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Esso Australia Ltd.

907468 002

WELL COMPLETION REPORT

BLACKBACK A-2

GIPPSLAND BASIN, VICTORIA

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Compiler: Sheryl Sazenis
December 1999

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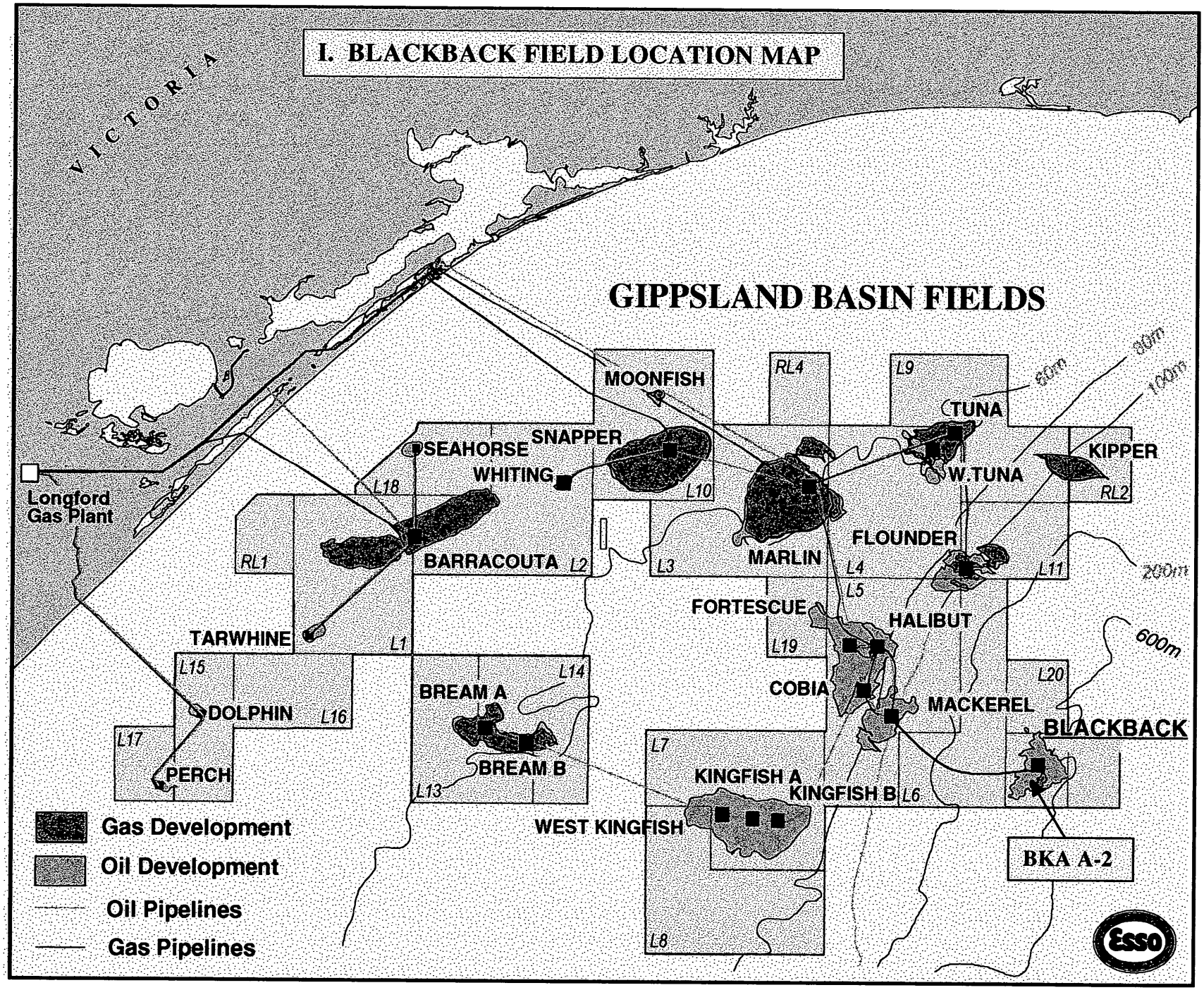
I. BLACKBACK FIELD LOCATION MAP
VICTORIA
GIPPSLAND BASIN FIELDS
MOONFISH
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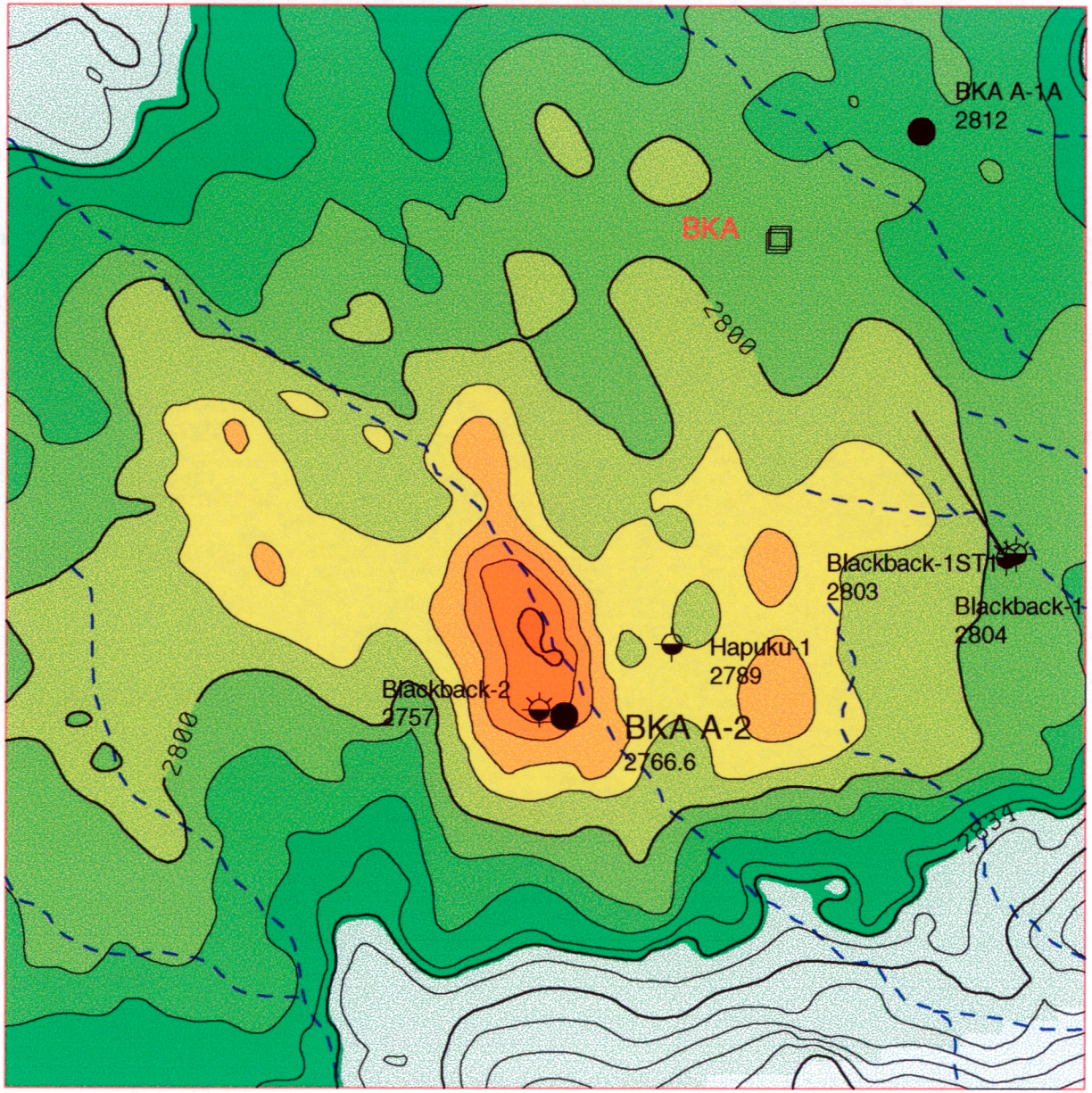
Top of Latrobe Group Depth Structure Map



--------- INTRA-LATROBE FAULT

N

0 500 1000

METRES

CONTOUR INTERVAL 10 M

9074468 005

II. WELL DATA RECORD (cont.)

LOCATION*

Field	Blackback
Well Name	Blackback A-2
Conductor Number	N/A
State	Victoria
Permit/Licence	VIC/L20
Geological Basin	Gippsland
Top of Latrobe	3632.8mMDRT
	2792.6m TVDRT
	2766.6mTVDSS
AMG X	634 567.2mE
AMG Y	5 731 121.0mN

Wellhead Coordinates	
AMG X	635 363.261mE
AMG Y	5 732 885.850mN
Latitude	38° 32' 31.2684" S
Longitude	148° 33' 11.6028" E
Perforations (wireline)	1. 3685.0 - 3694.0mMDRT
	2827.4 - 2833.3m TVDRT
	2801.4 - 2807.3mTVDSS
	2. 3699.0 - 3708.0m MDRT
	2836.5 - 2842.3m TVDRT
	2810.5 - 2816.3mTVDSS
AMG X	634 550.6mE
AMG Y	5 731 085.1mN

ELEVATIONS & DEPTHS

Water Depth	395.0m
Top Wellhead to MSL	417.75m
Main Deck Rel to MSL	N/A
RT Relative to MSL	26.0m
Average Well Angle	48°
Total Depth	3811mMDRT
	2902.08mTVDRT
Plug Back Depth	3777mMDRT
	(Bridge Plug)

DATES

Skid Rig	21/02/1999*
Spudded Well	21/02/1999*
Development Rig Days	42.3
NPT Days	4.0
Rig Released	02/06/1999
I.P. Established	12/06/1999

*A-2 temporarily released 24/2 to drill A-1, then re-skidded to A-2 and resume drilling on 24/4.

MISCELLANEOUS

Operator	Esso Australia Ltd
Esso Interest	50%
Permittee/Licencee	Esso/BHPP
Other Interest	50% BHPP
Overriding Royalty	N/A
Drilling AFE No.	L06249906

Contractor	Sedco Forex
Rig Name	Sedco 702
Equipment Type	Semi-submersible
Completion Type	Single Oil
Completion Size	4 1/2"

WELL CLASSIFICATION

Before Drilling	Subsea Development	**After Drilling**	Oil Well
	***Datum**	AGD-66	
	Spheroid	ANS	
	Projection	UTM Zone 55	

II. WELL DATA RECORD (cont.)

CASING RECORD

Type	Size (inches)	Weight (ppf)	Grade	Thread	Depth (mMDRT)
Conductor	30	457 / 310	X-52	RL-4	487.0
Surface	20	129.3	X-56	RL-4S	682.57
Intermediate	13.375	68	K-55	BTC	1296.31
Production	10.75 9.625	55.5 47.0 53.5	L-80 N-80 N-80	VAM TOP LTC LTC	1158.31 2504.97 3803.58
Tubing	4.5	12.6	13CRS-80/L-80	Vam Ace	3605.21

CEMENTING RECORD

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	Class G	1100	2% Calcium Chloride	131	236	15.9	487 - 421	--
Surface Casing Lead	Class G	398	0.45 gal/sx Econolite	118	135	12.5		1000
Surface Casing Tail	Class G	1435	1% Calcium Chloride	171	295	15.9	682 - 421	1000
Intermediate Casing	Class G	948	Neat	115	194	15.8	1295 - 817	1500
Production Casing Lead	Class G	552	0.14 gal/sx SCR-100L 0.75 gal/sx Gas Con-469 0.01 gal/sx NF-5	118	177	13.2	2800-3520	2300
Production Casing Tail	Class G	372	0.05 gal/sx SCR-100L 0.39 gal/sx halad-413L 0.02 gal/sx Gas Con-469 0.01 gal/sx NF-5	42	77	15.8	3520-3804	

II. WELL DATA RECORD (cont.)

DRILLING PERFORMANCE

Esso Australia Ltd./ Drilling Division - Technical Report
BLACKBACK A-2 FINAL WELL REPORT

Facility: Blackback	**Rig:** Sedco 702	**Reservoir:** Latrobe
Well: A-2	**Location:** VIC-L-20	**Well Type:** Subsea

**DEPTH:*	**INCLINATION:*	**MUD:*
m MD: 3811	**Average (deg):** 48.2	**Type:** Petrofree
m TVD: 2909	**Maximum (deg):** 50.9	**Max. wt. (ppg):** 11.2

Vert. Section (m): 2069.9	**m per day:** 167.8

**TIME ANALYSIS:*

Start Date: 21 Feb 99 @ 04:30	**Finish Date:** 2 June 99 @ 02:15	**Total Days:** 42.3
Target Days: 29.75	**% Over/Under Target:** 42.2% Over	**AFE Days:** 48.0

NPT Days: 4.0	**% of Total:** 9.50%

**COSTS:*

AFE No.: L06249906	**Revisions:** 1

	Material	Equipment	Contracts	Allocations	Contingency	TOTAL
AFE	$1,840,000	$2,490,000	$9,480,000	$1,690,000	$0	$15,500,000
Revised AFE	$1,920,000	$2,650,000	$12,360,000	$2,270,000	$0	$19,200,000
DIMS	$1,888,075	$2,921,021	$10,848,743	$2,002,339	$0	$17,660,178
Projected	$1,888,075	$2,921,021	$10,848,743	$2,002,339	$0	$17,660,178

$ per day: 417498	**$ per day (excl. T&L):** 340909	**$ per m:** 5209

**CASING:*

	Size / Weight / Grade / Thread	m MDRT	m TVDRT	PIT
Structural	30"/457&310/X-52/RL4HT&RL4	491	491	N/A
Conductor	20"/129.3/X-56/RL4S	682	682	10.5 ppg, jug
Surface Casing	13-3/8"/68/K55/BTC	1296	1236	12.5 ppg, jug
Production Casing	10-3/4"/55.5/L80/VAM TOP & 9-5/8"/53.5&47/LTC	3804	2905	N/A

Casing Comments:

**COMPLETION:*

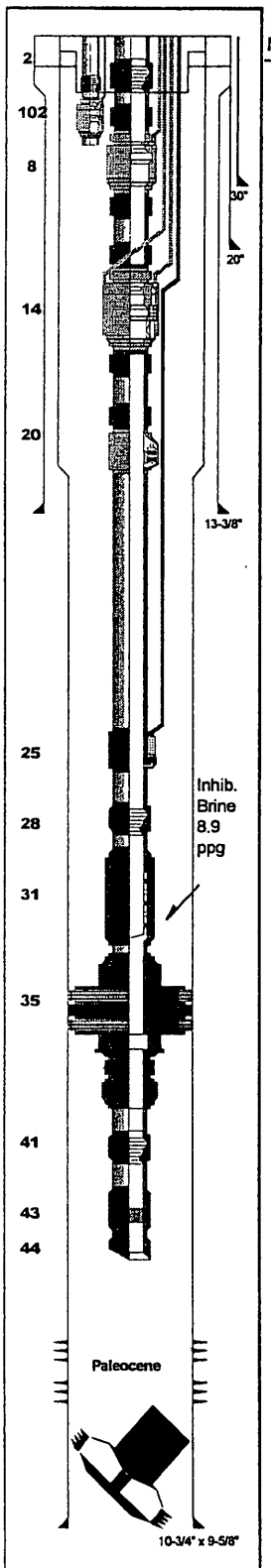
Size: 4-1/2"	**Type:** Single Oil	**Perforation Intervals:**	3685.0m-3694.0m, 3699m- 3708.0m

Completion Comments:

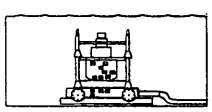
The well was perforated 350 psi underbalanced with 7" HSD gun, 12 shots/ft, using MAXR gun hanger. Perforation depth was correlated with cased hole gamma ray. The gas lift orifice was run in the side pocket mandrel. After perforating, the orifice was sheared open with 4000 psi annulus pressure. The subsea tree was landed and pressure tested. The subsurface safety valves, control system and pressure/temperature transducers were functional.

Field: BLACKBACK Plat: BKA Well: A2

Updated By: cmshaug Rev. Date 31/08/99



No.	Qty.	Description	OD Max	ID Min	Length (m)	MD (m)	TVD (m)
1	1	RT to top of Tubing Hanger			418.00		
2	1	Tubing Hanger, ABB Vetco Gray, for MS-700 WH, 4.5" x 2.375", 3.813" X Profile	18.560	1.875	0.72	418.00	418
3	1	Tubing, 4-1/2" 12.6 lb/ft Super 13Cr-80 VAM ACE	4.500	3.958	9.39	418.72	
4	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.18	428.11	
5	5	Tubing, 4-1/2" 12.6 lb/ft Super 13Cr-80 VAM ACE	4.500	3.958	48.44	429.29	
6	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.75	477.73	
7	1	Flow Coupling, 4-1/2" Hbtn 811FN38117, Vam Ace BxP, Inc-925	5.250	3.865	1.75	479.48	
8	1	Comm Nipple, 4-1/2" Camco RH-2 Hbtn 3.813 "X" Profile, Vam Ace BxP, Inc-925	6.813	3.813	0.77	481.23	481
9	1	Flow Coupling, 4-1/2" Hbtn 811FN38117, Vam Ace BxP, Inc-925	5.250	3.865	1.75	482.00	
10	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.80	483.75	
11	54	Tubing, 4-1/2" 12.6 lb/ft Super 13Cr-80 VAM ACE	4.500	3.958	522.39	485.55	
12	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.80	1007.94	
13	1	Flow Coupling, 4-1/2" Hbtn 811FN38117, Vam Ace BxP, Inc-925	5.250	3.865	1.75	1009.74	
14	1	TRSSV, 4-1/2" Camco TRC-DH-5-F, 3.75" DB profile, Vam Ace BxP, Inc-925	7.437	3.750	3.74	1011.49	1007
15	1	Flow Coupling, 4-1/2" Hbtn 811FN38117, Vam Ace BxP, Inc-925	5.250	3.865	1.75	1015.23	
16	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.80	1016.98	
17	5	Tubing, 4-1/2" 12.6 lb/ft Super 13Cr-80 VAM ACE	4.500	3.958	48.44	1018.78	
18	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.80	1067.22	
19	1	Flow Coupling, 4-1/2" Hbtn 811FN38117, Vam Ace BxP, Inc-925	5.250	3.865	1.75	1069.02	
20	1	Side Pocket Mandrel, 4-1/2" Camco Type MMRG-4, 1.5" pocket to accept SO2-30R Valve w/ RKP Latch, Inc-925	7.250	3.855	2.92	1070.77	1061
21	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.80	1073.69	
22	257	Tubing, 4-1/2" 12.6 lb/ft Super 13Cr-80 VAM ACE	4.500	3.958	2485.51	1075.49	
23	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.80	3561.00	
24	1	Coupling, 4-1/2" 12.6 lb/ft Super13Cr-80 VAM ACE	4.961	3.958	0.24	3562.80	
25	1	Solid Gauge Mandrel, 4-1/2" with Perm Quartz Gauge, Schlum. Vam Ace PxP, Alloy 450	6.023	3.958	2.29	3563.04	2746
26	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.80	3565.33	
27	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.80	3567.13	
28	1	Landing Nipple, 4-1/2" Hbtn "R", 3.688" bore, Vam Ace, Inc925	4.991	3.688	0.36	3568.93	2750
29	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.79	3569.29	
30	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.80	3571.08	
31	1	PBR, 5" Seal Bore, 20' stroke, Hbtn 812PBA70503, 4-1/2" VAMACE BxP, Inconel	5.875	3.850	8.13	3572.88	2752
32	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.80	3581.01	
33	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.80	3582.81	
34	1	Ratch Latch Seal Assembly, 4-1/2" Hbtn 812SSR5001, Vam Ace Box, Inc925	5.290	3.938	0.51	3584.61	
35	1	Packer, 9-5/8" Hbtn MHP 212MHP9500-C, 36-59.4lb, Btm Thd 5" Vam Ace box, Inc-925	8.125	3.875	1.98	3585.12	2760
36	1	Millout Extension, 5" Hbtn 812MOE40019, 15# Vam Ace PxP, Inc-925	5.036	4.250	2.35	3587.10	
37	1	Xover, 4-1/2" x 5", Vam Ace x Vam Ace PxB, Inc925	5.593	3.958	0.21	3589.45	
38	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.80	3589.66	
39	1	Tubing, 4-1/2" 12.6 lb/ft Super 13Cr-80 VAM ACE	4.500	3.958	9.67	3591.46	
40	1	Pup Joint, 4-1/2" 12.6 lb/ft Super 13Cr-80 V/Ace	4.500	3.958	1.80	3601.13	
41	1	Landing Nipple, 4-1/2" Hbtn "RN", 3.437" bore, 3.260" NoGo, Vam Ace BxP, Inc925	4.991	3.260	0.41	3602.93	2772
42	1	Xover, 4-1/2" x 4-1/2" VAMACE x NEWVAM, BxP, Hbtn , 9Cr1Mo	4.500	3.958	0.26	3603.34	
43	1	Plug, Mirage Tailpipe, 4-1/2" NEWVAM BxP, Hbtn 21MPA38800, 13Cr	5.880	3.880	1.40	3603.60	
44	1	Wireline Guide, 4-1/2" New Vam Box, 13Cr	5.875	3.984	0.21	3605.00	
45	1	Bottom of Tubing				3605.21	2774
100	0						
101	1	Pup Joint, 2-3/8" 4.6 lb/ft 13Cr(S)80 VAM ACE PxP	2.697	1.995	2.93		
102	1	TRSSV, 2-3/8" Camco "TRM-4P", 1.875" X profile, 13Cr/410, Vam Ace BxP	3.640	1.875	1.21		
103	1	Pup Joint, 2-3/8" 4.6 lb/ft 13Cr(S)80 VAM ACE BxP	2.697	1.995	3.03		
104	1	Mule Shoe Guide (2-3/8" VAM ACE Modified Coupling with Brass Pin)	3.850	2.992	0.18		



Wellhead Size and Type:

ABB Vetco Gray MS-700 10,000 psi Subsea Wellhead System

Wellhead Cap:

ABB Vetco Gray, TR-16, 5" x 2", LC-7 Mandrel Up

BPV Preparation:

Halliburton 3.813" X

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NOTE: See Page 2 of 2 for Casing and Perforation Data

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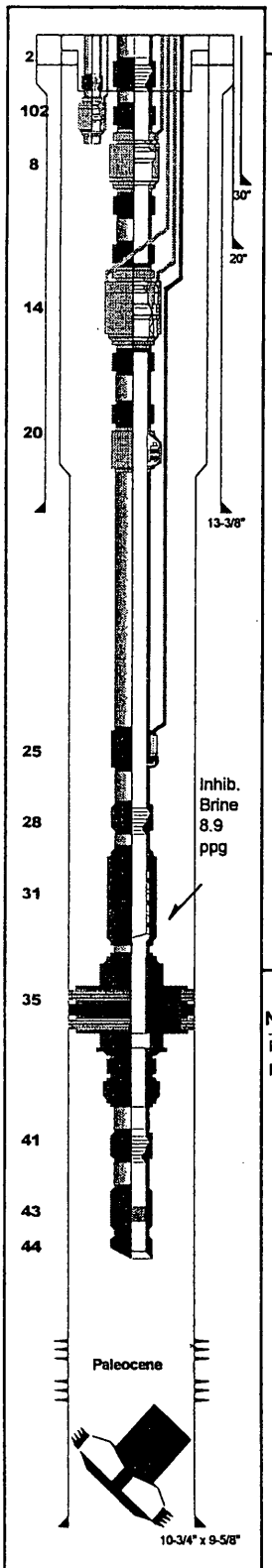
Field: BLACKBACK Plat: BKA Well: A2

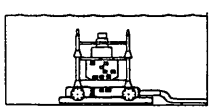
Updated By: cmshaug Rev. Date 31/08/99



No.	Description	OD Max	ID Min	Length (m)	MD (m)	TVD (m)
1	RT to top of 10-3/4" Casing Hanger			418.48		
2	Casing Hanger, 10-3/4"		9.760	0.34	418.48	418
3	Pup Joint - Production Casing, 10-3/4" 55.5 lb/ft VAM TOP	11.750	9.760	2.97	418.82	
4	Production Casing, 10-3/4" 55.5 lb/ft VAM TOP (61 jts)	11.750	9.760	736.52	421.79	
5	Crossover, 10-3/4" x 9-5/8"	11.750	8.681	9.36	1158.31	1135
6	Production Casing, 9-5/8" 47 lb/ft L-80 LTC (113 jts)	10.625	8.681	1337.30	1167.67	
7	Production Casing, 9-5/8" 53.5 lb/ft L-80 LTC (82 jts)	10.625	8.535	975.05	2504.97	
8	Pup Joint - Production Casing, 9-5/8" 53.5 lb/ft L-80 LTC	10.625	8.535	3.20	3480.02	
9	Production Casing, 9-5/8" 53.5 lb/ft L-80 LTC (4 jts)	10.625	8.535	47.81	3483.22	
10	RA PIP Tag			0.00	3531.03	2724
11	Production Casing, 9-5/8" 53.5 lb/ft L-80 LTC (21 jts)	10.625	8.535	248.06	3531.03	
12	Float Collar, 9-5/8" 53.5 lb/ft L-80 LTC	10.625	8.535	0.36	3779.09	
13	Production Casing, 9-5/8" 53.5 lb/ft L-80 LTC	10.625	8.535	11.52	3779.45	
14	Production Casing Float Shoe Joint, 9-5/8" 53.5 lb/ft L-80 LTC	10.625	8.535	12.61	3790.97	
15	Production Casing Setting Depth			0.00	3803.58	2905
16						
1	RT to top of 13-3/8" Casing Hanger			418.82		
2	Casing Hanger Joint, 13-3/8"		12.415	3.39	418.82	419
3	Surface Casing, 13-3/8" 68 lb/ft K-55 BTC (72 Jts)	14.375	12.415	849.60	422.21	
4	Float Collar, 13-3/8"	14.375	12.415	0.35	1271.81	
5	Surface Casing, 13-3/8" 68 lb/ft K-55 BTC (2 Jts)	14.375	12.415	23.62	1272.16	
6	Float Shoe, 13-3/8"	14.375	12.415	0.53	1295.78	
7	Surface Casing Setting Depth			0.00	1296.31	1236
8						
1	RT to Top 18-3/4" Wellhead Housing			417.75		
2	18-3/4" Wellhead Housing Joint, 20" 129.3 lb/ft X-56 RL-4S	27.375	17.563	4.39	417.75	418
3	Structural Casing, 20" 129.3 lb/ft X-56 RL-4S (21 jts)	20.000	18.750	248.36	422.14	
4	Structural Casing Float Shoe Joint, 20" 129.3 lb/ft X-56 RL-4S	20.000	18.750	11.95	670.50	
6	Structural Casing Setting Depth			0.00	682.45	682
7						
1	RT to 30" Wellhead Housing			418.53		
2	Wellhead Housing Joint, 30 " 1-1/2" Wall 457 lb/ft X-52 RL-4HT	35.750	27.000	10.40	418.53	419
3	Structural Casing, 30" 1" Wall 310 lb/ft X-52 RL-4HT (3 jts)	30.000	28.000	34.86	428.93	
4	Structural Casing, 30" 1" Wall 310 lb/ft X-52 RL-4S (2 jts)	30.000	28.000	23.28	452.21	
5	Float Shoe, 30" RL-4	30.000		0.23	487.07	
6	Structural Casing Setting Depth			0.00	487.30	487

Perforation Details

Name	Eff.	Aband.	Top	Bot.	Interval	TVD	Gun Description	Comment
Paleocene Up	30/05/1999		3685.0	3694.0	9.00	2828	7" HSD 12 SPF 51J Ultraje	Open 2828-34 m TVD
Paleocene Lo	30/05/1999		3699.0	3708.0	9.00	2837	7" HSD 12 SPF 51J Ultraje	Open 2837-43 m TVD



Wellhead Size and Type:
ABB Vetco Gray MS-700 10,000 psi Subsea Wellhead System

Wellhead Cap:
ABB Vetco Gray, TR-16, 5" x 2", LC-7 Mandrel Up

BPV Preparation:
Halliburton 3.813" X

Avg Angle: 48°

Max: 51° @ 1361

Original Completion: /06/1999

Last Workover:

Other: Description	Depth
RT to Sea Level	26.00
Water Depth	395.00

III. SAMPLES

Cuttings

Three sets of washed and oven dried cuttings were taken at 10m intervals from 3460 metres (aproximately 150m MDRT above predicted top of Latrobe Group) to 3620 metres (approximate top of Latrobe Group) then at 5m intervals to TD. Cuttings descriptions for the interval 2760m to 3811 m MDRT are contained in Appendix 3a.

Conventional coring

No conventional cores were cut.

Sidewall coring

No sidewall cores were shot.

IV. LOGS AND SURVEYS

Survey/Log	Company	Top (m MDRT)	Bottom (m MDRT)
MWD (Directional)	Anadrill	703.47*	3790.16
PEX(AIT)-HNGS	Schlumberger	2800	3763
GR (MWD)	Schlumberger	1295	3811

* Gamma Ray from 1300mMD.

V. FORMATION RESERVOIR TOPS

Formation/ Zone	m TVDSS			m MDRT	m TVT Net Oil Sand	
	Predicted	Actual	Difference	Actual	Predicted	Actual
Sea Floor	402	395	-7	421		
Gippsland Limestone	402	395	-7	421		
Base of High Velocity Channel (BHVC)		2419.5		3108.8		
Top of Lakes Entrance Formation (TOLE)	2518	2515.9	-2.1	3254.4		
Mid-Miocene Marker (MMM)		2550.0		3306.4		
Top of Latrobe Group (TOL)	2757	2766.6	9.6	3632.8		
Top of B210 (Top of Gas)	2776	2773.6	-2.4	3643.2		
Lowest Known Gas (LKG) *		2791.1*		3669.4		
Top of B230 (Indeterminate HC*)		2796.6*		3677.7		
Highest Known Oil (HKO) *	2803	2802.4*	-0.6	3685.6	18.85+	19.34
Top of B240		2803.1		3687.6		
Top of B250		2812.5		3702.0		
Oil-Water Contact (OWC)	2834°	2832.5	-1.5°	3733.3		
Base Paleocene	2855	2848.3	-6.7	3757.8		
Total Depth (TD)	2900	2883.1	-16.9	3811.0		

* Indeterminate hydrocarbon (possibly gas) is present over 3677.7-3682.9mMD (2796.6-2800.0mTVDSS). In Blackback-2 the correlative unit (2804.5-2827.2mMD; 2801.5-2804.2mTVDSS) was considered to be oil-bearing.

+ Prognosed 29m gross oil column with 65% net.

° OWC for Blackback-2 subsequently revised to 2832.1 mTVDSS; so OWC in A-2 is 0.4m low.

VI. GEOLOGICAL ANALYSIS

Drilling Operations Summary

Phase I of the Blackback "new field" development comprises three subsea wellheads spaced 25 metres apart and joined by flexible jumpers in a "daisy chain" arrangement at the end of a 23 kilometre pipeline to host facilities on Mackerel platform.

The Blackback Phase I (BKA) development program commenced at 1930hrs on February 13, 1999, with the arrival of the Sedco 702 semi-submersible drilling rig at the nominated location of the subsea completion. Drilling operations commenced at 0000hrs on February 16 with the batch drilling and emplacement of three conductors (A-3, then A-2 and A-1) followed by deployment of the inter-well flexible jumpers and Completion Guide Bases (CGBs).

Having already set surface casing for BKA A-3, the rig began to move to the A-2 location at 0430hrs on February 21 and, after running a Temporary Guide Base to the sea floor (395mSS) the BKA A-2 well was spudded at 1530hrs that day. A 36" hole was drilled to 491m with 30" casing set to 487m and then a 26" hole was drilled to 688m, with 20" casing set to 682.57m.

At 0000hrs on February 24 the rig was temporarily released from BKA A-2 to continue batch setting on A-1. The rig returned to A-2 briefly (0930-1930hrs) on March 1 to run the CGB, then proceeded to drill BKA A-1.

On April 24 at 0000hrs the rig returned to BKA A-2 and, later that day, drilling resumed with a 17½" bit drilling out of surface casing and continuing to 1305m, after which 13$^{3}/_{8}$" casing was set at 1296.31m. The 12¼" hole section commenced on April 30 and was drilled to 3764m, at which depth wireline logs were run early on May 10. After wireline logging, the hole was drilled (with difficulty due to junk in the hole) to a slightly shortened TD of 3811m (pre-drill 3828m) which was reached at 1645hrs on May 12.

The 10¾"x9$^{5}/_{8}$" production casing was then run and cemented to 3803.58m and the well was completed to produce the two oil sands. The TCP perforating guns were fired late on May 30 and, after running the tree cap, the rig was released from BKA A-2 (to A-1A) at 0730hrs on June 2.

Objectives

In 1992 the Blackback-2 appraisal well drilled the top of a Top of Latrobe Group knoll in the south central part of Blackback field and encountered Paleocene strata containing both gas- and oil-bearing sands. The two major gas sands intersected were determined to be separate from both each other and the underlying oil column based on pressure data. The two high-quality reservoir sands within the 29-metre oil column were production tested at rates of up to 5659 and 6640 BOPD.

VI. GEOLOGICAL ANALYSIS (CONT'D)

Blackback A-2, the second well in the Blackback Phase I development, was designed to develop the high-productivity oil sands.

Positioning of the target (pre-drill 'Location D') to the east/south-east of Blackback-2 was driven by;

(i) optimization of structural height and net sand,
(ii) minimization of the risk of intersecting the intra-Latrobe Group fault 100m to the north-east,
(iii) avoidance of a steep erosional Top of Latrobe Group truncation slope 50m to the south-east, and
(iv) requirement to stay clear of the (cased) Blackback-2 well bore 105m to the west (at target depth).

Relative to Blackback-2, the "most likely" case expected at Location D was for the TOL to be at the same depth or slightly deeper, but the internal reservoir sands to be shallower, due to the south/south-east dip of the TOL surface and the west-north-west dip of the Paleocene strata. Proximity to Blackback-2 largely removed geological/geophysical uncertainty for BKA A-2, so that operational (ie. drilling/completion) risks were the only significant threat to obtaining a successful outcome.

Results

Depth Uncertainty

Wireline logs in BKA A-2 were acquired in a single run without any hole or tool problems. While running in hole, the depth check at the $13^3/_8$" casing shoe showed a minor discrepancy, seemingly increased by a +1.0m stretch correction applied to the wireline depth (final logger's depth 1299m vs Driller's depth of 1296.3m). At TD (3764m Driller) a logger's depth of 3773m was initially measured, with a +5.9m stretch correction applied. However, upon correlating to the BKA A-2 MWD Gamma Ray and the OWC in Blackback-2 a clear depth "bust" of about +7m was apparent. This was "corrected" by tying the wireline logs to a spike at 3701.5mMD on the MWD Gamma Ray log, in effect applying a –7m "bulk shift" correction to the wireline logs. No wireline logs were recorded above 2800mMD, so no tie to the $13^3/_8$" casing shoe was done on the trip out of the hole.

Log picks have been made on the resulting measured depth logs and converted to TVD using the MWD survey data. After depth correction the OWC datum in BKA A-2 occurs at 3733.3mMD (2832.5mTVDSS) which compares well with the OWC in Blackback-2 (2832.1 mTVDSS from logs) located just 126 metres to the north west of the BKA A-2 OWC intersection.

VI. GEOLOGICAL ANALYSIS (CONT'D)

Hydrocarbons

BKA A-2 intersected the Top of Latrobe (TOL) unconformity at 3632.8mMD (2766.6mTVDSS) 9.6mTVD low and 124m east-south-east of the same horizon in Blackback-2. As expected, a very similar Paleocene section, comprising mostly high-quality sands with interbedded silts and shales, was encountered, and confirmed to be updip relative to Blackback-2.

As indicated on the Well Completion Log, since drilling BKA A-2 reservoir unit names have been assigned to sands within the hydrocarbon column. Units B210 through B220 are clearly gas-bearing (as the correlative sands in Blackback-2 were confirmed to be by wireline testing) and came in 3-5 metres higher than in the exploration well. The target oil sands (the upper and lower oil sands production tested in Blackback-2) have been labelled B240 and B250, respectively, and these came in about 4.5 metres higher than in Blackback-2 (120 metres north-west).

An Oil/Water Contact (OWC) is identified just below the base of B250, at 3733.3mMD (2832.5mTVDSS), which indicates a good depth correlation with the Blackback-2 OWC (2832.1mTVDSS). Similar to Blackback-2, a Gas/Oil Contact (GOC) could not be identified in A-2, so Lowest Known Gas (LKG) is placed within B220 at 3669.4mMD (2791.2mTVDSS) and Highest Known Oil (HKO) at 3685.6mMD (2801.8mTVDSS) just above the top B240. Between these two horizons the poorer-quality B230 sand (3677.7-3682.9mMD) is identified as hydrocarbon-bearing, but whether the fluid is oil or gas remains uncertain. (The same sand in Blackback-2 was concluded to be most likely oil-bearing).

If the indeterminate zone could be shown to be oil, then the gross column would be 35.9 metres TVD (29m prognosed), with a net oil pay of 21m TVD (19m prognosed) yielding a net-to-gross of 58%.

Excluding this indeterminate zone, a total of 19.3m TVD of net oil pay (within a gross 30.7-metre TVD column) is calculated in BKA A-2, with a mean effective porosity of 17% (as prognosed) and a mean effective water saturation of 18% (33% prognosed) yielding a net-to-gross of 63%.. While net pay and porosity are in line with expectations, the water saturation is substantially lower than prognosed. However, the 33% prognosed was (conservatively) based on a weighted average of all oil and gas zones from both Hapuku-1 and Blackback-2. A direct comparison of oil-bearing zones between BKA A-2 and Blackback-2 indicates that calculated water saturation in the latter is only a few percent higher, probably due to deeper invasion of mud filtrate subduing the hydrocarbon response.

VI. GEOLOGICAL ANALYSIS (CONT'D)

BKA A-2 was perforated over the intervals 3685.0-3694.0mMD (2801.4-2807.3mTVDSS) and 3699.0-3708.0mMD (2810.5-2816.3mTVDSS). Production commenced on June 12 and A-2 produced at rates averaging 8,000 stbd through a 50% choke, limited by slug flow constraints in the pipeline to Mackerel. Higher than anticipated apparent gas/oil ratio and the almost immediate onset of water cut are inconsistent with wireline and production test data from both Blackback-2 and the A-2 well. The higher GOR and early water limited the well's performance to the extent that it was shut-in on August 19 (just prior to the other wells coming on-line).

Geophysical Analysis

The TOL encountered in BKA A-2 is 0.35% low to the "most likely" prognosis. This small error is due to a combination of the well being drilled slightly to the southeast of the target location and an inability to resolve on seismic data the steep erosional edge of the Top of Latrobe Group knoll.

APPENDIX 1a

BLACKBACK A-2

Survey Data

907468 019

Schlumberger
Anadrill

Survey

Client:	Esso Australia Ltd	Survey Computation Method:	Minimum Curvature
Field:	BlackBack Gippsland Offshore	DLS Computation Method:	Lubinski
Structure:	Blackback Sedco 702 A-2	Vertical Section Azimuth:	205.140°
Well:	A-2	Vertical Section Origin:	N 11.600 m, E 7.900 m
Borehole:	A-2	TVD Reference:	Rotary Table
API #:			26.0 m above MSL
Date:	May 12, 1999	Magnetic Declination:	13.384°
Grid Convergence:	-0.96794049°	Total Field Strength:	60296.748 nT
Scale Factor:	0.99982564	Dip:	-69.042°
		Declination Date:	February 25, 1999
Location:	S 38 32 31.296, E 148 33 11.593	Magnetic Declination Model:	BGS 1998
:	N 5732885.000 m, E 635363.000 m	North Reference:	Grid North
Coordinate System:	UTM Zone 55 S on Australian Datum 1984	Coordinate Reference To:	Structure Reference Point

Station ID	MD (m)	Incl (°)	Azim (°)	TVD (m)	VSec (m)	N/-S (m)	E/-W (m)	Closure (m)	at Azim (°)	DLS (°/30m)	TF (°)
Rotary Table	0.00	0.00	0.00	0.00	0.00	11.60	7.90	0.00	34.26	0.00	65.6MTF
	421.00	0.00	65.64	421.00	0.00	11.60	7.90	0.00	34.26	0.00	65.6MTF
	424.00	1.50	65.64	424.00	-0.03	11.62	7.94	0.04	34.34	15.00	65.6MTF
	433.00	1.70	65.64	433.00	-0.22	11.72	8.17	0.29	34.86	0.67	65.6MTF
	443.00	1.90	65.64	442.99	-0.46	11.85	8.45	0.61	35.50	0.60	65.6MTF
	452.00	1.90	65.64	451.99	-0.69	11.97	8.72	0.91	36.08	0.00	65.6MTF
	461.00	1.80	65.64	460.98	-0.91	12.09	8.99	1.20	36.62	0.33	65.6MTF
	490.00	1.80	65.64	489.97	-1.60	12.47	9.82	2.11	38.22	0.00	65.6MTF
	519.00	1.83	65.64	518.95	-2.30	12.85	10.66	3.03	39.67	0.03	71.0MTF
	548.00	1.92	71.00	547.94	-2.99	13.20	11.54	3.97	41.16	0.20	65.8MTF
	577.20	1.80	65.77	577.12	-3.68	13.55	12.42	4.92	42.51	0.21	56.5MTF
	606.20	1.79	56.49	606.11	-4.41	13.98	13.21	5.82	43.37	0.30	50.0MTF
	635.20	1.59	50.04	635.10	-5.16	14.49	13.90	6.66	43.80	0.29	53.9MTF
Tie In Point	651.00	1.41	53.92	650.89	-5.53	14.75	14.22	7.06	43.96	0.39	54.0MTF
26th April 1999	703.09	1.42	54.03	702.96	-6.66	15.50	15.26	8.33	44.55	0.01	78.7MTF
	732.47	1.56	78.73	732.33	-7.22	15.79	15.95	9.08	45.28	0.67	103.1MTF
	760.04	1.74	103.05	759.89	-7.53	15.77	16.72	9.76	46.68	0.78	127.5MTF
	789.25	2.35	127.52	789.08	-7.49	15.31	17.63	10.41	49.03	1.08	152.2MTF
	818.14	3.48	152.24	817.94	-6.84	14.17	18.51	10.92	52.56	1.73	164.6MTF
	845.54	5.72	164.65	845.25	-5.30	12.12	19.26	11.37	57.82	2.67	46.4
	873.10	8.27	181.05	872.60	-2.44	8.81	19.59	12.01	65.78	3.50	44.3
	902.30	10.50	192.04	901.41	2.07	4.11	18.99	13.38	77.79	2.93	56.7
	931.93	12.08	202.22	930.47	7.80	-1.40	17.26	16.02	94.65	2.57	18.3
	961.20	13.87	204.67	958.99	14.36	-7.43	14.63	20.18	116.91	1.92	4.0
	991.18	17.12	205.45	987.88	22.37	-14.68	11.24	26.49	142.57	3.26	-4.8
	1019.87	20.70	204.60	1015.02	31.67	-23.10	7.31	34.71	162.44	3.75	-1.3
	1046.48	25.04	204.37	1039.53	42.01	-32.51	3.03	44.38	174.68	4.89	5.0
	1075.12	28.01	204.92	1065.15	54.79	-44.14	-2.31	56.66	183.00	3.12	-3.9
	1101.98	31.18	204.50	1088.51	68.06	-56.19	-7.85	69.59	187.96	3.55	3.8
	1130.35	34.69	204.91	1112.31	83.48	-70.20	-14.30	84.76	191.51	3.72	1.1
	1159.05	37.79	205.01	1135.46	100.44	-85.58	-21.46	101.51	194.08	3.24	60.0
27th April 1999	1190.84	38.63	207.28	1160.44	120.10	-103.22	-30.13	120.96	196.27	1.54	-40.1
	1223.50	41.51	203.69	1185.43	141.11	-122.20	-39.15	141.83	197.76	3.39	-0.5
	1254.23	44.71	203.65	1207.86	162.11	-141.43	-47.58	162.78	198.59	3.12	-3.3
	1282.69	48.40	203.37	1227.43	182.76	-160.38	-55.82	183.40	199.19	3.90	-8.1
	1296.30	50.40	203.00	1236.29	193.08	-169.88	-59.89	193.72	199.42	4.45	-4.0
30th Aprill 1999	1305.71	50.96	202.95	1242.25	200.36	-176.58	-62.73	201.00	199.56	1.79	113.2
	1332.65	50.95	202.98	1259.22	221.27	-195.84	-70.89	221.90	199.90	0.03	16.3
	1361.59	51.03	203.01	1277.44	243.74	-216.54	-79.68	244.38	200.20	0.09	-155.9
	1391.78	50.77	202.86	1296.48	267.15	-238.12	-88.81	267.79	200.45	0.28	-178.6

	1420.80	50.45	202.85	1314.89	289.56	-258.79	-97.52	290.21	200.65	0.33	154.3
	1449.64	50.10	203.07	1333.32	311.73	-279.21	-106.17	312.38	200.82	0.40	-166.5
	1478.70	49.72	202.95	1352.04	333.94	-299.68	-114.86	334.61	200.97	0.40	157.6
	1508.15	49.48	203.08	1371.13	356.35	-320.32	-123.63	357.03	201.10	0.26	168.9
	1536.65	49.02	203.20	1389.73	377.93	-340.17	-132.11	378.61	201.22	0.49	-148.2
	1564.95	48.79	203.01	1408.33	399.24	-359.79	-140.48	399.93	201.33	0.29	146.0
	1593.71	48.48	203.29	1427.34	420.82	-379.63	-148.97	421.51	201.43	0.39	-154.3
	1622.84	48.17	203.09	1446.71	442.56	-399.63	-157.54	443.26	201.51	0.35	164.6
1st May 1999	1651.63	47.74	203.25	1465.99	463.93	-419.29	-165.95	464.64	201.59	0.46	168.1
	1679.83	47.46	203.33	1485.00	484.74	-438.42	-174.18	485.46	201.67	0.30	155.2
	1708.60	47.08	203.57	1504.52	505.87	-457.81	-182.59	506.59	201.74	0.44	-24.7
	1738.80	47.24	203.47	1525.06	528.00	-478.11	-191.43	528.72	201.82	0.17	-0.8
	1767.83	47.79	203.46	1544.66	549.40	-497.75	-199.95	550.13	201.89	0.57	-8.6
	1796.76	48.53	203.31	1563.96	570.94	-517.53	-208.51	571.67	201.94	0.78	25.0
	1826.10	49.13	203.68	1583.28	593.02	-537.79	-217.31	593.75	202.00	0.68	-20.1
	1854.97	49.84	203.34	1602.03	614.96	-557.91	-226.07	615.70	202.06	0.79	3.7
	1882.46	50.08	203.36	1619.72	636.00	-577.23	-234.41	636.74	202.10	0.26	176.5
	1911.34	49.58	203.40	1638.35	658.05	-597.49	-243.17	658.81	202.15	0.52	-164.2
	1941.18	49.18	203.25	1657.77	680.69	-618.29	-252.14	681.45	202.19	0.42	148.8
	1970.30	48.50	203.80	1676.94	702.61	-638.39	-260.89	703.37	202.23	0.82	-174.7
	1998.78	48.02	203.74	1695.90	723.85	-657.84	-269.45	724.62	202.27	0.51	166.6
2nd May 1999	2027.55	47.22	204.00	1715.29	745.10	-677.27	-278.05	745.86	202.32	0.86	-173.5
	2056.70	46.71	203.92	1735.18	766.40	-696.74	-286.70	767.16	202.37	0.53	136.3
	2086.58	46.46	204.25	1755.72	788.10	-716.56	-295.56	788.86	202.41	0.35	32.8
	2115.34	46.72	204.48	1775.49	808.99	-735.59	-304.18	809.75	202.47	0.32	31.2
	2144.51	47.01	204.72	1795.43	830.28	-754.94	-313.04	831.02	202.52	0.35	-3.4
	2173.74	47.38	204.69	1815.29	851.72	-774.43	-322.00	852.45	202.58	0.38	38.0
	2202.86	47.55	204.87	1834.98	873.18	-793.91	-331.00	873.90	202.63	0.22	9.7
	2231.19	47.94	204.96	1854.03	894.15	-812.93	-339.83	894.85	202.69	0.42	6.4
	2261.01	48.34	205.02	1873.93	916.36	-833.06	-349.21	917.05	202.74	0.40	133.9
	2289.65	48.14	205.30	1893.00	937.72	-852.39	-358.30	938.39	202.80	0.30	172.8
	2317.59	47.44	205.42	1911.77	958.42	-871.09	-367.16	959.07	202.86	0.76	143.7
	2346.36	47.37	205.49	1931.24	979.59	-890.22	-376.26	980.23	202.91	0.09	10.9
	2375.43	47.91	205.63	1950.83	1001.07	-909.59	-385.53	1001.69	202.97	0.57	152.6
	2403.81	47.81	205.70	1969.87	1022.12	-928.56	-394.65	1022.72	203.03	0.12	151.0
	2434.28	47.61	205.85	1990.38	1044.66	-948.86	-404.45	1045.23	203.09	0.23	33.6
	2461.73	47.80	206.02	2008.85	1064.96	-967.12	-413.33	1065.52	203.14	0.25	19.9
	2490.61	48.17	206.20	2028.18	1086.41	-986.39	-422.77	1086.95	203.20	0.41	163.8
	2520.19	47.94	206.29	2047.95	1108.41	-1006.12	-432.50	1108.92	203.26	0.24	172.3
	2548.70	47.23	206.42	2065.83	1127.98	-1023.66	-441.19	1128.47	203.32	0.81	167.6
3rd May 1999	2577.38	46.70	206.58	2086.77	1150.40	-1043.73	-451.19	1150.86	203.38	0.53	2.3
	2607.27	46.88	206.59	2107.23	1172.17	-1063.21	-460.94	1172.62	203.44	0.18	29.8
	2637.10	47.11	206.77	2127.58	1193.98	-1082.70	-470.74	1194.40	203.50	0.27	147.7
	2665.47	46.96	206.90	2146.91	1214.73	-1101.22	-480.11	1215.13	203.56	0.19	-142.9
	2693.48	46.72	206.65	2166.07	1235.15	-1119.47	-489.31	1235.53	203.61	0.32	170.3
4th May 1999	2723.53	46.38	206.73	2186.74	1256.96	-1138.96	-499.11	1257.32	203.66	0.34	-162.6
	2750.46	45.56	206.37	2205.46	1276.32	-1156.28	-507.77	1276.66	203.71	0.96	-12.3
	2780.43	45.79	206.30	2226.40	1297.75	-1175.49	-517.28	1298.08	203.75	0.24	-6.3
	2810.24	46.98	206.12	2246.96	1319.33	-1194.85	-526.81	1319.64	203.79	1.20	4.5
	2840.18	47.82	206.21	2267.23	1341.37	-1214.63	-536.53	1341.66	203.83	0.84	-10.7
5th May 1999	2868.85	48.90	205.94	2286.28	1362.79	-1233.88	-545.95	1363.07	203.87	1.15	-175.5
	2897.29	47.86	205.83	2305.17	1384.05	-1253.01	-555.23	1384.32	203.90	1.10	180.0
	2927.30	47.79	205.83	2325.31	1406.29	-1273.03	-564.92	1406.55	203.93	0.07	-8.1
	2956.30	48.74	205.65	2344.62	1427.93	-1292.52	-574.32	1428.18	203.96	0.99	-122.7
	2984.63	48.62	205.40	2363.32	1449.20	-1311.72	-583.48	1449.45	203.98	0.24	173.8
	3014.42	47.94	205.50	2383.15	1471.44	-1331.80	-593.04	1471.68	204.00	0.69	-7.3
	3042.79	49.18	205.29	2401.92	1492.70	-1351.01	-602.16	1492.94	204.02	1.32	-164.7
	3069.97	48.74	205.13	2419.77	1513.21	-1369.56	-610.89	1513.44	204.04	0.50	-165.2
	3098.42	48.26	204.96	2438.62	1534.51	-1388.86	-619.91	1534.74	204.05	0.52	0.8
	3126.27	49.34	204.98	2456.97	1555.47	-1407.86	-628.76	1555.70	204.07	1.16	-176.7
	3157.60	48.81	204.94	2477.49	1579.14	-1429.32	-638.75	1579.37	204.08	0.51	-168.1

6th May 1999	3184.96	48.49	204.85	2495.57	1599.68	-1447.95	-647.39	1599.90	204.09	0.36	167.2
	3212.88	48.13	204.96	2514.13	1620.53	-1466.86	-656.17	1620.75	204.10	0.40	-155.7
	3243.10	47.90	204.82	2534.35	1642.99	-1487.24	-665.63	1643.21	204.11	0.25	-1.4
	3271.69	49.17	204.78	2553.28	1664.41	-1506.68	-674.61	1664.63	204.12	1.33	142.9
	3300.22	49.15	204.80	2571.94	1686.00	-1526.28	-683.66	1686.22	204.13	0.03	-157.6
	3329.23	49.04	204.74	2590.93	1707.92	-1546.19	-692.85	1708.14	204.14	0.12	173.9
	3358.94	48.90	204.76	2610.44	1730.33	-1566.54	-702.23	1730.55	204.15	0.14	-162.1
	3389.71	48.83	204.73	2630.68	1753.51	-1587.59	-711.93	1753.73	204.15	0.07	-165.9
	3418.74	48.80	204.72	2649.79	1775.35	-1607.43	-721.07	1775.57	204.16	0.03	-172.5
	3446.43	48.63	204.69	2668.06	1796.16	-1626.33	-729.77	1796.38	204.17	0.19	-173.4
	3474.40	48.50	204.67	2686.57	1817.13	-1645.39	-738.52	1817.35	204.17	0.14	-173.9
	3504.68	48.43	204.66	2706.65	1839.80	-1665.99	-747.98	1840.01	204.18	0.07	-166.6
7th May 1999	3534.68	48.18	204.58	2726.61	1862.20	-1686.35	-757.31	1862.42	204.18	0.26	163.3
	3562.06	47.81	204.73	2744.93	1882.54	-1704.84	-765.80	1882.76	204.19	0.42	-173.5
	3591.78	47.68	204.71	2764.91	1904.54	-1724.82	-775.00	1904.76	204.20	0.13	140.9
	3619.56	47.58	204.82	2783.64	1925.06	-1743.46	-783.60	1925.28	204.20	0.14	108.7
	3648.98	47.56	204.90	2803.49	1946.78	-1763.16	-792.73	1946.99	204.21	0.06	1.6
	3680.05	48.88	204.95	2824.19	1969.94	-1784.17	-802.49	1970.16	204.22	1.28	-6.3
	3707.48	50.28	204.75	2841.97	1990.83	-1803.12	-811.27	1991.04	204.22	1.54	-159.1
9th May 1999	3738.56	49.98	204.60	2861.89	2014.68	-1824.80	-821.22	2014.90	204.23	0.31	177.5
11th May 1999	3756.09	49.63	204.62	2873.21	2028.07	-1836.97	-826.80	2028.29	204.23	0.60	-158.2
12th May 1999	3790.16	49.10	204.34	2895.40	2053.92	-1860.50	-837.51	2054.14	204.24	0.50	180.0
Projection to bit	3811.00	48.80	204.34	2909.08	2069.64	-1874.82	-843.99	2069.86	204.24	0.43	

APPENDIX 1b

BLACKBACK A-2

MD-TVD Survey Data Listing

BLACKBACK A-2 MD-TVD Survey Data Listing

MD	Angle	Direction	TVDRT	TVDSS	DNorth	DEast	Northing	Easting
0	0.0	0.00	0.00	-26.00	11.60	7.90	5732884.9	635362.8
5	0.00	0.78	5.00	-21.00	11.60	7.90	5732884.9	635362.8
10	0.00	1.56	10.00	-16.00	11.60	7.90	5732884.9	635362.8
15	0.00	2.34	15.00	-11.00	11.60	7.90	5732884.9	635362.8
20	0.00	3.12	20.00	-6.00	11.60	7.90	5732884.9	635362.8
25	0.00	3.90	25.00	-1.00	11.60	7.90	5732884.9	635362.8
30	0.00	4.68	30.00	4.00	11.60	7.90	5732884.9	635362.8
35	0.00	5.46	35.00	9.00	11.60	7.90	5732884.9	635362.8
40	0.00	6.24	40.00	14.00	11.60	7.90	5732884.9	635362.8
45	0.00	7.02	45.00	19.00	11.60	7.90	5732884.9	635362.8
50	0.00	7.80	50.00	24.00	11.60	7.90	5732884.9	635362.8
55	0.00	8.58	55.00	29.00	11.60	7.90	5732884.9	635362.8
60	0.00	9.35	60.00	34.00	11.60	7.90	5732884.9	635362.8
65	0.00	10.13	65.00	39.00	11.60	7.90	5732884.9	635362.8
70	0.00	10.91	70.00	44.00	11.60	7.90	5732884.9	635362.8
75	0.00	11.69	75.00	49.00	11.60	7.90	5732884.9	635362.8
80	0.00	12.47	80.00	54.00	11.60	7.90	5732884.9	635362.8
85	0.00	13.25	85.00	59.00	11.60	7.90	5732884.9	635362.8
90	0.00	14.03	90.00	64.00	11.60	7.90	5732884.9	635362.8
95	0.00	14.81	95.00	69.00	11.60	7.90	5732884.9	635362.8
100	0.00	15.59	100.00	74.00	11.60	7.90	5732884.9	635362.8
105	0.00	16.37	105.00	79.00	11.60	7.90	5732884.9	635362.8
110	0.00	17.15	110.00	84.00	11.60	7.90	5732884.9	635362.8
115	0.00	17.93	115.00	89.00	11.60	7.90	5732884.9	635362.8
120	0.00	18.71	120.00	94.00	11.60	7.90	5732884.9	635362.8
125	0.00	19.49	125.00	99.00	11.60	7.90	5732884.9	635362.8
130	0.00	20.27	130.00	104.00	11.60	7.90	5732884.9	635362.8
135	0.00	21.05	135.00	109.00	11.60	7.90	5732884.9	635362.8
140	0.00	21.83	140.00	114.00	11.60	7.90	5732884.9	635362.8
145	0.00	22.61	145.00	119.00	11.60	7.90	5732884.9	635362.8
150	0.00	23.39	150.00	124.00	11.60	7.90	5732884.9	635362.8
155	0.00	24.17	155.00	129.00	11.60	7.90	5732884.9	635362.8
160	0.00	24.95	160.00	134.00	11.60	7.90	5732884.9	635362.8
165	0.00	25.73	165.00	139.00	11.60	7.90	5732884.9	635362.8
170	0.00	26.51	170.00	144.00	11.60	7.90	5732884.9	635362.8
175	0.00	27.29	175.00	149.00	11.60	7.90	5732884.9	635362.8
180	0.00	28.06	180.00	154.00	11.60	7.90	5732884.9	635362.8
185	0.00	28.84	185.00	159.00	11.60	7.90	5732884.9	635362.8
190	0.00	29.62	190.00	164.00	11.60	7.90	5732884.9	635362.8
195	0.00	30.40	195.00	169.00	11.60	7.90	5732884.9	635362.8
200	0.00	31.18	200.00	174.00	11.60	7.90	5732884.9	635362.8
205	0.00	31.96	205.00	179.00	11.60	7.90	5732884.9	635362.8
210	0.00	32.74	210.00	184.00	11.60	7.90	5732884.9	635362.8
215	0.00	33.52	215.00	189.00	11.60	7.90	5732884.9	635362.8
220	0.00	34.30	220.00	194.00	11.60	7.90	5732884.9	635362.8
225	0.00	35.08	225.00	199.00	11.60	7.90	5732884.9	635362.8
230	0.00	35.86	230.00	204.00	11.60	7.90	5732884.9	635362.8
235	0.00	36.64	235.00	209.00	11.60	7.90	5732884.9	635362.8
240	0.00	37.42	240.00	214.00	11.60	7.90	5732884.9	635362.8
245	0.00	38.20	245.00	219.00	11.60	7.90	5732884.9	635362.8
250	0.00	38.98	250.00	224.00	11.60	7.90	5732884.9	635362.8
255	0.00	39.76	255.00	229.00	11.60	7.90	5732884.9	635362.8
260	0.00	40.54	260.00	234.00	11.60	7.90	5732884.9	635362.8
265	0.00	41.32	265.00	239.00	11.60	7.90	5732884.9	635362.8
270	0.00	42.10	270.00	244.00	11.60	7.90	5732884.9	635362.8
275	0.00	42.88	275.00	249.00	11.60	7.90	5732884.9	635362.8
280	0.00	43.66	280.00	254.00	11.60	7.90	5732884.9	635362.8
285	0.00	44.44	285.00	259.00	11.60	7.90	5732884.9	635362.8
290	0.00	45.22	290.00	264.00	11.60	7.90	5732884.9	635362.8
295	0.00	45.99	295.00	269.00	11.60	7.90	5732884.9	635362.8
300	0.00	46.77	300.00	274.00	11.60	7.90	5732884.9	635362.8
305	0.00	47.55	305.00	279.00	11.60	7.90	5732884.9	635362.8
310	0.00	48.33	310.00	284.00	11.60	7.90	5732884.9	635362.8
315	0.00	49.11	315.00	289.00	11.60	7.90	5732884.9	635362.8
320	0.00	49.89	320.00	294.00	11.60	7.90	5732884.9	635362.8
325	0.00	50.67	325.00	299.00	11.60	7.90	5732884.9	635362.8
330	0.00	51.45	330.00	304.00	11.60	7.90	5732884.9	635362.8
335	0.00	52.23	335.00	309.00	11.60	7.90	5732884.9	635362.8

MD	Angle	Direction	TVDRT	TVDSS	DNorth	DEast	Northing	Easting
340	0.00	53.01	340.00	314.00	11.60	7.90	5732884.9	635362.8
345	0.00	53.79	345.00	319.00	11.60	7.90	5732884.9	635362.8
350	0.00	54.57	350.00	324.00	11.60	7.90	5732884.9	635362.8
355	0.00	55.35	355.00	329.00	11.60	7.90	5732884.9	635362.8
360	0.00	56.13	360.00	334.00	11.60	7.90	5732884.9	635362.8
365	0.00	56.91	365.00	339.00	11.60	7.90	5732884.9	635362.8
370	0.00	57.69	370.00	344.00	11.60	7.90	5732884.9	635362.8
375	0.00	58.47	375.00	349.00	11.60	7.90	5732884.9	635362.8
380	0.00	59.25	380.00	354.00	11.60	7.90	5732884.9	635362.8
385	0.00	60.03	385.00	359.00	11.60	7.90	5732884.9	635362.8
390	0.00	60.81	390.00	364.00	11.60	7.90	5732884.9	635362.8
395	0.00	61.59	395.00	369.00	11.60	7.90	5732884.9	635362.8
400	0.00	62.37	400.00	374.00	11.60	7.90	5732884.9	635362.8
405	0.00	63.15	405.00	379.00	11.60	7.90	5732884.9	635362.8
410	0.00	63.92	410.00	384.00	11.60	7.90	5732884.9	635362.8
415	0.00	64.70	415.00	389.00	11.60	7.90	5732884.9	635362.8
420	0.00	65.48	420.00	394.00	11.60	7.90	5732884.9	635362.8
425	1.52	65.64	425.00	399.00	11.63	7.96	5732885.0	635362.9
430	1.63	65.64	430.00	404.00	11.68	8.09	5732885.0	635363.0
435	1.74	65.64	435.00	409.00	11.74	8.22	5732885.1	635363.2
440	1.84	65.64	439.99	413.99	11.81	8.36	5732885.1	635363.3
445	1.90	65.64	444.99	418.99	11.88	8.51	5732885.2	635363.5
450	1.90	65.64	449.99	423.99	11.95	8.66	5732885.3	635363.6
455	1.87	65.64	454.98	428.98	12.01	8.81	5732885.4	635363.8
460	1.81	65.64	459.98	433.98	12.08	8.96	5732885.4	635363.9
465	1.80	65.64	464.98	438.98	12.14	9.10	5732885.5	635364.0
470	1.80	65.64	469.98	443.98	12.21	9.24	5732885.5	635364.2
475	1.80	65.64	474.97	448.97	12.27	9.39	5732885.6	635364.3
480	1.80	65.64	479.97	453.97	12.34	9.53	5732885.7	635364.5
485	1.80	65.64	484.97	458.97	12.40	9.67	5732885.7	635364.6
490	1.80	65.64	489.97	463.97	12.47	9.82	5732885.8	635364.8
495	1.81	65.64	494.96	468.96	12.53	9.96	5732885.9	635364.9
500	1.81	65.64	499.96	473.96	12.60	10.10	5732885.9	635365.1
505	1.82	65.64	504.96	478.96	12.66	10.25	5732886.0	635365.2
510	1.82	65.64	509.96	483.96	12.73	10.39	5732886.1	635365.3
515	1.83	65.64	514.95	488.95	12.79	10.54	5732886.1	635365.5
520	1.83	65.82	519.95	493.95	12.86	10.68	5732886.2	635365.6
525	1.85	66.75	524.95	498.95	12.92	10.83	5732886.3	635365.8
530	1.86	67.67	529.95	503.95	12.99	10.98	5732886.3	635365.9
535	1.88	68.60	534.94	508.94	13.05	11.13	5732886.4	635366.1
540	1.90	69.52	539.94	513.94	13.11	11.28	5732886.4	635366.2
545	1.91	70.45	544.94	518.94	13.16	11.44	5732886.5	635366.4
550	1.91	70.64	549.94	523.94	13.22	11.60	5732886.6	635366.5
555	1.89	69.75	554.93	528.93	13.27	11.75	5732886.6	635366.7
560	1.87	68.85	559.93	533.93	13.33	11.91	5732886.7	635366.9
565	1.85	67.96	564.93	538.93	13.39	12.06	5732886.7	635367.0
570	1.83	67.06	569.93	543.93	13.45	12.21	5732886.8	635367.2
575	1.81	66.16	574.92	548.92	13.52	12.35	5732886.9	635367.3
580	1.80	64.87	579.92	553.92	13.58	12.50	5732886.9	635367.4
585	1.80	63.27	584.92	558.92	13.65	12.64	5732887.0	635367.6
590	1.80	61.67	589.92	563.92	13.72	12.78	5732887.1	635367.7
595	1.79	60.07	594.91	568.91	13.80	12.91	5732887.1	635367.9
600	1.79	58.47	599.91	573.91	13.88	13.05	5732887.2	635368.0
605	1.79	56.87	604.91	578.91	13.96	13.18	5732887.3	635368.1
610	1.76	55.64	609.91	583.91	14.05	13.31	5732887.4	635368.3
615	1.73	54.53	614.90	588.90	14.13	13.43	5732887.5	635368.4
620	1.69	53.42	619.90	593.90	14.22	13.55	5732887.6	635368.5
625	1.66	52.31	624.90	598.90	14.31	13.67	5732887.6	635368.6
630	1.63	51.20	629.90	603.90	14.40	13.78	5732887.7	635368.7
635	1.59	50.08	634.90	608.90	14.49	13.89	5732887.8	635368.8
640	1.54	51.22	639.89	613.89	14.57	14.00	5732887.9	635368.9
645	1.48	52.45	644.89	618.89	14.65	14.10	5732888.0	635369.0
650	1.42	53.67	649.89	623.89	14.73	14.20	5732888.1	635369.1
655	1.41	53.93	654.89	628.89	14.80	14.30	5732888.1	635369.2
660	1.41	53.94	659.89	633.89	14.87	14.40	5732888.2	635369.3
665	1.41	53.95	664.89	638.89	14.95	14.50	5732888.3	635369.4
670	1.41	53.96	669.88	643.88	15.02	14.60	5732888.4	635369.5
675	1.41	53.97	674.88	648.88	15.09	14.70	5732888.4	635369.6
680	1.42	53.98	679.88	653.88	15.16	14.80	5732888.5	635369.7
685	1.42	53.99	684.88	658.88	15.24	14.90	5732888.6	635369.8
690	1.42	54.00	689.88	663.88	15.31	15.00	5732888.7	635369.9

MD	Angle	Direction	TVDRT	TVDSS	DNorth	DEast	Northing	Easting
695	1.42	54.01	694.88	668.88	15.38	15.10	5732888.7	635370.0
700	1.42	54.02	699.87	673.87	15.46	15.20	5732888.8	635370.1
705	1.43	55.64	704.87	678.87	15.53	15.30	5732888.9	635370.2
710	1.45	59.84	709.87	683.87	15.60	15.41	5732888.9	635370.4
715	1.48	64.04	714.87	688.87	15.65	15.52	5732889.0	635370.5
720	1.50	68.25	719.87	693.87	15.71	15.64	5732889.0	635370.6
725	1.52	72.45	724.87	698.87	15.75	15.76	5732889.1	635370.7
730	1.55	76.65	729.87	703.87	15.78	15.88	5732889.1	635370.8
735	1.58	80.96	734.86	708.86	15.80	16.02	5732889.1	635371.0
740	1.61	85.37	739.86	713.86	15.82	16.15	5732889.2	635371.1
745	1.64	89.78	744.86	718.86	15.83	16.29	5732889.2	635371.2
750	1.67	94.19	749.86	723.86	15.82	16.44	5732889.2	635371.4
755	1.71	98.60	754.86	728.86	15.80	16.58	5732889.1	635371.5
760	1.74	103.01	759.85	733.85	15.77	16.72	5732889.1	635371.7
765	1.84	107.21	764.85	738.85	15.73	16.87	5732889.1	635371.8
770	1.95	111.39	769.85	743.85	15.68	17.03	5732889.0	635372.0
775	2.05	115.58	774.84	748.84	15.60	17.19	5732888.9	635372.1
780	2.16	119.77	779.84	753.84	15.52	17.34	5732888.9	635372.3
785	2.26	123.96	784.84	758.84	15.41	17.50	5732888.8	635372.4
790	2.38	128.16	789.83	763.83	15.29	17.65	5732888.6	635372.6
795	2.57	132.44	794.83	768.83	15.15	17.82	5732888.5	635372.8
800	2.77	136.72	799.82	773.82	14.98	17.98	5732888.3	635372.9
805	2.97	141.00	804.82	778.82	14.79	18.14	5732888.1	635373.1
810	3.16	145.28	809.81	783.81	14.58	18.29	5732887.9	635373.2
815	3.36	149.55	814.80	788.80	14.34	18.43	5732887.7	635373.4
820	3.63	153.08	819.79	793.79	14.07	18.56	5732887.4	635373.5
825	4.04	155.35	824.78	798.78	13.77	18.71	5732887.1	635373.7
830	4.45	157.61	829.77	803.77	13.43	18.85	5732886.8	635373.8
835	4.86	159.88	834.75	808.75	13.05	18.99	5732886.4	635373.9
840	5.27	162.14	839.73	813.73	12.63	19.12	5732886.0	635374.1
845	5.68	164.41	844.71	818.71	12.17	19.24	5732885.5	635374.2
850	6.13	167.30	849.68	823.68	11.67	19.37	5732885.0	635374.3
855	6.60	170.28	854.65	828.65	11.13	19.47	5732884.5	635374.4
860	7.06	173.25	859.62	833.62	10.54	19.55	5732883.9	635374.5
865	7.52	176.23	864.58	838.58	9.91	19.60	5732883.3	635374.5
870	7.98	179.21	869.53	843.53	9.24	19.60	5732882.6	635374.6
875	8.42	181.77	874.48	848.48	8.53	19.58	5732881.9	635374.5
880	8.80	183.65	879.43	853.43	7.79	19.54	5732881.1	635374.5
885	9.18	185.53	884.37	858.37	7.01	19.48	5732880.4	635374.4
890	9.56	187.41	889.30	863.30	6.20	19.38	5732879.5	635374.3
895	9.94	189.29	894.23	868.23	5.37	19.25	5732878.7	635374.2
900	10.32	191.17	899.15	873.15	4.51	19.08	5732877.9	635374.0
905	10.64	192.97	904.07	878.07	3.62	18.88	5732877.0	635373.8
910	10.91	194.69	908.98	882.98	2.72	18.66	5732876.1	635373.6
915	11.18	196.40	913.89	887.89	1.79	18.40	5732875.1	635373.3
920	11.44	198.12	918.79	892.79	0.86	18.11	5732874.2	635373.1
925	11.71	199.84	923.69	897.69	-0.08	17.78	5732873.3	635372.7
930	11.98	201.56	928.58	902.58	-1.04	17.41	5732872.3	635372.4
935	12.27	202.48	933.47	907.47	-2.00	17.01	5732871.3	635372.0
940	12.57	202.90	938.36	912.36	-3.00	16.59	5732870.3	635371.5
945	12.88	203.31	943.23	917.23	-4.01	16.16	5732869.3	635371.1
950	13.19	203.73	948.10	922.10	-5.04	15.71	5732868.3	635370.7
955	13.49	204.15	952.97	926.97	-6.09	15.24	5732867.2	635370.2
960	13.80	204.57	957.83	931.83	-7.17	14.75	5732866.2	635369.7
965	14.28	204.77	962.68	936.68	-8.27	14.25	5732865.1	635369.2
970	14.82	204.90	967.52	941.52	-9.41	13.72	5732863.9	635368.7
975	15.37	205.03	972.35	946.35	-10.59	13.17	5732862.8	635368.1
980	15.91	205.16	977.16	951.16	-11.81	12.60	5732861.5	635367.5
985	16.45	205.29	981.96	955.96	-13.07	12.00	5732860.3	635366.9
990	16.99	205.42	986.75	960.75	-14.37	11.38	5732859.0	635366.3
995	17.60	205.34	991.53	965.53	-15.71	10.75	5732857.6	635365.7
1000	18.22	205.19	996.28	970.28	-17.10	10.09	5732856.2	635365.0
1005	18.84	205.04	1001.03	975.03	-18.54	9.42	5732854.8	635364.4
1010	19.47	204.89	1005.75	979.75	-20.03	8.72	5732853.3	635363.7
1015	20.09	204.74	1010.45	984.45	-21.56	8.02	5732851.8	635363.0
1020	20.72	204.60	1015.14	989.14	-23.15	7.29	5732850.2	635362.2
1025	21.54	204.56	1019.80	993.80	-24.79	6.54	5732848.6	635361.5
1030	22.35	204.51	1024.44	998.44	-26.49	5.76	5732846.9	635360.7
1035	23.17	204.47	1029.05	1003.05	-28.25	4.96	5732845.1	635359.9
1040	23.98	204.43	1033.63	1007.63	-30.07	4.13	5732843.3	635359.1
1045	24.80	204.38	1038.19	1012.19	-31.95	3.28	5732841.4	635358.2

MD	Angle	Direction	TVDRT	TVDSS	DNorth	DEast	Northing	Easting
1050	25.41	204.44	1042.71	1016.71	-33.88	2.41	5732839.5	635357.4
1055	25.92	204.53	1047.22	1021.22	-35.85	1.51	5732837.5	635356.5
1060	26.44	204.63	1051.71	1025.71	-37.86	0.59	5732835.5	635355.5
1065	26.96	204.73	1056.17	1030.17	-39.90	-0.35	5732833.4	635354.6
1070	27.48	204.82	1060.62	1034.62	-41.98	-1.31	5732831.4	635353.6
1075	28.00	204.92	1065.05	1039.05	-44.09	-2.29	5732829.3	635352.7
1080	28.59	204.84	1069.45	1043.45	-46.24	-3.28	5732827.1	635351.7
1085	29.18	204.77	1073.83	1047.83	-48.43	-4.30	5732824.9	635350.6
1090	29.77	204.69	1078.18	1052.18	-50.66	-5.33	5732822.7	635349.6
1095	30.36	204.61	1082.51	1056.51	-52.94	-6.37	5732820.4	635348.6
1100	30.95	204.53	1086.81	1060.81	-55.26	-7.43	5732818.1	635347.5
1105	31.55	204.54	1091.08	1065.08	-57.62	-8.51	5732815.7	635346.4
1110	32.17	204.62	1095.33	1069.33	-60.02	-9.60	5732813.3	635345.3
1115	32.79	204.69	1099.55	1073.55	-62.46	-10.72	5732810.9	635344.2
1120	33.41	204.76	1103.74	1077.74	-64.94	-11.87	5732808.4	635343.1
1125	34.03	204.83	1107.90	1081.90	-67.46	-13.03	5732805.9	635341.9
1130	34.65	204.90	1112.02	1086.02	-70.02	-14.22	5732803.3	635340.7
1135	35.19	204.93	1116.12	1090.12	-72.61	-15.42	5732800.7	635339.5
1140	35.73	204.94	1120.20	1094.20	-75.24	-16.65	5732798.1	635338.3
1145	36.27	204.96	1124.24	1098.24	-77.91	-17.89	5732795.4	635337.1
1150	36.81	204.98	1128.26	1102.26	-80.61	-19.14	5732792.7	635335.8
1155	37.35	205.00	1132.25	1106.25	-83.34	-20.42	5732790.0	635334.5
1160	37.82	205.08	1136.21	1110.21	-86.11	-21.71	5732787.2	635333.2
1165	37.95	205.43	1140.15	1114.15	-88.88	-23.02	5732784.5	635331.9
1170	38.08	205.79	1144.09	1118.09	-91.66	-24.35	5732781.7	635330.6
1175	38.21	206.15	1148.03	1122.03	-94.43	-25.70	5732778.9	635329.2
1180	38.34	206.51	1151.95	1125.95	-97.21	-27.07	5732776.1	635327.9
1185	38.48	206.86	1155.87	1129.87	-99.99	-28.47	5732773.4	635326.5
1190	38.61	207.22	1159.78	1133.78	-102.76	-29.89	5732770.6	635325.1
1195	39.00	206.82	1163.68	1137.68	-105.55	-31.31	5732767.8	635323.6
1200	39.44	206.27	1167.55	1141.55	-108.38	-32.73	5732765.0	635322.2
1205	39.88	205.72	1171.40	1145.40	-111.24	-34.12	5732762.1	635320.8
1210	40.32	205.17	1175.23	1149.23	-114.15	-35.51	5732759.2	635319.4
1215	40.76	204.62	1179.03	1153.03	-117.10	-36.87	5732756.2	635318.1
1220	41.20	204.07	1182.80	1156.80	-120.09	-38.22	5732753.3	635316.7
1225	41.67	203.69	1186.55	1160.55	-123.12	-39.55	5732750.2	635315.4
1230	42.19	203.68	1190.27	1164.27	-126.17	-40.89	5732747.2	635314.1
1235	42.71	203.68	1193.96	1167.96	-129.27	-42.25	5732744.1	635312.7
1240	43.23	203.67	1197.62	1171.62	-132.39	-43.62	5732741.0	635311.3
1245	43.75	203.66	1201.25	1175.25	-135.54	-45.00	5732737.8	635309.9
1250	44.27	203.66	1204.85	1178.85	-138.72	-46.39	5732734.6	635308.6
1255	44.81	203.64	1208.41	1182.41	-141.93	-47.80	5732731.4	635307.1
1260	45.46	203.59	1211.94	1185.94	-145.18	-49.22	5732728.2	635305.7
1265	46.11	203.54	1215.42	1189.42	-148.46	-50.65	5732724.9	635304.3
1270	46.75	203.49	1218.87	1192.87	-151.79	-52.10	5732721.6	635302.9
1275	47.40	203.45	1222.27	1196.27	-155.14	-53.55	5732718.2	635301.4
1280	48.05	203.40	1225.64	1199.64	-158.54	-55.02	5732714.8	635299.9
1285	48.74	203.31	1228.96	1202.96	-161.97	-56.51	5732711.4	635298.4
1290	49.47	203.17	1232.23	1206.23	-165.44	-58.00	5732707.9	635296.9
1295	50.21	203.04	1235.46	1209.46	-168.96	-59.50	5732704.4	635295.4
1300	50.62	202.98	1238.64	1212.64	-172.51	-61.00	5732700.8	635293.9
1305	50.92	202.95	1241.80	1215.80	-176.07	-62.52	5732697.3	635292.4
1310	50.96	202.95	1244.95	1218.95	-179.65	-64.03	5732693.7	635290.9
1315	50.96	202.96	1248.10	1222.10	-183.23	-65.54	5732690.1	635289.4
1320	50.95	202.97	1251.25	1225.25	-186.80	-67.06	5732686.5	635287.9
1325	50.95	202.97	1254.40	1228.40	-190.38	-68.57	5732683.0	635286.4
1330	50.95	202.98	1257.55	1231.55	-193.95	-70.09	5732679.4	635284.9
1335	50.96	202.98	1260.70	1234.70	-197.53	-71.61	5732675.8	635283.3
1340	50.97	202.99	1263.85	1237.85	-201.10	-73.12	5732672.2	635281.8
1345	50.98	202.99	1267.00	1241.00	-204.68	-74.64	5732668.7	635280.3
1350	51.00	203.00	1270.14	1244.14	-208.25	-76.16	5732665.1	635278.8
1355	51.01	203.00	1273.29	1247.29	-211.83	-77.68	5732661.5	635277.3
1360	51.03	203.01	1276.44	1250.44	-215.41	-79.20	5732657.9	635275.8
1365	51.00	202.99	1279.58	1253.58	-218.99	-80.71	5732654.4	635274.2
1370	50.96	202.97	1282.73	1256.73	-222.56	-82.23	5732650.8	635272.7
1375	50.91	202.94	1285.88	1259.88	-226.14	-83.74	5732647.2	635271.2
1380	50.87	202.92	1289.03	1263.03	-229.71	-85.26	5732643.6	635269.7
1385	50.83	202.89	1292.19	1266.19	-233.28	-86.77	5732640.1	635268.2
1390	50.79	202.87	1295.35	1269.35	-236.85	-88.27	5732636.5	635266.7
1395	50.73	202.86	1298.51	1272.51	-240.42	-89.78	5732632.9	635265.2
1400	50.68	202.86	1301.68	1275.68	-243.99	-91.28	5732629.4	635263.7

MD	Angle	Direction	TVDRT	TVDSS	DNorth	DEast	Northing	Easting
1405	50.62	202.86	1304.85	1278.85	-247.55	-92.78	5732625.8	635262.2
1410	50.57	202.85	1308.02	1282.02	-251.11	-94.28	5732622.2	635260.7
1415	50.51	202.85	1311.20	1285.20	-254.67	-95.78	5732618.7	635259.2
1420	50.46	202.85	1314.38	1288.38	-258.22	-97.28	5732615.1	635257.7
1425	50.40	202.88	1317.57	1291.57	-261.77	-98.78	5732611.6	635256.2
1430	50.34	202.92	1320.76	1294.76	-265.32	-100.28	5732608.0	635254.7
1435	50.28	202.96	1323.95	1297.95	-268.86	-101.78	5732604.5	635253.2
1440	50.22	203.00	1327.15	1301.15	-272.40	-103.28	5732600.9	635251.7
1445	50.16	203.03	1330.35	1304.35	-275.94	-104.78	5732597.4	635250.2
1450	50.10	203.07	1333.55	1307.55	-279.47	-106.28	5732593.9	635248.7
1455	50.03	203.05	1336.76	1310.76	-283.00	-107.78	5732590.3	635247.2
1460	49.96	203.03	1339.98	1313.98	-286.52	-109.28	5732586.8	635245.7
1465	49.90	203.01	1343.20	1317.20	-290.04	-110.78	5732583.3	635244.2
1470	49.83	202.99	1346.42	1320.42	-293.56	-112.27	5732579.8	635242.7
1475	49.77	202.97	1349.65	1323.65	-297.08	-113.76	5732576.3	635241.2
1480	49.71	202.96	1352.88	1326.88	-300.59	-115.25	5732572.8	635239.7
1485	49.67	202.98	1356.11	1330.11	-304.10	-116.74	5732569.2	635238.2
1490	49.63	203.00	1359.35	1333.35	-307.61	-118.22	5732565.7	635236.7
1495	49.59	203.02	1362.59	1336.59	-311.11	-119.71	5732562.2	635235.2
1500	49.55	203.04	1365.83	1339.83	-314.62	-121.20	5732558.7	635233.7
1505	49.51	203.07	1369.08	1343.08	-318.12	-122.69	5732555.2	635232.3
1510	49.45	203.09	1372.33	1346.33	-321.61	-124.18	5732551.7	635230.8
1515	49.37	203.11	1375.58	1349.58	-325.11	-125.67	5732548.2	635229.3
1520	49.29	203.13	1378.84	1352.84	-328.59	-127.16	5732544.7	635227.8
1525	49.21	203.15	1382.10	1356.10	-332.08	-128.65	5732541.3	635226.3
1530	49.13	203.17	1385.37	1359.37	-335.55	-130.14	5732537.8	635224.8
1535	49.05	203.19	1388.65	1362.65	-339.03	-131.62	5732534.3	635223.3
1540	48.99	203.18	1391.93	1365.93	-342.50	-133.11	5732530.8	635221.8
1545	48.95	203.14	1395.21	1369.21	-345.97	-134.59	5732527.4	635220.4
1550	48.91	203.11	1398.49	1372.49	-349.43	-136.07	5732523.9	635218.9
1555	48.87	203.08	1401.78	1375.78	-352.90	-137.55	5732520.4	635217.4
1560	48.83	203.04	1405.07	1379.07	-356.36	-139.03	5732517.0	635215.9
1565	48.79	203.01	1408.36	1382.36	-359.82	-140.50	5732513.5	635214.4
1570	48.74	203.06	1411.66	1385.66	-363.28	-141.97	5732510.1	635213.0
1575	48.68	203.11	1414.96	1388.96	-366.74	-143.44	5732506.6	635211.5
1580	48.63	203.16	1418.26	1392.26	-370.19	-144.92	5732503.1	635210.0
1585	48.57	203.21	1421.57	1395.57	-373.64	-146.39	5732499.7	635208.6
1590	48.52	203.25	1424.88	1398.88	-377.08	-147.87	5732496.3	635207.1
1595	48.47	203.28	1428.19	1402.19	-380.52	-149.35	5732492.8	635205.6
1600	48.41	203.25	1431.51	1405.51	-383.96	-150.83	5732489.4	635204.1
1605	48.36	203.21	1434.83	1408.83	-387.40	-152.30	5732485.9	635202.6
1610	48.31	203.18	1438.15	1412.15	-390.83	-153.78	5732482.5	635201.2
1615	48.25	203.14	1441.48	1415.48	-394.26	-155.24	5732479.1	635199.7
1620	48.20	203.11	1444.81	1418.81	-397.69	-156.71	5732475.7	635198.2
1625	48.14	203.10	1448.15	1422.15	-401.12	-158.17	5732472.2	635196.8
1630	48.06	203.13	1451.49	1425.49	-404.54	-159.63	5732468.8	635195.3
1635	47.99	203.16	1454.83	1428.83	-407.96	-161.09	5732465.4	635193.9
1640	47.91	203.19	1458.18	1432.18	-411.37	-162.55	5732462.0	635192.4
1645	47.84	203.21	1461.53	1435.53	-414.78	-164.01	5732458.6	635190.9
1650	47.76	203.24	1464.89	1438.89	-418.18	-165.47	5732455.2	635189.5
1655	47.71	203.26	1468.25	1442.25	-421.58	-166.93	5732451.8	635188.0
1660	47.66	203.27	1471.62	1445.62	-424.98	-168.39	5732448.4	635186.6
1665	47.61	203.29	1474.99	1448.99	-428.37	-169.86	5732445.0	635185.1
1670	47.56	203.30	1478.36	1452.36	-431.76	-171.31	5732441.6	635183.6
1675	47.51	203.32	1481.74	1455.74	-435.15	-172.77	5732438.2	635182.2
1680	47.46	203.33	1485.12	1459.12	-438.53	-174.23	5732434.8	635180.7
1685	47.39	203.37	1488.50	1462.50	-441.91	-175.69	5732431.4	635179.3
1690	47.33	203.41	1491.89	1465.89	-445.29	-177.15	5732428.1	635177.8
1695	47.26	203.46	1495.28	1469.28	-448.66	-178.61	5732424.7	635176.3
1700	47.19	203.50	1498.67	1472.67	-452.03	-180.08	5732421.3	635174.9
1705	47.13	203.54	1502.07	1476.07	-455.39	-181.54	5732418.0	635173.4
1710	47.09	203.57	1505.48	1479.48	-458.75	-183.00	5732414.6	635171.9
1715	47.11	203.55	1508.88	1482.88	-462.10	-184.47	5732411.2	635170.5
1720	47.14	203.53	1512.28	1486.28	-465.46	-185.93	5732407.9	635169.0
1725	47.17	203.52	1515.68	1489.68	-468.83	-187.39	5732404.5	635167.6
1730	47.19	203.50	1519.08	1493.08	-472.19	-188.86	5732401.2	635166.1
1735	47.22	203.48	1522.48	1496.48	-475.55	-190.32	5732397.8	635164.6
1740	47.26	203.47	1525.87	1499.87	-478.92	-191.78	5732394.4	635163.2
1745	47.36	203.47	1529.26	1503.26	-482.29	-193.25	5732391.0	635161.7
1750	47.45	203.47	1532.65	1506.65	-485.67	-194.71	5732387.7	635160.2
1755	47.55	203.46	1536.03	1510.03	-489.05	-196.18	5732384.3	635158.8

MD	Angle	Direction	TVDRT	TVDSS	DNorth	DEast	Northing	Easting
1760	47.64	203.46	1539.40	1513.40	-492.44	-197.65	5732380.9	635157.3
1765	47.74	203.46	1542.76	1516.76	-495.83	-199.12	5732377.5	635155.8
1770	47.85	203.45	1546.12	1520.12	-499.22	-200.60	5732374.1	635154.4
1775	47.97	203.42	1549.47	1523.47	-502.63	-202.07	5732370.7	635152.9
1780	48.10	203.40	1552.82	1526.82	-506.04	-203.55	5732367.3	635151.4
1785	48.23	203.37	1556.15	1530.15	-509.46	-205.03	5732363.9	635149.9
1790	48.36	203.35	1559.48	1533.48	-512.89	-206.51	5732360.5	635148.4
1795	48.48	203.32	1562.80	1536.80	-516.32	-207.99	5732357.0	635147.0
1800	48.60	203.35	1566.11	1540.11	-519.76	-209.47	5732353.6	635145.5
1805	48.70	203.41	1569.41	1543.41	-523.21	-210.96	5732350.1	635144.0
1810	48.80	203.48	1572.71	1546.71	-526.66	-212.46	5732346.7	635142.5
1815	48.90	203.54	1576.00	1550.00	-530.11	-213.96	5732343.2	635141.0
1820	49.01	203.60	1579.28	1553.28	-533.57	-215.47	5732339.8	635139.5
1825	49.11	203.67	1582.56	1556.56	-537.03	-216.98	5732336.3	635138.0
1830	49.23	203.63	1585.83	1559.83	-540.49	-218.50	5732332.9	635136.4
1835	49.35	203.58	1589.09	1563.09	-543.96	-220.02	5732329.4	635134.9
1840	49.47	203.52	1592.34	1566.34	-547.44	-221.53	5732325.9	635133.4
1845	49.59	203.46	1595.59	1569.59	-550.93	-223.05	5732322.4	635131.9
1850	49.72	203.40	1598.82	1572.82	-554.43	-224.56	5732318.9	635130.4
1855	49.84	203.34	1602.05	1576.05	-557.93	-226.08	5732315.4	635128.9
1860	49.88	203.34	1605.27	1579.27	-561.44	-227.59	5732311.9	635127.4
1865	49.93	203.35	1608.50	1582.50	-564.96	-229.11	5732308.4	635125.8
1870	49.97	203.35	1611.71	1585.71	-568.47	-230.63	5732304.9	635124.3
1875	50.01	203.35	1614.93	1588.93	-571.99	-232.14	5732301.4	635122.8
1880	50.06	203.36	1618.14	1592.14	-575.50	-233.66	5732297.8	635121.3
1885	50.04	203.36	1621.35	1595.35	-579.02	-235.18	5732294.3	635119.8
1890	49.95	203.37	1624.56	1598.56	-582.54	-236.70	5732290.8	635118.2
1895	49.86	203.38	1627.78	1601.78	-586.05	-238.22	5732287.3	635116.7
1900	49.78	203.38	1631.01	1605.01	-589.56	-239.74	5732283.8	635115.2
1905	49.69	203.39	1634.24	1608.24	-593.06	-241.25	5732280.3	635113.7
1910	49.60	203.40	1637.48	1611.48	-596.56	-242.76	5732276.8	635112.2
1915	49.53	203.38	1640.72	1614.72	-600.05	-244.27	5732273.3	635110.7
1920	49.46	203.36	1643.97	1617.97	-603.54	-245.78	5732269.8	635109.2
1925	49.40	203.33	1647.22	1621.22	-607.03	-247.29	5732266.3	635107.7
1930	49.33	203.31	1650.48	1624.48	-610.51	-248.79	5732262.8	635106.2
1935	49.26	203.28	1653.74	1627.74	-613.99	-250.29	5732259.3	635104.7
1940	49.20	203.26	1657.00	1631.00	-617.47	-251.78	5732255.9	635103.2
1945	49.09	203.32	1660.27	1634.27	-620.94	-253.28	5732252.4	635101.7
1950	48.97	203.42	1663.55	1637.55	-624.41	-254.78	5732248.9	635100.2
1955	48.86	203.51	1666.84	1640.84	-627.87	-256.28	5732245.5	635098.7
1960	48.74	203.61	1670.13	1644.13	-631.32	-257.78	5732242.0	635097.2
1965	48.62	203.70	1673.43	1647.43	-634.76	-259.29	5732238.6	635095.7
1970	48.51	203.79	1676.74	1650.74	-638.19	-260.80	5732235.2	635094.2
1975	48.42	203.79	1680.06	1654.06	-641.61	-262.31	5732231.7	635092.6
1980	48.34	203.78	1683.38	1657.38	-645.03	-263.81	5732228.3	635091.1
1985	48.25	203.77	1686.70	1660.70	-648.45	-265.32	5732224.9	635089.6
1990	48.17	203.76	1690.04	1664.04	-651.86	-266.82	5732221.5	635088.1
1995	48.08	203.75	1693.37	1667.37	-655.27	-268.32	5732218.1	635086.6
2000	47.99	203.75	1696.72	1670.72	-658.67	-269.82	5732214.7	635085.1
2005	47.85	203.80	1700.07	1674.07	-662.07	-271.31	5732211.3	635083.6
2010	47.71	203.84	1703.43	1677.43	-665.45	-272.81	5732207.9	635082.1
2015	47.57	203.89	1706.80	1680.80	-668.83	-274.30	5732204.5	635080.6
2020	47.43	203.93	1710.17	1684.17	-672.20	-275.80	5732201.1	635079.1
2025	47.29	203.98	1713.56	1687.56	-675.56	-277.29	5732197.8	635077.7
2030	47.18	203.99	1716.96	1690.96	-678.92	-278.78	5732194.4	635076.2
2035	47.09	203.98	1720.36	1694.36	-682.27	-280.27	5732191.1	635074.7
2040	47.00	203.97	1723.76	1697.76	-685.61	-281.76	5732187.7	635073.2
2045	46.91	203.95	1727.18	1701.18	-688.95	-283.24	5732184.4	635071.7
2050	46.83	203.94	1730.60	1704.60	-692.28	-284.72	5732181.1	635070.2
2055	46.74	203.92	1734.02	1708.02	-695.61	-286.20	5732177.7	635068.7
2060	46.68	203.96	1737.45	1711.45	-698.94	-287.68	5732174.4	635067.3
2065	46.64	204.01	1740.88	1714.88	-702.26	-289.16	5732171.1	635065.8
2070	46.60	204.07	1744.31	1718.31	-705.58	-290.64	5732167.8	635064.3
2075	46.56	204.12	1747.75	1721.75	-708.90	-292.12	5732164.4	635062.8
2080	46.52	204.18	1751.19	1725.19	-712.21	-293.60	5732161.1	635061.3
2085	46.47	204.23	1754.63	1728.63	-715.52	-295.09	5732157.8	635059.9
2090	46.49	204.28	1758.08	1732.08	-718.82	-296.58	5732154.5	635058.4
2095	46.54	204.32	1761.52	1735.52	-722.13	-298.07	5732151.2	635056.9
2100	46.58	204.36	1764.96	1738.96	-725.44	-299.57	5732147.9	635055.4
2105	46.63	204.40	1768.39	1742.39	-728.74	-301.07	5732144.6	635053.9
2110	46.67	204.44	1771.82	1745.82	-732.06	-302.57	5732141.3	635052.4

MD	Angle	Direction	TVDRT	TVDSS	DNorth	DEast	Northing	Easting
2115	46.72	204.48	1775.25	1749.25	-735.37	-304.08	5732138.0	635050.9
2120	46.77	204.52	1778.68	1752.68	-738.68	-305.59	5732134.7	635049.4
2125	46.82	204.56	1782.10	1756.10	-742.00	-307.10	5732131.3	635047.8
2130	46.87	204.60	1785.52	1759.52	-745.31	-308.62	5732128.0	635046.3
2135	46.92	204.64	1788.94	1762.94	-748.63	-310.14	5732124.7	635044.8
2140	46.97	204.68	1792.35	1766.35	-751.95	-311.66	5732121.4	635043.3
2145	47.02	204.72	1795.76	1769.76	-755.27	-313.19	5732118.1	635041.8
2150	47.08	204.71	1799.17	1773.17	-758.60	-314.72	5732114.7	635040.2
2155	47.14	204.71	1802.57	1776.57	-761.92	-316.25	5732111.4	635038.7
2160	47.21	204.70	1805.97	1779.97	-765.26	-317.79	5732108.1	635037.2
2165	47.27	204.70	1809.37	1783.37	-768.59	-319.32	5732104.7	635035.6
2170	47.33	204.69	1812.76	1786.76	-771.93	-320.86	5732101.4	635034.1
2175	47.39	204.70	1816.14	1790.14	-775.27	-322.39	5732098.1	635032.6
2180	47.42	204.73	1819.53	1793.53	-778.62	-323.93	5732094.7	635031.0
2185	47.45	204.76	1822.91	1796.91	-781.96	-325.47	5732091.4	635029.5
2190	47.47	204.79	1826.29	1800.29	-785.30	-327.02	5732088.0	635027.9
2195	47.50	204.82	1829.67	1803.67	-788.65	-328.56	5732084.7	635026.4
2200	47.53	204.85	1833.05	1807.05	-792.00	-330.11	5732081.3	635024.8
2205	47.58	204.88	1836.42	1810.42	-795.34	-331.66	5732078.0	635023.3
2210	47.65	204.89	1839.79	1813.79	-798.69	-333.22	5732074.6	635021.7
2215	47.72	204.91	1843.16	1817.16	-802.05	-334.77	5732071.3	635020.2
2220	47.79	204.92	1846.52	1820.52	-805.40	-336.33	5732067.9	635018.6
2225	47.85	204.94	1849.88	1823.88	-808.76	-337.90	5732064.6	635017.1
2230	47.92	204.96	1853.23	1827.23	-812.13	-339.46	5732061.2	635015.5
2235	47.99	204.97	1856.58	1830.58	-815.49	-341.03	5732057.8	635013.9
2240	48.06	204.98	1859.92	1833.92	-818.86	-342.60	5732054.5	635012.4
2245	48.13	204.99	1863.26	1837.26	-822.24	-344.17	5732051.1	635010.8
2250	48.19	205.00	1866.60	1840.60	-825.61	-345.74	5732047.7	635009.2
2255	48.26	205.01	1869.93	1843.93	-828.99	-347.32	5732044.3	635007.6
2260	48.33	205.02	1873.26	1847.26	-832.37	-348.90	5732041.0	635006.1
2265	48.31	205.06	1876.58	1850.58	-835.76	-350.48	5732037.6	635004.5
2270	48.28	205.11	1879.91	1853.91	-839.14	-352.06	5732034.2	635002.9
2275	48.24	205.16	1883.23	1857.23	-842.52	-353.64	5732030.8	635001.3
2280	48.21	205.21	1886.57	1860.57	-845.89	-355.23	5732027.4	634999.7
2285	48.17	205.25	1889.90	1863.90	-849.26	-356.82	5732024.1	634998.1
2290	48.13	205.30	1893.23	1867.23	-852.63	-358.41	5732020.7	634996.5
2295	48.01	205.32	1896.58	1870.58	-855.99	-360.00	5732017.3	634994.9
2300	47.88	205.34	1899.93	1873.93	-859.35	-361.59	5732014.0	634993.4
2305	47.76	205.37	1903.28	1877.28	-862.70	-363.17	5732010.6	634991.8
2310	47.63	205.39	1906.65	1880.65	-866.04	-364.76	5732007.3	634990.2
2315	47.50	205.41	1910.02	1884.02	-869.37	-366.34	5732004.0	634988.6
2320	47.43	205.43	1913.40	1887.40	-872.70	-367.92	5732000.6	634987.0
2325	47.42	205.44	1916.79	1890.79	-876.02	-369.50	5731997.3	634985.4
2330	47.41	205.45	1920.17	1894.17	-879.35	-371.09	5731994.0	634983.9
2335	47.40	205.46	1923.55	1897.55	-882.67	-372.67	5731990.7	634982.3
2340	47.39	205.47	1926.94	1900.94	-885.99	-374.25	5731987.3	634980.7
2345	47.37	205.49	1930.32	1904.32	-889.32	-375.83	5731984.0	634979.1
2350	47.44	205.51	1933.71	1907.71	-892.64	-377.42	5731980.7	634977.5
2355	47.53	205.53	1937.09	1911.09	-895.96	-379.01	5731977.4	634975.9
2360	47.62	205.56	1940.46	1914.46	-899.29	-380.60	5731974.0	634974.4
2365	47.72	205.58	1943.83	1917.83	-902.63	-382.19	5731970.7	634972.8
2370	47.81	205.60	1947.19	1921.19	-905.97	-383.79	5731967.4	634971.2
2375	47.90	205.63	1950.54	1924.54	-909.31	-385.39	5731964.0	634969.6
2380	47.89	205.64	1953.90	1927.90	-912.65	-387.00	5731960.7	634967.9
2385	47.88	205.65	1957.25	1931.25	-916.00	-388.60	5731957.3	634966.3
2390	47.86	205.67	1960.60	1934.60	-919.34	-390.21	5731954.0	634964.7
2395	47.84	205.68	1963.96	1937.96	-922.68	-391.82	5731950.7	634963.1
2400	47.82	205.69	1967.31	1941.31	-926.02	-393.42	5731947.3	634961.5
2405	47.80	205.71	1970.67	1944.67	-929.36	-395.03	5731944.0	634959.9
2410	47.77	205.73	1974.03	1948.03	-932.70	-396.64	5731940.6	634958.3
2415	47.74	205.76	1977.39	1951.39	-936.03	-398.24	5731937.3	634956.7
2420	47.70	205.78	1980.76	1954.76	-939.36	-399.85	5731934.0	634955.1
2425	47.67	205.80	1984.12	1958.12	-942.69	-401.46	5731930.7	634953.5
2430	47.64	205.83	1987.49	1961.49	-946.02	-403.07	5731927.3	634951.9
2435	47.61	205.85	1990.86	1964.86	-949.34	-404.68	5731924.0	634950.3
2440	47.65	205.89	1994.23	1968.23	-952.66	-406.29	5731920.7	634948.7
2445	47.68	205.92	1997.60	1971.60	-955.99	-407.91	5731917.4	634947.0
2450	47.72	205.95	2000.96	1974.96	-959.32	-409.52	5731914.0	634945.4
2455	47.75	205.98	2004.33	1978.33	-962.64	-411.14	5731910.7	634943.8
2460	47.79	206.01	2007.69	1981.69	-965.97	-412.77	5731907.4	634942.2
2465	47.84	206.04	2011.04	1985.04	-969.30	-414.39	5731904.0	634940.6

MD	Angle	Direction	TVDRT	TVDSS	DNorth	DEast	Northing	Easting
2470	47.91	206.07	2014.40	1988.40	-972.63	-416.02	5731900.7	634938.9
2475	47.97	206.10	2017.75	1991.75	-975.96	-417.65	5731897.4	634937.3
2480	48.03	206.13	2021.09	1995.09	-979.30	-419.29	5731894.0	634935.7
2485	48.10	206.17	2024.43	1998.43	-982.64	-420.93	5731890.7	634934.0
2490	48.16	206.20	2027.77	2001.77	-985.98	-422.57	5731887.4	634932.4
2495	48.14	206.21	2031.11	2005.11	-989.32	-424.22	5731884.0	634930.7
2500	48.10	206.23	2034.44	2008.44	-992.66	-425.86	5731880.7	634929.1
2505	48.06	206.24	2037.79	2011.79	-996.00	-427.50	5731877.3	634927.4
2510	48.02	206.26	2041.13	2015.13	-999.33	-429.15	5731874.0	634925.8
2515	47.98	206.27	2044.47	2018.47	-1002.67	-430.79	5731870.7	634924.2
2520	47.94	206.29	2047.82	2021.82	-1006.00	-432.44	5731867.3	634922.5
2525	47.81	206.31	2051.18	2025.18	-1009.32	-434.08	5731864.0	634920.9
2530	47.68	206.34	2054.54	2028.54	-1012.64	-435.72	5731860.7	634919.2
2535	47.54	206.36	2057.91	2031.91	-1015.95	-437.36	5731857.4	634917.6
2540	47.41	206.39	2061.29	2035.29	-1019.25	-439.00	5731854.1	634915.9
2545	47.28	206.41	2064.68	2038.68	-1022.54	-440.63	5731850.8	634914.3
2550	47.17	206.44	2068.07	2042.07	-1025.83	-442.27	5731847.5	634912.7
2555	47.09	206.46	2071.47	2045.47	-1029.11	-443.90	5731844.2	634911.0
2560	47.00	206.49	2074.88	2048.88	-1032.38	-445.53	5731841.0	634909.4
2565	46.91	206.52	2078.29	2052.29	-1035.65	-447.16	5731837.7	634907.8
2570	46.83	206.54	2081.71	2055.71	-1038.92	-448.79	5731834.4	634906.2
2575	46.74	206.57	2085.14	2059.14	-1042.18	-450.42	5731831.2	634904.5
2580	46.72	206.58	2088.56	2062.56	-1045.43	-452.05	5731827.9	634902.9
2585	46.75	206.58	2091.99	2065.99	-1048.69	-453.68	5731824.7	634901.3
2590	46.78	206.58	2095.42	2069.42	-1051.95	-455.31	5731821.4	634899.6
2595	46.81	206.59	2098.84	2072.84	-1055.21	-456.94	5731818.1	634898.0
2600	46.84	206.59	2102.26	2076.26	-1058.47	-458.57	5731814.9	634896.4
2605	46.87	206.59	2105.68	2079.68	-1061.73	-460.20	5731811.6	634894.7
2610	46.90	206.61	2109.10	2083.10	-1064.99	-461.84	5731808.3	634893.1
2615	46.94	206.64	2112.51	2086.51	-1068.26	-463.47	5731805.1	634891.5
2620	46.98	206.67	2115.93	2089.93	-1071.52	-465.11	5731801.8	634889.8
2625	47.02	206.70	2119.34	2093.34	-1074.79	-466.75	5731798.6	634888.2
2630	47.06	206.73	2122.74	2096.74	-1078.06	-468.40	5731795.3	634886.5
2635	47.09	206.76	2126.15	2100.15	-1081.33	-470.05	5731792.0	634884.9
2640	47.09	206.78	2129.55	2103.55	-1084.60	-471.70	5731788.7	634883.3
2645	47.07	206.81	2132.96	2106.96	-1087.87	-473.35	5731785.5	634881.6
2650	47.04	206.83	2136.36	2110.36	-1091.13	-475.00	5731782.2	634879.9
2655	47.02	206.85	2139.77	2113.77	-1094.40	-476.65	5731778.9	634878.3
2660	46.99	206.87	2143.18	2117.18	-1097.66	-478.30	5731775.7	634876.6
2665	46.96	206.90	2146.59	2120.59	-1100.92	-479.96	5731772.4	634875.0
2670	46.92	206.86	2150.01	2124.01	-1104.18	-481.61	5731769.2	634873.3
2675	46.88	206.81	2153.42	2127.42	-1107.44	-483.26	5731765.9	634871.7
2680	46.84	206.77	2156.84	2130.84	-1110.69	-484.90	5731762.6	634870.0
2685	46.79	206.73	2160.26	2134.26	-1113.95	-486.54	5731759.4	634868.4
2690	46.75	206.68	2163.69	2137.69	-1117.20	-488.18	5731756.1	634866.8
2695	46.70	206.65	2167.12	2141.12	-1120.46	-489.81	5731752.9	634865.1
2700	46.65	206.67	2170.55	2144.55	-1123.71	-491.44	5731749.6	634863.5
2705	46.59	206.68	2173.98	2147.98	-1126.95	-493.07	5731746.4	634861.9
2710	46.53	206.69	2177.42	2151.42	-1130.20	-494.71	5731743.1	634860.2
2715	46.48	206.71	2180.86	2154.86	-1133.44	-496.34	5731739.9	634858.6
2720	46.42	206.72	2184.31	2158.31	-1136.68	-497.96	5731736.7	634857.0
2725	46.34	206.71	2187.75	2161.75	-1139.91	-499.59	5731733.4	634855.4
2730	46.18	206.64	2191.21	2165.21	-1143.14	-501.21	5731730.2	634853.7
2735	46.03	206.58	2194.68	2168.68	-1146.36	-502.83	5731727.0	634852.1
2740	45.88	206.51	2198.15	2172.15	-1149.57	-504.43	5731723.8	634850.5
2745	45.73	206.44	2201.64	2175.64	-1152.78	-506.03	5731720.6	634848.9
2750	45.57	206.38	2205.14	2179.14	-1155.98	-507.62	5731717.4	634847.3
2755	45.59	206.36	2208.64	2182.64	-1159.18	-509.21	5731714.2	634845.7
2760	45.63	206.35	2212.13	2186.13	-1162.39	-510.79	5731711.0	634844.2
2765	45.67	206.34	2215.63	2189.63	-1165.59	-512.38	5731707.8	634842.6
2770	45.71	206.32	2219.12	2193.12	-1168.80	-513.97	5731704.5	634841.0
2775	45.75	206.31	2222.61	2196.61	-1172.01	-515.56	5731701.3	634839.4
2780	45.79	206.30	2226.10	2200.10	-1175.22	-517.14	5731698.1	634837.8
2785	45.97	206.27	2229.58	2203.58	-1178.44	-518.73	5731694.9	634836.2
2790	46.17	206.24	2233.05	2207.05	-1181.67	-520.33	5731691.7	634834.6
2795	46.37	206.21	2236.50	2210.50	-1184.91	-521.92	5731688.4	634833.0
2800	46.57	206.18	2239.95	2213.95	-1188.16	-523.52	5731685.2	634831.4
2805	46.77	206.15	2243.38	2217.38	-1191.42	-525.13	5731681.9	634829.8
2810	46.97	206.12	2246.80	2220.80	-1194.70	-526.73	5731678.6	634828.2
2815	47.11	206.13	2250.20	2224.20	-1197.98	-528.35	5731675.4	634826.6
2820	47.25	206.15	2253.60	2227.60	-1201.28	-529.96	5731672.1	634825.0

MD	Angle	Direction	TVDRT	TVDSS	DNorth	DEast	Northing	Easting
2825	47.39	206.16	2256.99	2230.99	-1204.58	-531.58	5731668.8	634823.4
2830	47.53	206.18	2260.37	2234.37	-1207.88	-533.21	5731665.5	634821.7
2835	47.67	206.19	2263.74	2237.74	-1211.20	-534.84	5731662.1	634820.1
2840	47.81	206.21	2267.11	2241.11	-1214.52	-536.47	5731658.8	634818.5
2845	48.00	206.16	2270.46	2244.46	-1217.85	-538.11	5731655.5	634816.8
2850	48.19	206.12	2273.80	2247.80	-1221.19	-539.75	5731652.2	634815.2
2855	48.38	206.07	2277.12	2251.12	-1224.54	-541.39	5731648.8	634813.6
2860	48.57	206.02	2280.44	2254.44	-1227.90	-543.03	5731645.4	634811.9
2865	48.75	205.98	2283.74	2257.74	-1231.28	-544.68	5731642.1	634810.3
2870	48.86	205.94	2287.03	2261.03	-1234.66	-546.33	5731638.7	634808.6
2875	48.68	205.92	2290.33	2264.33	-1238.04	-547.97	5731635.3	634807.0
2880	48.49	205.90	2293.64	2267.64	-1241.42	-549.61	5731631.9	634805.3
2885	48.31	205.88	2296.96	2270.96	-1244.78	-551.24	5731628.6	634803.7
2890	48.13	205.86	2300.29	2274.29	-1248.13	-552.87	5731625.2	634802.1
2895	47.94	205.84	2303.63	2277.63	-1251.48	-554.49	5731621.9	634800.5
2900	47.85	205.83	2306.98	2280.98	-1254.82	-556.10	5731618.5	634798.8
2905	47.84	205.83	2310.34	2284.34	-1258.15	-557.72	5731615.2	634797.2
2910	47.83	205.83	2313.70	2287.70	-1261.49	-559.33	5731611.9	634795.6
2915	47.82	205.83	2317.05	2291.05	-1264.83	-560.95	5731608.5	634794.0
2920	47.81	205.83	2320.41	2294.41	-1268.16	-562.56	5731605.2	634792.4
2925	47.80	205.83	2323.77	2297.77	-1271.49	-564.18	5731601.8	634790.8
2930	47.88	205.81	2327.13	2301.13	-1274.83	-565.79	5731598.5	634789.2
2935	48.04	205.78	2330.47	2304.47	-1278.17	-567.41	5731595.2	634787.5
2940	48.21	205.75	2333.81	2307.81	-1281.53	-569.02	5731591.8	634785.9
2945	48.37	205.72	2337.14	2311.14	-1284.89	-570.65	5731588.5	634784.3
2950	48.53	205.69	2340.46	2314.46	-1288.26	-572.27	5731585.1	634782.7
2955	48.70	205.66	2343.76	2317.76	-1291.64	-573.89	5731581.7	634781.1
2960	48.72	205.62	2347.06	2321.06	-1295.03	-575.52	5731578.3	634779.4
2965	48.70	205.57	2350.36	2324.36	-1298.42	-577.14	5731574.9	634777.8
2970	48.68	205.53	2353.66	2327.66	-1301.81	-578.76	5731571.5	634776.2
2975	48.66	205.48	2356.96	2330.96	-1305.19	-580.38	5731568.1	634774.6
2980	48.64	205.44	2360.26	2334.26	-1308.58	-581.99	5731564.8	634773.0
2985	48.61	205.40	2363.57	2337.57	-1311.97	-583.60	5731561.4	634771.3
2990	48.50	205.42	2366.88	2340.88	-1315.36	-585.21	5731558.0	634769.7
2995	48.38	205.43	2370.20	2344.20	-1318.74	-586.82	5731554.6	634768.1
3000	48.27	205.45	2373.52	2347.52	-1322.11	-588.42	5731551.2	634766.5
3005	48.16	205.47	2376.85	2350.85	-1325.47	-590.03	5731547.9	634764.9
3010	48.04	205.49	2380.19	2354.19	-1328.83	-591.63	5731544.5	634763.3
3015	47.97	205.50	2383.54	2357.54	-1332.19	-593.23	5731541.2	634761.7
3020	48.18	205.46	2386.88	2360.88	-1335.55	-594.83	5731537.8	634760.1
3025	48.40	205.42	2390.20	2364.20	-1338.92	-596.43	5731534.4	634758.5
3030	48.62	205.38	2393.52	2367.52	-1342.30	-598.04	5731531.0	634756.9
3035	48.84	205.35	2396.81	2370.81	-1345.70	-599.65	5731527.6	634755.3
3040	49.06	205.31	2400.10	2374.10	-1349.10	-601.26	5731524.2	634753.7
3045	49.14	205.28	2403.37	2377.37	-1352.52	-602.87	5731520.8	634752.1
3050	49.06	205.25	2406.64	2380.64	-1355.94	-604.49	5731517.4	634750.5
3055	48.98	205.22	2409.92	2383.92	-1359.36	-606.10	5731514.0	634748.9
3060	48.90	205.19	2413.21	2387.21	-1362.77	-607.70	5731510.6	634747.2
3065	48.82	205.16	2416.50	2390.50	-1366.18	-609.30	5731507.2	634745.6
3070	48.74	205.13	2419.79	2393.79	-1369.58	-610.90	5731503.8	634744.0
3075	48.66	205.10	2423.09	2397.09	-1372.98	-612.50	5731500.4	634742.5
3080	48.57	205.07	2426.40	2400.40	-1376.38	-614.09	5731497.0	634740.9
3085	48.49	205.04	2429.71	2403.71	-1379.77	-615.67	5731493.6	634739.3
3090	48.40	205.01	2433.02	2407.02	-1383.16	-617.26	5731490.2	634737.7
3095	48.32	204.98	2436.35	2410.35	-1386.55	-618.83	5731486.8	634736.1
3100	48.32	204.96	2439.67	2413.67	-1389.93	-620.41	5731483.4	634734.5
3105	48.52	204.96	2442.99	2416.99	-1393.32	-621.99	5731480.0	634733.0
3110	48.71	204.97	2446.30	2420.30	-1396.72	-623.57	5731476.6	634731.4
3115	48.90	204.97	2449.59	2423.59	-1400.13	-625.16	5731473.2	634729.8
3120	49.10	204.98	2452.87	2426.87	-1403.56	-626.75	5731469.8	634728.2
3125	49.29	204.98	2456.14	2430.14	-1406.99	-628.35	5731466.4	634726.6
3130	49.28	204.98	2459.40	2433.40	-1410.42	-629.95	5731462.9	634725.0
3135	49.19	204.97	2462.66	2436.66	-1413.86	-631.55	5731459.5	634723.4
3140	49.11	204.96	2465.93	2439.93	-1417.28	-633.15	5731456.1	634721.8
3145	49.02	204.96	2469.21	2443.21	-1420.71	-634.74	5731452.6	634720.2
3150	48.94	204.95	2472.49	2446.49	-1424.13	-636.33	5731449.2	634718.6
3155	48.85	204.94	2475.78	2449.78	-1427.55	-637.92	5731445.8	634717.0
3160	48.78	204.93	2479.07	2453.07	-1430.96	-639.51	5731442.4	634715.4
3165	48.72	204.92	2482.37	2456.37	-1434.37	-641.09	5731439.0	634713.9
3170	48.66	204.90	2485.67	2459.67	-1437.77	-642.67	5731435.6	634712.3
3175	48.61	204.88	2488.97	2462.97	-1441.18	-644.25	5731432.2	634710.7

MD	Angle	Direction	TVDRT	TVDSS	DNorth	DEast	Northing	Easting
3180	48.55	204.87	2492.28	2466.28	-1444.58	-645.83	5731428.8	634709.1
3185	48.49	204.85	2495.59	2469.59	-1447.98	-647.41	5731425.4	634707.5
3190	48.43	204.87	2498.91	2472.91	-1451.37	-648.98	5731422.0	634706.0
3195	48.36	204.89	2502.23	2476.23	-1454.76	-650.55	5731418.6	634704.4
3200	48.30	204.91	2505.55	2479.55	-1458.15	-652.12	5731415.2	634702.8
3205	48.23	204.93	2508.88	2482.88	-1461.54	-653.70	5731411.8	634701.3
3210	48.17	204.95	2512.21	2486.21	-1464.92	-655.27	5731408.4	634699.7
3215	48.11	204.95	2515.55	2489.55	-1468.29	-656.84	5731405.0	634698.1
3220	48.08	204.93	2518.89	2492.89	-1471.67	-658.41	5731401.7	634696.5
3225	48.04	204.90	2522.23	2496.23	-1475.04	-659.97	5731398.3	634695.0
3230	48.00	204.88	2525.58	2499.58	-1478.41	-661.54	5731394.9	634693.4
3235	47.96	204.86	2528.92	2502.92	-1481.78	-663.10	5731391.6	634691.8
3240	47.92	204.83	2532.27	2506.27	-1485.15	-664.66	5731388.2	634690.3
3245	47.98	204.82	2535.62	2509.62	-1488.52	-666.22	5731384.8	634688.7
3250	48.21	204.81	2538.96	2512.96	-1491.90	-667.78	5731381.4	634687.2
3255	48.43	204.80	2542.29	2516.29	-1495.29	-669.35	5731378.1	634685.6
3260	48.65	204.80	2545.60	2519.60	-1498.69	-670.92	5731374.7	634684.0
3265	48.87	204.79	2548.89	2522.89	-1502.10	-672.50	5731371.2	634682.5
3270	49.09	204.78	2552.18	2526.18	-1505.53	-674.08	5731367.8	634680.9
3275	49.17	204.78	2555.44	2529.44	-1508.96	-675.66	5731364.4	634679.3
3280	49.16	204.79	2558.71	2532.71	-1512.39	-677.25	5731360.9	634677.7
3285	49.16	204.79	2561.98	2535.98	-1515.83	-678.84	5731357.5	634676.1
3290	49.16	204.79	2565.25	2539.25	-1519.26	-680.42	5731354.1	634674.5
3295	49.15	204.80	2568.52	2542.52	-1522.70	-682.01	5731350.6	634672.9
3300	49.15	204.80	2571.79	2545.79	-1526.13	-683.59	5731347.2	634671.4
3305	49.13	204.79	2575.07	2549.07	-1529.56	-685.18	5731343.8	634669.8
3310	49.11	204.78	2578.34	2552.34	-1532.99	-686.76	5731340.3	634668.2
3315	49.09	204.77	2581.61	2555.61	-1536.43	-688.35	5731336.9	634666.6
3320	49.07	204.76	2584.89	2558.89	-1539.86	-689.93	5731333.5	634665.0
3325	49.06	204.75	2588.16	2562.16	-1543.29	-691.51	5731330.1	634663.4
3330	49.04	204.74	2591.44	2565.44	-1546.72	-693.09	5731326.6	634661.9
3335	49.01	204.74	2594.72	2568.72	-1550.15	-694.67	5731323.2	634660.3
3340	48.99	204.75	2598.00	2572.00	-1553.57	-696.25	5731319.8	634658.7
3345	48.97	204.75	2601.28	2575.28	-1557.00	-697.83	5731316.3	634657.1
3350	48.94	204.75	2604.56	2578.56	-1560.42	-699.41	5731312.9	634655.5
3355	48.92	204.76	2607.85	2581.85	-1563.85	-700.99	5731309.5	634654.0
3360	48.90	204.76	2611.13	2585.13	-1567.27	-702.57	5731306.1	634652.4
3365	48.89	204.75	2614.42	2588.42	-1570.69	-704.15	5731302.7	634650.8
3370	48.87	204.75	2617.71	2591.71	-1574.11	-705.72	5731299.2	634649.2
3375	48.86	204.74	2621.00	2595.00	-1577.53	-707.30	5731295.8	634647.6
3380	48.85	204.74	2624.29	2598.29	-1580.95	-708.87	5731292.4	634646.1
3385	48.84	204.73	2627.58	2601.58	-1584.37	-710.45	5731289.0	634644.5
3390	48.83	204.73	2630.87	2604.87	-1587.79	-712.02	5731285.6	634642.9
3395	48.82	204.73	2634.16	2608.16	-1591.21	-713.60	5731282.1	634641.3
3400	48.82	204.73	2637.45	2611.45	-1594.62	-715.17	5731278.7	634639.8
3405	48.81	204.72	2640.75	2614.75	-1598.04	-716.75	5731275.3	634638.2
3410	48.81	204.72	2644.04	2618.04	-1601.46	-718.32	5731271.9	634636.6
3415	48.80	204.72	2647.33	2621.33	-1604.88	-719.89	5731268.5	634635.1
3420	48.79	204.72	2650.62	2624.62	-1608.30	-721.47	5731265.0	634633.5
3425	48.76	204.71	2653.92	2627.92	-1611.71	-723.04	5731261.6	634631.9
3430	48.73	204.71	2657.22	2631.22	-1615.13	-724.61	5731258.2	634630.3
3435	48.70	204.70	2660.52	2634.52	-1618.54	-726.18	5731254.8	634628.8
3440	48.67	204.70	2663.82	2637.82	-1621.95	-727.75	5731251.4	634627.2
3445	48.64	204.69	2667.12	2641.12	-1625.36	-729.32	5731248.0	634625.6
3450	48.61	204.69	2670.42	2644.42	-1628.77	-730.89	5731244.6	634624.1
3455	48.59	204.68	2673.73	2647.73	-1632.18	-732.45	5731241.2	634622.5
3460	48.57	204.68	2677.04	2651.04	-1635.59	-734.02	5731237.8	634620.9
3465	48.54	204.68	2680.35	2654.35	-1638.99	-735.58	5731234.3	634619.4
3470	48.52	204.67	2683.66	2657.66	-1642.40	-737.15	5731230.9	634617.8
3475	48.50	204.67	2686.97	2660.97	-1645.80	-738.71	5731227.5	634616.2
3480	48.49	204.67	2690.29	2664.29	-1649.20	-740.27	5731224.1	634614.7
3485	48.48	204.67	2693.60	2667.60	-1652.60	-741.84	5731220.7	634613.1
3490	48.46	204.66	2696.92	2670.92	-1656.01	-743.40	5731217.3	634611.5
3495	48.45	204.66	2700.23	2674.23	-1659.41	-744.96	5731213.9	634610.0
3500	48.44	204.66	2703.55	2677.55	-1662.81	-746.52	5731210.5	634608.4
3505	48.43	204.66	2706.86	2680.86	-1666.21	-748.08	5731207.1	634606.9
3510	48.39	204.65	2710.18	2684.18	-1669.61	-749.64	5731203.7	634605.3
3515	48.34	204.63	2713.51	2687.51	-1673.00	-751.20	5731200.3	634603.7
3520	48.30	204.62	2716.83	2690.83	-1676.40	-752.76	5731196.9	634602.2
3525	48.26	204.61	2720.16	2694.16	-1679.79	-754.31	5731193.6	634600.6
3530	48.22	204.59	2723.49	2697.49	-1683.18	-755.86	5731190.2	634599.1

MD	Angle	Direction	TVDRT	TVDSS	DNorth	DEast	Northing	Easting
3535	48.18	204.58	2726.82	2700.82	-1686.57	-757.41	5731186.8	634597.5
3540	48.11	204.61	2730.16	2704.16	-1689.96	-758.96	5731183.4	634596.0
3545	48.04	204.64	2733.50	2707.50	-1693.34	-760.51	5731180.0	634594.4
3550	47.97	204.66	2736.84	2710.84	-1696.72	-762.06	5731176.6	634592.9
3555	47.91	204.69	2740.19	2714.19	-1700.09	-763.61	5731173.3	634591.3
3560	47.84	204.72	2743.55	2717.55	-1703.46	-765.16	5731169.9	634589.8
3565	47.80	204.73	2746.90	2720.90	-1706.82	-766.71	5731166.5	634588.2
3570	47.78	204.72	2750.26	2724.26	-1710.19	-768.26	5731163.2	634586.7
3575	47.75	204.72	2753.63	2727.63	-1713.55	-769.81	5731159.8	634585.1
3580	47.73	204.72	2756.99	2730.99	-1716.91	-771.36	5731156.4	634583.6
3585	47.71	204.71	2760.35	2734.35	-1720.27	-772.90	5731153.1	634582.0
3590	47.69	204.71	2763.72	2737.72	-1723.63	-774.45	5731149.7	634580.5
3595	47.67	204.72	2767.08	2741.08	-1726.99	-776.00	5731146.4	634579.0
3600	47.65	204.74	2770.45	2744.45	-1730.35	-777.54	5731143.0	634577.4
3605	47.63	204.76	2773.82	2747.82	-1733.70	-779.09	5731139.6	634575.9
3610	47.61	204.78	2777.19	2751.19	-1737.05	-780.64	5731136.3	634574.3
3615	47.60	204.80	2780.56	2754.56	-1740.41	-782.19	5731132.9	634572.8
3620	47.58	204.82	2783.93	2757.93	-1743.76	-783.73	5731129.6	634571.2
3625	47.58	204.83	2787.31	2761.31	-1747.11	-785.28	5731126.2	634569.7
3630	47.57	204.85	2790.68	2764.68	-1750.46	-786.84	5731122.9	634568.1
3632	47.57	204.85	2792.03	2766.03	-1751.80	-787.46	5731121.5	634567.5
3633	47.57	204.86	2792.70	2766.70	-1752.47	-787.77	5731120.9	634567.2
3634	47.57	204.86	2793.38	2767.38	-1753.14	-788.08	5731120.2	634566.9
3635	47.57	204.86	2794.05	2768.05	-1753.81	-788.39	5731119.5	634566.6
3636	47.57	204.86	2794.73	2768.73	-1754.47	-788.70	5731118.9	634566.3
3637	47.57	204.87	2795.40	2769.40	-1755.14	-789.01	5731118.2	634565.9
3638	47.57	204.87	2796.08	2770.08	-1755.81	-789.32	5731117.5	634565.6
3639	47.57	204.87	2796.75	2770.75	-1756.48	-789.63	5731116.9	634565.3
3640	47.57	204.88	2797.43	2771.43	-1757.15	-789.94	5731116.2	634565.0
3641	47.57	204.88	2798.10	2772.10	-1757.82	-790.25	5731115.5	634564.7
3642	47.56	204.88	2798.78	2772.78	-1758.49	-790.56	5731114.8	634564.4
3643	47.56	204.88	2799.45	2773.45	-1759.16	-790.87	5731114.2	634564.1
3644	47.56	204.89	2800.12	2774.12	-1759.83	-791.18	5731113.5	634563.8
3645	47.56	204.89	2800.80	2774.80	-1760.50	-791.49	5731112.8	634563.5
3646	47.56	204.89	2801.47	2775.47	-1761.17	-791.80	5731112.2	634563.1
3647	47.56	204.89	2802.15	2776.15	-1761.84	-792.11	5731111.5	634562.8
3648	47.56	204.90	2802.82	2776.82	-1762.51	-792.42	5731110.8	634562.5
3649	47.56	204.90	2803.50	2777.50	-1763.18	-792.73	5731110.2	634562.2
3650	47.60	204.90	2804.17	2778.17	-1763.85	-793.04	5731109.5	634561.9
3651	47.65	204.90	2804.85	2778.85	-1764.52	-793.36	5731108.8	634561.6
3652	47.69	204.90	2805.52	2779.52	-1765.19	-793.67	5731108.2	634561.3
3653	47.73	204.91	2806.19	2780.19	-1765.86	-793.98	5731107.5	634561.0
3654	47.77	204.91	2806.87	2780.87	-1766.53	-794.29	5731106.8	634560.7
3655	47.82	204.91	2807.54	2781.54	-1767.20	-794.60	5731106.1	634560.3
3656	47.86	204.91	2808.21	2782.21	-1767.88	-794.91	5731105.5	634560.0
3657	47.90	204.91	2808.88	2782.88	-1768.55	-795.23	5731104.8	634559.7
3658	47.94	204.91	2809.55	2783.55	-1769.22	-795.54	5731104.1	634559.4
3659	47.99	204.92	2810.22	2784.22	-1769.89	-795.85	5731103.4	634559.1
3660	48.03	204.92	2810.89	2784.89	-1770.57	-796.17	5731102.8	634558.8
3661	48.07	204.92	2811.56	2785.56	-1771.24	-796.48	5731102.1	634558.5
3662	48.11	204.92	2812.22	2786.22	-1771.92	-796.79	5731101.4	634558.2
3663	48.16	204.92	2812.89	2786.89	-1772.59	-797.11	5731100.7	634557.8
3664	48.20	204.92	2813.56	2787.56	-1773.27	-797.42	5731100.1	634557.5
3665	48.24	204.93	2814.23	2788.23	-1773.95	-797.73	5731099.4	634557.2
3666	48.28	204.93	2814.89	2788.89	-1774.62	-798.05	5731098.7	634556.9
3667	48.33	204.93	2815.56	2789.56	-1775.30	-798.36	5731098.0	634556.6
3668	48.37	204.93	2816.22	2790.22	-1775.98	-798.68	5731097.4	634556.3
3669	48.41	204.93	2816.88	2790.88	-1776.66	-798.99	5731096.7	634556.0
3670	48.45	204.93	2817.55	2791.55	-1777.33	-799.31	5731096.0	634555.6
3671	48.50	204.94	2818.21	2792.21	-1778.01	-799.62	5731095.3	634555.3
3672	48.54	204.94	2818.87	2792.87	-1778.69	-799.94	5731094.6	634555.0
3673	48.58	204.94	2819.54	2793.54	-1779.37	-800.26	5731094.0	634554.7
3674	48.62	204.94	2820.20	2794.20	-1780.05	-800.57	5731093.3	634554.4
3675	48.67	204.94	2820.86	2794.86	-1780.73	-800.89	5731092.6	634554.1
3676	48.71	204.94	2821.52	2795.52	-1781.41	-801.21	5731091.9	634553.7
3677	48.75	204.95	2822.18	2796.18	-1782.09	-801.52	5731091.2	634553.4
3678	48.79	204.95	2822.84	2796.84	-1782.78	-801.84	5731090.6	634553.1
3679	48.84	204.95	2823.50	2797.50	-1783.46	-802.16	5731089.9	634552.8
3680	48.88	204.95	2824.15	2798.15	-1784.14	-802.48	5731089.2	634552.5
3681	48.93	204.94	2824.81	2798.81	-1784.83	-802.79	5731088.5	634552.2

MD	Angle	Direction	TVDRT	TVDSS	DNorth	DEast	Northing	Easting
3682	48.98	204.94	2825.47	2799.47	-1785.51	-803.11	5731087.8	634551.8
3683	49.03	204.93	2826.12	2800.12	-1786.19	-803.43	5731087.1	634551.5
3684	49.08	204.92	2826.78	2800.78	-1786.88	-803.75	5731086.5	634551.2
3685	49.13	204.91	2827.43	2801.43	-1787.56	-804.07	5731085.8	634550.9
3686	49.18	204.91	2828.09	2802.09	-1788.25	-804.39	5731085.1	634550.6
3687	49.23	204.90	2828.74	2802.74	-1788.94	-804.70	5731084.4	634550.2
3688	49.29	204.89	2829.39	2803.39	-1789.62	-805.02	5731083.7	634549.9
3689	49.34	204.88	2830.04	2804.04	-1790.31	-805.34	5731083.0	634549.6
3690	49.39	204.88	2830.70	2804.70	-1791.00	-805.66	5731082.3	634549.3
3691	49.44	204.87	2831.35	2805.35	-1791.69	-805.98	5731081.7	634549.0
3692	49.49	204.86	2832.00	2806.00	-1792.38	-806.30	5731081.0	634548.6
3693	49.54	204.86	2832.65	2806.65	-1793.07	-806.62	5731080.3	634548.3
3694	49.59	204.85	2833.29	2807.29	-1793.76	-806.94	5731079.6	634548.0
3695	49.64	204.84	2833.94	2807.94	-1794.45	-807.26	5731078.9	634547.7
3696	49.69	204.83	2834.59	2808.59	-1795.14	-807.58	5731078.2	634547.4
3697	49.75	204.83	2835.24	2809.24	-1795.84	-807.90	5731077.5	634547.0
3698	49.80	204.82	2835.88	2809.88	-1796.53	-808.22	5731076.8	634546.7
3699	49.85	204.81	2836.53	2810.53	-1797.22	-808.54	5731076.1	634546.4
3700	49.90	204.80	2837.17	2811.17	-1797.92	-808.86	5731075.4	634546.1
3701	49.95	204.80	2837.82	2811.82	-1798.61	-809.18	5731074.7	634545.8
3702	50.00	204.79	2838.46	2812.46	-1799.31	-809.50	5731074.0	634545.4
3703	50.05	204.78	2839.10	2813.10	-1800.00	-809.83	5731073.3	634545.1
3704	50.10	204.78	2839.74	2813.74	-1800.70	-810.15	5731072.6	634544.8
3705	50.15	204.77	2840.38	2814.38	-1801.39	-810.47	5731071.9	634544.5
3706	50.20	204.76	2841.02	2815.02	-1802.09	-810.79	5731071.2	634544.2
3707	50.26	204.75	2841.66	2815.66	-1802.79	-811.11	5731070.6	634543.8
3708	50.27	204.75	2842.30	2816.30	-1803.49	-811.43	5731069.9	634543.5
3709	50.27	204.74	2842.94	2816.94	-1804.19	-811.76	5731069.2	634543.2
3710	50.26	204.74	2843.58	2817.58	-1804.89	-812.08	5731068.5	634542.9
3711	50.25	204.73	2844.22	2818.22	-1805.58	-812.40	5731067.8	634542.5
3712	50.24	204.73	2844.86	2818.86	-1806.28	-812.72	5731067.1	634542.2
3713	50.23	204.72	2845.50	2819.50	-1806.98	-813.04	5731066.4	634541.9
3714	50.22	204.72	2846.14	2820.14	-1807.68	-813.36	5731065.7	634541.6
3715	50.21	204.71	2846.78	2820.78	-1808.38	-813.69	5731065.0	634541.3
3716	50.20	204.71	2847.42	2821.42	-1809.07	-814.01	5731064.3	634540.9
3717	50.19	204.70	2848.06	2822.06	-1809.77	-814.33	5731063.6	634540.6
3718	50.18	204.70	2848.70	2822.70	-1810.47	-814.65	5731062.9	634540.3
3719	50.17	204.69	2849.34	2823.34	-1811.17	-814.97	5731062.2	634540.0
3720	50.16	204.69	2849.98	2823.98	-1811.86	-815.29	5731061.5	634539.7
3721	50.15	204.68	2850.62	2824.62	-1812.56	-815.61	5731060.8	634539.3
3722	50.14	204.68	2851.26	2825.26	-1813.26	-815.93	5731060.1	634539.0
3723	50.13	204.68	2851.90	2825.90	-1813.96	-816.25	5731059.4	634538.7
3724	50.12	204.67	2852.55	2826.55	-1814.65	-816.57	5731058.7	634538.4
3725	50.11	204.67	2853.19	2827.19	-1815.35	-816.89	5731058.0	634538.1
3726	50.10	204.66	2853.83	2827.83	-1816.05	-817.21	5731057.3	634537.7
3727	50.09	204.66	2854.47	2828.47	-1816.75	-817.53	5731056.6	634537.4
3728	50.08	204.65	2855.11	2829.11	-1817.44	-817.85	5731055.9	634537.1
3729	50.07	204.65	2855.75	2829.75	-1818.14	-818.17	5731055.2	634536.8
3730	50.06	204.64	2856.39	2830.39	-1818.84	-818.49	5731054.5	634536.5
3731	50.05	204.64	2857.04	2831.04	-1819.53	-818.81	5731053.8	634536.1
3732	50.04	204.63	2857.68	2831.68	-1820.23	-819.13	5731053.1	634535.8
3733	50.03	204.63	2858.32	2832.32	-1820.93	-819.45	5731052.4	634535.5
3734	50.02	204.62	2858.96	2832.96	-1821.62	-819.77	5731051.7	634535.2
3735	50.01	204.62	2859.61	2833.61	-1822.32	-820.09	5731051.0	634534.9
3736	50.00	204.61	2860.25	2834.25	-1823.02	-820.41	5731050.3	634534.5
3737	50.00	204.61	2860.89	2834.89	-1823.71	-820.73	5731049.6	634534.2
3738	49.99	204.60	2861.53	2835.53	-1824.41	-821.05	5731048.9	634533.9
3739	49.97	204.60	2862.18	2836.18	-1825.11	-821.37	5731048.2	634533.6
3740	49.95	204.60	2862.82	2836.82	-1825.80	-821.68	5731047.5	634533.3
3741	49.93	204.60	2863.46	2837.46	-1826.50	-822.00	5731046.8	634532.9
3742	49.91	204.60	2864.11	2838.11	-1827.19	-822.32	5731046.1	634532.6
3743	49.89	204.61	2864.75	2838.75	-1827.89	-822.64	5731045.5	634532.3
3744	49.87	204.61	2865.40	2839.40	-1828.59	-822.96	5731044.8	634532.0
3745	49.85	204.61	2866.04	2840.04	-1829.28	-823.28	5731044.1	634531.7
3746	49.83	204.61	2866.69	2840.69	-1829.98	-823.59	5731043.4	634531.4
3747	49.81	204.61	2867.33	2841.33	-1830.67	-823.91	5731042.7	634531.0
3748	49.79	204.61	2867.98	2841.98	-1831.36	-824.23	5731042.0	634530.7
3749	49.77	204.61	2868.62	2842.62	-1832.06	-824.55	5731041.3	634530.4
3750	49.75	204.61	2869.27	2843.27	-1832.75	-824.87	5731040.6	634530.1
3751	49.73	204.61	2869.91	2843.91	-1833.45	-825.18	5731039.9	634529.8
3752	49.71	204.62	2870.56	2844.56	-1834.14	-825.50	5731039.2	634529.4

MD	Angle	Direction	TVDRT	TVDSS	DNorth	DEast	Northing	Easting
3753	49.69	204.62	2871.21	2845.21	-1834.83	-825.82	5731038.5	634529.1
3754	49.67	204.62	2871.85	2845.85	-1835.53	-826.14	5731037.8	634528.8
3755	49.65	204.62	2872.50	2846.50	-1836.22	-826.46	5731037.1	634528.5
3756	49.63	204.62	2873.15	2847.15	-1836.91	-826.77	5731036.4	634528.2
3757	49.62	204.61	2873.80	2847.80	-1837.60	-827.09	5731035.7	634527.9
3758	49.60	204.60	2874.45	2848.45	-1838.30	-827.41	5731035.0	634527.5
3759	49.58	204.60	2875.09	2849.09	-1838.99	-827.72	5731034.4	634527.2
3760	49.57	204.59	2875.74	2849.74	-1839.68	-828.04	5731033.7	634526.9
3761	49.55	204.58	2876.39	2850.39	-1840.37	-828.36	5731033.0	634526.6
3762	49.54	204.57	2877.04	2851.04	-1841.07	-828.67	5731032.3	634526.3
3763	49.52	204.56	2877.69	2851.69	-1841.76	-828.99	5731031.6	634526.0
3764	49.51	204.55	2878.34	2852.34	-1842.45	-829.31	5731030.9	634525.6
3765	49.49	204.55	2878.99	2852.99	-1843.14	-829.62	5731030.2	634525.3
3766	49.48	204.54	2879.64	2853.64	-1843.83	-829.94	5731029.5	634525.0
3767	49.46	204.53	2880.29	2854.29	-1844.52	-830.25	5731028.8	634524.7
3768	49.44	204.52	2880.94	2854.94	-1845.22	-830.57	5731028.1	634524.4
3769	49.43	204.51	2881.59	2855.59	-1845.91	-830.88	5731027.4	634524.1
3770	49.41	204.51	2882.24	2856.24	-1846.60	-831.20	5731026.7	634523.7
3771	49.40	204.50	2882.89	2856.89	-1847.29	-831.51	5731026.1	634523.4
3772	49.38	204.49	2883.54	2857.54	-1847.98	-831.83	5731025.4	634523.1
3773	49.37	204.48	2884.19	2858.19	-1848.67	-832.14	5731024.7	634522.8
3774	49.35	204.47	2884.84	2858.84	-1849.36	-832.46	5731024.0	634522.5
3775	49.34	204.46	2885.49	2859.49	-1850.05	-832.77	5731023.3	634522.2
3776	49.32	204.46	2886.15	2860.15	-1850.74	-833.09	5731022.6	634521.9
3777	49.30	204.45	2886.80	2860.80	-1851.43	-833.40	5731021.9	634521.5
3778	49.29	204.44	2887.45	2861.45	-1852.12	-833.71	5731021.2	634521.2
3779	49.27	204.43	2888.10	2862.10	-1852.81	-834.03	5731020.5	634520.9
3780	49.26	204.42	2888.75	2862.75	-1853.50	-834.34	5731019.8	634520.6
3781	49.24	204.42	2889.41	2863.41	-1854.19	-834.65	5731019.1	634520.3
3782	49.23	204.41	2890.06	2864.06	-1854.88	-834.97	5731018.5	634520.0
3783	49.21	204.40	2890.71	2864.71	-1855.57	-835.28	5731017.8	634519.7
3784	49.20	204.39	2891.37	2865.37	-1856.26	-835.59	5731017.1	634519.4
3785	49.18	204.38	2892.02	2866.02	-1856.95	-835.91	5731016.4	634519.0
3786	49.16	204.37	2892.67	2866.67	-1857.64	-836.22	5731015.7	634518.7
3787	49.15	204.37	2893.33	2867.33	-1858.33	-836.53	5731015.0	634518.4
3788	49.13	204.36	2893.98	2867.98	-1859.02	-836.84	5731014.3	634518.1
3789	49.12	204.35	2894.64	2868.64	-1859.71	-837.15	5731013.6	634517.8
3790	49.10	204.34	2895.29	2869.29	-1860.39	-837.47	5731012.9	634517.5
3791	49.09	204.34	2895.95	2869.95	-1861.08	-837.78	5731012.3	634517.2
3792	49.07	204.34	2896.60	2870.60	-1861.77	-838.09	5731011.6	634516.9
3793	49.06	204.34	2897.26	2871.26	-1862.46	-838.40	5731010.9	634516.5
3794	49.04	204.34	2897.91	2871.91	-1863.15	-838.71	5731010.2	634516.2
3795	49.03	204.34	2898.57	2872.57	-1863.84	-839.02	5731009.5	634515.9
3796	49.02	204.34	2899.22	2873.22	-1864.52	-839.33	5731008.8	634515.6
3797	49.00	204.34	2899.88	2873.88	-1865.21	-839.64	5731008.1	634515.3
3798	48.99	204.34	2900.53	2874.53	-1865.90	-839.96	5731007.4	634515.0
3799	48.97	204.34	2901.19	2875.19	-1866.59	-840.27	5731006.8	634514.7
3800	48.96	204.34	2901.85	2875.85	-1867.27	-840.58	5731006.1	634514.4
3801	48.94	204.34	2902.50	2876.50	-1867.96	-840.89	5731005.4	634514.1
3802	48.93	204.34	2903.16	2877.16	-1868.65	-841.20	5731004.7	634513.7
3803	48.92	204.34	2903.82	2877.82	-1869.34	-841.51	5731004.0	634513.4
3804	48.90	204.34	2904.48	2878.48	-1870.02	-841.82	5731003.3	634513.1
3805	48.89	204.34	2905.13	2879.13	-1870.71	-842.13	5731002.6	634512.8
3806	48.87	204.34	2905.79	2879.79	-1871.39	-842.44	5731001.9	634512.5
3807	48.86	204.34	2906.45	2880.45	-1872.08	-842.75	5731001.3	634512.2
3808	48.84	204.34	2907.11	2881.11	-1872.77	-843.06	5731000.6	634511.9
3809	48.83	204.34	2907.76	2881.76	-1873.45	-843.37	5730999.9	634511.6
3810	48.81	204.34	2908.42	2882.42	-1874.14	-843.68	5730999.2	634511.3
3811	48.80	204.34	2909.08	2883.08	-1874.82	-843.99	5730998.5	634511.0

APPENDIX 2a

BLACKBACK A-2

Petrophysics Evaluation Summary

Esso Australia Ltd

Exploration Department

Blackback A-2
Formation Evaluation
Log Analysis Report

R. J. Lyons

September 1999

Endorsed by:
FE Team Leader

Date: 30./09./..99.

Blackback A-2 LOG ANALYSIS

Blackback A-2 was the second well of the Blackback Phase 1 development project. The well was drilled by the semi-submersible Sedco 702 intersecting the Top of Latrobe approximately 120m south-east of the Blackback-2 appraisal well, targeting Paleoocene reservoir sands. The well was spudded on February 21, 1999. After setting 20" casing at 682m the rig was temporarily released to drill Blackback A-1. The rig returned to location on April 24 and drilled 17 ½" hole to a depth of 1305m, setting 13 3/8" intermediate casing at 1296m MD. The 12 ¼" production hole was then drilled to 3764 (MD Drlr) on May 10, 1999 and logged open hole with PEX(AIT)-HNGS on a single wireline run. The hole was then drilled to a slightly shortened TD of 3811m (pre-drill 3828m) on May 12, 1999.

The electric log data have been analysed for effective porosity and water saturation from 3596 to 3755m. Esso's "K12" log model was used to derive effective porosity from density and neutron log responses and saturation using the Dual Water model. Note that all depths quoted below are logged MDKB unless specified otherwise. The result of the analyses is included as Attachment 1.

DATA

Open Hole Logs Acquired

1.	PEX(AIT-H), HNGS:	3595 – 3764m
	GR, CAL:	2800 – 3764m
2.	MWD-GR	1300 – 3800m

Hole Data

Hole Size:	12 ¼"
Max. Deviation:	51 degrees

Mud Data

Mud Type:	Petrofree
O/W:	77/23, water phase salinity 238,000 ppm
Mud Weight:	11.2 LB/G
BHT:	86 ^{0}C

Log Quality

Neutron Log Response:

As with the other Blackback Phase 1 development wells the neutron logs appear to read anomalously low relative to the exploration and appraisal wells. In the case of the A-2 well, the neutron reads approximately 9 p.u. lower in the oil sands than in Blackback-2 (Figure 1). The discrepancy does not appear to be attributed to either tool malfunction or incorrect processing parameters in the A-2 well. Nuclear modelling suggests that the discrepancy between the two wells may be attributed to differences in invasion profiles and possibly slight changes in lithology. The procedure and rational used are as follows:

- Neutron response for 20 p.u. clean, quartzose sand were modelled in SNUPAR assuming varying degrees of water-based mud invasion ranging from 100% to 0%. The results of the modelling are shown in Figure 2, and suggest that NPHI and TNPH could vary between 17 and 8 p.u. depending on the extent of water-based mud invasion.

- Tool response was modelled for the combined effects of lithology and invasion. Reservoir properties were obtained from quantitative mineralogy (MINQUANT), core porosity, and PVT data from Blackback-2 (Figure 3). The following conditions were assumed:

  1) The hydrocarbon effect was totally masked by water mud invasion in Blackback 2. *The modelled data is with-in one p.u. of the measured data.*

  2) There was negligible oil mud filtrate invasion in the Blackback A-2 oil zone. *The modelled data is approximately 6 p.u. lower than the measured log response in Blackback 2.*

  3) The 2nd model was rerun without glauconite in the matrix. *The modelled data is approximately 11 p.u. lower than the measured log response.*

  Although this is not a unique solution, the modelling does support that the measured log responses are possible given; (1) significant water-based mud invasion in Blackback-2, (2) very low invasion of OBM in A-2, and (3) possibly lower amounts of glauconite in the A-2 well.

- Finally, the neutron-density responses across non-reservoir zones were compared (Figure 4) to test the invasion theory. The neutron data agree well (mean values agree within 1 p.u.), supporting the conclusion that neutron response in A-2 is correct and that deep water-based mud invasion masked the hydrocarbon effect in Blackback-2.

Resistivity Response:

- As in the A-1 ST1 well the array induction tool is affected by the high relative dip (approximately 50 degrees) between the borehole and formation. At these high angles, the tool's response cuts across several beds and is unable to resolve individual beds. The varying depths of investigation (10, 20, 30, 60, 90 inches) measure differing formation volumes resulting in horns at bed boundaries and unstable resistivity profiles. For example, the separation observed between the induction curves over the oil zone (3702 to 3733m) is attributed to high dip effects (ie. the deeper reading measurement AT90 reads lower than the AT30 or AT10 as the AT90 is more strongly influenced by adjacent, lower resistivity beds than the shallow reading curves).

- The resistivity horn at 3730.5m was hand edited.

- In general, resistivities are higher in the hydrocarbon sands in the A-2 well than in Blackback-2. The lower resistivies in Blackback-2 are attributed to water-based mud invasion.

Depth Control

- The PEX up pass was recorded after applying a +1m stretch correction at the 13 3/8" shoe and a +5.9m stretch correction at TD. This resulted in the wireline gamma ray being approximately 7m deep to the MWD gamma ray, and the apparent oil/water contact approximately 7 m MD deep to the oil water contact in Blackback-2.

- As a result the logs were tied into the MWD gamma ray spike at 3701.5m MD. These "corrected" logs are displayed on the field prints and recorded on digital tapes.

- The input logs were then depth aligned using the GR as the base curve.

INTERPRETATION

Logs Used

GR, AHT90, RHOZ, NPHI

Analysis Parameters

a	1	
m	1.83	*From Blackback-2 SCAL data.*
n	1.87	*From Blackback-2 SCAL data*

Fluid Density	0.85
GRmin	40
GRmax	120
Apparent Shale Neutron Porosity	.30
Apparent Shale Bulk Density	2.52
Input Hydrocarbon Density	.2 - .6
Shale Resistivity	10
Lower Grain Density Limit	2.645 g/cc
Upper Grain Density Limit	2.675 g/cc
Formation Water Resistivity	.086
Measured Rmf	N/A, POBM used

Free Formation Water Resistivity

The free formation water resistivity of 0.086 ohmm (30,000 ppm NaCl @ 90C) used in this analysis is consistent with the value used in the 1994 Blackback Field Study and is equivalent to 100% water saturation in clean water sands underlying the oil leg (assuming a=1, m=1.83). Note, the temperature used in this calculation is from the Blackback-2 Production Test, the maximum BHT (86C) measured from the wireline logs is slightly lower.

Shale Volume, Total Porosity and Water Saturation

An initial VSH calculated from the GR was compared to a calculated neutron-density value to test for input into an iterative log analysis model (K12). Initial neutron-density total porosity and dual-water total water saturation were then calculated and hydrocarbon and shale corrections applied to the neutron and density data using those values. The resulting calculated grain density was compared to a supplied grain density window and the initial VSH increased or decreased until the calculated GD fell within the window.

Effective Porosity and Water Saturations

Effective porosity was calculated using the final values of total porosity and VSH and the effective water saturation from the total water saturation using the following equations:

PHIE = (PHIT - (VSH * PHISH))
SWE = (1 - ((PHIT/PHIE) * (1 - SWT)))

DISCUSSION

1. The neutron logs show considerably more light hydrocarbon effect in the A-2 well than in Blackback-2. Nuclear modelling (SNUPAR) and comparison of non-reservoir intervals indicate that the observed differences can be explained by (1) deep invasion of water based mud in Blackback-2, masking hydrocarbon effect on the logs, and (2) very shallow invasion of the oil-based mud in the A-2 well. Minor changes in lithology (i.e. decreasing glauconite in A-2) may also contribute to the

differences in neutron response.

2. A gas/oil contact can not be determined (Figure 5). Lowest Known Gas (LKG) is placed at 3669.4m MD (-2791.2m SS), Highest Known Oil (HKO) at 3685.6m MD (-2801.8m SS) based on log response and visual shows.

3. Blackback A-2 penetrated 28.6 m MD (19.3m TVD) of net known oil pay with a mean effective porosity of 17 p.u., and a mean effective water saturation of 18 s.u. (Table 1).

4. The log-derived water saturations are consistent with capillary pressure data from the Blackback-2 well, approximately 120 meters to the south-east.

5. A formation oil / water contact is placed at 3733.3 MD (-2832.5m SS). This compares to an interpreted OWC of –2832.1m SS in Blackback-2 (wireline log interpretation) and a Field OWC of -2834m SS. The interpreted contact coincides with a distinct change in lithology evidenced by increased gamma radiation and neutron – density separation. Quantitative mineralogical analyses (MINQUANT) from the Blackback-2 core indicates increasing amounts of glauconite over this interval. Reservoir quality however, remains good, with overburden corrected permeabilties ranging from 30 to 1000 md. Based on the log-derived effective porosity and supporting core data from Blackback-2, the decrease in resistivity observed at 3733.3 m MD is attributed to increased free water and is interpreted as a fluid contract rather than oil on rock.

6. The well was perforated over the intervals 3685.0 - 3694.0 m MD and 3699.0 - 3708.0 m MD (Reference Wireline GR). Initial oil production was approximately 8000 stb/d (50% choke) with higher than anticipated GOR and water cut (Figures 6 and 7). The initial production, in particular the onset of water production almost immediately, is inconsistent with the log data and the possibility of a cement channel can not be ruled out. It should be noted that the cement plug was not bumped and returns were partially lost during the cementing operation. A cement evaluation log has not been run to date in this well.

Attached are the following presentations of results:

- Table 1 - Summary of Results, Blackback A-2
- Figure 1 - Neutron – Density Crossplot, A-2, Blackback 2, Oil Reservoir.
- Figure 2 - Snupar Modelling Results, 20 p.u. sand.
- Figure 3 - Snupar Modelling Results, assuming variations in lithology and invasion.
- Figure 4 - Neutron – Density Crossplot, A-2, Blackback 2, Non-Reservoir.
- Figure 5 - Depth Plot of Analysis.
- Figure 6 - Blackback A-2, Oil Production and Water Cut.
- Figure 7 - Blackback A-2, Oil Production and GOR.
- Attachment 1 - Analysis Depth Plot Blackback A-2

BLACKBACK A-2

PETROPHYSICS ANALYSIS SUMMARY

Net porosity cut-off: 0.120 volume per volume
Net water saturation cut-off: 0.500 volume per volume
Depth reference: MDKB

Net Porous Interval based on Porosity cut-off only.
Both Porosity and Sw cut-offs invoked when generating Hydrocarbon-Metres.

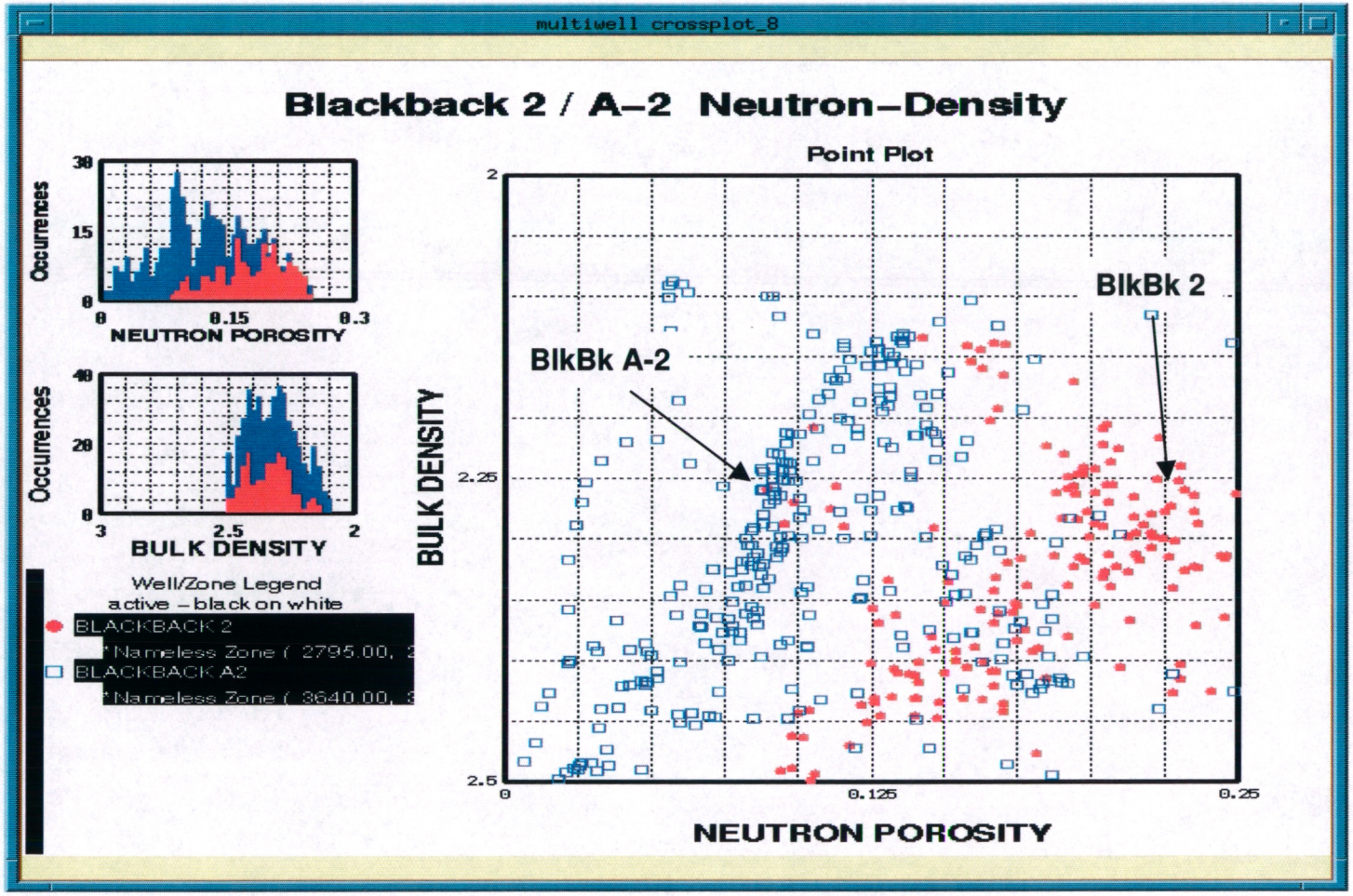
Measured Depth

GROSS INTERVAL		NET POROUS INTERVAL									
(metres) MD		Gross	Net	Net to	Mean	(Std.)	Mean	(Std.)	Mode	Mean	Comments
(top)	(base)	Metres	Metres	Gross(%)	Vwclay	(Dev.)	Porosity	(Dev.)	Porosity	Sw	
3643.2	3649.4	6.2	3.2	52	0.18	0.09	0.15	0.02	0.17	0.53	Gas
3654.7	3669.4	14.7	10.6	72	0.13	0.12	0.2	0.04	0.25	0.20	**Lowest Known Gas 3669.4m MD**
3643.2	**3669.4**	**26.2**	**13.9**	**53**	**0.14**	**0.12**	**0.19**	**0.04**	**0.18**	**0.28**	**Gas Column**
3677.7	3682.9	5.1	2.5	48	0.42	0.03	0.14	0.01	0.13	0.58	Indeterminant (shaly sand)
3685.6	3693.1	7.5	5.2	69	0.17	0.15	0.17	0.03	0.22	0.31	**Highest Known Oil 3685.6m MD**
3694.2	3701.6	7.4	3.8	51	0.41	0.02	0.13	0.01	0.14	0.49	Oil, marginal reservoir, 10 - 20 md in Blackback 2
3702.2	3733.3	31.1	20.7	67	0.01	0.03	0.18	0.04	0.21	0.09	**Oil**
3685.6	**3733.3**	**47.7**	**30**	**63**	**0.09**	**0.15**	**0.17**	**0.04**	**0.14**	**0.18**	**Oil Column (avg)**
3733.3	3734.8	1.5	1.5	100	0.33	0.02	0.14	0.01	0.14	0.81	Relict Oil
3734.8	3755	20.2	14.9	74	0.21	0.10	0.16	0.03	0.15	1.00	Water

TVD SS

GROSS INTERVAL		NET POROUS INTERVAL									
(metres) TVD ss		Gross	Net	Net to	Mean	(Std.)	Mean	(Std.)	Mode	Mean	Comments
(top)	(base)	Metres	Metres	Gross(%)	Vwclay	(Dev.)	Porosity	(Dev.)	Porosity	Sw	
2773.6	2791.2	17.60	**9.33**	53	0.14	0.12	**0.19**	0.04	0.18	**0.28**	Gas Column, average deviation 48.25 degrees.
2801.8	2832.5	30.70	**19.34**	63	0.09	0.15	**0.17**	0.04	0.14	**0.18**	Oil Column, average deviation 49.8 degrees

Blackback A-2 / 2
Neutron - Density Comparison, Oil Reservoir



CNL (NPHI) from Blackback-2 compared w/ PEX (NPHI) A-2 Well

Figure 1

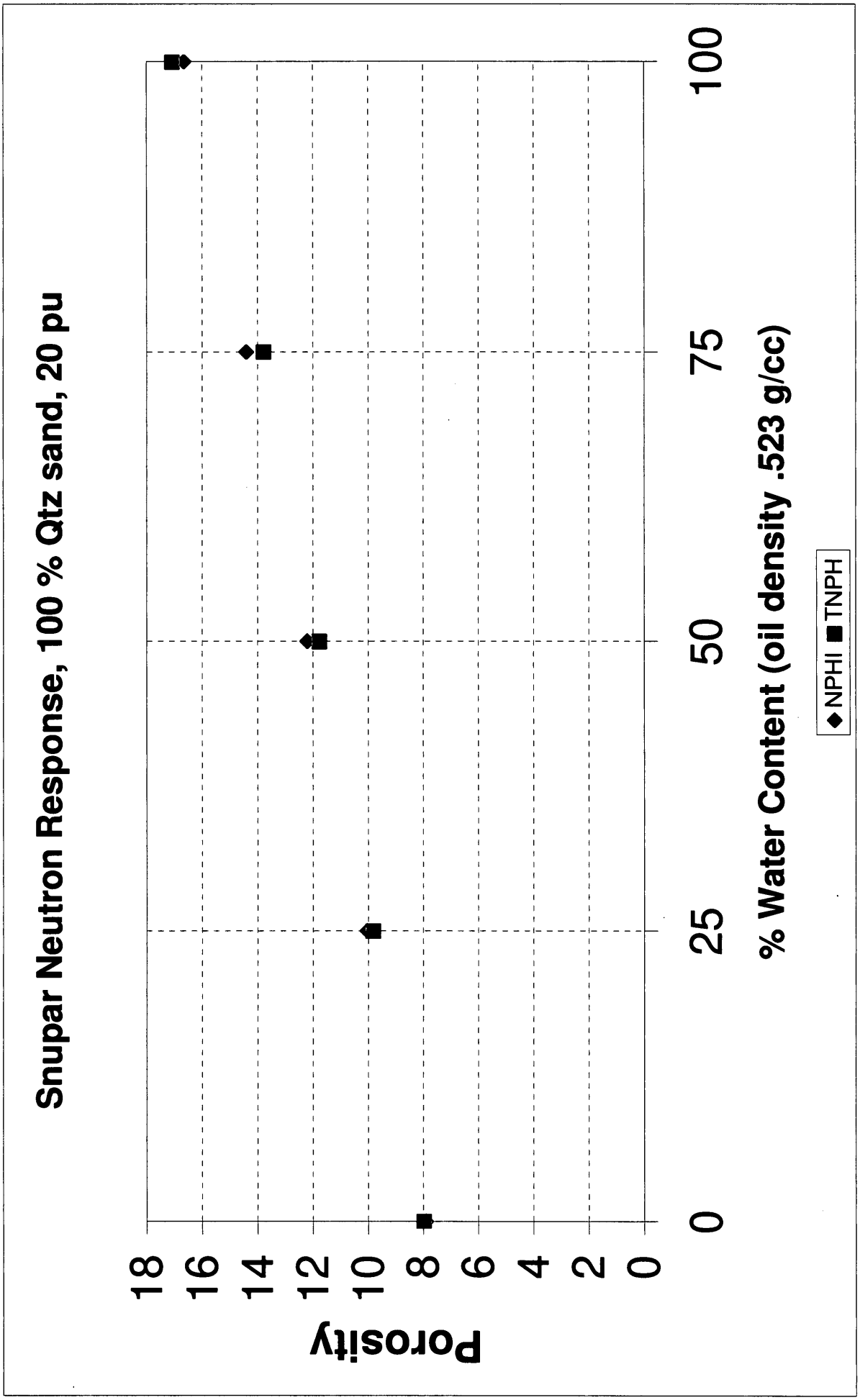

Snupar Neutron Response, 100 % Qtz sand, 20 pu
Porosity
18
16
14
12
10
8
6
4
2
0
0
25
50
75
100
% Water Content (oil density .523 g/cc)
◆NPHI ■TNPH

Figure 2.

Modelled Neutron Response **BLACKBACK 2**

Oil Density g/cc @ res	Res Temp Deg F	Mtrx
0.523	194	LMST

DEPTH	TNPH	RHOB	PHIC_O	Rhma	Blackback 2 Minquant Results (EPR)					% Hc in	Hydrocb	Snupar Output		Delta log - Snupar)	
metres	FRAC	G/CM3	FRAC	g/cc	CARB	GLAUC	KFELDS	ILLIT +	QTZ_+	Pore Space	Density	NPHI	TNPH	NPHI	**TNPH**
2840.9	**0.207**	2.235	**0.215**	**2.63**	0	6	12	2	80	0		0.206	0.198	-0.01	-0.02
					0	6	12	2	80	0.900	0.523	0.1595	0.1522	-0.06	-0.06
					0	**0**	12	2	**86**	0.900	0.523	0.1093	0.1061	-0.11	-0.11

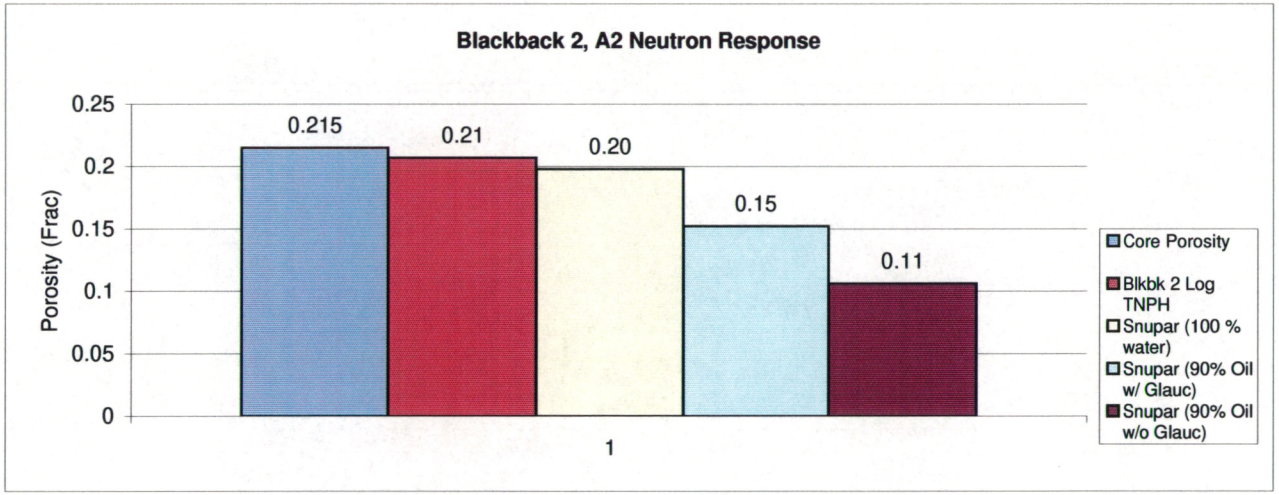
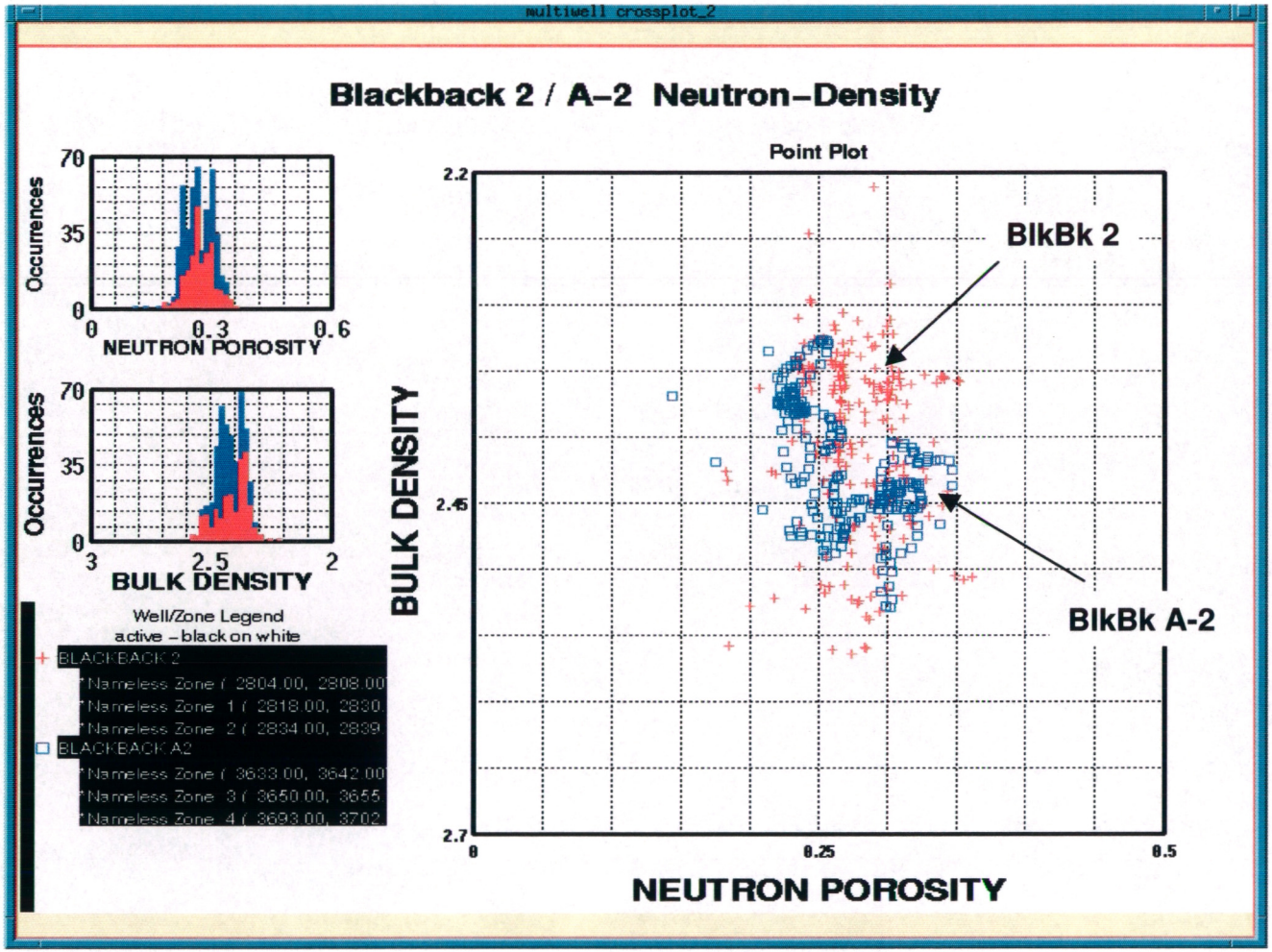


Figure 3.

Blackback A-2 / 2
Neutron - Density Comparison, Non-Reservoir.



CNL (NPHI) from Blackback-2 compared w/ PEX (NPHI) A-2 Well

Figure 4

Blackback A-2

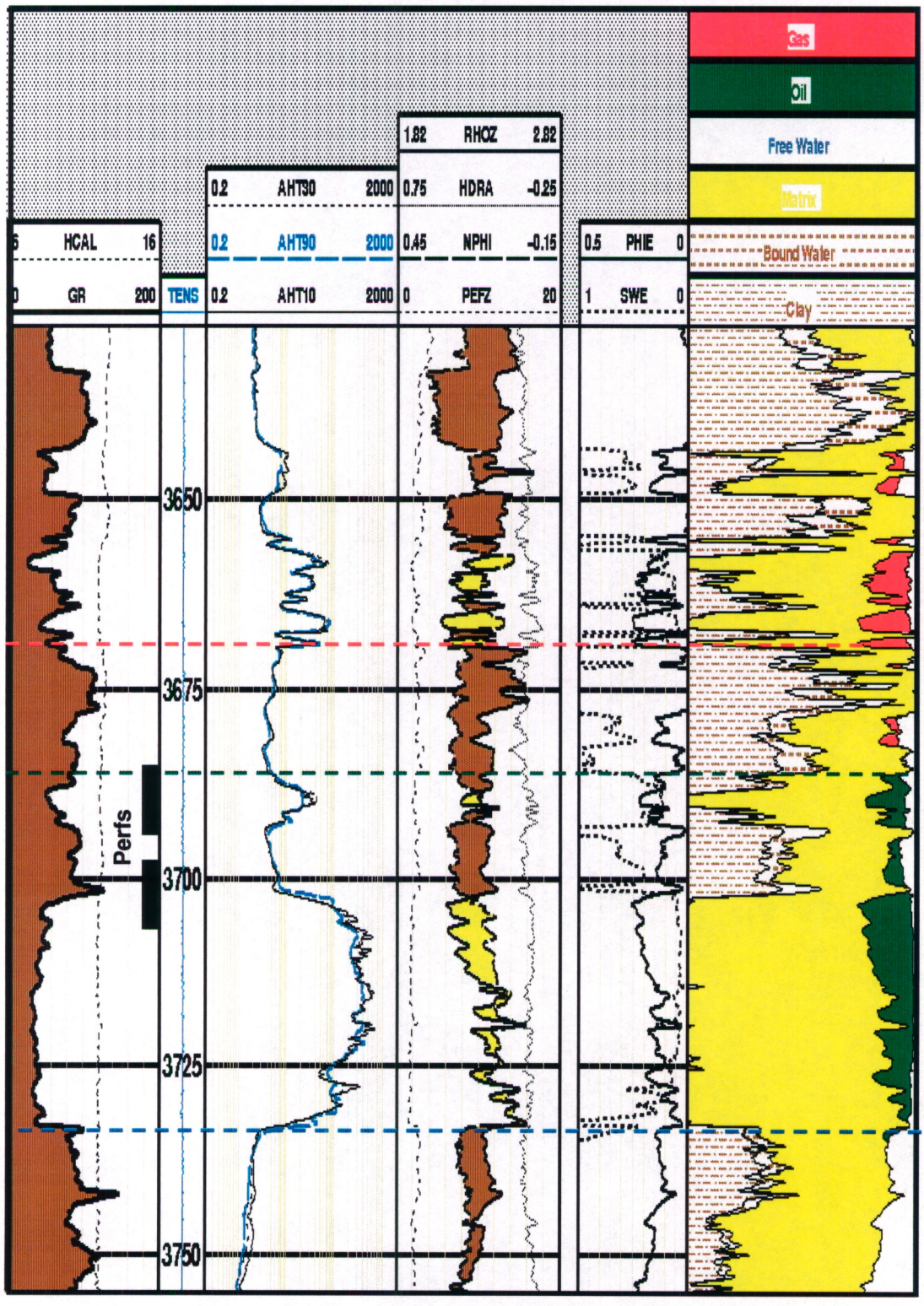
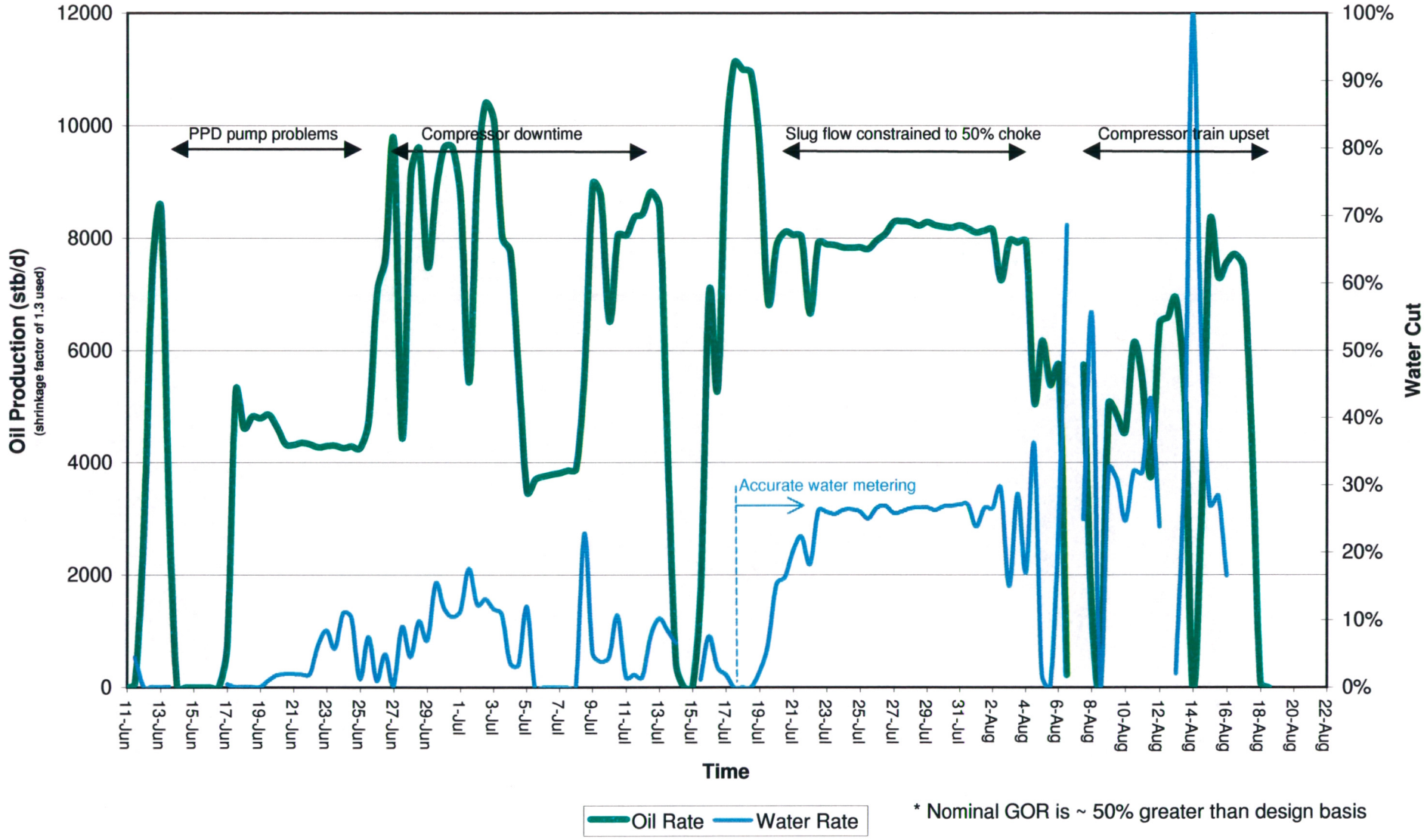


Figure 5.

BLACKBACK A-2, Oil Production and Water Cut

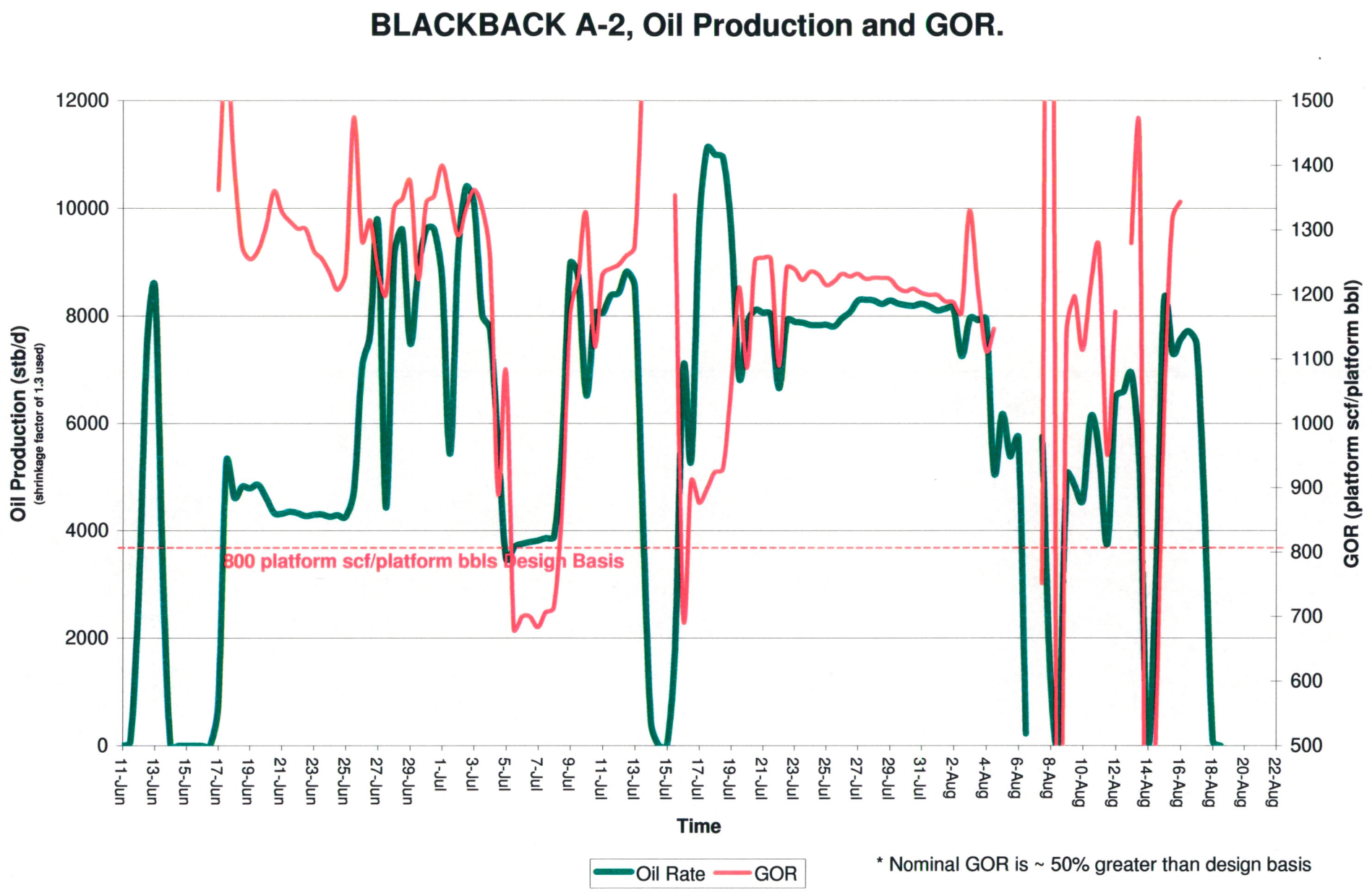


* Nominal GOR is ~ 50% greater than design basis

907468 050

Figure 6.

H:\PN\TS\RT\FIELD\BKA\5DE\WELLS\A2\Charts for GG.xls A-2 (O&W)
MHHALL 9/30/99



907468 051

Figure 7.

H:\PN\TS\RT\FIELD\BKA\5DE\WELLS\A2\Charts for GG.xls A-2 (GOR)
MHHALL 9/30/99

PE605450

This is an enclosure indicator page.
The enclosure PE605450 is enclosed within the container PE907468 at this location in this document.

The enclosure PE605450 has the following characteristics:

ITEM_BARCODE	PE605450
CONTAINER_BARCODE	PE907468
NAME	Blackback-A2 Log Analysis Depth Plot
BASIN	GIPPSLAND
ONSHORE?	N
DATA_TYPE	WELL
DATA_SUB_TYPE	WELL_LOG
DESCRIPTION	Blackback-A2 Log Analysis Depth Plot 3590-3765 MD, Attachment 1.
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	05-OCT-1999
DATE_RECEIVED	01-DEC-1999
RECEIVED_FROM	Esso Australia Ltd
WELL_NAME	Blackback-A2
CONTRACTOR	Solar
AUTHOR	
ORIGINATOR	Esso Australia Ltd
TOP_DEPTH	3590
BOTTOM_DEPTH	3765
ROW_CREATED_BY	PC00_SW

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 3a

BLACKBACK A-2

Lithology/Show Descriptions

Geologist: Greg Clota

Blackback A-2 Lithology/Show Descriptions

Interval	%	Lithology/Show Description
		Geologist onboard from 2760mMD
2760-2790	100	**LIMESTONE:** Brown black to olive black, calcisiltite, micritic, trace off white very fine calcarenite inclusions, trace forams, trace to common fine calcareous sand, rare carbonaceous specks, firm to locally moderately hard, blocky to massive.
2790-2820	100	**LIMESTONE:** Predominantly as above, trace off white calcite infill.
2820-2850	100	**LIMESTONE:** Dark grey to brown black, calcisiltite becomes very argillaceous grades to calcilutite, micritic, trace carbonaceous specks, trace white calcite infill, trace very fine calcareous sand, firm, blocky.
2850-2880	100	**LIMESTONE:** As above.
2880-2910	100	**LIMESTONE:** Dark grey, brown black, calcilutite, slightly silty, micritic, trace carbonaceous specks, trace light grey very fine to silty calcarenite inclusions, firm, blocky.
2910-2940	100	**LIMESTONE:** As above.
2940-2970	100	**LIMESTONE:** Brown black to dark grey, calcilutite, locally silty grades to calcisiltite in part, micritic, trace light grey very fine calcarenite inclusions, rare fine calcareous sand, firm to moderately hard, blocky to massive.
2970-3000	100	**LIMESTONE:** Predominantly as above, calcilutite grades to calcisiltite.
3000-3030	100	**LIMESTONE:** Medium to dark grey, brown grey, calcilutite, locally very silty grades to calcisiltite, micritic, trace carbonaceous specks, common light grey very fine calcarenite inclusions, firm, massive to blocky.
3030-3060	100	**LIMESTONE:** Brown grey to dark grey, calcilutite, locally very silty grades to calcisiltite, micritic, trace carbonaceous specks, rare forams, trace light grey very fine calcarenite inclusions, firm to moderately hard, blocky.
3060-3090	100	**LIMESTONE:** Brown grey, medium to dark grey, calcilutite becoming very argillaceous grades to calcareous claystone, slightly silty, micritic, trace carbonaceous specks, firm to locally moderately hard, massive to blocky.
3090-3120	90	**LIMESTONE:** Brown grey to dark grey, calcilutite, locally very argillaceous grades to calcareous claystone, slightly silty, trace carbonaceous specks, firm to locally moderately hard, massive to blocky.
	10	**CLAYSTONE:** Light to medium grey, very calcareous grades to calcilutite, slightly silty, trace disseminated pyrite, trace very fine calcareous sand, soft to firm, massive to amorphous.
3120-3150	70	**LIMESTONE:** As above.
	30	**CLAYSTONE:** As above.
3150-3180	60	**LIMESTONE:** Brown grey, medium to dark grey, calcilutite, slightly silty, locally very argillaceous grades to calcareous claystone, micritic, trace carbonaceous specks, occasionally very fine calcareous sand, firm to locally moderately hard, massive to blocky.
	40	**CLAYSTONE:** Light to medium grey, locally very calcareous grades to calcilutite, slightly silty, trace disseminated pyrite, trace fine calcareous sand, soft to plastic, massive to amorphous.
3180-3210	50	**LIMESTONE:** As above.
	50	**CLAYSTONE:** Pale grey, light to medium grey, very calcareous grades to calcilutite, trace disseminated and nodular pyrite, trace fine calcareous sand, rare glauconite, occasionally carbonaceous specks, marly texture, soft to plastic, massive to amorphous.
3210-3240	70	**CLAYSTONE:** Predominantly as above, trace forams.
	30	**LIMESTONE:** As above.
3240-3270	80	**CLAYSTONE:** Light to medium grey, pale grey, very calcareous, trace carbonaceous specks, minor fine calcareous sand, rare disseminated pyrite, soft to firm, plastic, massive to amorphous.
	20	**LIMESTONE:** As above.
3270-3300	100	**CLAYSTONE:** Light to medium grey, occasionally brown grey, moderately calcareous, locally very calcareous grades to calcilutite, slightly silty, trace carbonaceous fragments, trace very fine calcareous sand, soft to firm, massive to blocky.
3300-3330	100	**CLAYSTONE:** Medium to dark grey, moderately calcareous, slightly silty in part, locally common light grey calcilutitic laminae/inclusions, trace carbonaceous specks, soft to locally firm, massive to amorphous.

Interval	%	Lithology/Show Description
3330-3360	100	**CLAYSTONE:** Light to medium grey, dark grey in part, moderately to occasionally very calcareous, trace carbonaceous specks, occasionally fine calcareous sand, occasionally off white to pale grey calcilutite laminae, soft to plastic, massive to amorphous.
3360-3390	100	**CLAYSTONE:** Medium to medium dark grey, medium bluish grey in part, slightly to moderately calcareous, slightly silty, trace disseminated pyrite, rare carbonaceous specks, soft to firm, massive to amorphous, blocky in part.
3390-3420	100	**CLAYSTONE:** Medium to medium dark grey, medium bluish grey, slightly calcareous, trace disseminated pyrite, rare glauconite, trace carbonaceous specks, waxy texture, homogeneous, homogeneous, firm to moderately hard, massive to blocky.
3420-3450	100	**CLAYSTONE:** Predominantly as above, trace light grey calcilutite soft to plastic laminae/inclusions.
3450-3460	100	**CLAYSTONE:** Predominantly as above with common light grey calcilutite laminae/inclusions, trace forams, rare glauconite, occasionally pale orange cryptocrystalline dolomitic inclusions.
3460-3470	100	**CLAYSTONE:** Medium to medium dark grey, medium bluish grey in part, slightly calcareous, trace pale orange dolomitic inclusions, trace disseminated pyrite, trace carbonaceous specks, common light grey calcilutite inclusions/laminae, firm to moderately hard, massive to blocky.
3470-3480	100	**CLAYSTONE:** As above.
3480-3490	100	**CLAYSTONE:** Medium to dark grey, slightly calcareous, trace disseminated pyrite, trace carbonaceous specks, rare pale orange dolomitic inclusions, minor light grey calcilutite inclusions, homogeneous, waxy texture, firm to moderately hard, blocky to massive.
3490-3500	100	**CLAYSTONE:** As above.
3500-3510	100	**CLAYSTONE:** As above. Abundant Barocarb contamination in the sample returns.
3510-3520	100	**CLAYSTONE:** Medium to medium dark grey, slightly to moderately calcareous, trace disseminated pyrite, trace carbonaceous specks, homogeneous, soft to firm, massive to blocky.
3520-3530	100	**CLAYSTONE:** Predominantly as above, slightly silty.
3530-3540	100	**CLAYSTONE:** Claystone, medium dark grey, brown grey, slightly to moderately calcareous, trace disseminated pyrite, locally common light grey calcilutite inclusions/laminae, soft to firm, massive.
3540-3550	100	**CLAYSTONE:** As above.
3550-3560	100	**CLAYSTONE:** Light to medium grey, occasionally medium dark grey, locally moderately calcareous, slightly silty in part, trace carbonaceous specks, soft to firm, massive.
3560-3570	100	**CLAYSTONE:** As above.
3570-3580	100	**CLAYSTONE:** Medium to medium dark grey, slightly to moderately calcareous, slightly silty in part, trace disseminated pyrite, trace light to pale grey calcilutite laminae/inclusions, trace carbonaceous specks, soft to firm, massive.
3580-3590	100	**CLAYSTONE:** As above.
3590-3600	100	**CLAYSTONE:** Medium to dark grey, moderately calcareous, trace carbonaceous specks, waxy texture, homogeneous, soft to plastic, massive to amorphous.
3600-3610	100	**CLAYSTONE:** Predominantly as above, common light grey calcilutite laminae/inclusions.
3610-3620	100	**CLAYSTONE:** As above.
3620-3625	100	**CLAYSTONE:** Medium to medium dark grey, slightly calcareous, slightly silty, trace carbonaceous specks, rare glauconite, trace very fine calcareous sand, common light to pale grey calcilutite, soft to firm, plastic, massive to blocky.
3625-3630	100	**CLAYSTONE:** As above.
3630-3635	20	**SILTSTONE:** Dark brown to brown black, very argillaceous, slightly micromicaceous, trace glauconite, trace carbonaceous fragments, soft to sticky, massive.
	80	**CLAYSTONE:** Medium to medium dark grey, slightly to non calcareous, trace carbonaceous specks, common light to pale grey calcilutite inclusions, soft to firm, plastic, massive to blocky.
3635-3640	30	**SILTSTONE:** As above.
	70	**CLAYSTONE:** As above.
3640-3645	60	**SILTSTONE:** Medium dark brown, brown black, very argillaceous grades to argillaceous siltstone, trace to locally common pelletal and microglauconite, micromicaceous, trace medium to coarse limonitic stained quartz float, soft to sticky, massive.
	40	**CLAYSTONE:** As above.

Interval	%	Lithology/Show Description
3645-3650	70	**SILTSTONE:** Dark brown, brown black, brown grey, very argillaceous grades to argillaceous siltstone, common pelletal glauconite, micromicaceous, trace very fine quartz float, soft to sticky, massive.
	30	**CLAYSTONE:** As above.
3650-3655	10	**SANDSTONE:** Clear to translucent, frosted, fine to predominantly medium to coarse, angular to subangular, poor sorting, clean, trace nodular pyrite, disaggregated, very good porosity, no fluorescence.
	80	**SILTSTONE:** As above.
	10	**CLAYSTONE:** As above.
3655-3660	30	**SANDSTONE:** Clear to translucent, frosted, medium to predominantly coarse to very coarse, angular to subangular, poor sorting, clean, trace nodular pyrite, very good porosity, no fluorescence.
	70	**SILTSTONE:** Dark brown, medium dark grey, very argillaceous grades o argillaceous siltstone, common pelletal and microglauconite, micromicaceous, slightly arenaceous, soft to sticky, massive.
3660-3665	30	**SANDSTONE:** Predominantly as above. Becomes medium to coarse.
	70	**SILTSTONE:** As above.
3665-3670	40	**SANDSTONE:** Clear to translucent, frosted, medium to coarse, subangular to subrounded, moderately sorted, clean, common glauconite, common nodular pyrite, disaggregated, good porosity, no fluorescence.
	60	**SILTSTONE:** As above.
3670-3675	30	**SANDSTONE:** Clear to translucent, frosted, medium to coarse occasionally very coarse, angular to subrounded, poor sorting, clean, common glauconite, common very coarse quartz float, trace nodular pyrite, disaggregated, good porosity, no fluorescence.
	50	**SILTSTONE:** Dark grey dark green grey in part, brown grey, very argillaceous, trace medium quartz float, abundant glauconite, trace nodular pyrite, soft to sticky, massive to amorphous.
	20	**CLAYSTONE:** Dark grey, olive grey, slightly silty, micromicaceous, trace disseminated pyrite, firm, platy.
3675-3680	20	**SANDSTONE:** As above.
	80	**SILTSTONE:** As above.
3680-3685	20	**SANDSTONE:** Clear to translucent, frosted, medium to predominantly coarse to very coarse, angular to subangular, poor sorting, common coarse milky quartz float, disaggregated, good porosity, no fluorescence.
	80	**SILTSTONE:** Dark grey to brown black, very argillaceous, abundant pelletal and micro-glauconite, micromicaceous, trace carbonaceous fragments, trace disseminated pyrite, trace lithic fragments, soft to firm, moderately hard in part, massive.
3685-3690	30	**SANDSTONE:** Clear to translucent, frosted, coarse to very coarse, subangular to subrounded, moderately sorted, trace pyritic cement, predominantly clean, common very coarse milky quartz float, disaggregated, good porosity. FLUORESCENCE: Trace moderately bright yellow green pinpoint fluorescence, faint weak instant cut, trace to nil ring residue.
	70	**SILTSTONE:** As above.
3690-3695	20	**SANDSTONE:** Clear to translucent, frosted, medium to coarse, occasionally very coarse, angular to subangular, poor to moderate sorting, clean, trace nodular pyrite, common glauconite, occasionally limonite stained quartz, disaggregated, good porosity. FLUORESCENCE: Trace patchy moderately bright yellow green fluorescence, faint weak instant cut, trace to nil ring residue.
	80	**SILTSTONE:** Medium to dark grey, very argillaceous, grades to argillaceous siltstone, abundant glauconite, common medium quartz float, micromicaceous, soft to sticky, massive.
3695-3700	10	**SANDSTONE:** As above. FLUORESCENCE: Trace fluorescence as above.
	90	**SILTSTONE:** As above.
3700-3705	70	**SANDSTONE:** Clear to translucent, frosted, medium to coarse, angular to subrounded, moderately sorted, clean, trace nodular pyrite, trace coarse to very coarse limonite stained quartz, disaggregated, good porosity. FLUORESCENCE: Trace fluorescence as above.
	30	**SILTSTONE:** As above.

Interval	%	Lithology/Show Description
3705-3710	80	**SANDSTONE:** Clear to translucent, frosted, medium to coarse, subangular to subrounded, moderate sorting, trace pyritic cement, trace kaolinitic inclusions, rare haematitic stained quartz, disaggregated, good porosity. FLUORESCENCE: Trace dull patchy to pinpoint yellow green fluorescence, faint weak instant cut, nil ring residue.
	20	**SILTSTONE:** As above.
3710-3715	60	**SANDSTONE:** Predominantly as above, locally common kaolinitic inclusions/matrix, trace nodular pyrite. FLUORESCENCE: 10% Dull to moderately bright patchy yellow green fluorescence, faint weak instant cut, nil ring residue.
	40	**SILTSTONE:** As above.
3715-3720	70	**SANDSTONE:** Clear to translucent, frosted, medium to coarse, subangular to subrounded, moderate to good sorting, trace pyritic cement, common kaolinitic matrix/inclusions, trace glauconite, disaggregated, fair to good porosity. FLUORESCENCE: Trace moderately bright pinpoint yellow green fluorescence, faint weak instant cut, nil ring residue.
	30	**SILTSTONE:** As above.
3720-3725	90	**SANDSTONE:** Clear to translucent, frosted, medium to coarse, subangular to subrounded, moderate sorting, strong siliceous cement, common kaolinitic inclusions, common very coarse milky quartz float, trace glauconite, trace quartz overgrowths, hard, disaggregated, poor porosity. FLUORESCENCE: Moderately bright patchy yellow green fluorescence, slow streaming cut, thin ring residue.
	10	**SILTSTONE:** Medium dark grey, brown grey, very argillaceous, common glauconite, micromicaceous, soft to firm, sticky in part, massive to blocky.
3725-3730	90	**SANDSTONE:** Clear to translucent, frosted, coarse to very coarse, granular in part, angular to subrounded, poor sorting, strong siliceous cement in part, trace pyritic cement, locally common kaolinitic inclusions, common glauconite, common very coarse milky quartz, trace Fe stained quartz, disaggregated, occasionally hard aggregates, poor to fair porosity. FLUORESCENCE: 10% Bright pale yellow solid fluorescence, fast streaming cut, moderately thick ring residue.
	10	**CLAYSTONE:** Dark grey, brown grey, slightly silty, micromicaceous, homogeneous, firm, moderately hard, blocky to platy.
3730-3735	70	**SANDSTONE:** Clear to translucent, frosted, medium to predominantly coarse to very coarse, poor sorting, trace siliceous cement, trace pyritic cement, common kaolinitic matrix, common glauconite, common milky quartz float, disaggregated, poor porosity. FLUORESCENCE: 20% Fluorescence as above.
	30	**CLAYSTONE:** Predominantly as above, locally very silty, locally abundant glauconite, grades to siltstone in part.
3735-3740	60	**SANDSTONE:** Clear to translucent, frosted, medium to very coarse, subangular to subrounded, moderately sorted, common white kaolinitic matrix, trace glauconite, friable to disaggregated, poor porosity. FLUORESCENCE: 20% Fluorescence as above.
	40	**CLAYSTONE:** Medium to dark grey, olive grey, very silty grades to silty claystone, common glauconite, micromicaceous, trace medium quartz float, trace carbonaceous fragments, soft to firm, sticky, massive.
3740-3745	50	**SANDSTONE:** Predominantly as above, becomes medium. FLUORESCENCE: Trace fluorescence, as above.
	50	**CLAYSTONE:** As above.
3745-3750	20	**SANDSTONE:** Clear to translucent, frosted, fine to predominantly medium, subangular to subrounded, moderate to good sorting, trace kaolinitic inclusions, trace coarse milky quartz, trace glauconite, rare quartz overgrowths, disaggregated, good porosity, no fluorescence.
	80	**CLAYSTONE:** As above.
3750-3755	30	**SANDSTONE:** Clear to translucent, frosted, medium, subangular to subrounded, rare pyritic matrix, common kaolinitic matrix, common coarse milky/smoky quartz, fair to good porosity, no fluorescence.
	70	**CLAYSTONE:** Medium dark grey to brown grey, moderately silty in part, trace to locally common glauconite, trace disseminated pyrite, micromicaceous, soft, massive to amorphous.
3755-3760	40	**SANDSTONE:** Predominantly as above, trace dolocalcareous cement, poor porosity, trace dull yellow mineral fluorescence.
	60	**CLAYSTONE:** As above.
3760-3764	40	**SANDSTONE:** As above.
	60	**CLAYSTONE:** As above.

Interval	%	Lithology/Show Description
		Run Wireline Logs at 3764m.
3764-3765	100	**SANDSTONE:** Clear to translucent, frosted, coarse to very coarse, angular to subangular, moderately sorted, trace siliceous cement, common very coarse milky quartz, common pelletal glauconite, disaggregated, good porosity, no fluorescence.
3765-3770	100	**SANDSTONE:** Predominantly as above, becomes medium to coarse.
3770-3775	100	**SANDSTONE:** Clear to translucent, frosted, fine to medium, subangular to subrounded, moderate to good sorting, common kaolinitic matrix and inclusions, common coarse milky quartz float, trace pelletal glauconite, disaggregated, no visual porosity.
3775-3780	100	**SANDSTONE:** Clear to translucent, frosted, fine to medium, angular to subrounded, good sorting, weak siliceous cement in part, trace kaolinitic matrix/inclusions, trace coarse milky quartz float, locally trace glauconite, poor porosity, no fluorescence.
3780-3785	100	**SANDSTONE:** Predominantly as above, common kaolinitic matrix, trace disseminated pyrite, poor porosity, no fluorescence.
3785-3790	100	**SANDSTONE:** Clear to translucent, frosted, fine to predominantly medium to coarse, angular to subangular, poor to moderate sorting, weak siliceous cement, locally common kaolinitic matrix, common glauconite, occasionally very coarse milky quartz, trace nodular pyrite, friable in part, predominantly disaggregated, fair porosity, no fluorescence.
3790-3795	100	**SANDSTONE:** Predominantly as above, becomes medium to coarse.
3795-3800	100	**SANDSTONE:** Clear to translucent, frosted, medium to occasionally coarse, moderate to good sorting, trace dolocalcareous cement in part, trace kaolinitic matrix/inclusions, common glauconite, trace nodular pyrite, trace very coarse quartz float, disaggregated, occasionally moderately hard aggregates, poor to fair porosity, trace pale yellow mineral fluorescence only.
3800-3805	100	**SANDSTONE:** Clear to translucent, frosted, fine to predominantly medium to coarse, angular to subangular, poor sorting, weak siliceous cement in part, trace pyritic cement, minor kaolinitic matrix/inclusions, common glauconite, trace quartz overgrowths, disaggregated, good porosity, no fluorescence.
3805-3811	100	**SANDSTONE:** As above.

Reached Total Depth of 3811mMDRT/2909.08mTVDRT at 16:30 hours 12/05/1999.

APPENDIX 4

APPENDIX 4a

BLACKBACK A-2

Mud Log

PE605451

This is an enclosure indicator page.
The enclosure PE605451 is enclosed within the container PE907468 at this location in this document.

The enclosure PE605451 has the following characteristics:

ITEM_BARCODE	= PE605451
CONTAINER_BARCODE	= PE907468
NAME	= Blackback-A2 Mud Log
BASIN	= GIPPSLAND
ONSHORE?	= N
DATA_TYPE	= WELL
DATA_SUB_TYPE	= MUD_LOG
DESCRIPTION	= Blackback-A2 Mud Log, Master Log, Appendix 4a.
REMARKS	=
DATE_WRITTEN	=
DATE_PROCESSED	=
DATE_RECEIVED	= 01-DEC-1999
RECEIVED_FROM	= Esso Australia Ltd
WELL_NAME	= Blackback-A2
CONTRACTOR	= Geoservices
AUTHOR	=
ORIGINATOR	= Esso Australia Ltd
TOP_DEPTH	= 660
BOTTOM_DEPTH	= 3830
ROW_CREATED_BY	= PC00_SW

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 4b

BLACKBACK A-2

Well Completion Log

PE605452

This is an enclosure indicator page.
The enclosure PE605452 is enclosed within the container PE907468 at this location in this document.

The enclosure PE605452 has the following characteristics:

ITEM_BARCODE	= PE605452
CONTAINER_BARCODE	= PE907468
NAME	= Blackback-A2 Well Completion Log
BASIN	= GIPPSLAND
ONSHORE?	= N
DATA_TYPE	= WELL
DATA_SUB_TYPE	= COMPLETION_LOG
DESCRIPTION	= Blackback-A2 Well Completion Log, Appendix 4b.
REMARKS	=
DATE_WRITTEN	=
DATE_PROCESSED	=
DATE_RECEIVED	= 01-DEC-1999
RECEIVED_FROM	= Esso Australia Ltd
WELL_NAME	= Blackback-A2
CONTRACTOR	=
AUTHOR	=
ORIGINATOR	= Esso Australia Ltd
TOP_DEPTH	= 2800
BOTTOM_DEPTH	= 3625
ROW_CREATED_BY	= PC00_SW

(Inserted by DNRE - Vic Govt Mines Dept)