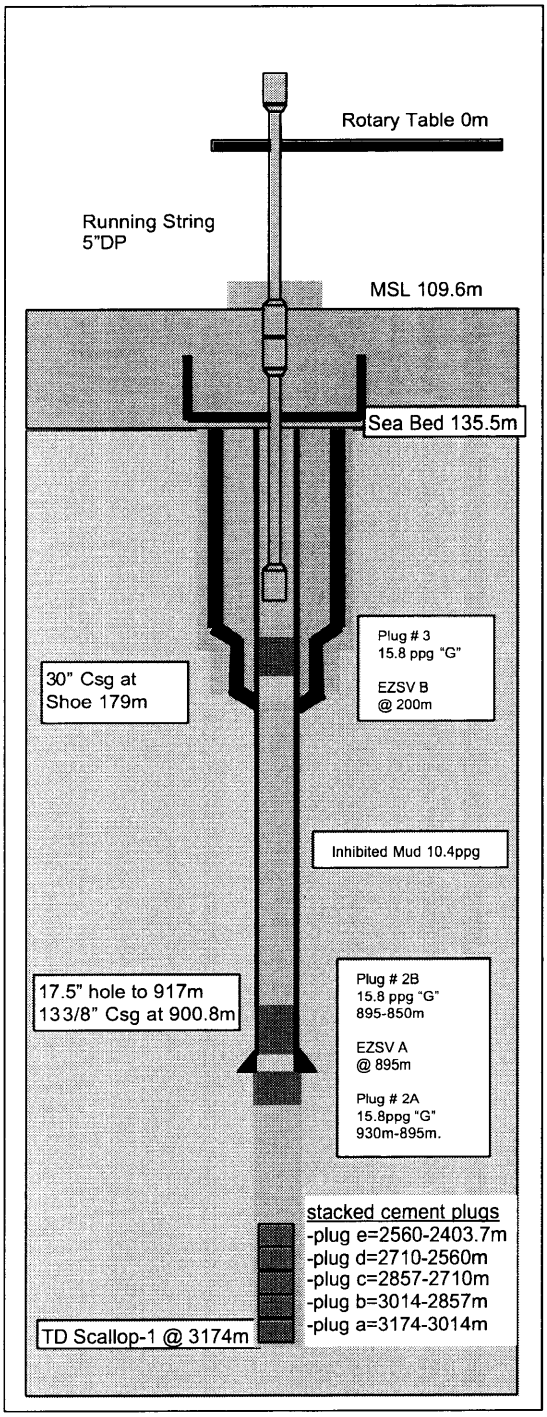
Cement Details

CEMENT PLUGS 1a-d:

TYPE:	Class G
SACKS:	1491 sx
WEIGHT:	15.8 ppg
MIX FLUID:	Mix with freshwater
	300 bbls of total mix fluid
	541 gals HALAD 413L
	05 gals of NF-5
	51 gals SCR-100L

CEMENT PLUG 1e:

TYPE:	Class G
SACKS:	343 sx
WEIGHT:	15.8 ppg
MIXFLUID:	Mix with Fresh water
	69 bbls of total mix fluid
	125 gals HALAD 413L
	01 gals of NF-5
	08 gals SCR-100L



Summary
Run in hole with 3.5"slotted mule shoe and 25 joints of 3.5" DP on 5" DP to 3174mTD. Circulated B/U with a max gas (associated with MDT pumps) of 7.91%. Set 5 balanced cement plugs in consecutive stages and circulate B/U in between each plug. WOC. Tag top cement plug at 2403.7m. Plug 2A set across the 13 3/8" shoe, POH to lay down cement stinger. R/U Schlumberger and set EZSV at 895mMD. RIH w/DP and pressure test EZSV and set Plug 2B. Displace to inhibited mud. R/U Schlumberger and set EZSV Bridge Plug B at 200mMD. RIH w/DP and pressure test EZSV. Set Plug 3 and POH.

Section 3

Geology and Shows

3.1 GEOLOGY AND SHOWS

Geological logging for Scallop-1 commenced in the 311mm (12.25") hole section from 917m MDRT and continued to the total depth of 3174m MDRT (All depths given in this section are taken from the datum of the Rotary Table, and the Measured Depth taken from the driller's depth unless otherwise specified). Full samples as per the Scallop-1 Drilling Programme were collected in the 311mm (12.25") hole section of Scallop-1.

During the course of the well, all gas equipment was checked and calibrated regularly, and spot samples were taken at drilling breaks and other changes in drilling parameters to better assess lithological change.

The Lithology as logged in Scallop-1 is described below. For more detailed descriptions, see Appendix 1, Formation Evaluation Log.

SAMPLE INTERVALS

Scallop-1	
917-930m	23m
930-1500m	30m
1500-1660m	10m
1660-3170m	5m
3170-3174m	4m

FORMATION DESCRIPTIONS:

914mm (36") Hole Section (135.5m to 179m)
Returns to seabed

444mm (17.5") Hole Section (179m to 917m)
Returns to seabed

311mm (12.25") Hole Section (917m to 3174m)
917m – 1410m: ARGILLACEOUS CALC ILUTITE with minor MARL
ARGILLACEOUS CALCILUTITE: Light grey to medium dark grey, light olive grey to olive grey, very soft to firm, dispersive in part, sub-blocky to blocky, argillaceous, trace carbonaceous specks, trace glauconite, trace dolomite, trace calcareous concretions, trace forams, trace fossil fragments.
MARL: Medium light grey, olive grey, soft to firm, sub-blocky to blocky, trace glauconite, trace carbonaceous specks, trace forams.
The section from 917m to 1410m was drilled with an average rate of penetration of 36.2 m/hr and ranged from 3.6 m/hr to 67.4 m/hr.

Total Gas (%)	C1 (%)	C2 (%)	C3 (%)	IC4 (%)	NC4 (%)	IC5 (%)	NC5 (%)
0.01 – 0.06	0 – 0.048	0	0	0	0	0	0

1410m – 1720m: MARL with minor ARGILLACEOUS CALCILUTITE
MARL: Light grey to medium light grey, medium grey to medium dark grey, light olive grey to olive grey, soft to firm, dispersive in part, sub-blocky to blocky, occasionally minor siltstone laminae, trace glauconite, trace pyrite nodules, trace carbonaceous specks, trace forams, trace fossil fragments.
ARGILLACEOUS CALCILUTITE: Light grey to medium grey, occasional light olive grey, soft to firm, sub-blocky to blocky, trace carbonaceous specks, trace foram, trace pyrite nodules, trace glauconite, trace fossil fragments, trace unconsolidated rounded quartz grains.

The section from 1410m to 1720m was drilled with an average rate of penetration of 37.6 m/hr and ranged from 9.5 m/hr to 86.4 m/hr.

Total Gas (%)	C1 (%)	C2 (%)	C3 (%)	IC4 (%)	NC4 (%)	IC5 (%)	NC5 (%)
0.01–0.04	0.014–0.044	0	0	0	0	0	0

1720m – 2610m: Interbedded CLAYSTONE and SANDSTONE with minor COAL and rare SILTSTONE and CONGLOMERATE

CLAYSTONE: Very light grey to dark grey, light brownish grey to brownish grey, greyish orange to dark yellowish orange, pale to dark yellowish brown, dusky brown to yellowish brown, greyish brown, brownish black, olive grey to dark olive grey, olive black, white to yellowish grey, occasional greenish grey, occasionally black, occasionally mottled, very soft to firm, amorphous, sub-blocky to blocky, occasionally dispersive, occasional micro-laminations, occasionally kaolinitic, trace to rare carbonaceous specks, occasionally trace to common glauconite, trace pyrite nodules, trace disseminated pyrite, trace quartz silt, sandy in part.

SANDSTONE: White to medium grey, greyish brown, very light grey to light brownish grey, moderate pink, clear to translucent quartz grains, occasionally frosted, predominantly loose, occasionally friable to hard aggregates, very fine to very coarse, occasional granules, predominantly very fine to medium, angular to rounded, sub-spherical to sub-elongate, very poorly to well sorted, occasionally broken loose grains, weak silica cement, occasional quartz overgrowths, trace pyrite cement, trace pyrite nodules, occasionally argillaceous, occasional to abundant kaolinite matrix, trace smoky quartz, trace grey chert and jasper, trace glauconite, trace coal, poor to good visual porosity, poor to good inferred porosity for loose grains.

FLUORESCENCE

1760-1770m: 30% decreasing to trace, moderate pale yellow, no cut, strong yellow crush cut, strong ring residue associated with dense argillaceous aggregates.

1790-1800m: 10% decreasing to trace, dull to moderate bright yellow, very slow faint diffuse cut, slow to moderate crush cut associated with argillaceous aggregates.

COAL: Bituminous, greyish black to black, dull to sub-vitreous, brownish black, occasional earthy lustre, firm to hard, sub-conchoidal, sub-angular to angular, sub-blocky to blocky, sub-fissile, uneven fracture.

SILTSTONE: Medium light grey to medium grey, brownish grey, off white, soft to firm, blocky, dispersive, abundant white kaolinite matrix, carbonaceous material, very fine to fine disseminated quartz grains, trace pyrite nodules, occasional quartz grains.

CONGLOMERATE: Disaggregated quartz granules (3-5mm), rounded, moderate to high sphericity, occasional clay matrix.

The section from 1720m to 2610m was drilled with an average rate of penetration of 16.8 m/hr and ranged from 0.5 m/hr to 105.1 m/hr.

Total Gas (%)	C1 (%)	C2 (%)	C3 (%)	IC4 (%)	NC4 (%)	IC5 (%)	NC5 (%)
0.01–0.12	0.012–0.059	0.021– 0.040	0–0.030	0–0.040	0–0.004	0.016	0–0.010

2610m – 3174m: ALTERED VOLCANICS and CLAYSTONE with minor SANDSTONE

ALTERED VOLCANICS: Black, white to very light grey to light grey to light brownish grey to brown, greyish red to greyish pink, greenish grey to dark greenish grey to light olive grey, very soft to very hard, amorphous to subangular to blocky, predominantly subangular, commonly kaolinitic, trace of chlorite, trace of silica.

CLAYSTONE: very light grey to dark grey, pale brown to greyish brown to dusky brown to dark yellowish brown, brownish black to black, very soft to firm, trace of carbonaceous matrix, trace of nodular pyrite, amorphous to sub blocky to sub fissile occasionally fissile, trace of carbonaceous specks.

SANDSTONE: Clear to transparent to translucent, white to light grey to dark grey to brownish grey quartz grains, predominantly loose, occasional hard to very hard aggregates, very fine to very coarse grained, predominantly fine to medium grained, angular to rounded, poorly sorted, trace pyrite cement, trace nodular pyrite, occasional trace of argillaceous matrix, occasional kaolinite matrix, fair inferred porosity, poor visible porosity.

FLUORESCENCE

2627-2635m: 80% moderate bright white fluorescence with very bright spots, very slow blooming white cut, thin ring residue, poor fluorescence for 2630-2635m, calcite cement mineral fluorescence.

2836-2838: 30%, bright white, patchy, associated with aggregates, occasional pinpoint, faint instant, strong blooming white crush cut, dull yellow ring residue.

2888m (spot sample): Trace dull yellow, spotty, slow bleeding cut, moderate ring residue, associated with tight sandstone aggregates with clay matrix.

2993m (spot sample): Moderate yellow-white, moderate blooming cut, moderate green-yellow ring residue, associated with lower porosity sand aggregates.

3026-3030m: 50%, bright white to yellowish white, spotted, associated with kaolinitic sandstone, slow cut, crush cut: pale blue film residue, blue-white ring residue.

3097-3107m: 10-70%, dull, pale yellow to pale brown, patchy, slow blooming cut, thin film residue, milky ring residue, associated with soft to firm kaolinitic matrix supported sandstone.

3115-3127m: 60% to trace, very dull pale yellowish white, no cut, moderate yellowish white crush cut, thin ring residue.

3137-3145m: 60% to trace, very dull pale yellowish white, no cut, moderate yellowish white crush cut, thin ring residue.

3150-3161m: 70%, decreasing to 10%, very dull yellow fluorescence, spotty on loose grains, solid on kaolinitic aggregates, nil cut, very faint crush cut, thin spotty yellow to white ring residue.

COAL: Black, moderately hard to hard, earthy to vitreous lustre, sub-angular to angular.

The section from 2610m to 3174m was drilled with an average rate of penetration of 4.9 m/hr and ranged from 1.0 m/hr to 16.1 m/hr.

Total Gas (%)	C1 (%)	C2 (%)	C3 (%)	IC4 (%)	NC4 (%)	IC5 (%)	NC5 (%)
0.02-0.25	0.006–0.170	0 – 0.025	0 – 0.020	0 –0.006	0 – 0.007	0 – 0.008	0 – 0.005

BAKER HUGHES

INTEQ

3.2 SAMPLES DISTRIBUTION LIST
ESSO AUSTRALIA PTY LTD
Scallop –1

CONTAINER: #112

Well Name: Scallop-1
Rig: Sedco 702
Operator: Esso Australia Pty.Ltd.

Lightly Washed and Dried (Palynology)

Set A — **ESSO,Melbourne** (200g)
Attn: Diana Giodano
C/O Kestrel Information Management (Australia)
596-600 Somerville Rd
Sunshine VIC 3020

Washed and Dried (100g)

Set B — **ESSO, Melbourne** (100g)
Attn: Diana Giodano
C/O Kestrel Information Management (Australia)
596-600 Somerville Rd
Sunshine VIC 3020

Set C — **BHPBilliton, Melbourne** (100g)
Attn: Diana Giodano
C/O Kestrel Information Management (Australia)
596-600 Somerville Rd
Sunshine VIC 3020

Set D — **Santos, Adelaide** (100g)
Attn: Andy Pietsch
Santos Core Library
C/o Ascot Transport
Francis Street
Gillman, South Australia 5013

Set E — **Woodside, Perth** (100g)
Attn: Gary Kemp
Core Laboratories
447-449 Belmont Ave
Kewdale, WA 6105

Set F — **DPI Core Sample Library** (100g)
South Road (off Sneydes Rd)
Werribee, VIC 3030

Set G — **Geoscience Australia** (100g)
Attn: Eddie Resiak
Cnr Jerrabomberra Ave & Hindmarsh Drive
Symonston ACT 2069

Set H (Charts etc.): — **ESSO, Melbourne** (Charts etc.)
Attn: Diana Giodano
C/O Kestrel Information Management (Australia)
596-600 Somerville Rd
Sunshine VIC 3020

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INTEQ

3.2 SAMPLES DISTRIBUTION LIST
ESSO AUSTRALIA PTY LTD
Scallop –1

Lightly Washed, Set A:

Split Box	1:	917m – 1440m
	2:	1440m – 1675m
	3:	1675m – 1795m
	4:	1795m – 1870m
	5:	1870m – 1945m
	6:	1945m – 2035m
	7:	2035m – 2140m
	8:	2140m – 2235m
	9:	2235m – 2325m
	10:	2325m – 2445m
	11:	2445m – 2520m
	12:	2520 m – 2595m
	13:	2595 m – 2670m
	14:	2670m – 2750m
	15:	2750m – 2825m
	16:	2825m – 2900m
	17:	2900m – 2990m
	18:	2990m – 3080m
	19:	3080m – 3174m

Washed & dried, Sets B,C, D, E, F &G (100g) :

Split Box	1:	917m – 1530m
	2:	1530m – 1705m
	3:	1705m – 1840m
	4:	1840m – 1920m
	5:	1920m – 2030m
	6:	2030m – 2130m
	7:	2130m – 2260m
	8:	2260m – 2360m
	9:	2360m – 2470m
	10:	2470m – 2585m
	11:	2585m – 2700m
	12:	2700m – 2805m
	13:	2805m – 2900m
	14:	2900m – 3020m
	15:	3020m – 3120m
	16:	3120m – 3174m

Printouts, Charts & Plots, Set H:

Siemens Charts
Chromatograph printouts
Online Drilling/Tripping/Reaming data
Loggers worksheets

BAKER HUGHES

INTEQ

3.2 SAMPLES DISTRIBUTION LIST
ESSO AUSTRALIA PTY LTD
Scallop –1

ESSO

SET A: 2 large boxes and one small box
SET B: 2 large boxes
SET C: 2 large boxes
SET D: 2 large boxes
SET E: 2 large boxes
SET F: 2 large boxes
SET G: 2 large boxes
SET H: 1 large box

Total 16 boxes for distribution to Esso Melbourne and onward forwarding to above addresses.

Section 4

Pressure Evaluation

4.1 PORE PRESSURE EVALUATION

Baker Hughes INTEQ formation pressure evaluation services commenced at 261m. Formation evaluation was carried out using data collected whilst drilling, with the aid of offset data provided by the client for correlation purposes and on-line MWD data. An average sea water density of 8.6 ppg was assumed as the normal saline pressure gradient for all calculations for Scallop-1. Using real-time data, such as the hydrocarbon gas trend, lithology, flowline temperature, character of drilled cuttings, constant drilling fluid parameters, corrected drilling exponent (Dxc) data, as well as wireline logging data when available, pore pressure estimates were made during the drilling of Scallop-1. For more details, please refer to Appendix 3, "Pressure Summary Plot".

444mm (17.5") Hole Section: 179m – 917m

The 17.5" hole section was drilled with returns to seabed, and was drilled with a PDC bit. Baker Hughes INTEQ commenced mudlogging services from 261m. No indications of shallow gas was seen in any offset wells or on seismic interpretations, and no shallow gas indications were observed(by ROV) while drilling this section. Rig safety on shallow gas procedures were adhered to throughout the drilling of this hole section. Seawater was used as the primary drilling fluid, with prehydrated gel sweeps pumped to assist in hole cleaning.

The Dxc profile while drilling from 261m to around 500m(Limestone lithology) showed no clear Dxc trend, but not as widely scattered as the typical Dxc profile in shallow depth drilling. The Dxc values ranged from 0.29 to 1.06(average = 0.67). The interval below 500m down to 650m showed a steeper, near-vertical Dxc trend with depth. The Dxc values ranged from 0.59 to 0.99(average = 0.76) which possibly correspond to silty/marly sections of the Gippsland Limestone formation. Below 650m to 800m, no clear Dxc trend could be discerned from the Dxc plot(Dxc range = 0.51 – 0.87, average = 0.67). From 800m to section TD of 917m, again, a steep Dxc trend with depth was shown by the Dxc plot(Dxc range = 0.68 – 0.99, average = 0.79).

The above Dxc profile trend analysis(while drilling without returns) merely suggested the absence of any significant Dxc trend(or compaction trend) which could be established after drilling the section from 179m to 917m. The prognosticated Limestone formation to be drilled in this interval seemed to agree with the general Dxc profile.

As this section was drilled successfully using seawater, the pore pressure was assumed to be normal at 8.6 ppg(1.03 sg) EMW.

311mm (12.25") Hole Section: 917m – 3174m (TD)

A KCl/PHPA/Polymer/Glycol water-based mud system was used throughout this section, with mud weights ranging from 9.0 ppg(1.08 sg) to 10.2 ppg(1.23 sg). The ECD varied from 9.1 ppg to 10.5ppg(1.09sg to 1.26 sg).

The 311mm (12.25") section consisted predominantly of Limestone, altered volcanics, Sandstone, Claystone, with minor Siltstone and Marl lithologies. This section was drilled initially with a PDC bit(NB3) from 917m down to 2618m. Penetration rates were maximized throughout most of the section, with the mud weight being increased with depth based on the predicted lithologic characteristics, and based on marginal overpressures in the offsett wells. The drilling parameters like weight on bit was occasionally controlled depending on the deviation surveys(Anderdrift) taken after every stand of drillpipe drilled. The rates of penetration ranged from 1 m/hr to 105 m/hr, with an average of 13 m/hr. The second bit (NB4) was an insert bit which drilled from 2618m down to 2933m. This bit drilled thru predominantly the altered volcanics, with some minor Claystone and Sandstone interbeds. The rates of penetration ranged from 2 m/hr to 16 m/hr, with an average of 5 m/hr. The last bit (NB5) was another insert bit which drilled from 2933m to the hole TD of 3174m. The lithologies drilled were altered volcanics, Claystone and Sandstone. The rates of penetration ranged from 1 m/hr to 16 m/hr, with an average of 4 m/hr

The Dxc plot analysis while drilling was utilized throughout the section, especially while drilling below 1700m with the intention of assessing for any indications of pore pressure increase(s) with depth. Although conditions were not ideal, due to bit type and lithologic interbeds/impurities, what was thought to represent a normal (1.03 sg EMW) compaction curve could be established from the Dxc plot below 1700m to approximately 1850m(Dxc range = 0.57 to 1.38), and below 2000m to nearly 2300m (Dxc range = 0.70 to 1.45). Below 2300m down to approximately 2570m, a different trend in the Dxc plot was apparent with the Dxc values ranging from 0.72 to 1.18 only. This could possibly be correlated to a rock formation change. Also, a minor shift in the Dxc trend was discernible within the depth intervals of about 2400m to 2500m. The lower Dxc values within the depth interval equate to an estimated pore pressure of 8.9 ppg (1.07 sg) EMW, or higher.

The Dxc plot corresponding to the two(2) insert bits run from 2618m to the hole TD of 3174m both showed a Dxc trend of generally decreasing drillability with depth. Both the Dxc trend lines showed a low-angle, positive slope with depth, e.g. from 2628m to 2933m, the Dxc values ranged from 1.06 to 1.87(average = 1.54); and from 2933m to 3174m, the Dxc values ranged from 1.22 to 1.99(average = 1.63). A sand-line could also be established from approximately 2940m to 3110m which appeared to run parallel the above-mentioned Dxc trend line. No increasing pore pressure, therefore, were indicated by the Dxc plot from 2618m to TD.

The background gas from 1000m to 2300m ranged from 0.01% to 0.08%, with an average of 0.03%. Below 2300m to around 2520m, the background gas ranged from 0.02% to 0.12%, with an average of 0.04%, despite the mud weight increasing from 9.9 ppg (1.19 sg) to 10.2 ppg (1.23 sg). The background gas below 2520m to TD (average was 0.05-0.06%) was relatively higher due to the gas-bearing sand interbeds and stringers drilled thru. No connection gasses were observed during the entire drilling. Trip gas at 2618m was 0.05% over a background of 0.02%, while at 2933m, the trip gas was 0.10% over a background of 0.04%.

The hole conditions whilst drilling the section were generally good, except for some tight spots when tripping out which could possibly be Sandstone/volcanic ledges. A wiper trip was performed after reaching the hole TD of 3174m, and the hole was circulated twice the annular volume with not much cuttings coming out over the shakers. Nill cavings were observed in the drill cuttings throughout the drilling of the 311mm (12.25") section.

Temperature data showed no abnormal variations, with all variations being attributed to surface mud transfers, changes in pump rates, and occasional cuttings accumulation in the possum belly.

Overall, no strong indications of increasing pore pressure were interpreted while drilling Scallop-1 based on the available pore pressure parameters. A possible higher(than normal) pore pressure regime was apparent in the Dxc plot between 2400m-2500m, which could correlate to slightly higher background gas in the same depth interval. As a corollary of the aforementioned pore pressure assessment, the hole was drilled with a good overbalance from 917m to the final TD of 3174m.

4.2 FRACTURE PRESSURE EVALUATION

Fracture pressure estimation for Scallop-1 was made using the Baker Hughes INTEQ zero tensile strength method. For a full explanation of this method, refer to INTEQ Manual MS-156 "The Theory and Evaluation of Formation Pressures".

The 660mm / 914mm (26" / 36") and 444mm (17 1/2") hole sections were drilled with seawater, with returns to the seabed. With no returns to surface it was not possible to estimate the fracture pressure through the 17.5" hole sections.

After running and testing the BOP stack and riser, the cement and the 340mm (13.375") casing shoe was drilled out from 843m to 900m, and the rathole was cleaned out to 917m. Three(3) meters of new 311mm (12.25") hole was drilled to 920m, and a Leak-Off Test (LOT) was performed. The results are shown below :

Casing Depth	Casing Size		Hole Size		Test Mud Density	PIT EMW	Test type
mMDRT	in	mm	in	mm	(sg/ppg)	(sg/ppg)	
900	13.375	340	12.25	311	1.15/9.0	1.98/16.5	LOT

The hole was displaced to a KCL/PHPA/Glycol/Polymer water-based mud system weighted at 9.0 ppg while drilling out the cement and casing shoe. A leak-off test was then performed recording a 16.5 ppg EMW formation leak-off strength. Drilling resumed with minimal surface losses. The mud system was weighted up slowly to 9.5 ppg to 9.8 ppg at approximately 2000m while drilling. Baracarb limestone mud additive was gradually added to the drilling fluid to minimise seepage losses into the Latrobe sands. Further additions of KCl and Baracarb then increased the mud weight to 10.2 ppg at around 2500m without significant mud loss into the formation. Flow checks conducted at drilling breaks showed static hole conditions. The maximum ECD of the mud while drilling the 12 ¼" hole from 917m to 3174m was 10.5 ppg(1.26 sg) which was low compared to the 16.5 ppg(1.98 sg) EMW measured strength of the weakest formation. The calculated maximum fracture pressure gradient in this section ranged from 15.8 ppg to 17.6 ppg(1.90-2.12 sg) EMW.

Tables

BAKER HUGHES INTEQ

Esso

LOCATION / WELL NAME
Vic / RL2
Scallop-1
OPERATOR
ESSO Australia Pty. Ltd.

CONTRACTOR / RIG
Transocean Sedco Forex
Sedco 702

Rotary Type Abbreviations
TS - Top Drive System
RT - Rotary Table
PD - Positive Displacement Motor
SB - Steerable PDM & Bent Sub
TB - Turbine
m - suffix designates MWD

Mud Type Abbreviations
PHG - Gel Sweeps GLY - Glycol
G - Gel PHPA - Polyacrylamide
SBM - Synthetic-Based Mud

Geology Abbreviations
Sd : Sand
Sst : Sandstone
Lst : Limestone
Slt : Silt
Stst : Siltstone
Cl : Clay
Clst : Claystone
Volc: Volcanics
Sh : Shale
Mdst : Mudstone

Dull Grade & Reason Pulled
A - All Rows
BC - Broken Cone
BHA - Bottomhole Assembly
BU - Balled Up Bit
CM - Condition Mud
CP - Core Point
DMF - Down Hole Motor Failure
DP - Drill Plug
DSF - Drill String Failure
DTF - Down Hole Tool Failure
E - Seals Effective
F - Seals Failed
FC - Flat Crested Wear
G - Gage Rows as 1/16
H - Heel
HP - Hole Problems
HR - Hours on Bit
PR - Penetration rate
RG - Rounded Gauge
SD - Shirt Tail Damage
TD - Total / Csg Depth
TQ - Torque
TW - Twist Off
WC - Weather Condition
WT - Worn Teeth
BT - Broken Teeth
JD - Junk Damage
LIH - Left In Hole
LOG - Run Logs
LT - Lost Teeth
M - Middle Rows
MH - Mid Heel
NO - No Dull Wear
O - Out of Gauge
PP - Pump Pressure

Run No.	Bit No.	Vendor	Type	Serial Number	Size (in)	IADC Code	Nozzles (x 1/32")	Depth In	Depth Out	Drilled m	Drilled hrs	ROP (m/hr)	WOB (klb)	RPM (at bit)	TORQ. (kftlb)	TBR x1000	RT	Pump Pr (psi)	Flow Rate (gpm)	Dev (deg)	Geology Formation	W sg	Mud Type	PV/YP	IADC Dull Grade (G in 1/16") I	O	D	L	B	G	O	R
660mm / 914mm (26" / 36") Hole Section 135.5 - 179m																																
1	NB1	Reed	Y11	660478	26"	111	1 X 20 3 x 18	135.5	179	43.5	2	21.8	2	90	3.00	10.8	TS	2800	1204	0.00	Returns to seabed	1.03	SW / Hi-Vis	1 / 1	1	1	PN	A	1	1	RR	TD
			Hole Opener		36"		5 x 20																									
444mm (17.5") Hole Section 179 - 917m																																
2	NB2	Hycalog	DS34HF	244002	17.5"		8 x 14	179	917	738	14.1	52.3	0.5 - 13.2	54 - 152	1.5 - 11.6	118.7	TS	1585 - 2840	1090 - 1230	0.00	Returns to seabed	1.03	SW / Hi-Vis	1 / 1	1	1	ER	T	X	1	NO	TD
311mm (12.25") Hole Section 917m - 3174m								(Start M/Logging F/261m)																								
3	NB3	Smith	MA89PX	JT0152	12.25"	M223	7 x 14	917	2618	1701	127.8	13.3	3.8 - 20	23 - 148	1.6 - 12.7	14.5	TS	1000 - 3408	800 - 1014	2.12	Sst, Clst, Slst	1.20	KCL/PHPAPoly/Glycol	21/24	2	4	CT	S	X	0	BT	PR
4	NB4	Hughes	MX20DDT	6007902	12.25"	1/05/2007	3 x 20	2618	2933	315	69.1	4.6	11-54	77-138	5 - 6	403.9	TS	2605-3000	820 - 830	2.00	Sst, Clst, Slst, Volc	1.23	KCL/PHPAPoly/Glycol	24/37	4	7	BT	S	E	1	WT	TQ
5	NB5	Hughes	MX20DX	WD42DV	12.25"	1/05/2007	3 x 18	2933	3174	241	69.3	3.5	32-55	75-133	5 -7	404.3	TS	3400 - 3500	750-850	1.52	Sst, Clst, Volc	1.22	KCL/PHPAPoly/Glycol	24/38	3	7	BT	S	E	2	RG	TD

BAKER HUGHES INTEQ

Bit Hydraulics Summary

ESSO

Operator	Well Name	Location	Drilling Contractor	Rig
ESSO Australia Pty. Ltd.	Scallop-1	VIC / RL2	Transocean Sedco Forex	Sedco 702

Drillstring Abbreviations
N Normal; P Positive Displacement Motor; S Camco SRD Tool
M MWD; A Adjustable Gauge Stabilizer; T Halliburton TRACS Tool
C Core

Hydraulics Models
Power Law Model used for drilling with Mud
Bingham Model used for coring and drilling with sea water

Bit No.	Depth (m)	Hole Size in	Jets x 1/32"	Drill String Type	Mud Type	Mud Density sg	PV cP	YP lbs/100 ft sq	Flow Rate gpm	Jet Vel m/sec	Impact Force lbf	Hydraulic Power hhp	Power/ Area hp/sq in	Bit Loss Psi	Bit Loss %	Pipe Loss Psi	ECD sg	Annular Velocities DP OH m/min	Annular Velocities DC OH m/min	Annular Velocities DC Critical m/min
	914mm (36") Hole Section																			
NB1	179	36"	3x18	N	SW&Hi-Vis Pills	1.03	1	1	855	70	855	195.0	0.8	395	64.0	165	1.04	-	4	24
	444mm (17.5"") Hole Section																			
NB2	917	17.5"	8x14	N	SW&Hi-Vis Pills	1.03	1	1	1220	99	1765	577.0	2.4	813	33.3	655	1.03	32	42	45
	311mm (12.25"") Hole Section																			
NB3	1303	12.25	7x14	N	KCl/Polymer/Glycol	1.15	14	25	1000	93	1513	464.2	4.0	796	36.4	1223	1.17	60	91	138
	1870	12.25	7x14	N	KCl/Polymer/Glycol	1.15	20	26	950	88	1365	398.0	3.4	719	28.1	1678	1.17	57	87	144
	2154	12.25	7x14	N	KCl/Polymer/Glycol	1.16	21	31	990	92	1495	454.0	3.9	787	27.0	1947	1.18	59	90	160
	2303	12.25	7x14	N	KCl/Polymer/Glycol	1.19	20	35	1000	93	1565	480.0	4.1	824	26.9	1997	1.22	60	91	168
	2465	12.25	7x14	N	KCl/Polymer/Glycol	1.22	22	40	1005	93	1621	500.0	4.3	853	26.1	2189	1.25	57	85	176
	2595	12.25	7x14	N	KCl/Polymer/Glycol	1.23	21	35	1005	93	1634	504.0	4.3	860	25.5	2297	1.26	57	85	162
NB4	2706	12.25	3x20	N	KCl/Polymer/Glycol	1.23	21	37	825	88	1259	364.0	3.1	758	26.6	1889	1.26	47	75	170
	2830	12.25"	3x20	N	KCl/Polymer/Glycol	1.23	22	34	810	86	1214	345.0	3.0	731	25.3	1972	1.25	47	74	163
	2933	12.25"	3x20	N	KCl/Polymer/Glycol	1.23	24	37	800	85	1184	332.0	2.9	713	24.4	2033	1.26	48	73	172
NB5	2996	12.25"	3x18	N	KCl/Polymer/Glycol	1.23	22	36	830	109	1573	565.0	4.9	1169	31.1	2415	1.26	47	73	166
	3174	12.25"	3x18	N	KCl/Polymer/Glycol	1.22	24	38	820	108	1523	541.0	4.7	1132	29.5	2522	1.25	47	75	175

Table 3: Survey data summary **Tables**

Esso Australia Pty Ltd. **February 2003**

Gyro Survey listings

Survey number	Measured Depth Depth	Inclination Deg.	Azimuth Deg.	Survey number	Measured Depth Depth	Inclination Deg.	Azimuth Deg.
1	157.8	0.25	195.26	51	1610.8	0.84	19.01
2	185.1	2.83	2.83	52	1639.9	0.96	51.87
3	212.5	0.35	350.71	53	1668.9	0.99	5.3
4	239.9	0.32	1.45	54	1698	1.05	16.09
5	267.5	0.35	15.59	55	1727.1	1.07	8.49
6	296.4	0.35	357.5	56	1756.1	0.97	37.88
7	325.4	0.35	358.93	57	1785.1	1.64	8.97
8	354.4	0.31	351.16	58	1814.2	1.49	355.64
9	383.2	0.28	342.33	59	1843.1	1.39	352.07
10	412.2	0.28	333.71	60	1871.8	1.36	10.96
11	441.3	0.3	330.59	61	1900.9	1.42	5.91
12	470.3	0.26	329.95	62	1930.1	1.06	350.75
13	499.3	0.27	316.67	63	1959.1	1.45	318.73
14	528.3	0.29	341.21	64	1988.2	1.54	10.39
15	557.3	0.35	334.17	65	2017.3	1.5	350.44
16	586.3	0.37	339.92	66	2046.2	1.62	18.76
17	644.2	0.44	344.86	67	2075.3	1.4	356.86
18	673.1	0.48	339.4	68	2104.3	1.68	29.66
19	702.1	0.47	355.15	69	2133.1	1.45	11.55
20	731.1	0.49	354.85	70	2162.1	1.41	6
21	760.1	0.46	355.22	71	2191.2	1.38	355.52
22	789.1	0.46	350.78	72	2220.2	1.25	3.94
23	818.2	0.41	301.7	73	2249.3	1.27	342.71
24	847.2	0.51	355.47	74	2278.2	1.32	17.85
25	876.2	0.53	338.22	75	2307.2	1.42	358.33
26	885.8	0.51	327.67	76	2336.3	1.52	359.27
27	907.8	0.39	329.98	77	2365.4	1.49	352.09
28	945.5	0.45	10.33	78	2394.5	1.39	344.11
29	974.4	0.51	49.51	79	2423.4	1.31	350.73
30	1003.2	0.5	44.1	80	2452.4	1.36	357.28
31	1032.1	0.56	65.45	81	2481.2	1.28	8.12
32	1060.9	0.53	47.97	82	2510.2	1.31	3.41
33	1089.8	0.58	59.57	83	2539.1	1.3	359.16
34	1118.7	0.56	29.96	84	2568.1	1.17	4.09
35	1147.6	0.64	46.68	85	2597.1	1.09	6.25
36	1176.5	0.62	19.17	86	2626.2	1.14	1.74
37	1205.3	0.56	31.6	87	2655.2	1.19	357.56
38	1234.1	0.58	34.13	88	2684.2	1.36	10.59
39	1263	0.64	42.47	89	2713.1	1.15	121.25
40	1291.9	0.64	44.73	90	2742.1	1.26	336.84
41	1321	0.6	16.43	91	2771.1	1.18	349.21
42	1350.1	0.6	43.77	92	2800.1	1.12	286.24
43	1378.9	0.63	46.82	93	2829	1.3	317.47
44	1407.6	0.65	54.2	94	2858	1.13	327.9
45	1436.5	0.63	47.67	95	2887	1.27	345.2
46	1465.3	0.64	55.52	96	2916	1.29	328.73
47	1494.5	0.73	32.93	97	2923	1.35	28.95
48	1523.6	0.83	36.39				
49	1552.7	0.85	12.09				
50	1581.8	0.88	5.86				

Table 3: Survey data summary **Tables**

Directional Survey listings

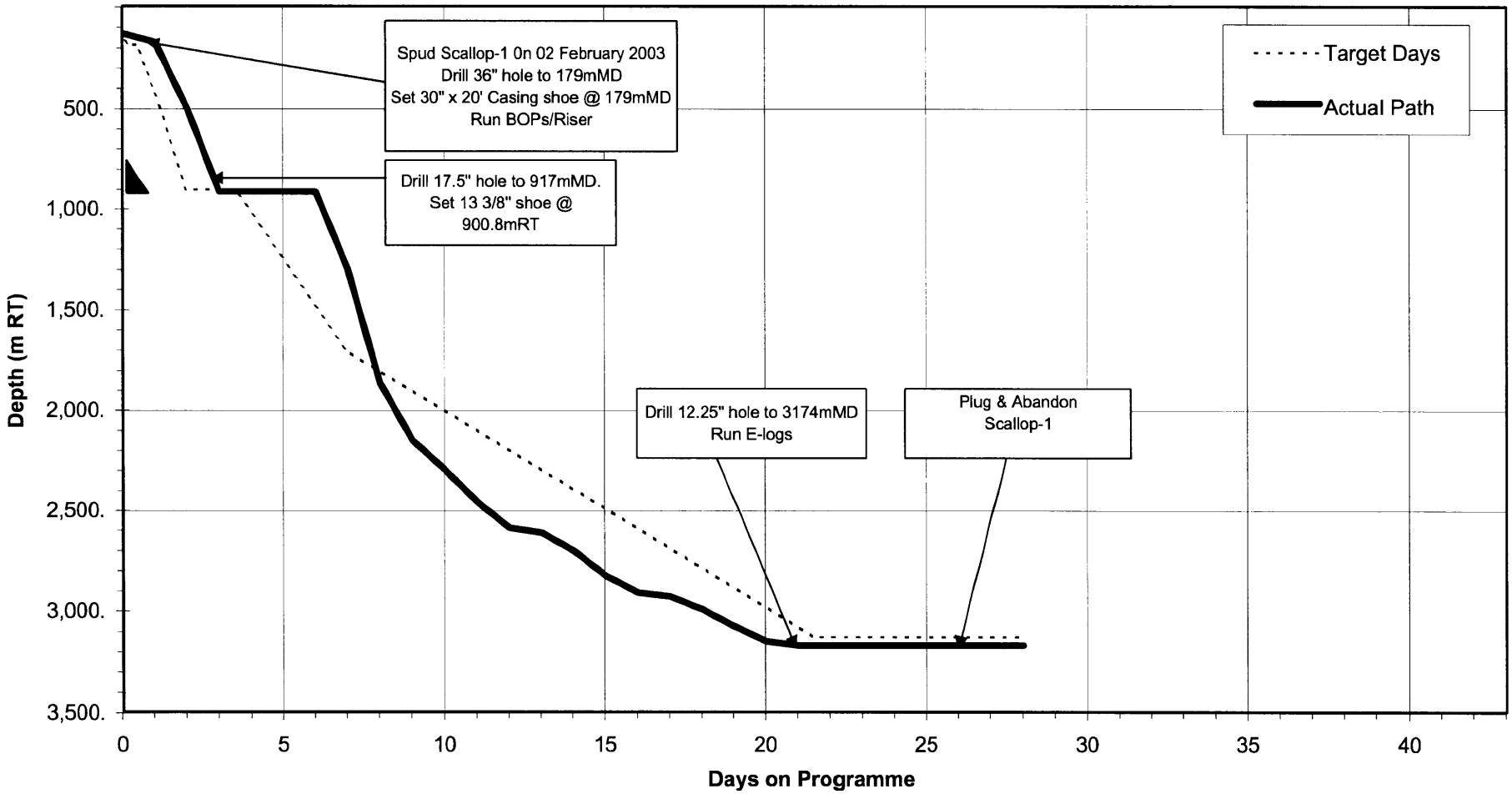
Seq # -	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S- (m)	Displ +E/W- (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 10m)	Srvy tool type	Tool Corr (deg)
1	2923	1.35	28.95	0	2922.61	37.24	37.24	2.84	37.35	4.36	0	TIP	None
2	2936.3	1.36	325.18	13.3	2935.91	37.51	37.51	2.83	37.61	4.31	1.08	MWD	None
3	2964.01	1.45	327.72	27.71	2963.61	38.07	38.07	2.45	38.15	3.68	0.04	MWD	None
4	2993.09	1.51	327.61	29.08	2992.68	38.71	38.71	2.05	38.76	3.03	0.02	MWD	None
5	3023.62	1.56	335.57	30.53	3023.2	39.43	39.43	1.66	39.46	2.41	0.07	MWD	None
6	3051.74	1.55	335.18	28.12	3051.31	40.12	40.12	1.34	40.14	1.92	0.01	MWD	None
7	3080.66	1.55	331.24	28.92	3080.22	40.82	40.82	0.99	40.83	1.39	0.04	MWD	None
8	3110.84	1.52	333.82	30.18	3110.39	41.53	41.53	0.62	41.54	0.85	0.02	MWD	None
9	3138.26	1.52	333.59	27.42	3137.8	42.19	42.19	0.3	42.19	0.4	0	MWD	None

BAKER HUGHES INTEQ

ESSO AUSTRALIA PTY LTD

Scallop-1

Time vs. Depth Curve



APPENDIX 5

LWD REPORT

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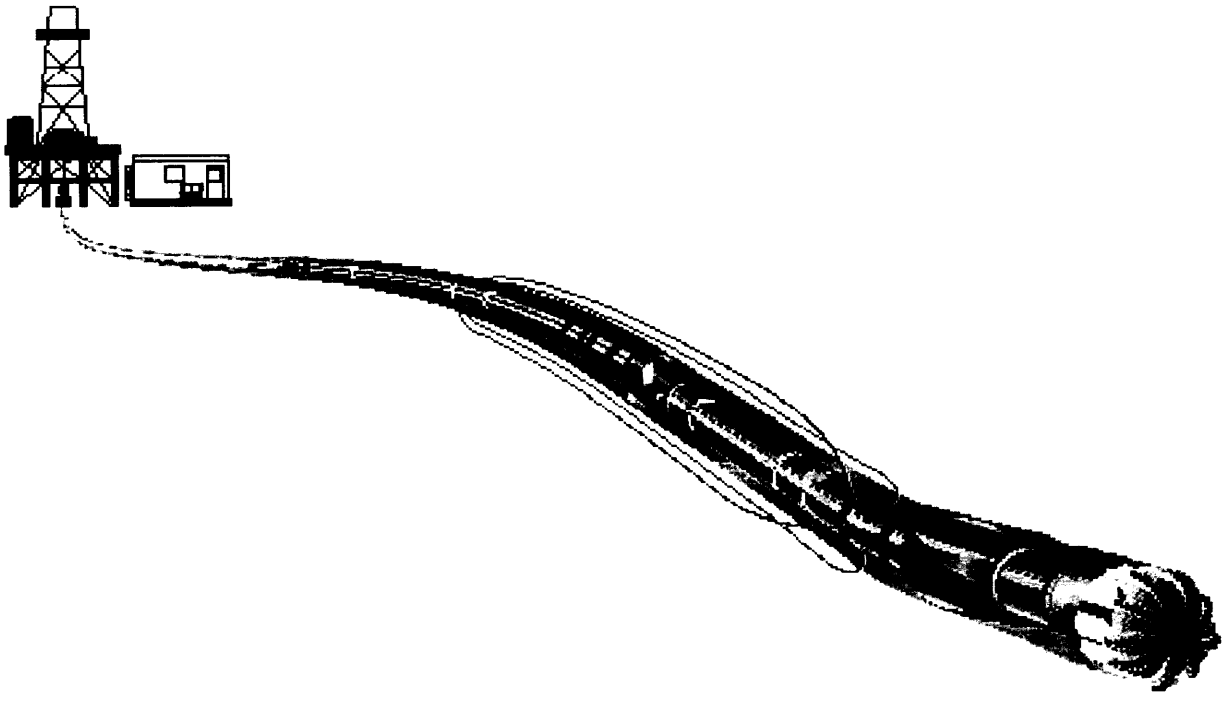
ESSO

Scallop-1

MWD - LWD End of Well Report



Report complied by: _____

Report checked by: _____

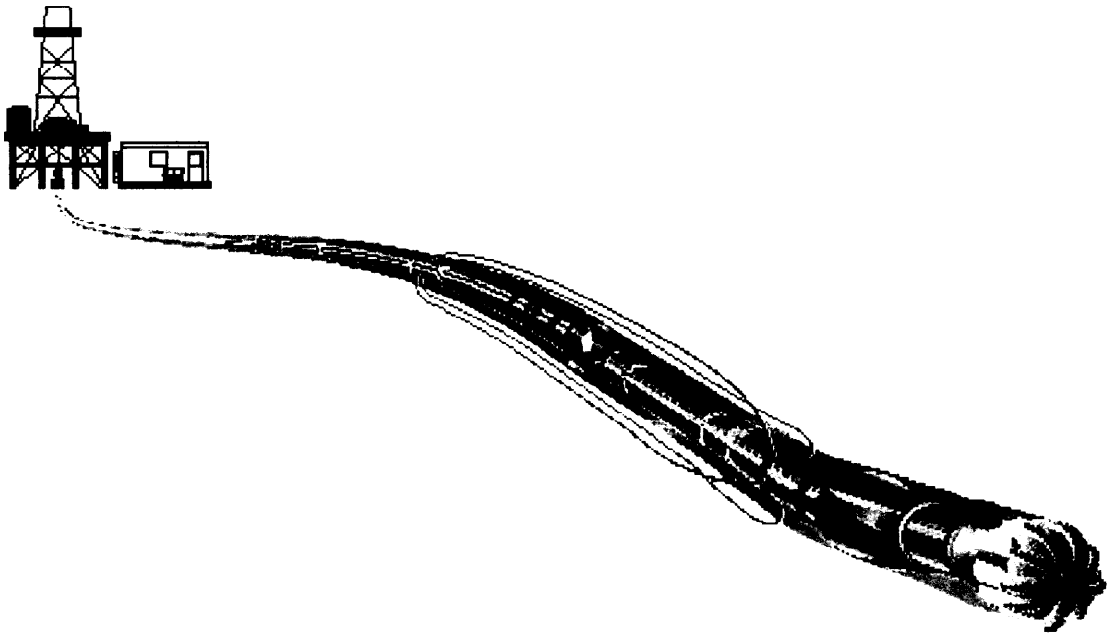
Schlumberger

IDEAL

End of Well Report for Scallop-1

Contents

- General Information
- Logging While Drilling Overview
- Geomagnetic and Survey Reference Criteria
- Survey Report
- Bit Run Summary



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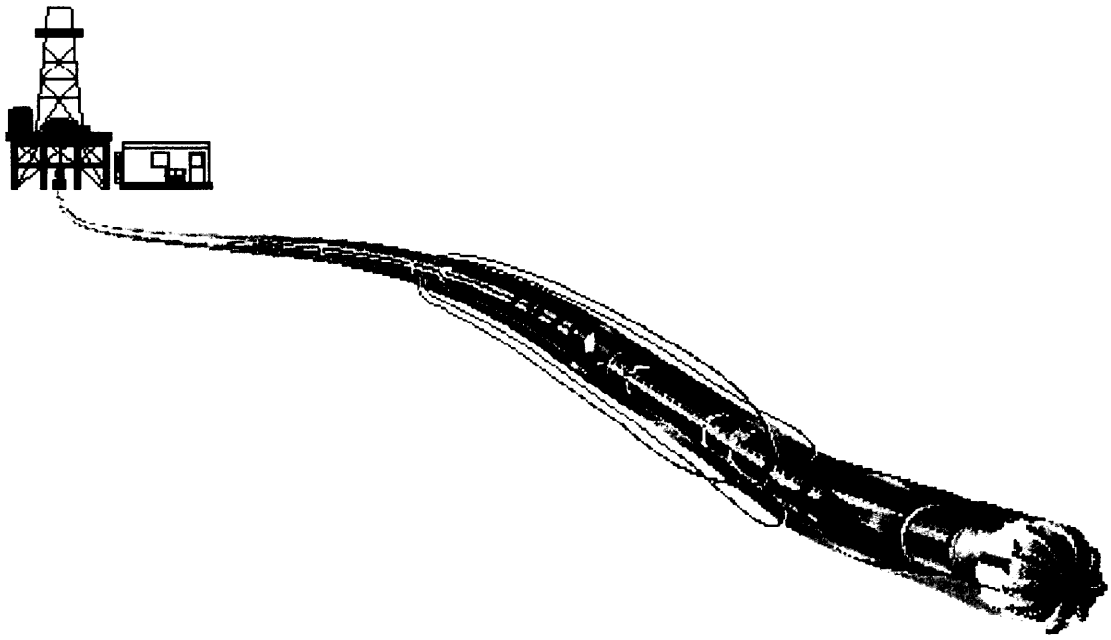
General Information



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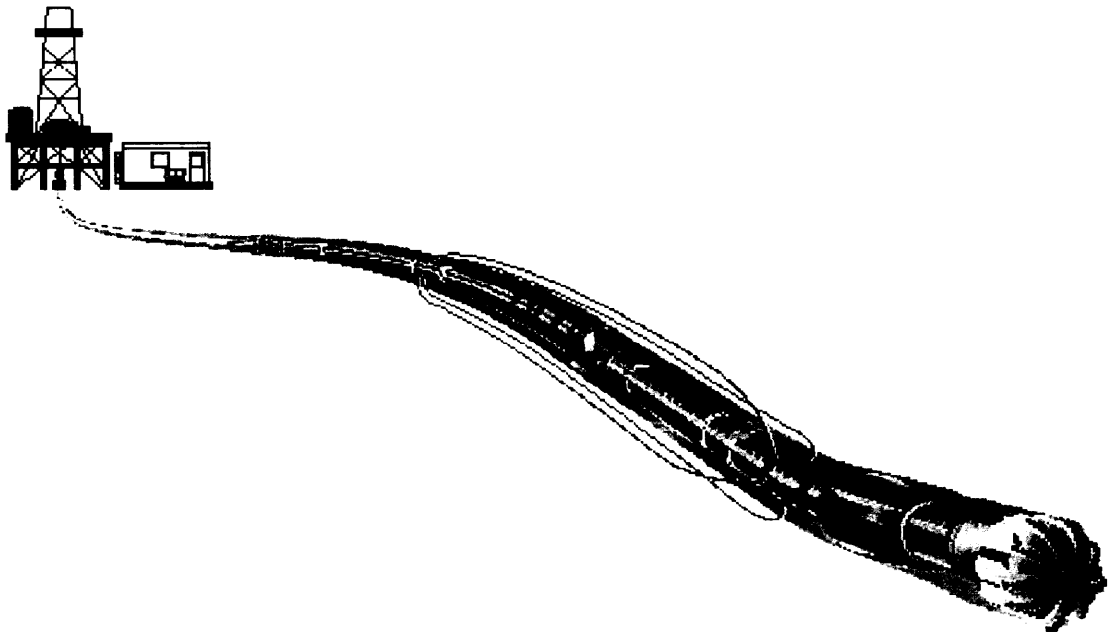
General Information

Well Name:	Scallop-1
Rig:	TransOcean Sedco Forex 702
Field:	Exploration / Permit VIC / RL2
Location:	Gippsland Basin, Offshore Victoria
Country:	Australia
Cell Members:	Luis Bon – Cell Manager Kym Handley – LWD/MWD Engineer
Town Contacts:	Justin Walta – Location Manager - ASQ David de Freitas – ESSO Co-Ordinator - ASQ
Company Representatives:	George Sharkey / Murray Jackson



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Logging While Drilling Overview

Anadrill provided a RAB8* Logging While Drilling service on Scallop-1 which provided the following measurements in recorded mode and real-time:

- Gamma Ray
- Ring Resistivity
- Deep Button Resistivity
- Medium Button Resistivity
- Shallow Button Resistivity
- MWD Surveys

The following Anadrill LWD tools were used to provide the above measurements:

- PowerPulse*.
- Resistivity-at-Bit (RAB8*)

The logging tools performed to specification and provided real-time data for the duration of the well. Low rates of penetration and high sampling rates of the tools meant that the recorded and real-time data density exceeded 2 samples per foot.

12-1/4" Hole Section

The 12-1/4 inch hole section utilised a GeoVISION Resistivity* service composed of the RAB8*, and PowerPulse*. This combination of tools provided surveys in Real-Time, gamma ray and resistivity data in real time and recorded mode. Schlumberger Drilling and Measurements provided MWD services using the PowerPulse tool in the 12¼" section of Scallop-1. Surveys were taken at each connection.

The MWD real-time shock data indicated little or no shocks were present while drilling the 12 1/4" section. The PowerPulse MWD tool performed well throughout the 12¼" section, and no problems were encountered.

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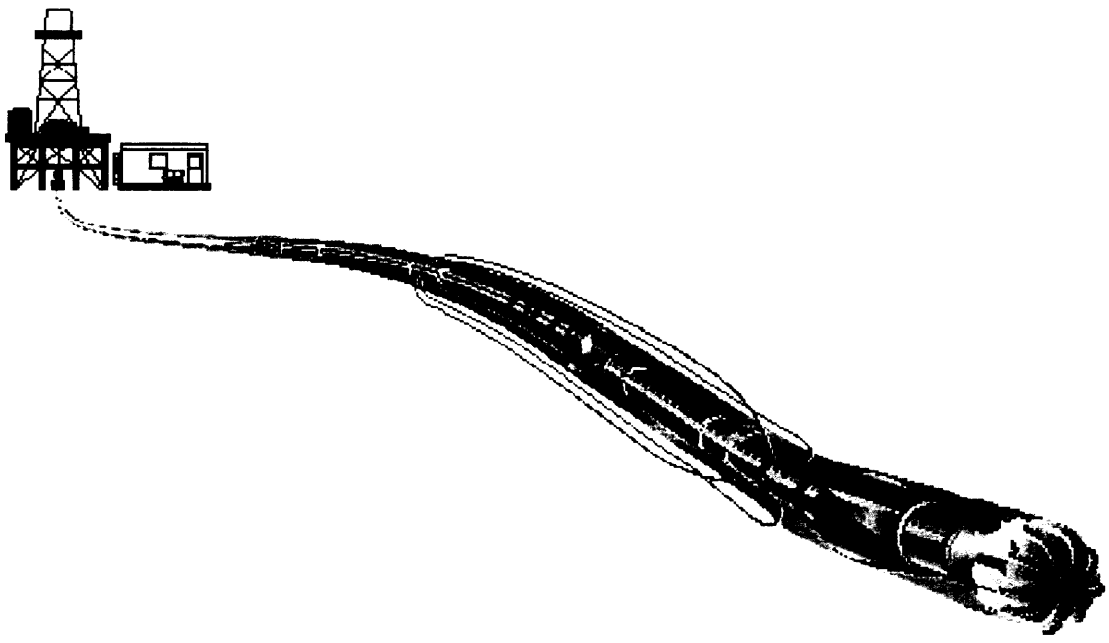
Geomagnetic and Survey Reference Criteria



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Geomagnetic and Survey Reference Criteria

Geomagnetic Data

Magnetic Model:	BGGM Version 2002
Magnetic Date:	13th February 2003
Magnetic Field Strength:	1199.66 HCNT
Magnetic Declination:	13.241°
Magnetic Dip:	-68.66°

Survey Reference Criteria

Reference G:	1000.025 mgal
Reference H:	1199.66 HCNT
Reference Dip:	-68.66°
G value Tolerance:	± 2.50 mgal
H value Tolerance:	± 6.00 HCNT
Dip Tolerance:	± 0.45 degrees

Survey Corrections Applied

Magnetic Declination:	13.241°
Grid Convergence:	-0.98°
Total Azimuth Correction:	14.22°

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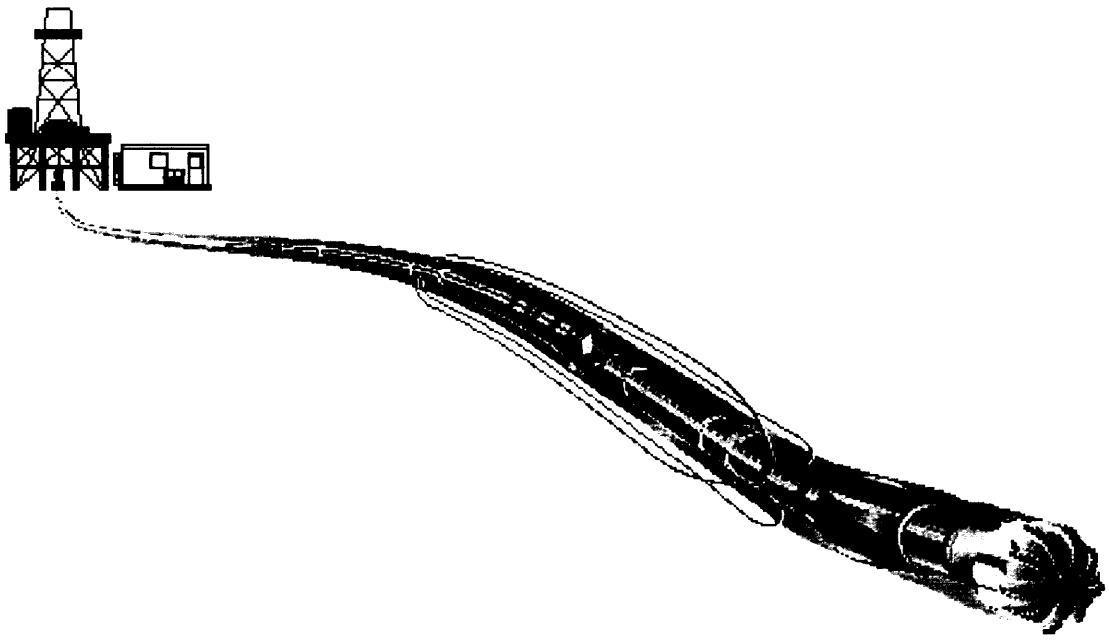
Survey Report



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Survey Report - Standard

Report Date:	03-Mar-2003	**Survey / DLS Computation Method:**	Minimum Curvature / Lubinski
Client:	Esso Australia Ltd	**Vertical Section Azimuth:**	0.000°
Field:	Scallop	**Vertical Section Origin:**	N 0.000 m, E 0.000 m
Structure / Slot:	Scallop / Sedco 702	**TVD Reference Datum:**	Rotary Table
Well:	Scallop 1	**TVD Reference Elevation:**	25.900 m relative to MSL
Borehole:	Scallop 1	**Sea Bed / Ground Level Elevation:**	109.600 m relative to MSL
UWI / API#:		**Magnetic Declination:**	+13.243°
Survey Name / Date:	Scallop 1 Final / February 21, 2003	**Total Field Strength:**	59987.689 nT
Tort / AHD / DDI / ERD ratio:	33.014° / 48.32 m / 3.719 / 0.015	**Magnetic Dip:**	-68.663°
Grid Coordinate System:	GDA94/MGA94 Zone 55	**Declination Date:**	February 21, 2003
Location Lat / Long:	S 38 12 48.615, E 148 35 28.879	**Magnetic Declination Model:**	BGGM 2002
Location Grid N/E Y/X:	N 5769298.855 m, E 639314.948 m	**North Reference:**	Grid North
Grid Convergence Angle:	-0.98456042°	**Total Corr Mag North -> Grid North:**	+14.228°
Grid Scale Factor:	0.99983903	**Local Coordinates Referenced To:**	Well Head

Station ID	MD (m)	Incl (°)	Azim (°)	TVD (m)	VSec (m)	N/-S (m)	E/-W (m)	Closure (m)	at Azim (°)	DLS (°/30m)	TF (°)
Tie-In	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		-164.7 M
	157.80	0.25	195.26	157.80	-0.33	-0.33	-0.09	0.34	195.26	0.05	2.8 M
	185.10	0.37	2.83	185.10	-0.30	-0.30	-0.10	0.32	198.68	0.68	-9.3 M
	212.50	0.35	350.71	212.50	-0.13	-0.13	-0.11	0.17	220.38	0.09	1.5 M
	239.90	0.32	1.45	239.90	0.03	0.03	-0.12	0.13	283.08	0.08	15.6 M
	267.50	0.35	15.59	267.50	0.19	0.19	-0.10	0.21	332.30	0.10	-2.5 M
	296.40	0.35	357.50	296.40	0.36	0.36	-0.08	0.37	347.75	0.11	-1.1 M
	325.40	0.35	358.93	325.40	0.54	0.54	-0.08	0.54	351.14	0.01	-8.8 M
	354.40	0.31	351.16	354.40	0.70	0.70	-0.10	0.71	352.11	0.06	-18.7 M
	383.20	0.28	341.33	383.20	0.85	0.85	-0.13	0.86	351.15	0.06	-26.3 M
	412.20	0.28	333.71	412.20	0.98	0.98	-0.19	0.99	349.23	0.04	-29.4 M
	441.30	0.30	330.59	441.30	1.11	1.11	-0.25	1.14	347.04	0.03	-40.0 M
	470.30	0.26	319.95	470.29	1.22	1.22	-0.33	1.27	344.72	0.07	-43.3 M
	499.30	0.27	316.67	499.29	1.32	1.32	-0.42	1.39	342.25	0.02	-18.8 M
	528.30	0.29	341.21	528.29	1.44	1.44	-0.49	1.53	341.10	0.12	-25.8 M
	557.30	0.35	334.17	557.29	1.59	1.59	-0.56	1.69	340.74	0.07	-20.1 M
	586.30	0.37	339.92	586.29	1.76	1.76	-0.63	1.87	340.39	0.04	-8.0 M
	615.20	0.44	352.04	615.19	1.96	1.96	-0.67	2.07	340.99	0.11	-15.1 M
	644.20	0.44	344.86	644.19	2.18	2.18	-0.72	2.29	341.71	0.06	-20.6 M
	673.10	0.48	339.40	673.09	2.40	2.40	-0.79	2.52	341.74	0.06	-4.9 M
	702.10	0.47	355.15	702.09	2.63	2.63	-0.84	2.76	342.21	0.14	-5.1 M
	731.10	0.49	354.85	731.09	2.87	2.87	-0.86	3.00	343.23	0.02	-4.8 M
	760.10	0.46	355.22	760.09	3.11	3.11	-0.89	3.23	344.10	0.03	-9.2 M
	789.10	0.46	350.78	789.09	3.34	3.34	-0.91	3.46	344.70	0.04	-58.3 M
	818.20	0.41	301.70	818.19	3.51	3.51	-1.02	3.66	343.78	0.38	-4.5 M
	847.20	0.51	355.47	847.19	3.69	3.69	-1.12	3.86	343.14	0.44	-21.8 M
	876.20	0.53	338.22	876.18	3.95	3.95	-1.18	4.12	343.36	0.16	-32.3 M
	885.80	0.51	327.67	885.78	4.02	4.02	-1.22	4.20	343.15	0.31	-30.0 M
	907.80	0.39	329.98	907.78	4.17	4.17	-1.31	4.37	342.58	0.17	10.3 M
	945.50	0.45	10.33	945.48	4.43	4.43	-1.35	4.63	343.09	0.23	49.5 M
	974.40	0.51	49.51	974.38	4.62	4.62	-1.23	4.78	345.12	0.34	44.1 M
	1003.20	0.50	44.10	1003.18	4.80	4.80	-1.04	4.91	347.73	0.05	65.4 M
	1032.10	0.56	65.45	1032.08	4.95	4.95	-0.83	5.02	350.51	0.21	48.0 M

1060.90	0.53	47.97	1060.88	5.09	5.09	-0.60	5.13	353.28	0.18	59.6 M
1089.80	0.58	59.57	1089.78	5.26	5.26	-0.37	5.27	355.92	0.13	30.0 M
1118.70	0.56	29.96	1118.67	5.45	5.45	-0.18	5.46	358.13	0.30	46.7 M
1147.60	0.64	46.68	1147.57	5.69	5.69	0.01	5.69	0.10	0.20	19.2 M
1176.50	0.62	19.17	1176.47	5.95	5.95	0.18	5.95	1.72	0.31	31.6 M
1205.30	0.56	31.60	1205.27	6.21	6.21	0.30	6.22	2.80	0.15	34.1 M
1234.10	0.58	34.13	1234.07	6.45	6.45	0.46	6.47	4.07	0.03	42.5 M
1263.00	0.64	42.47	1262.97	6.69	6.69	0.65	6.72	5.55	0.11	44.7 M
1291.90	0.64	44.73	1291.87	6.93	6.93	0.87	6.98	7.18	0.03	16.4 M
1321.00	0.60	16.43	1320.96	7.19	7.19	1.03	7.26	8.16	0.32	43.8 M
1350.10	0.60	43.77	1350.06	7.44	7.44	1.18	7.54	9.00	0.29	46.8 M
1378.90	0.63	46.82	1378.86	7.66	7.66	1.40	7.79	10.34	0.05	54.2 M
1407.60	0.65	54.20	1407.56	7.87	7.87	1.65	8.04	11.82	0.09	47.7 M
1436.50	0.63	47.67	1436.46	8.07	8.07	1.90	8.29	13.22	0.08	55.5 M
1465.30	0.64	55.52	1465.26	8.27	8.27	2.15	8.54	14.55	0.09	32.9 M
1494.50	0.73	32.93	1494.45	8.51	8.51	2.38	8.84	15.62	0.29	36.4 M
1523.60	0.83	36.39	1523.55	8.84	8.84	2.61	9.22	16.43	0.11	12.1 M
1552.70	0.85	12.09	1552.65	9.22	9.22	2.78	9.63	16.76	0.37	5.9 M
1581.80	0.88	5.86	1581.74	9.65	9.65	2.85	10.06	16.42	0.10	19.0 M
1610.80	0.84	19.01	1610.74	10.08	10.08	2.94	10.50	16.25	0.21	51.9 M
1639.90	0.96	51.87	1639.84	10.43	10.43	3.20	10.91	17.05	0.54	5.3 M
1668.90	0.99	5.30	1668.83	10.83	10.83	3.41	11.35	17.49	0.80	16.1 M
1698.00	1.05	16.09	1697.93	11.33	11.33	3.51	11.87	17.21	0.21	8.5 M
1727.10	1.07	8.49	1727.02	11.86	11.86	3.62	12.40	16.99	0.15	37.9 M
1756.10	0.97	37.88	1756.02	12.32	12.32	3.81	12.90	17.20	0.54	9.0 M
1785.10	1.64	8.97	1785.01	12.92	12.92	4.03	13.54	17.32	0.95	-4.4 M
1814.20	1.49	355.64	1814.10	13.71	13.71	4.07	14.30	16.52	0.40	-7.9 M
1843.10	1.39	352.07	1842.99	14.43	14.43	3.99	14.98	15.45	0.14	11.0 M
1871.80	1.36	10.96	1871.68	15.11	15.11	4.01	15.64	14.84	0.47	5.9 M
1900.90	1.42	5.91	1900.78	15.81	15.81	4.11	16.34	14.57	0.14	-9.3 M
1930.10	1.06	350.75	1929.97	16.44	16.44	4.10	16.94	14.01	0.50	-41.3 M
1959.10	1.45	318.73	1958.96	16.98	16.98	3.82	17.40	12.67	0.81	10.4 M
1988.20	1.54	10.39	1988.05	17.64	17.64	3.65	18.01	11.68	1.35	-9.6 M
2017.30	1.50	350.44	2017.14	18.40	18.40	3.65	18.76	11.23	0.54	18.8 M
2046.20	1.62	18.76	2046.03	19.16	19.16	3.72	19.52	10.99	0.80	-3.1 M
2075.30	1.40	356.86	2075.12	19.90	19.90	3.83	20.27	10.90	0.63	29.7 M
2104.30	1.68	29.66	2104.11	20.63	20.63	4.02	21.02	11.04	0.94	11.6 M
2133.10	1.45	11.55	2132.90	21.35	21.35	4.31	21.78	11.40	0.56	6.0 M
2162.10	1.41	6.00	2161.89	22.07	22.07	4.42	22.50	11.32	0.15	-4.5 M
2191.20	1.38	355.52	2190.99	22.77	22.77	4.43	23.20	11.00	0.26	3.9 M
2220.20	1.25	3.94	2219.98	23.44	23.44	4.42	23.85	10.69	0.24	-17.3 M
2249.30	1.27	342.71	2249.07	24.06	24.06	4.35	24.45	10.24	0.48	17.9 M
2278.20	1.32	17.85	2277.96	24.68	24.68	4.35	25.06	10.01	0.81	-1.7 M
2307.20	1.42	358.33	2306.96	25.36	25.36	4.45	25.75	9.95	0.49	-0.7 M
2336.30	1.52	359.27	2336.05	26.11	26.11	4.43	26.48	9.63	0.11	-7.9 M
2365.40	1.49	352.09	2365.14	26.87	26.87	4.37	27.22	9.25	0.20	-15.9 M
2394.50	1.39	344.11	2394.23	27.58	27.58	4.23	27.90	8.71	0.23	-9.3 M
2423.40	1.31	350.73	2423.12	28.24	28.24	4.08	28.54	8.21	0.18	-2.7 M
2452.40	1.36	357.28	2452.11	28.91	28.91	4.01	29.19	7.89	0.17	8.1 M
2481.20	1.28	8.12	2480.90	29.57	29.57	4.04	29.85	7.77	0.27	3.4 M
2510.20	1.31	3.41	2509.90	30.23	30.23	4.10	30.50	7.73	0.11	-0.8 M
2539.10	1.30	359.16	2538.79	30.88	30.88	4.12	31.16	7.59	0.10	4.1 M
2568.10	1.17	4.09	2567.78	31.51	31.51	4.13	31.78	7.47	0.17	6.3 M

	2597.10	1.09	6.25	2596.78	32.08	32.08	4.18	32.35	7.43	0.09	1.7 M
	2626.20	1.14	1.74	2625.87	32.64	32.64	4.22	32.91	7.37	0.10	-2.4 M
	2655.20	1.19	357.56	2654.86	33.23	33.23	4.22	33.50	7.23	0.10	10.6 M
	2684.20	1.36	10.59	2683.86	33.87	33.87	4.27	34.14	7.18	0.35	121.3 M
	2713.10	1.15	121.25	2712.75	34.06	34.06	4.58	34.36	7.66	2.15	-23.2 M
	2742.10	1.26	336.84	2741.75	34.20	34.20	4.70	34.52	7.83	2.37	-10.8 M
	2771.10	1.18	349.21	2770.74	34.79	34.79	4.52	35.08	7.41	0.28	-73.8 M
	2800.10	1.12	286.24	2799.74	35.16	35.16	4.19	35.41	6.80	1.24	-42.5 M
	2829.00	1.30	317.47	2828.63	35.48	35.48	3.70	35.67	5.96	0.70	-32.1 M
	2858.00	1.13	327.90	2857.63	35.96	35.96	3.33	36.12	5.29	0.29	-14.8 M
	2887.00	1.27	345.20	2886.62	36.52	36.52	3.09	36.65	4.84	0.40	-31.3 M
	2916.00	1.29	328.73	2915.61	37.11	37.11	2.84	37.21	4.38	0.38	29.0 M
	2923.00	1.35	28.95	2922.61	37.25	37.25	2.84	37.35	4.36	5.68	-34.8 M
	2936.30	1.36	325.18	2935.91	37.51	37.51	2.83	37.62	4.31	3.23	-32.3 M
	2964.01	1.45	327.72	2963.61	38.08	38.08	2.45	38.16	3.68	0.12	-32.4 M
	2993.09	1.51	327.61	2992.68	38.71	38.71	2.05	38.77	3.03	0.06	-24.4 M
	3023.62	1.56	335.57	3023.20	39.43	39.43	1.66	39.47	2.41	0.22	-24.8 M
	3051.74	1.55	335.18	3051.31	40.13	40.13	1.34	40.15	1.92	0.02	-28.8 M
	3080.66	1.55	331.24	3080.22	40.82	40.82	0.99	40.83	1.39	0.11	-26.2 M
	3110.84	1.52	333.82	3110.39	41.54	41.54	0.62	41.54	0.85	0.07	-26.4 M
	3138.26	1.52	333.59	3137.80	42.19	42.19	0.30	42.19	0.40	0.01	-26.4 M
Projected to Bit	3174.00	1.52	333.59	3173.53	43.04	43.04	-0.13	43.04	359.83	0.00	---

Survey Error Model: **Wolff & deWardt 2.0000 sigma**

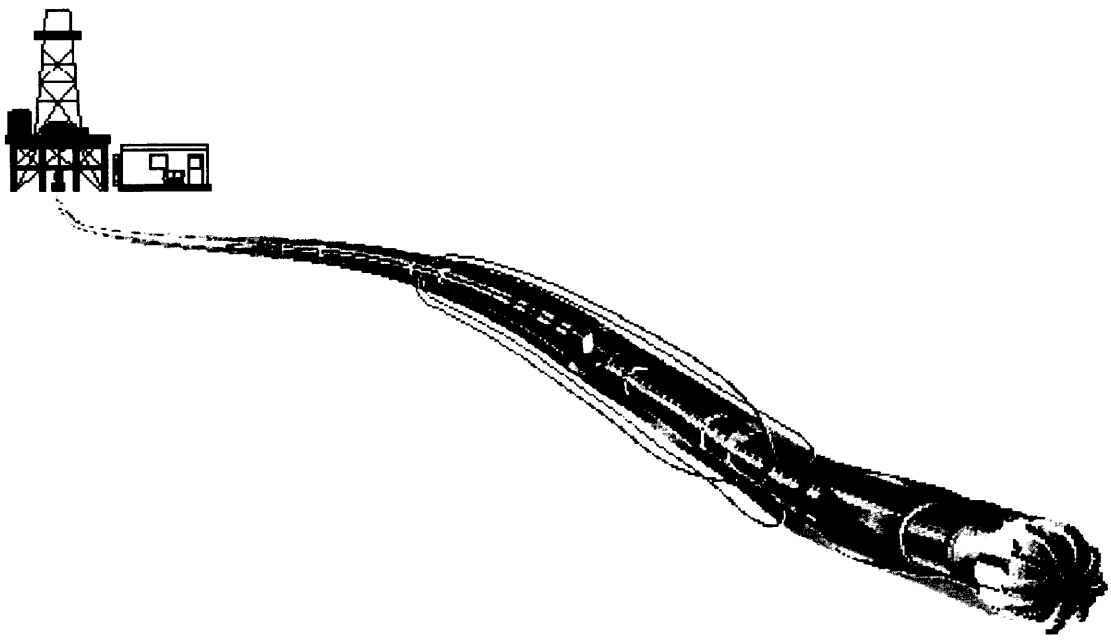
Surveying Programme:

MD From (m)	MD To (m)	EOU Freq	Survey Tool Type
0.00	2923.00	Act-Stns	Rate Gyro
2923.00	3174.00	Act-Stns	Anadrill MWD

Schlumberger

IDEAL

Bit Run Summary



Schlumberger

DRILLING & MEASUREMENTS BHA DATA

Job Number	ASQ-03-02
Run Number	1
BHA Number	5

Item	Description	Vendor	Material	Serial Number	Fishing Neck OD	Fishing Neck Length	Stab OD	Stab OD	Stab ID	Bot Connection Size	Bot Connection Type	Top Connection Size	Top Connection Type	Len	Cum Len
	UNITS				in	m	in	in	in					m	m
1	TCI Bit			W42DV	12.25							6.63	Reg-B	0.33	0.33
2	Near Bit Stabiliser			GU2191	12.25					6.63	Reg-B	6.63	Reg-B	2.45	2.78
3	Pony Drill Collar			502A7	8.00					6.63	Reg-P	6.63	Reg-B	2.92	5.70
4	IB Stabiliser			207A31	12.25					6.63	Reg-P	6.63	Reg-B	1.44	7.14
5	Drill Collar			93081	8.25					6.63	Reg-P	6.63	Reg-B	9.33	16.47
6	IB Stabiliser			207A190	12.25					6.63	Reg-P	6.63	Reg-B	1.80	18.27
7	XO	SLB								6.63	Reg-P	6.63	Reg-P	0.31	18.58
8	RAB8	SLB	Non-Mag	010	8.25					6.63	Reg-B	6.63	FH-B	3.82	22.40
9	PowerPulse	SLB	Non-Mag	M805	8.25					6.63	FH-P	6.63	Reg-B	8.44	30.84
10	12 x Drill Collars				8.25					6.63	Reg-P	6.63	Reg-B	109.23	140.07
11	XO			MSO275	8.00					6.63	Reg-P	4.50	IF-B	0.61	140.68
12	2 x HWDP				5.00					4.50	IF-P	4.50	IF-B	18.51	159.19
13	Dailey Jar			14161590	6.50					4.50	IF-P	4.50	IF-B	9.77	168.96
14	24 x HWDP				5.00					4.50	IF-P	4.50	IF-B	219.83	388.79
15															
16															
17															
18															
19															
20															
21															
22															
23															
24															

PREDICTED BHA TENDENCY

Hookload	lbs	Wt. Below Jars	66800.00 lbs
Pickup Wt.	lbs	Wt. Above Jars	37730.00 lbs
Slack Wt.	110000.00 lbs	Total Air Wt.	lbs

TIME/DEPTH DETAILS

	1	2	3	4	5
Date/Time	19/02/2003	20/02/2003	20/02/2003	21/02/2003	
Field Engineer	KH	LB	KH	KH	
Depth	2979.00	3004.83	3067.00	3147.50	
Average ROP	3.95	3.00	3.95	3.69	
Avg. Std. Pres.	3628.00	3500.00	3628.00	3550.00	
Desurger 1	850.00	850.00	850.00	850.00	
Desurger 2	840.00	840.00	840.00	840.00	
Tur. RPM @ FR	2890.00	2850.00	2812.50	2812.50	
FR @ Tur. RPM	833.00	820.00	819.00	814.00	
Avg. RPM	80.00	100.00	106.00	90.00	
Max RPM	80.00				
Total Shocks	0.00		0.00	10.07	
Max Shock	0.00		0.00		
Avg. Surf. WOB	50.14	50.00	34.98	51.08	
Max Surf. WOB					
Avg. DH WOB					
Max DH WOB					
Avg. Surf. Torq.	6.60	5.00	4.00	5.29	
Max Surf. Torq.					
Avg. DH Torq.					
Max DH Torq.					
Formation Type	Shale		Claystone	Claystone	
Friction					
Drag Up					
Drag Down					
Mud Weight	10.20	10.20	10.20	10.20	
Funnel Vis.	57.00	57.00	53.00		
Plastic Vis.	22.00	22.00	22.00		
Circ. Temp	72.00	78.00	80.78	83.14	
Signal Strength	11.30	12.00	9.60	10.20	
Bit Deviation	86.00	90.00	94.00	91.00	
Differential Pres.					

Stabilizer Description	Mid Pt To Bit	BLADE Type	BLADE Length	BLADE Width	GAUGE Length	GAUGE In	GAUGE Out
UNITS	m		in	in	in	in	in
NB	1.60	Reamer	2.45	12.25			
String	6.42	Spiral	1.44	12.25			
String	17.37	Spiral	1.80	12.25			

Bit To Read Out Port		Bit To Measurement Port	
RAB	19.37 m	GR LWD	19.40 m
PPL	24.18 m	RES LWD	19.66 m
	m	D&I PPL	26.53 m
	m		m
	m		m
	m		m
	m		m

BATTERY Tool	Unloaded (V) Before	Unloaded (V) After	Loaded (V) Before	Loaded (V) After	Run Hrs BOT	Run Hrs AMP	Cum Hrs BOT	Cum Hrs AMP

Schlumberger — DRILLING & MEASUREMENTS

RUN INFORMATION

Job Number	Company Rep.	Date In	Date Out	D&M Run Number	Rig Run Number
ASQ-03-02	G.Sharkey	18-Feb-03	23-Feb-03	1	5

Company	Esso Australia Ltd	Grid Corr	Brief Run Summary	Bit Run Number	Cell Manager
Rig Name	TSF 702	-0.98	Good Run	1	Luis Bon
Well Name	Scallop-1	Tot Corr	Hole Depth	D&M Crew	
Location	Bass Strait	14.22	From 2933 m To 3174.00 m	Kym Handley	
Mapfile	Mag Dec	PP Slot ID	Inclination (Drift)	Pumping Hours	Below Rotary Tbl Hrs
BGGM 2002	13.24		From 1.35 deg To 1.52 deg	77.90 hrs.	112.00 hrs.

BPS	Frequency	Mod Type	Azimuth	Rotary Hours	Rotary Distance
6.4	16	QPSK	From 28.95 deg To 333.59 deg	69.09 hrs.	241.00 m

Pump Type	Pump Output	Pump Strk Len.	True Vertical Depth	Slide Hours	Slide Distance
Oil Well PT 1700	0.09	12.00	From 2932.20 m To 3173.52 m	0.00 hrs.	0.00 m

Pump Liner ID	Min DLS	Max DLS	Hole Size	Water Depth	Air Gap	Drilling Hours	Drilling Distance
5.50	0.00	0.00	12.25 in	110 m	25.9 m	69.09 hrs.	241.00 m

Bent Sub Angle	Bent HSG Ang	Depth Max DLS	RKB Height	Ground Elev.	Mod Gap	Reaming Hours	Reaming Distance
0 deg	0 deg	m	25.9 m	-110 m	0.14 in	0.25 hrs.	13.00 m

Pulse Ht Thresh	Min Pulse Wdt	Max Pulse Wdt	Digit Time	T/F Arc	T/F Angle	On Bottom Hours	Service
				0 in	0 deg	69.09 hrs.	GEOVISION Resistivity

Conn Phase Ang	Rise Const	Fall Const	H2S In Well	Damp Press	Signal Streng.	Last Casing	
0 deg			☐	850.00 psi	10.00	Size 13.375 in	Depth 900 m

Directional Driller(s)	Turbine RPM @ Min Flow Rate		Turbine RPM @ Max Flow Rate	
	RPM 2083.00	FR 600 gpm	RPM 4166.00	FR 1200 gpm

Run Objective: Drill to TD, Find S1 Sand.

EQUIPMENT DATA

Equipment Code	Pump Hrs Start	Pump Hrs Cum	SW Vers	Tool Size	Equipment Code	Pump Hrs Start	Pump Hrs Cum	SW Vers	Tool Size	Sensors Code	Real Time Hrs	Real Time Fail	Real Time Drilled	Recorded Time Hrs	Recorded Time Fail	Recorded Time Drilled
MDC-DC-M805	0	78	6.1C00	8.25						MDC-DC-M805	77.9		241	112		241
RBDC-CA-010	0	78	5.0B14	8.25						RBDC-CA-010	77.9		241	112		241

Surface Sys	IDEAL/SPM	IDEAL/SPM
Version	ID8_0C_07	HSPM8_0C_13

DH MOTOR

Manufacturer		Stage Length m	Bit to Bend Dist. m	Bearing Gap In	
Type		Rubber	RSS Mfr	Bearing Gap Out	
Size		Sleeve Position	RSS Type	Radial Bearing Play	
Serial Number		Sleeve Size in	RSS Size	Thrust Bearing Play	
Lobe Config.		Motor Fail ☐	RSS SN		

OPERATING COND.

Max Circ Temp	84.00 C	Avg ROP	3.49 m/hr	Min Actl FlowRt	814.00 gpm	Max Shock Dur	0.21 sec.
Min Circ Temp	72.00 C	Max ROP	5.00 m/hr	Avg PmpPres	3495.97 psi	Total DH Shocks (k)	10.24 k
End Mud Wt	10.35 lb/gal	Avg Surf RPM	90.00	PmpPres On Bot	psi	CHECK SHOT	
End Funnel Vis	55.00 CPS	Min RPM	80.00	PmpPres Off Bot	psi	Type	
End Plastic Vis	24.00 CPS	Max RPM	106.00	Avg Surf WOB	50.00 klbs	Depth	m
End Yield Point	39.00 CPS	Avg FlowRate	810.00 gpm	Avg Surf Torq	5000.00 ft-lbs	Inclination	deg
End Mud Resist	0.11	Max Actl FlowRt	833.00 gpm	Max Shock Lev	131.00	Azimuth	deg

MUD

Company	Baroid	PH	8.70	Percent Sand	0.15 %	Additives	None
Brand	Generic	Chlorides	38500.00	Percent Solids	8.80 %	Clean	☐
Type	KCl/Polymer/Gly	Other		Percent Oil	0.00 %		
LCM Type				LCM Size		LCM Concentation	

BHA

BHA Type	Packed Hole	Tur Rotor Prt #		Turbine Config		Surface Screen	☐
Int TF Offset		Stator Prt #		Pulser Config		DFS Used	☐
Low Oil Flag	☐	Hrs @ Low Oil	hrs.	Stab Spacing	in	Formation	

DD Objectives Achieved ☐ — If not, why?

BIT

Bit Type: | Other:

Manufacturer	Model	IADC Code	No. of Jets	Size of Jets	Bit TFA	Total Revs	Stick/Slip
HTC	MX-20D		3	18	0.75		

Inner Row	Outer Row	Dull Char	Location	Brng/Seals	Gauge (1/16")	Other Char	Reason Pulled
3	7	BT	S	E	IN	RG	TD

FAILURE

Trans Fail	☐	Jamming	☐	Client Inconv.	☐	Surface Noise	☐
Pres Incr @ Fail	☐	Jamming Time	hrs.	Lost Time	hrs.	Down Hole Noise	☐
D&M Trip	☐	Sync Hours	hrs.	Surface Vib	☐	Surface Sys Failure	☐

SUMMARY

DRILLING & MEASUREMENTS

Schlumberger

Job Number:	ASQ-03-02
Run Number:	1

Date	Time	Depth	Operating Details
18-Feb-03	18:40	0.00	Initilise RAB8 on pipdeck
	19:00	0.00	Make up BHA
	19:45	0.00	Pick up PowerPulse and RAB8
	20:30	0.00	SHT, 700 gpm
19-Feb-03	0:35	935.00	Test BOP, Slip and Cut line
	7:30	2933.00	Tag bottom and drill ahead according to well plan
	12:26	2951.90	Run Auto Back-Up on IDEAL
	14:15	2959.00	Mud Sample: Rmf= 0.1806 @ 16.4°C; Rm= 0.1227 @ 18°C; Rmc= 0.412 (?) @ 22.1°C
	17:04	2969.37	Hole depth jumped ahead by about 3.7m (decreased hole depth from 2973.07 to 2969.37)
	20:23	2983.00	Mud Sample: Rmf= 0.1057 @ 20.5°C; Rm= 0.1240 @ 20.6°C; Rmc= 0.223 @ 21.5°C
	22:35	2993.00	Run Auto Back-Up on IDEAL
20-Feb-03	0:00	3039.00	Mud Sample: Rmf= 0.0938 @ 19.7°C; Rm= 0.1106 @ 20.9°C; Rmc= 0.309 @ 23.1°C
	14:34	3051.00	Run Auto Back-Up on IDEAL
	17:12	3060.00	Mud Sample: Rmf= 0.0898 @ 23.1°C; Rm= 0.1144 @ 21.2°C; Rmc= 0.279 @ 21.3°C
21-Feb-03	1:20	3081.00	GTE disconnected and greased, line was not retracting properly. Connected back shortly thereafter.
	2:08	3084.00	Restarted IDEAL, got locked up.
	10:00	3110.00	Mud Sample: Rmf= 0.0954 @ 22.5°C; Rm= 0.1133 @ 22.9°C; Rmc= Gone with the wind
	14:20	3127.60	Mud Sample: Rmf= 0.0921 @ 19.8°C; Rm= 0.1193 @ 20.4°C; Rmc= 0.293 @ 20.6 deg
	19:10	3137.37	Survey No. 23 was accepted after 3 other attempts, Tool G was good, but MWDstat 4
22-Feb-03	3:30	3163.00	Pressure Drop, 500 psi due to decrease in flow rate from 830 gpm to 770 gpm.
	4:13	3164.00	Lost unit power. Override Purge and continue, need to check Purge system in town, also gusty winds
			on rig might have had an effect.
	9:25	3174.00	Mud Sample: Rmf= 0.0914 @ 21°C; Rm= 0.1089 @ 22.3°C; Rmc= 0.309 @ 24.3°C
	10:00	3174.00	TD. -0.1 Tide
	11:00	900.00	Pull up to casing shoe
	17:30	900.00	Wiper Trip
	21:00	3174.00	CBU
	23:00	3174.00	POOH
23-Feb-03	7:30	0.00	TART
	11:00	0.00	Dump RAB8

APPENDIX 6

VSP REPORT

ExxonMobil Schlumberger

ESSO Australia Pty Ltd

Scallop-1

WELL SEISMIC PROCESSING REPORT

VSP

FIELD: Exploration

COUNTRY: Australia

COORDINATES: Latitude: 38 12' 48.615" S
: Longitude: 148 35' 28.879" E
PERMIT: VIC/RL2

DATE OF SURVEY: 23-FEB-2003
SURVEY TYPE: Rig Source VSP, Offshore, Airgun

REFERENCE NO: DS 0403

INTERVAL: 3171 m – 174 m KB

Prepared by: L. Dahlhaus

Schlumberger Oilfield Australia Pty Ltd
Level 5, 256 St. Georges Terrace, Perth
WA 6000 Australia

ExxonMobil Schlumberger

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ExxonMobil Schlumberger

1 Introduction

A borehole seismic survey was recorded in one run in the vertical offshore Victoria exploration well Scallop-1 on 23 February 2003. This survey included rig source VSP measurements in open and cased hole. The data were acquired using a Dual Combinable Seismic Acquisition Tool (CSAT-B) downhole and an Air gun source deployed from a crane on the rig.

This report describes the VSP processing techniques used, the parameters chosen and presents the results of the data processing.

2 Data Acquisition

The data were acquired in one logging run in both open and cased hole, using a Dual three component Combinable Seismic Acquisition Tool (CSAT-B) fitted with GAC accelerometers. Two 150 cu in G-Gun Airguns were used as the source operating under 2000 psi. The guns were suspended in sea 5m at 45m offset from the wellhead. Two reference hydrophones were positioned at 5m below the guns. Recording was made on the Schlumberger Maxis 500 Unit using DLIS format.

The VSP levels were acquired from 3171 m KB to 174 m KB at 15m intervals. A minimum of 5 good shots were recorded for each level.

Table 1. Survey Parameters

Elevation of KB/DF	25.9 m above MSL
Elevation of GL	-109.6 m
Well Deviation	Max 1.68 deg
Energy Source	2x 150 cu in G-Guns
Reference Sensor	Hydrophone
Source & Hyd. Offset	45 m
Source & Hyd. Azimuth	035 deg
Source Depth	30.9 m below KB
Hydrophone Depth	35.9 m below KB
Tool	Dual CSAT-B
Sensor Type	3-C GAC – Geophone Accelerometer
Sampling Rate	1 ms.
Recording Time	4.0 sec.
Recording Format	DLIS

3 Well Seismic Edit

The initial preparation of the data is called Well Seismic Edit and consists of:

- Load Data
- Edit bad records & Sort Data
- Pick Reference Break times
- Median stack
- Geophone transform
- Pick Break time on Stacked Data

Each shot of the raw GAC data was evaluated and edited to remove bad traces. The hydrophone data were also evaluated for signature changes and timing shifts. The good shots at each level were stacked, using a median stacking technique, to increase the signal to noise ratio of the data. After Stacking the GAC data are transformed to a Geophone response and the transit time of each trace was re-computed.

The following subsections describe the main aspects of the well seismic edit phase.

3.1 Data Quality

The data quality is very good. The source signature is stable indicating a constant gun pressure and gun depth. The horizontal components show some shear energy, but the vertical component data shows good continuity and little shear contamination. Some tube wave energy is visible, but this is not affecting the corridor stack and will be removed for better display. Attenuation (Q) analysis and shear velocity estimation are feasible, but were not requested for this processing project.

3.2 Transit Time Measurement

The measured transit time corresponds to the difference between arrivals recorded by surface and downhole sensors. The reference time (zero time) is the physical recording of the source signal by accelerometers on the gun or sensors positioned near the source. In this case, a hydrophone positioned 5 m below the gun was used as the reference. An inflection point tangent first break picking algorithm was used on both the hydrophone and the geophone data.

3.3 Stacking

After reordering and selecting the raw shots, a median stack was performed on the three component data. In this method of stacking, at each sample time, the amplitudes of the input traces are read and sorted in ascending order. The output is the median amplitude value from this ordering. If an even number of traces is input, the first is dropped and a median calculated. Then the last is dropped and another median found. The final output is the average of these two median values. The surface sensor (hydrophone) breaks are used as the zero time for stacking. The break time of each trace is recomputed after stacking and GAC transform. The X, Y and Z component stacks are presented in Figures 2 ,3 and 4. There is good shear energy observable on the horizontal components.

4 VSP Processing Chain

The vertical component of the VSP data was processed using standard VSP processing techniques. The following subsections describe the main aspects of the VSP processing chain:

- Bandpass Filter
- Spherical Divergence Correction
- Trace Normalization
- Transit time correction to Datum
- Wavefield Separation
- Waveshape Deconvolution
- NMO Correction
- Upgoing Enhancement
- Corridor Stack

4.1 Bandpass Filter

The effective bandwidth of the recorded data is evaluated by examining the amplitude spectrum of the stacked vertical component presented in Figure 1. A wide zero phase Butterworth Bandpass filter was applied to the data limiting the bandwidth to 5-120 Hz.

4.2 Spherical Divergence Correction

To correct the recorded amplitudes for the loss of energy due to the spherical divergence of the wave front, a time varying gain function of the exponential form:

$$Gain(T) = \left(\frac{T}{T_0}\right)^{\alpha}$$

where T is the recorded time, T_0 is the first break time and a = 1.5 was applied.

4.3 Trace Normalization

Trace equalization was applied by normalizing the RMS amplitude of the first break to correct for transmission losses of the direct wave. A normalization window of 200 milliseconds was used. Results are shown in Figure 4a.

4.4 Transit Time Correction to Datum

Seismic Reference Datum (SRD) is at Mean Sea Level. A static shift of 6.6 ms was applied to the data to correct to SRD. This correction to SRD was calculated using a surface velocity of 1524 m/s .

4.5 Wavefield Separation

A velocity filter (coherency) technique was used to separate upgoing and downgoing wavefields.

The downgoing coherent compressional energy is estimated using a 5 level Tuckey trimean velocity filter parallel to the direct arrival curve. The filter array is moved down one level after each computation and the process is repeated level by level over the entire dataset.
The downgoing wavefield is displayed in one-way time (Figure 5).

The residual wavefield is obtained by subtracting the estimated downgoing coherent energy from the total wavefield. The residual wavefield is dominated by reflected compressional events as shown in Figure 6. Some later arriving tube wave energy has been removed from this residual wavefield using a similar velocity filter method.

4.6 Zero Phase Waveshape Deconvolution

The waveshaping process shortens the seismic pulse within traces and centers their amplitude peak on the reflector. This improves the resolution of the seismic data and helps to clarify the correlation of the seismic events. It is also applied to collapse the recorded multiples.

The waveshaping deconvolution operator is a double-sided Wiener-Levinson waveshaping filter. The operator is computed for each level of the downgoing wavefield using a design window length of 2 s starting 5 ms before the picked break times in order to include the wavelet precisely. The designed outputs were chosen to be zero phase with a bandwidth of 5-80 Hz. Once the design is made upon the downgoing wavefield, it is applied to the both downgoing and upgoing wavefields at the same level as displayed in Figures 7 and 8.

4.7 NMO Correction

To correct for the lateral offset of the source position with respect to the downhole receiver in this well, a NMO correction was applied to the zero phase upgoing wavefield. This resulted in small time adjustments to obtain a vertical time referenced to SRD.

4.8 Upgoing Enhancement

A velocity filter (coherency) technique was used to enhance the zero phase upgoing wavefield.

The upgoing coherent compressional energy is estimated using a 3 level Tuckey trimean velocity filter orthogonal to the direct arrival curve. The filter array is moved down one level after each computation and the process is repeated level by level over the entire dataset.
This enhanced upgoing wavefield is displayed in two way time (TWT) in Figure 9.

4.9 Corridor Stack

A corridor stack in two way time (TWT) was computed on the enhanced zero phase upgoing wavefield by designing a constant 100 ms timing window along the two-way time depth curve and stacking the data onto a single trace. The deepest 10 traces are stacked entirely. The resulting trace provides the seismic representation of the borehole in vertical two-way time. This corridor stack is also displayed in Figure 9 along with the enhanced upgoing wavefield in two way time.

A snapshot of the 20 cm/s normal polarity composite display (PLOT-1) is shown in figure 10. A composite display in reverse polarity is included as well (PLOT-2). The polarity convention is explained in Figure 14.

ESSO uses a quad phase wavelet for their seismic interpretation. The corridor stack has been transformed to this standard using a 90 deg phase rotation. Now an increase in acoustic impedance is preceded by a trough and followed by a peak. Figure 11 shows the zero phase and the quad phase corridor stack side-by side.

A comparison of the corridor stack with part of the Skipper 99 surface seismic Inline 1025 was made shown in Figures 12a to 12d. The well location on the surface seismic line is at CDP 1330. Figures 12a and 12b show the unfiltered quad phase corridor stack in the top and bottom half of the section. The frequency is higher and match filtering is recommended. Events correlate very well above app 1.4 s TWT, but below this the surface seismic reflectors come in progressively later. The maximum time shift at TD is approximately 6 ms.

To provide a more ready comparison with the lower frequency surface seismic a filtered Corridor Stack was added. On Plots 1 and 2 additional panels shows the corridor stack with a Band pass Filter of 5-50 Hz and shifted down by 6ms on the surface seismic. Figures 12c and 12d also show this for the top and bottom half of the seismic section. Notice that shifting the data is not correct above 1.4 s TWT.

To investigate if the increased time delay can be explained by a rapid change in raypaths a 3-Component first arrival angle analysis was done. Figure 13 shows the angle the maximum downgoing energy component makes with the horizontal. The angles around 1750m (or 1.4 s TWT) are stable and raypaths are almost vertical.

As the surface seismic reflections at TD come in slightly later it cannot be attributed to TIV anisotropy. This would cause the surface seismic (dominated by the more slant raypaths from offset traces) to be faster than the vertical VSP rays.

Possible mechanisms to investigate are velocity inversion, internal multiples and dip effects on the seismic velocity analysis .

ExxonMobil Schlumberger

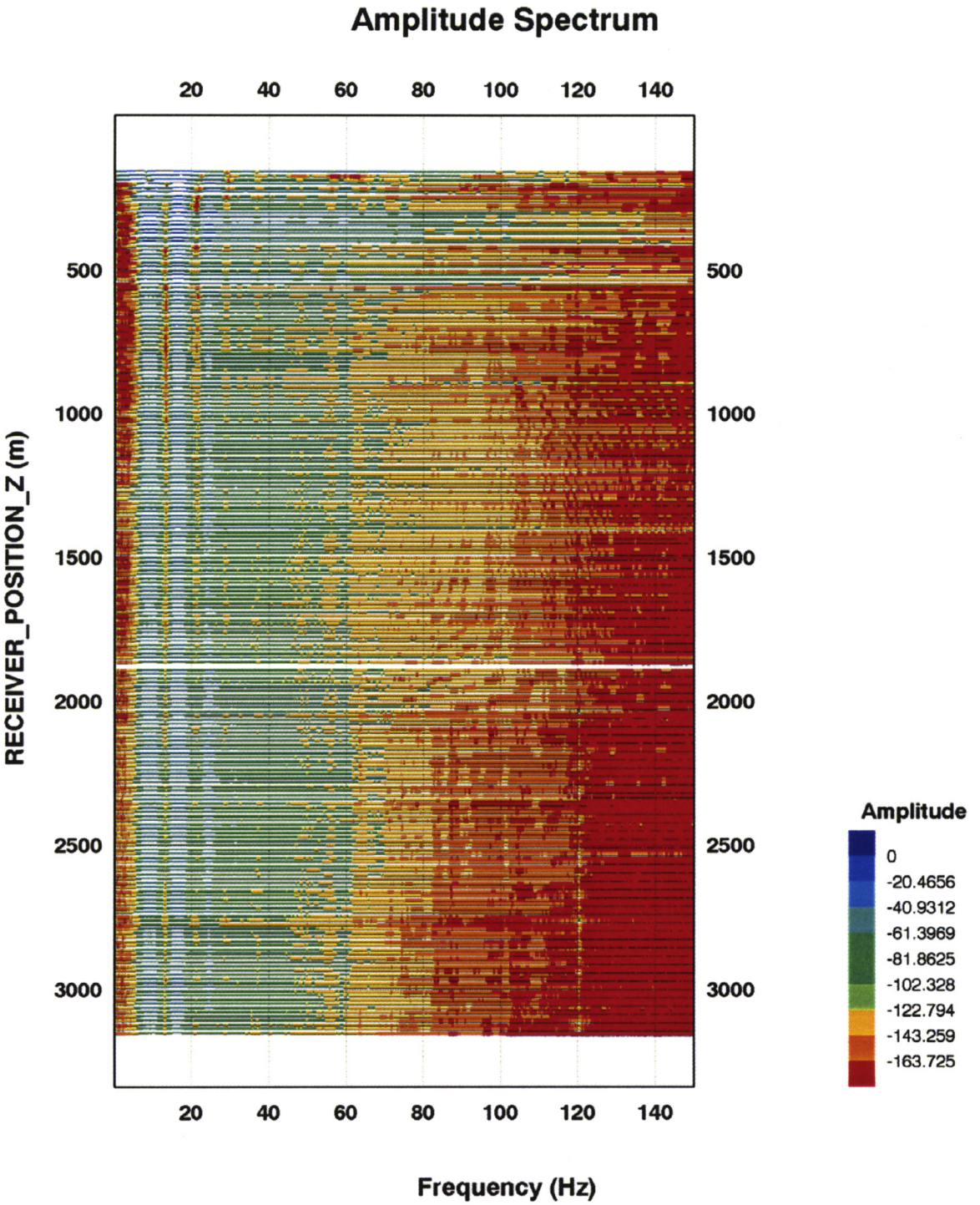

Figure 1. Amplitude Spectrum

ExxonMobil Schlumberger

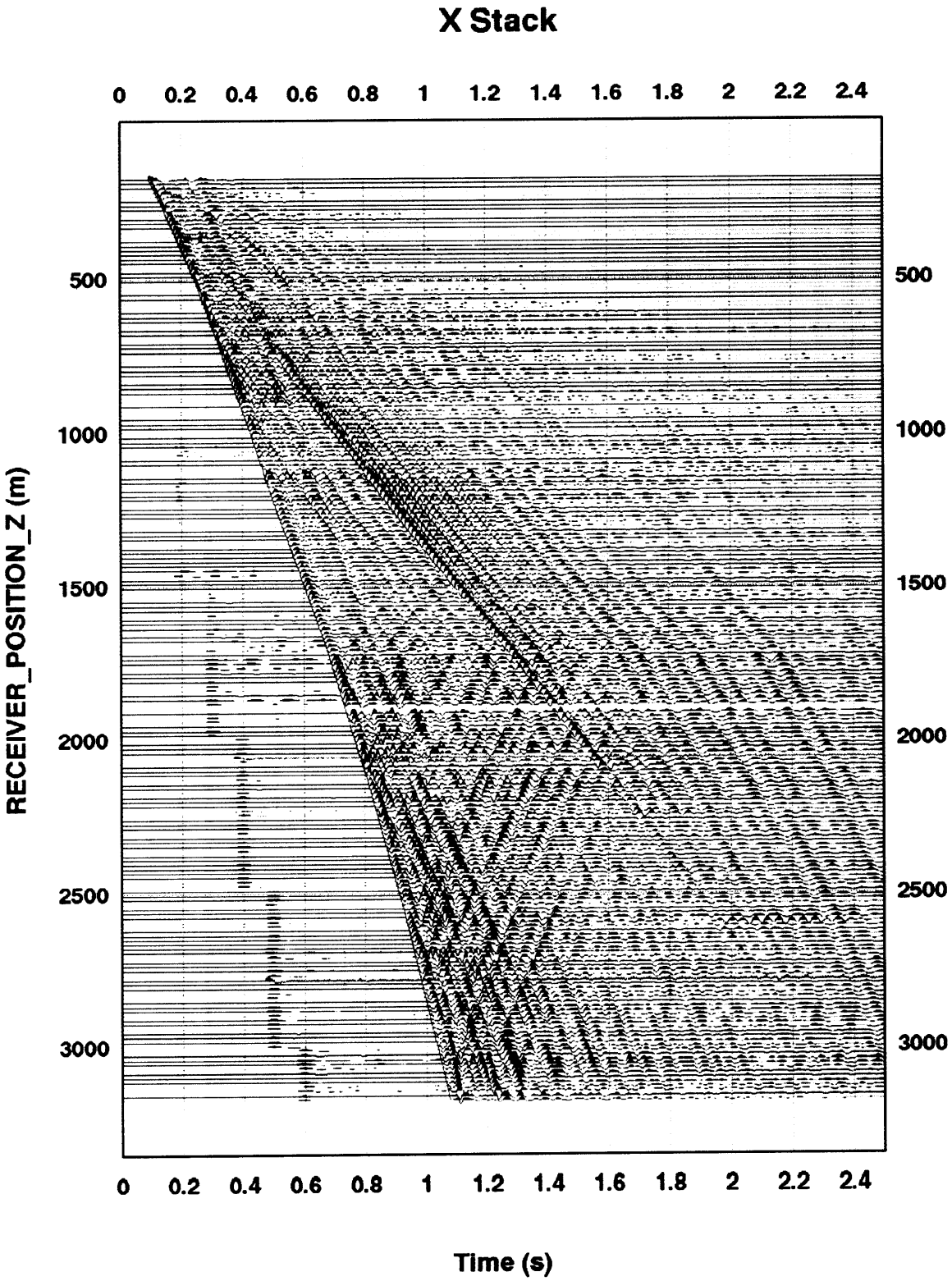

Figure 2. X Component Stack

ExxonMobil Schlumberger

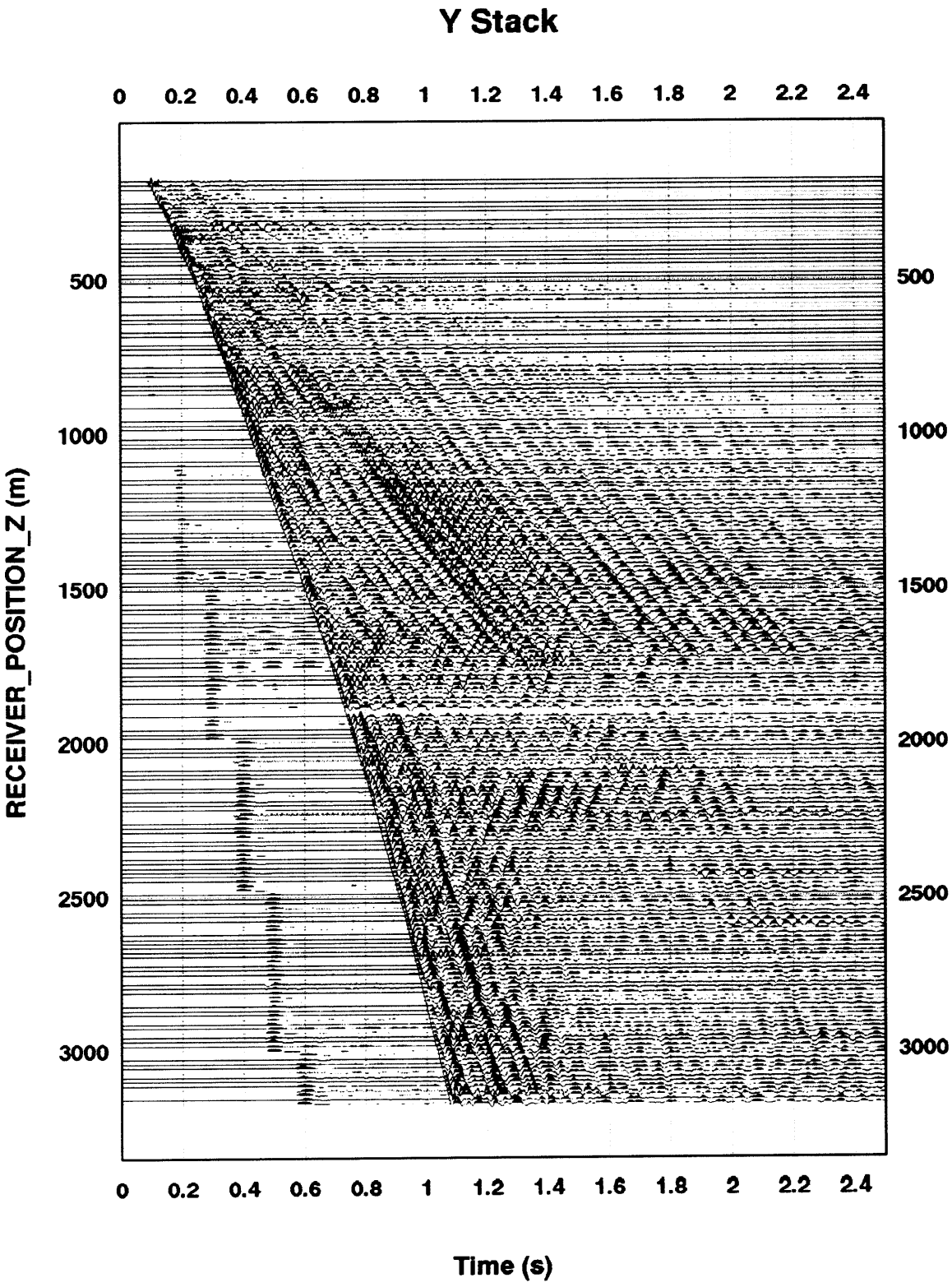

Figure 3. Y Component Stack

ExxonMobil Schlumberger

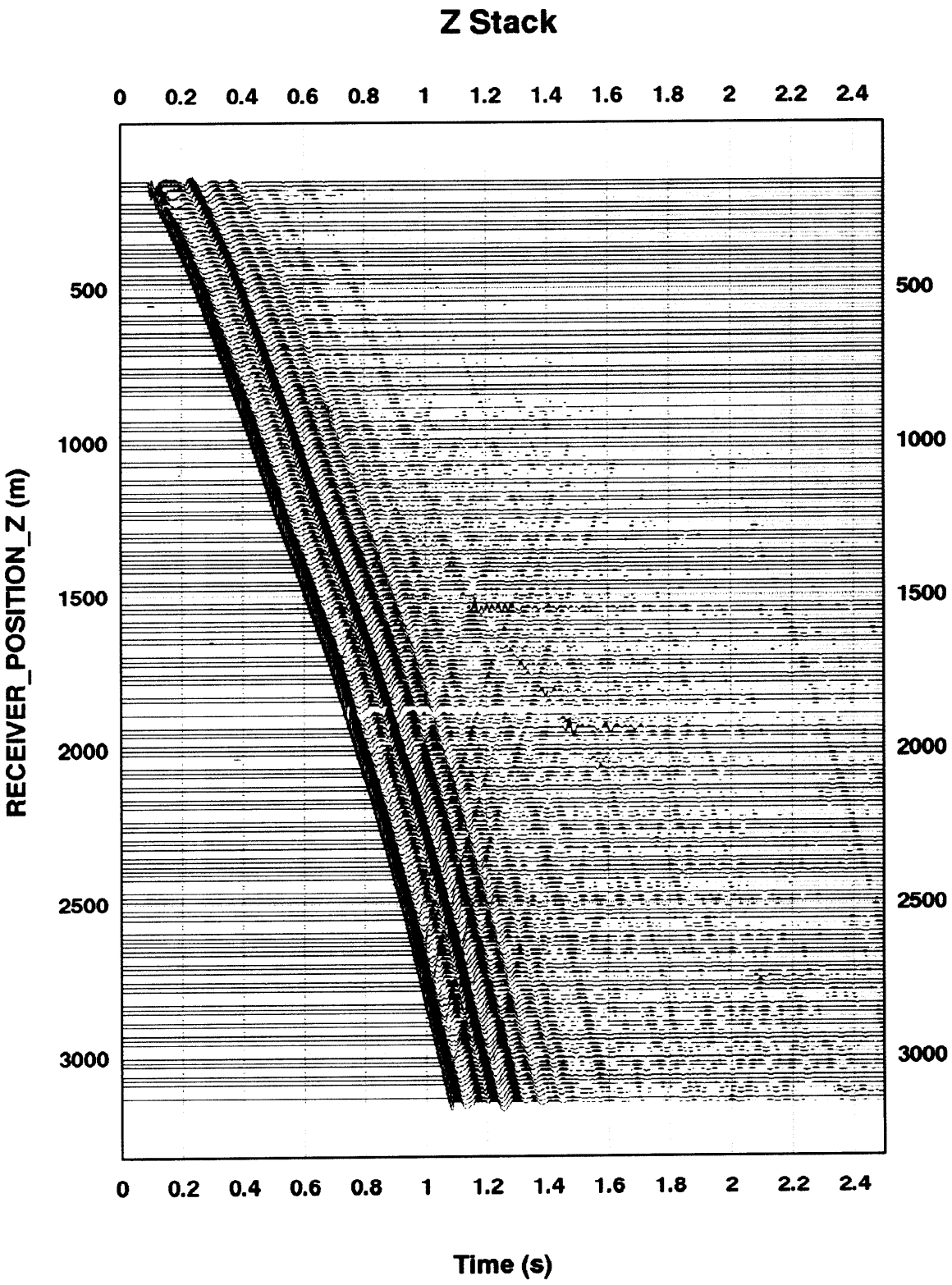

Figure 4. Z Component Stack

ExxonMobil Schlumberger

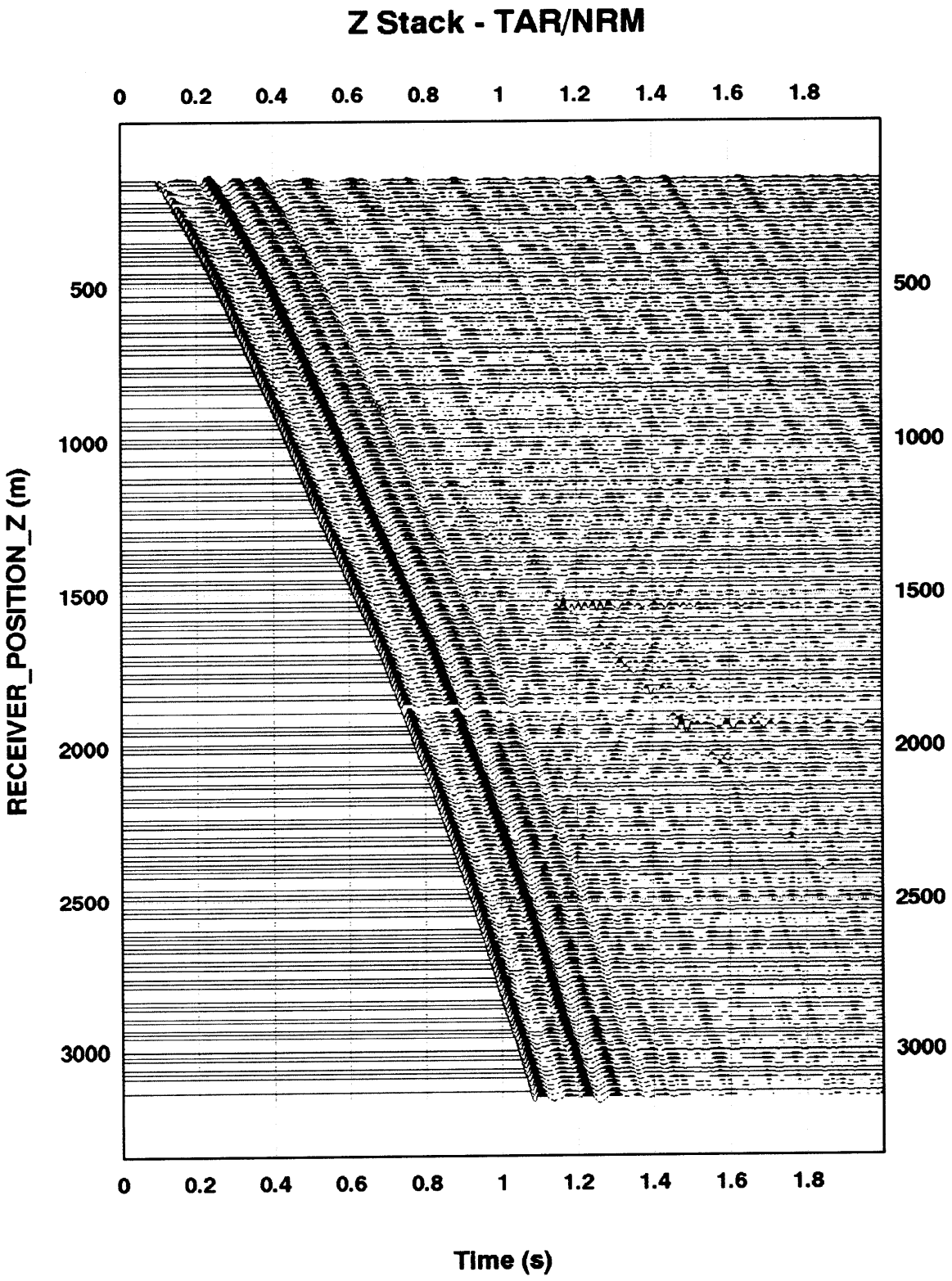

Figure 4a. Z Component Stack after Amplitude Recovery and Normalisation

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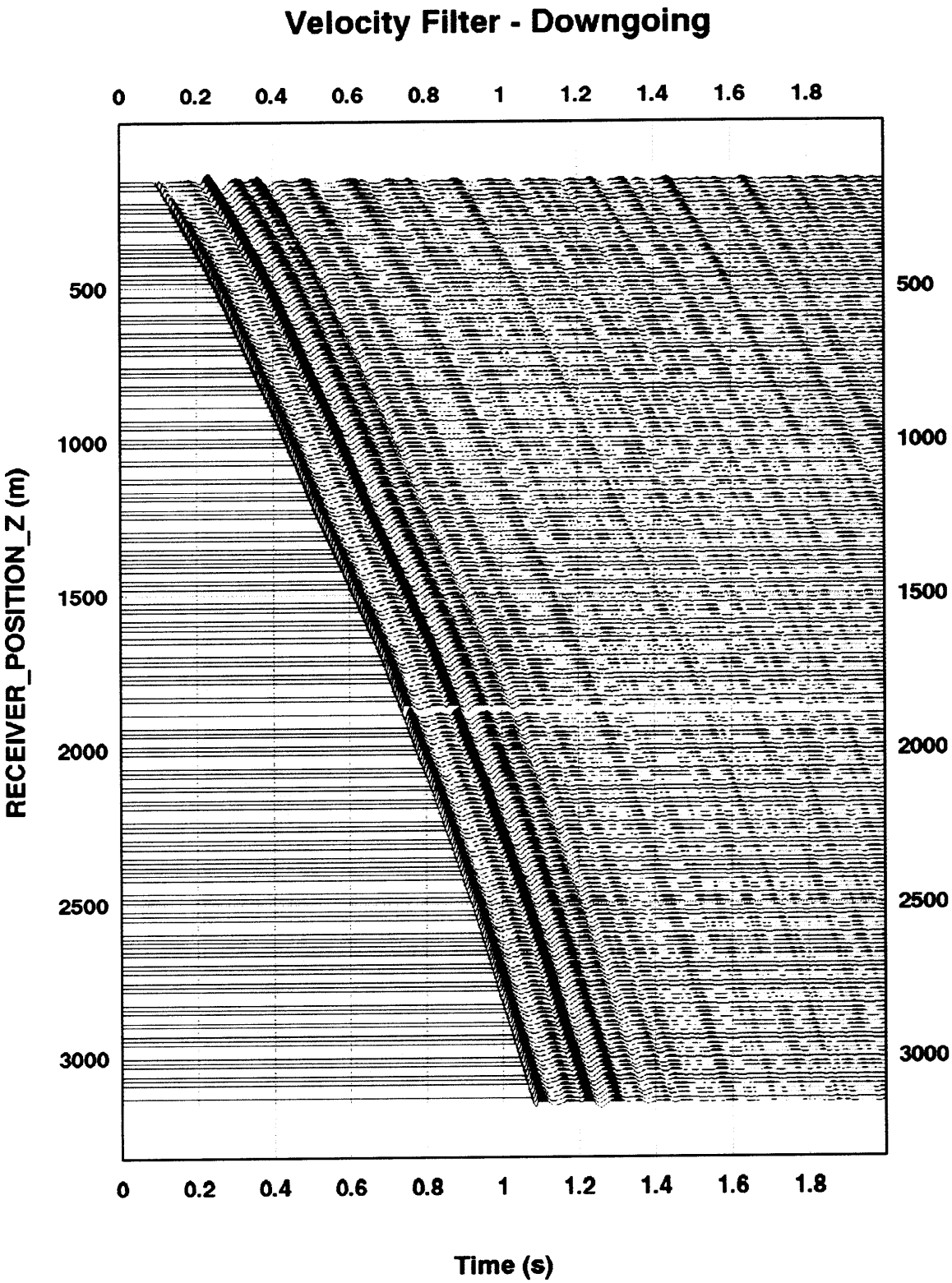

Figure 5. Downgoing Wavefield after Wavefield Separation

ExxonMobil Schlumberger

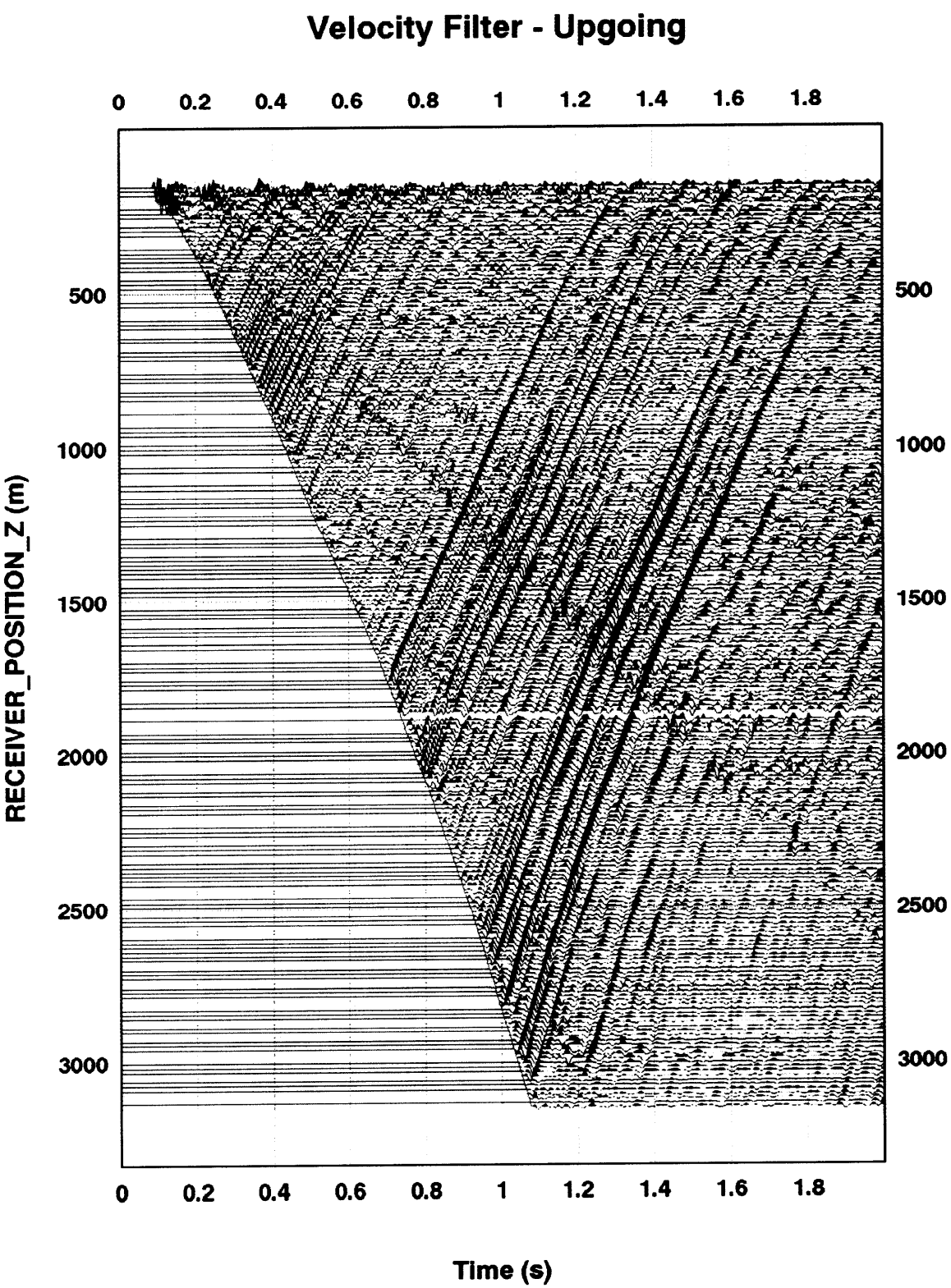

Figure 6. Upgoing Wavefield after Wavefield Separation

ExxonMobil Schlumberger

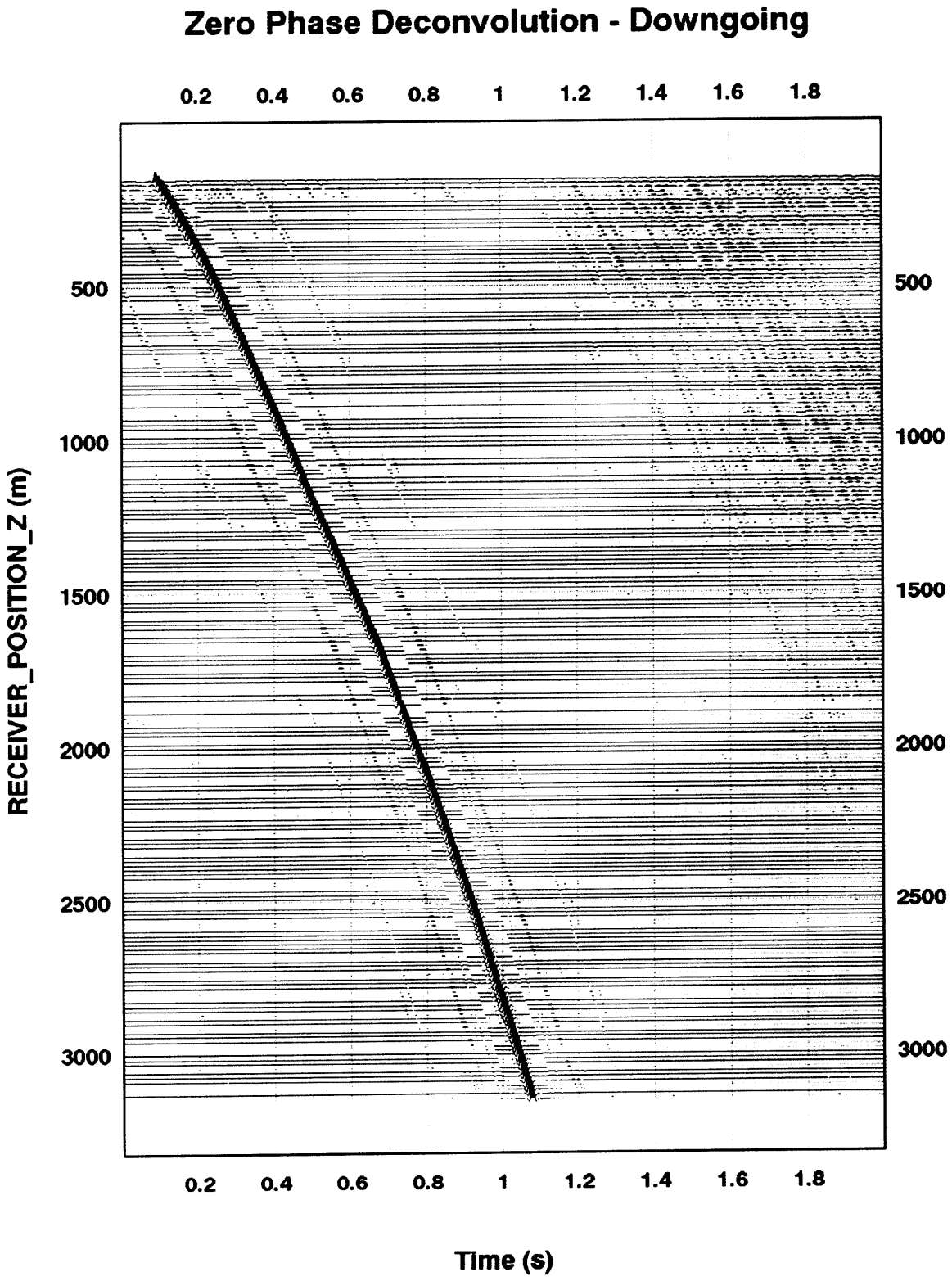

Figure 7. Downgoing Wavefield after Waveshaping Deconvolution

ExxonMobil Schlumberger

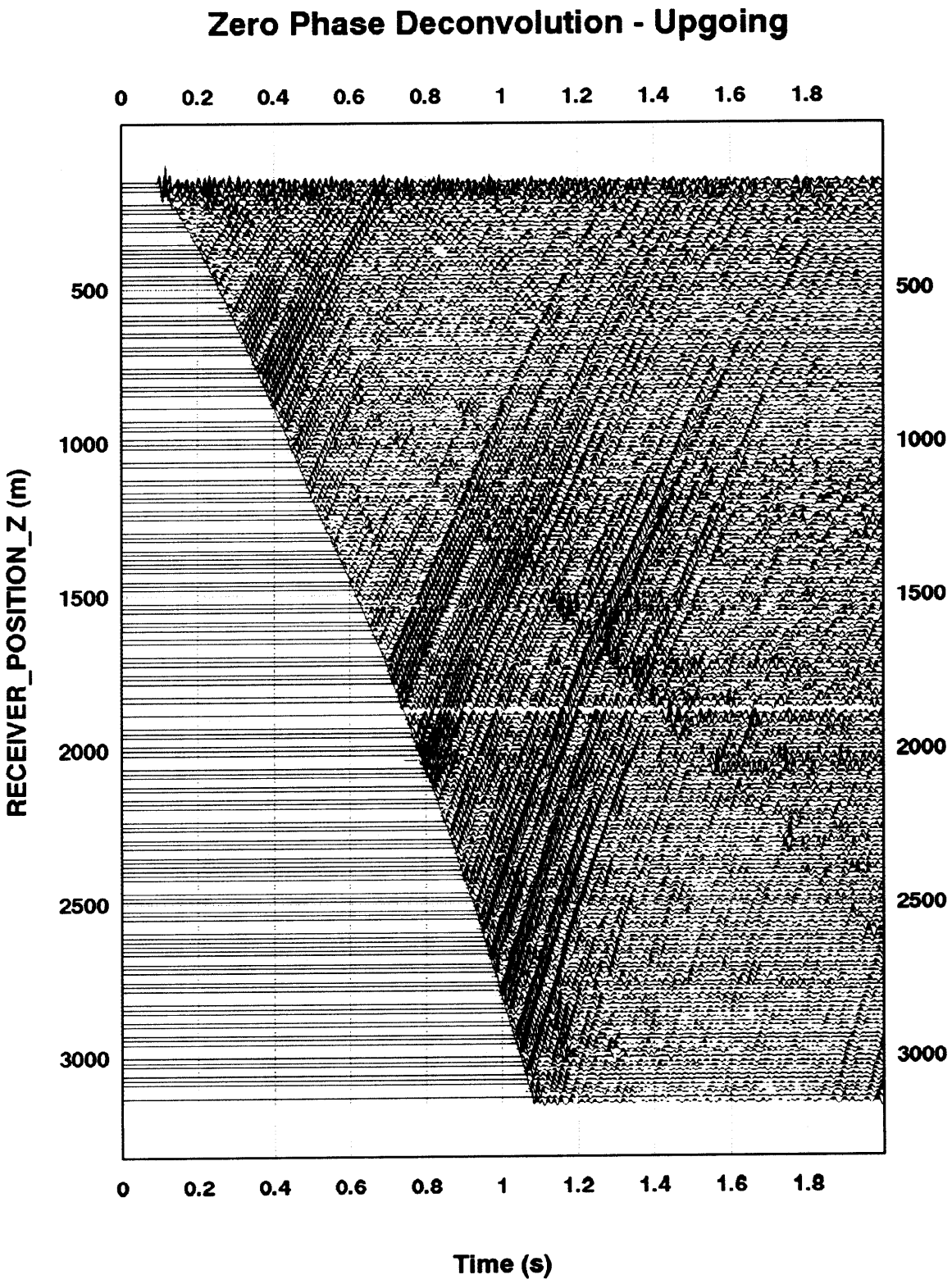

Figure 8. Upgoing Wavefield after Waveshaping Deconvolution

ExxonMobil Schlumberger

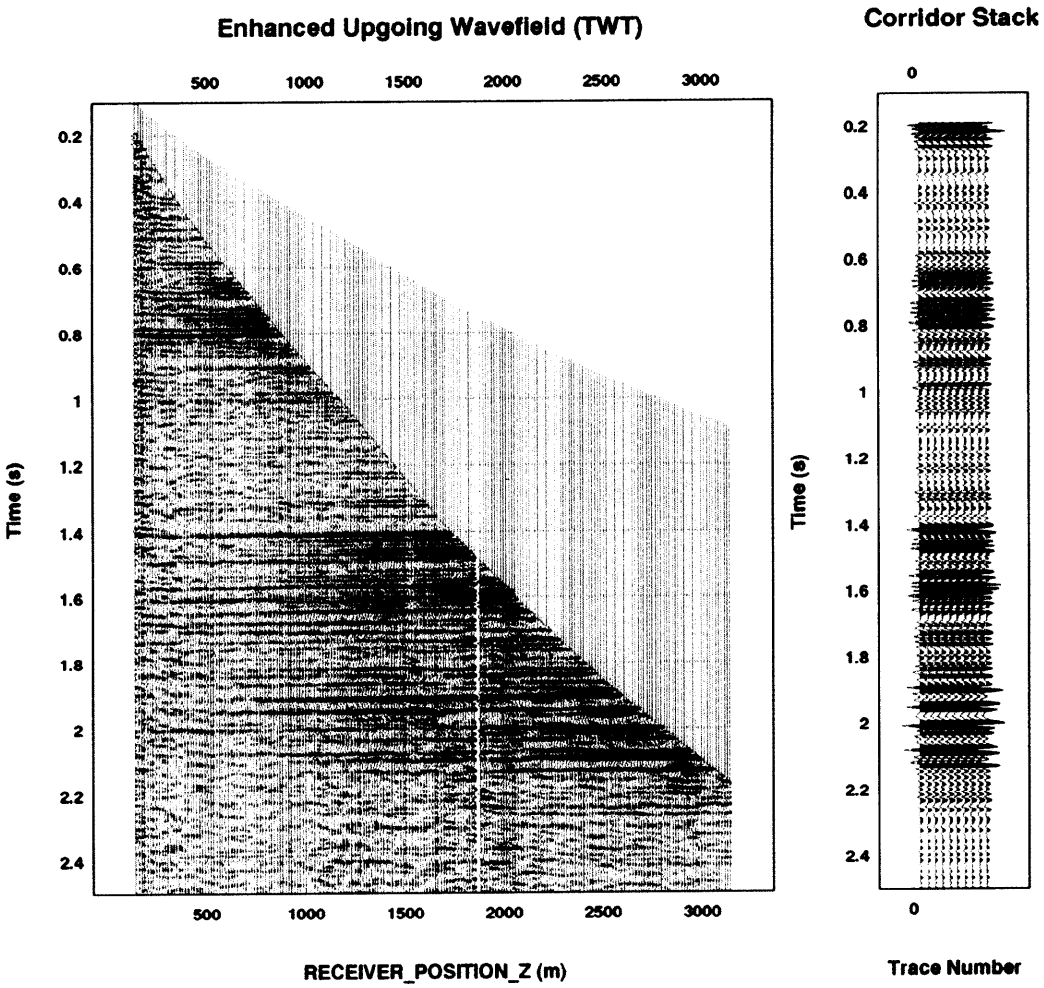

Figure 9. Enhanced Upgoing Zero Phase Wavefield and Corridor Stack in TWT

ExxonMobil Schlumberger

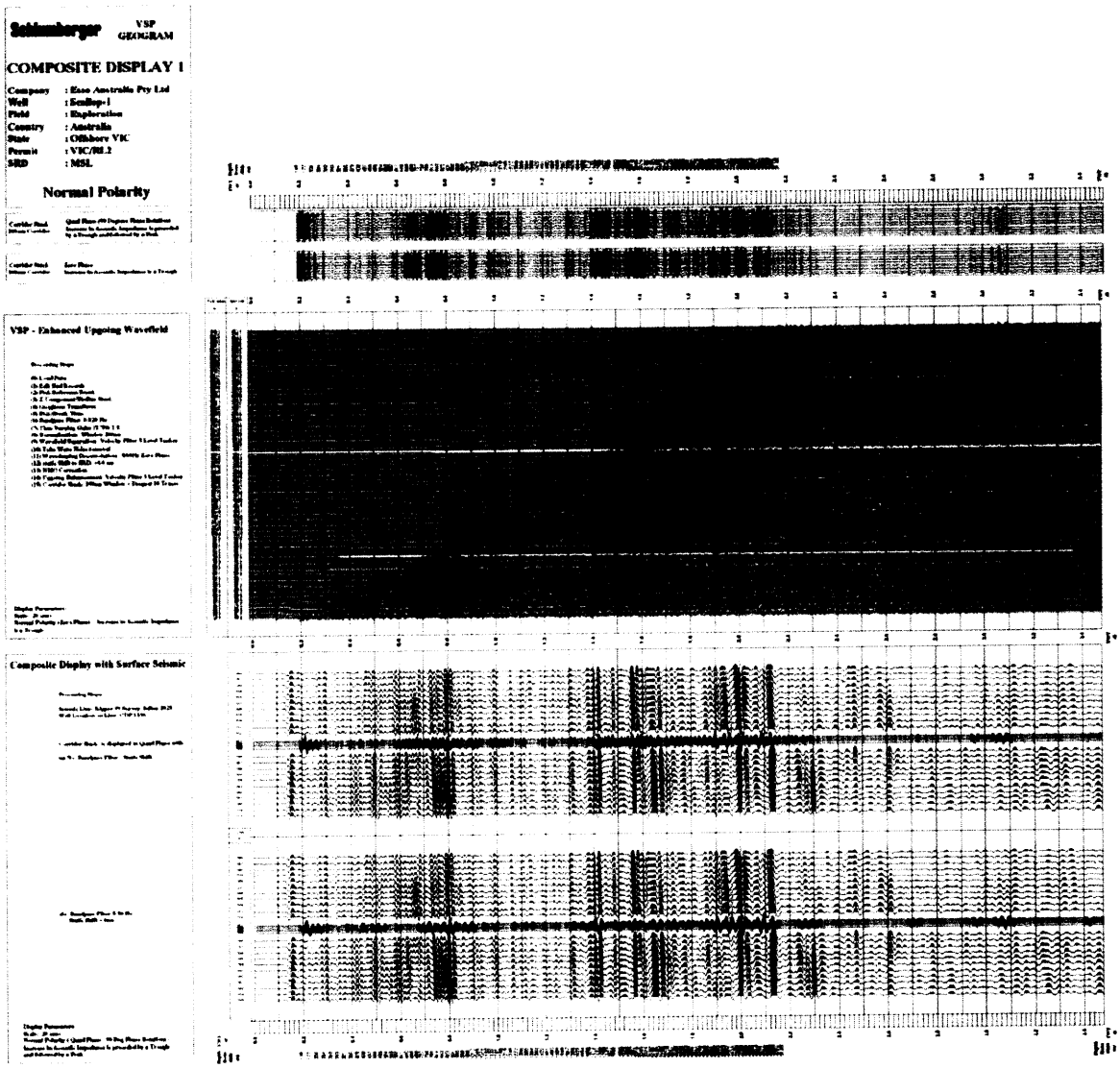

Figure 10. Composite Display (See Plot 1)

ExxonMobil Schlumberger

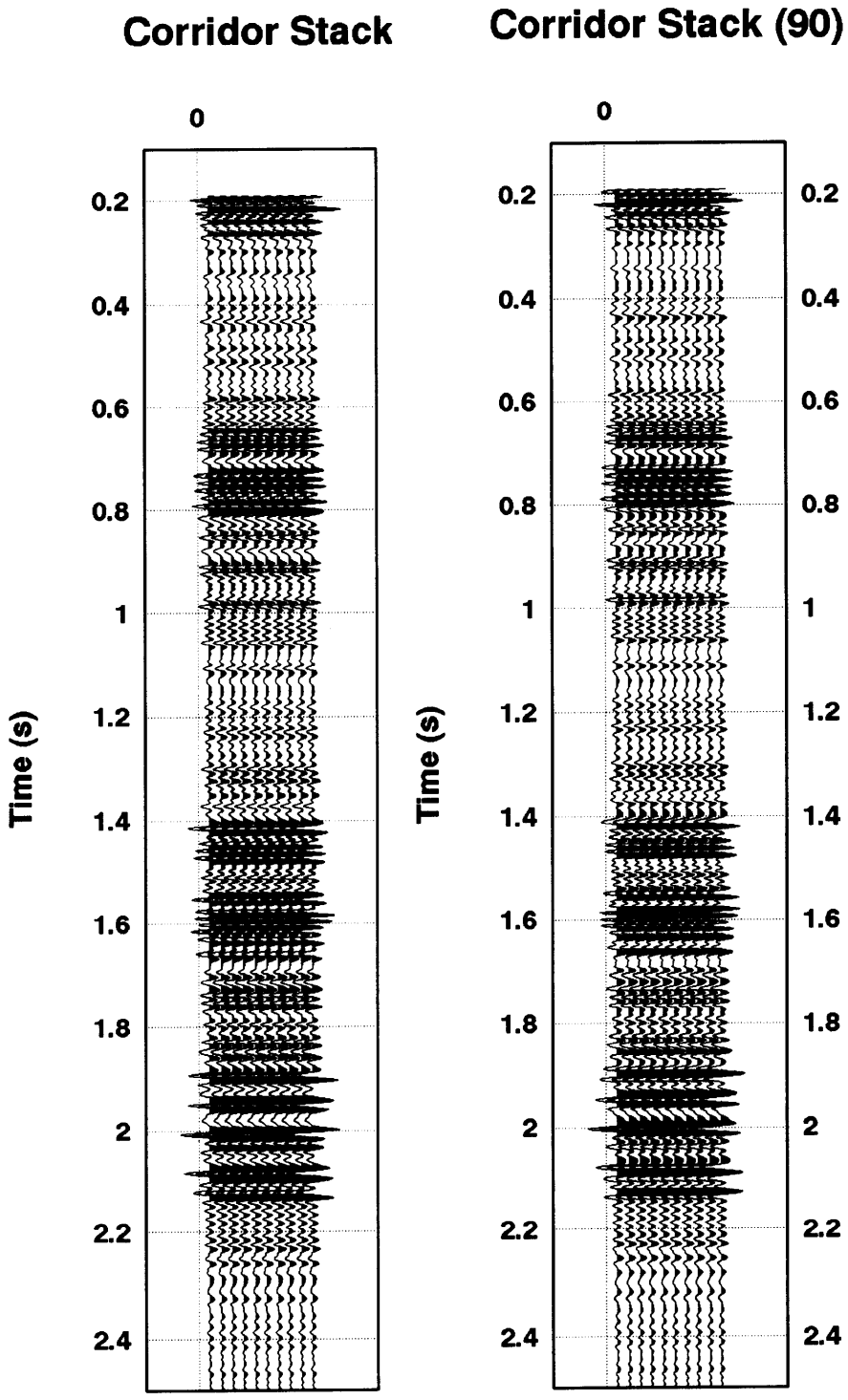

Figure 11. Corridor Stack : (1) Zero Phase (2) Quad Phase – Normal Polarity

ExxonMobil Schlumberger

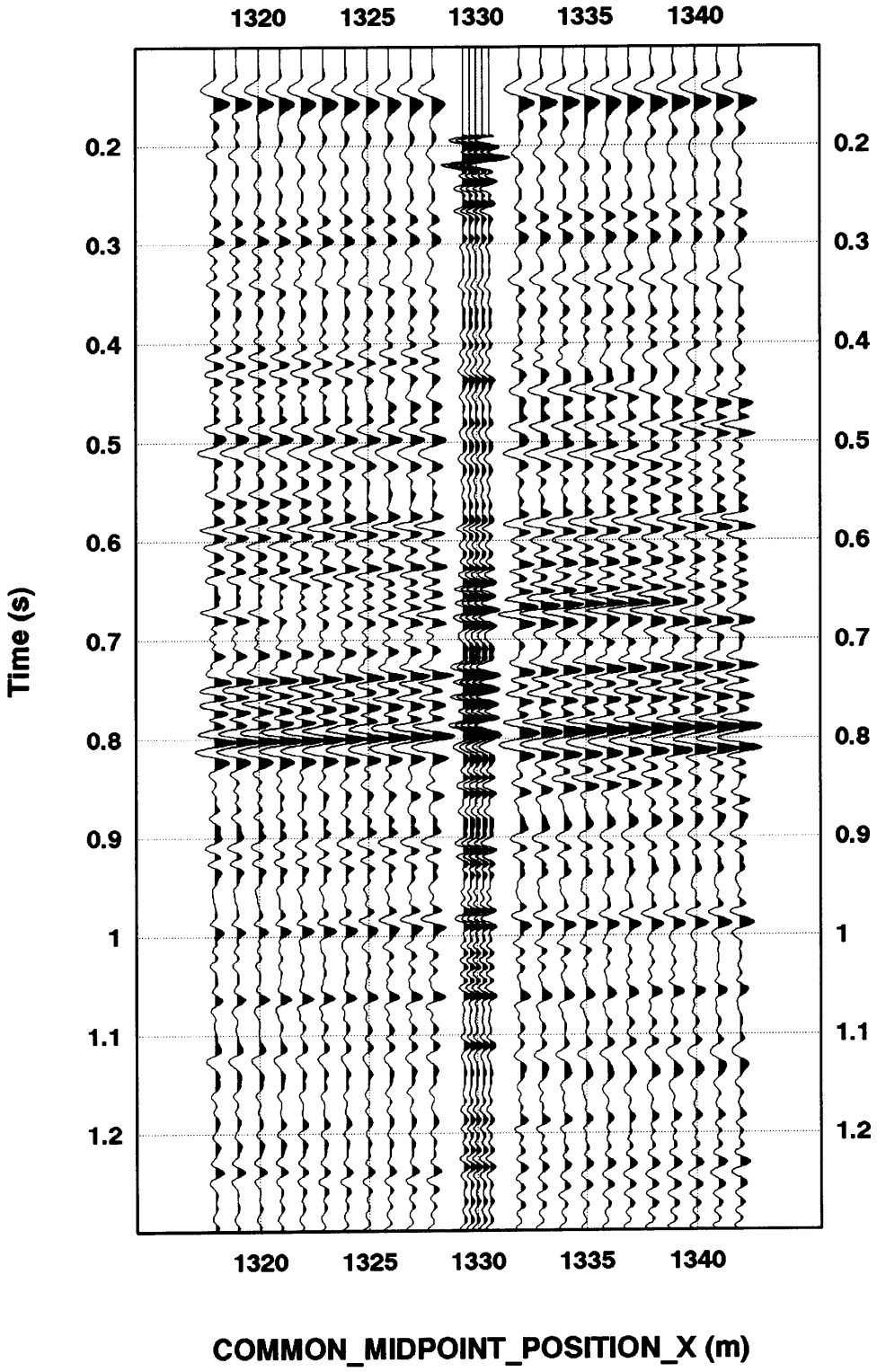

Figure 12a. Composite Display of Surface Seismic and Corridor Stack (Top)

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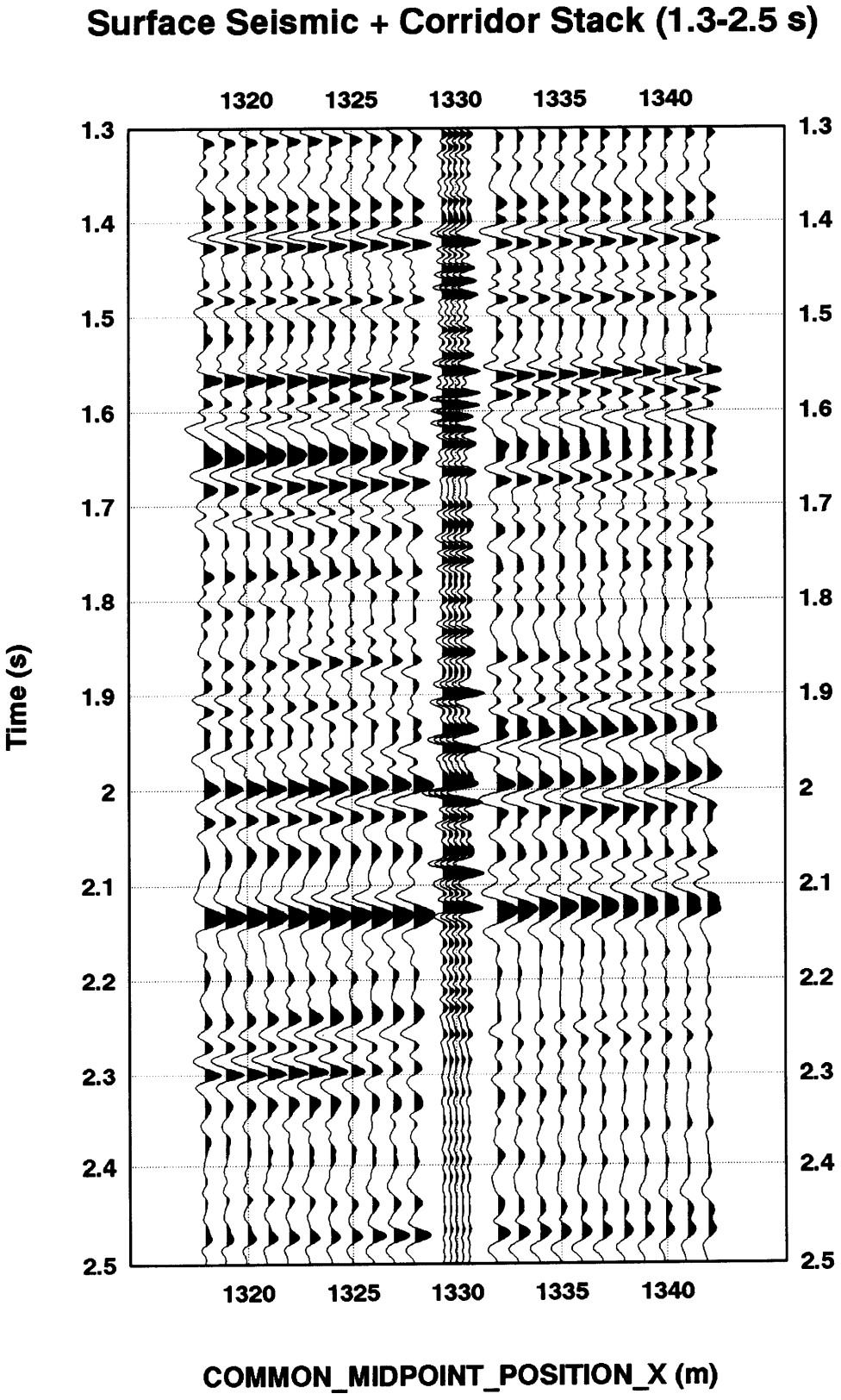

Figure 12b. Composite Display of Surface Seismic and Corridor Stack (Bottom)

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Surface Seismic + Shifted/Filtered Coridor Stack

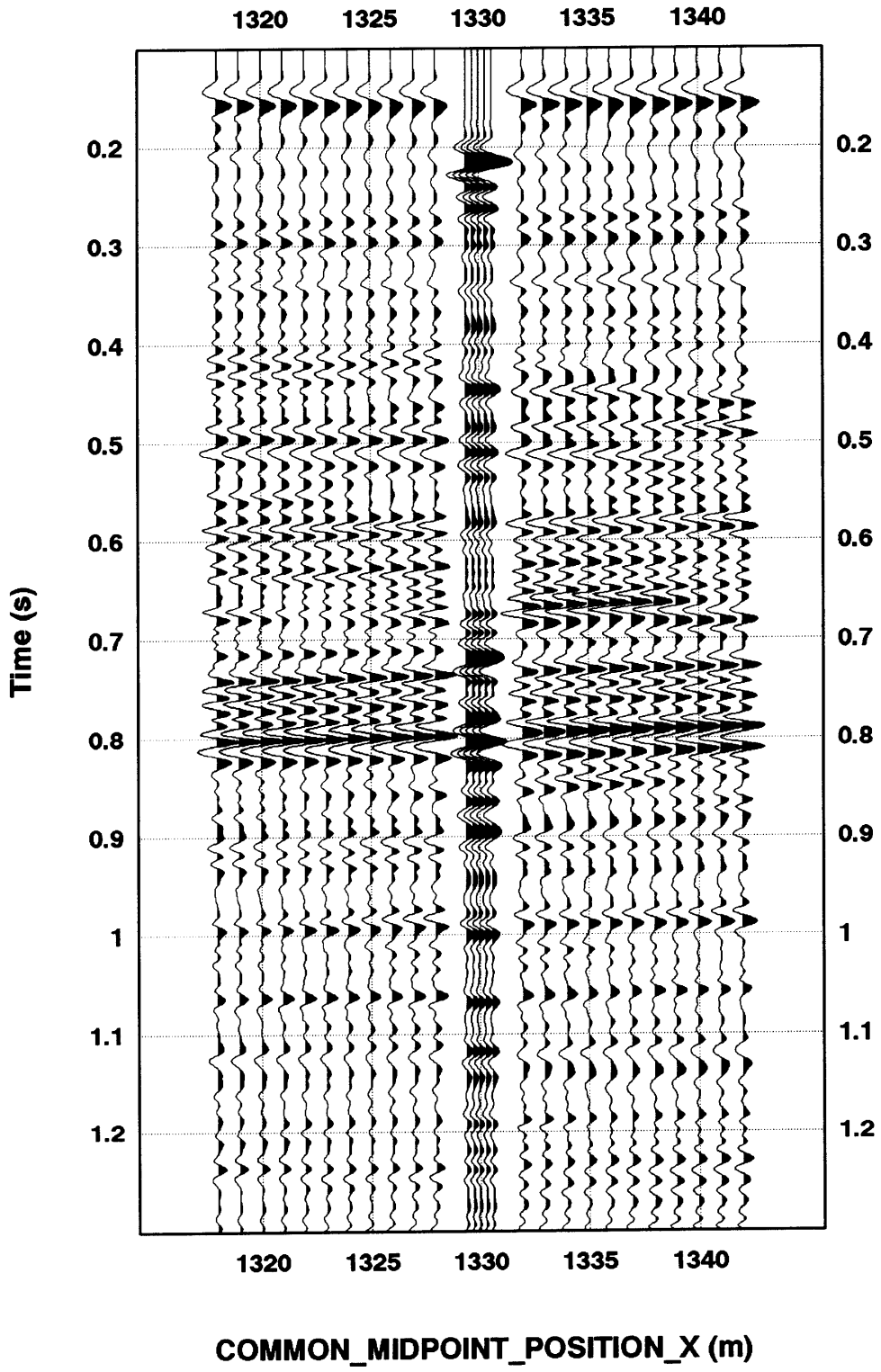

Figure 12c. Composite of Surface Seismic and shifted 5-50 Hz Corridor Stack (Top)

ExxonMobil Schlumberger

Surface Seismic + Shifted/Filtered Coridor Stack

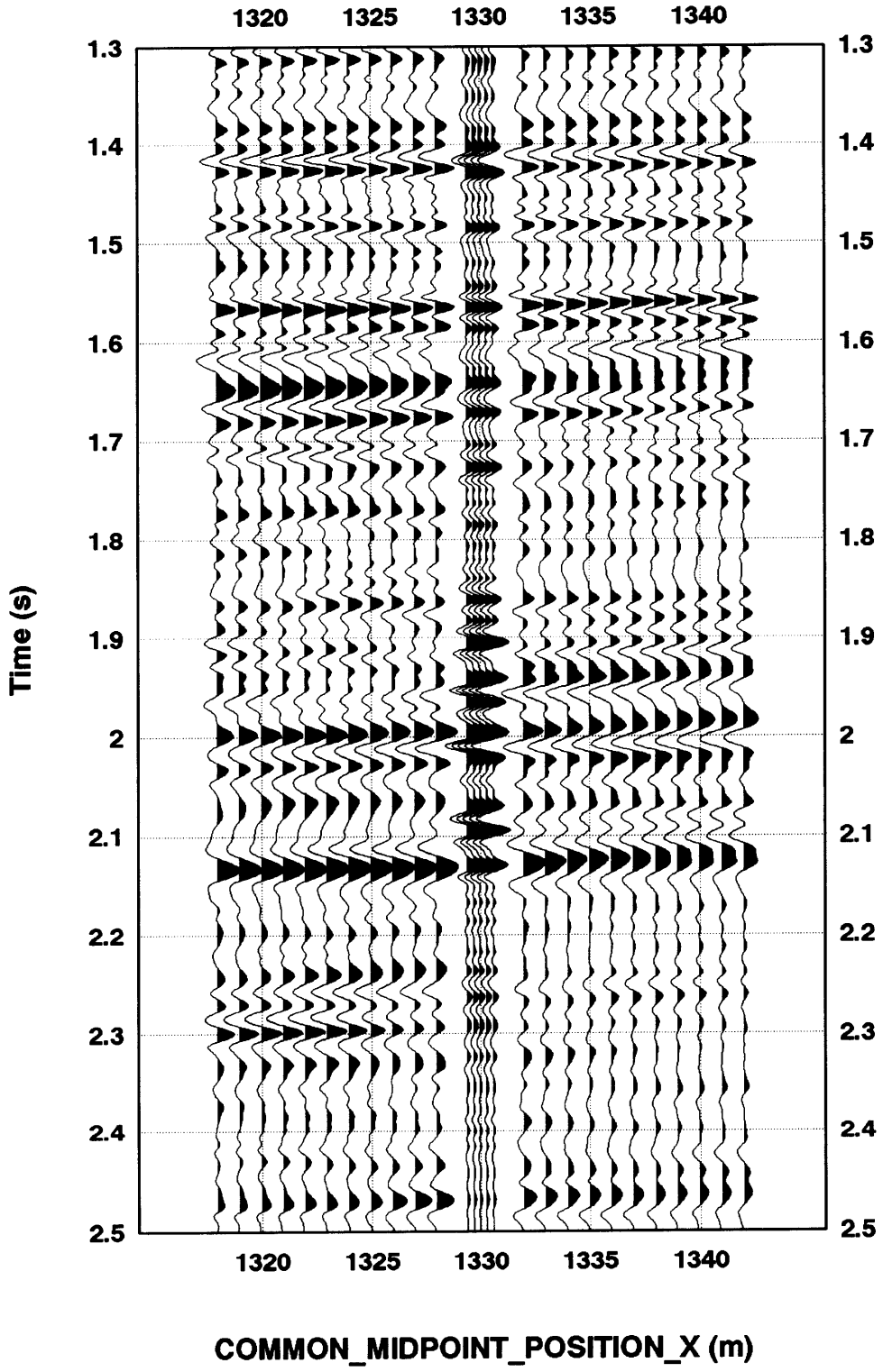

Figure 12d. Composite of Surface Seismic and shifted 5-50 Hz Corridor Stack (Bottom)

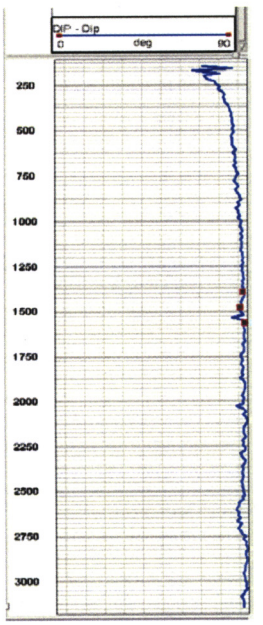

Figure 13. 3-C Polarization Analysis: First arriving energy (down P) angle w.r.t. Horizontal

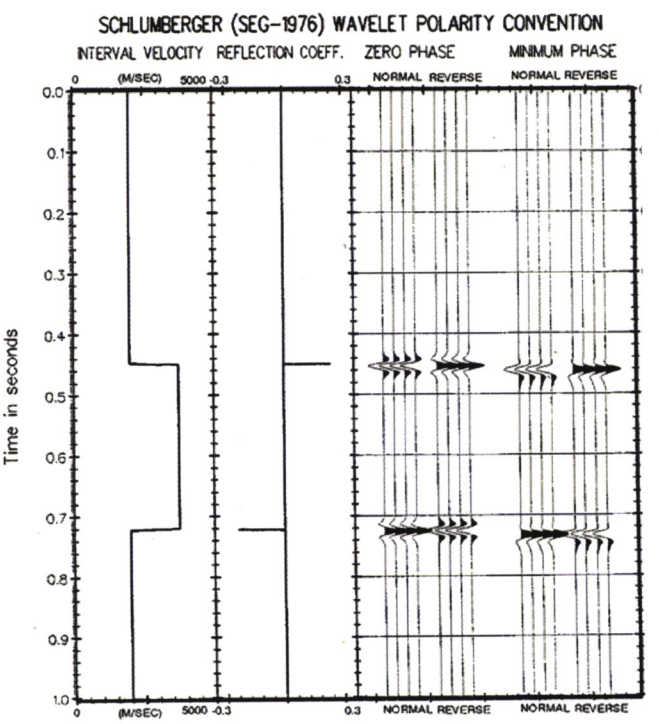

Figure 14. Schlumberger Wavelet Polarity Convention

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Attachment 1: Summary of Geophysical Listings

One geophysical data listing is appended to this report. A1 is included in the report and is also provided in electronic form on the CD-ROM. Following is a brief description of the format.

A1 Check Shot Data

1. Level number: the level number starting from the top level (includes any imposed shots).

2. Vertical depth form SRD: *dsrd*, the depth in meters from seismic reference datum.

3. Measured depth from KB: *dkb*, the depth in meters from KB.

4. Observed travel time HYD to GEO: *tim0*, the transit time picked form the stacked data by subtracting the surface sensor first break time from the downhole sensor first break time.

5. Vertical travel time SRD to GEO: *shtm*, is *timv* – vertical time, corrected for the vertical distance between source and datum.

6. Delta depth between shots: $\Delta depth$, the vertical distance between each level.

7. Delta time between shots: $\Delta time$, difference in vertical travel time (*shtm*) between each level.

8. Interval velocity between shots: average velocity between each level, $\Delta depth/\Delta time$

9. Average velocity SRD to GEO: average velocity from datum to the checkshot level, shtm/dsrd

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Attachment 2: A-1 Well Seismic Report

Client and Well Information

Country	Australia
State	Offshore Victoria
Logging Date	23-Feb-2003
Company	ESSO Australia Pty Ltd
Field	Exploration VIC/RL2
Well	Scallop-1

Check Shot Data (Continued)

LEVEL NUMBER	VERTICAL DEPTH FROM SRD m	MEASURED DEPTH FROM KB m	OBSERVED TRAVEL TIME s	VERTICAL TRAVEL TIME SRD (OWT) s	DELTA DEPTH m	DELTA TIME s	ACOUSTIC INTERVAL VELOCITY m/s	ACOUSTIC AVERAGE VELOCITY m/s
1	0.0			0.0000				
							1558	
2	147.7	173.6	0.0927	0.0948				1558
					14.5	0.0081	1788	
3	162.2	188.1	0.1004	0.1029				1576
					14.4	0.0078	1835	
4	176.6	202.5	0.1079	0.1108				1594
					14.5	0.0073	1990	
5	191.1	217.0	0.1148	0.1181				1619
					14.5	0.0074	1958	
6	205.6	231.5	0.1219	0.1255				1639
					14.5	0.0074	1969	
7	220.1	246.0	0.1291	0.1328				1657
					14.4	0.0078	1841	
8	234.5	260.4	0.1367	0.1407				1667
					14.5	0.0071	2055	
9	249.0	274.9	0.1436	0.1477				1686
					14.5	0.0070	2068	
10	263.5	289.4	0.1504	0.1547				1703
					14.5	0.0068	2118	
11	278.0	303.9	0.1571	0.1616				1721
					14.6	0.0070	2096	
12	292.6	318.5	0.1640	0.1685				1736
					14.5	0.0070	2085	
13	307.1	333.0	0.1708	0.1755				1750
					14.4	0.0068	2130	
14	321.5	347.4	0.1775	0.1823				1764
					14.5	0.0064	2255	
15	336.0	361.9	0.1838	0.1887				1781
					14.5	0.0068	2117	

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LEVEL NUMBER	VERTICAL DEPTH FROM SRD m	MEASURED DEPTH FROM KB m	OBSERVED TRAVEL TIME s	VERTICAL TRAVEL TIME SRD (OWT) s	DELTA DEPTH m	DELTA TIME s	ACOUSTIC INTERVAL VELOCITY m/s	ACOUSTIC AVERAGE VELOCITY m/s
16	350.5	376.4	0.1906	0.1955				1793
					14.5	0.0066	2203	
17	365.0	390.9	0.1971	0.2021				1806
					14.3	0.0067	2144	
18	379.3	405.2	0.2037	0.2088				1817
					14.5	0.0064	2254	
19	393.8	419.7	0.2101	0.2152				1830
					14.5	0.0061	2367	
20	408.3	434.2	0.2161	0.2213				1845
					14.5	0.0060	2411	
21	422.8	448.7	0.2221	0.2274				1860
					14.6	0.0059	2480	
22	437.4	463.3	0.2279	0.2332				1875
					14.4	0.0055	2611	
23	451.8	477.7	0.2334	0.2388				1892
					14.5	0.0060	2411	
24	466.3	492.2	0.2394	0.2448				1905
					14.5	0.0059	2456	
25	480.8	506.7	0.2452	0.2507				1918
					14.5	0.0057	2553	
26	495.3	521.2	0.2509	0.2564				1932
					14.4	0.0060	2412	
27	509.7	535.6	0.2568	0.2623				1943
					14.5	0.0056	2606	
28	524.2	550.1	0.2623	0.2679				1957
					14.5	0.0054	2677	
29	538.7	564.6	0.2677	0.2733				1971
					14.5	0.0050	2896	
30	553.2	579.1	0.2727	0.2783				1988
					14.5	0.0054	2710	
31	567.7	593.6	0.2780	0.2837				2001
					14.5	0.0053	2715	
32	582.2	608.1	0.2833	0.2890				2014
					14.5	0.0055	2652	
33	596.7	622.6	0.2888	0.2945				2026
					14.4	0.0055	2598	
34	611.1	637.0	0.2943	0.3000				2037
					14.5	0.0055	2657	
35	625.6	651.5	0.2997	0.3055				2048
					14.5	0.0053	2758	
36	640.1	666.0	0.3049	0.3107				2060
					14.5	0.0052	2790	
37	654.6	680.5	0.3101	0.3159				2072
					14.4	0.0053	2693	
38	669.0	694.9	0.3154	0.3213				2082
					14.5	0.0053	2750	
39	683.5	709.4	0.3207	0.3265				2093
					14.5	0.0051	2823	
40	698.0	723.9	0.3258	0.3317				2104

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LEVEL NUMBER	VERTICAL DEPTH FROM SRD m	MEASURED DEPTH FROM KB m	OBSERVED TRAVEL TIME s	VERTICAL TRAVEL TIME SRD (OWT) s	DELTA DEPTH m	DELTA TIME s	ACOUSTIC INTERVAL VELOCITY m/s	ACOUSTIC AVERAGE VELOCITY m/s
					14.5	0.0051	2838	
41	712.5	738.4	0.3309	0.3368				2116
					14.4	0.0055	2616	
42	726.9	752.8	0.3364	0.3423				2124
					14.5	0.0050	2878	
43	741.4	767.3	0.3414	0.3473				2135
					14.4	0.0052	2784	
44	755.8	781.7	0.3466	0.3525				2144
					14.5	0.0051	2825	
45	770.3	796.2	0.3517	0.3576				2154
					14.6	0.0054	2687	
46	784.9	810.8	0.3571	0.3631				2162
					14.4	0.0055	2626	
47	799.3	825.2	0.3626	0.3686				2169
					14.5	0.0054	2710	
48	813.8	839.7	0.3679	0.3739				2176
					14.4	0.0054	2689	
49	828.2	854.1	0.3733	0.3793				2184
					14.6	0.0054	2689	
50	842.8	868.7	0.3787	0.3847				2191
					14.5	0.0054	2700	
51	857.3	883.2	0.3840	0.3901				2198
					14.5	0.0055	2619	
52	871.8	897.7	0.3896	0.3956				2204
					14.5	0.0049	2953	
53	886.3	912.2	0.3945	0.4005				2213
					14.4	0.0060	2414	
54	900.7	926.6	0.4004	0.4065				2216
					14.5	0.0050	2881	
55	915.2	941.1	0.4054	0.4115				2224
					14.5	0.0050	2881	
56	929.7	955.6	0.4105	0.4165				2232
					14.5	0.0050	2906	
57	944.2	970.1	0.4154	0.4215				2240
					14.4	0.0050	2852	
58	958.6	984.5	0.4205	0.4266				2247
					14.5	0.0049	2989	
59	973.1	999.0	0.4253	0.4314				2256
					14.5	0.0052	2785	
60	987.6	1013.5	0.4305	0.4366				2262
					14.5	0.0050	2919	
61	1002.1	1028.0	0.4355	0.4416				2269
					14.5	0.0050	2912	
62	1016.6	1042.5	0.4405	0.4466				2276
					14.5	0.0048	3018	
63	1031.1	1057.0	0.4453	0.4514				2284
					14.2	0.0050	2820	
64	1045.3	1071.2	0.4503	0.4564				2290
					14.4	0.0050	2907	

ExxonMobil Schlumberger

LEVEL NUMBER	VERTICAL DEPTH FROM SRD m	MEASURED DEPTH FROM KB m	OBSERVED TRAVEL TIME s	VERTICAL TRAVEL TIME SRD (OWT) s	DELTA DEPTH m	DELTA TIME s	ACOUSTIC INTERVAL VELOCITY m/s	ACOUSTIC AVERAGE VELOCITY m/s
65	1059.7	1085.6	0.4552	0.4614				2297
					14.8	0.0050	2935	
66	1074.5	1100.4	0.4603	0.4664				2304
					14.5	0.0047	3082	
67	1089.0	1114.9	0.4650	0.4711				2311
					14.4	0.0048	3023	
68	1103.4	1129.3	0.4697	0.4759				2319
					14.5	0.0049	2961	
69	1117.9	1143.8	0.4746	0.4808				2325
					14.5	0.0049	2963	
70	1132.4	1158.3	0.4795	0.4857				2332
					14.4	0.0048	3004	
71	1146.8	1172.7	0.4843	0.4905				2338
					14.6	0.0048	3042	
72	1161.4	1187.3	0.4891	0.4953				2345
					14.4	0.0045	3199	
73	1175.8	1201.7	0.4936	0.4998				2353
					14.5	0.0051	2830	
74	1190.3	1216.2	0.4987	0.5049				2358
					14.5	0.0049	2965	
75	1204.8	1230.7	0.5036	0.5098				2363
					14.5	0.0053	2731	
76	1219.3	1245.2	0.5089	0.5151				2367
					14.5	0.0051	2854	
77	1233.8	1259.7	0.5140	0.5202				2372
					14.4	0.0055	2602	
78	1248.2	1274.1	0.5195	0.5257				2374
					14.5	0.0053	2759	
79	1262.7	1288.6	0.5247	0.5310				2378
					14.5	0.0056	2610	
80	1277.2	1303.1	0.5303	0.5365				2381
					14.5	0.0054	2670	
81	1291.7	1317.6	0.5357	0.5420				2383
					14.5	0.0056	2587	
82	1306.2	1332.1	0.5413	0.5476				2385
					14.5	0.0053	2761	
83	1320.7	1346.6	0.5466	0.5528				2389
					14.4	0.0054	2683	
84	1335.1	1361.0	0.5519	0.5582				2392
					14.5	0.0054	2698	
85	1349.6	1375.5	0.5573	0.5636				2395
					14.5	0.0053	2714	
86	1364.1	1390.0	0.5626	0.5689				2398
					14.5	0.0051	2835	
87	1378.6	1404.5	0.5678	0.5740				2402
					14.3	0.0053	2680	
88	1392.9	1418.8	0.5731	0.5793				2404
					14.5	0.0052	2782	
89	1407.4	1433.3	0.5783	0.5846				2408

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LEVEL NUMBER	VERTICAL DEPTH FROM SRD m	MEASURED DEPTH FROM KB m	OBSERVED TRAVEL TIME s	VERTICAL TRAVEL TIME SRD (OWT) s	DELTA DEPTH m	DELTA TIME s	ACOUSTIC INTERVAL VELOCITY m/s	ACOUSTIC AVERAGE VELOCITY m/s
					14.5	0.0055	2655	
90	1421.9	1447.8	0.5838	0.5900				2410
					14.5	0.0051	2851	
91	1436.4	1462.3	0.5888	0.5951				2414
					14.6	0.0052	2825	
92	1451.0	1476.9	0.5940	0.6003				2417
					14.5	0.0050	2908	
93	1465.5	1491.4	0.5990	0.6053				2421
					14.3	0.0051	2810	
94	1479.8	1505.7	0.6041	0.6103				2425
					14.5	0.0051	2819	
95	1494.3	1520.2	0.6092	0.6155				2428
					14.5	0.0054	2670	
96	1508.8	1534.7	0.6146	0.6209				2430
					14.5	0.0051	2819	
97	1523.3	1549.2	0.6198	0.6261				2433
					14.5	0.0053	2713	
98	1537.8	1563.7	0.6251	0.6314				2435
					14.3	0.0052	2760	
99	1552.1	1578.0	0.6303	0.6366				2438
					14.7	0.0056	2637	
100	1566.8	1592.7	0.6359	0.6422				2440
					14.5	0.0051	2861	
101	1581.3	1607.2	0.6409	0.6472				2443
					14.5	0.0053	2730	
102	1595.8	1621.7	0.6462	0.6525				2446
					14.4	0.0050	2867	
103	1610.2	1636.1	0.6513	0.6576				2449
					14.4	0.0052	2787	
104	1624.6	1650.5	0.6564	0.6627				2451
					14.5	0.0051	2845	
105	1639.1	1665.0	0.6615	0.6678				2454
					14.6	0.0053	2738	
106	1653.7	1679.6	0.6669	0.6732				2457
					14.4	0.0051	2829	
107	1668.1	1694.0	0.6719	0.6783				2459
					14.5	0.0051	2816	
108	1682.6	1708.5	0.6771	0.6834				2462
					14.4	0.0049	2915	
109	1697.0	1722.9	0.6820	0.6883				2465
					14.6	0.0045	3215	
110	1711.6	1737.5	0.6866	0.6929				2470
					14.4	0.0043	3351	
111	1726.0	1751.9	0.6909	0.6972				2476
					14.6	0.0042	3440	
112	1740.6	1766.5	0.6951	0.7014				2482
					14.4	0.0045	3191	
113	1755.0	1780.9	0.6996	0.7059				2486
					14.5	0.0041	3537	

ExxonMobil Schlumberger

LEVEL NUMBER	VERTICAL DEPTH FROM SRD m	MEASURED DEPTH FROM KB m	OBSERVED TRAVEL TIME s	VERTICAL TRAVEL TIME SRD (OWT) s	DELTA DEPTH m	DELTA TIME s	ACOUSTIC INTERVAL VELOCITY m/s	ACOUSTIC AVERAGE VELOCITY m/s
114	1769.5	1795.4	0.7037	0.7100				2492
					14.5	0.0044	3316	
115	1784.0	1809.9	0.7081	0.7144				2497
					14.5	0.0045	3252	
116	1798.5	1824.4	0.7125	0.7189				2502
					14.4	0.0048	2990	
117	1812.9	1838.8	0.7173	0.7237				2505
					14.5	0.0044	3296	
118	1827.4	1853.3	0.7217	0.7281				2510
					14.5	0.0046	3177	
119	1841.9	1867.8	0.7263	0.7326				2514
					14.5	0.0043	3360	
120	1856.4	1882.3	0.7306	0.7370				2519
					28.9	0.0086	3364	
121	1885.3	1911.2	0.7392	0.7456				2529
					14.5	0.0046	3166	
122	1899.8	1925.7	0.7438	0.7501				2533
					14.5	0.0043	3394	
123	1914.3	1940.2	0.7481	0.7544				2537
					14.5	0.0042	3481	
124	1928.8	1954.7	0.7522	0.7586				2543
					14.5	0.0042	3455	
125	1943.3	1969.2	0.7564	0.7628				2548
					14.4	0.0041	3513	
126	1957.7	1983.6	0.7605	0.7669				2553
					14.5	0.0043	3388	
127	1972.2	1998.1	0.7648	0.7711				2557
					14.4	0.0044	3249	
128	1986.6	2012.5	0.7692	0.7756				2561
					14.5	0.0043	3411	
129	2001.1	2027.0	0.7735	0.7798				2566
					14.5	0.0045	3200	
130	2015.6	2041.5	0.7780	0.7844				2570
					14.5	0.0044	3292	
131	2030.1	2056.0	0.7824	0.7888				2574
					14.5	0.0045	3255	
132	2044.6	2070.5	0.7869	0.7932				2578
					14.5	0.0052	2815	
133	2059.1	2085.0	0.7920	0.7984				2579
					14.5	0.0051	2844	
134	2073.6	2099.5	0.7971	0.8035				2581
					14.5	0.0053	2750	
135	2088.1	2114.0	0.8024	0.8087				2582
					14.4	0.0043	3352	
136	2102.5	2128.4	0.8067	0.8130				2586
					14.5	0.0044	3315	
137	2117.0	2142.9	0.8110	0.8174				2590
					14.4	0.0039	3646	
138	2131.4	2157.3	0.8150	0.8214				2595

ExxonMobil Schlumberger

LEVEL NUMBER	VERTICAL DEPTH FROM SRD m	MEASURED DEPTH FROM KB m	OBSERVED TRAVEL TIME s	VERTICAL TRAVEL TIME SRD (OWT) s	DELTA DEPTH m	DELTA TIME s	ACOUSTIC INTERVAL VELOCITY m/s	ACOUSTIC AVERAGE VELOCITY m/s
					14.6	0.0040	3653	
139	2146.0	2171.9	0.8190	0.8254				2600
					14.5	0.0037	3884	
140	2160.5	2186.4	0.8227	0.8291				2606
					14.5	0.0040	3618	
141	2175.0	2200.9	0.8267	0.8331				2611
					14.4	0.0040	3578	
142	2189.4	2215.3	0.8307	0.8371				2615
					14.4	0.0044	3238	
143	2203.8	2229.7	0.8352	0.8416				2619
					14.5	0.0040	3638	
144	2218.3	2244.2	0.8392	0.8456				2623
					14.5	0.0040	3628	
145	2232.8	2258.7	0.8432	0.8496				2628
					14.5	0.0042	3421	
146	2247.3	2273.2	0.8474	0.8538				2632
					14.5	0.0044	3274	
147	2261.8	2287.7	0.8518	0.8582				2635
					14.5	0.0040	3630	
148	2276.3	2302.2	0.8558	0.8622				2640
					14.4	0.0042	3435	
149	2290.7	2316.6	0.8600	0.8664				2644
					14.5	0.0043	3379	
150	2305.2	2331.1	0.8643	0.8707				2648
					14.6	0.0038	3808	
151	2319.8	2345.7	0.8681	0.8745				2653
					14.4	0.0041	3474	
152	2334.2	2360.1	0.8723	0.8787				2656
					14.5	0.0039	3691	
153	2348.7	2374.6	0.8762	0.8826				2661
					14.5	0.0040	3610	
154	2363.2	2389.1	0.8802	0.8866				2665
					14.5	0.0039	3751	
155	2377.7	2403.6	0.8841	0.8905				2670
					14.4	0.0041	3547	
156	2392.1	2418.0	0.8881	0.8945				2674
					14.5	0.0042	3458	
157	2406.6	2432.5	0.8923	0.8987				2678
					14.5	0.0037	3941	
158	2421.1	2447.0	0.8960	0.9024				2683
					14.4	0.0038	3743	
159	2435.5	2461.4	0.8999	0.9063				2687
					14.5	0.0042	3462	
160	2450.0	2475.9	0.9040	0.9105				2691
					14.6	0.0041	3567	
161	2464.6	2490.5	0.9081	0.9145				2695
					14.5	0.0042	3472	
162	2479.1	2505.0	0.9123	0.9187				2698
					14.4	0.0043	3324	

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LEVEL NUMBER	VERTICAL DEPTH FROM SRD m	MEASURED DEPTH FROM KB m	OBSERVED TRAVEL TIME s	VERTICAL TRAVEL TIME SRD (OWT) s	DELTA DEPTH m	DELTA TIME s	ACOUSTIC INTERVAL VELOCITY m/s	ACOUSTIC AVERAGE VELOCITY m/s
163	2493.5	2519.4	0.9166	0.9231				2701
					14.5	0.0042	3445	
164	2508.0	2533.9	0.9209	0.9273				2705
					14.5	0.0039	3716	
165	2522.5	2548.4	0.9248	0.9312				2709
					14.5	0.0040	3667	
166	2537.0	2562.9	0.9287	0.9351				2713
					14.4	0.0035	4171	
167	2551.4	2577.3	0.9322	0.9386				2718
					14.4	0.0038	3822	
168	2565.8	2591.7	0.9359	0.9423				2723
					14.6	0.0038	3890	
169	2580.4	2606.3	0.9397	0.9461				2727
					14.5	0.0037	3894	
170	2594.9	2620.8	0.9434	0.9498				2732
					14.5	0.0034	4290	
171	2609.4	2635.3	0.9468	0.9532				2738
					14.4	0.0040	3592	
172	2623.8	2649.7	0.9508	0.9572				2741
					14.5	0.0033	4444	
173	2638.3	2664.2	0.9541	0.9605				2747
					14.4	0.0033	4350	
174	2652.7	2678.6	0.9574	0.9638				2752
					14.6	0.0035	4204	
175	2667.3	2693.2	0.9608	0.9673				2758
					14.4	0.0033	4431	
176	2681.7	2707.6	0.9641	0.9705				2763
					14.5	0.0037	3945	
177	2696.2	2722.1	0.9678	0.9742				2768
					14.5	0.0037	3899	
178	2710.7	2736.6	0.9715	0.9779				2772
					14.5	0.0037	3924	
179	2725.2	2751.1	0.9752	0.9816				2776
					14.5	0.0037	3890	
180	2739.7	2765.6	0.9789	0.9853				2781
					14.5	0.0036	4008	
181	2754.2	2780.1	0.9825	0.9889				2785
					14.4	0.0029	4998	
182	2768.6	2794.5	0.9854	0.9918				2791
					14.5	0.0035	4097	
183	2783.1	2809.0	0.9889	0.9954				2796
					14.5	0.0032	4573	
184	2797.6	2823.5	0.9921	0.9985				2802
					14.5	0.0038	3826	
185	2812.1	2838.0	0.9959	1.0023				2806
					14.4	0.0040	3588	
186	2826.5	2852.4	0.9999	1.0063				2809
					14.5	0.0033	4359	
187	2841.0	2866.9	1.0032	1.0097				2814

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LEVEL NUMBER	VERTICAL DEPTH FROM SRD m	MEASURED DEPTH FROM KB m	OBSERVED TRAVEL TIME s	VERTICAL TRAVEL TIME SRD (OWT) s	DELTA DEPTH m	DELTA TIME s	ACOUSTIC INTERVAL VELOCITY m/s	ACOUSTIC AVERAGE VELOCITY m/s
					14.5	0.0036	4010	
188	2855.5	2881.4	1.0068	1.0133				2818
					14.5	0.0031	4707	
189	2870.0	2895.9	1.0099	1.0164				2824
					14.5	0.0038	3865	
190	2884.5	2910.4	1.0137	1.0201				2828
					14.5	0.0036	3988	
191	2899.0	2924.9	1.0173	1.0237				2832
					14.5	0.0036	4073	
192	2913.5	2939.4	1.0209	1.0273				2836
					14.4	0.0036	4040	
193	2927.9	2953.8	1.0244	1.0309				2840
					14.4	0.0031	4685	
194	2942.3	2968.2	1.0275	1.0339				2846
					14.6	0.0039	3750	
195	2956.9	2982.8	1.0314	1.0378				2849
					14.4	0.0039	3669	
196	2971.3	2997.2	1.0353	1.0418				2852
					14.5	0.0034	4300	
197	2985.8	3011.7	1.0387	1.0451				2857
					14.5	0.0038	3818	
198	3000.3	3026.2	1.0425	1.0489				2860
					14.5	0.0038	3847	
199	3014.8	3040.7	1.0463	1.0527				2864
					14.5	0.0035	4198	
200	3029.3	3055.2	1.0497	1.0562				2868
					14.5	0.0036	4066	
201	3043.8	3069.7	1.0533	1.0597				2872
					14.5	0.0033	4415	
202	3058.3	3084.2	1.0566	1.0630				2877
					14.4	0.0027	5258	
203	3072.7	3098.6	1.0593	1.0657				2883
					14.5	0.0036	4010	
204	3087.2	3113.1	1.0629	1.0694				2887
					14.5	0.0038	3843	
205	3101.7	3127.6	1.0667	1.0731				2890
					14.5	0.0034	4301	
206	3116.2	3142.1	1.0701	1.0765				2895
					14.4	0.0034	4269	
207	3130.6	3156.5	1.0734	1.0799				2899
					14.5	0.0031	4679	
208	3145.1	3171.0	1.0765	1.0830				2904

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Attachment 3: Listing of Deliverables (CD-ROM)

Report:

SC1_VSP_report	VSP/Geogram Processing Report	PDF

Graphics Displays:

SC1_comp1	Plot 1. Composite Display 1– Normal Polarity	PDF / PDS / CGM
SC1_comp2	Plot 2. Composite Display 2 – Reverse Polarity	PDF / PDS / CGM

Data files plus Verification (.txt) listings:

SC1_rawx.sgy	raw x axis downhole data	SEGY
SC1_rawy.sgy	raw y axis downhole data	SEGY
SC1_rawz.sgy	raw z axis downhole data	SEGY
SC1_rawh.sgy	surface sensor data	SEGY
SC1_xstk.sgy	stacked x axis data	SEGY
SC1_ystk.sgy	stacked y axis data	SEGY
SC1_zstk.sgy	stacked z axis data	SEGY
SC1_upp.sgy	Zero Phase upgoing wavefield TWT	SEGY
SC1_corstk.sgy	Zero phase corridor stack	SEGY
SC1_corstk90.sgy	Quad Phase corridor stack	SEGY

Listings:

A1	Well_Seismic_Report	EXCEL / PDF

PE613621

This is an enclosure indicator page.
The enclosure PE613621 is enclosed within the container PE915058 at this location in this document.

The enclosure PE613621 has the following characteristics:

ITEM_BARCODE	PE613621
CONTAINER_BARCODE	PE915058
NAME	Scallop-1 VSP Composite Display 1
BASIN	GIPPSLAND
ONSHORE?	N
DATA_TYPE	WELL
DATA_SUB_TYPE	SYNTH_SEISMOGRAM
DESCRIPTION	Scallop-1 Vertical Seismic Profile Composite Display 1. Normal Polarity. Scale: 20 cm/s. By Schlumberger for Esso Australia Pty. Ltd. August 2003
REMARKS	
DATE_WRITTEN	31-AUG-2003
DATE_PROCESSED	
DATE_RECEIVED	03-SEP-2003
RECEIVED_FROM	Esso Australia Pty Ltd
WELL_NAME	Scallop-1
CONTRACTOR	Schlumberger
AUTHOR	
ORIGINATOR	Esso Australia Pty Ltd
TOP_DEPTH	
BOTTOM_DEPTH	
ROW_CREATED_BY	DH00_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE613622

This is an enclosure indicator page.
The enclosure PE613622 is enclosed within the container PE915058 at this location in this document.

The enclosure PE613622 has the following characteristics:

ITEM_BARCODE	PE613622
CONTAINER_BARCODE	PE915058
NAME	Scallop-1 VSP Composite Display 2
BASIN	GIPPSLAND
ONSHORE?	N
DATA_TYPE	WELL
DATA_SUB_TYPE	SYNTH_SEISMOGRAM
DESCRIPTION	Scallop-1 Vertical Seismic Profile Composite Display 2. Reverse Polarity. Scale: 20 cm/s. By Schlumberger for Esso Australia Pty. Ltd. August 2003
REMARKS	
DATE_WRITTEN	31-AUG-2003
DATE_PROCESSED	
DATE_RECEIVED	03-SEP-2003
RECEIVED_FROM	Esso Australia Pty Ltd
WELL_NAME	Scallop-1
CONTRACTOR	Schlumberger
AUTHOR	
ORIGINATOR	Esso Australia Pty Ltd
TOP_DEPTH	
BOTTOM_DEPTH	
ROW_CREATED_BY	DH00_SW

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 7

PVT ANALYSIS

A. C. N. # 008 130 667
July 14, 2003
PO Box 410
Magill, SA 5072

Esso Australia Limited
GPO Box 400C
Melbourne
VIC 3001
Attention: Mr. Diyar Barzanji

Subject: PVT Study
Well : Scallop # 1
File : E - 23004

Dear Sir,

From February 19 to 28, 2003, representatives of Petrolab transferred eleven Schlumberger MDT tools into Petrolab cylinders on the Sedco 702. Six of them, 450 ccs volume each contained gas reservoir fluid from three different depths, while the others, four 450 ccs and one 1 Gallon volume contained oil from two different horizons.

On-site analyses for light hydrocarbons, CO2 and H2S were performed on gas from two zones while the other samples were dispatched to Adelaide for further fluid studies. The results of this study are presented in the following report.

The compositions of the gas and oil reservoir fluids were determined by flashing the samples under atmospheric conditions into two phases. Through measurements of densities, molecular weights, quantities produced and compositions of the evolved stock tank gas and liquid from the flash experiment, we were able to mathematically recombine these products into the desired fluid compositions. The compositions were extended to C12+ by means of Capillary Column Gas Chromatography and High Temperature Vacuum Distillation.

At the reservoir temperatures saturation pressures were determined for each different type of reservoir fluid.

We thank Esso Australia Limited for the opportunity to be of service. Please do not hesitate in contacting us should you require any further information or if we can assist you in any other way.

Yours Sincerely,

Jan G. Bon
Manager

PETROLAB

Company : Esso Australia Limited
Well : Scallop # 1 File : E - 23004

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Company : Esso Australia Limited
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GAS TRANSFER DETAILS

Run / Seat # :	1	2	3	4	5	6
Sample Depth (mdrkb) :	3146.5	3146.5	3120.5	3120.5	3109	3109
Chamber Size (cc / gallon) :	450	450	450	450	450	450
Chamber Serial # :	1591	1584	1590	1583	1581	1582
Date Sampled :	24-2-2003	24-2-2003	24-2-2003	24-2-2003	24-2-2003	24-2-2003
Formation Pressure (psia) :	4598.6	4598.6	04:33	4563.19	4541.3	4541.3
Formation Temperature (°C) :	118.19	118.19	117.37	117.37	116.74	116.74
Date Transferred :	25-2-2003	25-2-2003	25-2-2003	25-2-2003	25-2-2003	26-2-2003
Opening Pressure (psig) :	2100	3000	3900	3820	3900	3900
Transfer Pressure (psig) :	5000	5000	6000	6000	6000	6000
Transfer Temperature (°C) :	23.3	22	21.7	21.4	21	26
Volume Transferred (cc) :	100	100	350	350	380	390
Transferred to Cylinder # :	84094102	84062103	89032109	841218	84062404	84103206
Cylinder Volume (cc) :	650	650	650	650	650	650
Interpreted Fluid :	gas-water	gas-water	gas	gas	gas	gas
Free Water :	250	300	TR	TR	TR	TR

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OIL TRANSFER DETAILS

Run / Seat # :	7	8	9	10	11
Sample Depth (mdrkb) :	2840	2840	2840	2630.2	2630.2
Chamber Size (cc / gallon) :	SC 1Gal	450	450	450	450
Chamber Serial # :	36	136	316	477	501
Date Sampled :	25-2-2003	25-2-2003	25-2-2003	25-2-2003	25-2-2003
Formation Pressure (psia) :	4092.86	4093.2	4093.2	3661.5	3665.06
Formation Temperature (°C) :	109.3	108.07	108.07	102.68	102.68
Date Transferred :	26-2-2003	26-2-2003	26-2-2003	26-2-2003	26-2-2003
Opening Pressure (psig) :	2525	2800	2850	2300	2480
Transfer Pressure (psig) :		6000	6000	6000	6000
Transfer Temperature (°C) :		21.7	24.4	21	24.1
Volume Transferred (cc) :	4*600	410	420	395	420
Transferred to Cylinder # :	84062601 84103217 84093202 84063609	84032809	84062602	8403-X	84062304
Cylinder Volume (cc) :	4 * 650	650	650	650	650
Interpreted Fluid :	oil	oil	oil	oil	oil
Free Water :	v. clean	TR	TR	TR	TR
Bubble Point Pressure (psig) :	app. 3600	3900	3900	2700	2700
GOR (scf/stbbl) :		1705		1174	
API Gravity @ 60 °F :		40.7		40	
Density @ 60 °F (gr/cc) :		0.8209		0.8241	
Pour Point (°C) :		28		25	

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Field Compositional Gas Analyses

Sample :	1a	1b	3a	3b	5a	5b
Run / Seat # :	1	1	3	3	5	5
Depth (mdrkb) :	3146.5	3146.5	3120.5	3120.5	3109	3109
Chamber # :	1591	1591	1590	1590	1581	1581
Component	Mol %	Mol %	Mol %	Mol %	Mol %	Mol %
Hydrogen Sulphide	0.00	0.00	0.00	0.00	0.00	0.00
Carbon Dioxide	10.43	10.23	18.60	18.94	18.83	18.36
Nitrogen	0.29	0.34	0.21	0.16	0.17	0.13
Methane	76.56	76.66	67.44	67.80	68.87	69.81
Ethane	7.10	7.04	6.22	6.45	6.31	6.18
Propane	2.66	2.65	2.63	2.96	2.64	2.35
Iso-Butane	0.53	0.52	0.76	0.48	0.48	0.61
N-Butane	0.94	0.92	0.91	0.62	0.92	0.72
Iso-Pentane	0.28	0.27	0.40	0.25	0.25	0.32
N-Pentane	0.30	0.29	0.42	0.27	0.27	0.34
Hexanes plus	0.91	1.08	2.42	2.08	1.25	1.18
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00

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FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY

On Stock Tank Oil from atmospheric flash of sample in cylinder # 84062103 - Bottom Gas @ 3146.5 m

Component		Mol %
Hexanes minus	C6-	0.19
Hexanes	C6	1.98
Heptanes	C7	9.70
Octanes	C8	11.70
Nonanes	C9	15.06
Decanes	C10	9.79
Undecanes	C11	6.21
Dodecanes	C12	5.35
Tridecanes	C13	5.50
Tetradecanes	C14	8.48
Pentadecanes	C15	7.44
Hexadecanes	C16	6.15
Heptadecanes	C17	4.35
Octadecanes	C18	2.01
Nonadecanes	C19	1.34
Eicosanes	C20	1.09
Heneicosanes	C21	0.89
Docosanes	C22	0.67
Tricosanes	C23	0.54
Tetracosanes	C24	0.41
Pentacosanes	C25	0.28
Hexacosanes	C26	0.20
Heptacosanes	C27	0.18
Octacosanes	C28	0.14
Nonacosanes	C29	0.12
Triacontanes	C30	0.09
Hentriacontanes	C31	0.07
Dotriacontanes	C32	0.04
Tritriacontanes	C33	0.03
Tetratriacontanes	C34	0.00
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

Molecular Weight Calculated *	:	162.1
Density @ 60 °F Calculated *	:	0.8028
Molecular Weight Measured	:	--
Density @ 60 °F Measured	:	0.8028

*Calculation based on generalized properties as published by Katz and Firoozabadi

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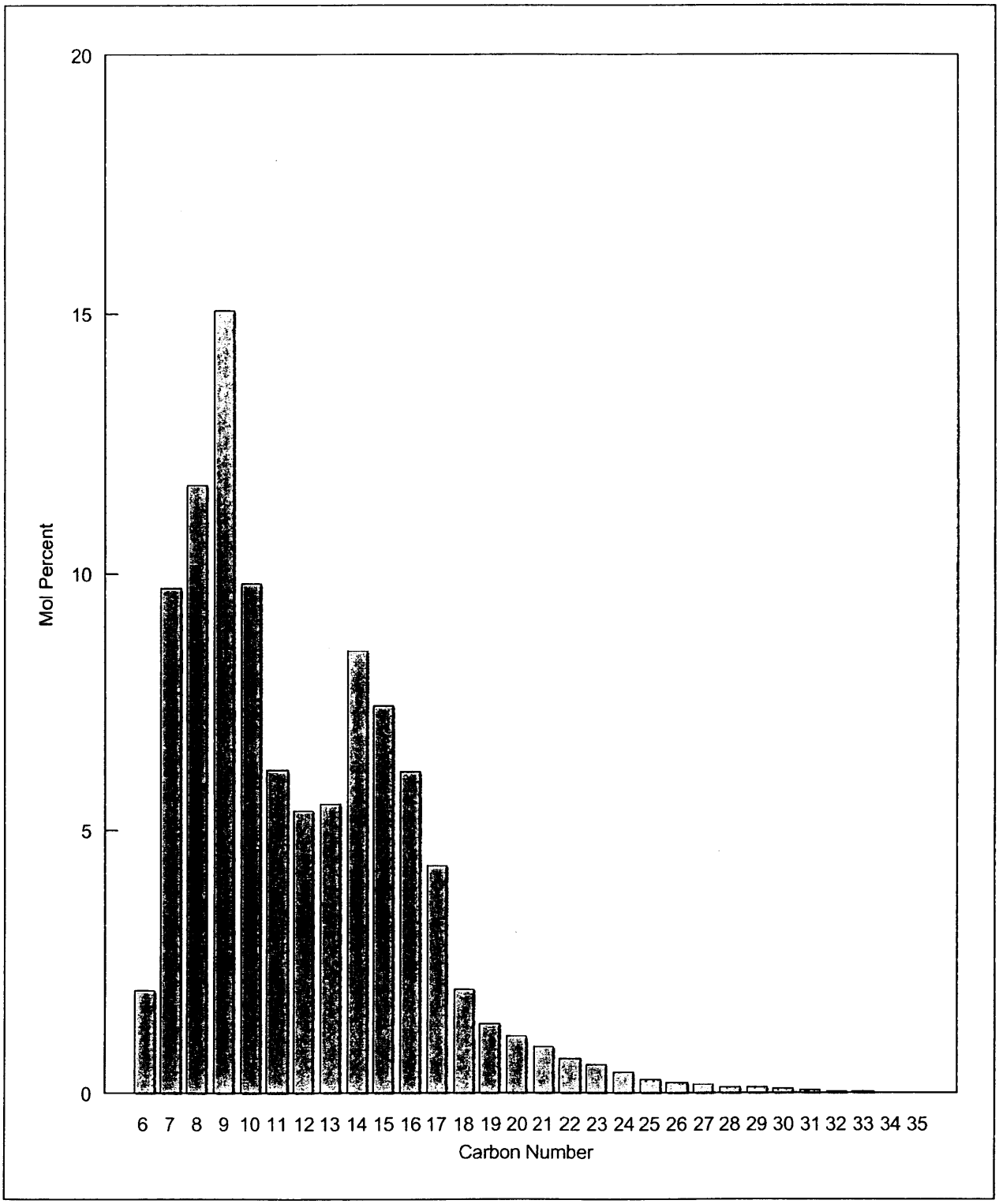
FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY

On Stock Tank Oil from atmospheric flash of sample in cylinder # 84062103 - Bottom Gas @ 3146.5 m



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Company : Esso Australia Limited
Well : Scallop # 1

COMPOSITIONAL ANALYSIS OF RESERVOIR FLUID

Cylinder # 84062103 - Bottom Gas @ 3146.5 m

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.06	3.89	3.73
Nitrogen	N2	0.00	0.30	0.29
Methane	C1	0.47	81.67	78.19
Ethane	C2	0.25	7.50	7.19
Propane	C3	0.39	3.24	3.12
Iso-Butane	iC4	0.14	0.48	0.47
N-Butane	nC4	0.37	0.87	0.85
Iso-Pentane	iC5	0.32	0.28	0.28
N-Pentane	nC5	0.42	0.29	0.30
Hexanes	C6	1.94	0.40	0.47
Heptanes	C7	9.48	0.62	1.00
Octanes	C8	11.44	0.31	0.79
Nonanes	C9	14.72	0.13	0.76
Decanes	C10	9.57	0.02	0.43
Undecanes	C11	6.07	0.00	0.26
Dodecanes Plus	C12+	44.36	0.00	1.87
TOTAL		100.00	100.00	100.00

Ratios				
Molar Ratio	:	0.0429	0.9571	1.0000
Mass Ratio	:	0.2511	0.7489	1.0000
Liquid Ratio (bbl/bbl)	:	1.0000 @ SC	--	6.4413 @ PT*
Gas Liquid Ratio	:	1.0000 bbl @ SC	14955 SCF	--
Stream Properties				
Molecular Weight	:	158.8	21.23	27.13
Density obs. (gm/cc)	:	0.8003 @ 60 °F	--	0.4964 @ PT*
Gravity (AIR = 1.000)	:	45.1 °API @ 60 °F	0.735	153.3
GHV (BTU/scf)	:	--	1193	--
Hexanes Plus Properties				
Mol %	:	97.58	1.48	5.58
Molecular Weight	:	161.6	97.8	145.4
Density (gm/cc @ 60 °F)	:	0.8033	0.6861	0.7806
Gravity (°API @ 60 °F)	:	44.5	74.5	49.6
Heptanes Plus Properties				
Mol %	:	95.65	1.08	5.11
Molecular Weight	:	163.1	102.9	151.0
Density (gm/cc @ 60 °F)	:	0.8047	0.6928	0.7873
Gravity (°API @ 60 °F)	:	44.2	72.5	48.1
Decanes Plus Properties				
Mol %	:	60.00	0.02	2.56
Molecular Weight	:	194.8	133.9	194.3
Density (gm/cc @ 60 °F)	:	0.8257	0.7277	0.8252
Gravity (°API @ 60 °F)	:	39.7	62.8	39.8
Undecanes Plus Properties				
Mol %	:	50.43	0.00	2.13
Molecular Weight	:	206.3	--	206.3
Density (gm/cc @ 60 °F)	:	0.8320	--	0.8320
Gravity (°API @ 60 °F)	:	38.4	--	38.4
Dodecanes Plus Properties				
Mol %	:	44.36	0.00	1.87
Molecular Weight	:	214.4	--	214.4
Density (gm/cc @ 60 °F)	:	0.8363	--	0.8363
Gravity (°API @ 60 °F)	:	37.5	--	37.5

* (P)ressure : 6000 psig * (T)emperature : 81 °F

DEW POINT PRESSURE : 5150 @ 118 ° C

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FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY

On Stock Tank Oil from atmospheric flash of sample in cylinder # 841218 - Middle Gas @ 3120.5 m

Component		Mol %
Hexanes minus	C6-	1.84
Hexanes	C6	2.47
Heptanes	C7	10.08
Octanes	C8	8.98
Nonanes	C9	12.94
Decanes	C10	11.16
Undecanes	C11	8.05
Dodecanes	C12	6.28
Tridecanes	C13	5.88
Tetradecanes	C14	4.95
Pentadecanes	C15	5.14
Hexadecanes	C16	3.53
Heptadecanes	C17	4.13
Octadecanes	C18	2.52
Nonadecanes	C19	2.08
Eicosanes	C20	1.82
Heneicosanes	C21	1.74
Docosanes	C22	1.38
Tricosanes	C23	1.24
Tetracosanes	C24	1.05
Pentacosanes	C25	0.87
Hexacosanes	C26	0.63
Heptacosanes	C27	0.48
Octacosanes	C28	0.29
Nonacosanes	C29	0.23
Triacontanes	C30	0.13
Hentriacontanes	C31	0.08
Dotriacontanes	C32	0.03
Tritriacontanes	C33	0.00
Tetratriacontanes	C34	0.00
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

Molecular Weight Calculated *	:	167.2
Density @ 60 °F Calculated *	:	0.8065
Molecular Weight Measured	:	--
Density @ 60 °F Measured	:	0.8065

*Calculation based on generalized properties as published by Katz and Firoozabadi

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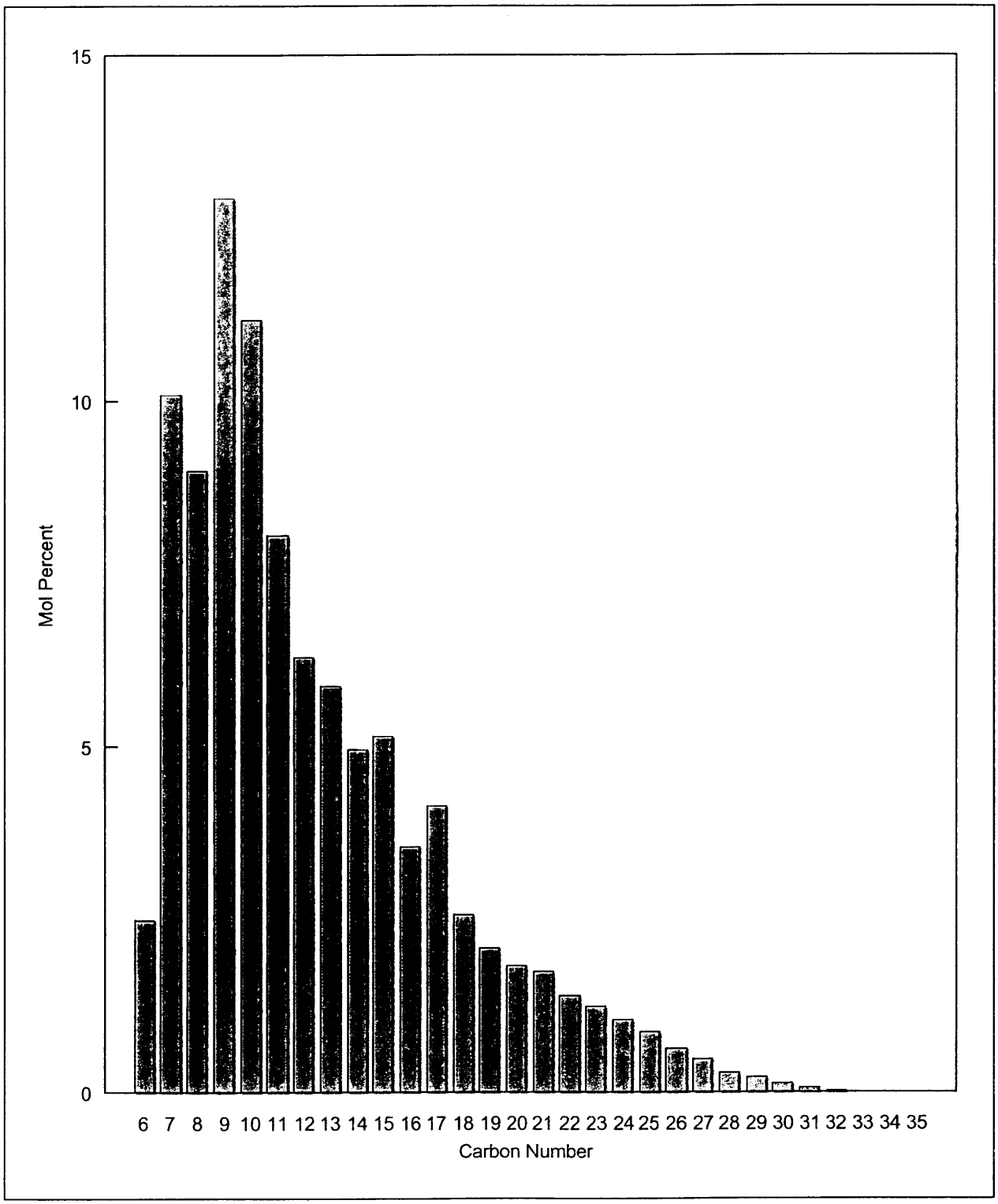
FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY

On Stock Tank Oil from atmospheric flash of sample in cylinder # 841218 - Middle Gas @ 3120.5 m



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COMPOSITIONAL ANALYSIS OF RESERVOIR FLUID

Cylinder # 841218 - Middle Gas @ 3120.5 m

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.26	17.55	17.37
Nitrogen	N2	0.00	0.13	0.13
Methane	C1	0.42	70.77	70.04
Ethane	C2	0.21	5.97	5.91
Propane	C3	0.34	2.68	2.66
Iso-Butane	iC4	0.15	0.46	0.46
N-Butane	nC4	0.31	0.66	0.66
Iso-Pentane	iC5	0.35	0.28	0.28
N-Pentane	nC5	0.43	0.27	0.27
Hexanes	C6	2.45	0.37	0.39
Heptanes	C7	10.02	0.54	0.64
Octanes	C8	8.92	0.21	0.30
Nonanes	C9	12.86	0.10	0.23
Decanes	C10	11.09	0.01	0.13
Undecanes	C11	8.00	0.00	0.08
Dodecanes Plus	C12+	44.20	0.00	0.45
TOTAL		100.00	100.00	100.00
Ratios				
Molar Ratio	:	0.0104	0.9896	1.0000
Mass Ratio	:	0.0669	0.9331	1.0000
Liquid Ratio (bbl/bbl)	:	1.0000 @ SC	--	23.8902 @ PT*
Gas Liquid Ratio	:	1.0000 bbl @ SC	61527 SCF	--
Stream Properties				
Molecular Weight	:	165.5	24.33	25.80
Density obs. (gm/cc)	:	0.8062 @ 60 °F	--	0.5069 @ PT*
Gravity (AIR = 1.000)	:	43.8 °API @ 60 °F	0.843	147.4
GHV (BTU/scf)	:	--	1018	--
Hexanes Plus Properties				
Mol %	:	97.53	1.23	2.22
Molecular Weight	:	168.5	96.6	129.3
Density (gm/cc @ 60 °F)	:	0.8089	0.6845	0.7532
Gravity (°API @ 60 °F)	:	43.3	75.0	56.2
Heptanes Plus Properties				
Mol %	:	95.08	0.86	1.83
Molecular Weight	:	170.6	102.0	138.9
Density (gm/cc @ 60 °F)	:	0.8108	0.6918	0.7660
Gravity (°API @ 60 °F)	:	42.9	72.9	53.0
Decanes Plus Properties				
Mol %	:	63.29	0.01	0.66
Molecular Weight	:	201.5	133.9	200.5
Density (gm/cc @ 60 °F)	:	0.8301	0.7277	0.8290
Gravity (°API @ 60 °F)	:	38.8	62.8	39.0
Undecanes Plus Properties				
Mol %	:	52.20	0.00	0.53
Molecular Weight	:	215.8	--	215.8
Density (gm/cc @ 60 °F)	:	0.8375	--	0.8375
Gravity (°API @ 60 °F)	:	37.3	--	37.3
Dodecanes Plus Properties				
Mol %	:	44.20	0.00	0.45
Molecular Weight	:	228.3	--	228.3
Density (gm/cc @ 60 °F)	:	0.8436	--	0.8436
Gravity (°API @ 60 °F)	:	36.1	--	36.1

* (P)ressure : 6000 psig * (T)emperature : 81 °F

DEW POINT PRESSURE : 4395 @ 117 ° C

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FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY

On Stock Tank Oil from atmospheric flash of sample in cylinder # 84062404 - Top Gas @ 3109 m

Component		Mol %
Hexanes minus	C6-	1.27
Hexanes	C6	1.72
Heptanes	C7	7.51
Octanes	C8	9.05
Nonanes	C9	14.27
Decanes	C10	11.11
Undecanes	C11	7.84
Dodecanes	C12	6.50
Tridecanes	C13	6.76
Tetradecanes	C14	5.88
Pentadecanes	C15	5.53
Hexadecanes	C16	4.33
Heptadecanes	C17	4.06
Octadecanes	C18	2.72
Nonadecanes	C19	2.10
Eicosanes	C20	1.94
Heneicosanes	C21	1.68
Docosanes	C22	1.43
Tricosanes	C23	1.26
Tetracosanes	C24	0.98
Pentacosanes	C25	0.77
Hexacosanes	C26	0.50
Heptacosanes	C27	0.36
Octacosanes	C28	0.19
Nonacosanes	C29	0.13
Triacontanes	C30	0.06
Hentriacontanes	C31	0.03
Dotriacontanes	C32	0.02
Tritriacontanes	C33	0.00
Tetratriacontanes	C34	0.00
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

Molecular Weight Calculated *	:	169.2
Density @ 60 °F Calculated *	:	0.8082
Molecular Weight Measured	:	--
Density @ 60 °F Measured	:	0.8082

*Calculation based on generalized properties as published by Katz and Firoozabadi

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FINGERPRINT ANALYSIS
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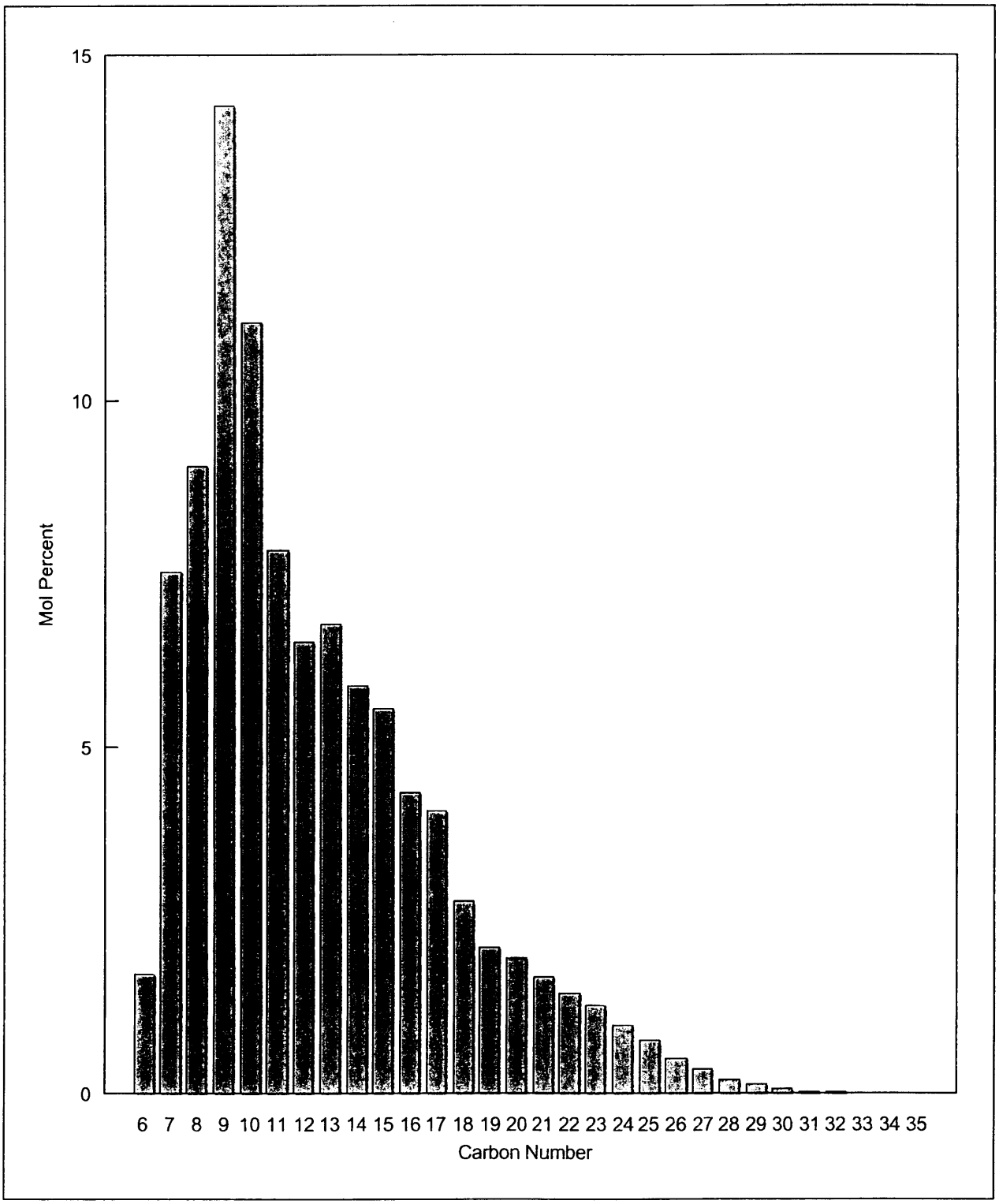
On Stock Tank Oil from atmospheric flash of sample in cylinder # 84062404 - Top Gas @ 3109 m



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COMPOSITIONAL ANALYSIS OF RESERVOIR FLUID

Cylinder # 84062404 - Top Gas @ 3109 m

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.26	17.59	17.44
Nitrogen	N2	0.00	0.12	0.12
Methane	C1	0.42	71.15	70.52
Ethane	C2	0.20	5.75	5.70
Propane	C3	0.31	2.42	2.40
Iso-Butane	iC4	0.13	0.39	0.39
N-Butane	nC4	0.31	0.67	0.67
Iso-Pentane	iC5	0.27	0.22	0.22
N-Pentane	nC5	0.35	0.22	0.22
Hexanes	C6	1.70	0.33	0.34
Heptanes	C7	7.43	0.57	0.63
Octanes	C8	8.96	0.32	0.40
Nonanes	C9	14.13	0.19	0.31
Decanes	C10	11.00	0.05	0.15
Undecanes	C11	7.76	0.01	0.08
Dodecanes Plus	C12+	46.76	0.00	0.41
TOTAL		100.00	100.00	100.00

Ratios				
Molar Ratio	:	0.0089	0.9911	1.0000
Mass Ratio	:	0.0579	0.9421	1.0000
Liquid Ratio (bbl/bbl)	:	1.0000 @ SC	--	27.6314 @ PT*
Gas Liquid Ratio	:	1.0000 bbl @ SC	71567 SCF	--
Stream Properties				
Molecular Weight	:	167.2	24.40	25.67
Density obs. (gm/cc)	:	0.8075 @ 60 °F	--	0.5064 @ PT*
Gravity (AIR = 1.000)	:	43.6 °API @ 60 °F	0.845	147.6
GHV (BTU/scf)	:	--	1021	--
Hexanes Plus Properties				
Mol %	:	97.74	1.47	2.32
Molecular Weight	:	170.0	100.6	126.5
Density (gm/cc @ 60 °F)	:	0.8100	0.6899	0.7454
Gravity (°API @ 60 °F)	:	43.0	73.4	58.2
Heptanes Plus Properties				
Mol %	:	96.04	1.14	1.98
Molecular Weight	:	171.5	105.4	133.8
Density (gm/cc @ 60 °F)	:	0.8112	0.6960	0.7552
Gravity (°API @ 60 °F)	:	42.8	71.6	55.7
Decanes Plus Properties				
Mol %	:	65.52	0.06	0.64
Molecular Weight	:	199.8	136.1	193.7
Density (gm/cc @ 60 °F)	:	0.8289	0.7299	0.8216
Gravity (°API @ 60 °F)	:	39.0	62.2	40.6
Undecanes Plus Properties				
Mol %	:	54.52	0.01	0.49
Molecular Weight	:	213.1	146.9	211.7
Density (gm/cc @ 60 °F)	:	0.8359	0.7399	0.8344
Gravity (°API @ 60 °F)	:	37.6	59.6	37.9
Dodecanes Plus Properties				
Mol %	:	46.76	0.00	0.41
Molecular Weight	:	224.0	--	224.0
Density (gm/cc @ 60 °F)	:	0.8413	--	0.8413
Gravity (°API @ 60 °F)	:	36.5	--	36.5

* (P)ressure : 6000 psig * (T)emperature : 81 °F

DEW POINT PRESSURE : 4820 @ 117 ° C

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Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 3385 psig @ 26 ° C

Sample # 7a

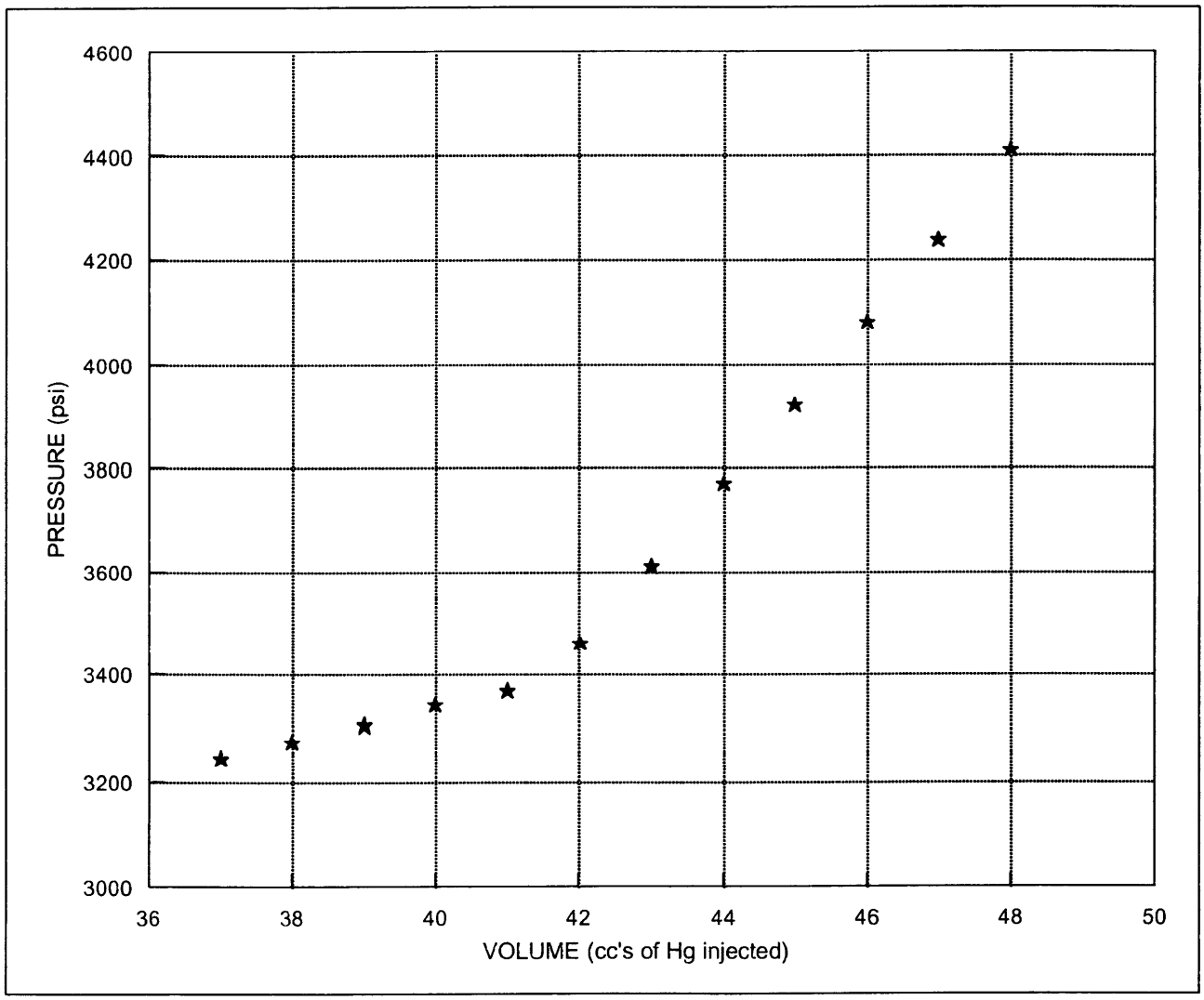
Sampling Conditions

Date	:	February 25, 2003
Reservoir Pressure	:	4093.2 psia
Reservoir Temperature	:	109.3 ° C

Sampler ID	:	MDT - BA 36
Volume	:	1 Gallon
Depth	:	2840 m

Tranferred into Cylinder #	:	84062601

Volume (cc's)	Pressure (psi)
48.00	4410
47.00	4240
46.00	4080
45.00	3920
44.00	3770
43.00	3610
42.00	3460
41.00	3370
40.00	3340
39.00	3305
38.00	3275
37.00	3245



PETROLAB

Company : Esso Australia Limited	Page : 14 of 47
Well : Scallop # 1	File : E - 23004

Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 3380 psig @ 26 ° C

Sample # 7b

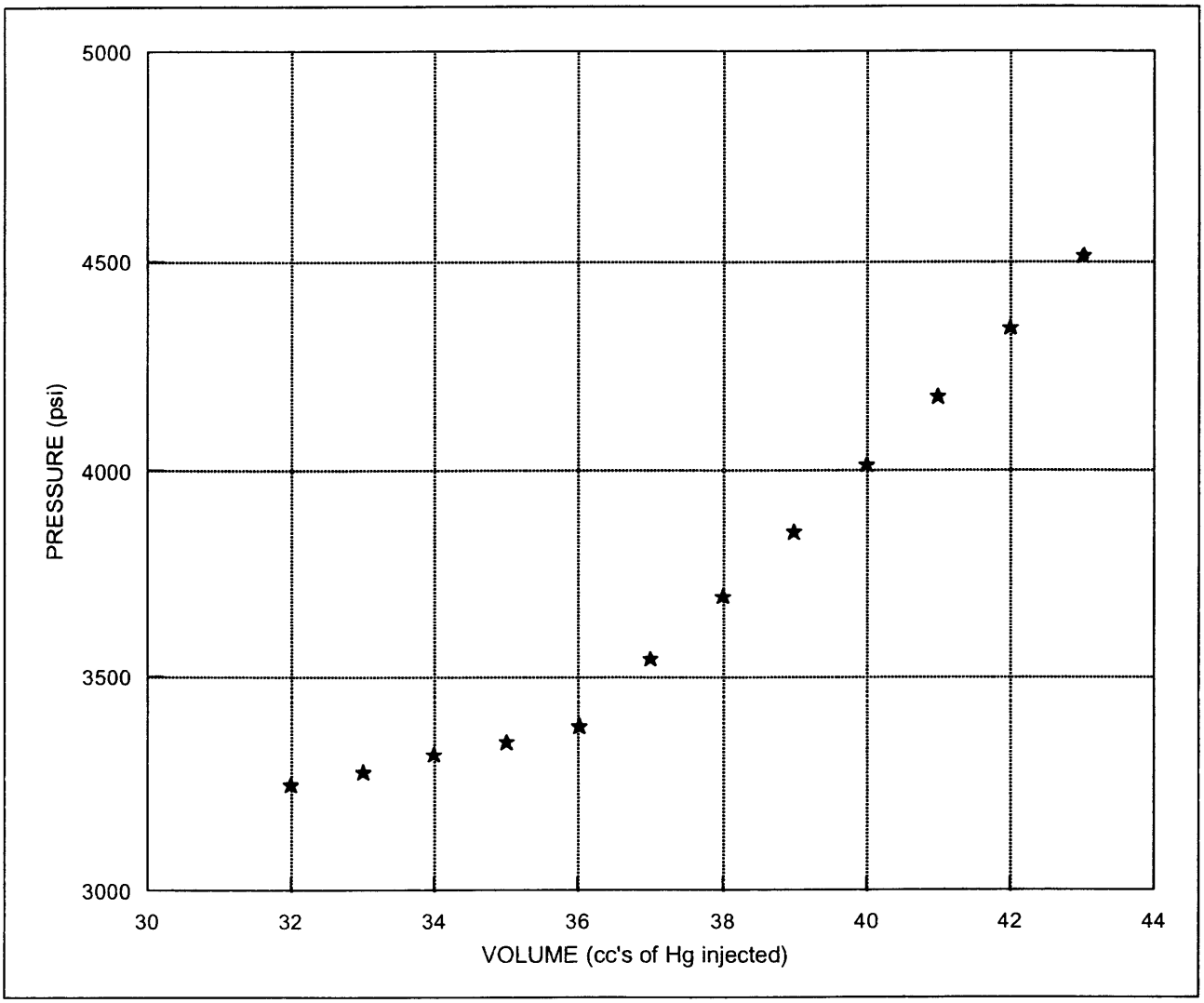
Sampling Conditions

Date	:	February 25, 2003
Reservoir Pressure	:	4093.2 psia
Reservoir Temperature	:	109.3 ° C

Sampler ID	:	MDT - BA 36
Volume	:	1 Gallon
Depth	:	2840 m

Tranferred into Cylinder #	:	84103217

Volume (cc's)	Pressure (psi)
43.00	4510
42.00	4340
41.00	4175
40.00	4010
39.00	3850
38.00	3695
37.00	3540
36.00	3390
35.00	3350
34.00	3320
33.00	3280
32.00	3250



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Company : Esso Australia Limited	Page : 15 of 47
Well : Scallop # 1	File : E - 23004

Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 3390 psig @ 26 ° C

Sample # 7c

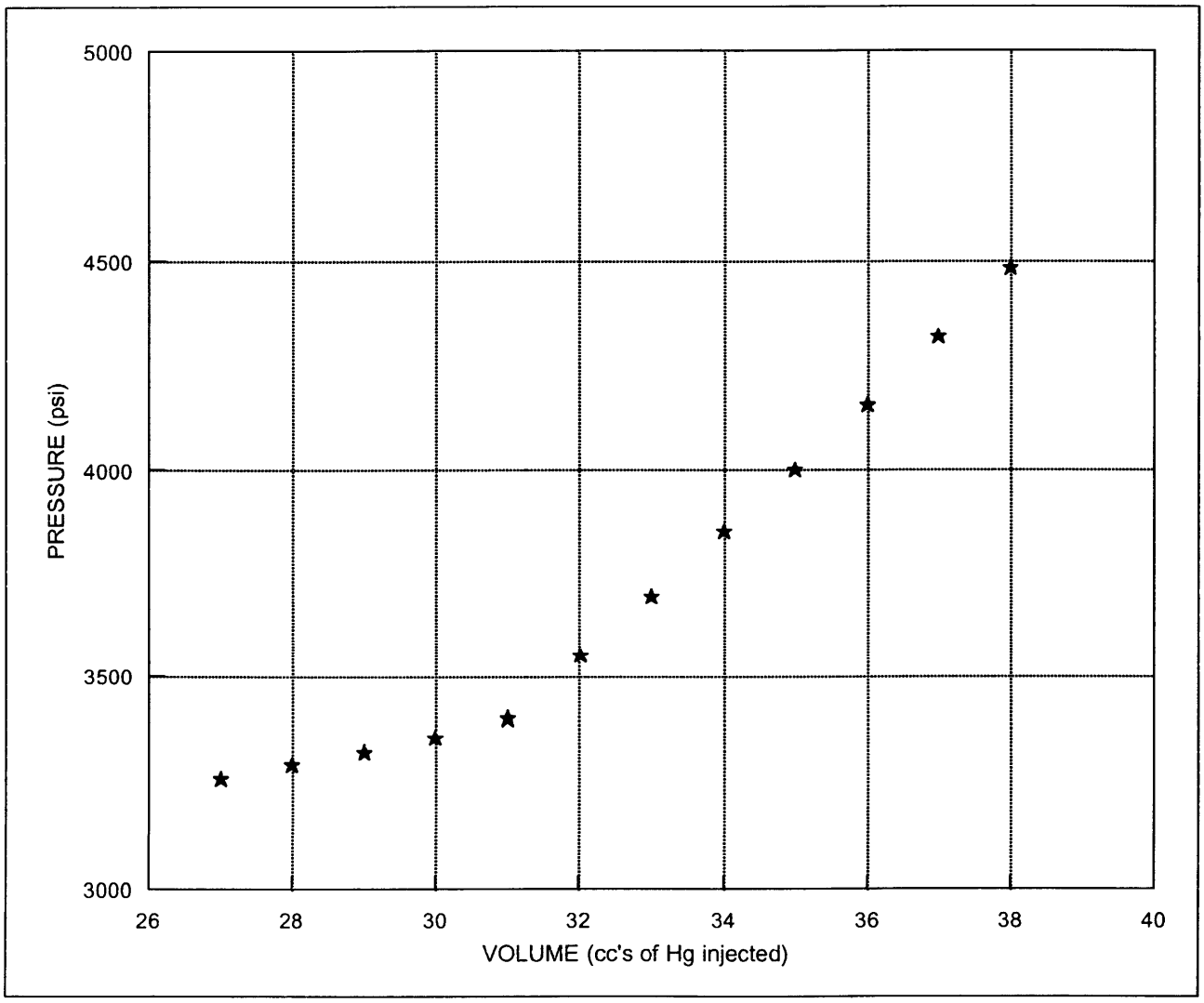
Sampling Conditions

Date	:	February 25, 2003
Reservoir Pressure	:	4093.2 psia
Reservoir Temperature	:	109.3 ° C

Sampler ID	:	MDT - BA 36
Volume	:	1 Gallon
Depth	:	2840 m

Tranferred into Cylinder #	:	84093202

Volume (cc's)	Pressure (psi)
38.00	4480
37.00	4320
36.00	4155
35.00	4000
34.00	3850
33.00	3695
32.00	3550
31.00	3400
30.00	3360
29.00	3325
28.00	3295
27.00	3265



PETROLAB

Company : Esso Australia Limited	Page : 16 of 47
Well : Scallop # 1	File : E - 23004

Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 3385 psig @ 26 ° C

Sample # 7d

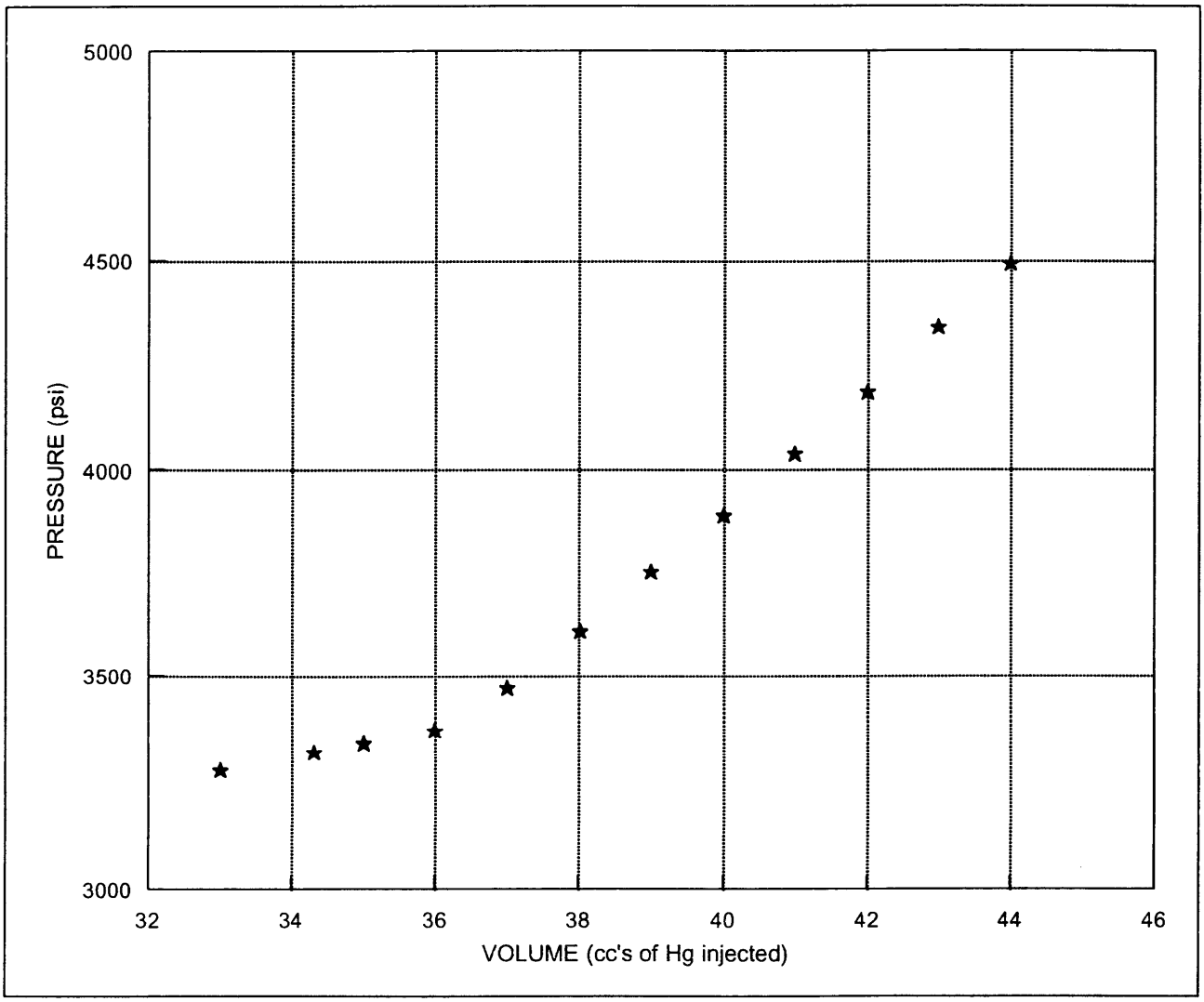
Sampling Conditions

Date	:	February 25, 2003
Reservoir Pressure	:	4093.2 psia
Reservoir Temperature	:	109.3 ° C

Sampler ID	:	MDT - BA 36
Volume	:	1 Gallon
Depth	:	2840 m

Tranferred into Cylinder #	:	84063609

Volume (cc's)	Pressure (psi)
44.00	4490
43.00	4340
42.00	4185
41.00	4035
40.00	3890
39.00	3755
38.00	3610
37.00	3470
36.00	3375
35.00	3345
34.30	3325
33.00	3285



PETROLAB

Company : Esso Australia Limited	Page : 17 of 47
Well : Scallop # 1	File : E - 23004

Reservoir Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 3960 psig @ 109 ° C

Sample # 7a

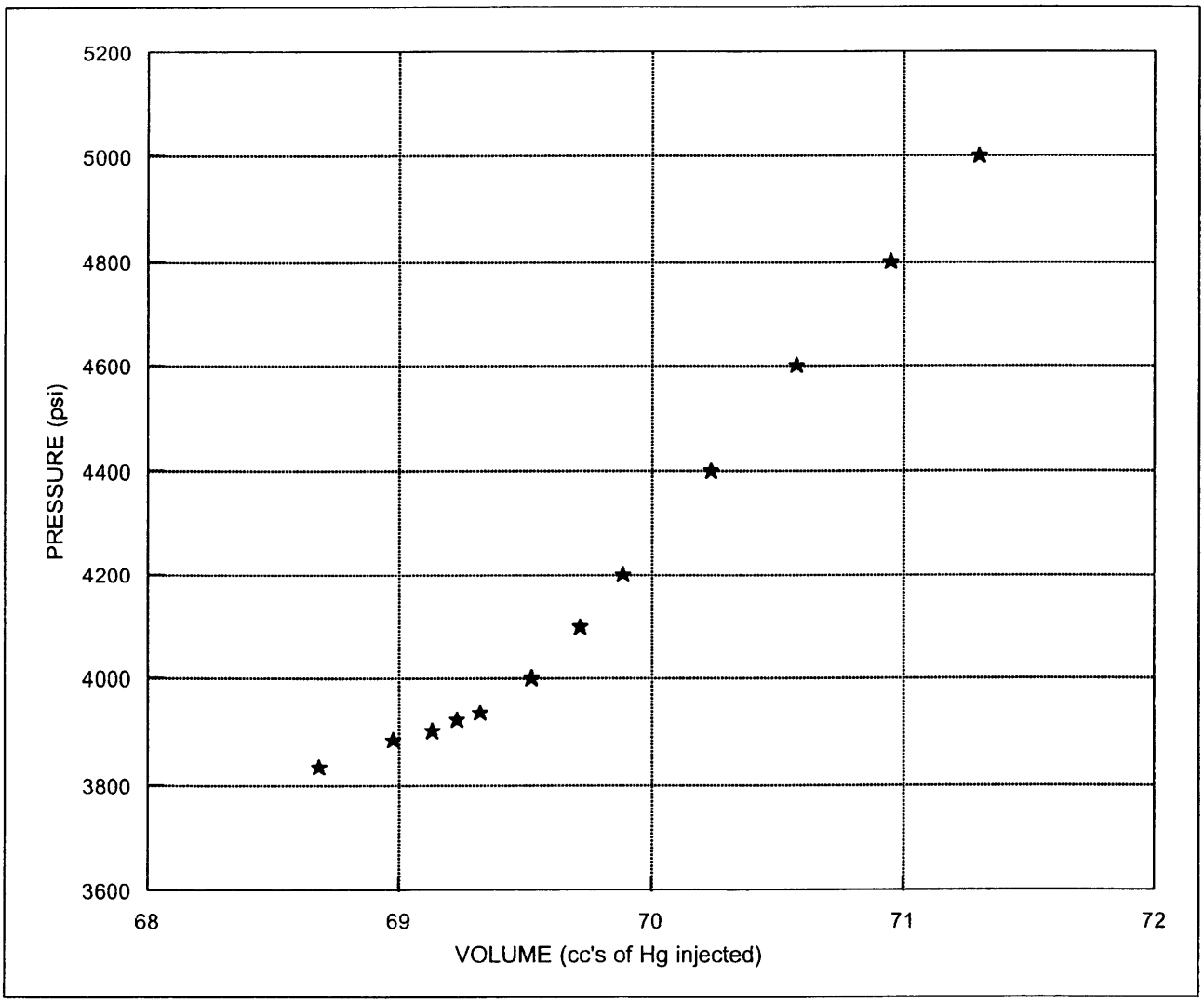
Sampling Conditions

Date	:	February 25, 2003
Reservoir Pressure	:	4093.2 psia
Reservoir Temperature	:	109.3 ° C

Sampler ID	:	MDT - BA 36
Volume	:	1 Gallon
Depth	:	2840 m

Tranferred into Cylinder #	:	84062601

Volume (cc's)	Pressure (psi)
71.30	5000
70.95	4800
70.58	4600
70.24	4400
69.89	4200
69.72	4100
69.53	4000
69.32	3933
69.23	3920
69.13	3902
68.98	3883
68.68	3832



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Company : Esso Australia Limited
Well : Scallop # 1

FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY

On Stock Tank Oil from atmospheric flash of sample in cylinder # 84062601 - Bottom Oil @ 2840 m

Component		Mol %
Hexanes minus	C6-	6.85
Hexanes	C6	5.66
Heptanes	C7	13.20
Octanes	C8	7.41
Nonanes	C9	7.71
Decanes	C10	6.13
Undecanes	C11	4.40
Dodecanes	C12	3.59
Tridecanes	C13	3.99
Tetradecanes	C14	3.45
Pentadecanes	C15	4.03
Hexadecanes	C16	3.37
Heptadecanes	C17	4.04
Octadecanes	C18	2.81
Nonadecanes	C19	2.36
Eicosanes	C20	2.41
Heneicosanes	C21	2.38
Docosanes	C22	2.26
Tricosanes	C23	2.30
Tetracosanes	C24	2.18
Pentacosanes	C25	2.18
Hexacosanes	C26	1.89
Heptacosanes	C27	1.81
Octacosanes	C28	1.28
Nonacosanes	C29	1.04
Triacontanes	C30	0.61
Hentriacontanes	C31	0.39
Dotriacontanes	C32	0.15
Tritriacontanes	C33	0.12
Tetratriacontanes	C34	0.00
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

Molecular Weight Calculated *	:	182.5
Density @ 60 °F Calculated *	:	0.8168
Molecular Weight Measured	:	--
Density @ 60 °F Measured	:	0.8215

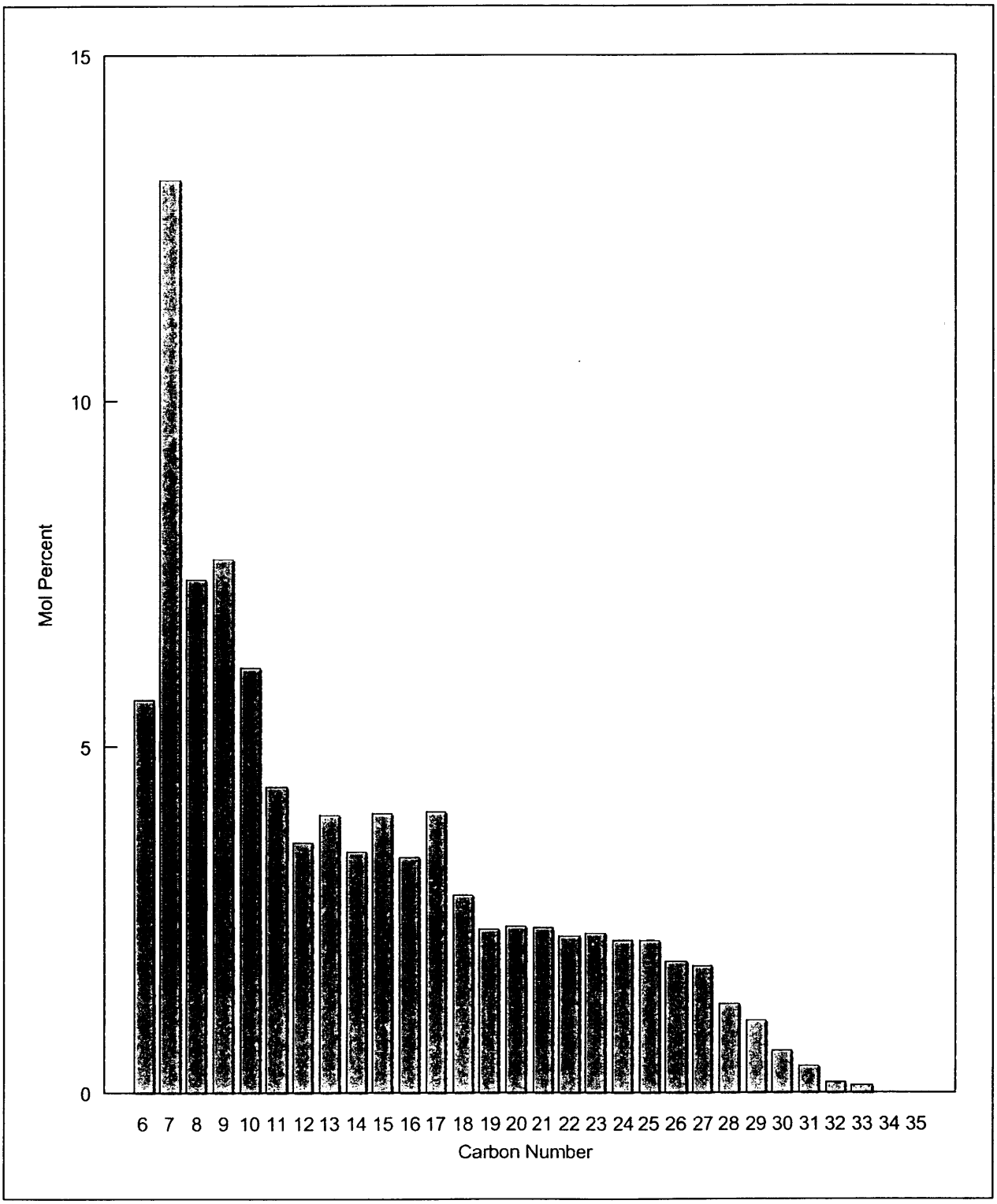
*Calculation based on generalized properties as published by Katz and Firoozabadi

PETROLAB

Company : Esso Australia Limited	Page : 19 of 47
Well : Scallop # 1	File : E - 23004

FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY

On Stock Tank Oil from atmospheric flash of sample in cylinder # 84062601 - Bottom Oil @ 2840 m



PETROLAB

Company : Esso Australia Limited	Page : 20 of 47
Well : Scallop # 1	File : E - 23004

COMPOSITIONAL ANALYSIS OF RESERVOIR FLUID

Cylinder # 84062601 - Bottom Oil @ 2840 m

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.05	3.14	2.20
Nitrogen	N2	0.00	0.15	0.10
Methane	C1	0.42	70.65	49.41
Ethane	C2	0.37	10.34	7.32
Propane	C3	1.00	7.70	5.67
Iso-Butane	iC4	0.48	1.46	1.16
N-Butane	nC4	1.36	2.87	2.41
Iso-Pentane	iC5	1.19	0.94	1.02
N-Pentane	nC5	1.50	0.92	1.10
Hexanes	C6	5.69	0.92	2.36
Heptanes	C7	13.27	0.71	4.51
Octanes	C8	7.45	0.14	2.35
Nonanes	C9	7.75	0.05	2.38
Decanes	C10	6.16	0.01	1.87
Undecanes	C11	4.42	0.00	1.34
Dodecanes Plus	C12+	48.90	0.00	14.80
TOTAL		100.00	100.00	100.00

Ratios				
Molar Ratio	:	0.3024	0.6976	1.0000
Mass Ratio	:	0.7613	0.2387	1.0000
Liquid Ratio (bbl/bbl)	:	1.0000 @ SC	--	1.8489 @ PT*
Gas Liquid Ratio	:	1.0000 bbl @ SC	1375 SCF	--
Stream Properties				
Molecular Weight	:	182.5	24.80	72.49
Density obs. (gm/cc)	:	0.8179 @ 60 °F	--	0.5819 @ PT*
Gravity (AIR = 1.000)	:	41.3 °API @ 60 °F	0.860	111.4
GHV (BTU/scf)	:	--	1409	--
Hexanes Plus Properties				
Mol %	:	93.64	1.83	29.61
Molecular Weight	:	191.0	91.7	186.7
Density (gm/cc @ 60 °F)	:	0.8251	0.6776	0.8213
Gravity (°API @ 60 °F)	:	39.8	77.1	40.6
Heptanes Plus Properties				
Mol %	:	87.96	0.91	27.25
Molecular Weight	:	197.9	99.5	195.6
Density (gm/cc @ 60 °F)	:	0.8298	0.6884	0.8277
Gravity (°API @ 60 °F)	:	38.9	73.8	39.3
Decanes Plus Properties				
Mol %	:	59.49	0.01	18.01
Molecular Weight	:	242.1	133.9	242.1
Density (gm/cc @ 60 °F)	:	0.8511	0.7277	0.8511
Gravity (°API @ 60 °F)	:	34.6	62.8	34.6
Undecanes Plus Properties				
Mol %	:	53.32	0.00	16.14
Molecular Weight	:	254.6	--	254.6
Density (gm/cc @ 60 °F)	:	0.8560	--	0.8560
Gravity (°API @ 60 °F)	:	33.6	--	33.6
Dodecanes Plus Properties				
Mol %	:	48.90	0.00	14.80
Molecular Weight	:	264.3	--	264.3
Density (gm/cc @ 60 °F)	:	0.8597	--	0.8597
Gravity (°API @ 60 °F)	:	32.9	--	32.9

* (P)ressure : 3960 psig * (T)emperature : 229 °F

PETROLAB

Company : Esso Australia Limited
Well : Scallop # 1

DISTILLATION OF STOCK TANK LIQUID SAMPLE

(Hexanes to Eicosanes Plus)
ON STOCK TANK OIL FLASHED FROM CYLINDER # 84062601 - Bottom Oil @ 2840 m

		Cut (°C)	Mol %	Weight	Weight %	Volume %	Density (gm/cc)	API Gravity
Hexanes	C6	59 - 84	5.68	92	2.50	2.98	0.6920	72.8
Heptanes	C7	85 - 112	12.17	97	5.65	6.20	0.7527	56.3
Octanes	C8	113 - 138	8.83	107	4.52	4.85	0.7700	52.1
Nonanes	C9	139 - 162	7.26	119	4.15	4.33	0.7917	47.1
Decanes	C10	163 - 185	6.29	132	3.97	4.12	0.7958	46.1
Undecanes	C11	186 - 206	4.47	145	3.12	3.22	0.8005	45.1
Dodecanes	C12	207 - 227	3.60	160	2.76	2.83	0.8054	44.0
Tridecanes	C13	228 - 246	4.00	174	3.34	3.40	0.8102	43.0
Tetradecanes	C14	247 - 263	3.56	187	3.20	3.25	0.8151	41.9
Pentadecanes	C15	264 - 280	4.18	200	4.01	4.04	0.8202	40.9
Hexadecanes	C16	281 - 296	3.50	214	3.58	3.58	0.8260	39.6
Heptadecanes	C17	297 - 312	4.17	228	4.55	4.53	0.8308	38.7
Octadecanes	C18	313 - 322	2.87	242	3.33	3.28	0.8377	37.3
Nonadecanes	C19	323 - 335	2.36	256	2.90	2.84	0.8435	36.1
Eicosanes Plus	C20+	> 336	27.06	373	48.42	46.55	0.8588	33.1
	TOTAL		100.00		100.00	100.00		

PETROLAB

Company : Esso Australia Limited	Page : 22 of 47
Well : Scallop # 1	File : E - 23004

COMPOSITIONAL ANALYSIS OF RESERVOIR FLUID IN CYLINDER # 84062601 - Bottom Oil @ 2840 m

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.05	3.14	2.26
Nitrogen	N2	0.00	0.15	0.11
Methane	C1	0.42	70.65	50.64
Ethane	C2	0.37	10.34	7.50
Propane	C3	1.00	7.70	5.79
Iso-Butane	iC4	0.48	1.46	1.18
N-Butane	nC4	1.36	2.87	2.44
Iso-Pentane	iC5	1.19	0.94	1.01
N-Pentane	nC5	1.50	0.92	1.08
Hexanes	C6	5.33	0.92	2.18
Heptanes	C7	11.40	0.71	3.76
Octanes	C8	8.27	0.14	2.46
Nonanes	C9	6.79	0.05	1.97
Decanes	C10	5.89	0.01	1.68
Undecanes	C11	4.19	0.00	1.19
Dodecanes	C12	3.37	0.00	0.96
Tridecanes	C13	3.74	0.00	1.07
Tetradecanes	C14	3.33	0.00	0.95
Pentadecanes	C15	3.92	0.00	1.12
Hexadecanes	C16	3.27	0.00	0.93
Heptadecanes	C17	3.90	0.00	1.11
Octadecanes	C18	2.69	0.00	0.77
Nonadecanes	C19	2.21	0.00	0.63
Eicosanes Plus	C20+	25.34	0.00	7.21
TOTAL		100.00	100.00	100.00

Ratios				
Molar Ratio	:	0.2849	0.7151	1.0000
Mass Ratio	:	0.7616	0.2384	1.0000
Liquid Ratio (bbl/bbl)	:	1.0000 @ SC	--	1.8469 @ PT*
Gas Liquid Ratio	:	1.0000 bbl @ SC	1375 SCF	--

Stream Properties					
Molecular Weight	210.56	:	198.9	24.80	74.46
Density obs. (gm/cc)	0.825	:	0.8192 @ 60 °F	--	0.5832 @ PT*
Gravity (AIR = 1.000)		:	41.1 °API @ 60 °F	0.860	110.9 °API
GHV (BTU/scf)		:	--	1409	--

Hexanes Plus Properties			
Mol %	:	93.64	1.83	27.99
Molecular Weight	:	208.52	95.76	203.22
Density (gm/cc @ 60 °F)	:	0.8258	0.6834	0.8221
Gravity (°API @ 60 °F)	:	39.67	75.36	40.46

Heptanes Plus Properties				
Mol %	:	88.31	0.91	25.81
Molecular Weight	:	215.58	99.94	212.67
Density (gm/cc @ 60 °F)	:	0.8300	0.6890	0.8280
Gravity (°API @ 60 °F)	:	38.83	73.67	39.24

Dodecanes Plus Properties				
Mol %	:	51.77	0.00	14.75
Molecular Weight	:	286.96	--	286.96
Density (gm/cc @ 60 °F)	:	0.8457	--	0.8457
Gravity (°API @ 60 °F)	:	35.65	--	35.65

Eicosanes Plus Properties				
Mol %	:	25.34	0.00	7.21
Molecular Weight	:	373.00	--	373.00
Density (gm/cc @ 60 °F)	:	0.8588	--	0.8588
Gravity (°API @ 60 °F)	:	33.11	--	33.11

* (P)ressure : 3960 psig * (T)emperature : 229 °F

PETROLAB

Company : Esso Australia Limited	Page : 23 of 47
Well : Scallop # 1	File : E - 23004

Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 4010 psig @ 26 ° C

Sample # 8

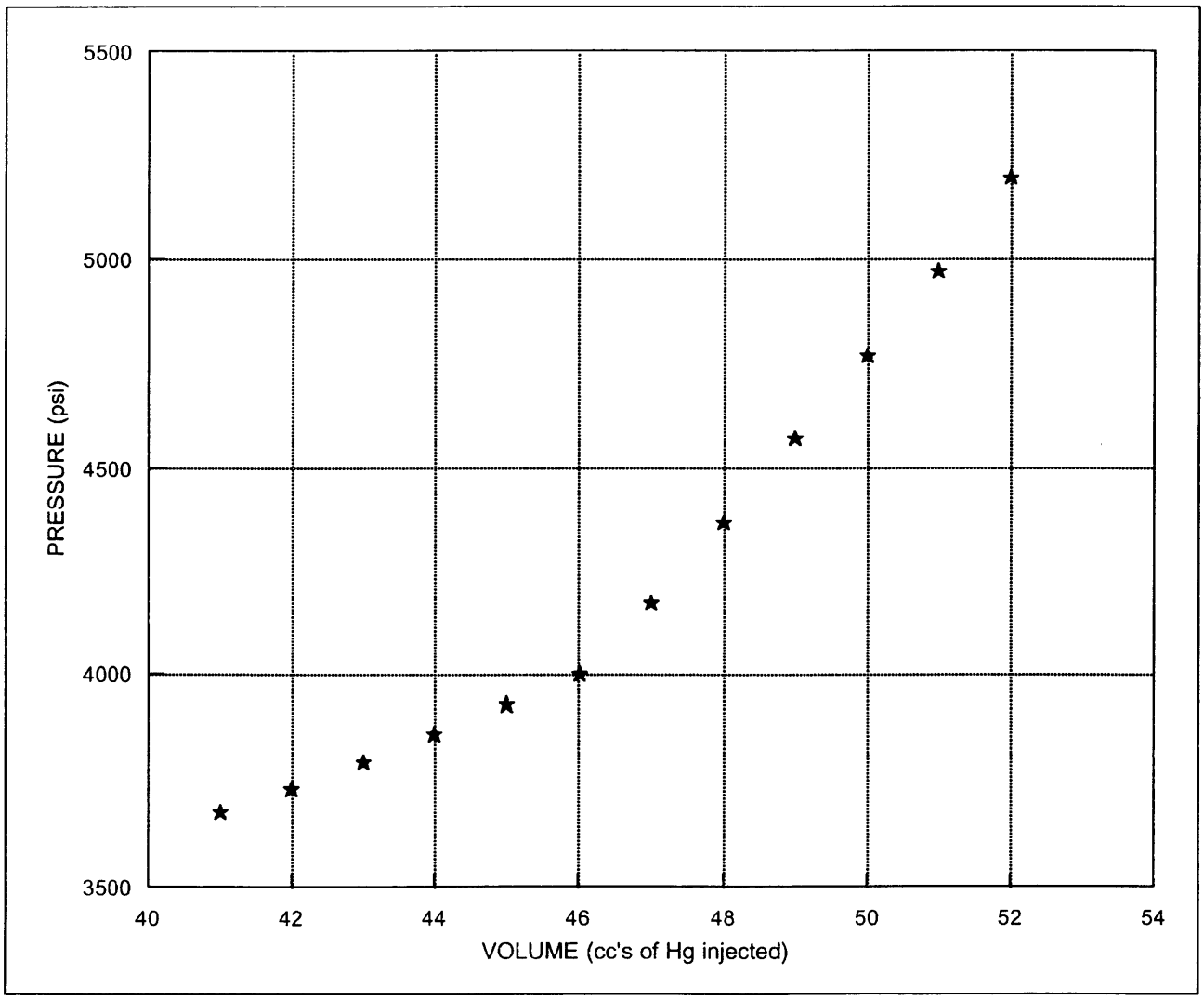
Sampling Conditions

Date	:	February 25, 2003
Reservoir Pressure	:	4092.7 psia
Reservoir Temperature	:	108.07 ° C

Sampler ID	:	MPSR - 136
Volume	:	450 cc
Depth	:	2840 m

Tranferred into Cylinder #	:	84032809

Volume (cc's)	Pressure (psi)
52.00	5195
51.00	4970
50.00	4770
49.00	4570
48.00	4370
47.00	4175
46.00	4000
45.00	3930
44.00	3860
43.00	3795
42.00	3735
41.00	3680



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Company : Esso Australia Limited	Page : 24 of 47
Well : Scallop # 1	File : E - 23004

Reservoir Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 4525 psig @ 108 ° C

Sample # 8

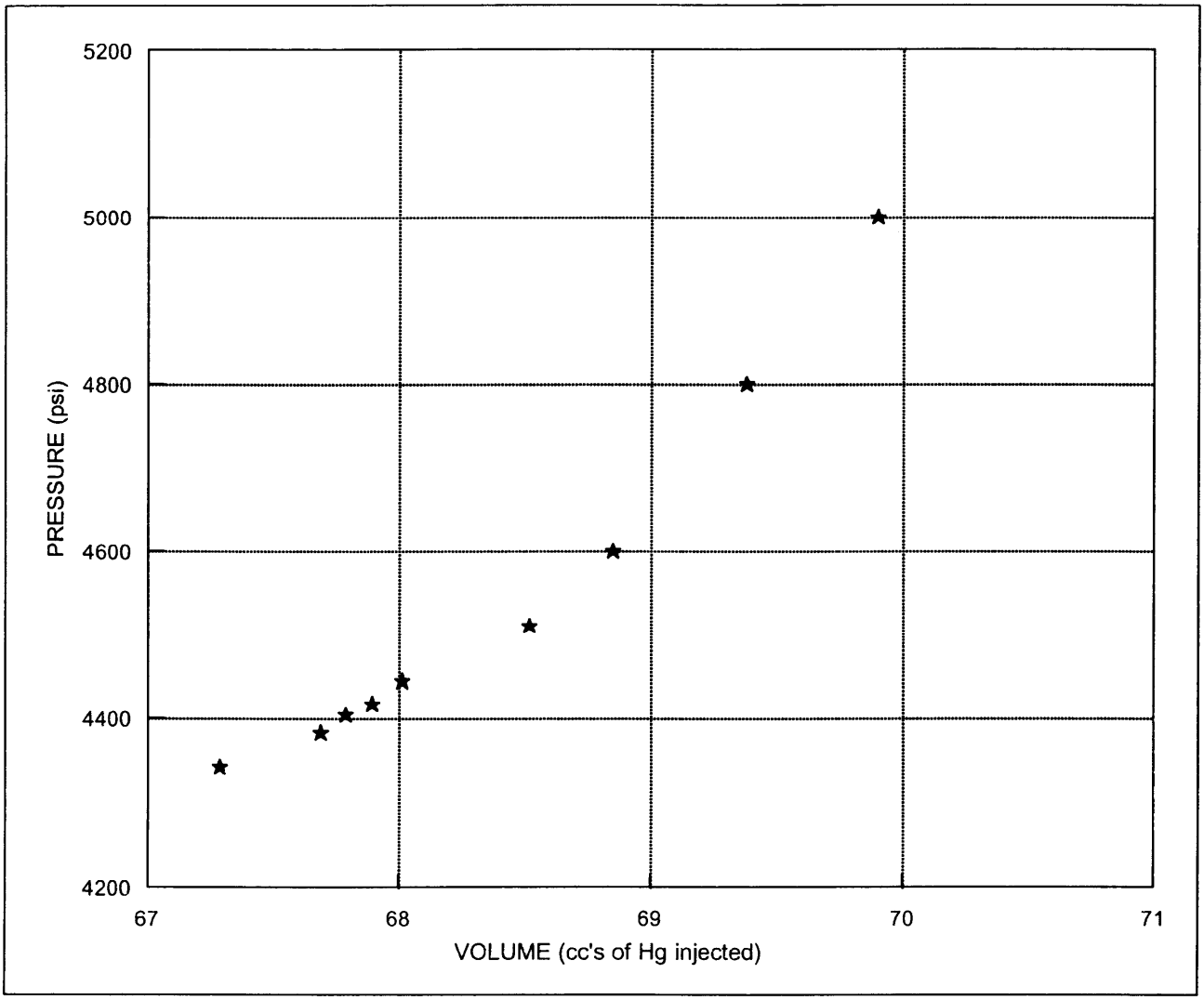
Sampling Conditions

Date	:	February 25, 2003
Reservoir Pressure	:	4092.7 psia
Reservoir Temperature	:	108.07 ° C

Sampler ID	:	MPSR - 136
Volume	:	450 cc
Depth	:	2840 m

Tranferred into Cylinder #	:	84032809

Volume (cc's)	Pressure (psi)
69.90	5000
69.38	4800
68.85	4600
68.52	4510
68.01	4442
67.89	4418
67.79	4405
67.69	4384
67.29	4344
67.79	4405
67.79	4405
67.79	4405



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Well : Scallop # 1	File : E - 23004

FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY

On Stock Tank Oil from atmospheric flash of sample in cylinder # 84032809 - Bottom Oil @ 2840 m

Component		Mol %
Hexanes minus	C6-	5.23
Hexanes	C6	5.45
Heptanes	C7	13.09
Octanes	C8	7.24
Nonanes	C9	7.84
Decanes	C10	6.30
Undecanes	C11	4.64
Dodecanes	C12	3.71
Tridecanes	C13	4.19
Tetradecanes	C14	3.77
Pentadecanes	C15	4.47
Hexadecanes	C16	3.48
Heptadecanes	C17	4.42
Octadecanes	C18	2.85
Nonadecanes	C19	2.41
Eicosanes	C20	2.61
Heneicosanes	C21	2.49
Docosanes	C22	2.29
Tricosanes	C23	2.33
Tetracosanes	C24	2.18
Pentacosanes	C25	2.15
Hexacosanes	C26	1.82
Heptacosanes	C27	1.68
Octacosanes	C28	1.21
Nonacosanes	C29	0.96
Triacontanes	C30	0.57
Hentriacontanes	C31	0.33
Dotriacontanes	C32	0.12
Tritriacontanes	C33	0.11
Tetratriacontanes	C34	0.06
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

Molecular Weight Calculated *	:	184.8
Density @ 60 °F Calculated *	:	0.8188
Molecular Weight Measured	:	--
Density @ 60 °F Measured	:	0.8231

*Calculation based on generalized properties as published by Katz and Firoozabadi

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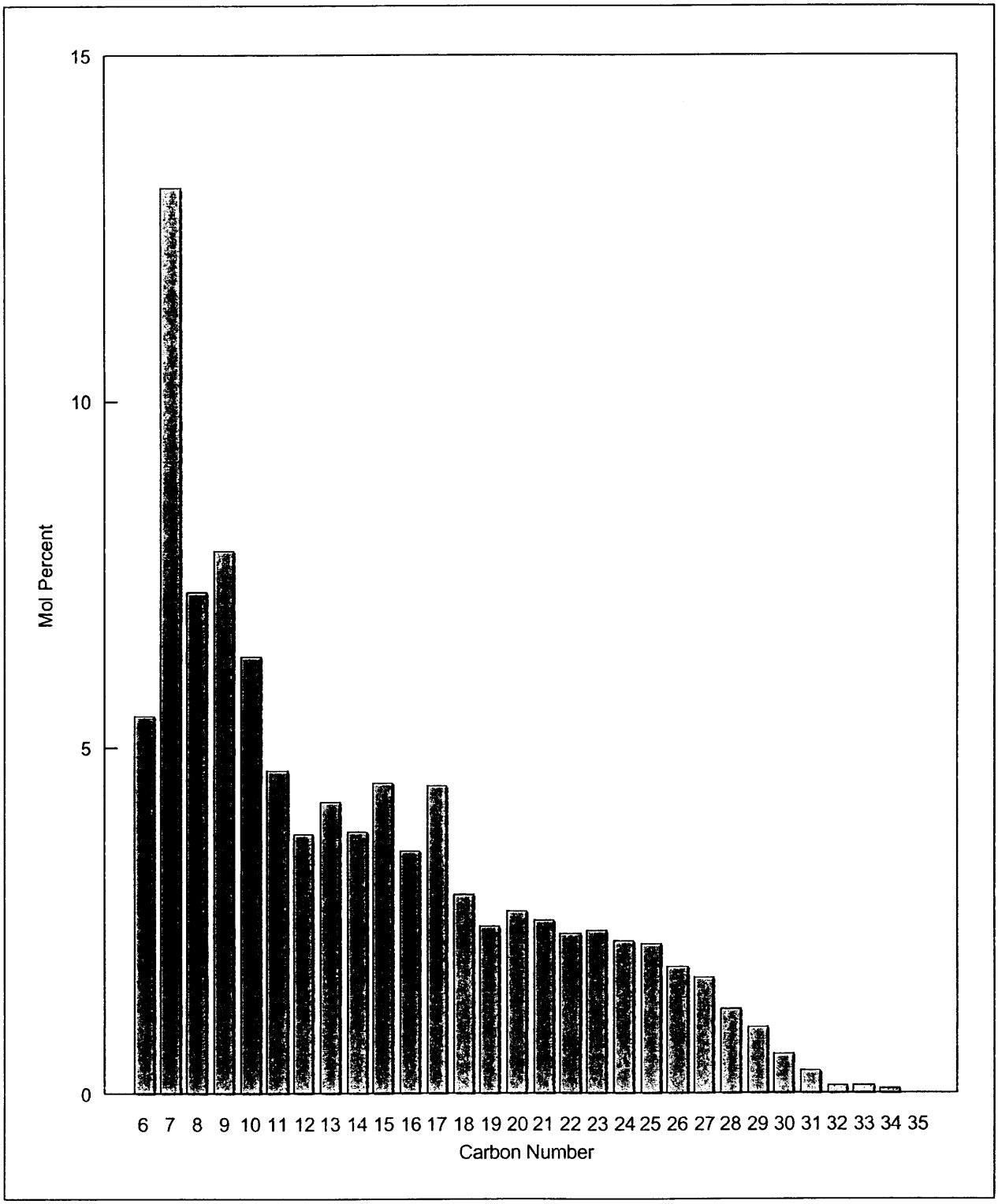
Company : Esso Australia Limited	Page : 26 of 47
Well : Scallop # 1	File : E - 23004

FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY

On Stock Tank Oil from atmospheric flash of sample in cylinder # 84032809 - Bottom Oil @ 2840 m



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Company : Esso Australia Limited	Page : 27 of 47
Well : Scallop # 1	File : E - 23004

COMPOSITIONAL ANALYSIS OF RESERVOIR FLUID

Cylinder # 84032809 - Bottom Oil @ 2840 m

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.04	2.78	2.06
Nitrogen	N2	0.00	0.18	0.13
Methane	C1	0.42	72.52	53.59
Ethane	C2	0.35	9.99	7.46
Propane	C3	0.89	7.10	5.47
Iso-Butane	iC4	0.42	1.32	1.08
N-Butane	nC4	1.16	2.56	2.19
Iso-Pentane	iC5	1.03	0.86	0.91
N-Pentane	nC5	1.31	0.85	0.97
Hexanes	C6	5.43	0.87	2.07
Heptanes	C7	13.04	0.72	3.95
Octanes	C8	7.21	0.16	2.01
Nonanes	C9	7.81	0.07	2.10
Decanes	C10	6.27	0.02	1.66
Undecanes	C11	4.62	0.00	1.21
Dodecanes Plus	C12+	50.00	0.00	13.14
TOTAL		100.00	100.00	100.00

Ratios				
Molar Ratio	:	0.2626	0.7374	1.0000
Mass Ratio	:	0.7293	0.2707	1.0000
Liquid Ratio (bbl/bbl)	:	1.0000 @ SC	--	1.9989 @ PT*
Gas Liquid Ratio	:	1.0000 bbl @ SC	1668 SCF	--
Stream Properties				
Molecular Weight	:	183.4	24.24	66.02
Density obs. (gm/cc)	:	0.8186 @ 60 °F	--	0.5624 @ PT*
Gravity (AIR = 1.000)	:	41.2 °API @ 60 °F	0.841	119.8
GHV (BTU/scf)	:	--	1387	--
Hexanes Plus Properties				
Mol %	:	94.37	1.84	26.14
Molecular Weight	:	190.9	92.6	185.8
Density (gm/cc @ 60 °F)	:	0.8250	0.6790	0.8204
Gravity (°API @ 60 °F)	:	39.9	76.7	40.8
Heptanes Plus Properties				
Mol %	:	88.95	0.97	24.07
Molecular Weight	:	197.4	100.4	194.6
Density (gm/cc @ 60 °F)	:	0.8294	0.6896	0.8268
Gravity (°API @ 60 °F)	:	38.9	73.5	39.5
Decanes Plus Properties				
Mol %	:	60.89	0.02	16.01
Molecular Weight	:	239.7	133.9	239.6
Density (gm/cc @ 60 °F)	:	0.8500	0.7277	0.8500
Gravity (°API @ 60 °F)	:	34.8	62.8	34.8
Undecanes Plus Properties				
Mol %	:	54.62	0.00	14.35
Molecular Weight	:	251.8	--	251.8
Density (gm/cc @ 60 °F)	:	0.8549	--	0.8549
Gravity (°API @ 60 °F)	:	33.9	--	33.9
Dodecanes Plus Properties				
Mol %	:	50.00	0.00	13.14
Molecular Weight	:	261.5	--	261.5
Density (gm/cc @ 60 °F)	:	0.8586	--	0.8586
Gravity (°API @ 60 °F)	:	33.1	--	33.1

* (P)ressure : 4525 psig * (T)emperature : 227 °F

PETROLAB

Company : Esso Australia Limited	Page : 28 of 47
Well : Scallop # 1	File : E - 23004

Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 3805 psig @ 26 ° C

Sample # 9

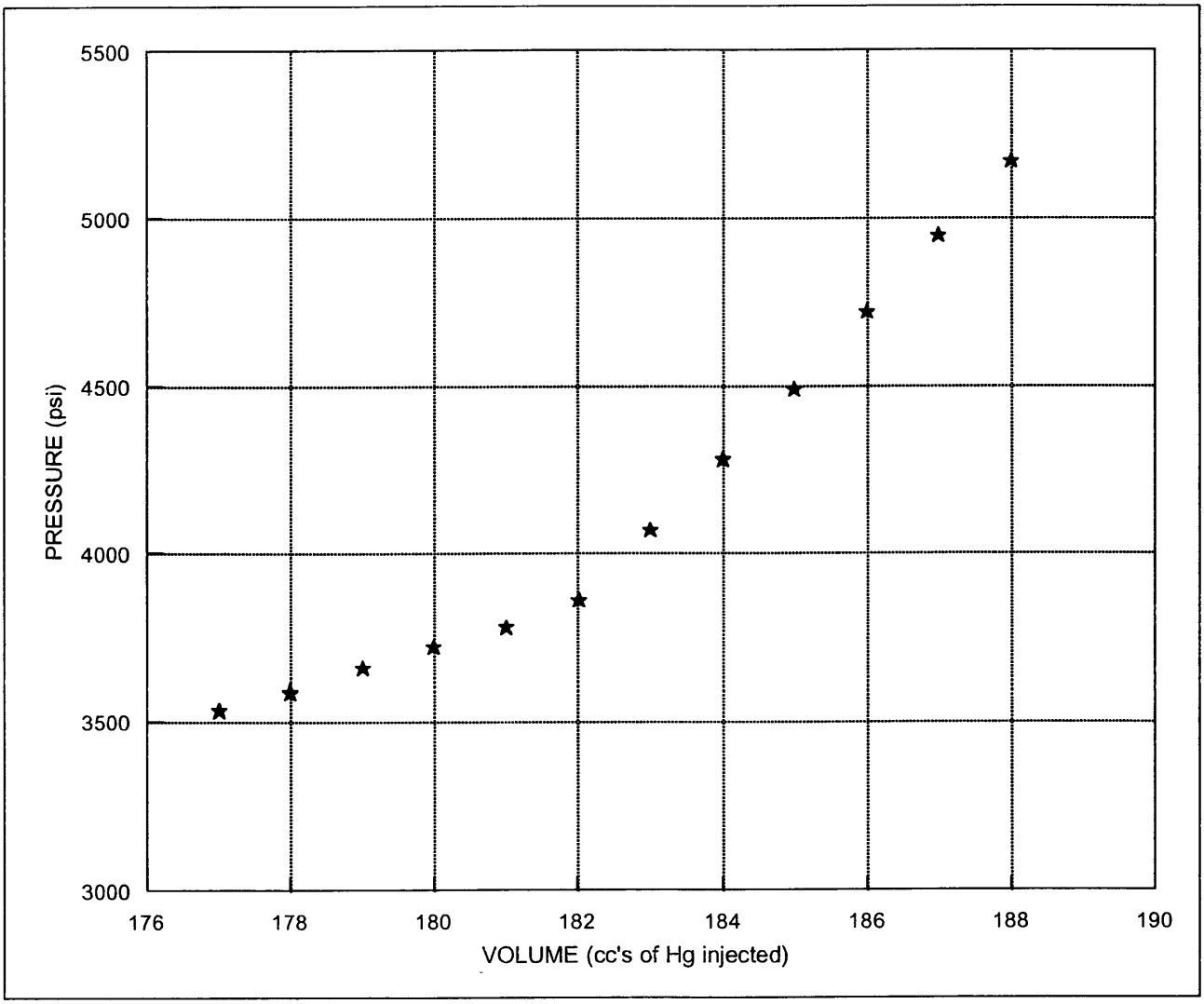
Sampling Conditions

Date	:	February 25, 2003
Reservoir Pressure	:	4092.7 psia
Reservoir Temperature	:	108.07 ° C

Sampler ID	:	MPSR - 316
Volume	:	450 cc
Depth	:	2840 m

Tranferred into Cylinder #	:	84062602

Volume (cc's)	Pressure (psi)
188.00	5170
187.00	4945
186.00	4720
185.00	4490
184.00	4280
183.00	4070
182.00	3860
181.00	3770
180.00	3710
179.00	3650
178.00	3585
177.00	3535



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Reservoir Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 4380 psig @ 108 ° C

Sample # 9

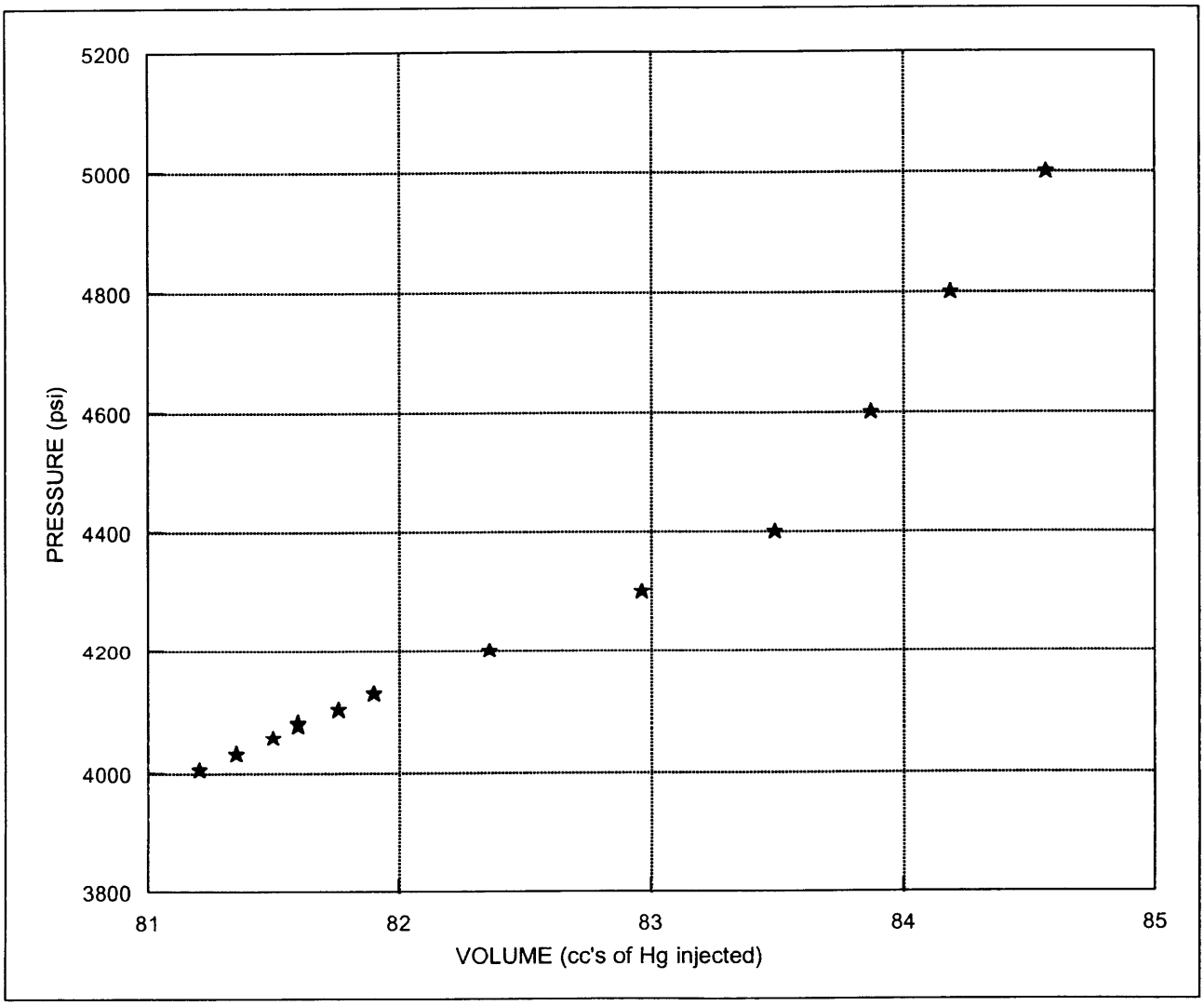
Sampling Conditions

Date	:	February 25, 2003
Reservoir Pressure	:	4092.7 psia
Reservoir Temperature	:	108.07 ° C

Sampler ID	:	MPSR - 316
Volume	:	450 cc
Depth	:	2840 m

Tranferred into Cylinder #	:	84062602

Volume (cc's)	Pressure (psi)
84.57	5000
84.19	4800
83.87	4600
83.49	4400
82.96	4300
82.36	4200
81.90	4124
81.76	4099
81.60	4078
81.50	4058
81.35	4030
81.20	4005



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FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY

On Stock Tank Oil from atmospheric flash of sample in cylinder # 84062602 - Bottom oil @ 2840 m

Component		Mol %
Hexanes minus	C6-	4.29
Hexanes	C6	5.79
Heptanes	C7	13.85
Octanes	C8	7.47
Nonanes	C9	7.89
Decanes	C10	6.27
Undecanes	C11	4.55
Dodecanes	C12	3.69
Tridecanes	C13	4.10
Tetradecanes	C14	4.05
Pentadecanes	C15	3.95
Hexadecanes	C16	3.70
Heptadecanes	C17	4.31
Octadecanes	C18	2.83
Nonadecanes	C19	2.48
Eicosanes	C20	2.49
Heneicosanes	C21	2.46
Docosanes	C22	2.34
Tricosanes	C23	2.25
Tetracosanes	C24	2.19
Pentacosanes	C25	2.19
Hexacosanes	C26	1.90
Heptacosanes	C27	1.73
Octacosanes	C28	1.20
Nonacosanes	C29	0.93
Triacontanes	C30	0.53
Hentriacontanes	C31	0.32
Dotriacontanes	C32	0.13
Tritriacontanes	C33	0.12
Tetratriacontanes	C34	0.00
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

Molecular Weight Calculated *	:	184.7
Density @ 60 °F Calculated *	:	0.8191
Molecular Weight Measured	:	--
Density @ 60 °F Measured	:	0.8219

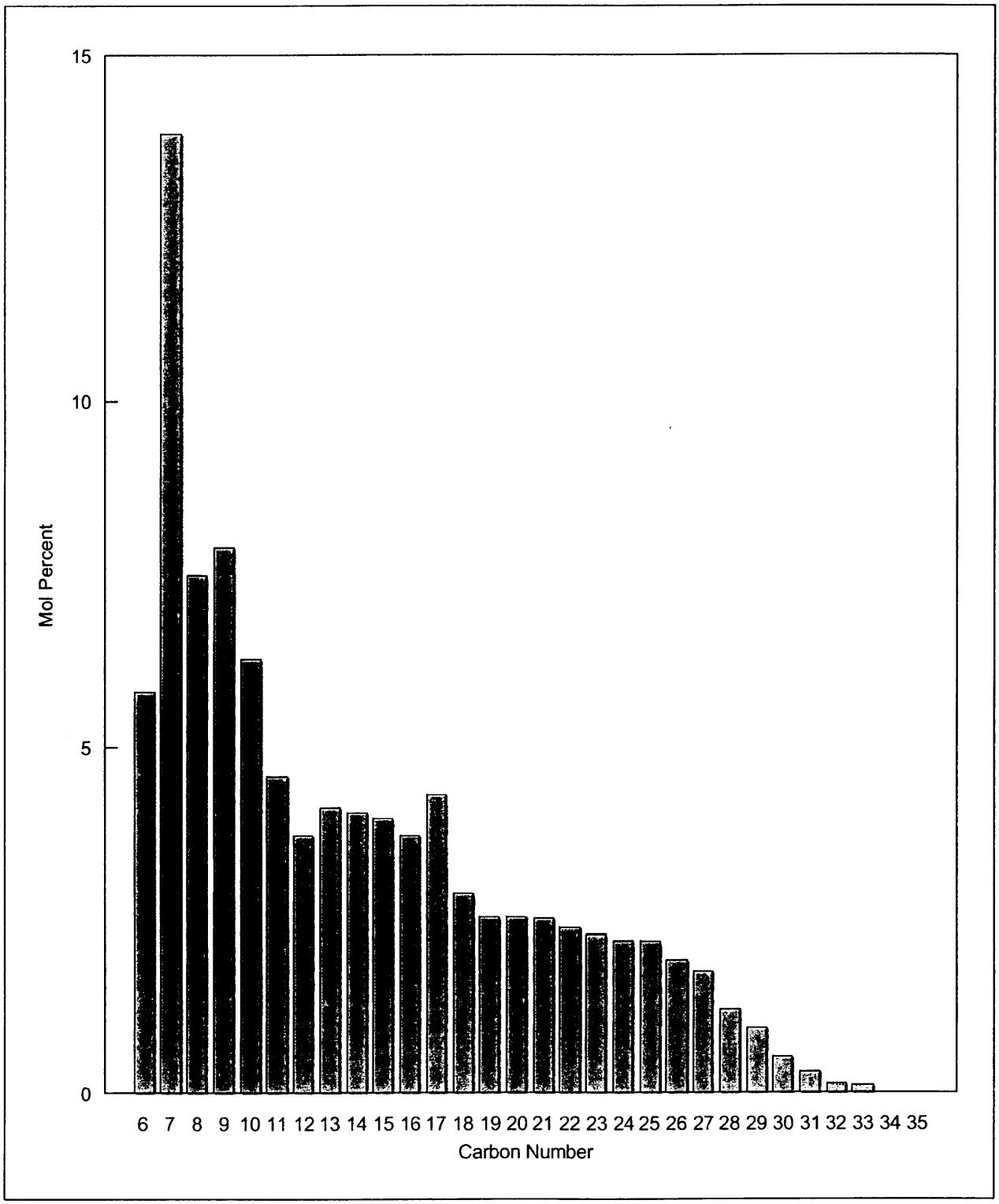
*Calculation based on generalized properties as published by Katz and Firoozabadi

PETROLAB

Company : Esso Australia Limited	Page : 31 of 47
Well : Scallop # 1	File : E - 23004

FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY

On Stock Tank Oil from atmospheric flash of sample in cylinder # 84062602 - Bottom oil @ 2840 m



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Company : Esso Australia Limited	Page : 32 of 47
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COMPOSITIONAL ANALYSIS OF RESERVOIR FLUID

Cylinder # 84062602 - Bottom oil @ 2840 m

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.04	2.92	2.12
Nitrogen	N2	0.00	0.17	0.12
Methane	C1	0.42	72.25	52.36
Ethane	C2	0.35	10.15	7.44
Propane	C3	0.90	7.31	5.54
Iso-Butane	iC4	0.44	1.40	1.13
N-Butane	nC4	1.15	2.57	2.18
Iso-Pentane	iC5	0.97	0.82	0.86
N-Pentane	nC5	1.18	0.78	0.89
Hexanes	C6	5.72	0.77	2.14
Heptanes	C7	13.68	0.64	4.25
Octanes	C8	7.38	0.14	2.14
Nonanes	C9	7.79	0.06	2.20
Decanes	C10	6.19	0.02	1.73
Undecanes	C11	4.49	0.00	1.24
Dodecanes Plus	C12+	49.28	0.00	13.66
TOTAL		100.00	100.00	100.00

Ratios				
Molar Ratio	:	0.2770	0.7230	1.0000
Mass Ratio	:	0.7427	0.2573	1.0000
Liquid Ratio (bbl/bbl)	:	1.0000 @ SC	--	1.9376 @ PT*
Gas Liquid Ratio	:	1.0000 bbl @ SC	1559 SCF	--
Stream Properties				
Molecular Weight	:	182.1	24.17	67.92
Density obs. (gm/cc)	:	0.8178 @ 60 °F	--	0.5691 @ PT*
Gravity (AIR = 1.000)	:	41.4 °API @ 60 °F	0.838	116.9
GHV (BTU/scf)	:	--	1380	--
Hexanes Plus Properties				
Mol %	:	94.54	1.63	27.36
Molecular Weight	:	189.4	92.7	185.2
Density (gm/cc @ 60 °F)	:	0.8240	0.6790	0.8202
Gravity (°API @ 60 °F)	:	40.1	76.7	40.8
Heptanes Plus Properties				
Mol %	:	88.82	0.86	25.22
Molecular Weight	:	196.2	100.4	193.8
Density (gm/cc @ 60 °F)	:	0.8286	0.6897	0.8265
Gravity (°API @ 60 °F)	:	39.1	73.5	39.5
Decanes Plus Properties				
Mol %	:	59.97	0.02	16.63
Molecular Weight	:	239.8	133.9	239.7
Density (gm/cc @ 60 °F)	:	0.8501	0.7277	0.8500
Gravity (°API @ 60 °F)	:	34.8	62.8	34.8
Undecanes Plus Properties				
Mol %	:	53.77	0.00	14.90
Molecular Weight	:	252.0	--	252.0
Density (gm/cc @ 60 °F)	:	0.8549	--	0.8549
Gravity (°API @ 60 °F)	:	33.9	--	33.9
Dodecanes Plus Properties				
Mol %	:	49.28	0.00	13.66
Molecular Weight	:	261.6	--	261.6
Density (gm/cc @ 60 °F)	:	0.8586	--	0.8586
Gravity (°API @ 60 °F)	:	33.1	--	33.1

* (P)ressure : 4380 psig * (T)emperature : 227 °F

PETROLAB

Company : Esso Australia Limited	Page : 33 of 47
Well : Scallop # 1	File : E - 23004

Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 2820 psig @ 26 ° C

Sample # 10

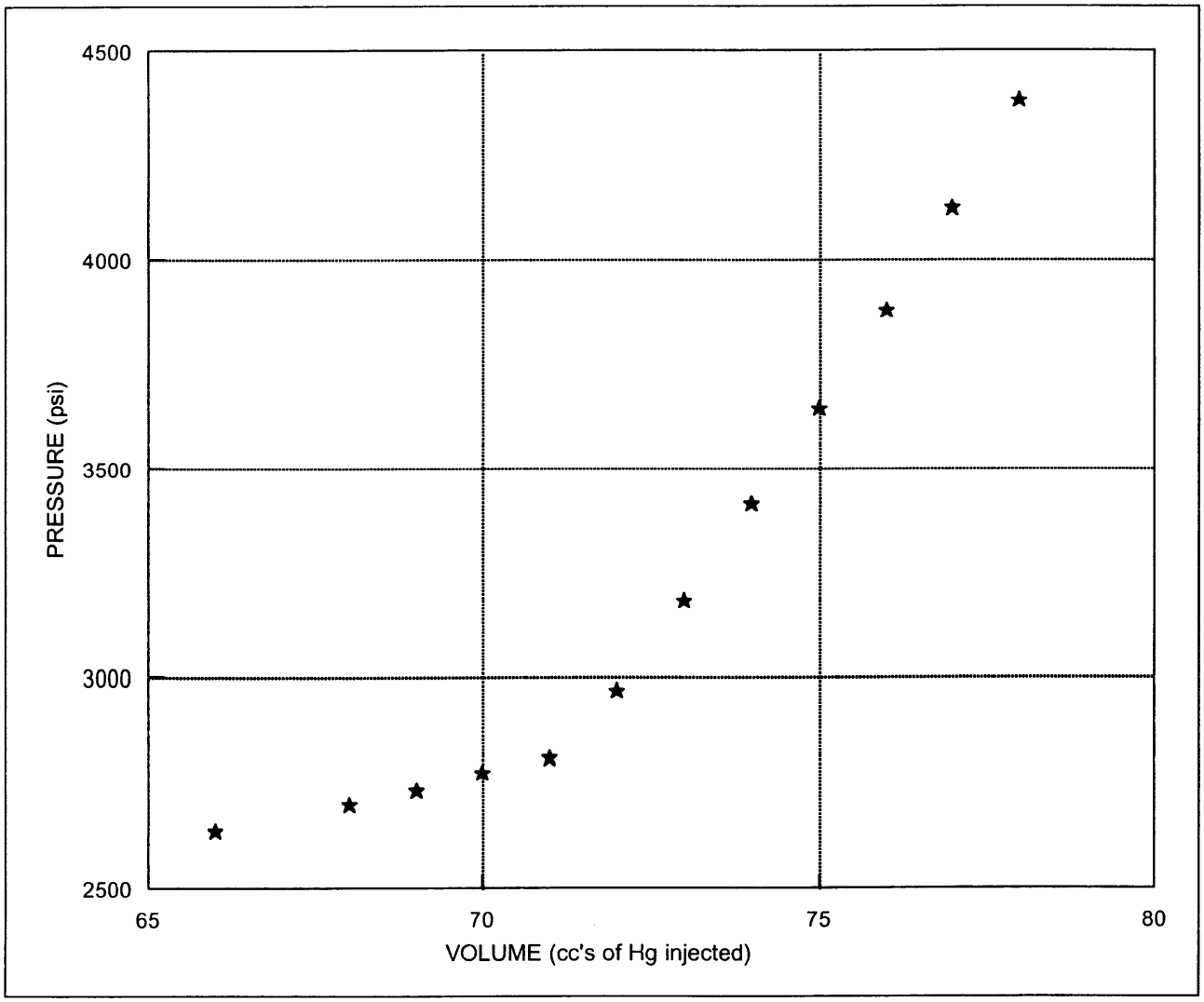
Sampling Conditions

Date	:	February 25, 2003
Reservoir Pressure	:	3668.27 psia
Reservoir Temperature	:	102.68 ° C

Sampler ID	:	MPSR - 477
Volume	:	450 cc
Depth	:	2630.2 m

Tranferred into Cylinder #	:	8403-X

Volume (cc's)	Pressure (psi)
78.00	4380
77.00	4125
76.00	3880
75.00	3645
74.00	3415
73.00	3185
72.00	2970
71.00	2810
70.00	2775
69.00	2735
68.00	2700
66.00	2635



PETROLAB

Company : Esso Australia Limited	Page : 34 of 47
Well : Scallop # 1	File : E - 23004

Room Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 2820 psig @ 26 ° C

Sample # 11

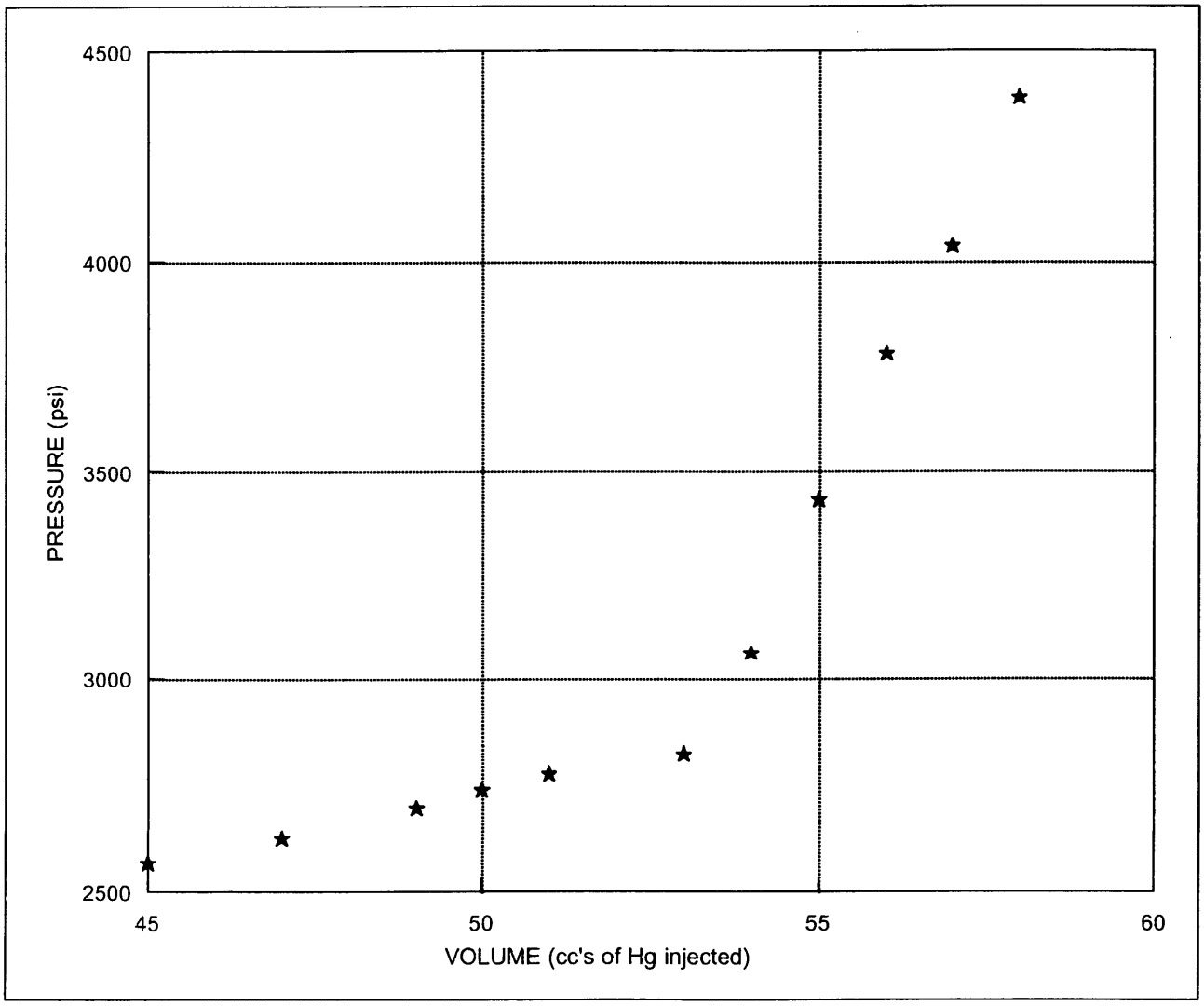
Sampling Conditions

Date	:	February 25, 2003
Reservoir Pressure	:	3668.27 psia
Reservoir Temperature	:	102.68 ° C

Sampler ID	:	MPSR - 501
Volume	:	450 cc
Depth	:	2630.2 m

Tranferred into Cylinder #	:	84062304

Volume (cc's)	Pressure (psi)
59.00	4565
58.00	4390
57.00	4035
56.00	3780
55.00	3430
54.00	3060
53.00	2825
51.00	2780
50.00	2740
49.00	2700
47.00	2630
45.00	2570



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Company : Esso Australia Limited	Page : 35 of 47
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Reservoir Temperature Validity Check On Bottom Hole Sample

Saturation Pressure : 3520 psig @ 103 ° C

Sample # 10

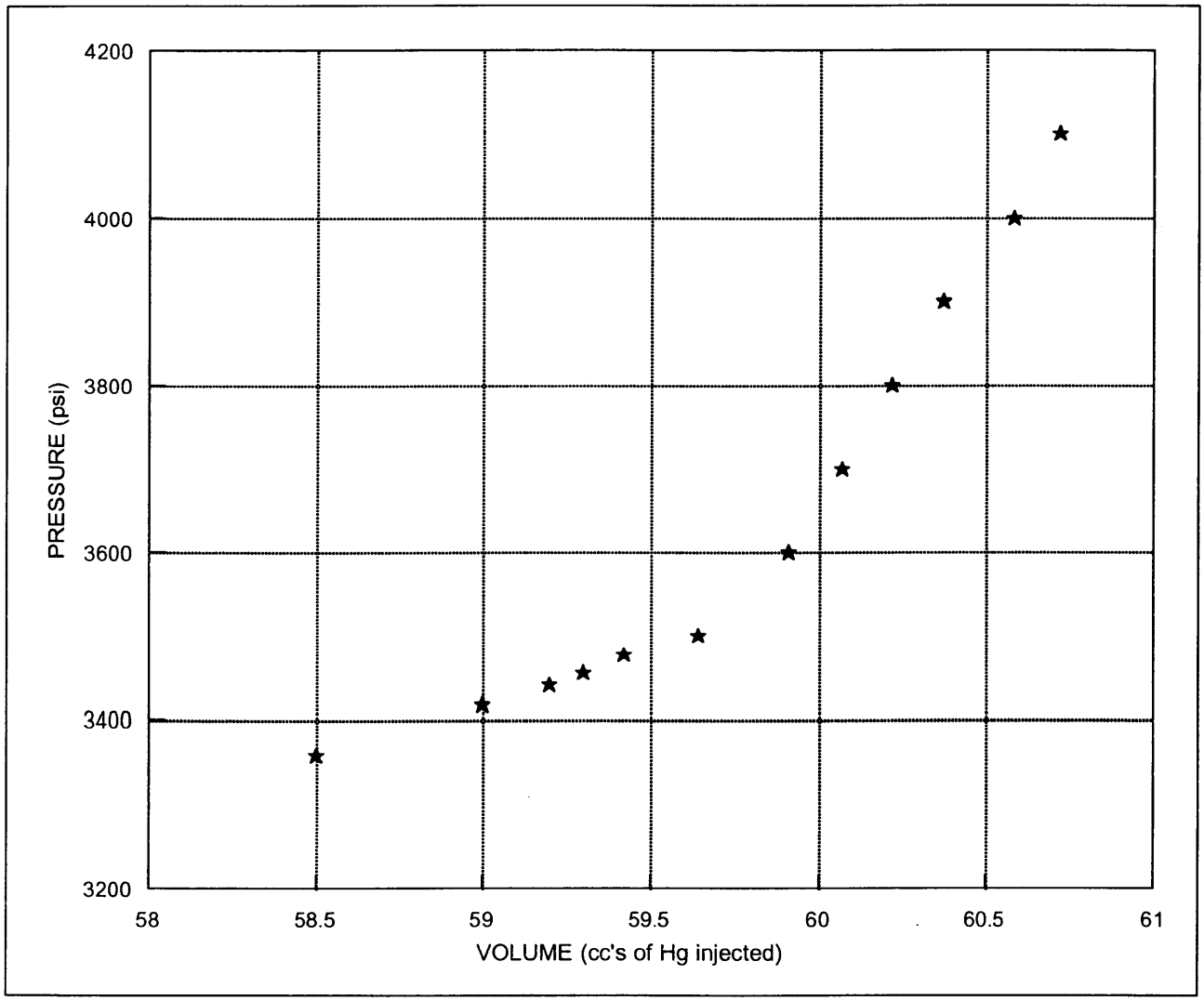
Sampling Conditions

Date	:	February 25, 2003
Reservoir Pressure	:	3668.27 psia
Reservoir Temperature	:	102.68 ° C

Sampler ID	:	MPSR - 477
Volume	:	450 cc
Depth	:	2630.2 m

Tranferred into Cylinder #	:	8403-X

Volume (cc's)	Pressure (psi)
60.72	4100
60.58	4000
60.37	3900
60.22	3800
60.07	3700
59.91	3600
59.64	3500
59.42	3475
59.30	3454
59.20	3438
59.00	3416
58.50	3359



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FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY

On Stock Tank Oil from atmospheric flash of sample in cylinder # 8403-X - Top Oil @ 2630.2 m

Component		Mol %
Hexanes minus	C6-	6.65
Hexanes	C6	5.90
Heptanes	C7	13.25
Octanes	C8	7.23
Nonanes	C9	7.66
Decanes	C10	6.39
Undecanes	C11	4.57
Dodecanes	C12	3.74
Tridecanes	C13	4.05
Tetradecanes	C14	3.96
Pentadecanes	C15	4.05
Hexadecanes	C16	3.57
Heptadecanes	C17	4.14
Octadecanes	C18	2.82
Nonadecanes	C19	2.33
Eicosanes	C20	2.43
Heneicosanes	C21	2.36
Docosanes	C22	2.01
Tricosanes	C23	2.02
Tetracosanes	C24	1.85
Pentacosanes	C25	1.76
Hexacosanes	C26	1.54
Heptacosanes	C27	1.52
Octacosanes	C28	1.19
Nonacosanes	C29	1.01
Triacontanes	C30	0.73
Hentriacontanes	C31	0.60
Dotriacontanes	C32	0.40
Tritriacontanes	C33	0.27
Tetratriacontanes	C34	0.00
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

Molecular Weight Calculated *	:	181.7
Density @ 60 °F Calculated *	:	0.8164
Molecular Weight Measured	:	--
Density @ 60 °F Measured	:	0.8242

*Calculation based on generalized properties as published by Katz and Firoozabadi

PETROLAB

Company : Esso Australia Limited	Page : 37 of 47
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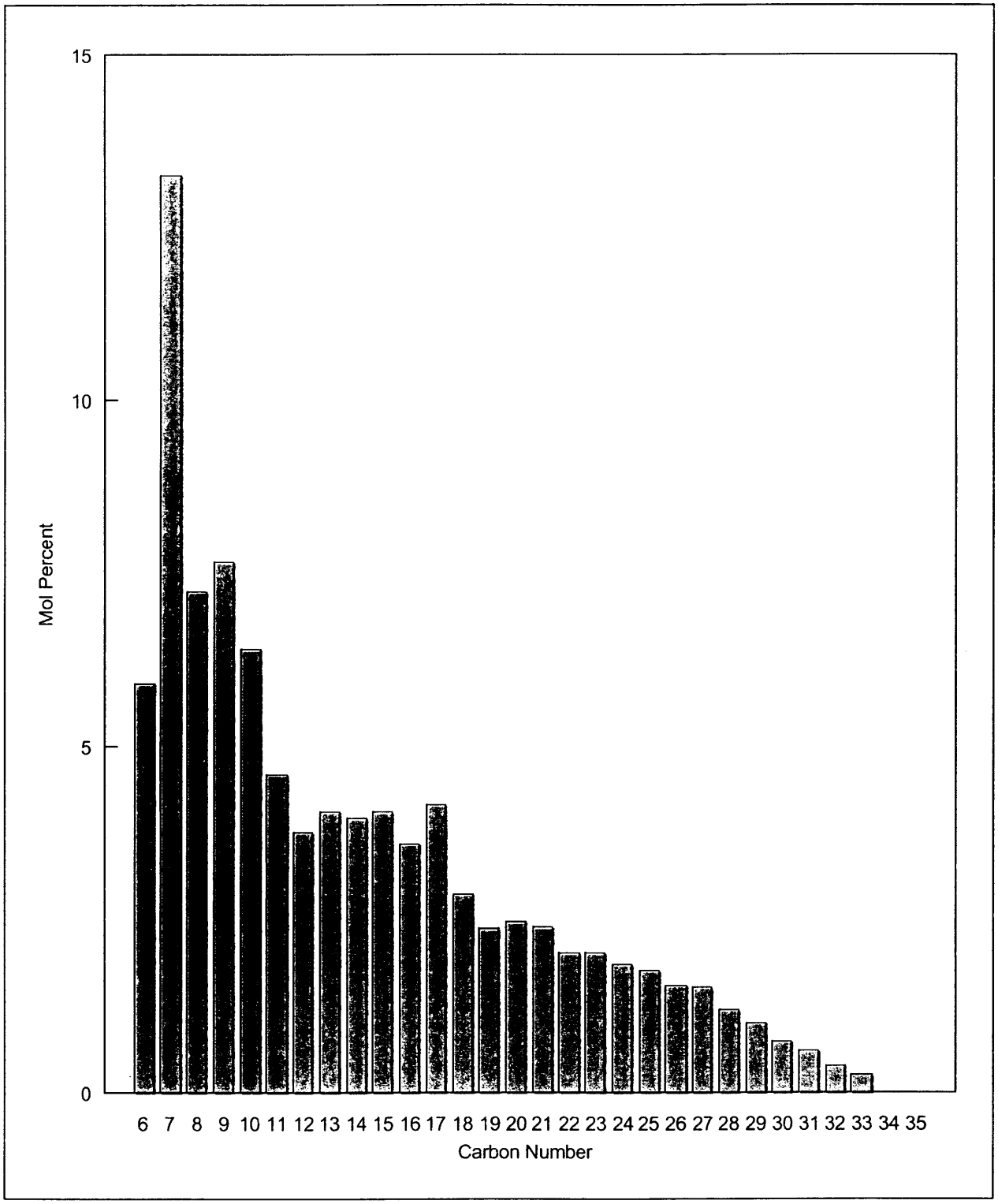
FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY

On Stock Tank Oil from atmospheric flash of sample in cylinder # 8403-X - Top Oil @ 2630.2 m



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Company : Esso Australia Limited	Page : 38 of 47
Well : Scallop # 1	File : E - 23004

COMPOSITIONAL ANALYSIS OF RESERVOIR FLUID

Cylinder # 8403-X - Top Oil @ 2630.2 m

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.02	1.16	0.78
Nitrogen	N2	0.00	0.26	0.17
Methane	C1	0.40	69.09	46.11
Ethane	C2	0.40	11.55	7.82
Propane	C3	1.13	8.91	6.31
Iso-Butane	iC4	0.59	1.86	1.44
N-Butane	nC4	1.47	3.19	2.61
Iso-Pentane	iC5	1.27	1.04	1.12
N-Pentane	nC5	1.56	0.99	1.18
Hexanes	C6	5.89	0.96	2.61
Heptanes	C7	13.22	0.74	4.92
Octanes	C8	7.21	0.16	2.52
Nonanes	C9	7.64	0.07	2.60
Decanes	C10	6.38	0.02	2.15
Undecanes	C11	4.56	0.00	1.53
Dodecanes Plus	C12+	48.25	0.00	16.13
TOTAL		100.00	100.00	100.00
Ratios				
Molar Ratio	:	0.3345	0.6655	1.0000
Mass Ratio	:	0.7819	0.2181	1.0000
Liquid Ratio (bbl/bbl)	:	1.0000 @ SC	--	1.7470 @ PT*
Gas Liquid Ratio	:	1.0000 bbl @ SC	1198 SCF	--
Stream Properties				
Molecular Weight	:	180.3	25.27	77.12
Density obs. (gm/cc)	:	0.8161 @ 60 °F	--	0.5983 @ PT*
Gravity (AIR = 1.000)	:	41.7 °API @ 60 °F	0.877	104.8
GHV (BTU/scf)	:	--	1483	--
Hexanes Plus Properties				
Mol %	:	93.16	1.95	32.46
Molecular Weight	:	189.3	92.3	185.4
Density (gm/cc @ 60 °F)	:	0.8240	0.6785	0.8205
Gravity (°API @ 60 °F)	:	40.1	76.9	40.8
Heptanes Plus Properties				
Mol %	:	87.27	0.99	29.85
Molecular Weight	:	196.4	100.3	194.3
Density (gm/cc @ 60 °F)	:	0.8288	0.6895	0.8269
Gravity (°API @ 60 °F)	:	39.1	73.5	39.5
Decanes Plus Properties				
Mol %	:	59.19	0.02	19.81
Molecular Weight	:	239.5	133.9	239.4
Density (gm/cc @ 60 °F)	:	0.8500	0.7277	0.8500
Gravity (°API @ 60 °F)	:	34.8	62.8	34.8
Undecanes Plus Properties				
Mol %	:	52.81	0.00	17.66
Molecular Weight	:	252.2	--	252.2
Density (gm/cc @ 60 °F)	:	0.8551	--	0.8551
Gravity (°API @ 60 °F)	:	33.8	--	33.8
Dodecanes Plus Properties				
Mol %	:	48.25	0.00	16.13
Molecular Weight	:	262.1	--	262.1
Density (gm/cc @ 60 °F)	:	0.8589	--	0.8589
Gravity (°API @ 60 °F)	:	33.1	--	33.1

* (P)ressure : 3520 psig * (T)emperature : 217 °F

PETROLAB

Company : Esso Australia Limited
Well : Scallop # 1

CONSTANT MASS STUDY
@ 243 °F
On MDT Bottom Hole Sample from cylinder # 841218

Pressure (psig)		Relative Volume (V/Vsat) (1)	Formation Volume Factor (Bg) (2)	Gas Expansion Factor (E) (3)	Deviation Factor (Z)	Specific Volume (CFT/LB)	Gas Viscosity (Centipoise) (4)
5000		0.9138	0.00389	257.18	0.982	0.06180	0.0315
4900		0.9267	0.00394	253.60	0.976	0.06267	0.0310
4800		0.9401	0.00400	249.97	0.970	0.06358	0.0305
4700		0.9541	0.00406	246.30	0.964	0.06452	0.0301
4600		0.9687	0.00412	242.59	0.958	0.06551	0.0296
4548	*	0.9757	0.00415	240.86	0.954	0.06598	0.0293
4500		0.9829	0.00418	239.08	0.951	0.06647	0.0291
4450		0.9908	0.00422	237.18	0.948	0.06700	0.0289
4400		0.9989	0.00425	235.27	0.945	0.06755	0.0286
4395	**	1.0000	0.00426	235.00	0.945	0.06763	0.0286

* Reservoir Pressure
** Dew Point Pressure

(1) Cubic feet of gas at indicated pressure and temperature per cubic foot at reservoir pressure
(2) Cubic feet of gas at indicated pressure and temperature per cubic foot at 14.696 psia and 60 °F
(3) Cubic feet of gas at 14.696 psia and 60 °F per cubic foot at indicated pressure and temperature
(4) Calculated from correlation of Lee, Gonzales and Eakin

PETROLAB

CONSTANT MASS STUDY
@ 243 °F
On MDT Bottom Hole Sample from cylinder # 841218

Pressure (psig)	Relative Volume (V/Vsat) (1)	Retrograde Liquid Deposit (Bbl/MMSCF) (2)	(Volume%) (3)
4395 *	1.0000	0.00	0.00
4300	1.0134	0.61	0.08
4200	1.0308	1.52	0.20
3850	1.0988	4.62	0.61
3500	1.1869	7.58	1.00
3150	1.3020	10.38	1.37
2800	1.4539	12.96	1.71
2450	1.6585	15.46	2.04
2100	1.9418	17.05	2.25
1750	2.3534	17.13	2.26
1400	2.9884	15.76	2.08
1050	4.0497	13.72	1.81

* Dew Point Pressure

(1) Cubic feet of gas at indicated pressure and temperature per cubic foot at saturation pressure
(2) Barrels of liquid at indicated pressure and temperature per MMSCF of original reservoir fluid
(3) Percent of reservoir hydrocarbon pore space at dew point

PETROLAB

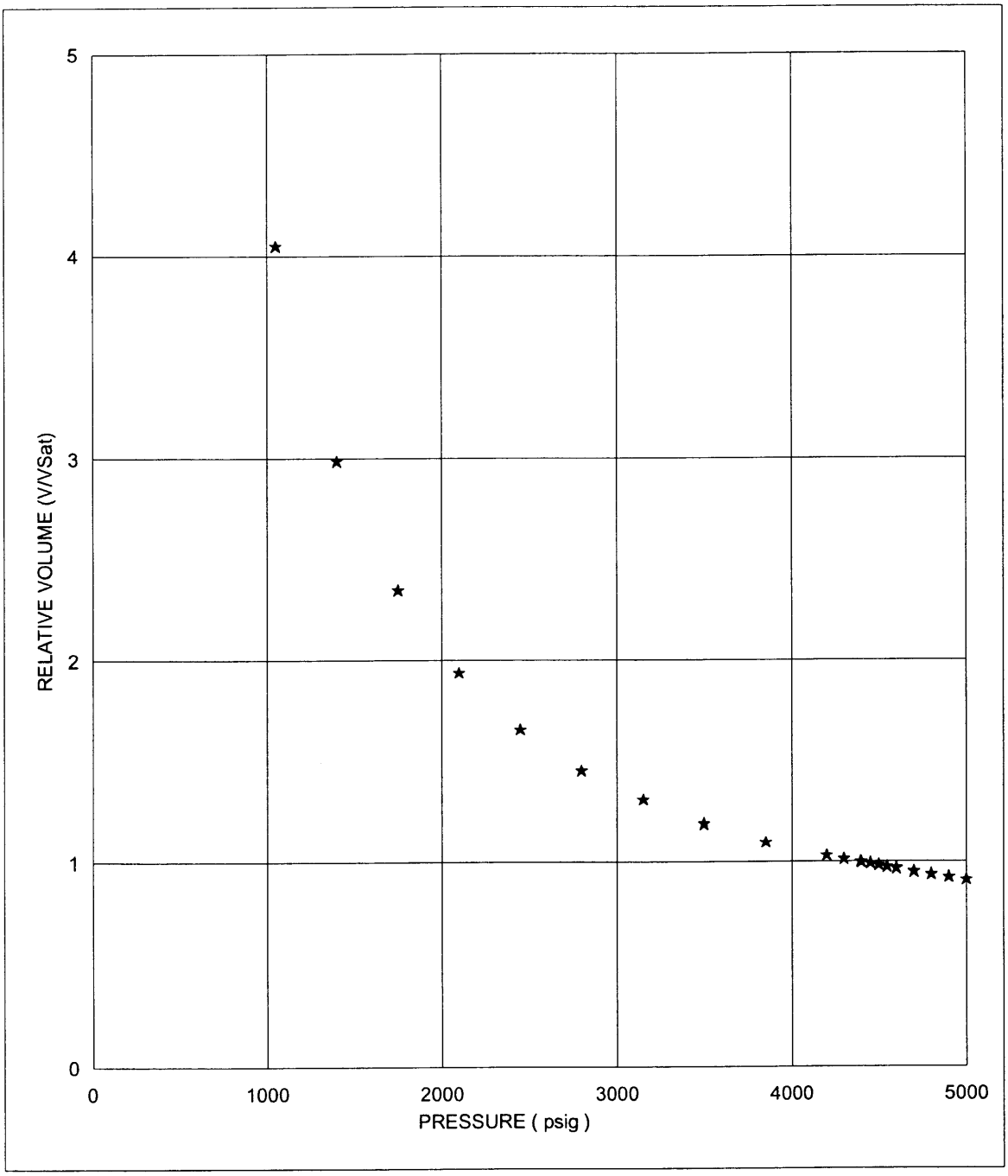
Company : Esso Australia Limited
Well : Scallop # 1

RELATIVE VOLUME

Equation of best fit

V/VSat

V/VSat = +9.86E+00 -8.29E-03 * P +3.14E-06 * P^2 -5.49E-10 * P^3 +3.62E-14 * P^4



PETROLAB

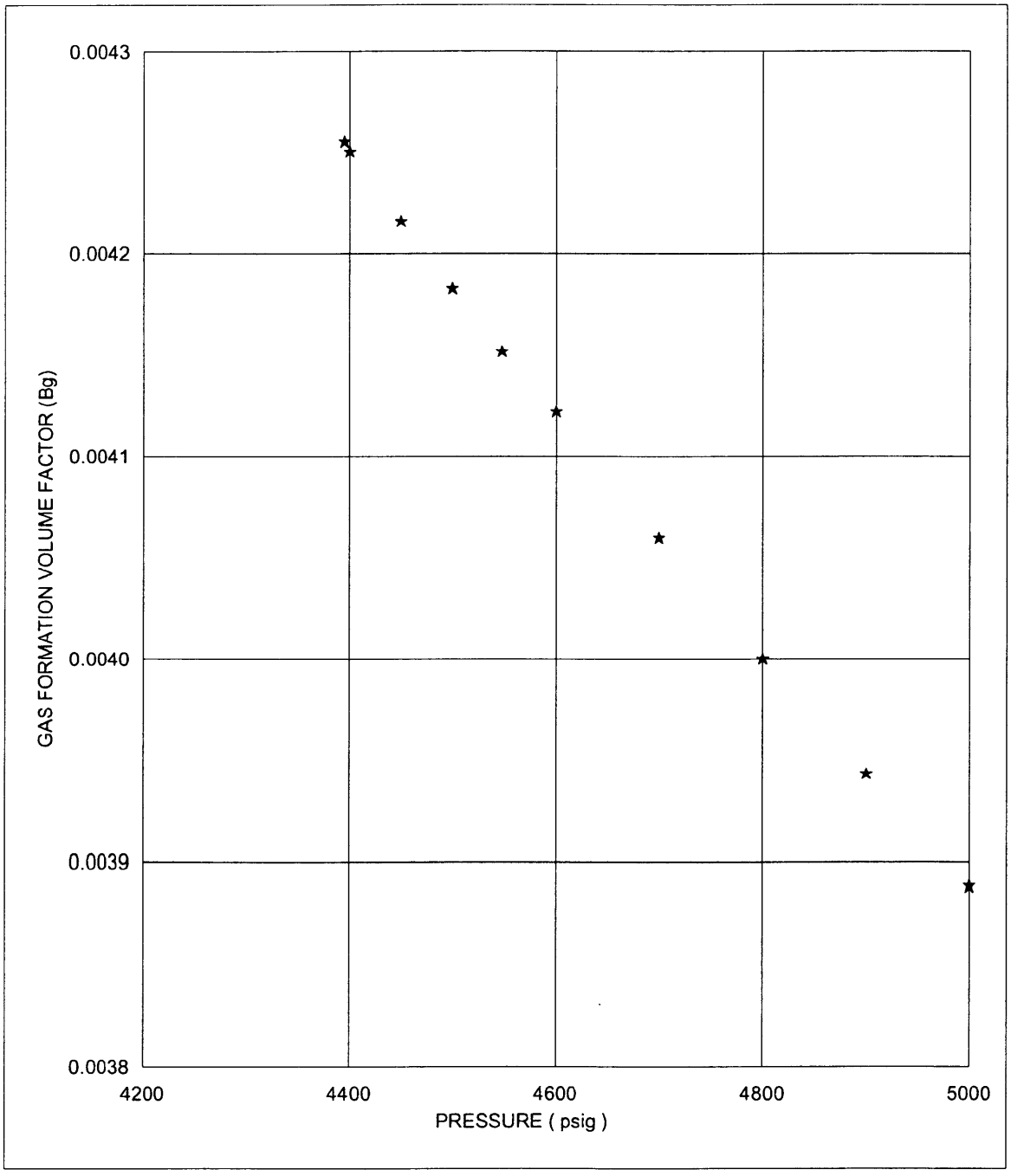
Company : Esso Australia Limited
Well : Scallop # 1

GAS FORMATION VOLUME FACTOR

Equation of best fit

Bg

Bg = +1.98E-02 -8.34E-06 * P +1.54E-09 * P^2 -1.01E-13 * P^3 +0.00E+00 * P^4



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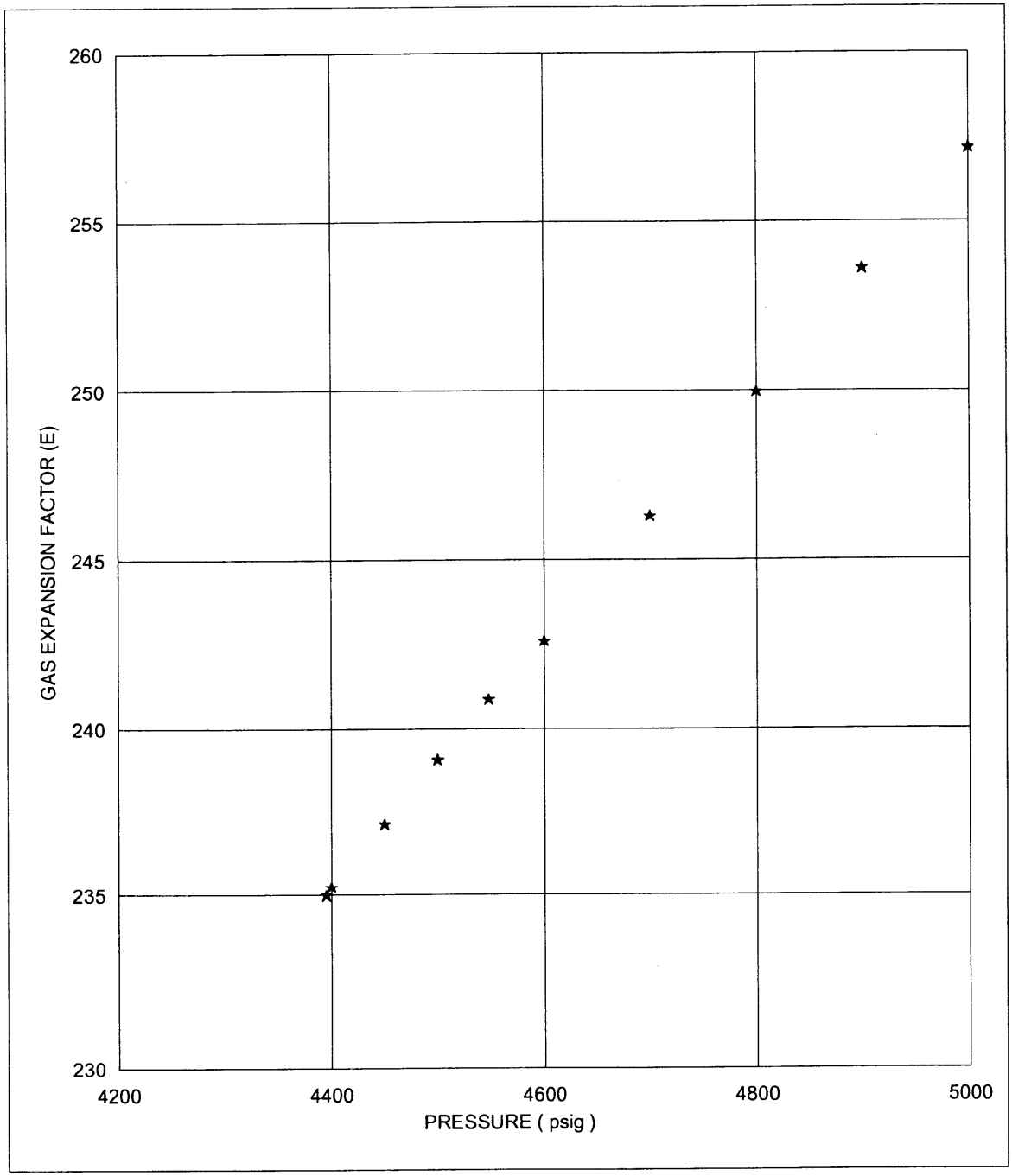
Company : Esso Australia Limited
Well : Scallop # 1

GAS EXPANSION FACTOR

Equation of best fit

E

E = -4.29E+02 +3.53E-01 * P -6.61E-05 * P^2 +4.60E-09 * P^3 +0.00E+00 * P^4



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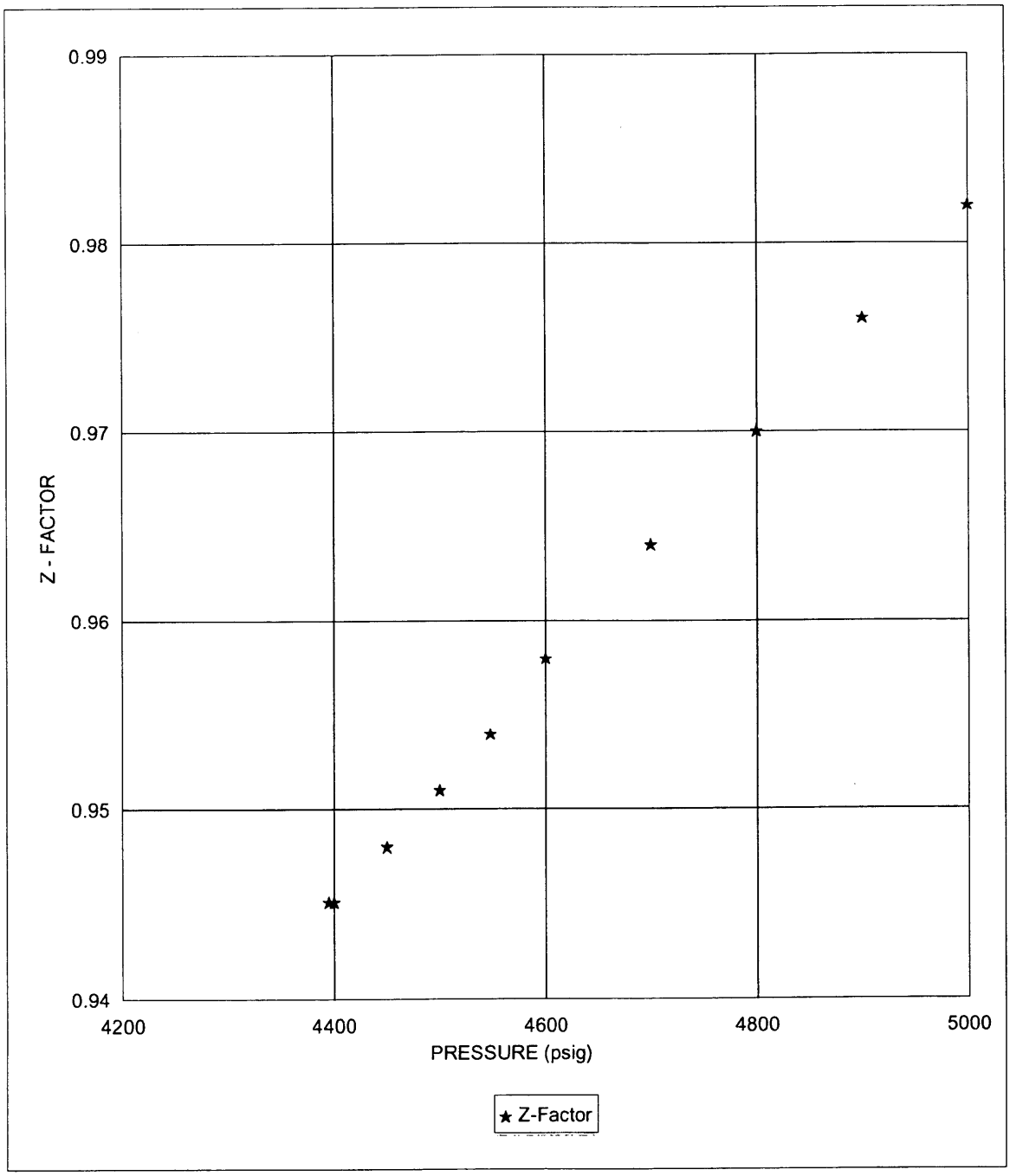
Company : Esso Australia Limited
Well : Scallop # 1

GAS DEVIATION FACTOR

Equation of best fit

Z

$$Z = +3.19E+00 \ -1.56E-03 * P \ +3.49E-07 * P^2 \ -2.50E-11 * P^3 \ +0.00E+00 * P^4$$



PETROLAB

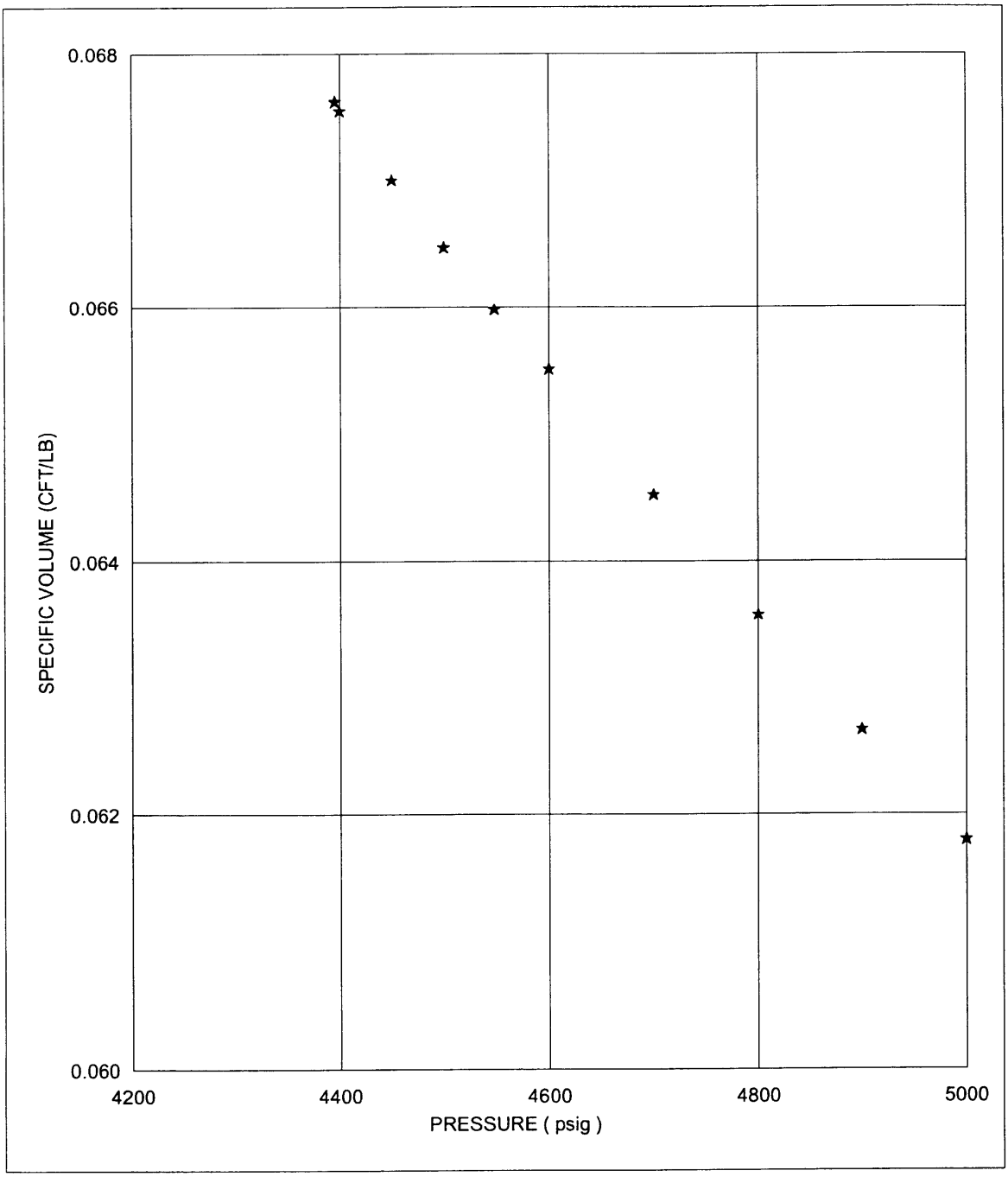
Company : Esso Australia Limited
Well : Scallop # 1

RESERVOIR FLUID SPECIFIC VOLUME

Equation of best fit

SV

SV = +3.15E-01 -1.33E-04 * P +2.44E-08 * P^2 -1.61E-12 * P^3 +0.00E+00 * P^4



PETROLAB

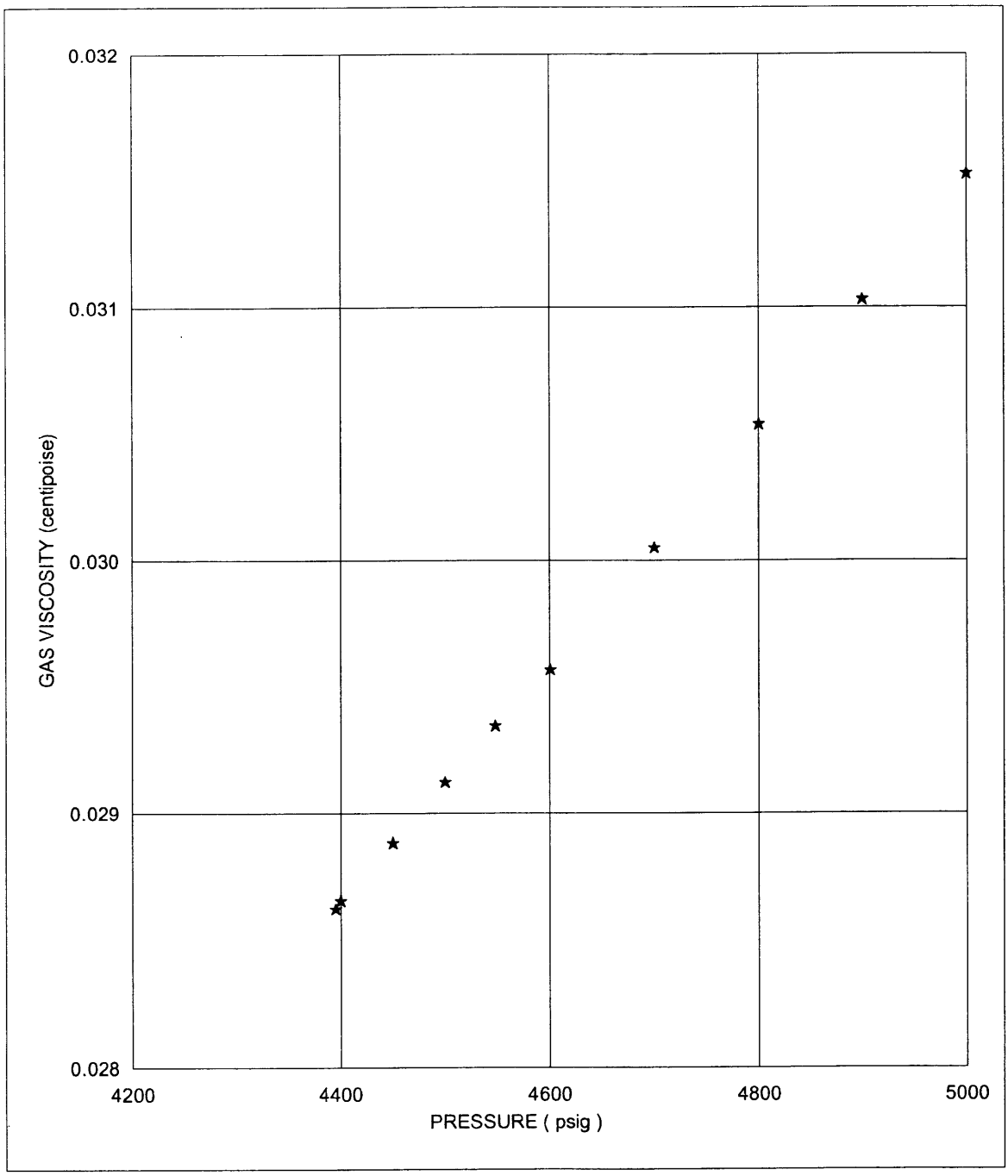
Company : Esso Australia Limited
Well : Scallop # 1

VISCOSITY OF RESERVOIR FLUID

Equation of best fit

μ

μ = -6.98E-02 +5.56E-05 * P -1.11E-08 * P^2 +8.10E-13 * P^3 +0.00E+00 * P^4



PETROLAB

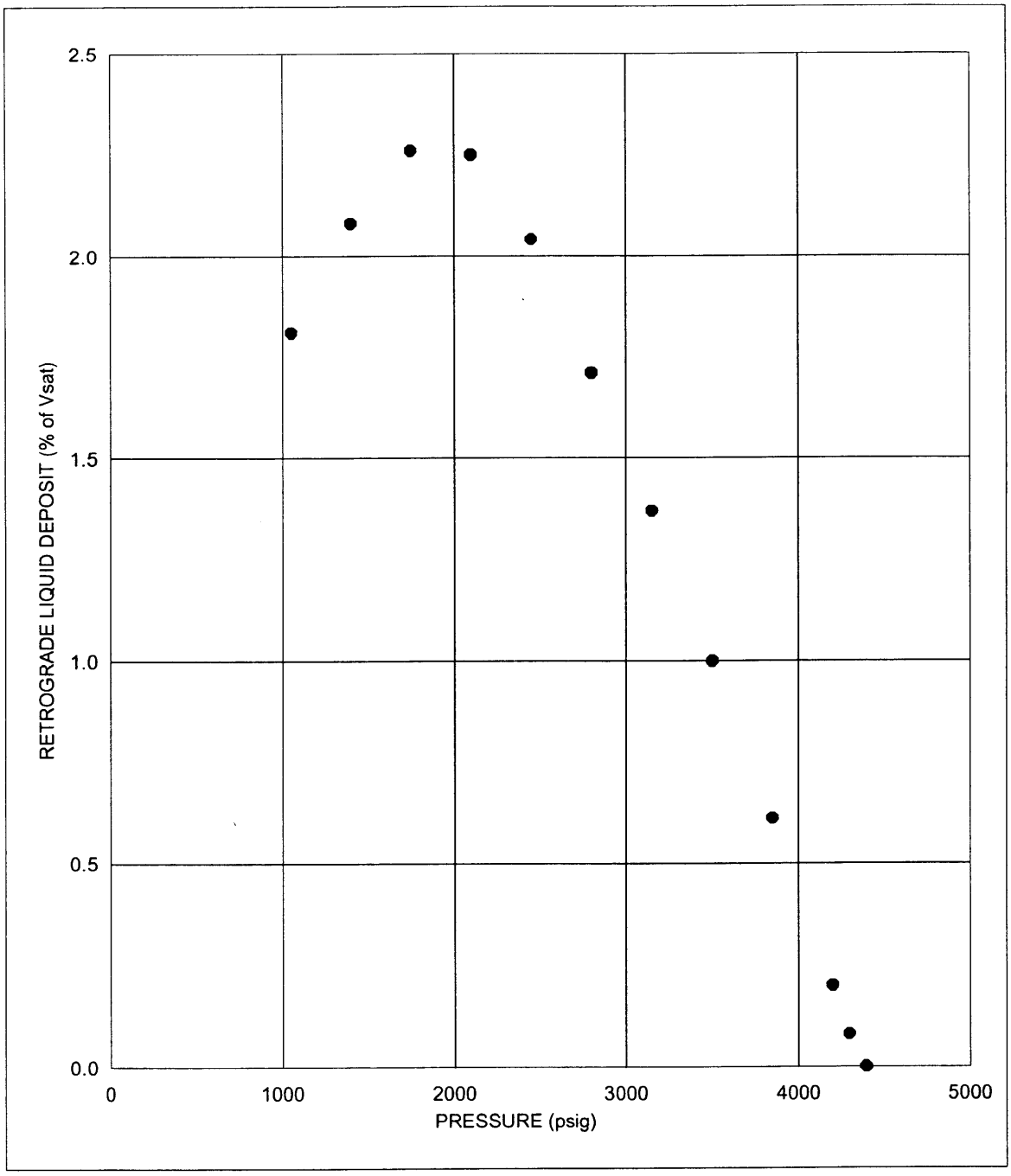
Company : Esso Australia Limited
Well : Scallop # 1

RETROGRADE CONDENSATION

Equation of best fit

RLD

RLD = -8.68E-01 +3.95E-03 * P -1.53E-06 * P^2 +1.73E-10 * P^3 -4.55E-15 * P^4



APPENDIX 8

PALYNOLOGY ANALYSIS

PE915059

This is an enclosure indicator page.
The enclosure PE915059 is enclosed within the container PE915058 at this location in this document.

The enclosure PE915059 has the following characteristics:

ITEM_BARCODE	= PE915059
CONTAINER_BARCODE	= PE915058
NAME	= Scallop-1 Palynological Data Chart
BASIN	= GIPPSLAND
ONSHORE?	= N
DATA_TYPE	= WELL
DATA_SUB_TYPE	= BIOSTRAT
DESCRIPTION	= Scallop-1 Palynological Data Chart. Interval: 1705 - 3185m. Scale 1:5000. Basic data version. By Morgan Palaeo Associates Maitland, South Australia for Esso Australia Pty. Ltd. August 2003
REMARKS	=
DATE_WRITTEN	= 12-AUG-2003
DATE_PROCESSED	=
DATE_RECEIVED	= 03-SEP-2003
RECEIVED_FROM	= Esso Australia Pty Ltd
WELL_NAME	= Scallop-1
CONTRACTOR	= Morgan Palaeo Associates
AUTHOR	=
ORIGINATOR	= Esso Australia Pty Ltd
TOP_DEPTH	= 1705
BOTTOM_DEPTH	= 3185
ROW_CREATED_BY	= DH00_SW

(Inserted by DNRE - Vic Govt Mines Dept)

915058 214

ENCLOSURES

ENCLOSURE 1

MUD LOG

PE613623

This is an enclosure indicator page.
The enclosure PE613623 is enclosed within the container PE915058 at this location in this document.

The enclosure PE613623 has the following characteristics:

ITEM_BARCODE	PE613623
CONTAINER_BARCODE	PE915058
NAME	Scallop-1 Mud Log. 1:500
BASIN	GIPPSLAND
ONSHORE?	N
DATA_TYPE	WELL
DATA_SUB_TYPE	MUD_LOG
DESCRIPTION	Scallop-1 Mud (Formation Evaluation) Log. 1:500. By Baker Hughes Inteq for Esso Australia Pty Ltd. February 2003. Enclosure 1
REMARKS	
DATE_WRITTEN	22-FEB-2003
DATE_PROCESSED	
DATE_RECEIVED	03-SEP-2003
RECEIVED_FROM	Esso Australia Pty Ltd
WELL_NAME	Scallop-1
CONTRACTOR	Esso Australia Pty Ltd
AUTHOR	
ORIGINATOR	Esso Australia Pty Ltd
TOP_DEPTH	250
BOTTOM_DEPTH	3174
ROW_CREATED_BY	DH00_SW

(Inserted by DNRE - Vic Govt Mines Dept)

915058_217

Formation Evaluation Log

1: 500

ENCLOSURE 2

PRESSURE LOG

PE613624

This is an enclosure indicator page.
The enclosure PE613624 is enclosed within the container PE915058 at this location in this document.

The enclosure PE613624 has the following characteristics:

ITEM_BARCODE	PE613624
CONTAINER_BARCODE	PE915058
NAME	Scallop-1 Pressure Data Plot. 1:1000
BASIN	GIPPSLAND
ONSHORE?	N
DATA_TYPE	WELL
DATA_SUB_TYPE	WELL_LOG
DESCRIPTION	Scallop-1 Pressure Data Plot. 1:1000. By Baker Hughes Inteq for Esso Australia Pty. Ltd. February 2003. Enclosure 2
REMARKS	
DATE_WRITTEN	22-FEB-2003
DATE_PROCESSED	
DATE_RECEIVED	03-SEP-2003
RECEIVED_FROM	Esso Australia Pty Ltd
WELL_NAME	Scallop-1
CONTRACTOR	Esso Australia Pty Ltd
AUTHOR	
ORIGINATOR	Esso Australia Pty Ltd
TOP_DEPTH	250
BOTTOM_DEPTH	3174
ROW_CREATED_BY	DH00_SW

(Inserted by DNRE - Vic Govt Mines Dept)

915058_220

Pressure Data Plot

1: 1000

ENCLOSURE 3

PRESSURE SUMMARY LOG

PE613625

This is an enclosure indicator page.
The enclosure PE613625 is enclosed within the container PE915058 at this location in this document.

The enclosure PE613625 has the following characteristics:

ITEM_BARCODE	PE613625
CONTAINER_BARCODE	PE915058
NAME	Scallop-1 Pressure Summary Plot. 1:7500
BASIN	GIPPSLAND
ONSHORE?	N
DATA_TYPE	WELL
DATA_SUB_TYPE	WELL_LOG
DESCRIPTION	Scallop-1 Pressure Summary Plot. 1:7500. By Baker Hughes Inteq for Esso Australia Pty. Ltd. February 2003. Enclosure 3
REMARKS	
DATE_WRITTEN	22-FEB-2003
DATE_PROCESSED	
DATE_RECEIVED	03-SEP-2003
RECEIVED_FROM	Esso Australia Pty Ltd
WELL_NAME	Scallop-1
CONTRACTOR	Esso Australia Pty Ltd
AUTHOR	
ORIGINATOR	Esso Australia Pty Ltd
TOP_DEPTH	0
BOTTOM_DEPTH	3174
ROW_CREATED_BY	DH00_SW

(Inserted by DNRE - Vic Govt Mines Dept)

915058_223

Pressure Summary Plot

1: 7500

ENCLOSURE 4

DRILLING LOG

PE613626

This is an enclosure indicator page.
The enclosure PE613626 is enclosed within the container PE915058 at this location in this document.

The enclosure PE613626 has the following characteristics:

ITEM_BARCODE	PE613626
CONTAINER_BARCODE	PE915058
NAME	Scallop-1 Drilling Data Plot. 1:1000
BASIN	GIPPSLAND
ONSHORE?	N
DATA_TYPE	WELL
DATA_SUB_TYPE	WELL_LOG
DESCRIPTION	Scallop-1 Drilling Data Plot. 1:1000. By Baker Hughes Inteq for Esso Australia Pty. Ltd. February 2003. Enclosure 4
REMARKS	
DATE_WRITTEN	22-FEB-2003
DATE_PROCESSED	
DATE_RECEIVED	03-SEP-2003
RECEIVED_FROM	Esso Australia Pty Ltd
WELL_NAME	Scallop-1
CONTRACTOR	Esso Australia Pty Ltd
AUTHOR	
ORIGINATOR	Esso Australia Pty Ltd
TOP_DEPTH	250
BOTTOM_DEPTH	3174
ROW_CREATED_BY	DH00_SW

(Inserted by DNRE - Vic Govt Mines Dept)

915058_226

Drilling Data Plot

1: 1000

ENCLOSURE 5

GAS RATIO LOG

PE613627

This is an enclosure indicator page.
The enclosure PE613627 is enclosed within the container PE915058 at this location in this document.

The enclosure PE613627 has the following characteristics:

ITEM_BARCODE	= PE613627
CONTAINER_BARCODE	= PE915058
NAME	= Scallop-1 Gas Ratio Analys. Plot. 1:500
BASIN	= GIPPSLAND
ONSHORE?	= N
DATA_TYPE	= WELL
DATA_SUB_TYPE	= WELL_LOG
DESCRIPTION	= Scallop-1 Gas Ratio Analysis Plot. 1:500. By Baker Hughes Inteq for Esso Australia Pty. Ltd. February 2003. Enclosure 5
REMARKS	=
DATE_WRITTEN	= 22-FEB-2003
DATE_PROCESSED	=
DATE_RECEIVED	= 03-SEP-2003
RECEIVED_FROM	= Esso Australia Pty Ltd
WELL_NAME	= Scallop-1
CONTRACTOR	= Esso Australia Pty Ltd
AUTHOR	=
ORIGINATOR	= Esso Australia Pty Ltd
TOP_DEPTH	= 1725
BOTTOM_DEPTH	= 3174
ROW_CREATED_BY	= DH00_SW

(Inserted by DNRE - Vic Govt Mines Dept)

915058_229

Gas Ratio Analysis Plot

1: 500