WELL COMPLETION REPORT

BREAM A19A

GIPPSLAND BASIN, VICTORIA

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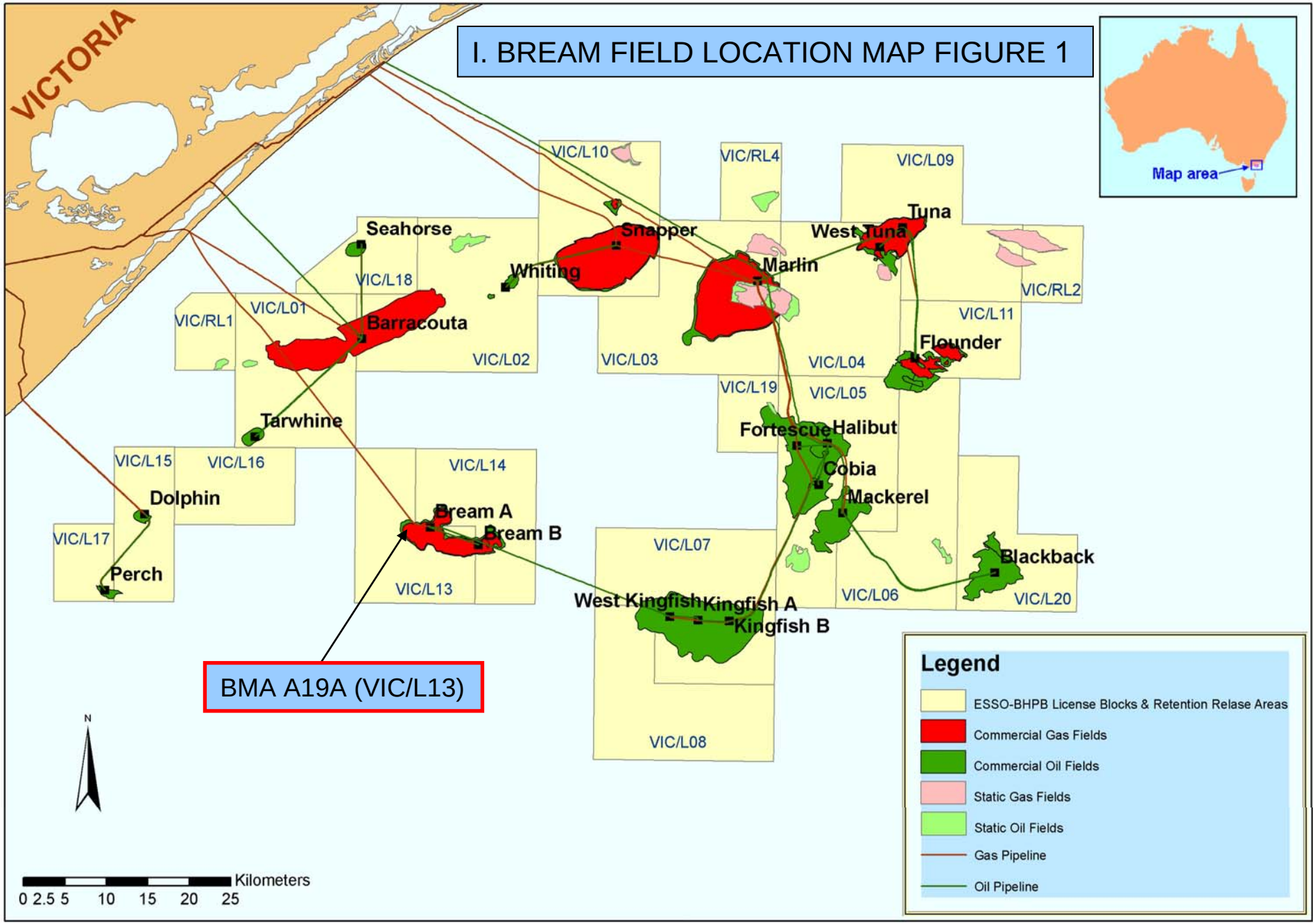
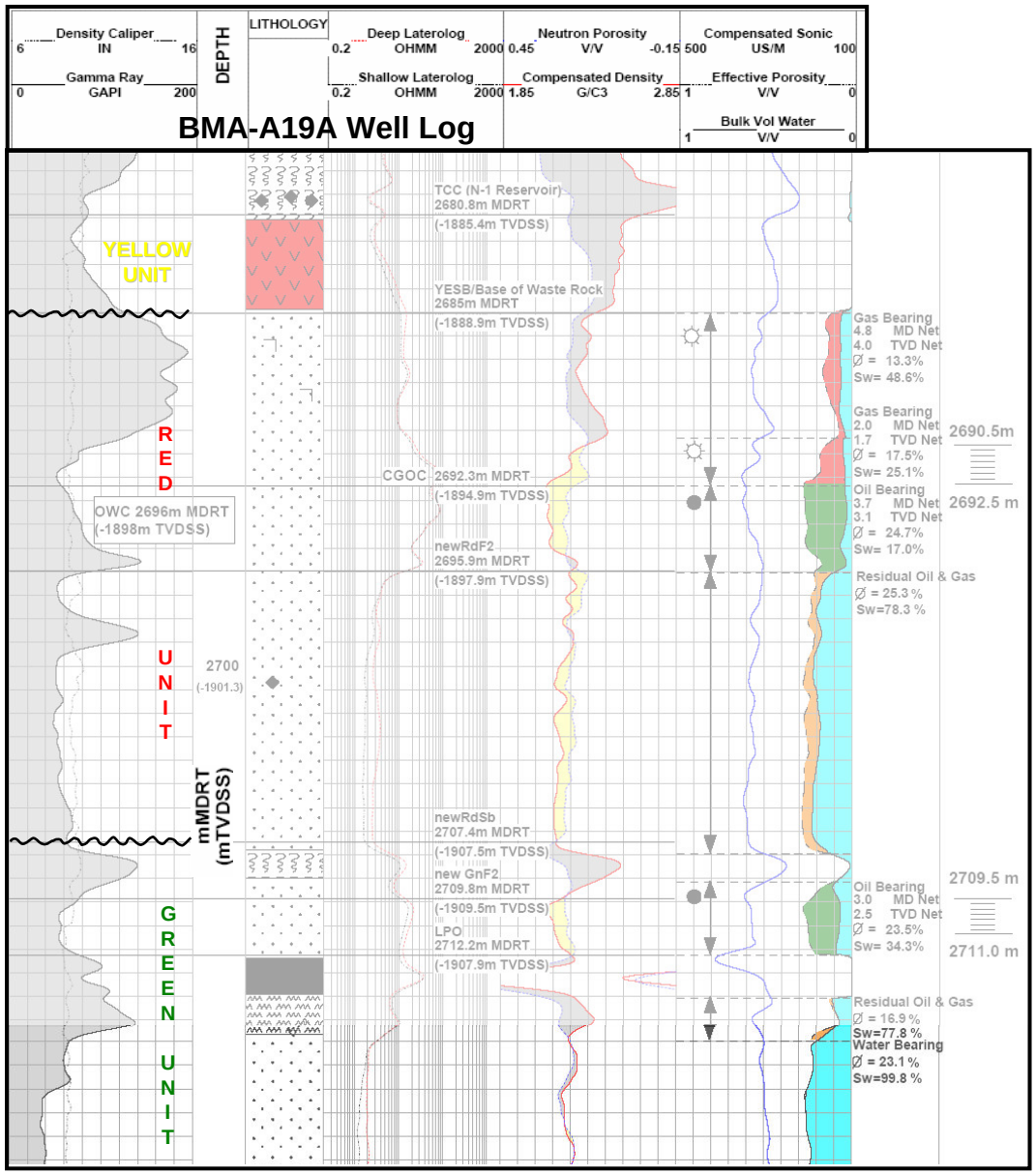
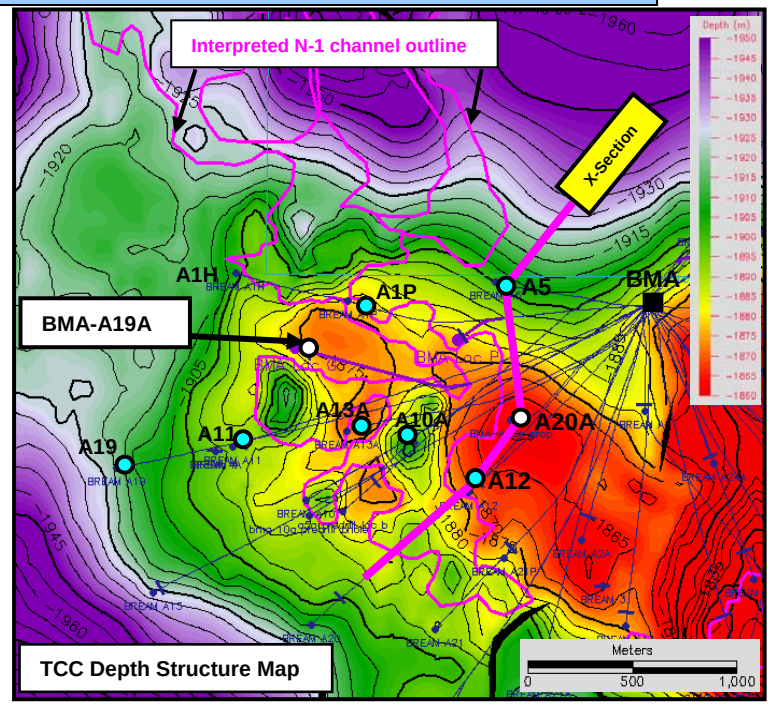
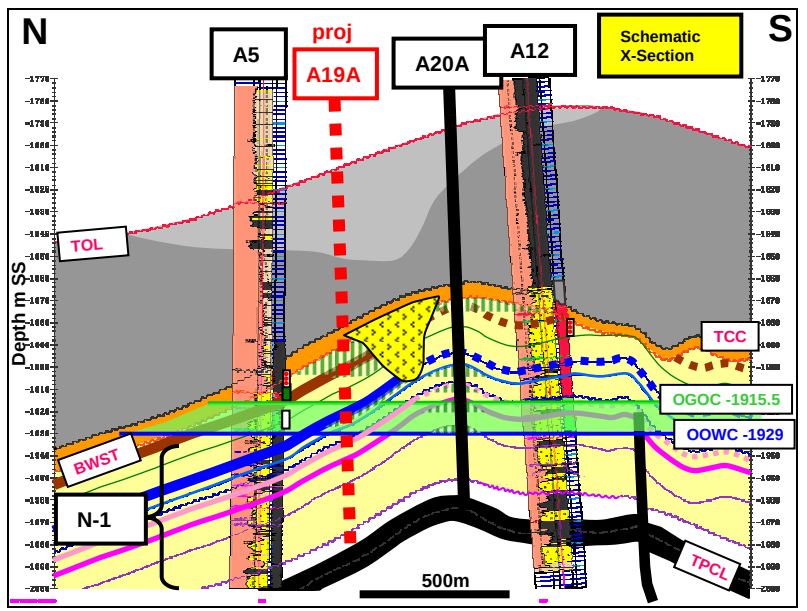

I. BREAM FIELD LOCATION MAP FIGURE 1
VICTORIA
Map area
VIC/L10
VIC/RL4
VIC/L09
Seahorse
Snapper
Tuna
West Tuna
Whiting
Marlin
VIC/L18
VIC/RL2
VIC/L01
VIC/RL1
Barracouta
VIC/L11
Flounder
VIC/L02
VIC/L03
VIC/L04
VIC/L19
VIC/L05
Tarwhine
Fortescue
Halibut
VIC/L15
VIC/L16
VIC/L14
Cobia
Dolphin
Mackerel
Bream A
Bream B
VIC/L17
VIC/L07
Blackback
Perch
VIC/L13
VIC/L06
VIC/L20
West Kingfish
Kingfish A
Kingfish B
BMA A19A (VIC/L13)
VIC/L08
N
Kilometers
0 2.5 5 10 15 20 25
Legend
ESSO-BHPB License Blocks & Retention Relase Areas
Commercial Gas Fields
Commercial Oil Fields
Static Gas Fields
Static Oil Fields
Gas Pipeline
Oil Pipeline

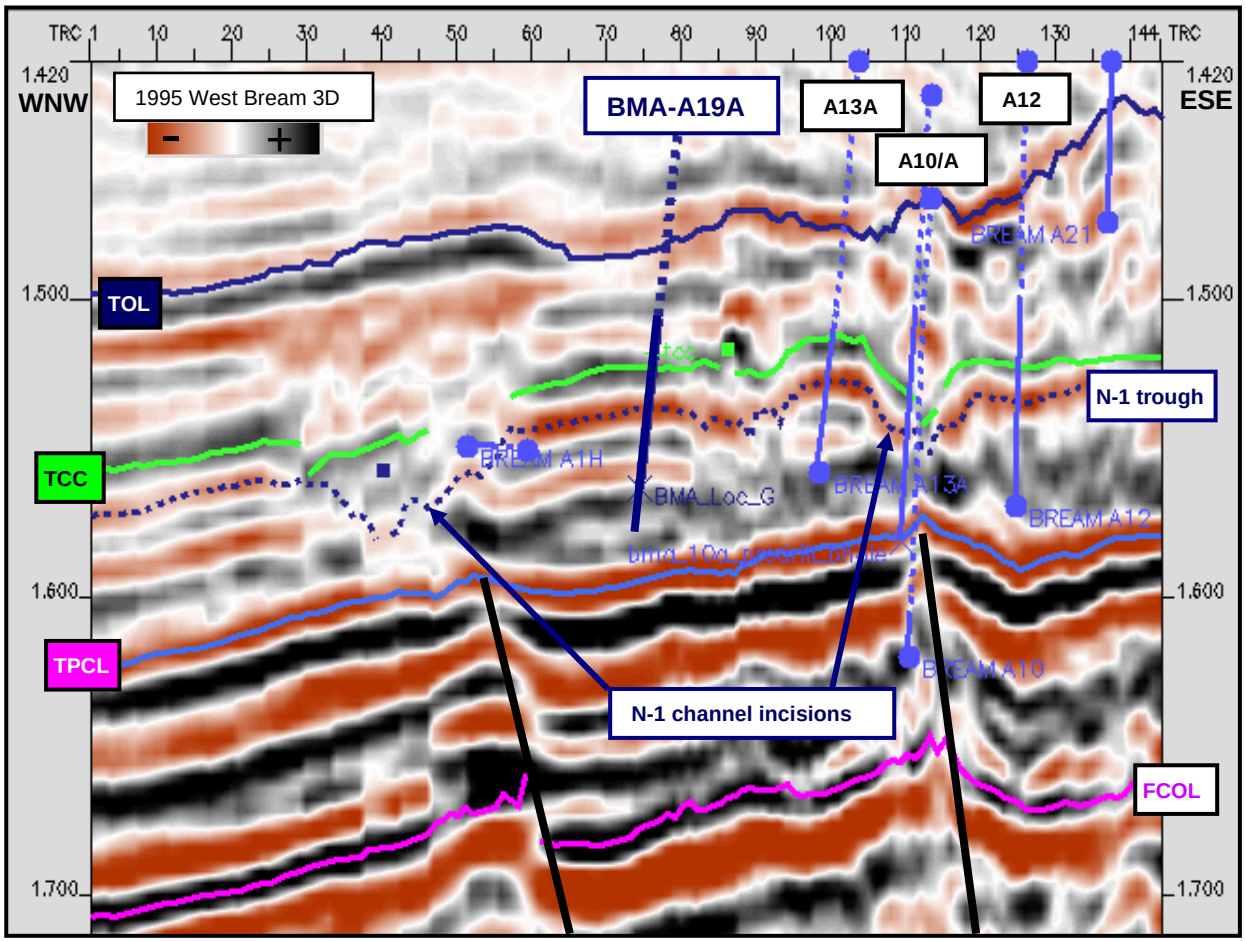
II. WELL DATA RECORD: BREAM A19A Summary Log, Map & N-1 section FIGURE 2

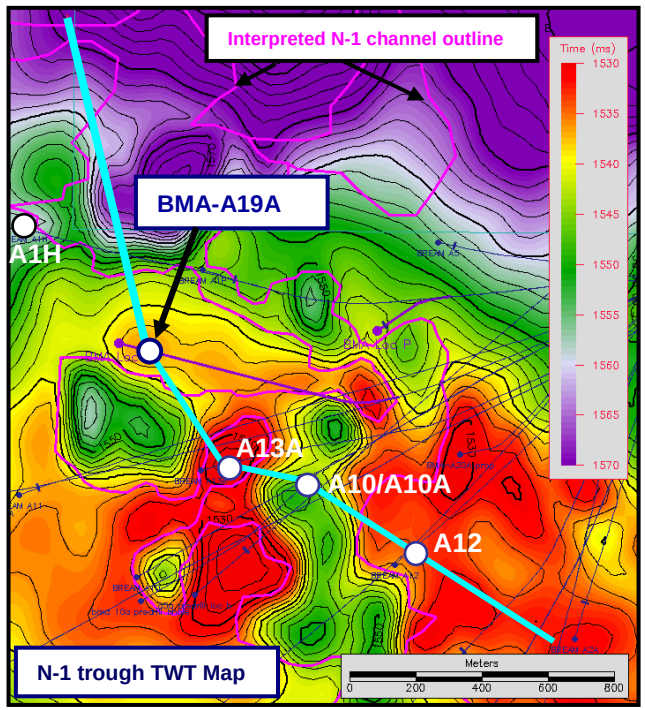






II. WELL DATA RECORD: BREAM A19A Seismic Profile through well location FIGURE 3





II. WELL DATA RECORD (cont'd)

LOCATION

Field	**Bream**		
Well Name	**A19A** (Loc G)	**Conductor #19 Surface Coordinates**	
Conductor Number	Slot 19	(GDA94) X	567336.1m E
State	Victoria	(MGA94) Y	5738458.2 N
Permit/Licence	Vic/L13	Latitude	38° 29' 58.891" S
Geological Basin	Gippsland	Longitude	147° 46' 19.967" E
Top of Latrobe	2600.5m MDRT	**Perforations** (driller)	2690.5 – 2692.5m MDRT
	1851.4m TVDRT		1926.3 – 1927.9m TVDRT
	-1818.6m TVDSS		2709.5 – 2711.0m MDRT
MGA94 X	565766.6m E		1942.1 – 1943.3m TVDRT
MGA94 Y	5738231.6m N	**Datum**	GDA94 (GRS80)
Latitude	38º 30' 6.668" S	**Projection**	Transverse Mercator
Longitude	147º 45' 15.253" E		MGA94/UTM Zone 55 (S)

ELEVATIONS & DEPTHS

Water Depth	59.43 m
Top Wellhead to MSL	27.71m
Main Deck Rel to MSL	25.12 m
RT Relative to MSL	32.82 m
Average Well Angle	35.5 deg (Tan)
Total Depth	2804.0m MDRT
	2020.9m TVDRT
	-1988.1m TVDSS
Plug Back Depth	2771.0m MDRT

DATES

Skid Rig	22/11/2005
Kicked Off	24/11/2005
Development Rig Days	17.5
NPT Days	0.75
Rig Released	10/12/2005
I.P. Established	24/12/2005

MISCELLANEOUS

Operator	Esso Australia Pty Ltd		
Esso Interest	50%	**Contractor**	International Sea Drilling Ltd
Permittee/Licensee	Esso/BHPP	**Rig Name**	Nabors Rig 453
Other Interest	50% J.V. Interest	**Equipment Type**	Platform
Overriding Royalty	2.5%	**Completion Type**	Triple
Drilling AFE No.	L0501F465	**Completion Size**	3-1/2"

WELL CLASSIFICATION

Before Drilling	Oil and gas Development	**After Drilling**	Oil well

CASING RECORD

Type	**Size** (Inches)	**Weight** (lb/ft)	**Grade**	**Thread**	**Depth** (mMDRT)
Original A19 Surface	$10^{3}/_{4}$	40.5	J-55	BTC	1433.6
Production	7	26	L-80	Vam Top	2799.0

CEMENTING RECORD

Casing details	**Cement Type**	**Dry Cement Volume** (sacks)	**Cement Additives**	**Mix Water** (bbls)	**Slurry Volume** (bbls)	**Slurry Density** (ppg)	**Cement to/from** (m MDRT)	**Casing Pressure Test** (psi)
7" 26 lb/ft	ABC HTB	528	HALAD 413L 30 gal / 10 bbl NF-6 0.25 gal / 10 bbl CFR-3L 3 gal / 10 bbl SCR-100L 0.5 gal / 10 bbl	59.6	106.14	15.8	1960.0 to 2799.0	2500 for 15 minutes

II. WELL DATA RECORD (cont.)

DRILLING PERFORMANCE

BMA A19A - Final Well Report

GENERAL

Platform:	Bream A	**Rig:**	453	**Reservoir:**	N-1 Sands
Well:	A19A	**Well Slot:**	#19	**RT-MSL (Rig453)**	32.82m
Drilling Complexity Index	3.2	**Completion Complexity Index**	2.1		

DEPTH		**PERFORMANCE**		**MUD**	
m MDRT	2,804.00	**20" Cond. Hole**	N/A	**Max Wt (ppg)**	10.1 (drilling)
m TVDRT	2,020.94	**12-1/4" Surf. Hole**	N/A	**Type (Surf. Hole)**	N/A
Vert. Section (m)	1691.71	**8-1/2" Prod. Hole**	380m/day	**Type (Inter. Hole)**	N/A
INCLINATION		**6" Liner Hole**	N/A	**Type (Prod. Hole)**	KCl/PHPA/Poly/Glycol
Max (deg) / Ave (deg)	60.3/ 35.5 (Tang)	* time to drill interval, incl's Connections & NPT.		**Type (Liner Hole)**	N/A

Comments: New hole drilled: 1,434m to 2,804m MDRT (1,370m MDRT drilled).

TIME ANALYSIS

Start Date:	22/11/2006, 1300hrs	**Finish Date:**	10/12/2005, 0045hrs		
Target Days (P10):	12.7	**Total Days:**	17.5	**% Under Target:**	37.8% (over)
AFE Days (P50):	15.0	**NPT Days:**	0.75	**% of Total Days:**	4.3%
Supplementary AFE Days (P50):	N/A				

COSTS *(based on projected)*

AFE No.:	L0501F465	**Revisions:**	--	**$ per m**	A $2.83 k / metre (new hole)
$ per day:	A$ 222 k/day	**$ per day (excl. T + L)** * Equipment, LWD & Reeves	A$ 183 k/day		A$ 1.38 k / metre* * based on TD **not** new hole

	Equipment	**Materials**	**Contracts**	**Allocations**	**Contingency**	**Total**
AFE (Original)	971,000	505,000	1,734,680	639,300	150,000	A$4,000,000
AFE (Supplement)	N/A	N/A	N/A	N/A	N/A	N/A
Projected	560,000	462,000	1,942,000	741,000	175,000	A$3,880,000

CASING *(all depths herein are based on Rig453 elevations: RT-MSL=32.82m)*

	Size / Weight / Grade / Thread	**m MDRT**	**m TVDRT**	**PIT (ppg)**
Conductor Casing *	26"	169	169	N/A
Surface Casing *	10-3/4", 40.5 ppf, K55, BTC	1,433.6	972	13.0 PIT
Intermediate Casing *	N/A	N/A	N/A	N/A
Prod Casing	7", 26.0ppf, L80, Vam Top HC	2,799	2,016	N/A

Comments: * Pre-existing casing strings.

COMPLETION

	Size / Weight / Grade / Thread	**MMDRT**	**MTVDRT**	**Type**
Completion	3-1/2", 9.2ppf, 13Cr80, Vam Ace	2,709.0	1,942.0	Triple Oil

	Upper Interval [m MDRT]	**Upper Interval [m TVDRT]**	**Lower Interval [mMDRT]**	**Lower Interval [mTVDRT]**	**Gun Type**
Perforation Interval:	1942.5-1943.5 (N-1)	1926.0-1927.9	2709.5-2711.0	2690.5-2692.5	Wireline HSD guns

Comments: Single completion was 3-1/2" 13Cr80 with TR-SSSV, 3 SPM's for gas lift, and one packer set at 2,143m MDRT.

ADDITIONAL

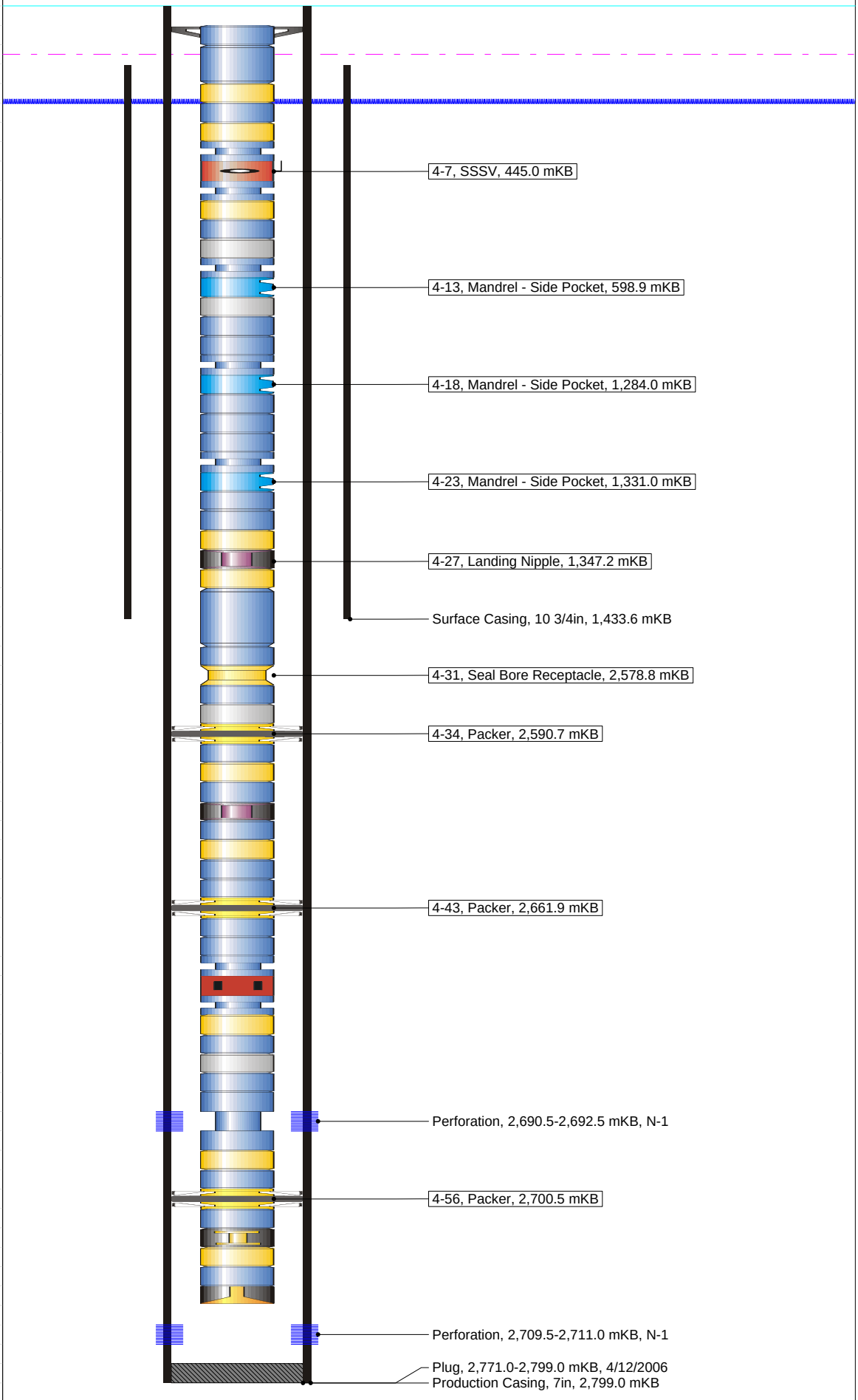
		Upper Interval [m MDRT]	**Lower Interval [m MDRT]**
Logs Run	GR-Resistivity-Density-Neutron-Sonic-Caliper	1,474	2,291

Comments: The 8-1/2" hole interval was logged using the Reeves well shuttle system. All data was retrieved on first attempt.

Bream A19A: Existing Schematic

Incl	mKB (TVD)
0.1	11
0.1	12
0.2	13
0.2	13
0.3	15
29.4	424
29.6	426
29.8	427
29.9	428
30.1	430
30.3	432
44.0	546
44.2	548
44.3	549
44.5	551
44.7	552
60.1	897
60.1	898
60.1	899
60.1	900
60.1	901
60.2	920
60.3	921
60.3	922
60.3	923
60.3	924
60.2	929
60.2	930
60.2	930
60.2	931
60.3	973
60.3	973
35.0	1,833
35.0	1,834
34.8	1,841
34.8	1,842
34.7	1,843
34.7	1,845
34.7	1,846
34.6	1,847
34.6	1,849
34.5	1,849
34.5	1,851
34.5	1,853
33.5	1,901
33.4	1,902
33.4	1,904
33.5	1,906
33.5	1,907
33.5	1,909
33.5	1,910
33.5	1,912
33.5	1,913
33.5	1,914
33.5	1,916
33.5	1,924
33.5	1,926
33.6	1,928
33.6	1,931
33.6	1,933
33.7	1,935
33.7	1,936
33.7	1,937
33.7	1,938
33.7	1,940
33.7	1,941
33.7	1,941
33.8	1,942
33.8	1,943
33.2	1,993
32.9	2,017

Schematic - Actual



III. SAMPLES

The cuttings sampling programme for BREAM A19A are detailed in the following table:

Interval	Formation	Sampling Details
KOP to 150 m above Top of Latrobe (prognosed at 2593.1 mMDRT) 1436.0 – 2430.0 mMDRT	Lakes Entrance	Cuttings samples for description only at 30 m intervals.
150 m above Top of Latrobe to Top of Latrobe (prognosed at 2593.1 mMDRT) 2430.0 – 2580.0 mMDRT	Latrobe Group	Three sets of washed and oven dried cuttings at 10 m intervals.
Top of Latrobe (prognosed at 2593.1 mMDRT) to **Total Depth (TD)** 2580.0 – 2804.0 mMDRT	Latrobe Group / Coarse Clastics	Three sets of washed and oven dried cuttings at 5 m intervals.

Detailed cuttings descriptions for the interval 1436.0 to 2804.0 mMDRT (TD) are contained in Appendix 3a.

CONVENTIONAL CORING

No conventional cores were cut in BREAM A19A.

SIDEWALL CORING

No sidewall core samples were shot in BREAM A19A.

IV. LOGS AND SURVEYS

Survey/Log	Company	Top (m MDRT)	Bottom (m MDRT)
MWD Run 1, Powerpulse (Directional & GR)	Schlumberger/Anadrill	1401.0	1401.0
MWD Run 2, Powerpulse (Directional & GR)	Schlumberger/Anadrill	1436.0	1475.0
MWD Run 3, Powerpulse (Directional & GR)	Schlumberger/Anadrill	1475.0	2804.0
Run 1: Compact Logging MCG-MDN-MPD-MSS-MDL	Reeves (Precision Logging) Compact wireline tools run on drillpipe (Shuttle System, memory mode)	2480.5	2801.0

(Reeves logs = memory/compact GR-Dual Neutron-Photo Density -Sonic -Dual Laterolog

V. FORMATION RESERVOIR TOPS

Horizon	m TVDSS			m MDRT	mTVT HC Column	
	Predicted Tops	ACTUAL	Diff. (m)	ACTUAL	Predicted	ACTUAL
Lakes Entrance Fm	949.3	950.4	1.1 L	1454.5	-	-
Top of Latrobe (TOL)	1813.0	1818.6	5.6 L	2600.5	-	-
Top Intra-Gurn (N-0) Sand	-	1828.1	-	2612.0	-	3.3m net gas
TCC (N-1 Reservoir)	1878.0	1885.3	7.3 L	2680.8	-	-
YESB/Base of Waste	1883.0	1888.9	5.9 L-	2685.0	22m gross	5.7m net
Current GOC	1905.0	1894.9	10.1 H	2692.3	gas	gas
RdF2	-	1897.9	-	2695.9	5.0m	3.1m
Current OWC	1910.0	-1898.0	12.0 H	2696.0	net	net oil
newRdSb_04	-	1907.5	-	2707.4	oil	-
new GnF2	1900.1	1909.5	9.4 L	2709.8	-	2.5m net oil
newGnSb_04	1914.8	1925.3	10.5 L	2728.8	-	-
newCbF2	1918.0	1927.7	9.7 L	2731.7	-	-
newCbF1_04	1926.5	1931.9	5.4 L	2736.8	-	-
newCbSb_04	1933.0	1938.1	5.1 L	2744.2	-	-
newPkF2	1935.7	1942.9	7.2 L	2749.9	-	-
newPkF1	1940.1	1945.6	5.5 L	2753.2	-	-
newPkSb_04	1950.0	1955.4	5.4 L	2765.0	-	-
newMvF2_04	1955.8	1963.1	7.3 L	2774.2	-	-
newMvSB_04	1958.0	1966.7	8.7 L	2778.5	-	-
Total Depth (TD)	1980.0	1988.1	8.1 L	2804.0	-	-

VI. GEOLOGICAL ANALYSIS - BREAM A19A

Objectives

BMA-A19A was designed to capture N-1 oil reserves on the central west flank of the Bream A field (Figure 1). The well was targeted to intersect a structural high between two branches (north and south) of an erosional *N.asperus* aged channel system (N-1 channel) (refer to Figures 2 & 3). This channel is interpreted to be filled with an impermeable, debritic sandstone facies predicted to form at least a partial barrier to oil movement. The A19A well was targeting oil primarily in the Red unit (Figure 2) of the upper N-1 reservoir. The Green unit (Figure 2) was considered a secondary reservoir objective. The BMA-A19A well was expected to encounter a similar stratigraphy to that observed in the up-dip A13A well which penetrated well developed N-1 reservoir sandstones.

Results

The Bream A19A well was spudded on 24th November, 2005. The 7" production casing from the A19 well was cut and pulled from 1495.0 mMDRT. A kick off plug was set at 1401.0 mMDRT. An 8-1/2" production hole was drilled to a total depth of 2804.0 mMDRT (2020.94 mTVDRT). The well was logged with the Precision Energy Services' compact shuttle system. After running 7" production casing, the well was completed as a tandem producer with a sliding sleeve over 3½" tubing and perforated from 2690.5 – 2692.5 mMDRT and from 2709.5 – 2711.0 mMDRT. Initial production was established on 24th December, 2005.

The Top of Latrobe Group (TOL) was intersected at 2600.5 mMDRT (-1818.6 mSS), 5.6m TVD low to prediction. A 3.9m gross (3.3m TVD net) gas bearing sandstone was intersected at 2612m MDRT within the Gurnard Formation. The remaining Gurnard Formation interval was comprised of claystone with minor interbedded limestone and sandstone layers.

The Top Coarse Clastics (TCC) was intersected at 2680.8 m MDRT (-1885.3 mSS), 7.3m low to prognosis. The Base of Waste (BWST), representing the effective top of N-1 porosity was intersected at 2685m MDRT (-1888.9mSS) at the top of an interpreted 5.7m TVD net gas interval. This sand has an average porosity ranging from 13.3 to 17.5%. Within the A19A well, the current gas-oil contact is interpreted at 2692.3m MDRT (-1894.9mSS) within the upper Red unit. A 3.1m TVD net oil column (versus a prognosis of 4-6m TVD net oil) was also intersected within the Red unit. The current oil-water contact is interpreted at 2696m MDRT (-1898mSS). The remainder of the Red sandstone unit is interpreted to be 'swept'. The combined residual oil and gas saturation within the swept zone is 21.7%.

Immediately below a 2m TVD siltstone, at the Green unit flooding surface #2 (newGnF2, Figure 2), 2.5m net 'oil-on-rock' was intersected with Lowest Proved Oil at 2712.2m MDRT (-1907.9mSS) picked at the top of a 1.5m MD coal (Figure 2). Oil was not prognosed within the Green Unit in the most likely pre-drill case but was considered as a secondary objective. A 2m 'swept' zone is interpreted below this thin coal.

Overall, formation tops were intersected between 5.4 and 10.5m TVD low to prognosis (average 7.2m low) suggesting a minor depth mapping error (0.38%) at the A19A location. Given the distance to the nearest well control is 350m to the NE (BMA-A1) and 420m to the SE (BMA-A13A), the magnitude of this error is considered to be within acceptable limits.

VI. GEOLOGICAL ANALYSIS - BREAM A19A (cont'd)

The N-1 reservoir sandstone units were found to be present and well developed, as predicted from nearby control. The primary hydrocarbon column was intersected within the upper half of the Red unit, with the main oil column logged within a well developed, 4m thick, high porosity (average porosity 24.7%) sandstone. The depth of the current OWC was intersected 12m TVD high to prognosis suggesting more efficient sweep in this area than prognosed. The 2.5m TVD oil column intersected within the upper Green unit is interpreted to represent 'hung-up' or lagging oil impeded from up-dip production by localised siltstones which act as flow barriers to vertical oil migration. Alternatively, this particular 2-3m thick sandstone layer within the Green unit may pinch-out up-dip onto the main structural high to the east effectively isolating this oil column from the up-dip producers. The remainder of the N-1 reservoir units (Cobalt, Pink and Mauve) are interpreted to be water bearing. The well reached it's programmed total depth before intersecting the *P. Asperopolus* coal marker.

APPENDIX 1a

BREAM A19A

Survey Data

BMA A-19A Final Geodetic Survey

Report Date:	November 28, 2005	Survey / DLS Computation Method:	Minimum Curvature / Lubinski
Client:	Esso Australia Pty Ltd	Vertical Section Azimuth:	263.420°
Field:	Bream A GDA 94	Vertical Section Origin:	S 4.240 m, W 0.380 m
Structure / Slot:	Bream A / 19	TVD Reference Datum:	RKB
Well:	19	TVD Reference Elevation:	32.8 m relative to MSL
Borehole:	BMA A-19A	Sea Bed / Ground Level Elevation:	-59.400 m relative to MSL
UWI/API#:		Magnetic Declination:	13.106°
Survey Name / Date:	BMA A-19A Final / November 25, 2005	Total Field Strength:	60136.156 nT
Tort / AHD / DDI / ERD ratio:	142.438° / 1773.59 m / 6.061 / 0.878	Magnetic Dip:	-69.020°
Grid Coordinate System:	GDA94/MGA94 Zone 55	Declination Date:	November 25, 2005
Location Lat/Long:	S 38 29 58.893, E 147 46 19.968	Magnetic Declination Model:	BGGM 2004
Location Grid N/E Y/X:	N 5738458.220 m, E 567336.120 m	North Reference:	Grid North
Grid Convergence Angle:	-0.48072898°	Total Corr Mag North -> Grid North:	+13.587°
Grid Scale Factor:	0.99965584	Local Coordinates Referenced To:	Structure Reference Point

Comments	Measured Depth (m)	Inclination (deg)	Azimuth (deg)	TVD (m)	Vertical Section (m)	NS (m)	EW (m)	DLS (deg/30 m)	Northing (m)	Easting (m)	Latitude	Longitude
Tie-In	0.00	0.00	0.00	0.00	0.00	-4.24	-0.38	0.00	5738458.22	567336.12	S 38 29 58.893	E 147 46 19.968
	9.32	0.00	249.95	9.32	0.00	-4.24	-0.38	0.00	5738458.22	567336.12	S 38 29 58.893	E 147 46 19.968
	19.32	0.43	249.95	19.32	0.04	-4.25	-0.42	1.29	5738458.21	567336.08	S 38 29 58.893	E 147 46 19.967
	29.32	0.48	263.73	29.32	0.12	-4.27	-0.49	0.36	5738458.19	567336.01	S 38 29 58.894	E 147 46 19.964
	39.32	0.48	261.26	39.32	0.20	-4.28	-0.58	0.06	5738458.18	567335.92	S 38 29 58.894	E 147 46 19.960
	49.32	0.47	263.45	49.32	0.28	-4.29	-0.66	0.06	5738458.17	567335.84	S 38 29 58.894	E 147 46 19.957
	59.32	0.44	272.47	59.32	0.36	-4.30	-0.74	0.23	5738458.16	567335.76	S 38 29 58.895	E 147 46 19.954
	69.32	0.44	280.62	69.32	0.44	-4.29	-0.81	0.19	5738458.17	567335.69	S 38 29 58.894	E 147 46 19.951
	79.32	0.44	292.06	79.32	0.51	-4.27	-0.89	0.26	5738458.19	567335.61	S 38 29 58.894	E 147 46 19.948
	89.32	0.49	295.77	89.32	0.58	-4.23	-0.96	0.18	5738458.23	567335.54	S 38 29 58.893	E 147 46 19.944
	99.32	0.88	275.00	99.32	0.69	-4.21	-1.08	1.37	5738458.25	567335.43	S 38 29 58.892	E 147 46 19.940
	109.32	1.92	253.15	109.31	0.93	-4.25	-1.31	3.45	5738458.21	567335.19	S 38 29 58.893	E 147 46 19.930
	119.32	3.30	245.57	119.30	1.37	-4.42	-1.73	4.26	5738458.04	567334.77	S 38 29 58.899	E 147 46 19.913
	129.32	4.93	243.29	129.28	2.04	-4.73	-2.38	4.91	5738457.73	567334.12	S 38 29 58.909	E 147 46 19.886
	139.32	6.36	241.40	139.23	2.96	-5.19	-3.25	4.33	5738457.27	567333.25	S 38 29 58.924	E 147 46 19.850
	149.32	7.54	241.55	149.15	4.08	-5.77	-4.31	3.54	5738456.70	567332.19	S 38 29 58.943	E 147 46 19.807
	159.32	8.71	242.43	159.05	5.40	-6.43	-5.56	3.53	5738456.03	567330.94	S 38 29 58.965	E 147 46 19.755
	169.32	10.36	243.56	168.92	6.95	-7.18	-7.04	4.98	5738455.28	567329.46	S 38 29 58.990	E 147 46 19.695
	179.32	11.21	245.07	178.74	8.72	-7.99	-8.72	2.69	5738454.47	567327.78	S 38 29 59.016	E 147 46 19.625
	189.32	12.02	245.45	188.53	10.63	-8.83	-10.55	2.44	5738453.63	567325.95	S 38 29 59.044	E 147 46 19.550
	199.32	12.51	245.25	198.31	12.65	-9.72	-12.48	1.48	5738452.75	567324.02	S 38 29 59.074	E 147 46 19.471
	209.32	13.29	244.31	208.05	14.77	-10.67	-14.50	2.42	5738451.79	567322.00	S 38 29 59.105	E 147 46 19.388
	219.32	14.25	242.70	217.77	17.00	-11.73	-16.63	3.10	5738450.73	567319.87	S 38 29 59.140	E 147 46 19.300
	229.32	15.02	241.31	227.44	19.36	-12.92	-18.86	2.54	5738449.55	567317.64	S 38 29 59.179	E 147 46 19.209
	239.32	15.68	240.17	237.08	21.80	-14.21	-21.17	2.18	5738448.25	567315.33	S 38 29 59.222	E 147 46 19.114
	249.32	16.15	239.42	246.70	24.31	-15.59	-23.54	1.54	5738446.87	567312.97	S 38 29 59.267	E 147 46 19.017
	259.32	16.63	238.62	256.30	26.88	-17.05	-25.96	1.59	5738445.42	567310.55	S 38 29 59.315	E 147 46 18.917
	269.32	17.11	237.81	265.86	29.51	-18.57	-28.43	1.60	5738443.89	567308.08	S 38 29 59.365	E 147 46 18.816
	279.32	17.61	237.35	275.41	32.19	-20.17	-30.95	1.56	5738442.29	567305.56	S 38 29 59.418	E 147 46 18.713
	289.32	18.12	237.05	284.93	34.94	-21.84	-33.52	1.55	5738440.63	567302.99	S 38 29 59.472	E 147 46 18.607
	299.32	18.68	237.20	294.42	37.77	-23.55	-36.18	1.69	5738438.92	567300.34	S 38 29 59.529	E 147 46 18.498
	309.32	19.25	237.47	303.87	40.69	-25.30	-38.91	1.73	5738437.16	567297.60	S 38 29 59.586	E 147 46 18.386
	319.32	19.82	237.84	313.30	43.70	-27.09	-41.74	1.75	5738435.38	567294.78	S 38 29 59.645	E 147 46 18.270
	329.32	20.37	238.27	322.69	46.81	-28.91	-44.65	1.71	5738433.56	567291.86	S 38 29 59.705	E 147 46 18.150
	339.32	21.08	238.72	332.04	50.02	-30.76	-47.67	2.18	5738431.71	567288.85	S 38 29 59.765	E 147 46 18.026
	349.32	21.99	239.03	341.34	53.36	-32.66	-50.81	2.75	5738429.81	567285.71	S 38 29 59.828	E 147 46 17.897
	359.32	22.84	239.11	350.59	56.83	-34.62	-54.08	2.55	5738427.86	567282.44	S 38 29 59.892	E 147 46 17.763
	369.32	23.71	239.23	359.77	60.43	-36.64	-57.48	2.61	5738425.83	567279.04	S 38 29 59.959	E 147 46 17.623
	379.32	24.51	239.41	368.90	64.16	-38.73	-60.99	2.41	5738423.75	567275.53	S 38 30 0.027	E 147 46 17.479
	389.32	25.22	239.63	377.97	68.01	-40.86	-64.61	2.15	5738421.62	567271.91	S 38 30 0.098	E 147 46 17.330
	399.32	25.89	239.82	387.00	71.96	-43.03	-68.34	2.02	5738419.44	567268.19	S 38 30 0.169	E 147 46 17.177
	409.32	26.54	240.00	395.97	76.01	-45.25	-72.16	1.96	5738417.23	567264.36	S 38 30 0.242	E 147 46 17.020
	419.32	27.35	240.14	404.88	80.17	-47.51	-76.09	2.44	5738414.97	567260.44	S 38 30 0.316	E 147 46 16.859
	429.32	28.21	240.28	413.73	84.45	-49.82	-80.13	2.59	5738412.65	567256.40	S 38 30 0.393	E 147 46 16.693
	439.32	29.19	240.38	422.50	88.87	-52.20	-84.30	2.94	5738410.28	567252.22	S 38 30 0.471	E 147 46 16.522
	449.32	30.19	240.49	431.19	93.43	-54.64	-88.61	3.00	5738407.83	567247.92	S 38 30 0.551	E 147 46 16.345
	459.32	31.21	240.56	439.79	98.13	-57.16	-93.06	3.06	5738405.32	567243.47	S 38 30 0.634	E 147 46 16.162
	469.32	32.23	240.63	448.29	102.98	-59.74	-97.64	3.06	5738402.74	567238.90	S 38 30 0.719	E 147 46 15.974

479.32	33.28	240.68	456.70	107.97	-62.39	-102.35	3.15	5738400.09	567234.18	S 38 30 0.806	E 147 46 15.780
489.32	34.35	240.72	465.01	113.10	-65.11	-107.21	3.21	5738397.37	567229.33	S 38 30 0.896	E 147 46 15.581
499.32	35.49	240.77	473.21	118.38	-67.91	-112.20	3.42	5738394.57	567224.34	S 38 30 0.988	E 147 46 15.376
509.32	36.62	240.83	481.29	123.81	-70.78	-117.34	3.39	5738391.70	567219.20	S 38 30 1.082	E 147 46 15.165
519.32	37.74	240.89	489.26	129.39	-73.72	-122.62	3.36	5738388.76	567213.92	S 38 30 1.179	E 147 46 14.948
529.32	38.84	240.98	497.11	135.12	-76.73	-128.03	3.30	5738385.75	567208.51	S 38 30 1.278	E 147 46 14.726
539.32	39.93	241.08	504.84	140.99	-79.81	-133.58	3.28	5738382.68	567202.96	S 38 30 1.379	E 147 46 14.498
549.32	40.85	241.26	512.45	146.98	-82.93	-139.26	2.78	5738379.56	567197.29	S 38 30 1.482	E 147 46 14.264
559.32	41.73	241.46	519.97	153.10	-86.09	-145.05	2.67	5738376.39	567191.50	S 38 30 1.586	E 147 46 14.026
569.32	42.33	241.75	527.40	159.32	-89.28	-150.94	1.89	5738373.21	567185.61	S 38 30 1.691	E 147 46 13.784
579.32	42.93	242.05	534.75	165.62	-92.47	-156.92	1.90	5738370.02	567179.64	S 38 30 1.796	E 147 46 13.539
589.32	43.58	242.39	542.04	172.00	-95.66	-162.98	2.07	5738366.83	567173.58	S 38 30 1.902	E 147 46 13.290
599.32	44.33	242.72	549.24	178.49	-98.86	-169.14	2.35	5738363.63	567167.42	S 38 30 2.007	E 147 46 13.037
609.32	45.33	243.03	556.33	185.09	-102.08	-175.41	3.07	5738360.42	567161.15	S 38 30 2.113	E 147 46 12.779
619.32	46.44	243.28	563.29	191.83	-105.32	-181.82	3.37	5738357.18	567154.74	S 38 30 2.220	E 147 46 12.516
629.32	47.68	243.45	570.10	198.70	-108.60	-188.36	3.74	5738353.90	567148.20	S 38 30 2.328	E 147 46 12.247
639.32	48.96	243.59	576.75	205.73	-111.93	-195.05	3.85	5738350.57	567141.52	S 38 30 2.438	E 147 46 11.972
649.32	50.28	243.71	583.23	212.89	-115.31	-201.87	3.97	5738347.19	567134.70	S 38 30 2.549	E 147 46 11.692
659.32	51.55	243.92	589.53	220.21	-118.73	-208.84	3.84	5738343.77	567127.73	S 38 30 2.662	E 147 46 11.405
669.32	52.82	244.16	595.66	227.66	-122.19	-215.94	3.85	5738340.31	567120.63	S 38 30 2.776	E 147 46 11.113
679.32	53.91	244.51	601.63	235.24	-125.67	-223.18	3.38	5738336.84	567113.40	S 38 30 2.891	E 147 46 10.816
689.32	54.96	244.89	607.45	242.95	-129.14	-230.53	3.28	5738333.36	567106.05	S 38 30 3.006	E 147 46 10.514
699.32	55.70	245.31	613.14	250.75	-132.61	-237.99	2.45	5738329.90	567098.59	S 38 30 3.120	E 147 46 10.207
709.32	56.42	245.74	618.72	258.65	-136.04	-245.54	2.41	5738326.46	567091.04	S 38 30 3.234	E 147 46 9.897
719.32	57.09	246.18	624.20	266.63	-139.45	-253.18	2.29	5738323.06	567083.41	S 38 30 3.346	E 147 46 9.583
729.32	57.88	246.62	629.58	274.69	-142.83	-260.91	2.62	5738319.68	567075.68	S 38 30 3.458	E 147 46 9.265
739.32	58.81	247.06	634.82	282.85	-146.17	-268.73	3.01	5738316.34	567067.86	S 38 30 3.568	E 147 46 8.943
749.32	59.63	247.42	639.94	291.10	-149.50	-276.65	2.63	5738313.01	567059.94	S 38 30 3.678	E 147 46 8.617
759.32	60.39	247.73	644.94	299.43	-152.80	-284.66	2.42	5738309.71	567051.94	S 38 30 3.788	E 147 46 8.288
769.32	60.81	247.94	649.85	307.82	-156.09	-292.73	1.37	5738306.43	567043.87	S 38 30 3.896	E 147 46 7.956
779.32	61.15	248.12	654.70	316.25	-159.36	-300.84	1.12	5738303.15	567035.77	S 38 30 4.005	E 147 46 7.623
789.32	61.22	248.27	659.52	324.71	-162.61	-308.97	0.45	5738299.90	567027.63	S 38 30 4.112	E 147 46 7.288
799.32	61.27	248.41	664.33	333.17	-165.85	-317.12	0.40	5738296.67	567019.49	S 38 30 4.220	E 147 46 6.953
809.32	61.27	248.51	669.14	341.64	-169.07	-325.28	0.26	5738293.45	567011.34	S 38 30 4.326	E 147 46 6.618
819.32	61.27	248.58	673.94	350.12	-172.28	-333.44	0.18	5738290.24	567003.18	S 38 30 4.432	E 147 46 6.282
829.32	61.29	248.60	678.75	358.60	-175.48	-341.60	0.08	5738287.04	566995.01	S 38 30 4.538	E 147 46 5.946
839.32	61.30	248.61	683.55	367.08	-178.68	-349.77	0.04	5738283.84	566986.85	S 38 30 4.644	E 147 46 5.610
849.32	61.29	248.62	688.36	375.56	-181.88	-357.94	0.04	5738280.65	566978.69	S 38 30 4.750	E 147 46 5.274
859.32	61.29	248.62	693.16	384.04	-185.07	-366.10	0.00	5738277.45	566970.52	S 38 30 4.856	E 147 46 4.938
869.32	61.28	248.62	697.96	392.52	-188.27	-374.27	0.03	5738274.25	566962.36	S 38 30 4.962	E 147 46 4.602
879.32	61.28	248.62	702.77	400.99	-191.47	-382.44	0.00	5738271.06	566954.20	S 38 30 5.068	E 147 46 4.266
889.32	61.27	248.61	707.58	409.47	-194.67	-390.60	0.04	5738267.86	566946.03	S 38 30 5.174	E 147 46 3.931
899.32	61.28	248.60	712.38	417.95	-197.86	-398.77	0.04	5738264.66	566937.87	S 38 30 5.280	E 147 46 3.595
909.32	61.30	248.58	717.19	426.43	-201.07	-406.93	0.08	5738261.46	566929.71	S 38 30 5.386	E 147 46 3.259
919.32	61.34	248.57	721.98	434.91	-204.27	-415.10	0.12	5738258.26	566921.54	S 38 30 5.492	E 147 46 2.923
929.32	61.38	248.55	726.78	443.39	-207.48	-423.27	0.13	5738255.05	566913.38	S 38 30 5.598	E 147 46 2.587
939.32	61.43	248.52	731.56	451.88	-210.69	-431.44	0.17	5738251.84	566905.21	S 38 30 5.705	E 147 46 2.251
949.32	61.49	248.50	736.34	460.37	-213.91	-439.61	0.19	5738248.62	566897.04	S 38 30 5.811	E 147 46 1.915
959.32	61.56	248.47	741.11	468.86	-217.13	-447.79	0.22	5738245.40	566888.86	S 38 30 5.918	E 147 46 1.578
969.32	61.67	248.46	745.86	477.36	-220.36	-455.98	0.33	5738242.17	566880.68	S 38 30 6.025	E 147 46 1.242
979.32	61.78	248.44	750.60	485.87	-223.60	-464.17	0.33	5738238.94	566872.49	S 38 30 6.132	E 147 46 0.905
989.32	61.87	248.42	755.32	494.38	-226.84	-472.36	0.28	5738235.70	566864.30	S 38 30 6.239	E 147 46 0.567
999.32	61.95	248.40	760.03	502.90	-230.09	-480.57	0.25	5738232.45	566856.10	S 38 30 6.347	E 147 46 0.230
1009.32	62.00	248.38	764.73	511.43	-233.34	-488.77	0.16	5738229.20	566847.89	S 38 30 6.455	E 147 45 59.892
1019.32	62.04	248.36	769.42	519.96	-236.59	-496.98	0.13	5738225.95	566839.69	S 38 30 6.562	E 147 45 59.555
1029.32	62.07	248.34	774.11	528.49	-239.85	-505.19	0.10	5738222.69	566831.48	S 38 30 6.670	E 147 45 59.217
1039.32	61.99	248.32	778.80	537.02	-243.11	-513.40	0.25	5738219.43	566823.27	S 38 30 6.778	E 147 45 58.879
1049.32	61.88	248.31	783.50	545.53	-246.37	-521.60	0.33	5738216.17	566815.08	S 38 30 6.886	E 147 45 58.542
1059.32	61.65	248.33	788.23	554.04	-249.63	-529.79	0.69	5738212.92	566806.89	S 38 30 6.994	E 147 45 58.205
1069.32	61.42	248.36	793.00	562.53	-252.87	-537.96	0.69	5738209.68	566798.73	S 38 30 7.101	E 147 45 57.869
1079.32	61.21	248.43	797.80	571.00	-256.10	-546.12	0.66	5738206.45	566790.57	S 38 30 7.208	E 147 45 57.534
1089.32	61.06	248.51	802.63	579.46	-259.32	-554.26	0.50	5738203.23	566782.43	S 38 30 7.315	E 147 45 57.199
1099.32	60.95	248.61	807.47	587.92	-262.51	-562.40	0.42	5738200.04	566774.29	S 38 30 7.421	E 147 45 56.864
1109.32	60.88	248.71	812.33	596.37	-265.69	-570.54	0.34	5738196.86	566766.15	S 38 30 7.526	E 147 45 56.529
1119.32	60.83	248.81	817.21	604.82	-268.86	-578.68	0.30	5738193.70	566758.02	S 38 30 7.631	E 147 45 56.194
1129.32	60.76	248.89	822.08	613.27	-272.01	-586.82	0.30	5738190.55	566749.88	S 38 30 7.735	E 147 45 55.859
1139.32	60.68	248.97	826.98	621.71	-275.14	-594.96	0.32	5738187.41	566741.74	S 38 30 7.839	E 147 45 55.524

1149.32	60.62	249.03	831.88	630.15	-278.27	-603.10	0.24	5738184.29	566733.61	S 38 30 7.942	E 147 45 55.190
1159.32	60.59	249.08	836.79	638.59	-281.38	-611.24	0.16	5738181.18	566725.47	S 38 30 8.046	E 147 45 54.855
1169.32	60.57	249.12	841.70	647.03	-284.49	-619.38	0.12	5738178.07	566717.34	S 38 30 8.149	E 147 45 54.520
1179.32	60.53	249.16	846.61	655.47	-287.59	-627.51	0.16	5738174.97	566709.20	S 38 30 8.251	E 147 45 54.186
1189.32	60.48	249.20	851.54	663.91	-290.68	-635.65	0.18	5738171.88	566701.07	S 38 30 8.354	E 147 45 53.851
1199.32	60.40	249.26	856.47	672.34	-293.77	-643.78	0.29	5738168.79	566692.94	S 38 30 8.456	E 147 45 53.516
1209.32	60.32	249.32	861.42	680.77	-296.84	-651.91	0.29	5738165.72	566684.81	S 38 30 8.558	E 147 45 53.182
1219.32	60.25	249.42	866.37	689.19	-299.90	-660.04	0.33	5738162.66	566676.69	S 38 30 8.659	E 147 45 52.847
1229.32	60.19	249.53	871.34	697.62	-302.94	-668.17	0.34	5738159.62	566668.56	S 38 30 8.760	E 147 45 52.513
1239.32	60.15	249.67	876.31	706.04	-305.97	-676.30	0.38	5738156.60	566660.43	S 38 30 8.860	E 147 45 52.178
1249.32	60.13	249.84	881.29	714.47	-308.97	-684.44	0.45	5738153.60	566652.30	S 38 30 8.960	E 147 45 51.844
1259.32	60.11	250.02	886.27	722.90	-311.94	-692.58	0.47	5738150.62	566644.16	S 38 30 9.059	E 147 45 51.509
1269.32	60.10	250.23	891.26	731.34	-314.89	-700.73	0.55	5738147.68	566636.01	S 38 30 9.156	E 147 45 51.173
1279.32	60.11	250.43	896.24	739.78	-317.81	-708.90	0.52	5738144.76	566627.85	S 38 30 9.253	E 147 45 50.837
1289.32	60.15	250.64	901.22	748.23	-320.70	-717.07	0.56	5738141.87	566619.67	S 38 30 9.349	E 147 45 50.501
1299.32	60.19	250.85	906.20	756.70	-323.56	-725.26	0.56	5738139.01	566611.49	S 38 30 9.444	E 147 45 50.164
1309.32	60.22	251.05	911.17	765.17	-326.39	-733.46	0.53	5738136.18	566603.29	S 38 30 9.538	E 147 45 49.826
1319.32	60.24	251.25	916.13	773.65	-329.20	-741.68	0.52	5738133.38	566595.08	S 38 30 9.631	E 147 45 49.488
1329.32	60.25	251.45	921.09	782.14	-331.97	-749.91	0.52	5738130.60	566586.85	S 38 30 9.724	E 147 45 49.150
1339.32	60.25	251.65	926.06	790.64	-334.72	-758.14	0.52	5738127.85	566578.62	S 38 30 9.815	E 147 45 48.811
1349.32	60.24	251.84	931.02	799.14	-337.44	-766.39	0.50	5738125.14	566570.38	S 38 30 9.905	E 147 45 48.471
1359.32	60.22	252.05	935.98	807.65	-340.13	-774.64	0.55	5738122.45	566562.13	S 38 30 9.995	E 147 45 48.132
1369.32	60.19	252.27	940.95	816.16	-342.79	-782.90	0.58	5738119.79	566553.87	S 38 30 10.083	E 147 45 47.792
1379.32	60.19	252.45	945.93	824.67	-345.42	-791.17	0.47	5738117.16	566545.60	S 38 30 10.171	E 147 45 47.451
1389.32	60.20	252.64	950.90	833.20	-348.02	-799.45	0.50	5738114.56	566537.33	S 38 30 10.257	E 147 45 47.111
1399.32	60.22	252.77	955.86	841.72	-350.60	-807.73	0.34	5738111.98	566529.05	S 38 30 10.343	E 147 45 46.770
1409.32	60.24	252.90	960.83	850.26	-353.16	-816.03	0.34	5738109.42	566520.76	S 38 30 10.429	E 147 45 46.428
1419.32	60.25	253.04	965.79	858.79	-355.71	-824.33	0.37	5738106.88	566512.46	S 38 30 10.513	E 147 45 46.087
1429.32	60.26	253.19	970.75	867.34	-358.23	-832.63	0.39	5738104.36	566504.15	S 38 30 10.597	E 147 45 45.745
1436.00	60.30	253.28	974.07	873.05	-359.90	-838.19	0.39	5738102.68	566498.60	S 38 30 10.653	E 147 45 45.516
1478.37	60.56	264.30	995.02	909.69	-367.04	-874.26	6.79	5738095.54	566462.55	S 38 30 10.894	E 147 45 44.030
1512.46	57.35	266.35	1012.60	938.88	-369.43	-903.36	3.22	5738093.15	566433.45	S 38 30 10.980	E 147 45 42.830
1541.14	55.51	267.56	1028.46	962.73	-370.70	-927.22	2.19	5738091.88	566409.60	S 38 30 11.027	E 147 45 41.845
1570.44	53.70	273.57	1045.44	986.41	-370.48	-951.08	5.35	5738092.10	566385.74	S 38 30 11.027	E 147 45 40.860
1599.11	52.97	278.07	1062.57	1008.86	-368.16	-973.95	3.85	5738094.43	566362.88	S 38 30 10.957	E 147 45 39.916
1628.05	52.08	282.48	1080.18	1030.83	-364.07	-996.54	3.74	5738098.52	566340.30	S 38 30 10.831	E 147 45 38.982
1656.34	48.28	281.71	1098.29	1051.41	-359.51	-1017.78	4.08	5738103.07	566319.07	S 38 30 10.689	E 147 45 38.104
1685.20	48.06	281.14	1117.54	1071.86	-355.25	-1038.86	0.50	5738107.33	566298.00	S 38 30 10.556	E 147 45 37.233
1713.81	44.58	282.85	1137.30	1091.48	-350.96	-1059.10	3.87	5738111.62	566277.77	S 38 30 10.422	E 147 45 36.396
1742.37	42.09	285.32	1158.07	1109.81	-346.20	-1078.11	3.16	5738116.38	566258.76	S 38 30 10.273	E 147 45 35.610
1771.22	38.18	285.68	1180.12	1127.04	-341.23	-1096.02	4.07	5738121.34	566240.85	S 38 30 10.117	E 147 45 34.869
1800.06	37.61	285.36	1202.88	1143.46	-336.49	-1113.09	0.63	5738126.08	566223.79	S 38 30 9.968	E 147 45 34.163
1828.75	36.76	285.25	1225.74	1159.55	-331.92	-1129.82	0.89	5738130.66	566207.07	S 38 30 9.824	E 147 45 33.471
1857.65	35.84	284.67	1249.03	1175.46	-327.50	-1146.35	1.02	5738135.07	566190.55	S 38 30 9.685	E 147 45 32.787
1886.53	35.35	284.85	1272.51	1191.12	-323.22	-1162.60	0.52	5738139.35	566174.30	S 38 30 9.550	E 147 45 32.115
1914.92	34.36	283.85	1295.81	1206.27	-319.19	-1178.32	1.21	5738143.37	566158.59	S 38 30 9.424	E 147 45 31.465
1943.71	34.09	283.70	1319.61	1221.45	-315.34	-1194.04	0.29	5738147.23	566142.87	S 38 30 9.303	E 147 45 30.815
1972.67	35.57	283.88	1343.39	1236.96	-311.40	-1210.11	1.54	5738151.17	566126.81	S 38 30 9.180	E 147 45 30.151
2001.00	36.77	284.06	1366.25	1252.61	-307.36	-1226.33	1.28	5738155.21	566110.59	S 38 30 9.053	E 147 45 29.480
2030.15	35.97	284.06	1389.73	1268.79	-303.16	-1243.10	0.82	5738159.40	566093.83	S 38 30 8.922	E 147 45 28.786
2058.86	37.03	282.95	1412.81	1284.83	-299.17	-1259.71	1.30	5738163.39	566077.23	S 38 30 8.797	E 147 45 28.100
2087.65	36.42	282.11	1435.88	1301.09	-295.44	-1276.51	0.82	5738167.12	566060.43	S 38 30 8.680	E 147 45 27.405
2116.90	35.54	282.13	1459.55	1317.37	-291.83	-1293.31	0.90	5738170.73	566043.63	S 38 30 8.568	E 147 45 26.710
2144.67	37.23	281.79	1481.91	1332.99	-288.42	-1309.43	1.84	5738174.14	566027.52	S 38 30 8.461	E 147 45 26.044
2173.44	36.14	281.59	1504.98	1349.31	-284.94	-1326.26	1.14	5738177.62	566010.70	S 38 30 8.353	E 147 45 25.348
2202.11	37.77	280.77	1527.89	1365.72	-281.60	-1343.17	1.78	5738180.96	565993.80	S 38 30 8.249	E 147 45 24.649
2231.11	37.02	281.20	1550.93	1382.51	-278.24	-1360.46	0.82	5738184.32	565976.51	S 38 30 8.145	E 147 45 23.935
2259.75	36.36	281.38	1573.89	1398.80	-274.89	-1377.24	0.70	5738187.66	565959.74	S 38 30 8.041	E 147 45 23.241
2288.58	36.30	281.60	1597.12	1415.04	-271.49	-1393.97	0.15	5738191.07	565943.01	S 38 30 7.935	E 147 45 22.549
2317.40	35.51	281.06	1620.46	1431.12	-268.17	-1410.55	0.89	5738194.39	565926.44	S 38 30 7.831	E 147 45 21.864
2346.23	34.94	282.32	1644.01	1446.91	-264.80	-1426.83	0.96	5738197.75	565910.16	S 38 30 7.726	E 147 45 21.191
2374.98	34.42	282.31	1667.66	1462.39	-261.31	-1442.81	0.54	5738201.24	565894.19	S 38 30 7.618	E 147 45 20.530
2403.55	35.11	282.88	1691.13	1477.77	-257.76	-1458.71	0.80	5738204.79	565878.29	S 38 30 7.507	E 147 45 19.873
2432.17	36.05	282.98	1714.40	1493.47	-254.03	-1474.94	0.99	5738208.52	565862.07	S 38 30 7.390	E 147 45 19.202
2460.56	35.22	283.04	1737.48	1509.05	-250.31	-1491.05	0.88	5738212.24	565845.96	S 38 30 7.274	E 147 45 18.535
2489.45	36.11	283.93	1760.95	1524.87	-246.38	-1507.43	1.07	5738216.17	565829.59	S 38 30 7.151	E 147 45 17.858
2518.32	35.25	284.65	1784.40	1540.61	-242.22	-1523.75	0.99	5738220.32	565813.27	S 38 30 7.020	E 147 45 17.183
2546.76	36.00	283.55	1807.51	1556.11	-238.19	-1539.82	1.04	5738224.35	565797.21	S 38 30 6.894	E 147 45 16.519

	2575.01	35.10	283.73	1830.50	1571.52	-234.32	-1555.78	0.96	5738228.22	565781.26	S 38 30 6.772	E 147 45 15.859
	2603.28	34.42	283.46	1853.72	1586.65	-230.53	-1571.45	0.74	5738232.01	565765.60	S 38 30 6.654	E 147 45 15.211
	2632.06	33.78	283.24	1877.56	1601.82	-226.80	-1587.14	0.68	5738235.74	565749.90	S 38 30 6.537	E 147 45 14.562
	2661.17	33.44	283.32	1901.80	1616.97	-223.10	-1602.83	0.35	5738239.44	565734.23	S 38 30 6.421	E 147 45 13.914
	2690.17	33.53	282.75	1925.99	1632.04	-219.49	-1618.41	0.34	5738243.04	565718.64	S 38 30 6.308	E 147 45 13.269
	2718.85	33.87	282.07	1949.85	1647.09	-216.07	-1633.96	0.53	5738246.46	565703.11	S 38 30 6.201	E 147 45 12.627
	2747.40	33.61	281.49	1973.59	1662.14	-212.83	-1649.48	0.44	5738249.70	565687.59	S 38 30 6.100	E 147 45 11.985
	2775.84	33.17	280.75	1997.33	1677.05	-209.82	-1664.84	0.63	5738252.72	565672.24	S 38 30 6.007	E 147 45 11.350
Projected to TD	2804.00	32.90	280.50	2020.94	1691.71	-206.98	-1679.92	0.32	5738255.55	565657.15	S 38 30 5.919	E 147 45 10.726

Survey Type: Definitive Survey

Survey Error Model: **SLB ISCWSA version 24 *** 3-D 95.00% Confidence 2.7955 sigma**

Surveying Prog:

MD From (m)	MD To (m)	EOU Freq	Survey Tool Type	Borehole -> Survey
0.00	92.22	Act-Stns	SLB_NSG+MSHOT-Depth Only	BMA A-19A -> BMA A-19A Final
92.22	1436.00	Act-Stns	SLB_NSG+MSHOT	BMA A-19A -> BMA A-19A Final
1436.00	2804.00	Act-Stns	SLB_MWD-STD	BMA A-19A -> BMA A-19A Final

APPENDIX 1b

BREAM A19A

Survey Data Listing

Report Date:	29 March 2005
Well:	Bream A19A
Structure / Slot:	NABORS Rig 453
TVD Reference Datum:	Drillsite Elevation
TVD Reference Elevation:	32.82 m relative to MSL
Sea Bed / Ground Level Elevation:	59.43 m relative to MSL
Grid Coordinate System:	GDA94/MGA94 Zone 55
Location Lat/Long:	S -38 29' 58.891200", E 147 46' 19.966800"
Location Grid N/E:	N 5738458.22 m, E 567336.12 m
Survey Azimuth Reference:	Grid North

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
0	0	360	0	32.82	0	0	5738458.22	567336.12
5	0	300.96	5	27.82	0	0	5738458.22	567336.12
10	0.03	249.95	10	22.82	0	0	5738458.22	567336.12
15	0.24	249.95	15	17.82	-0.01	-0.02	5738458.22	567336.1
20	0.43	250.89	20	12.82	-0.01	-0.04	5738458.21	567336.08
25	0.46	257.78	25	7.82	-0.02	-0.08	5738458.2	567336.04
30	0.48	263.56	30	2.82	-0.03	-0.12	5738458.19	567336
35	0.48	262.33	35	-2.18	-0.04	-0.16	5738458.19	567335.96
40	0.48	261.41	40	-7.18	-0.04	-0.2	5738458.18	567335.92
45	0.47	262.5	45	-12.18	-0.05	-0.24	5738458.18	567335.88
50	0.47	264.06	50	-17.18	-0.05	-0.28	5738458.17	567335.84
55	0.45	268.57	55	-22.18	-0.05	-0.32	5738458.17	567335.8
60	0.44	273.02	60	-27.18	-0.05	-0.36	5738458.17	567335.76
65	0.44	277.1	65	-32.18	-0.05	-0.4	5738458.17	567335.72
70	0.44	281.4	70	-37.18	-0.04	-0.44	5738458.18	567335.68
75	0.44	287.12	75	-42.18	-0.03	-0.47	5738458.19	567335.65
80	0.44	292.31	80	-47.18	-0.02	-0.51	5738458.2	567335.61
85	0.47	294.17	85	-52.18	-0.01	-0.55	5738458.22	567335.57
90	0.52	294.36	90	-57.18	0.01	-0.59	5738458.23	567335.53
95	0.71	283.97	95	-62.18	0.02	-0.65	5738458.24	567335.48
100	0.95	273.51	100	-67.18	0.03	-0.71	5738458.25	567335.41
105	1.47	262.59	105	-72.18	0.01	-0.83	5738458.23	567335.29
110	2.01	252.63	109.99	-77.17	-0.02	-0.96	5738458.2	567335.16
115	2.7	248.84	114.99	-82.17	-0.1	-1.17	5738458.12	567334.95
120	3.41	245.41	119.98	-87.16	-0.2	-1.4	5738458.02	567334.72
125	4.23	244.27	124.97	-92.15	-0.35	-1.72	5738457.87	567334.4
130	5.03	243.16	129.95	-97.13	-0.52	-2.06	5738457.7	567334.06
135	5.74	242.22	134.93	-102.11	-0.75	-2.49	5738457.47	567333.63
140	6.44	241.41	139.9	-107.08	-0.99	-2.94	5738457.24	567333.18
145	7.03	241.49	144.87	-112.05	-1.27	-3.47	5738456.95	567332.65
150	7.62	241.61	149.83	-117.01	-1.57	-4.02	5738456.65	567332.1
155	8.2	242.05	154.78	-121.96	-1.9	-4.64	5738456.32	567331.48
160	8.82	242.51	159.72	-126.9	-2.24	-5.28	5738455.98	567330.84
165	9.65	243.07	164.66	-131.84	-2.61	-6.02	5738455.61	567330.1
170	10.42	243.66	169.58	-136.76	-2.99	-6.77	5738455.23	567329.35
175	10.84	244.42	174.5	-141.68	-3.4	-7.62	5738454.82	567328.51
180	11.27	245.1	179.41	-146.59	-3.81	-8.47	5738454.42	567327.65
185	11.67	245.29	184.3	-151.48	-4.23	-9.38	5738454	567326.74
190	12.05	245.44	189.2	-156.38	-4.65	-10.3	5738453.57	567325.82
195	12.3	245.34	194.08	-161.26	-5.09	-11.27	5738453.13	567324.85
200	12.56	245.19	198.97	-166.15	-5.54	-12.24	5738452.68	567323.88
205	12.95	244.72	203.84	-171.02	-6.02	-13.25	5738452.21	567322.87
210	13.36	244.2	208.71	-175.89	-6.5	-14.27	5738451.72	567321.85
215	13.84	243.4	213.57	-180.75	-7.03	-15.33	5738451.19	567320.79
220	14.3	242.61	218.42	-185.6	-7.57	-16.4	5738450.65	567319.72
225	14.69	241.91	223.26	-190.44	-8.17	-17.52	5738450.06	567318.6

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
230	15.06	241.23	228.1	-195.28	-8.77	-18.64	5738449.46	567317.48
235	15.39	240.66	232.92	-200.1	-9.41	-19.79	5738448.81	567316.33
240	15.71	240.12	237.74	-204.92	-10.07	-20.95	5738448.16	567315.17
245	15.95	239.74	242.55	-209.73	-10.76	-22.14	5738447.47	567313.98
250	16.18	239.37	247.35	-214.53	-11.45	-23.33	5738446.77	567312.79
255	16.42	238.97	252.15	-219.33	-12.18	-24.54	5738446.05	567311.59
260	16.66	238.56	256.95	-224.13	-12.91	-25.75	5738445.31	567310.37
265	16.9	238.16	261.73	-228.91	-13.67	-26.98	5738444.55	567309.14
270	17.14	237.78	266.51	-233.69	-14.44	-28.22	5738443.78	567307.9
275	17.39	237.55	271.29	-238.47	-15.24	-29.48	5738442.98	567306.64
280	17.64	237.33	276.06	-243.24	-16.05	-30.74	5738442.18	567305.38
285	17.9	237.18	280.82	-248	-16.88	-32.03	5738441.35	567304.09
290	18.16	237.06	285.57	-252.75	-17.71	-33.33	5738440.51	567302.8
295	18.44	237.14	290.32	-257.5	-18.57	-34.65	5738439.65	567301.47
300	18.72	237.22	295.06	-262.24	-19.43	-35.98	5738438.8	567300.14
305	19	237.35	299.79	-266.97	-20.3	-37.35	5738437.92	567298.77
310	19.29	237.5	304.51	-271.69	-21.18	-38.72	5738437.04	567297.4
315	19.57	237.68	309.23	-276.41	-22.08	-40.14	5738436.14	567295.99
320	19.86	237.87	313.94	-281.12	-22.97	-41.55	5738435.25	567294.57
325	20.13	238.08	318.63	-285.81	-23.88	-43.01	5738434.34	567293.11
330	20.42	238.3	323.32	-290.5	-24.79	-44.48	5738433.43	567291.64
335	20.77	238.53	328	-295.18	-25.72	-45.99	5738432.5	567290.14
340	21.14	238.74	332.67	-299.85	-26.65	-47.5	5738431.58	567288.62
345	21.6	238.9	337.32	-304.5	-27.6	-49.07	5738430.63	567287.05
350	22.05	239.04	341.97	-309.15	-28.55	-50.65	5738429.67	567285.47
355	22.47	239.08	346.59	-313.77	-29.53	-52.29	5738428.69	567283.83
360	22.9	239.12	351.21	-318.39	-30.51	-53.93	5738427.71	567282.19
365	23.33	239.18	355.8	-322.98	-31.53	-55.63	5738426.7	567280.49
370	23.76	239.24	360.39	-327.57	-32.54	-57.33	5738425.68	567278.79
375	24.16	239.33	364.96	-332.14	-33.58	-59.09	5738424.64	567277.03
380	24.56	239.42	369.52	-336.7	-34.63	-60.85	5738423.59	567275.27
385	24.91	239.53	374.05	-341.23	-35.7	-62.67	5738422.53	567273.45
390	25.27	239.64	378.59	-345.77	-36.77	-64.49	5738421.46	567271.64
395	25.6	239.74	383.1	-350.28	-37.85	-66.35	5738420.37	567269.77
400	25.93	239.83	387.61	-354.79	-38.94	-68.22	5738419.28	567267.9
405	26.26	239.92	392.09	-359.27	-40.05	-70.13	5738418.17	567265.99
410	26.6	240.01	396.57	-363.75	-41.16	-72.05	5738417.06	567264.07
415	27	240.08	401.03	-368.21	-42.29	-74.01	5738415.93	567262.11
420	27.41	240.15	405.48	-372.66	-43.42	-75.98	5738414.8	567260.14
425	27.84	240.22	409.91	-377.09	-44.58	-78	5738413.64	567258.12
430	28.28	240.29	414.33	-381.51	-45.74	-80.04	5738412.48	567256.09
435	28.77	240.34	418.71	-385.89	-46.93	-82.12	5738411.29	567254
440	29.26	240.39	423.09	-390.27	-48.13	-84.22	5738410.1	567251.9
445	29.76	240.44	427.43	-394.61	-49.35	-86.37	5738408.88	567249.75
450	30.26	240.49	431.77	-398.95	-50.57	-88.54	5738407.65	567247.59
455	30.77	240.53	436.07	-403.25	-51.83	-90.76	5738406.39	567245.36
460	31.28	240.56	440.36	-407.54	-53.09	-92.99	5738405.13	567243.13
465	31.79	240.6	444.62	-411.8	-54.38	-95.28	5738403.84	567240.84
470	32.3	240.63	448.86	-416.04	-55.68	-97.58	5738402.55	567238.54
475	32.83	240.66	453.07	-420.25	-57	-99.94	5738401.22	567236.18
480	33.35	240.68	457.27	-424.45	-58.33	-102.3	5738399.89	567233.82
485	33.89	240.7	461.42	-428.6	-59.7	-104.73	5738398.53	567231.39
490	34.43	240.72	465.57	-432.75	-61.06	-107.17	5738397.16	567228.95
495	35	240.75	469.67	-436.85	-62.46	-109.66	5738395.76	567226.46
500	35.57	240.77	473.76	-440.94	-63.86	-112.17	5738394.36	567223.95
505	36.13	240.8	477.8	-444.98	-65.3	-114.74	5738392.92	567221.38
510	36.7	240.83	481.84	-449.02	-66.74	-117.32	5738391.48	567218.8
515	37.26	240.86	485.82	-453	-68.21	-119.96	5738390.01	567216.16

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
520	37.81	240.9	489.79	-456.97	-69.69	-122.61	5738388.54	567213.52
525	38.36	240.94	493.72	-460.9	-71.19	-125.31	5738387.03	567210.81
530	38.91	240.99	497.64	-464.82	-72.7	-128.03	5738385.52	567208.09
535	39.46	241.04	501.5	-468.68	-74.24	-130.81	5738383.98	567205.32
540	39.99	241.09	505.36	-472.54	-75.78	-133.59	5738382.44	567202.53
545	40.45	241.18	509.16	-476.34	-77.34	-136.43	5738380.88	567199.69
550	40.91	241.27	512.97	-480.15	-78.91	-139.27	5738379.32	567196.85
555	41.35	241.37	516.72	-483.9	-80.49	-142.17	5738377.74	567193.95
560	41.77	241.48	520.47	-487.65	-82.07	-145.07	5738376.15	567191.05
565	42.07	241.62	524.19	-491.37	-83.66	-148.02	5738374.56	567188.1
570	42.37	241.77	527.9	-495.08	-85.25	-150.97	5738372.97	567185.15
575	42.67	241.92	531.58	-498.76	-86.85	-153.96	5738371.37	567182.17
580	42.97	242.07	535.25	-502.43	-88.44	-156.95	5738369.78	567179.17
585	43.3	242.24	538.89	-506.07	-90.04	-159.98	5738368.18	567176.14
590	43.63	242.41	542.53	-509.71	-91.64	-163.02	5738366.58	567173.1
595	44.01	242.58	546.13	-513.31	-93.24	-166.1	5738364.98	567170.02
600	44.4	242.74	549.72	-516.9	-94.84	-169.19	5738363.38	567166.94
605	44.9	242.9	553.26	-520.44	-96.45	-172.32	5738361.78	567163.8
610	45.41	243.05	556.8	-523.98	-98.05	-175.47	5738360.17	567160.65
615	45.96	243.17	560.28	-527.46	-99.68	-178.67	5738358.55	567157.45
620	46.52	243.29	563.75	-530.93	-101.3	-181.88	5738356.92	567154.24
625	47.14	243.38	567.16	-534.34	-102.94	-185.16	5738355.28	567150.97
630	47.77	243.46	570.55	-537.73	-104.58	-188.44	5738353.64	567147.68
635	48.41	243.53	573.88	-541.06	-106.25	-191.78	5738351.97	567144.34
640	49.05	243.6	577.19	-544.37	-107.92	-195.13	5738350.31	567140.99
645	49.71	243.66	580.43	-547.61	-109.61	-198.55	5738348.61	567137.58
650	50.37	243.72	583.66	-550.84	-111.3	-201.97	5738346.92	567134.15
655	51	243.83	586.81	-553.99	-113.01	-205.45	5738345.21	567130.67
660	51.64	243.94	589.95	-557.13	-114.73	-208.94	5738343.49	567127.18
665	52.27	244.06	593.02	-560.2	-116.46	-212.49	5738341.77	567123.63
670	52.89	244.18	596.07	-563.25	-118.19	-216.05	5738340.03	567120.07
675	53.44	244.36	599.05	-566.23	-119.93	-219.67	5738338.3	567116.45
680	53.98	244.54	602.03	-569.21	-121.66	-223.29	5738336.56	567112.83
685	54.51	244.73	604.94	-572.12	-123.4	-226.97	5738334.82	567109.15
690	55.01	244.92	607.83	-575.01	-125.14	-230.66	5738333.08	567105.47
695	55.38	245.13	610.68	-577.86	-126.87	-234.39	5738331.35	567101.73
700	55.75	245.34	613.52	-580.7	-128.6	-238.12	5738329.62	567098
705	56.11	245.55	616.31	-583.49	-130.32	-241.9	5738327.91	567094.22
710	56.47	245.77	619.09	-586.27	-132.03	-245.68	5738326.19	567090.44
715	56.8	245.99	621.83	-589.01	-133.74	-249.5	5738324.49	567086.62
720	57.14	246.21	624.57	-591.75	-135.44	-253.32	5738322.78	567082.8
725	57.54	246.43	627.25	-594.43	-137.13	-257.19	5738321.1	567078.93
730	57.94	246.65	629.93	-597.11	-138.81	-261.06	5738319.41	567075.06
735	58.41	246.87	632.56	-599.74	-140.49	-264.97	5738317.74	567071.15
740	58.87	247.08	635.17	-602.35	-142.16	-268.89	5738316.06	567067.23
745	59.28	247.26	637.73	-604.91	-143.82	-272.85	5738314.4	567063.27
750	59.68	247.44	640.28	-607.46	-145.48	-276.82	5738312.74	567059.3
755	60.06	247.6	642.78	-609.96	-147.13	-280.82	5738311.09	567055.3
760	60.42	247.74	645.27	-612.45	-148.78	-284.83	5738309.44	567051.29
765	60.63	247.85	647.73	-614.91	-150.43	-288.86	5738307.8	567047.26
770	60.83	247.95	650.18	-617.36	-152.07	-292.9	5738306.15	567043.22
775	61	248.04	652.61	-619.79	-153.71	-296.95	5738304.52	567039.17
780	61.15	248.13	655.03	-622.21	-155.34	-301.01	5738302.88	567035.11
785	61.19	248.21	657.44	-624.62	-156.97	-305.08	5738301.26	567031.04
790	61.22	248.28	659.85	-627.03	-158.59	-309.15	5738299.63	567026.97
795	61.25	248.35	662.25	-629.43	-160.21	-313.22	5738298.01	567022.9
800	61.27	248.42	664.66	-631.84	-161.83	-317.29	5738296.39	567018.83
805	61.27	248.47	667.06	-634.24	-163.44	-321.37	5738294.79	567014.75

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
810	61.27	248.51	669.46	-636.64	-165.05	-325.45	5738293.18	567010.67
815	61.27	248.55	671.87	-639.05	-166.65	-329.53	5738291.57	567006.59
820	61.27	248.58	674.27	-641.45	-168.25	-333.61	5738289.97	567002.51
825	61.28	248.59	676.67	-643.85	-169.85	-337.7	5738288.37	566998.43
830	61.29	248.6	679.08	-646.26	-171.45	-341.78	5738286.77	566994.34
835	61.3	248.61	681.48	-648.66	-173.05	-345.86	5738285.17	566990.26
840	61.3	248.61	683.88	-651.06	-174.65	-349.94	5738283.57	566986.18
845	61.29	248.62	686.28	-653.46	-176.25	-354.03	5738281.97	566982.09
850	61.29	248.62	688.68	-655.86	-177.85	-358.11	5738280.37	566978.01
855	61.29	248.62	691.08	-658.26	-179.45	-362.19	5738278.77	566973.93
860	61.29	248.62	693.49	-660.67	-181.05	-366.28	5738277.17	566969.84
865	61.28	248.62	695.89	-663.07	-182.65	-370.36	5738275.57	566965.76
870	61.28	248.62	698.29	-665.47	-184.25	-374.45	5738273.98	566961.68
875	61.28	248.62	700.69	-667.87	-185.85	-378.53	5738272.38	566957.59
880	61.28	248.62	703.1	-670.28	-187.44	-382.61	5738270.78	566953.51
885	61.27	248.61	705.5	-672.68	-189.04	-386.69	5738269.18	566949.43
890	61.27	248.61	707.9	-675.08	-190.64	-390.78	5738267.58	566945.34
895	61.28	248.6	710.31	-677.49	-192.24	-394.86	5738265.98	566941.26
900	61.28	248.6	712.71	-679.89	-193.84	-398.94	5738264.38	566937.18
905	61.29	248.59	715.11	-682.29	-195.44	-403.03	5738262.78	566933.1
910	61.3	248.58	717.51	-684.69	-197.04	-407.11	5738261.18	566929.01
915	61.32	248.57	719.91	-687.09	-198.65	-411.19	5738259.58	566924.93
920	61.34	248.57	722.31	-689.49	-200.25	-415.28	5738257.97	566920.85
925	61.36	248.56	724.71	-691.89	-201.85	-419.36	5738256.37	566916.76
930	61.38	248.55	727.1	-694.28	-203.46	-423.44	5738254.77	566912.68
935	61.41	248.53	729.5	-696.68	-205.06	-427.53	5738253.16	566908.59
940	61.43	248.52	731.89	-699.07	-206.67	-431.62	5738251.55	566904.51
945	61.46	248.51	734.28	-701.46	-208.28	-435.7	5738249.94	566900.42
950	61.49	248.5	736.67	-703.85	-209.89	-439.79	5738248.34	566896.33
955	61.53	248.48	739.05	-706.23	-211.5	-443.88	5738246.72	566892.24
960	61.57	248.47	741.43	-708.61	-213.11	-447.97	5738245.11	566888.15
965	61.62	248.46	743.81	-710.99	-214.73	-452.06	5738243.5	566884.06
970	61.68	248.46	746.19	-713.37	-216.34	-456.15	5738241.88	566879.97
975	61.73	248.45	748.55	-715.73	-217.96	-460.25	5738240.26	566875.87
980	61.79	248.44	750.92	-718.1	-219.58	-464.34	5738238.65	566871.78
985	61.83	248.43	753.28	-720.46	-221.2	-468.44	5738237.02	566867.68
990	61.88	248.42	755.64	-722.82	-222.82	-472.54	5738235.4	566863.58
995	61.92	248.41	758	-725.18	-224.44	-476.64	5738233.78	566859.48
1000	61.95	248.4	760.35	-727.53	-226.06	-480.75	5738232.16	566855.38
1005	61.98	248.39	762.7	-729.88	-227.69	-484.85	5738230.53	566851.27
1010	62	248.38	765.05	-732.23	-229.32	-488.95	5738228.91	566847.17
1015	62.02	248.37	767.39	-734.57	-230.94	-493.06	5738227.28	566843.06
1020	62.04	248.36	769.74	-736.92	-232.57	-497.16	5738225.65	566838.96
1025	62.06	248.35	772.08	-739.26	-234.2	-501.27	5738224.02	566834.85
1030	62.06	248.34	774.43	-741.61	-235.83	-505.37	5738222.39	566830.75
1035	62.02	248.33	776.77	-743.95	-237.46	-509.48	5738220.76	566826.65
1040	61.98	248.32	779.12	-746.3	-239.09	-513.58	5738219.13	566822.54
1045	61.93	248.31	781.47	-748.65	-240.72	-517.68	5738217.5	566818.44
1050	61.86	248.31	783.82	-751	-242.35	-521.78	5738215.87	566814.34
1055	61.75	248.32	786.19	-753.37	-243.98	-525.87	5738214.24	566810.25
1060	61.63	248.33	788.56	-755.74	-245.61	-529.96	5738212.62	566806.16
1065	61.52	248.35	790.94	-758.12	-247.23	-534.05	5738210.99	566802.07
1070	61.41	248.36	793.33	-760.51	-248.85	-538.13	5738209.37	566797.99
1075	61.3	248.4	795.73	-762.91	-250.46	-542.21	5738207.76	566793.91
1080	61.2	248.44	798.13	-765.31	-252.08	-546.29	5738206.14	566789.83
1085	61.12	248.48	800.54	-767.72	-253.69	-550.36	5738204.54	566785.76
1090	61.05	248.52	802.96	-770.14	-255.29	-554.44	5738202.93	566781.69
1095	61	248.57	805.38	-772.56	-256.89	-558.51	5738201.33	566777.61

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1100	60.95	248.62	807.8	-774.98	-258.49	-562.58	5738199.74	566773.54
1105	60.91	248.67	810.24	-777.42	-260.08	-566.65	5738198.15	566769.47
1110	60.88	248.72	812.67	-779.85	-261.67	-570.72	5738196.56	566765.4
1115	60.85	248.77	815.1	-782.28	-263.25	-574.79	5738194.97	566761.33
1120	60.83	248.82	817.54	-784.72	-264.83	-578.86	5738193.39	566757.26
1125	60.79	248.86	819.98	-787.16	-266.4	-582.93	5738191.82	566753.19
1130	60.75	248.9	822.42	-789.6	-267.98	-587	5738190.25	566749.12
1135	60.71	248.94	824.86	-792.04	-269.55	-591.07	5738188.68	566745.05
1140	60.68	248.97	827.31	-794.49	-271.11	-595.14	5738187.11	566740.98
1145	60.65	249	829.76	-796.94	-272.67	-599.21	5738185.55	566736.92
1150	60.62	249.03	832.21	-799.39	-274.24	-603.27	5738183.99	566732.85
1155	60.6	249.06	834.66	-801.84	-275.79	-607.34	5738182.43	566728.78
1160	60.59	249.08	837.12	-804.3	-277.35	-611.41	5738180.87	566724.71
1165	60.58	249.1	839.58	-806.76	-278.9	-615.48	5738179.32	566720.64
1170	60.57	249.12	842.03	-809.21	-280.46	-619.55	5738177.77	566716.57
1175	60.55	249.14	844.49	-811.67	-282.01	-623.62	5738176.22	566712.5
1180	60.53	249.16	846.95	-814.13	-283.56	-627.69	5738174.67	566708.43
1185	60.5	249.18	849.41	-816.59	-285.1	-631.75	5738173.12	566704.37
1190	60.47	249.2	851.87	-819.05	-286.65	-635.82	5738171.57	566700.3
1195	60.43	249.23	854.34	-821.52	-288.19	-639.89	5738170.03	566696.23
1200	60.39	249.26	856.81	-823.99	-289.73	-643.95	5738168.49	566692.17
1205	60.35	249.29	859.28	-826.46	-291.27	-648.02	5738166.95	566688.1
1210	60.32	249.33	861.75	-828.93	-292.81	-652.08	5738165.42	566684.04
1215	60.28	249.38	864.23	-831.41	-294.34	-656.15	5738163.89	566679.97
1220	60.25	249.43	866.71	-833.89	-295.87	-660.21	5738162.36	566675.91
1225	60.22	249.48	869.19	-836.37	-297.39	-664.28	5738160.84	566671.85
1230	60.19	249.54	871.68	-838.86	-298.91	-668.34	5738159.32	566667.78
1235	60.17	249.61	874.17	-841.35	-300.42	-672.41	5738157.8	566663.72
1240	60.15	249.68	876.65	-843.83	-301.93	-676.47	5738156.29	566659.65
1245	60.14	249.77	879.14	-846.32	-303.43	-680.54	5738154.79	566655.58
1250	60.13	249.85	881.63	-848.81	-304.93	-684.61	5738153.29	566651.51
1255	60.12	249.94	884.12	-851.3	-306.42	-688.68	5738151.81	566647.44
1260	60.11	250.03	886.61	-853.79	-307.9	-692.75	5738150.32	566643.37
1265	60.1	250.14	889.11	-856.29	-309.38	-696.83	5738148.85	566639.29
1270	60.1	250.24	891.6	-858.78	-310.85	-700.91	5738147.38	566635.21
1275	60.11	250.34	894.09	-861.27	-312.31	-704.99	5738145.92	566631.13
1280	60.11	250.44	896.58	-863.76	-313.76	-709.07	5738144.46	566627.05
1285	60.13	250.55	899.07	-866.25	-315.21	-713.16	5738143.01	566622.96
1290	60.15	250.65	901.56	-868.74	-316.65	-717.25	5738141.57	566618.87
1295	60.17	250.76	904.05	-871.23	-318.08	-721.34	5738140.14	566614.78
1300	60.19	250.86	906.53	-873.71	-319.51	-725.44	5738138.71	566610.68
1305	60.21	250.96	909.02	-876.2	-320.93	-729.54	5738137.3	566606.58
1310	60.22	251.06	911.5	-878.68	-322.34	-733.64	5738135.88	566602.48
1315	60.23	251.16	913.99	-881.17	-323.74	-737.75	5738134.48	566598.37
1320	60.24	251.26	916.47	-883.65	-325.14	-741.86	5738133.08	566594.26
1325	60.25	251.36	918.95	-886.13	-326.53	-745.97	5738131.69	566590.15
1330	60.25	251.46	921.43	-888.61	-327.92	-750.08	5738130.3	566586.04
1335	60.25	251.56	923.91	-891.09	-329.29	-754.2	5738128.93	566581.92
1340	60.25	251.66	926.39	-893.57	-330.66	-758.32	5738127.56	566577.8
1345	60.24	251.76	928.88	-896.06	-332.02	-762.44	5738126.2	566573.68
1350	60.24	251.85	931.36	-898.54	-333.38	-766.57	5738124.84	566569.55
1355	60.23	251.96	933.84	-901.02	-334.73	-770.69	5738123.5	566565.43
1360	60.22	252.06	936.32	-903.5	-336.07	-774.82	5738122.15	566561.3
1365	60.2	252.17	938.81	-905.99	-337.4	-778.95	5738120.82	566557.17
1370	60.19	252.28	941.29	-908.47	-338.73	-783.08	5738119.5	566553.04
1375	60.19	252.37	943.78	-910.96	-340.04	-787.22	5738118.18	566548.91
1380	60.19	252.46	946.26	-913.44	-341.35	-791.35	5738116.87	566544.77
1385	60.2	252.56	948.75	-915.93	-342.65	-795.49	5738115.57	566540.63

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1390	60.2	252.65	951.23	-918.41	-343.95	-799.63	5738114.27	566536.49
1395	60.21	252.71	953.72	-920.9	-345.25	-803.77	5738112.98	566532.35
1400	60.22	252.78	956.2	-923.38	-346.53	-807.92	5738111.69	566528.21
1405	60.23	252.84	958.68	-925.86	-347.81	-812.06	5738110.41	566524.06
1410	60.24	252.91	961.17	-928.35	-349.09	-816.21	5738109.13	566519.91
1415	60.25	252.98	963.65	-930.83	-350.37	-820.36	5738107.86	566515.76
1420	60.25	253.05	966.13	-933.31	-351.64	-824.51	5738106.59	566511.61
1425	60.26	253.13	968.61	-935.79	-352.9	-828.67	5738105.33	566507.46
1430	60.26	253.2	971.09	-938.27	-354.16	-832.82	5738104.07	566503.3
1435	60.29	253.27	973.57	-940.75	-355.41	-836.98	5738102.81	566499.14
1440	60.32	254.32	976.04	-943.22	-356.33	-841.21	5738101.89	566494.91
1445	60.36	255.62	978.52	-945.7	-357.18	-845.47	5738101.05	566490.65
1450	60.39	256.92	980.99	-948.17	-358.02	-849.73	5738100.2	566486.4
1455	60.42	258.22	983.46	-950.64	-358.86	-853.98	5738099.36	566482.14
1460	60.45	259.52	985.94	-953.12	-359.71	-858.24	5738098.52	566477.88
1465	60.48	260.82	988.41	-955.59	-360.55	-862.49	5738097.67	566473.63
1470	60.51	262.12	990.88	-958.06	-361.39	-866.75	5738096.83	566469.37
1475	60.54	263.42	993.36	-960.54	-362.23	-871.01	5738095.99	566465.11
1480	60.41	264.4	995.86	-963.04	-362.92	-875.27	5738095.31	566460.85
1485	59.94	264.7	998.44	-965.62	-363.27	-879.54	5738094.96	566456.59
1490	59.46	265	1001.02	-968.2	-363.62	-883.8	5738094.61	566452.32
1495	58.99	265.3	1003.6	-970.78	-363.97	-888.07	5738094.26	566448.05
1500	58.52	265.6	1006.18	-973.36	-364.32	-892.34	5738093.9	566443.78
1505	58.05	265.9	1008.76	-975.94	-364.67	-896.61	5738093.55	566439.51
1510	57.58	266.2	1011.33	-978.51	-365.02	-900.88	5738093.2	566435.24
1515	57.19	266.46	1014.01	-981.19	-365.3	-905.09	5738092.92	566431.03
1520	56.87	266.67	1016.77	-983.95	-365.53	-909.25	5738092.7	566426.87
1525	56.55	266.88	1019.54	-986.72	-365.75	-913.41	5738092.48	566422.71
1530	56.22	267.09	1022.3	-989.48	-365.97	-917.57	5738092.25	566418.55
1535	55.9	267.3	1025.07	-992.25	-366.19	-921.73	5738092.03	566414.39
1540	55.58	267.51	1027.83	-995.01	-366.41	-925.89	5738091.81	566410.23
1545	55.27	268.35	1030.7	-997.88	-366.43	-929.98	5738091.79	566406.14
1550	54.96	269.38	1033.6	-1000.78	-366.4	-934.06	5738091.83	566402.07
1555	54.65	270.4	1036.49	-1003.67	-366.36	-938.13	5738091.86	566397.99
1560	54.34	271.43	1039.39	-1006.57	-366.32	-942.2	5738091.9	566393.92
1565	54.04	272.45	1042.29	-1009.47	-366.28	-946.27	5738091.94	566389.85
1570	53.73	273.48	1045.19	-1012.37	-366.25	-950.34	5738091.98	566385.78
1575	53.58	274.29	1048.17	-1015.35	-365.87	-954.34	5738092.35	566381.78
1580	53.46	275.07	1051.15	-1018.33	-365.47	-958.33	5738092.76	566377.79
1585	53.33	275.86	1054.14	-1021.32	-365.06	-962.32	5738093.16	566373.8
1590	53.2	276.64	1057.13	-1024.31	-364.65	-966.31	5738093.57	566369.82
1595	53.07	277.42	1060.11	-1027.29	-364.25	-970.29	5738093.97	566365.83
1600	52.94	278.21	1063.11	-1030.29	-363.79	-974.27	5738094.43	566361.85
1605	52.79	278.97	1066.15	-1033.33	-363.08	-978.17	5738095.14	566357.95
1610	52.64	279.73	1069.19	-1036.37	-362.38	-982.07	5738095.85	566354.05
1615	52.48	280.49	1072.24	-1039.42	-361.67	-985.98	5738096.55	566350.15
1620	52.33	281.25	1075.28	-1042.46	-360.96	-989.88	5738097.26	566346.24
1625	52.17	282.02	1078.32	-1045.5	-360.26	-993.78	5738097.97	566342.34
1630	51.82	282.43	1081.43	-1048.61	-359.51	-997.63	5738098.71	566338.49
1635	51.15	282.29	1084.63	-1051.81	-358.71	-1001.38	5738099.52	566334.74
1640	50.47	282.15	1087.83	-1055.01	-357.9	-1005.14	5738100.32	566330.99
1645	49.8	282.02	1091.03	-1058.21	-357.1	-1008.89	5738101.13	566327.23
1650	49.13	281.88	1094.23	-1061.41	-356.29	-1012.64	5738101.93	566323.48
1655	48.46	281.75	1097.44	-1064.62	-355.49	-1016.4	5738102.74	566319.72
1660	48.25	281.64	1100.73	-1067.91	-354.73	-1020.08	5738103.49	566316.04
1665	48.21	281.54	1104.07	-1071.25	-353.99	-1023.73	5738104.23	566312.39
1670	48.18	281.44	1107.4	-1074.58	-353.25	-1027.38	5738104.97	566308.74
1675	48.14	281.34	1110.74	-1077.92	-352.52	-1031.03	5738105.71	566305.09

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1680	48.1	281.24	1114.07	-1081.25	-351.78	-1034.68	5738106.45	566301.44
1685	48.06	281.14	1117.41	-1084.59	-351.04	-1038.34	5738107.18	566297.79
1690	47.48	281.43	1120.85	-1088.03	-350.29	-1041.88	5738107.93	566294.24
1695	46.87	281.73	1124.31	-1091.49	-349.54	-1045.41	5738108.68	566290.71
1700	46.26	282.02	1127.76	-1094.94	-348.79	-1048.95	5738109.43	566287.17
1705	45.65	282.32	1131.21	-1098.39	-348.04	-1052.49	5738110.18	566283.63
1710	45.04	282.62	1134.67	-1101.85	-347.29	-1056.02	5738110.93	566280.1
1715	44.48	282.95	1138.16	-1105.34	-346.52	-1059.51	5738111.7	566276.61
1720	44.04	283.39	1141.8	-1108.98	-345.69	-1062.84	5738112.54	566273.28
1725	43.6	283.82	1145.44	-1112.62	-344.85	-1066.17	5738113.37	566269.96
1730	43.17	284.25	1149.07	-1116.25	-344.02	-1069.49	5738114.2	566266.63
1735	42.73	284.68	1152.71	-1119.89	-343.19	-1072.82	5738115.03	566263.3
1740	42.3	285.12	1156.35	-1123.53	-342.36	-1076.15	5738115.87	566259.97
1745	41.73	285.35	1160.08	-1127.26	-341.51	-1079.36	5738116.72	566256.76
1750	41.06	285.42	1163.9	-1131.08	-340.65	-1082.47	5738117.58	566253.66
1755	40.38	285.48	1167.72	-1134.9	-339.79	-1085.57	5738118.44	566250.55
1760	39.7	285.54	1171.55	-1138.73	-338.93	-1088.68	5738119.3	566247.45
1765	39.02	285.6	1175.37	-1142.55	-338.06	-1091.78	5738120.16	566244.34
1770	38.35	285.66	1179.19	-1146.37	-337.2	-1094.89	5738121.02	566241.24
1775	38.11	285.64	1183.11	-1150.29	-336.37	-1097.88	5738121.85	566238.24
1780	38.01	285.58	1187.05	-1154.23	-335.55	-1100.84	5738122.67	566235.28
1785	37.91	285.53	1191	-1158.18	-334.73	-1103.8	5738123.49	566232.32
1790	37.81	285.47	1194.94	-1162.12	-333.91	-1106.76	5738124.32	566229.36
1795	37.71	285.42	1198.89	-1166.07	-333.09	-1109.72	5738125.14	566226.4
1800	37.61	285.36	1202.83	-1170.01	-332.26	-1112.68	5738125.96	566223.45
1805	37.46	285.34	1206.82	-1174	-331.47	-1115.59	5738126.76	566220.53
1810	37.32	285.32	1210.8	-1177.98	-330.67	-1118.51	5738127.56	566217.62
1815	37.17	285.3	1214.78	-1181.96	-329.87	-1121.42	5738128.35	566214.7
1820	37.02	285.28	1218.77	-1185.95	-329.07	-1124.34	5738129.15	566211.79
1825	36.87	285.26	1222.75	-1189.93	-328.27	-1127.25	5738129.95	566208.87
1830	36.72	285.22	1226.75	-1193.93	-327.49	-1130.15	5738130.74	566205.97
1835	36.56	285.12	1230.77	-1197.95	-326.72	-1133.01	5738131.5	566203.11
1840	36.4	285.02	1234.8	-1201.98	-325.96	-1135.87	5738132.27	566200.25
1845	36.24	284.92	1238.83	-1206.01	-325.19	-1138.73	5738133.03	566197.39
1850	36.08	284.82	1242.86	-1210.04	-324.43	-1141.59	5738133.79	566194.53
1855	35.92	284.72	1246.89	-1214.07	-323.66	-1144.45	5738134.56	566191.67
1860	35.8	284.68	1250.94	-1218.12	-322.91	-1147.29	5738135.31	566188.83
1865	35.72	284.72	1255.01	-1222.19	-322.17	-1150.1	5738136.05	566186.02
1870	35.63	284.75	1259.07	-1226.25	-321.43	-1152.92	5738136.79	566183.21
1875	35.55	284.78	1263.14	-1230.32	-320.69	-1155.73	5738137.54	566180.39
1880	35.46	284.81	1267.2	-1234.38	-319.95	-1158.54	5738138.28	566177.58
1885	35.38	284.84	1271.27	-1238.45	-319.2	-1161.36	5738139.02	566174.76
1890	35.23	284.73	1275.36	-1242.54	-318.49	-1164.14	5738139.74	566171.98
1895	35.05	284.55	1279.46	-1246.64	-317.78	-1166.91	5738140.45	566169.21
1900	34.88	284.38	1283.57	-1250.75	-317.07	-1169.68	5738141.15	566166.44
1905	34.71	284.2	1287.67	-1254.85	-316.36	-1172.45	5738141.86	566163.68
1910	34.53	284.02	1291.77	-1258.95	-315.65	-1175.21	5738142.57	566160.91
1915	34.36	283.85	1295.88	-1263.06	-314.94	-1177.98	5738143.28	566158.14
1920	34.31	283.82	1300.01	-1267.19	-314.27	-1180.71	5738143.95	566155.41
1925	34.27	283.8	1304.14	-1271.32	-313.6	-1183.44	5738144.62	566152.68
1930	34.22	283.77	1308.28	-1275.46	-312.93	-1186.18	5738145.29	566149.95
1935	34.17	283.75	1312.41	-1279.59	-312.26	-1188.91	5738145.96	566147.21
1940	34.12	283.72	1316.55	-1283.73	-311.59	-1191.64	5738146.63	566144.48
1945	34.16	283.71	1320.67	-1287.85	-310.92	-1194.38	5738147.3	566141.74
1950	34.41	283.74	1324.78	-1291.96	-310.24	-1197.15	5738147.98	566138.97
1955	34.67	283.77	1328.88	-1296.06	-309.56	-1199.93	5738148.66	566136.19
1960	34.92	283.8	1332.99	-1300.17	-308.88	-1202.7	5738149.34	566133.42
1965	35.18	283.83	1337.09	-1304.27	-308.2	-1205.47	5738150.02	566130.65

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1970	35.43	283.86	1341.19	-1308.37	-307.52	-1208.25	5738150.7	566127.87
1975	35.67	283.89	1345.27	-1312.45	-306.82	-1211.06	5738151.4	566125.06
1980	35.88	283.93	1349.3	-1316.48	-306.11	-1213.93	5738152.11	566122.2
1985	36.09	283.96	1353.34	-1320.52	-305.4	-1216.79	5738152.82	566119.33
1990	36.3	283.99	1357.38	-1324.56	-304.69	-1219.65	5738153.54	566116.47
1995	36.52	284.02	1361.41	-1328.59	-303.97	-1222.52	5738154.25	566113.61
2000	36.73	284.05	1365.45	-1332.63	-303.26	-1225.38	5738154.96	566110.74
2005	36.66	284.06	1369.48	-1336.66	-302.54	-1228.25	5738155.68	566107.87
2010	36.52	284.06	1373.5	-1340.68	-301.82	-1231.13	5738156.4	566104.99
2015	36.39	284.06	1377.53	-1344.71	-301.1	-1234.01	5738157.12	566102.12
2020	36.25	284.06	1381.55	-1348.73	-300.38	-1236.88	5738157.84	566099.24
2025	36.11	284.06	1385.58	-1352.76	-299.66	-1239.76	5738158.56	566096.36
2030	35.97	284.06	1389.61	-1356.79	-298.94	-1242.63	5738159.28	566093.49
2035	36.15	283.87	1393.62	-1360.8	-298.25	-1245.53	5738159.98	566090.6
2040	36.33	283.68	1397.64	-1364.82	-297.55	-1248.42	5738160.67	566087.7
2045	36.52	283.49	1401.66	-1368.84	-296.86	-1251.31	5738161.37	566084.81
2050	36.7	283.29	1405.68	-1372.86	-296.16	-1254.2	5738162.06	566081.92
2055	36.89	283.1	1409.7	-1376.88	-295.47	-1257.09	5738162.75	566079.03
2060	37.01	282.92	1413.72	-1380.9	-294.79	-1259.99	5738163.44	566076.13
2065	36.9	282.77	1417.73	-1384.91	-294.14	-1262.91	5738164.09	566073.21
2070	36.79	282.62	1421.73	-1388.91	-293.49	-1265.83	5738164.74	566070.29
2075	36.69	282.48	1425.74	-1392.92	-292.84	-1268.75	5738165.38	566067.38
2080	36.58	282.33	1429.75	-1396.93	-292.19	-1271.66	5738166.03	566064.46
2085	36.48	282.19	1433.76	-1400.94	-291.54	-1274.58	5738166.68	566061.54
2090	36.35	282.11	1437.78	-1404.96	-290.91	-1277.48	5738167.32	566058.64
2095	36.2	282.12	1441.83	-1409.01	-290.29	-1280.35	5738167.93	566055.77
2100	36.05	282.12	1445.87	-1413.05	-289.67	-1283.22	5738168.55	566052.9
2105	35.9	282.12	1449.92	-1417.1	-289.06	-1286.1	5738169.17	566050.03
2110	35.75	282.13	1453.97	-1421.15	-288.44	-1288.97	5738169.78	566047.15
2115	35.6	282.13	1458.01	-1425.19	-287.82	-1291.84	5738170.4	566044.28
2120	35.73	282.09	1462.05	-1429.23	-287.21	-1294.73	5738171.01	566041.39
2125	36.03	282.03	1466.07	-1433.25	-286.59	-1297.63	5738171.63	566038.49
2130	36.34	281.97	1470.1	-1437.28	-285.98	-1300.53	5738172.24	566035.59
2135	36.64	281.91	1474.12	-1441.3	-285.36	-1303.44	5738172.86	566032.69
2140	36.95	281.85	1478.15	-1445.33	-284.75	-1306.34	5738173.47	566029.78
2145	37.22	281.79	1482.17	-1449.35	-284.14	-1309.24	5738174.09	566026.88
2150	37.03	281.75	1486.18	-1453.36	-283.53	-1312.17	5738174.69	566023.96
2155	36.84	281.72	1490.19	-1457.37	-282.93	-1315.09	5738175.3	566021.03
2160	36.65	281.68	1494.2	-1461.38	-282.32	-1318.02	5738175.9	566018.11
2165	36.46	281.65	1498.21	-1465.39	-281.72	-1320.94	5738176.51	566015.18
2170	36.27	281.61	1502.22	-1469.4	-281.11	-1323.87	5738177.11	566012.26
2175	36.23	281.55	1506.22	-1473.4	-280.51	-1326.8	5738177.71	566009.32
2180	36.51	281.4	1510.22	-1477.4	-279.93	-1329.75	5738178.29	566006.37
2185	36.8	281.26	1514.21	-1481.39	-279.35	-1332.7	5738178.88	566003.43
2190	37.08	281.12	1518.21	-1485.39	-278.77	-1335.64	5738179.46	566000.48
2195	37.37	280.97	1522.21	-1489.39	-278.18	-1338.59	5738180.04	565997.53
2200	37.65	280.83	1526.2	-1493.38	-277.6	-1341.54	5738180.62	565994.58
2205	37.7	280.81	1530.18	-1497.36	-277.02	-1344.51	5738181.2	565991.61
2210	37.57	280.89	1534.16	-1501.34	-276.44	-1347.49	5738181.78	565988.63
2215	37.44	280.96	1538.13	-1505.31	-275.86	-1350.47	5738182.36	565985.65
2220	37.31	281.04	1542.1	-1509.28	-275.28	-1353.45	5738182.94	565982.67
2225	37.18	281.11	1546.07	-1513.25	-274.71	-1356.43	5738183.52	565979.69
2230	37.05	281.18	1550.04	-1517.22	-274.13	-1359.41	5738184.1	565976.71
2235	36.93	281.22	1554.05	-1521.23	-273.54	-1362.35	5738184.68	565973.77
2240	36.82	281.26	1558.05	-1525.23	-272.96	-1365.28	5738185.26	565970.84
2245	36.7	281.29	1562.06	-1529.24	-272.37	-1368.21	5738185.85	565967.91
2250	36.58	281.32	1566.07	-1533.25	-271.79	-1371.14	5738186.43	565964.98
2255	36.47	281.35	1570.08	-1537.26	-271.2	-1374.07	5738187.02	565962.05

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2260	36.36	281.38	1574.09	-1541.27	-270.62	-1377	5738187.6	565959.12
2265	36.35	281.42	1578.12	-1545.3	-270.03	-1379.9	5738188.19	565956.22
2270	36.34	281.46	1582.15	-1549.33	-269.44	-1382.81	5738188.78	565953.31
2275	36.33	281.5	1586.18	-1553.36	-268.85	-1385.71	5738189.37	565950.41
2280	36.32	281.53	1590.21	-1557.39	-268.26	-1388.61	5738189.96	565947.51
2285	36.31	281.57	1594.23	-1561.41	-267.67	-1391.51	5738190.55	565944.61
2290	36.26	281.57	1598.27	-1565.45	-267.08	-1394.41	5738191.14	565941.71
2295	36.12	281.48	1602.32	-1569.5	-266.51	-1397.28	5738191.72	565938.84
2300	35.99	281.39	1606.37	-1573.55	-265.93	-1400.16	5738192.29	565935.96
2305	35.85	281.29	1610.42	-1577.6	-265.35	-1403.03	5738192.87	565933.09
2310	35.71	281.2	1614.47	-1581.65	-264.78	-1405.91	5738193.44	565930.21
2315	35.58	281.1	1618.52	-1585.7	-264.2	-1408.78	5738194.02	565927.34
2320	35.46	281.17	1622.59	-1589.77	-263.62	-1411.63	5738194.6	565924.49
2325	35.36	281.39	1626.67	-1593.85	-263.04	-1414.46	5738195.18	565921.66
2330	35.26	281.61	1630.75	-1597.93	-262.45	-1417.28	5738195.77	565918.84
2335	35.16	281.83	1634.84	-1602.02	-261.87	-1420.11	5738196.35	565916.02
2340	35.06	282.05	1638.92	-1606.1	-261.29	-1422.93	5738196.94	565913.19
2345	34.96	282.27	1643.01	-1610.19	-260.7	-1425.75	5738197.52	565910.37
2350	34.87	282.32	1647.11	-1614.29	-260.1	-1428.54	5738198.12	565907.58
2355	34.78	282.32	1651.22	-1618.4	-259.49	-1431.32	5738198.73	565904.8
2360	34.69	282.32	1655.34	-1622.52	-258.89	-1434.1	5738199.34	565902.02
2365	34.6	282.31	1659.45	-1626.63	-258.28	-1436.88	5738199.94	565899.24
2370	34.51	282.31	1663.56	-1630.74	-257.67	-1439.66	5738200.55	565896.46
2375	34.42	282.31	1667.67	-1634.85	-257.07	-1442.44	5738201.16	565893.68
2380	34.54	282.41	1671.78	-1638.96	-256.44	-1445.22	5738201.78	565890.9
2385	34.66	282.51	1675.89	-1643.07	-255.82	-1448.01	5738202.4	565888.11
2390	34.78	282.61	1679.99	-1647.17	-255.2	-1450.79	5738203.02	565885.33
2395	34.9	282.71	1684.1	-1651.28	-254.58	-1453.57	5738203.64	565882.55
2400	35.02	282.81	1688.21	-1655.39	-253.96	-1456.35	5738204.27	565879.77
2405	35.16	282.89	1692.3	-1659.48	-253.33	-1459.15	5738204.9	565876.97
2410	35.32	282.9	1696.37	-1663.55	-252.68	-1461.99	5738205.55	565874.13
2415	35.49	282.92	1700.44	-1667.62	-252.03	-1464.82	5738206.2	565871.3
2420	35.65	282.94	1704.5	-1671.68	-251.37	-1467.66	5738206.85	565868.46
2425	35.81	282.95	1708.57	-1675.75	-250.72	-1470.49	5738207.5	565865.63
2430	35.98	282.97	1712.64	-1679.82	-250.07	-1473.33	5738208.15	565862.79
2435	35.97	282.99	1716.7	-1683.88	-249.42	-1476.17	5738208.8	565859.96
2440	35.82	283	1720.77	-1687.95	-248.76	-1479	5738209.46	565857.12
2445	35.67	283.01	1724.83	-1692.01	-248.11	-1481.84	5738210.12	565854.28
2450	35.53	283.02	1728.89	-1696.07	-247.45	-1484.68	5738210.77	565851.44
2455	35.38	283.03	1732.96	-1700.14	-246.8	-1487.52	5738211.43	565848.6
2460	35.24	283.04	1737.02	-1704.2	-246.14	-1490.36	5738212.08	565845.76
2465	35.36	283.18	1741.08	-1708.26	-245.46	-1493.19	5738212.76	565842.93
2470	35.51	283.33	1745.14	-1712.32	-244.78	-1496.03	5738213.44	565840.09
2475	35.66	283.48	1749.21	-1716.39	-244.1	-1498.86	5738214.12	565837.26
2480	35.82	283.64	1753.27	-1720.45	-243.42	-1501.7	5738214.8	565834.43
2485	35.97	283.79	1757.33	-1724.51	-242.74	-1504.53	5738215.48	565831.59
2490	36.09	283.94	1761.39	-1728.57	-242.06	-1507.36	5738216.16	565828.76
2495	35.94	284.07	1765.46	-1732.64	-241.34	-1510.19	5738216.88	565825.93
2500	35.8	284.19	1769.52	-1736.7	-240.62	-1513.02	5738217.6	565823.1
2505	35.65	284.32	1773.58	-1740.76	-239.9	-1515.84	5738218.32	565820.28
2510	35.5	284.44	1777.64	-1744.82	-239.18	-1518.67	5738219.04	565817.45
2515	35.35	284.57	1781.7	-1748.88	-238.46	-1521.49	5738219.76	565814.63
2520	35.29	284.59	1785.76	-1752.94	-237.74	-1524.32	5738220.48	565811.8
2525	35.43	284.39	1789.83	-1757.01	-237.03	-1527.14	5738221.19	565808.98
2530	35.56	284.2	1793.89	-1761.07	-236.33	-1529.97	5738221.9	565806.15
2535	35.69	284	1797.96	-1765.14	-235.62	-1532.79	5738222.61	565803.33
2540	35.82	283.81	1802.02	-1769.2	-234.91	-1535.62	5738223.32	565800.5
2545	35.95	283.62	1806.08	-1773.26	-234.2	-1538.44	5738224.03	565797.68

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2550	35.9	283.57	1810.15	-1777.33	-233.5	-1541.27	5738224.72	565794.85
2555	35.74	283.6	1814.22	-1781.4	-232.82	-1544.09	5738225.4	565792.03
2560	35.58	283.63	1818.29	-1785.47	-232.13	-1546.92	5738226.09	565789.2
2565	35.42	283.67	1822.35	-1789.53	-231.45	-1549.74	5738226.78	565786.38
2570	35.26	283.7	1826.42	-1793.6	-230.76	-1552.57	5738227.46	565783.55
2575	35.1	283.73	1830.49	-1797.67	-230.08	-1555.39	5738228.15	565780.73
2580	34.98	283.68	1834.6	-1801.78	-229.41	-1558.16	5738228.82	565777.96
2585	34.86	283.63	1838.71	-1805.89	-228.74	-1560.93	5738229.49	565775.19
2590	34.74	283.59	1842.81	-1809.99	-228.07	-1563.71	5738230.16	565772.42
2595	34.62	283.54	1846.92	-1814.1	-227.4	-1566.48	5738230.83	565769.65
2600	34.5	283.49	1851.03	-1818.21	-226.73	-1569.25	5738231.5	565766.87
2601	34.47	283.48	1851.85	-1819.03	-226.59	-1569.8	5738231.63	565766.32
2602	34.45	283.47	1852.67	-1819.85	-226.46	-1570.36	5738231.76	565765.77
2603	34.43	283.46	1853.49	-1820.67	-226.32	-1570.91	5738231.9	565765.21
2604	34.4	283.45	1854.32	-1821.5	-226.19	-1571.46	5738232.03	565764.66
2605	34.38	283.45	1855.15	-1822.33	-226.06	-1572	5738232.16	565764.12
2606	34.36	283.44	1855.98	-1823.16	-225.93	-1572.55	5738232.29	565763.57
2607	34.34	283.43	1856.8	-1823.98	-225.8	-1573.09	5738232.42	565763.03
2608	34.32	283.42	1857.63	-1824.81	-225.68	-1573.64	5738232.55	565762.48
2609	34.29	283.42	1858.46	-1825.64	-225.55	-1574.18	5738232.68	565761.94
2610	34.27	283.41	1859.29	-1826.47	-225.42	-1574.73	5738232.81	565761.39
2611	34.25	283.4	1860.12	-1827.3	-225.29	-1575.28	5738232.94	565760.85
2612	34.23	283.39	1860.94	-1828.12	-225.16	-1575.82	5738233.07	565760.3
2613	34.2	283.39	1861.77	-1828.95	-225.03	-1576.37	5738233.19	565759.75
2614	34.18	283.38	1862.6	-1829.78	-224.9	-1576.91	5738233.32	565759.21
2615	34.16	283.37	1863.43	-1830.61	-224.77	-1577.46	5738233.45	565758.66
2616	34.14	283.36	1864.26	-1831.44	-224.64	-1578	5738233.58	565758.12
2617	34.11	283.36	1865.09	-1832.27	-224.51	-1578.55	5738233.71	565757.57
2618	34.09	283.35	1865.91	-1833.09	-224.38	-1579.09	5738233.84	565757.03
2619	34.07	283.34	1866.74	-1833.92	-224.25	-1579.64	5738233.97	565756.48
2620	34.05	283.33	1867.57	-1834.75	-224.12	-1580.19	5738234.1	565755.94
2621	34.03	283.32	1868.4	-1835.58	-223.99	-1580.73	5738234.23	565755.39
2622	34	283.32	1869.23	-1836.41	-223.86	-1581.28	5738234.36	565754.85
2623	33.98	283.31	1870.05	-1837.23	-223.73	-1581.82	5738234.49	565754.3
2624	33.96	283.3	1870.88	-1838.06	-223.6	-1582.37	5738234.62	565753.75
2625	33.94	283.29	1871.71	-1838.89	-223.47	-1582.91	5738234.75	565753.21
2626	33.91	283.29	1872.54	-1839.72	-223.35	-1583.46	5738234.88	565752.66
2627	33.89	283.28	1873.37	-1840.55	-223.22	-1584	5738235.01	565752.12
2628	33.87	283.27	1874.19	-1841.37	-223.09	-1584.55	5738235.14	565751.57
2629	33.85	283.26	1875.02	-1842.2	-222.96	-1585.09	5738235.27	565751.03
2630	33.83	283.26	1875.85	-1843.03	-222.83	-1585.64	5738235.4	565750.48
2631	33.8	283.25	1876.68	-1843.86	-222.7	-1586.19	5738235.52	565749.94
2632	33.78	283.24	1877.51	-1844.69	-222.57	-1586.73	5738235.65	565749.39
2633	33.77	283.24	1878.34	-1845.52	-222.44	-1587.27	5738235.78	565748.85
2634	33.76	283.25	1879.17	-1846.35	-222.31	-1587.81	5738235.91	565748.31
2635	33.75	283.25	1880	-1847.18	-222.19	-1588.35	5738236.04	565747.77
2636	33.73	283.25	1880.84	-1848.02	-222.06	-1588.89	5738236.16	565747.23
2637	33.72	283.25	1881.67	-1848.85	-221.93	-1589.43	5738236.29	565746.7
2638	33.71	283.26	1882.5	-1849.68	-221.81	-1589.96	5738236.42	565746.16
2639	33.7	283.26	1883.34	-1850.52	-221.68	-1590.5	5738236.54	565745.62
2640	33.69	283.26	1884.17	-1851.35	-221.55	-1591.04	5738236.67	565745.08
2641	33.68	283.26	1885	-1852.18	-221.42	-1591.58	5738236.8	565744.54
2642	33.66	283.27	1885.83	-1853.01	-221.3	-1592.12	5738236.93	565744
2643	33.65	283.27	1886.67	-1853.85	-221.17	-1592.66	5738237.05	565743.46
2644	33.64	283.27	1887.5	-1854.68	-221.04	-1593.2	5738237.18	565742.92
2645	33.63	283.28	1888.33	-1855.51	-220.92	-1593.74	5738237.31	565742.39
2646	33.62	283.28	1889.17	-1856.35	-220.79	-1594.27	5738237.43	565741.85
2647	33.61	283.28	1890	-1857.18	-220.66	-1594.81	5738237.56	565741.31

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2648	33.59	283.28	1890.83	-1858.01	-220.53	-1595.35	5738237.69	565740.77
2649	33.58	283.29	1891.66	-1858.84	-220.41	-1595.89	5738237.82	565740.23
2650	33.57	283.29	1892.5	-1859.68	-220.28	-1596.43	5738237.94	565739.69
2651	33.56	283.29	1893.33	-1860.51	-220.15	-1596.97	5738238.07	565739.15
2652	33.55	283.29	1894.16	-1861.34	-220.03	-1597.51	5738238.2	565738.62
2653	33.54	283.3	1894.99	-1862.17	-219.9	-1598.05	5738238.32	565738.08
2654	33.52	283.3	1895.83	-1863.01	-219.77	-1598.58	5738238.45	565737.54
2655	33.51	283.3	1896.66	-1863.84	-219.64	-1599.12	5738238.58	565737
2656	33.5	283.31	1897.49	-1864.67	-219.52	-1599.66	5738238.71	565736.46
2657	33.49	283.31	1898.33	-1865.51	-219.39	-1600.2	5738238.83	565735.92
2658	33.48	283.31	1899.16	-1866.34	-219.26	-1600.74	5738238.96	565735.38
2659	33.47	283.31	1899.99	-1867.17	-219.13	-1601.28	5738239.09	565734.84
2660	33.45	283.32	1900.82	-1868	-219.01	-1601.82	5738239.22	565734.31
2661	33.44	283.32	1901.66	-1868.84	-218.88	-1602.35	5738239.34	565733.77
2662	33.44	283.3	1902.49	-1869.67	-218.76	-1602.89	5738239.47	565733.23
2663	33.45	283.28	1903.33	-1870.51	-218.63	-1603.43	5738239.59	565732.69
2664	33.45	283.26	1904.16	-1871.34	-218.51	-1603.97	5738239.72	565732.15
2665	33.45	283.24	1904.99	-1872.17	-218.38	-1604.51	5738239.84	565731.62
2666	33.45	283.23	1905.83	-1873.01	-218.26	-1605.04	5738239.96	565731.08
2667	33.46	283.21	1906.66	-1873.84	-218.13	-1605.58	5738240.09	565730.54
2668	33.46	283.19	1907.5	-1874.68	-218.01	-1606.12	5738240.21	565730
2669	33.46	283.17	1908.33	-1875.51	-217.88	-1606.66	5738240.34	565729.47
2670	33.47	283.15	1909.16	-1876.34	-217.76	-1607.19	5738240.46	565728.93
2671	33.47	283.13	1910	-1877.18	-217.64	-1607.73	5738240.59	565728.39
2672	33.47	283.11	1910.83	-1878.01	-217.51	-1608.27	5738240.71	565727.85
2673	33.48	283.09	1911.67	-1878.85	-217.39	-1608.81	5738240.84	565727.32
2674	33.48	283.07	1912.5	-1879.68	-217.26	-1609.34	5738240.96	565726.78
2675	33.48	283.05	1913.33	-1880.51	-217.14	-1609.88	5738241.08	565726.24
2676	33.49	283.03	1914.17	-1881.35	-217.01	-1610.42	5738241.21	565725.7
2677	33.49	283.01	1915	-1882.18	-216.89	-1610.96	5738241.33	565725.17
2678	33.49	282.99	1915.84	-1883.02	-216.76	-1611.49	5738241.46	565724.63
2679	33.5	282.97	1916.67	-1883.85	-216.64	-1612.03	5738241.58	565724.09
2680	33.5	282.95	1917.5	-1884.68	-216.52	-1612.57	5738241.71	565723.55
2681	33.5	282.93	1918.34	-1885.52	-216.39	-1613.1	5738241.83	565723.02
2682	33.5	282.91	1919.17	-1886.35	-216.27	-1613.64	5738241.96	565722.48
2683	33.51	282.89	1920.01	-1887.19	-216.14	-1614.18	5738242.08	565721.94
2684	33.51	282.87	1920.84	-1888.02	-216.02	-1614.72	5738242.2	565721.4
2685	33.51	282.85	1921.67	-1888.85	-215.89	-1615.25	5738242.33	565720.87
2686	33.52	282.83	1922.51	-1889.69	-215.77	-1615.79	5738242.45	565720.33
2687	33.52	282.81	1923.34	-1890.52	-215.64	-1616.33	5738242.58	565719.79
2688	33.52	282.79	1924.18	-1891.36	-215.52	-1616.87	5738242.7	565719.25
2689	33.53	282.77	1925.01	-1892.19	-215.4	-1617.4	5738242.83	565718.72
2690	33.53	282.75	1925.84	-1893.02	-215.27	-1617.94	5738242.95	565718.18
2691	33.54	282.73	1926.68	-1893.86	-215.15	-1618.48	5738243.07	565717.64
2692	33.55	282.71	1927.51	-1894.69	-215.03	-1619.03	5738243.19	565717.1
2693	33.56	282.68	1928.34	-1895.52	-214.91	-1619.57	5738243.31	565716.55
2694	33.58	282.66	1929.17	-1896.35	-214.79	-1620.11	5738243.43	565716.01
2695	33.59	282.64	1930	-1897.18	-214.67	-1620.65	5738243.55	565715.47
2696	33.6	282.61	1930.84	-1898.02	-214.55	-1621.19	5738243.67	565714.93
2697	33.61	282.59	1931.67	-1898.85	-214.44	-1621.73	5738243.79	565714.39
2698	33.62	282.56	1932.5	-1899.68	-214.32	-1622.28	5738243.91	565713.84
2699	33.63	282.54	1933.33	-1900.51	-214.2	-1622.82	5738244.03	565713.3
2700	33.65	282.52	1934.16	-1901.34	-214.08	-1623.36	5738244.14	565712.76
2701	33.66	282.49	1935	-1902.18	-213.96	-1623.9	5738244.26	565712.22
2702	33.67	282.47	1935.83	-1903.01	-213.84	-1624.44	5738244.38	565711.68
2703	33.68	282.45	1936.66	-1903.84	-213.72	-1624.99	5738244.5	565711.14
2704	33.69	282.42	1937.49	-1904.67	-213.6	-1625.53	5738244.62	565710.59
2705	33.71	282.4	1938.32	-1905.5	-213.48	-1626.07	5738244.74	565710.05

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2706	33.72	282.37	1939.16	-1906.34	-213.36	-1626.61	5738244.86	565709.51
2707	33.73	282.35	1939.99	-1907.17	-213.24	-1627.15	5738244.98	565708.97
2708	33.74	282.33	1940.82	-1908	-213.12	-1627.7	5738245.1	565708.43
2709	33.75	282.3	1941.65	-1908.83	-213	-1628.24	5738245.22	565707.88
2710	33.77	282.28	1942.48	-1909.66	-212.89	-1628.78	5738245.34	565707.34
2711	33.78	282.26	1943.32	-1910.5	-212.77	-1629.32	5738245.46	565706.8
2712	33.79	282.23	1944.15	-1911.33	-212.65	-1629.86	5738245.58	565706.26
2713	33.8	282.21	1944.98	-1912.16	-212.53	-1630.4	5738245.69	565705.72
2714	33.81	282.18	1945.81	-1912.99	-212.41	-1630.95	5738245.81	565705.17
2715	33.82	282.16	1946.64	-1913.82	-212.29	-1631.49	5738245.93	565704.63
2716	33.84	282.14	1947.47	-1914.65	-212.17	-1632.03	5738246.05	565704.09
2717	33.85	282.11	1948.31	-1915.49	-212.05	-1632.57	5738246.17	565703.55
2718	33.86	282.09	1949.14	-1916.32	-211.93	-1633.11	5738246.29	565703.01
2719	33.87	282.07	1949.97	-1917.15	-211.81	-1633.66	5738246.41	565702.47
2720	33.86	282.05	1950.8	-1917.98	-211.7	-1634.2	5738246.52	565701.92
2721	33.85	282.03	1951.63	-1918.81	-211.59	-1634.74	5738246.64	565701.38
2722	33.84	282.01	1952.47	-1919.65	-211.47	-1635.29	5738246.75	565700.83
2723	33.83	281.99	1953.3	-1920.48	-211.36	-1635.83	5738246.86	565700.29
2724	33.82	281.97	1954.13	-1921.31	-211.25	-1636.37	5738246.98	565699.75
2725	33.81	281.95	1954.96	-1922.14	-211.13	-1636.92	5738247.09	565699.2
2726	33.8	281.92	1955.79	-1922.97	-211.02	-1637.46	5738247.2	565698.66
2727	33.8	281.9	1956.62	-1923.8	-210.91	-1638.01	5738247.32	565698.12
2728	33.79	281.88	1957.46	-1924.64	-210.79	-1638.55	5738247.43	565697.57
2729	33.78	281.86	1958.29	-1925.47	-210.68	-1639.09	5738247.54	565697.03
2730	33.77	281.84	1959.12	-1926.3	-210.57	-1639.64	5738247.66	565696.48
2731	33.76	281.82	1959.95	-1927.13	-210.45	-1640.18	5738247.77	565695.94
2732	33.75	281.8	1960.78	-1927.96	-210.34	-1640.72	5738247.88	565695.4
2733	33.74	281.78	1961.61	-1928.79	-210.23	-1641.27	5738248	565694.85
2734	33.73	281.76	1962.44	-1929.62	-210.11	-1641.81	5738248.11	565694.31
2735	33.72	281.74	1963.28	-1930.46	-210	-1642.36	5738248.22	565693.77
2736	33.71	281.72	1964.11	-1931.29	-209.89	-1642.9	5738248.34	565693.22
2737	33.7	281.7	1964.94	-1932.12	-209.77	-1643.44	5738248.45	565692.68
2738	33.7	281.68	1965.77	-1932.95	-209.66	-1643.99	5738248.56	565692.13
2739	33.69	281.66	1966.6	-1933.78	-209.55	-1644.53	5738248.68	565691.59
2740	33.68	281.64	1967.43	-1934.61	-209.43	-1645.07	5738248.79	565691.05
2741	33.67	281.62	1968.27	-1935.45	-209.32	-1645.62	5738248.9	565690.5
2742	33.66	281.6	1969.1	-1936.28	-209.21	-1646.16	5738249.02	565689.96
2743	33.65	281.58	1969.93	-1937.11	-209.09	-1646.71	5738249.13	565689.42
2744	33.64	281.56	1970.76	-1937.94	-208.98	-1647.25	5738249.24	565688.87
2745	33.63	281.54	1971.59	-1938.77	-208.87	-1647.79	5738249.36	565688.33
2746	33.62	281.52	1972.42	-1939.6	-208.75	-1648.34	5738249.47	565687.78
2747	33.61	281.5	1973.26	-1940.44	-208.64	-1648.88	5738249.58	565687.24
2748	33.6	281.47	1974.09	-1941.27	-208.53	-1649.42	5738249.69	565686.7
2749	33.59	281.45	1974.92	-1942.1	-208.42	-1649.96	5738249.8	565686.16
2750	33.57	281.42	1975.76	-1942.94	-208.32	-1650.5	5738249.91	565685.62
2751	33.55	281.4	1976.59	-1943.77	-208.21	-1651.04	5738250.01	565685.08
2752	33.54	281.37	1977.43	-1944.61	-208.1	-1651.58	5738250.12	565684.54
2753	33.52	281.34	1978.26	-1945.44	-208	-1652.12	5738250.22	565684
2754	33.51	281.32	1979.1	-1946.28	-207.89	-1652.66	5738250.33	565683.46
2755	33.49	281.29	1979.93	-1947.11	-207.79	-1653.2	5738250.44	565682.92
2756	33.48	281.27	1980.77	-1947.95	-207.68	-1653.74	5738250.54	565682.38
2757	33.46	281.24	1981.6	-1948.78	-207.57	-1654.28	5738250.65	565681.84
2758	33.45	281.21	1982.44	-1949.62	-207.47	-1654.82	5738250.75	565681.3
2759	33.43	281.19	1983.27	-1950.45	-207.36	-1655.36	5738250.86	565680.76
2760	33.42	281.16	1984.11	-1951.29	-207.26	-1655.9	5738250.97	565680.22
2761	33.4	281.14	1984.94	-1952.12	-207.15	-1656.44	5738251.07	565679.68
2762	33.38	281.11	1985.78	-1952.96	-207.04	-1656.98	5738251.18	565679.14
2763	33.37	281.08	1986.61	-1953.79	-206.94	-1657.52	5738251.29	565678.6

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2764	33.35	281.06	1987.45	-1954.63	-206.83	-1658.06	5738251.39	565678.06
2765	33.34	281.03	1988.28	-1955.46	-206.72	-1658.6	5738251.5	565677.52
2766	33.32	281.01	1989.12	-1956.3	-206.62	-1659.14	5738251.6	565676.98
2767	33.31	280.98	1989.95	-1957.13	-206.51	-1659.68	5738251.71	565676.44
2768	33.29	280.95	1990.79	-1957.97	-206.41	-1660.22	5738251.82	565675.9
2769	33.28	280.93	1991.62	-1958.8	-206.3	-1660.76	5738251.92	565675.36
2770	33.26	280.9	1992.46	-1959.64	-206.19	-1661.3	5738252.03	565674.82
2771	33.24	280.88	1993.29	-1960.47	-206.09	-1661.84	5738252.13	565674.28
2772	33.23	280.85	1994.13	-1961.31	-205.98	-1662.38	5738252.24	565673.74
2773	33.21	280.82	1994.96	-1962.14	-205.88	-1662.92	5738252.35	565673.2
2774	33.2	280.8	1995.8	-1962.98	-205.77	-1663.46	5738252.45	565672.66
2775	33.18	280.77	1996.63	-1963.81	-205.66	-1664	5738252.56	565672.12
2776	33.17	280.75	1997.47	-1964.65	-205.56	-1664.54	5738252.66	565671.58
2777	33.16	280.74	1998.31	-1965.49	-205.46	-1665.08	5738252.77	565671.04
2778	33.15	280.73	1999.14	-1966.32	-205.36	-1665.61	5738252.87	565670.51
2779	33.14	280.72	1999.98	-1967.16	-205.26	-1666.15	5738252.97	565669.97
2780	33.13	280.71	2000.82	-1968	-205.16	-1666.68	5738253.07	565669.44
2781	33.12	280.7	2001.66	-1968.84	-205.06	-1667.22	5738253.17	565668.9
2782	33.11	280.7	2002.5	-1969.68	-204.96	-1667.76	5738253.27	565668.37
2783	33.1	280.69	2003.34	-1970.52	-204.85	-1668.29	5738253.37	565667.83
2784	33.09	280.68	2004.17	-1971.35	-204.75	-1668.83	5738253.47	565667.29
2785	33.08	280.67	2005.01	-1972.19	-204.65	-1669.36	5738253.57	565666.76
2786	33.07	280.66	2005.85	-1973.03	-204.55	-1669.9	5738253.67	565666.22
2787	33.06	280.65	2006.69	-1973.87	-204.45	-1670.44	5738253.77	565665.69
2788	33.05	280.64	2007.53	-1974.71	-204.35	-1670.97	5738253.87	565665.15
2789	33.04	280.63	2008.37	-1975.55	-204.25	-1671.51	5738253.97	565664.61
2790	33.03	280.62	2009.2	-1976.38	-204.15	-1672.04	5738254.07	565664.08
2791	33.02	280.62	2010.04	-1977.22	-204.05	-1672.58	5738254.17	565663.54
2792	33.02	280.61	2010.88	-1978.06	-203.95	-1673.11	5738254.27	565663.01
2793	33.01	280.6	2011.72	-1978.9	-203.85	-1673.65	5738254.37	565662.47
2794	33	280.59	2012.56	-1979.74	-203.75	-1674.19	5738254.47	565661.94
2795	32.99	280.58	2013.4	-1980.58	-203.65	-1674.72	5738254.57	565661.4
2796	32.98	280.57	2014.23	-1981.41	-203.55	-1675.26	5738254.68	565660.86
2797	32.97	280.56	2015.07	-1982.25	-203.45	-1675.79	5738254.78	565660.33
2798	32.96	280.55	2015.91	-1983.09	-203.35	-1676.33	5738254.88	565659.79
2799	32.95	280.54	2016.75	-1983.93	-203.25	-1676.86	5738254.98	565659.26
2800	32.94	280.54	2017.59	-1984.77	-203.15	-1677.4	5738255.08	565658.72
2801	32.93	280.53	2018.43	-1985.61	-203.05	-1677.94	5738255.18	565658.18
2802	32.92	280.52	2019.26	-1986.44	-202.94	-1678.47	5738255.28	565657.65
2803	32.91	280.51	2020.1	-1987.28	-202.84	-1679.01	5738255.38	565657.11
2804	32.9	280.5	2020.94	-1988.12	-202.74	-1679.54	5738255.48	565656.58

APPENDIX 2a

BREAM A19A

Petrophysics Evaluation Summary

Esso Australia Pty Ltd.

Exploration Department

Bream A19A
Petrophysics Report

Petrophysicist: B.L. Rayner

March 2006

INTRODUCTION

Bream A19A is a directional well designed to intersect the N-1 oil reservoir west of a mapped channel cut through the Bream A field.

Bream A19A was kicked-off from the 10¾" surface casing from 1436.0 mMDRT and drilled to a Total Depth of 2804.0 mMDRT (2020.94 mTVDRT) in an 8½" production hole.

LWD GR and D&I data was acquired using Schlumberger Drilling & Measurements PowerPulse while drilling from 1434 mMDRT to 2804 mMDRT.

After reaching TD, the well was logged up in memory mode with Precision Energy Service's shuttle on drill pipe from 2801 mMDRT to 1434 mMDRT.

The Precision logs were depth matched to the Schlumberger GR log and analysed for porosity, water saturation and net pay over the interval 2590 - 2790 mMDRT.

Note that all depths quoted in this report are logged mMDRT unless otherwise specified.

DATA

Data from the following logging surveys were used in the interpretation:

Survey/Log	Suite	Company	Top (m MDRT)	Bottom (m MDRT)
LWD-GR	3	Schlumberger	1434	2804
Dual Laterolog (DDLL, DSLL), Gamma Ray (GRGC), Photo Density (PDPE, DEN), Caliper (CLDC), Compensated Neutron (NPRL) and Compensated Sonic (DT)	1	Precision	1434	2787

Deviation
The well deviation over the reservoir interval was 32.9° towards an average azimuth of 280.5°.

Mud Data

Mud Type:	KCl/Glycol/PHPA
Mud Weight:	10.1 ppg
Rm:	0.228 @ 25 °C
Rmf:	0.091 @ 25 °C
Rmc:	0.359 @ 25 °C
KCL	8%
BHT:	70.6 °C (as measured by the Precision tools)

Hole Size
1434 - 2804 mMDRT 8 ½ inches

Data Acquisition & Log Quality
Good quality Schlumberger D&M LWD data and Precision shuttle data were acquired without incident.

Data Processing
The LWD-GR is the primary depth reference for this well and all the shuttle logs have been depth matched to the LWD-GR.

As the shuttle GR 1st reading was shallow to the LWD GR (1st reading of the shuttle GR was 2768 mMDRT, 1st reading of the LWD-GR log measurement is 2785 mMDRT) a complete GR for the well was generated by depth splicing the two GR

The resistivity logs (DDLL & DSLL) and the bulk density logs (DEN & related curves) were depth matched to the composite GR curve. The neutron logs (NPRL & related curves) and the sonic logs (DT-35 & related curves) were depth matched to the GR depth matched DEN curve.

The PDPE showed a sinusoidal habit that parallels the CLDC curve. The sinuosity is thought to reflect the rugosity rather than lithology. In order to damp this effect the PDPE was smoothed using a filter with a running average of 9 levels. Uma was computed using the following formulae:

Uma = (PEFfiltered-0.25)*((DEN + 0.1883)/1.0704)

INTERPRETATION

Logs Used

The primary logs used in the interpretation were the depth matched DDLL (deep resistivity), GR (composite gamma from GRGC and the basal LWD-GR), DEN (bulk density), PDPE (photo-electric effect) and NPRL (thermal neutron porosity). In addition coal intervals were identified using a coal flag (Flag_coal). Hydrocarbon types were denoted using a hydrocarbon flag (Flag_rhoh). A temperature log was created using the following data:

Depth (mMDRT)	Temperature (deg. C)
92	10
2787	81

The temperature at depth 92 mMDRT represents the temperature of the sea-bed and the temperature at 2787 mMDRT (first reading of the Precision logs) is the estimated formation temperature –BHT +10 deg.

A volcanic horizon is recognised in this well over the interval 2681 – 2685 mMDRT. This is based on the following characteristic combination of log responses: low GR response together with relatively low resistivity and shale like density-neutron separation.

The Bream A19A Intra-Gurnard Sandstone from 2611.6 – 2615.7 mMDRT and the "Waste" zone from 2685 – 2690.3 mMDRT are both hydrocarbon bearing as indicated by a significant increase in mud gas when drilled. However, unlike the hydrocarbon bearing zones below 2690.3 mMDRT, the resistivity (DDLL) across both the Intra-Gurnard Sandstone and the "Waste" zone are suppressed. It is thought that a combination of clay and conductive minerals are responsible for the suppressed resistivity, resulting in pessimistic water saturation estimates.

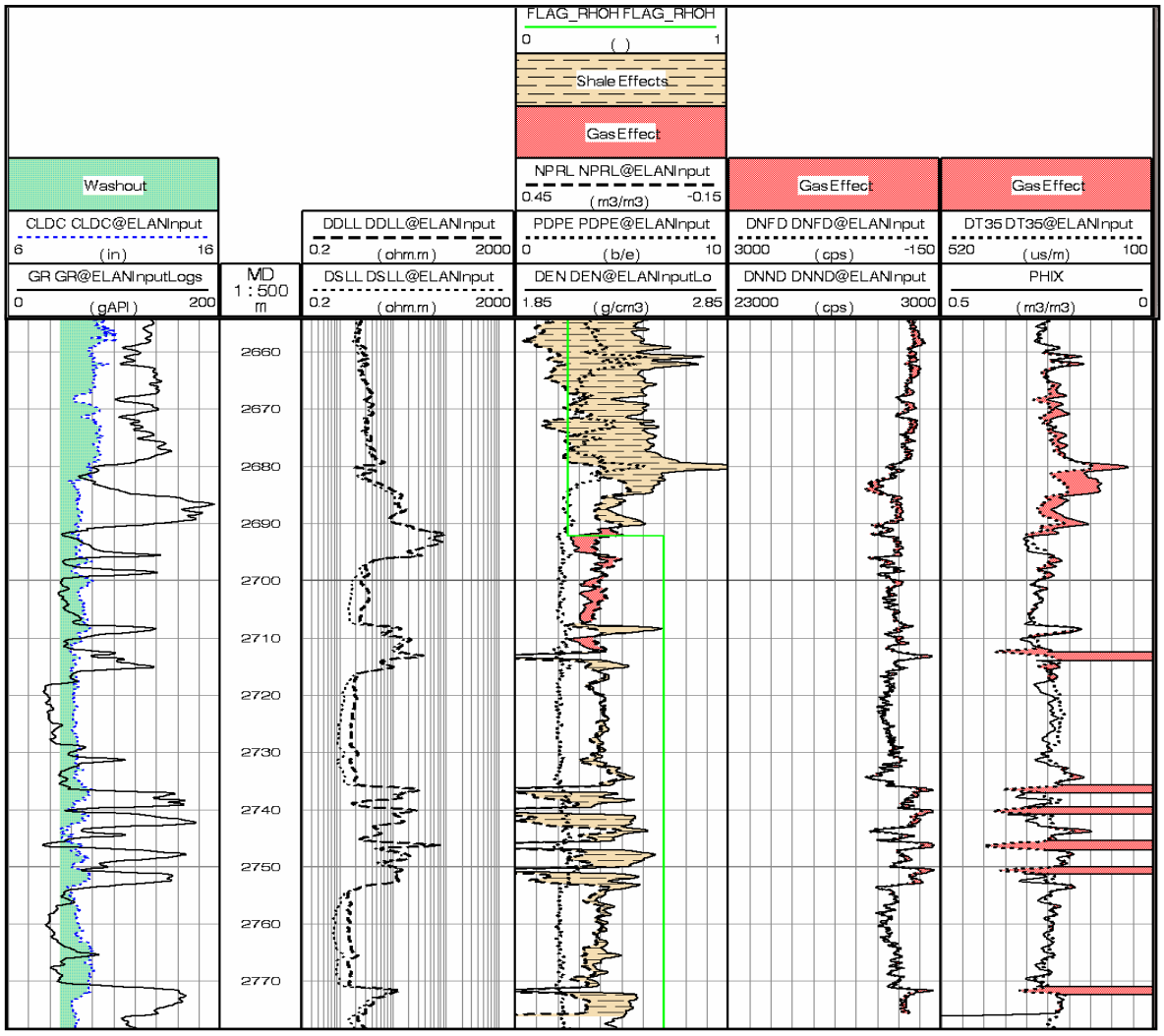
Several radioactive reservoir sands are present in the interval 2590 – 2708 mMDRT and the GR proved to be a poor clay indicator across this interval. The approach taken here to adequately characterise the clay content was to use both the U and GR measurements below 2708 mMDRT, but only the U measurement over the interval 2590 – 2708 mMDRT.

Formation Water Salinity

R_{wa} analysis using a = 1, m = 2 and n = 2 indicates clean water sands have an apparent formation water salinity of 25,000 ppm NaCl equivalent throughout the zone of interest.

Hydrocarbon Type Identification

A combination of resistivity, density-neutron logs, total Near-Far neutron counts, mud log shows and production from nearby Bream A wells were used to determine hydrocarbon types present in the reservoirs. In this well the neutron – density porosity curves did not highlight the gas effect as clearly as in some other Bream A wells and a comparison of PHIX vs DT was useful in highlighting the CGOC (See below).



The following table lists the determination made using this process:

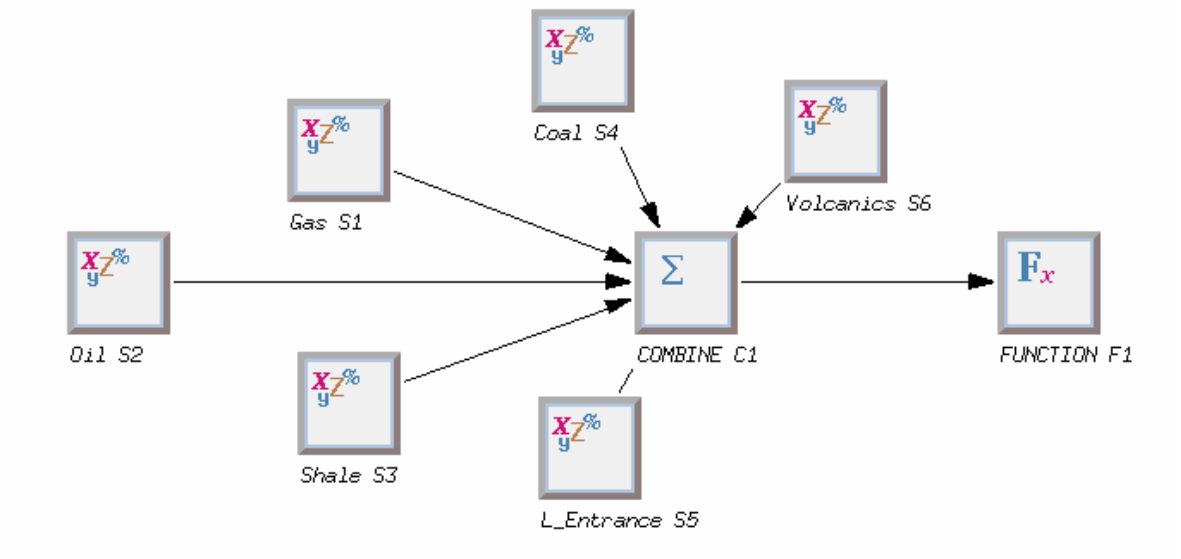
Zone	Top Depth mMD	Bottom Depth mMD	Comments
Intra_Gur_Gas	2611.6	2615.7	Gas Bearing
N1_Waste_Gas	2685.0	2690.3	Gas Bearing
N1_Red_Gas	2690.3	2692.3	Gas Bearing
N1_Red_Oil	2692.3	2696.0	Oil Bearing
N1_Red_Resid	2696.0	2707.9	Residual Oil & Gas
N1_Grn_Oil	2709.1	2712.2	Oil Bearing
N1_Grn_Resid	2714.0	2715.9	Residual Oil & Gas
N1_Grn_Water	2715.9	2735.8	Water Bearing
N1_Cob_Water	2737.2	2739.5	Water Bearing
N1_Pnk_Upp_Water	2742.9	2745.4	Water Bearing
N1_Pnk_Mid_Water	2748.8	2749.8	Water Bearing
N1_Pnk_Lwr_Water	2753.3	2770.8	Water Bearing

Shale Volume, Porosity and Water Saturation

Schlumberger's Geoframe ELAN+ module was used to determine mineral volumes, total porosity, effective porosity and effective saturation. The details of the models are illustrated in the figures and tables below.

ELAN+ MODEL

Elan+ Model and Module Configuration



ELAN Input Channels

Log Curve Selector | Selector Options

	Compound Name Spec	BREAM A19A
TEMP_CH	TEMP;*	TEMP TEMP@ELANInputLogs;4 [A1472548]
RHOB_IFAC_CH	IFRH;*	
NPHI_IFAC_CH	INPH;*	
RHOB_CH	DEN:BPB;*	DEN DEN@ELANInputLogs;8 .REVISED .REVISED
NPHI_CH	NPRL:BPB;*	NPRL NPRL@ELANInputLogs;6 [A1472531]
U_CH	U;*	U U@ELANInputLogs;4 [A1472541]
PHIT_CH	NPRL:BPB;*	NPRL NPRL@ELANInputLogs;6 [A1472531]
CUDC_CH/RT_CH	DDLL:BPB;*	DDLL DDLL@ELANInputLogs;6 [A1472523]
GR_CH	GR;*	GR GR@ELANInputLogs;9 [A1472546]
M_CH	MXP;*	
N_CH	SXP;*	
PRB1_CH	FLAG_RHOH;*	FLAG_RHOH FLAG_RHOH@ELANInputLogs;6 .RE
PRB2_CH	DEPT;*	DEPT DEPT@ELANInputLogs;4 [A1472550]
PRB3_CH	PRB3;*	
PRB4_CH	FLAG_COAL;*	FLAG_COAL FLAG_COAL@ELANInputLogs;7 .REV
PRB5_CH		
PRB6_CH	FLAG_VOLC;*	FLAG_VOLC.WELLEDIT FLAG_VOLC@Volcanic;2 .'

ELAN Global Parameters

Reference Index	MD
Processing Interval	2599.9949(m) To 2790.0000(m)
Sampling Rate	0.3281(m)
Uncertainty Channel	FALSE
Clay Input	DRY
Special Fluids	IMMOVABLE_HYDROCARBON

ELAN Zone Definition

Name	Bottom To Top
N1_useGR	2790.0000(m) To 2708.0000(m)
N1_usePEF	2708.0000(m) To 2690.3000(m)
Waste	2690.3000(m) To 2681.0000(m)
Waste 2	2681.0000(m) To 2615.9998(m)
Waste 1	2615.9998(m) To 2599.9949(m)

ELAN Process Definition

Process SOLVE1 "Gas"
Equations RHOB NPHI U CUDC_DWA GR CT1
Volumes QUAR ORTH PYRI ILLI XWAT UWAT XGAS UGAS

Constraint Zones	Bottom	Top
UNDEFINED	2790.0000(m)	2599.9949(m)

Constraints Applied
UNDEFINED - WaterBaseMud_SXO_gt_SW
UNDEFINED - IrreducibleXWater
UNDEFINED - IrreducibleUWater

Process SOLVE2 "Oil"
Equations RHOB NPHI U CUDC_DWA GR CT2
Volumes QUAR ORTH ILLI XWAT UWAT XOIL UOIL

Constraint Zones	Bottom	Top
UNDEFINED	2790.0000(m)	2599.9949(m)

Constraints Applied
UNDEFINED - IrreducibleXWater
UNDEFINED - IrreducibleUWater
UNDEFINED - WaterBaseMud_SXO_gt_SW

Process SOLVE3 "Shale"
Equations RHOB NPHI CUDC_DWA GR
Volumes QUAR ILLI XWAT UWAT

Constraint Zones	Bottom	Top
UNDEFINED	2790.0000(m)	2599.9949(m)

Process SOLVE4 "Coal"
Equations RHOB
Volumes COAL

Constraint Zones	Bottom	Top
UNDEFINED	2790.0000(m)	2599.9949(m)

Process SOLVE5 "L_Entrance"
Equations RHOB
Volumes ILLI

Constraint Zones	Bottom	Top
UNDEFINED	2790.0000(m)	2599.9949(m)

Process SOLVE6 "Volcanics"
Equations RHOB
Volumes IGNE

Constraint Zones	Bottom	Top
UNDEFINED	2790.0000(m)	2599.9949(m)

Process COMBINE 1 "COMBINE"
Order SOL.2 SOL.1 SOL.3 SOL.4 SOL.6 SOL.5
Combine Method
"Coarse Clast" 9153.5430 (m) Internal Average
"Gurnard " 8562.9922 (m) Sol.5
Probability Functions
probability(SOL.4, PRB4_CH)
probability(SOL.6, PRB6_CH)

prob3 = linear(ILLI_VOL.SOL.3, 0.3, 0, 0.5, 1)
probability(SOL.3, prob3)

prob1 = if (PRB1_CH <=0.25, 1, 0)
probability(SOL.1, prob1)

Process FUNCTION 1 "FUNCTION"
Outputs VCL SXWI SWT SUWI PIGN PHIT
User-defined Function/n swt_cmp=if((PRB4_CH > 0),1,(UWAT_VOL + XBWA_VOL)/(UWAT_VOL + XBWA_VOL + UOIL_VOL + UGAS_VOL))
output(SWT, swt_cmp)

ELAN Different Parameters

Parameters	N1_useGR	N1_usePEF	Waste	Waste 2
n**********	*********	*********	*********	*********
CXDC_XWAT (mS/m)	18.736	18.260	18.164	18.113
CXDC_XBWA (mS/m)	10.707	10.432	10.377	10.347
CUDC_UWAT (mS/m)	7.679	7.663	7.657	7.650
CUDC_UBWA (mS/m)	3.266	3.259	7.898	6.316
WCLP_ILLI (m3/m3)	0.154	0.154	0.154	0.240
RW (ohm.m)	0.568	0.556	0.554	0.553
GR_UNC_WM ( )	0.300	0.000	0.000	0.000

Parameters	Waste 1			
n**********	*********	*********	*********	*********
CXDC_XWAT (mS/m)	17.761			
CXDC_XBWA (mS/m)	10.143			
CUDC_UWAT (mS/m)	7.633			
CUDC_UBWA (mS/m)	7.871			
WCLP_ILLI (m3/m3)	0.240			
RW (ohm.m)	0.544			
GR_UNC_WM ( )	0.000			

ELAN Same Parameters

Parameter	Value	Parameter	Value
RHOB_QUAR	2.650(g/cm3)	RHOB_CALC	2.710(g/cm3)
RHOB_DOLO	2.847(g/cm3)	RHOB_ORTH	2.570(g/cm3)
RHOB_PYRI	4.990(g/cm3)	RHOB_GLAU	2.650(g/cm3)
RHOB_ILLI	2.780(g/cm3)	RHOB_KAOL	2.620(g/cm3)
RHOB_COAL	1.200(g/cm3)	RHOB_IGNE	3.000(g/cm3)
RHOB_XWAT	1.000(g/cm3)	RHOB_UWAT	0.987(g/cm3)
RHOB_XOIL	0.500(g/cm3)	RHOB_UOIL	0.500(g/cm3)
RHOB_XGAS	-0.018(g/cm3)	RHOB_UGAS	-0.018(g/cm3)
RHOB_XBWA	0.976(g/cm3)	NPHI_QUAR	-0.059(m3/m3)
NPHI_CALC	0.000(m3/m3)	NPHI_DOLO	0.032(m3/m3)
NPHI_ORTH	-0.010(m3/m3)	NPHI_PYRI	0.008(m3/m3)
NPHI_GLAU	0.410(m3/m3)	NPHI_ILLI	0.247(m3/m3)
NPHI_KAOL	0.450(m3/m3)	NPHI_COAL	0.450(m3/m3)
NPHI_IGNE	-0.010(m3/m3)	NPHI_XWAT	1.000(m3/m3)
NPHI_UWAT	1.000(m3/m3)	NPHI_XOIL	0.600(m3/m3)
NPHI_UOIL	0.600(m3/m3)	NPHI_XGAS	0.156(m3/m3)
NPHI_UGAS	0.156(m3/m3)	NPHI_XBWA	1.000(m3/m3)
DT_QUAR	55.500(us/m)	DT_CALC	47.800(us/m)
DT_DOLO	43.500(us/m)	DT_ORTH	60.000(us/m)
DT_ILLI	60.000(us/m)	DT_KAOL	91.318(us/m)
DT_COAL	121.920(us/m)	DT_IGNE	16.916(us/m)
DT_XWAT	0.000(us/m)	DT_UWAT	220.000(us/m)
DT_XOIL	0.000(us/m)	DT_UOIL	240.000(us/m)
DT_XGAS	0.000(us/m)	DT_UGAS	289.865(us/m)
DT_XBWA	189.000(us/m)	U_QUAR	5.000( )
U_CALC	14.100( )	U_DOLO	9.100( )
U_ORTH	8.700( )	U_PYRI	82.060( )
U_ILLI	9.900( )	U_KAOL	5.100( )
U_COAL	1.000( )	U_IGNE	1.000( )
U_XWAT	0.692( )	U_UWAT	0.000( )
U_XOIL	0.136( )	U_UOIL	0.000( )
U_XGAS	0.012( )	U_UGAS	0.000( )
U_XBWA	0.398( )	CXDC_ILLI	-999.250(mS/m)
CXDC_KAOL	-999.250(mS/m)	CUDC_GLAU	-999.250(mS/m)
CUDC_ILLI	-999.250(mS/m)	CUDC_KAOL	-999.250(mS/m)
GR_QUAR	40.000(gAPI)	GR_CALC	11.000(gAPI)
GR_DOLO	3.000(gAPI)	GR_ORTH	200.000(gAPI)
GR_PYRI	0.000(gAPI)	GR_GLAU	150.000(gAPI)
GR_ILLI	220.000(gAPI)	GR_KAOL	98.000(gAPI)
GR_COAL	40.000(gAPI)	GR_IGNE	40.000(gAPI)
GR_XWAT	0.000(gAPI)	GR_UWAT	0.000(gAPI)
GR_XOIL	0.000(gAPI)	GR_UOIL	0.000(gAPI)
GR_XGAS	0.000(gAPI)	GR_UGAS	0.000(gAPI)
GR_XBWA	0.000(gAPI)	EX1_QUAR	0.000( )
EX1_CALC	0.000( )	EX1_ORTH	0.000( )
EX1_PYRI	0.000( )	EX1_ILLI	0.000( )
EX1_COAL	0.000( )	EX1_XWAT	0.000( )
EX1_UWAT	0.000( )	EX1_XOIL	0.000( )
EX1_UOIL	0.000( )	EX1_XGAS	0.000( )
EX1_UGAS	0.000( )	EX1_XBWA	0.000( )

CT1_QUAR	0.000( )	CT1_CALC	0.000( )
CT1_DOLO	0.000( )	CT1_ORTH	0.000( )
CT1_PYRI	0.000( )	CT1_GLAU	0.000( )
CT1_ILLI	0.000( )	CT1_KAOL	0.000( )
CT1_COAL	0.000( )	CT1_IGNE	0.000( )
CT1_XWAT	0.000( )	CT1_UWAT	0.000( )
CT1_XOIL	0.000( )	CT1_UOIL	0.000( )
CT1_XGAS	1.000( )	CT1_UGAS	-0.300( )
CT1_XBWA	0.000( )	CT2_QUAR	0.000( )
CT2_CALC	0.000( )	CT2_DOLO	0.000( )
CT2_ORTH	0.000( )	CT2_PYRI	0.000( )
CT2_GLAU	0.000( )	CT2_ILLI	0.000( )
CT2_KAOL	0.000( )	CT2_COAL	0.000( )
CT2_IGNE	0.000( )	CT2_XWAT	0.000( )
CT2_UWAT	0.000( )	CT2_XOIL	1.000( )
CT2_UOIL	-0.300( )	CT2_XGAS	0.000( )
CT2_UGAS	0.000( )	CT2_XBWA	0.000( )
CT3_QUAR	-0.100( )	CT3_CALC	0.000( )
CT3_ORTH	1.000( )	CT3_PYRI	0.000( )
CT3_GLAU	0.000( )	CT3_ILLI	0.000( )
CT3_KAOL	0.000( )	CT3_COAL	0.000( )
CT3_XWAT	0.000( )	CT3_UWAT	0.000( )
CT3_XOIL	0.000( )	CT3_UOIL	0.000( )
CT3_XGAS	0.000( )	CT3_UGAS	0.000( )
CT3_XBWA	0.000( )	CT4_QUAR	0.010( )
CT4_CALC	0.000( )	CT4_ORTH	0.000( )
CT4_PYRI	-1.000( )	CT4_GLAU	0.000( )
CT4_ILLI	0.000( )	CT4_COAL	0.000( )
CT4_XWAT	0.000( )	CT4_UWAT	0.000( )
CT4_XOIL	0.000( )	CT4_UOIL	0.000( )
CT4_XGAS	0.000( )	CT4_UGAS	0.000( )
CT4_XBWA	0.000( )	ARHOB_GLAU	2.960(g/cm3)
ARHOB_ILLI	2.780(g/cm3)	ARHOB_KAOL	2.620(g/cm3)
WCLP_GLAU	0.156(m3/m3)	WCLP_KAOL	0.058(m3/m3)
CBWA_GLAU	-999.250(mS/m)	CBWA_ILLI	-999.250(mS/m)
CBWA_KAOL	-999.250(mS/m)	CECA_GLAU	0.233(meq/g)
CECA_ILLI	0.200(meq/g)	CECA_KAOL	0.090(meq/g)
RMF	0.160(ohm.m)	MST	61.880(degC)
RWT	-999.250(degC)	SALIN_ISOL	-999.250(ppk)
SALIN_PARA	-999.250(ppk)	SALIN_XWAT	12.924(ppk)
SALIN_UWAT	30.000(ppk)	SALIN_XIWA	-999.250(ppk)
SALIN_UIWA	-999.250(ppk)	SALIN_XOIL	0.000(ppk)
SALIN_UOIL	0.000(ppk)	SALIN_XGAS	0.000(ppk)
SALIN_UGAS	0.000(ppk)	SALIN_XSFL	-999.250(ppk)
SALIN_USFL	-999.250(ppk)	CT1_ZP	0.000( )
CT2_ZP	0.000( )	CT3_ZP	0.000( )
CT4_ZP	0.000( )	RHOB_UNC_ZP	0.027(g/cm3)
NPHI_UNC_ZP	0.015(m3/m3)	DT_UNC_ZP	2.250(us/m)
U_UNC_ZP	0.225( )	CXDC_UNC_ZP	0.072(mS/m)
CUDC_UNC_ZP	0.046(mS/m)	GR_UNC_ZP	2.250(gAPI)
EX1_UNC_ZP	0.015( )	CT1_UNC_ZP	0.015( )
CT2_UNC_ZP	0.015( )	CT3_UNC_ZP	0.015( )
CT4_UNC_ZP	0.015( )	VOLS_UNC_ZP	0.015(m3/m3)

RHOB_UNC_WM	1.000( )	NPHI_UNC_WM	1.000( )
DT_UNC_WM	0.300( )	U_UNC_WM	0.600( )
CXDC_UNC_WM	0.500( )	CUDC_UNC_WM	0.670( )
EX1_UNC_WM	1.000( )	CT1_UNC_WM	0.800( )
CT2_UNC_WM	0.800( )	CT3_UNC_WM	0.900( )
CT4_UNC_WM	1.000( )	VOLS_UNC_WM	1.000( )
RHOB_IFAC_ZP	0.600( )	NPHI_IFAC_ZP	0.400( )
A_ZP	1.000( )	N_ZP	2.000( )
C_DWA	0.000( )	M_DWA	2.000( )
BVIRR	0.010(m3/m3)		

RESULTS AND DISCUSSION

It is clear from the logs that the reservoir over the interval 2590 – 2708 mMDRT has several radioactive zones as indicated by the high GR levels. The reservoir properties of these zones are comparable to those zones with low GR levels, as indicated by their density-neutron character.

As discussed above, the Intra-Gurnard Sandstone and the “Waste” zone have suppressed resistivity readings due to the presence of clay and conductive minerals.

The Intra-Gurnard sands are gas bearing and have an average effective porosity and water saturation of 14% and 13% respectively.

The “Waste” zone is gas bearing and has an average effective porosity and water saturation of 13% and 49% respectively.

The petrophysical analysis indicates that there are two oil productive intervals in this well. The top oil zone extends from a CGOC at 2692.3 mMDRT to the top of the swept zone at 2696 mMDRT. The second oil zone extends from 2709.1 mMDRT to the top of a coal at 2712.2 mMDRT.

See also Figures 1, 2 & Table 1

Figure 1: Bream A19A Petrophysics Summary Log

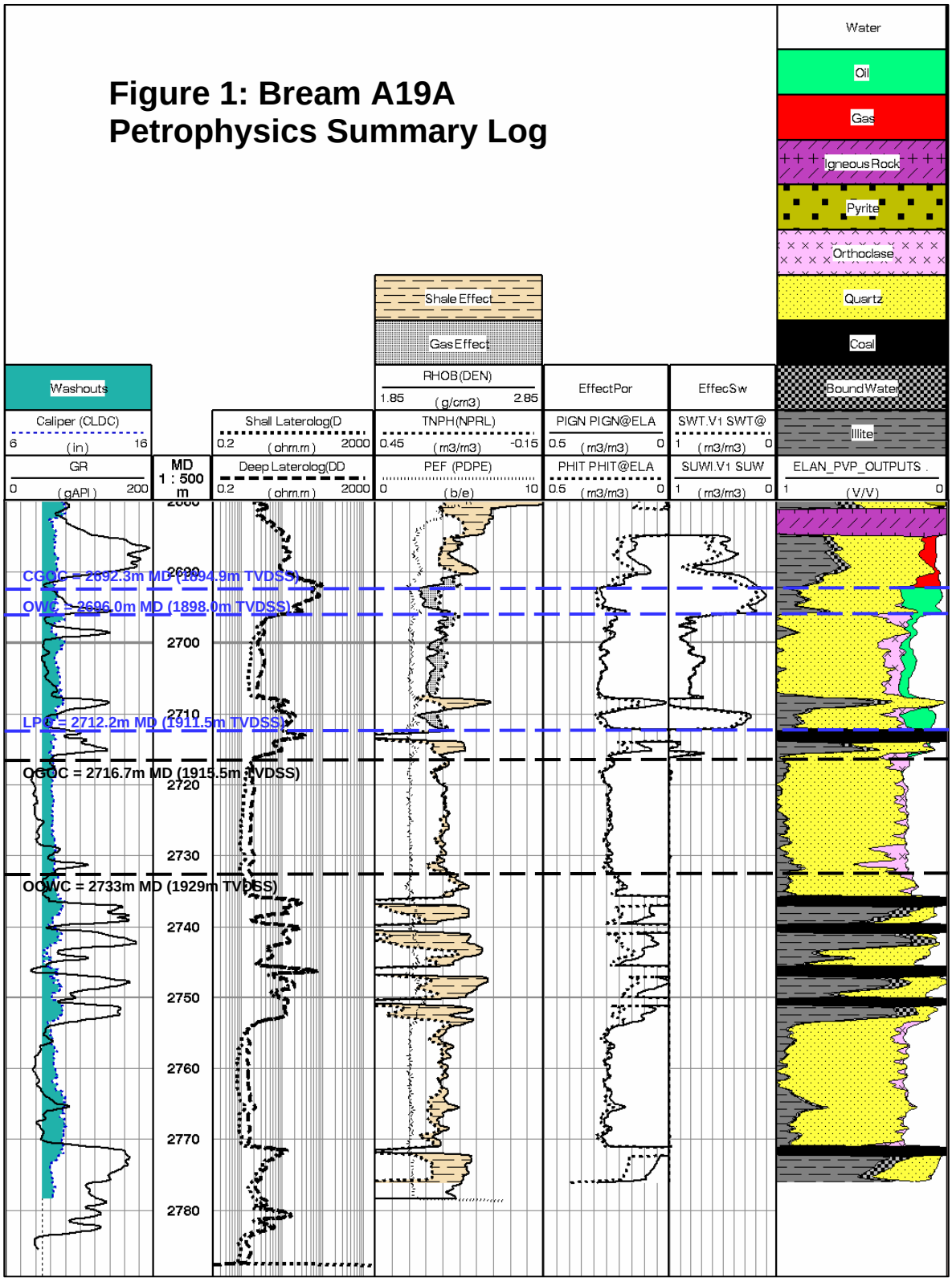
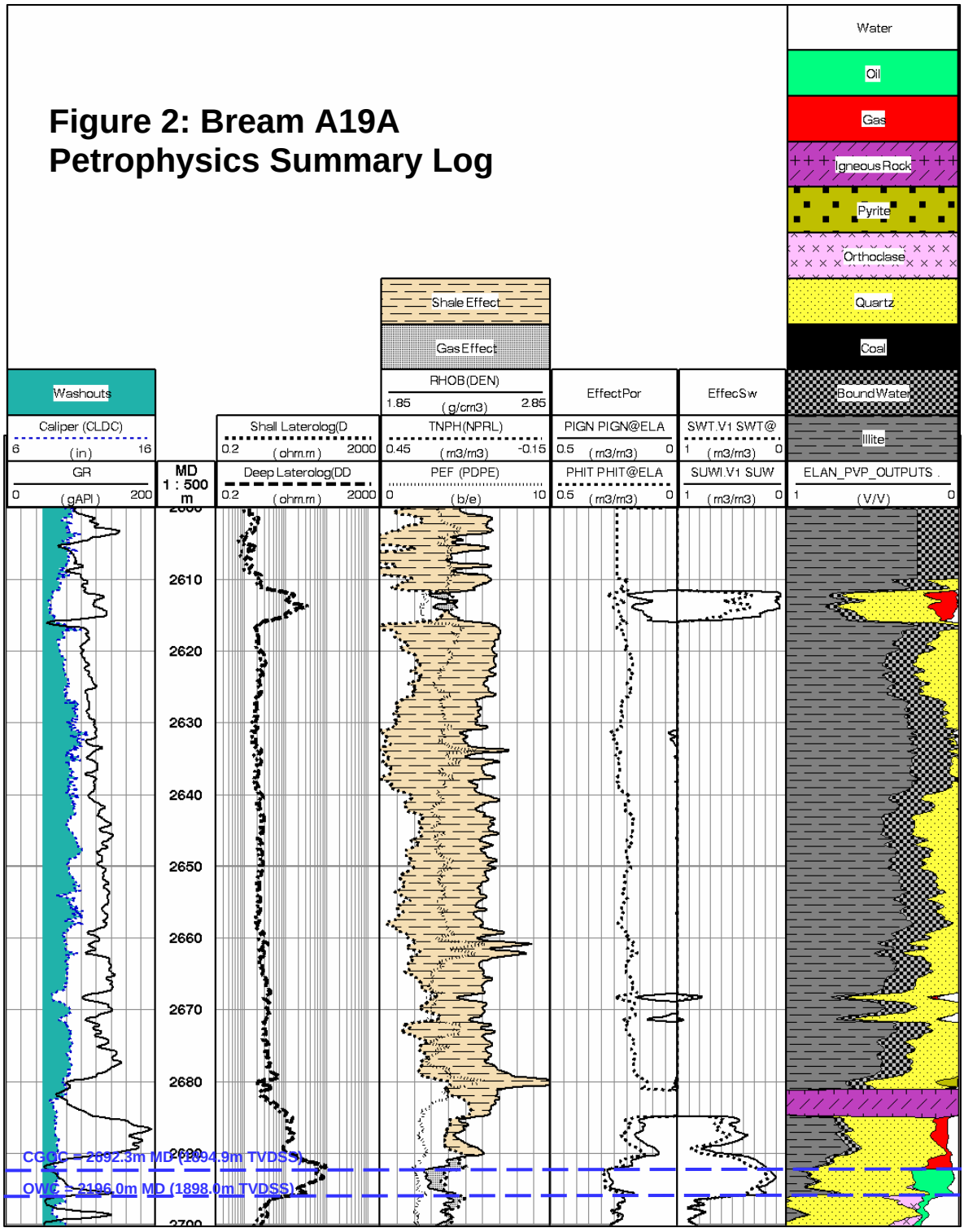


Figure 2: Bream A19A Petrophysics Summary Log



Bream A19A

Petrophysical Summary 2590 - 2780m MD

Depth Reference: Primary: MDKB

Mean VCL, Mean PHIE (or PIGN), Mean SWE (or SUWI) is based on a PHIE or PIGN cutoff: 0.08 for Gas, 0.12 for oil and water

Zone	Top Depth mMD	Top Depth mTVDSS	Bottom Depth mMD	Bottom Depth mTVDSS	Gross Thickness mMD	Gross Thickness mTVD	Net/Gross	Mean VCL	Mean PHIE	Mean SWE	Comments	Net Pay Thickness mMD	Net Pay Thickness mTVD
Intra_Gur_Gas	2611.6	1827.8	2615.7	1831.2	4.1	3.4	1.0	0.39	0.14	0.13	Gas Bearing	3.9	3.3
N1_Waste_Gas	2685.0	1888.9	2690.3	1893.3	5.3	4.4	0.9	0.37	0.13	0.49	Gas Bearing	4.8	4.0
N1_Red_Gas	2690.3	1893.3	2692.3	1894.9	2.0	1.7	1.0	0.24	0.18	0.25	Gas Bearing, CGOC @ 2692.3 mMD (1894.9 mTVDSS)	2.0	1.7
N1_Red_Oil	2692.3	1894.9	2696.0	1898.0	3.7	3.1	1.0	0.17	0.25	0.17	Oil Bearing, OWC @ 2696.0 mMD (1898.0 mTVDSS)	3.7	3.1
N1_Red_Resid	2696.0	1898.0	2707.9	1907.9	11.9	9.9	1.0	0.03	0.25	0.78	Residual Oil & Gas	0.0	0.0
N1_Grn_Oil	2709.1	1908.9	2712.2	1911.5	3.1	2.6	1.0	0.16	0.23	0.34	Oil Bearing, LPO @ 2712.2 mMD (1907.9 mTVDSS)	3.0	2.5
N1_Grn_Resid	2714.0	1913.0	2715.9	1914.6	1.9	1.6	0.4	0.30	0.17	0.78	Residual Oil & Gas	0.0	0.0
N1_Grn_Water	2715.9	1914.6	2735.8	1931.1	19.9	16.6	1.0	0.06	0.23	1.00	Water Bearing	0.0	0.0
N1_Cob_Water	2737.2	1932.3	2739.5	1934.2	2.3	1.9	0.2	0.61	0.14	1.00	Water Bearing	0.0	0.0
N1_Pnk_Upp_Water	2742.9	1937.0	2745.4	1939.1	2.5	2.1	0.4	0.30	0.17	1.00	Water Bearing	0.0	0.0
N1_Pnk_Mid_Water	2748.8	1941.9	2749.8	1942.8	1.0	0.8	0.3	0.37	0.12	1.00	Water Bearing	0.0	0.0
N1_Pnk_Lwr_Water	2753.3	1945.7	2770.8	1960.3	17.5	14.6	1.0	0.10	0.24	1.00	Water Bearing	0.0	0.0

Table 1

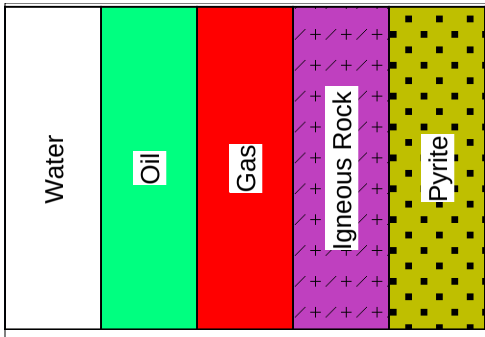
ExxonMobil

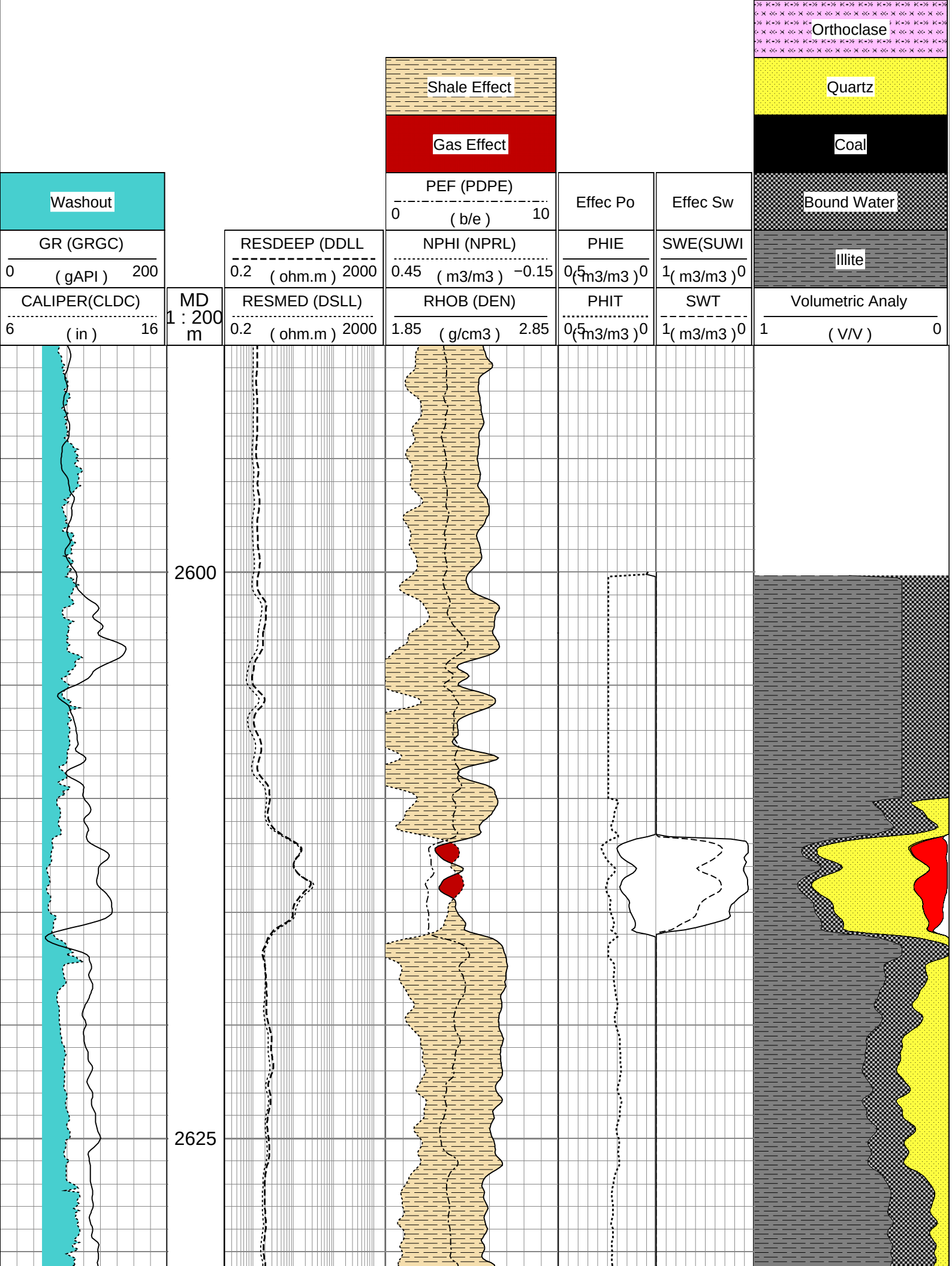
BREAM A19A

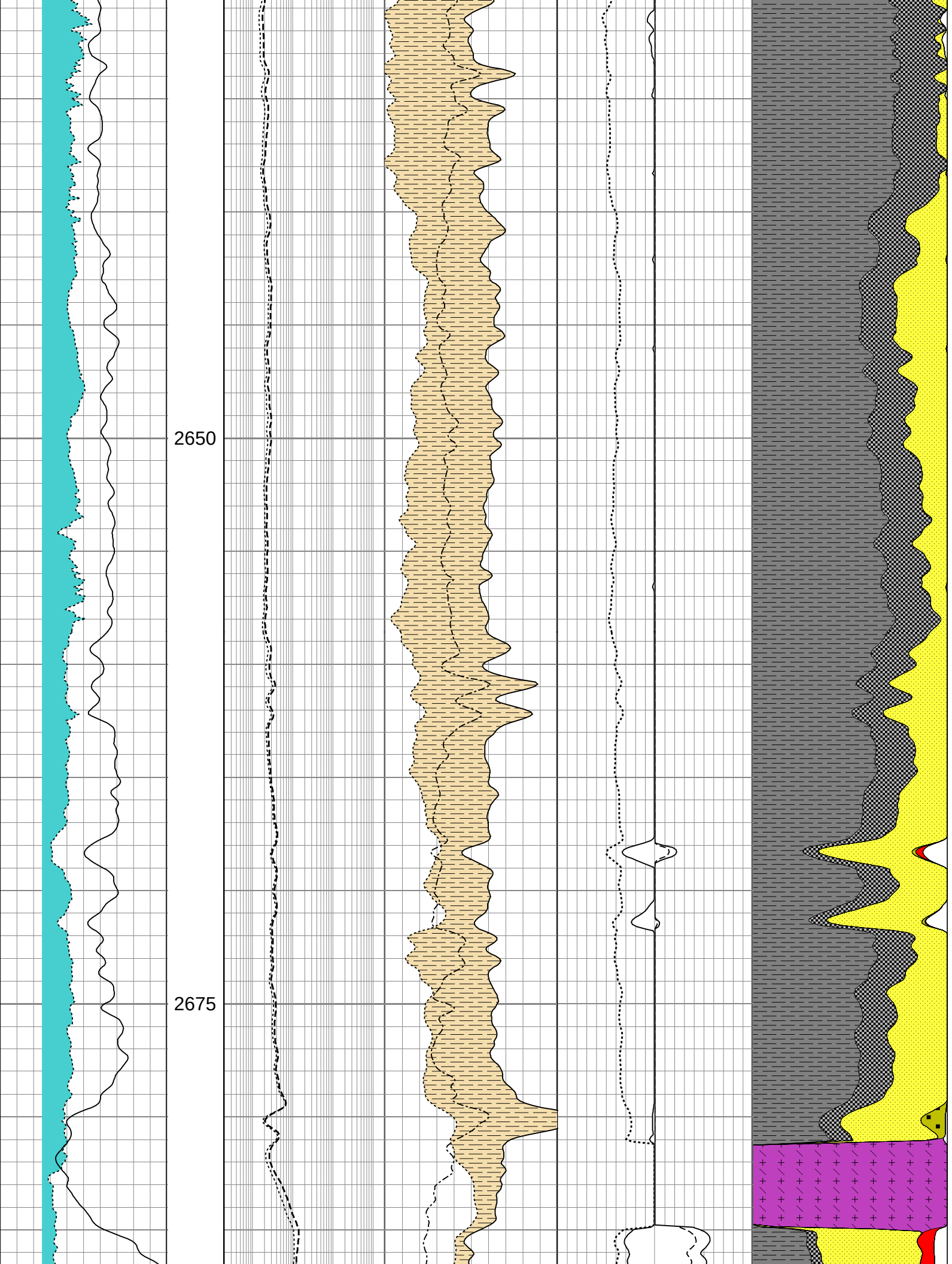
Petrophysical Analysis

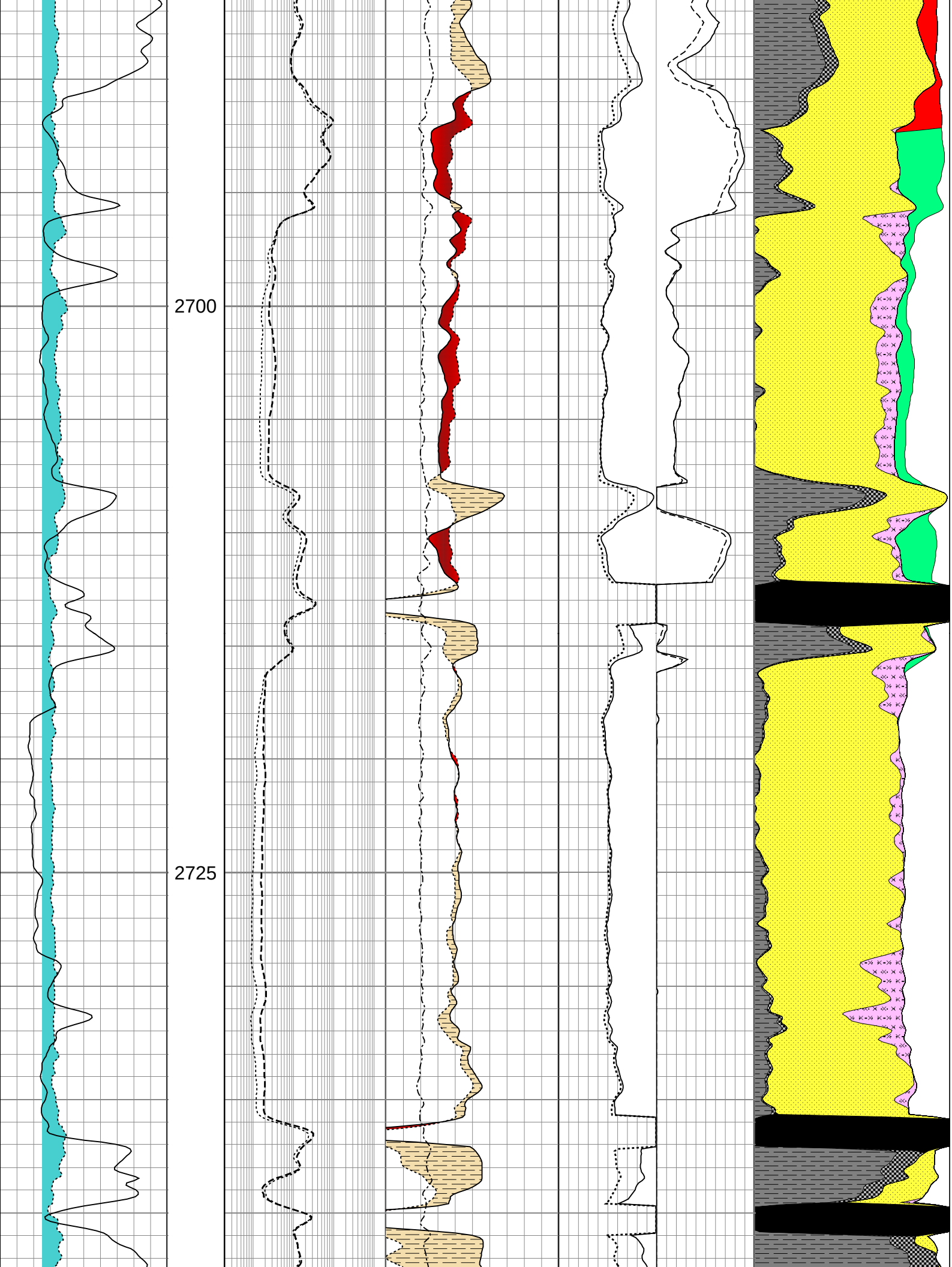
COMPANY:	Esso Australia Pty. Ltd.
WELL:	BREAM A19
BOREHOLE:	BREAM A19A
FIELD:	BREAM
STATE:	VIC
COUNTRY:	AUSTRALIA
PETROPHYSICIST:	BERNIE RAYNER

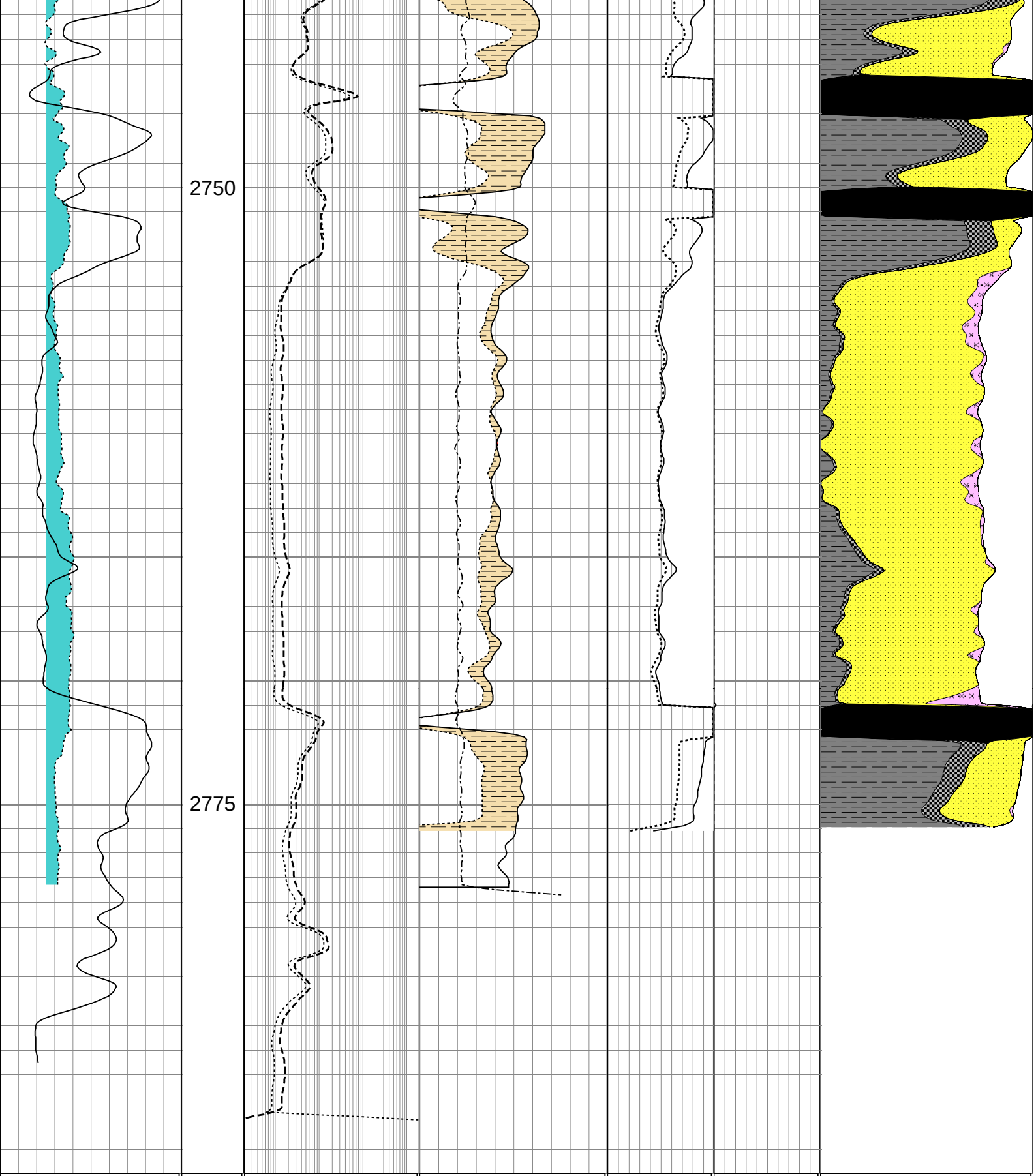
Date Logged:	November 2005	Date of Analysis: March 2006
Well Location:	<FL>	
Elevations:	K.B. 32.82 m	D.F. <DF>
Latitude:	<LATI>	G.L. <GL>
Longitude:	<LONG>	



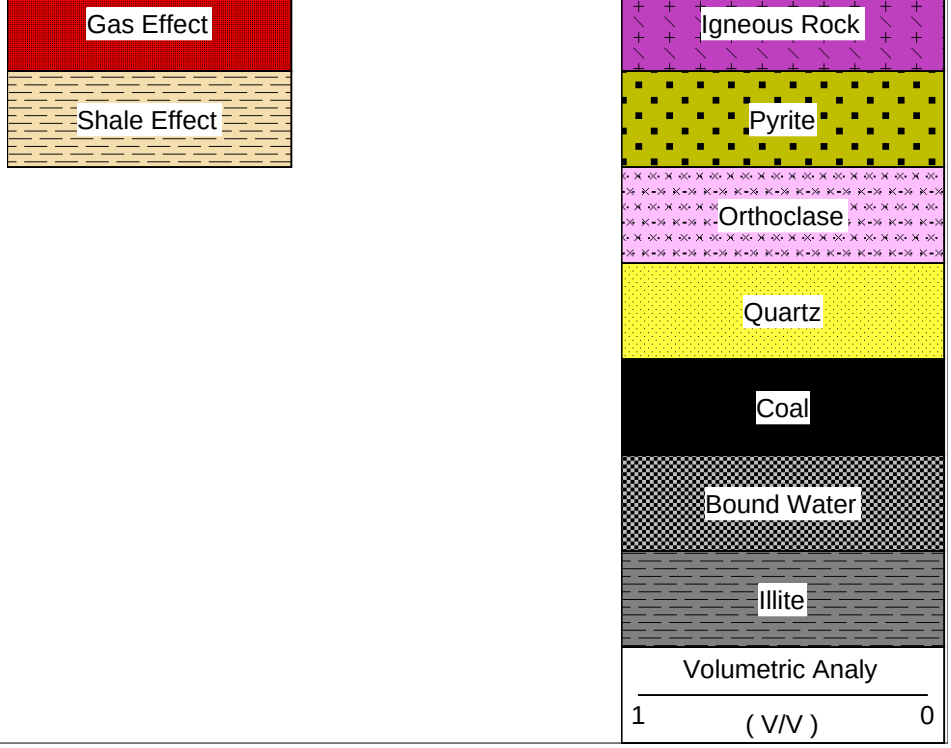

Orthoclase
Quartz
Coal
Bound Water
Illite
Shale Effect
Gas Effect
Washout
GR (GRGC)
0 (gAPI) 200
CALIPER(CLDC)
6 (in) 16
RESDEEP (DDLL
0.2 (ohm.m) 2000
RESMED (DSLL)
0.2 (ohm.m) 2000
PEF (PDPE)
0 (b/e) 10
NPHI (NPRL)
0.45 (m3/m3) −0.15
RHOB (DEN)
1.85 (g/cm3) 2.85
Effec Po
PHIE
0.5 (m3/m3) 0
PHIT
0.5 (m3/m3) 0
Effec Sw
SWE(SUWI
1 (m3/m3) 0
SWT
1 (m3/m3) 0
Volumetric Analy
1 (V/V) 0
MD
1 : 200
m
2600
2625


2650
2675


2700
2725



CALIPER(CLDC)	MD	RESMED (DSLL)	RHOB (DEN)	PHIT	SWT	Water
6 (in) 16	1 : 200 m	0.2 (ohm.m) 2000	1.85 (g/cm3) 2.85	0.5 (m3/m3) 0	1 (m3/m3) 0	
GR (GRGC)		RESDEEP (DDLL	NPHI (NPRL)	PHIE	SWE(SUWI	Oil
0 (gAPI) 200		0.2 (ohm.m) 2000	0.45 (m3/m3) −0.15	0.5 (m3/m3) 0	1 (m3/m3) 0	
Washout			PEF (PDPE) 0 (b/e) 10	Effec Po	Effec Sw	Gas


Gas Effect
Shale Effect
Igneous Rock
Pyrite
Orthoclase
Quartz
Coal
Bound Water
Illite
Volumetric Analy
1
(V/V)
0

APPENDIX 3a

BREAM A19A

Lithology/Show Descriptions

Bream A19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
			Previous Well History: 10.75" surface casing at 1434.0 mMDRT. 7" Production casing cut and pulled from 1495.0 mMDRT. Bream A19 Plugged and Abandoned in November 2005 (set a cement plug with the top of cement at 1401.0 mMDRT). Kick-off Bream A19A with a Security XS4 Tricone rock bit on steerable motor assembly at 1436.0 mMDRT at 0500 hrs 24 November 2005. Drilled ahead from 1434.0 mMDRT to 1475.0 mMDRT with a KCl/Glycol/PHPA mud system. Bit Details: BHA # 3, Bit # 1. Size: 8.5", Manufacturer / Type: Security XS4, Serial #: 10511865. Jets: 24 x 3, TFA: 1.33 sq.in, Grading: **1-1-WT-A-E-E-E-1-NO-PR.** Krevs: 67.0, Top Drive RPM: 50 (+ 164 DHM RPM). Depth In: 1434.0 mMDRT. Depth Out: 1475.0 mMDRT. Metres drilled: 41.0 m, HOB: 6.00. Average ROP: 6.83 m/hr. Rotating: 11.0 metres / Rotating HOB = 1.00, Average Rotating ROP = 11.00 m/hr. Steering: 30.0 metres / Steering HOB = 5.00 , Average Steering ROP = 6.00 m/hr. Spot Samples were taken at 1m intervals from 1434m to 1475m. Samples from 1436m onwards showed an increasing percentage of formation (Calcareous Claystone). At 1475 mMDRT when 50% new formation was seen in the samples, stopped drilling for a PIT. Perform PIT at 1434.0 mMDRT (973.1 mTVDRT)/ 513 psi/ 13.0 ppg EMW using 9.9 ppg mud, at 1215 hrs, 24 November 2005. POOH to change the Bit.
1434	1475 Spot sample	0-50	Samples 1434 to 1475 mMDRT showed an increasing percentage with depth. CALCAREOUS CLAYSTONE: medium grey to medium dark grey, silty, moderately calcareous, trace disseminated pyrite, trace fossil fragments, rare glauconite, firm to moderately hard, sub blocky to blocky. **Top of Lakes Entrance at 1454.5 mMDRT, 983.2 mTVDRT (-950.4 mTVDSS).** Bit Details: BHA # 4, Bit # 2. Size: 8.5", Manufacturer / Type: Smith S73PX /PDC bit, Serial #: JT6968. Jets: 20 x 6, TFA: 1.841 sq.in, Grading: **1-2-WT-A-X-1-CT-TD.** Krevs: 578, Top Drive RPM: 90-108 + (171 RPM DHM). Depth In: 1475.0 mMDRT. Depth Out: 2804.0 mMDRT. Metres drilled: 1329.0 m, HOB: 45.20, Average ROP: 29.40 m/hr. Rotating: 1169.0 metres / Rotating HOB = 33.00, Average Rotating ROP = 35.42 m/hr. Steering: 160.0 metres / Steering HOB = 12.20 , Average Steering ROP = 13.11 m/hr.
1475	1500	100	CALCAREOUS CLAYSTONE: medium grey to medium dark grey, silty, moderately calcareous, trace disseminated pyrite, trace fossil fragments, rare glauconite, firm to moderately hard, sub blocky to blocky. **Midnight Depth 24 November 2005 = 1504.0 mMDRT (1007.5 mTVDRT).**
1500	1530	100	CALCAREOUS CLAYSTONE: as above.
1530	1560	100	CALCAREOUS CLAYSTONE: as above.

Bream A19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
1560	1590	100	CALCAREOUS CLAYSTONE: as above.
1590	1620	100	CALCAREOUS CLAYSTONE: medium grey to medium dark grey, silty, moderately calcareous, trace disseminated pyrite, trace fossil fragments, firm to moderately hard, sub blocky to blocky.
1620	1650	100	CALCAREOUS CLAYSTONE: as above. **Geologist on rig at 1035 hrs, 25 November 2005 at 1625.0 mMDRT (1068.0 mTVDRT).**
1650	1680	100	CALCAREOUS CLAYSTONE: light grey to medium light grey, silty, moderately calcareous, trace disseminated pyrite, rare fossil fragments, firm to moderately hard, sub blocky to blocky.
1680	1710	100	CALCAREOUS CLAYSTONE: as above.
1710	1740	100	CALCAREOUS CLAYSTONE: light grey to medium light grey, silty, moderately calcareous, rare disseminated pyrite, rare fossil fragments, firm to moderately hard, sub blocky to blocky.
1740	1770	100	CALCAREOUS CLAYSTONE: as above + rare forams.
1770	1800	100	CALCAREOUS CLAYSTONE: as above + rare forams.
1800	1830	100	CALCAREOUS CLAYSTONE: light grey to medium light grey, silty, moderately calcareous, rare disseminated pyrite, rare fossil fragments, firm to moderately hard, sub blocky to blocky.
1830	1860	100	CALCAREOUS CLAYSTONE: as above. **Midnight Depth 25 November 2005 = 1878.0 mMDRT (1265.8 mTVDRT)**
1860	1890	100	CALCAREOUS CLAYSTONE: light grey to medium light grey, silty, moderately calcareous, rare disseminated pyrite, rare fossil fragments, firm to moderately hard, sub blocky to blocky.
1890	1920	100	CALCAREOUS CLAYSTONE: as above.
1920	1950	100	CALCAREOUS CLAYSTONE: light grey to medium light grey, silty, moderately calcareous, rare disseminated pyrite, rare fossil fragments, rare ooids, firm to moderately hard, sub blocky to blocky.
1950	1980	100	CALCAREOUS CLAYSTONE: as above.
1980	2010	100	CALCAREOUS CLAYSTONE: as above.
2010	2040	100	CALCAREOUS CLAYSTONE: light grey to medium light grey, occasionally light brownish grey, silty, moderately calcareous, rare disseminated pyrite, rare fossil fragments, rare ooids, firm to moderately hard, sub blocky to blocky.
2040	2070	100	CALCAREOUS CLAYSTONE: as above, + rare gastropods.
2070	2100	100	CALCAREOUS CLAYSTONE: medium light grey to medium grey, silty, moderately calcareous, rare disseminated pyrite, rare fossil fragments, rare ooids, firm to moderately hard, sub blocky to blocky.
2100	2130	100	CALCAREOUS CLAYSTONE: as above, occasionally light brownish grey.
2130	2160	100	CALCAREOUS CLAYSTONE: as above, + rare glauconite.
2160	2190	100	CALCAREOUS CLAYSTONE: medium grey to light brownish grey, silty, moderately calcareous, rare disseminated pyrite, rare fossil fragments, rare ooids, firm to moderately hard, sub blocky to blocky.
2190	2220	100	CALCAREOUS CLAYSTONE: as above, light brownish grey to medium grey.
2220	2250	100	CALCAREOUS CLAYSTONE: as above.
2250	2280	100	CALCAREOUS CLAYSTONE: as above + rare glauconite.
2280	2310	100	CALCAREOUS CLAYSTONE: light brownish grey to minor medium grey, silty, moderately calcareous, trace ooids, rare fossil fragments, rare disseminated pyrite and nodules, firm to moderately hard, sub blocky to blocky.
2310	2340	100	CALCAREOUS CLAYSTONE: as above.

Bream A19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
2340	2370	100	CALCAREOUS CLAYSTONE: medium light grey to medium grey, rare light brownish grey, silty, moderately calcareous, trace ooids, rare fossil fragments, rare disseminated pyrite, firm to moderately hard, sub blocky to blocky.
2370	2400	100	CALCAREOUS CLAYSTONE: as above.
			Midnight Depth 26 November 2005 = 2402.0 mMDRT (1690.1 mTVDRT)
2400	2430	100	CALCAREOUS CLAYSTONE: as above, + rare pyrite nodules.
			Last 30 metre spot sample at 2430.0 mMDRT.
			10 metre bagged samples from 2430.0 to 2580.0 mMDRT.
2430	2440	100	CALCAREOUS CLAYSTONE: dominantly medium light grey to medium grey, minor light brownish grey, silty, moderately calcareous, trace ooids, trace fossil fragments, rare disseminated pyrite, firm to moderately hard, sub blocky to blocky.
		Trace	SILTSTONE: light brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, slightly calcareous, firm to moderately hard, sub blocky to sub fissile.
2440	2450	100	CALCAREOUS CLAYSTONE: as above, + rare nodular pyrite.
		Trace	SILTSTONE: as above.
2450	2460	100	CALCAREOUS CLAYSTONE: medium grey to minor light brownish grey, silty, moderately calcareous, trace ooids, rare fossil fragments, rare disseminated pyrite, firm to moderately hard, sub blocky to blocky.
2460	2470	100	CALCAREOUS CLAYSTONE: as above.
2470	2480	100	CALCAREOUS CLAYSTONE: as above.
2480	2490	100	CALCAREOUS CLAYSTONE: medium grey to minor light brownish grey, silty, moderately calcareous, trace ooids, rare fossil fragments, rare disseminated pyrite, firm to moderately hard, sub blocky to blocky.
		Trace	SILTSTONE: light brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, non-calcareous, firm to moderately hard, sub blocky to sub fissile.
2490	2500	100	CALCAREOUS CLAYSTONE: light brownish grey to minor medium grey, silty, moderately calcareous, trace ooids, rare fossil fragments, rare disseminated pyrite, firm to moderately hard, sub blocky to blocky.
		Trace	SILTSTONE: as above.
2500	2510	100	CALCAREOUS CLAYSTONE: as above.
		Trace	SILTSTONE: as above.
2510	2520	100	CALCAREOUS CLAYSTONE: as above.
		Trace	SILTSTONE: light brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, non-calcareous, firm to moderately hard, sub blocky to sub fissile.
2520	2530	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, rare ooids, rare fossil fragments, rare disseminated pyrite, firm to moderately hard, sub blocky to blocky.
		Trace	SILTSTONE: as above.
2530	2540	100	CALCAREOUS CLAYSTONE: as above + rare glauconite.
		Trace	SILTSTONE: as above.
			Stop drilling at 0610 hrs on 27 November 2005, at 2539.0 mMDRT (1801.4 mTVDRT). Make wiper trip to change out saver sub. On bottom drilling at 2140 hrs, 27 November 2005. Trip gas = 34 units.
2540	2550	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace ooids, rare fossil fragments, firm to moderately hard, sub blocky to blocky.
			Baracarb at 5 ppb added to the mud system at 2544.0 mMDRT (1805.3 mTVDRT /-1772.5 mTVDSS). Baracarb seen in 2560.0 mMDRT sample.
2550	2560	100	CALCAREOUS CLAYSTONE: as above.

Bream A19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
2560	2570	100	CALCAREOUS CLAYSTONE: as above + rare glauconite.
2570	2580	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace disseminated pyrite, trace pyrite nodules, rare ooids, rare fossil fragments, rare glauconite, firm to moderately hard, sub blocky to blocky. **Last 10 metre bagged sample at 2580.0 mMDRT.** **5 metre bagged samples from 2580.0 to 2804.0 mMDRT (TD).**
2580	2585	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace disseminated pyrite, rare ooids, rare fossil fragments, rare glauconite, firm to moderately hard, sub blocky to blocky.
2585	2590	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace disseminated pyrite, rare fossil fragments, rare glauconite, firm to moderately hard, sub blocky to blocky.
2590	2595	100	CALCAREOUS CLAYSTONE: as above. **Midnight Depth 27 November 2005 = 2595.0 mMDRT (1846.2 mTVDRT)**
2595	2600	100	CALCAREOUS CLAYSTONE: as above. **Top of Latrobe at 2601.0 mMDRT, 1851.9 mTVDRT (-1819.1 mTVDSS).**
2600	2605	95	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace disseminated pyrite, rare fossil fragments, rare glauconite, firm to moderately hard, sub blocky to blocky.
		5	CLAYSTONE: light olive brown to dusky yellow, non calcareous, soft to firm, amorphous to sub blocky.
		Trace	SANDSTONE: Trace, white to pale green, very fine to fine, moderately well sorted, sub angular to sub rounded, common glauconite pellets, moderate glauconitic matrix, weak siliceous cement, hard aggregates, tight visual and inferred porosity. No fluorescence.
2605	2610	90	CALCAREOUS CLAYSTONE: as above.
		5	CLAYSTONE: as above.
		5	SILTSTONE: pale yellowish brown, very arenaceous grading to very fine Sandstone, trace glauconite, trace micromicaceous, firm to moderately hard, sub blocky.
		Trace	SANDSTONE: Trace, as above. No fluorescence.
2610	2615	65	CALCAREOUS CLAYSTONE : light brownish grey to medium grey, silty, moderately calcareous, trace disseminated pyrite, rare fossil fragments, rare glauconite, firm to moderately hard, sub blocky to blocky.
		5	CLAYSTONE: light olive brown to dusky yellow, non calcareous, soft to firm, amorphous to sub blocky.
		20	SILTSTONE: as above.
		10	SANDSTONE: white to pale green, very fine to fine, moderately well sorted, sub angular to sub rounded, common glauconite pellets, moderate glauconitic matrix, weak siliceous cement, hard aggregates, tight visual and inferred porosity. No fluorescence.
2615	2620	70	CALCAREOUS CLAYSTONE : as above.
		Trace	CLAYSTONE: as above.
		20	SILTSTONE: as above.
		10	SANDSTONE: as above. No fluorescence.
2620	2625	40	CALCAREOUS CLAYSTONE : light brownish grey to medium grey, silty, moderately calcareous, trace disseminated pyrite, rare fossil fragments, rare glauconite, firm to moderately hard, sub blocky to blocky.

Bream A19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
		55	SILTSTONE: pale yellowish brown, minor moderate brown, very arenaceous grading to very fine Sandstone, trace glauconite pellets, trace micromicaceous, firm to moderately hard, sub blocky.
		5	SANDSTONE: as above. No fluorescence.
2625	2630	15	CALCAREOUS CLAYSTONE: as above.
		80	SILTSTONE: moderate brown to pale brown, minor pale yellowish brown, very arenaceous grading to very fine Sandstone, trace glauconite pellets, trace micromicaceous, firm to moderately hard, sub blocky.
		5	SANDSTONE: white to pale green, very fine to fine, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, moderate glauconitic matrix, hard aggregates, tight visual and inferred porosity. No fluorescence.
2630	2635	15	CALCAREOUS CLAYSTONE : light brownish grey to medium grey, silty, moderately calcareous, rare fossil fragments, rare glauconite, firm to moderately hard, sub blocky to blocky.
		80	SILTSTONE: as above, common glauconite pellets.
		5	SANDSTONE: as above. No fluorescence.
2635	2640	10	CALCAREOUS CLAYSTONE: as above.
		85	SILTSTONE: as above, common glauconite pellets.
		5	SANDSTONE: as above. No fluorescence.
2640	2645	5	CALCAREOUS CLAYSTONE : light brownish grey to medium grey, silty, moderately calcareous, rare fossil fragments, rare glauconite, firm to moderately hard, sub blocky to blocky.
		85	SILTSTONE: as above, common glauconite pellets.
		10	SANDSTONE: as above. No fluorescence.
2645	2650	10	CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, rare glauconite, firm to moderately hard, sub blocky to blocky.
		80	SILTSTONE: moderate brown to pale brown, minor pale yellowish brown, very arenaceous grading to very fine Sandstone, common to abundant glauconite pellets, trace micromicaceous, firm to moderately hard, sub blocky.
		10	SANDSTONE: white to pale green, very fine to fine, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, weak glauconitic matrix, hard aggregates, tight visual and inferred porosity. No fluorescence.
2650	2655	5	CLAYSTONE: as above.
		90	SILTSTONE: as above, common to abundant glauconite pellets.
		5	SANDSTONE: as above. No fluorescence.
2655	2660	5	CLAYSTONE: as above.
		80	SILTSTONE: as above, common to abundant glauconite pellets.
		5	SANDSTONE: as above. No fluorescence.
		10	VOLCANICS: pale green to greyish green, dominantly chlorite, occasionally hard, crystalline, commonly bit crushed rock flour.
2660	2665	5	CLAYSTONE: cavings, as above.

Bream A19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
		75	SILTSTONE: moderate brown to pale brown, minor pale yellowish brown, very arenaceous grading to very fine Sandstone, common glauconite pellets, trace micromicaceous, firm to moderately hard, sub blocky.
		5	SANDSTONE: white to pale green, very fine to fine, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, weak glauconitic matrix, hard aggregates, tight visual and inferred porosity. No fluorescence.
		15	VOLCANICS: as above.
2665	2670	5	CLAYSTONE: 5%, cavings, as above.
		75	SILTSTONE: as above, common glauconite pellets.
		5	SANDSTONE: as above. No fluorescence.
		15	VOLCANICS: as above.
2670	2675	Trace	CLAYSTONE: cavings, as above.
		75	SILTSTONE: as above, common glauconite pellets.
		5	SANDSTONE: as above. No fluorescence.
		20	VOLCANICS: pale green to greyish green, dominantly chlorite, occasionally hard, crystalline, commonly bit crushed rock flour. **Top of Coarse Clastics (N-1 Reservoir) at 2679.0 mMDRT, 1916.7 mTVDRT (-1883.9 mTVDSS).**
2675	2680	Trace	CLAYSTONE: cavings, as above.
		75	SILTSTONE: as above, common glauconite pellets.
		10	SANDSTONE: translucent to light grey, very fine to fine, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, common micropyrite matrix, hard aggregates, tight visual and inferred porosity. No fluorescence.
		15	VOLCANICS: as above.
2680	2685	Trace	CLAYSTONE: cavings, as above.
		50	SILTSTONE: moderate brown to pale brown, minor pale yellowish brown, very arenaceous grading to very fine Sandstone, common glauconite pellets, trace micromicaceous, firm to moderately hard, sub blocky.
		20	SANDSTONE 1: 5%, translucent to light grey, very fine to fine, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, common micropyrite matrix, hard aggregates, tight visual and inferred porosity. SANDSTONE 2: 15%, clear to translucent, medium to very coarse, dominantly coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, clean, fair inferred and visible porosity. No fluorescence.
		30	VOLCANICS: pale green to greyish green, occasionally greyish brown, dominantly chlorite, occasionally hard, crystalline, commonly bit crushed rock flour. **Base of Waste (BWST) at 2686.5 mMDRT, 1922.9 mTVDRT (-1890.1 mTVDSS).**
2685	2690	Trace	CLAYSTONE: cavings, as above.
		70	SILTSTONE: as above, common glauconite pellets.
		20	SANDSTONE 1: 5%, as above. SANDSTONE 2: 15%, as above. No fluorescence.
		10	VOLCANICS: as above.

Bream A19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
2690	2695	5	CLAYSTONE: light blueish grey, slightly calcareous, silty, moderately hard to hard, blocky.
		45	SILTSTONE: pale brown to light brown, very arenaceous grading to very fine Sandstone, common glauconite pellets, trace micromicaceous, firm to moderately hard, sub blocky.
		45	SANDSTONE 1: 5%, translucent to light grey, very fine to fine, moderately well sorted, sub angular to sub rounded, moderate siliceous cement, common micropyrite matrix, hard aggregates, tight visual and inferred porosity. SANDSTONE 2: 40%, clear to translucent, medium to very coarse, dominantly coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, clean, fair inferred and visible porosity. No fluorescence.
		5	VOLCANICS: pale green to greyish green, occasionally greyish brown, dominantly chlorite, occasionally hard, crystalline, commonly bit crushed rock flour.
2695	2700	10	CLAYSTONE: as above.
		60	SILTSTONE: as above, common glauconite pellets.
		30	SANDSTONE: clear to translucent, medium to very coarse, dominantly coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace to common pyrite nodules, dominantly loose, generally clean, fair inferred and visible porosity. No fluorescence.
		Trace	VOLCANICS: as above.
2700	2705	5	CLAYSTONE: as above.
		25	SILTSTONE: as above, common glauconite pellets.
		70	SANDSTONE: clear to translucent, dominantly medium to occasionally very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, loose, clean, fair to good inferred and visible porosity. No fluorescence.
		Trace	VOLCANICS: as above. **Barablok at 4 ppb, added to the mud system at 2708.0 mMDRT (1940.8 mTVDRT / -1908.0 mTVDSS). Baracarb seen in 2720.0 mMDRT sample.**
2705	2710	10	CLAYSTONE: as above.
		20	SILTSTONE: as above, common glauconite pellets.
		65	SANDSTONE: clear to translucent, medium to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, loose, clean, fair to good inferred and visible porosity. No fluorescence.
		5	VOLCANICS: pale green to greyish green, occasionally greyish brown, dominantly chlorite, occasionally hard, crystalline, commonly bit crushed rock flour.
2710	2715	5	COAL: dusky brown to brownish black, silty grading to CARBONACEOUS SILTSTONE, earthy, moderately hard, sub blocky, trace quartz inclusions.
		20	CLAYSTONE: light grey to light blueish grey, silty, hard, blocky.
		25	SILTSTONE: pale brown to light brown, very arenaceous grading to very fine Sandstone, trace glauconite pellets, trace micromicaceous, firm to moderately hard, sub blocky.
		45	SANDSTONE: clear to translucent, coarse to dominantly very coarse, occasionally fractured quartz grains, moderately well sorted, sub angular to sub rounded, moderate pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair inferred and visible porosity. No fluorescence.
		5	VOLCANICS: as above.
2715	2720	Trace	COAL: cavings, as above.

Bream A19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
		15	CLAYSTONE: as above.
		15	SILTSTONE: pale brown to moderate brown, very arenaceous grading to very fine Sandstone, trace glauconite pellets, trace micromicaceous, firm to moderately hard, sub blocky.
		70	SANDSTONE: clear to translucent, medium to occasionally very coarse, dominantly medium to coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair inferred and visible porosity. No fluorescence.
		Trace	VOLCANICS: as above.
2720	2725	5	CLAYSTONE: light grey to light blueish grey, silty, hard, blocky.
		20	SILTSTONE: as above, trace glauconite pellets.
		70	SANDSTONE: clear to translucent, fine to occasionally very coarse, poorly sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, poor to fair inferred and visible porosity. No fluorescence.
		5	VOLCANICS: pale green to greyish green, occasionally greyish brown, dominantly chlorite, occasionally hard, crystalline, commonly bit crushed rock flour.
2725	2730	5	CLAYSTONE: light grey to light blueish grey, silty, hard, blocky.
		5	SILTSTONE: as above, trace glauconite pellets.
		90	SANDSTONE: clear to translucent, fine to occasionally very coarse, dominantly fine to medium, moderately well sorted, sub angular to sub rounded, weak pyrite cement, rare pyrite nodules, dominantly loose, generally clean, poor to fair inferred and visible porosity. No fluorescence.
		Trace	VOLCANICS: cavings, as above. **CBF2 Horizon (Cobalt sand) at 2731.0 mMDRT, 1960.4 mTVDRT (-1927.6 mTVDSS).**
2730	2735	5	CLAYSTONE: as above.
		5	SILTSTONE: as above, trace glauconite pellets.
		90	SANDSTONE: as above. No fluorescence.
		Trace	VOLCANICS: as above.
2735	2740	30	COAL: brownish black, silty grading to CARBONACEOUS SILTSTONE, brittle, sub blocky, uneven, woody texture, trace quartz inclusions.
		5	CLAYSTONE: as above.
		5	SILTSTONE: as above, trace glauconite pellets.
		60	SANDSTONE: clear to translucent, coarse to dominantly very coarse, occasionally fractured quartz grains, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, loose, clean, fair inferred and visible porosity. No fluorescence.
		Trace	VOLCANICS: cavings, as above. **CBF1 at 2742.0 mMDRT, 1969.1 mTVDRT (-1936.3 mTVDSS).**
2740	2745	10	COAL: black, minor brownish black, sub vitreous, brittle to moderately hard, sub blocky to sub fissile, uneven, trace quartz inclusions.
		15	CLAYSTONE: light grey to light blueish grey, silty, hard, blocky.
		25	SILTSTONE: pale brown to moderate brown, very arenaceous grading to very fine Sandstone, trace glauconite pellets, trace micromicaceous, firm to moderately hard, sub blocky.

Bream A19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
		50	SANDSTONE: as above. No fluorescence.
		Trace	VOLCANICS: cavings, as above. **CBSB (Base of Cobalt sand) at 2749.0 mMDRT, 1974.9 mTVDRT (-1942.1 mTVDSS).**
2745	2750	10	COAL: dusky brown, silty grading to CARBONACEOUS SILTSTONE, earthy, moderately hard, sub blocky, uneven, woody texture.
		10	CLAYSTONE: as above.
		25	SILTSTONE: pale brown to moderate brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, rare glauconite, firm to moderately hard, sub blocky.
		55	SANDSTONE: clear to translucent, rare very pale blue, coarse to dominantly very coarse, occasionally fractured quartz grains, moderately well sorted, sub angular to sub rounded, weak pyrite cement, rare pyrite nodules, loose, clean, fair inferred and visible porosity. No fluorescence.
		Trace	VOLCANICS: cavings, as above.
2750	2755	5	CLAYSTONE: as above.
		55	SILTSTONE: as above, rare glauconite.
		40	SANDSTONE: clear to translucent, coarse to dominantly very coarse, occasionally fractured quartz grains, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, loose, clean, fair inferred and visible porosity. No fluorescence.
2755	2760	10	CLAYSTONE: light grey to light blueish grey, silty, hard, blocky.
		40	SILTSTONE: as above, rare glauconite.
		50	SANDSTONE: clear to translucent, medium to very coarse, occasionally fractured quartz grains, poorly sorted, sub angular to sub rounded, weak pyrite cement, rare pyrite nodules, loose, clean, poor to fair inferred and visible porosity. No fluorescence.
2760	2765	Trace	CLAYSTONE: cavings, as above.
		20	SILTSTONE: as above, rare glauconite.
		80	SANDSTONE: clear to translucent, rare greyish pink, dominantly fine to rare coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, rare pyrite nodules, loose, clean, poor to fair inferred and visible porosity. No fluorescence. **PKSB (Base of Pink sand) at 2768.0 mMDRT, 1990.8 mTVDRT (-1958.0 mTVDSS).**
2765	2770	5	CLAYSTONE: as above.
		20	SILTSTONE: as above, rare glauconite.
		75	SANDSTONE: clear to translucent, rare greyish pink, medium to very coarse, dominantly coarse to very coarse, moderately well sorted, sub rounded to sub angular, weak pyrite cement, rare pyrite nodules, loose, clean, fair to good inferred and visible porosity. No fluorescence.
		Trace	VOLCANICS: cavings, as above.
2770	2775	5	CLAYSTONE: light grey to light blueish grey, silty, hard, blocky.
		15	SILTSTONE: as above, rare glauconite.
		80	SANDSTONE: clear to translucent, rare very pale orange, medium to very coarse, dominantly coarse to very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, rare pyrite nodules, loose, clean, fair to good inferred and visible porosity. No fluorescence. **MVSB at 2778.5 mMDRT, 1999.6 mTVDRT (-1966.8 mTVDSS).**

Bream A19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
2775	2780	10	COAL: brownish black, sub vitreous, brittle, sub blocky, uneven, trace quartz inclusions.
		10	CLAYSTONE: as above.
		15	SILTSTONE: pale brown to moderate brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		65	SANDSTONE: clear to translucent, rare very pale orange, medium to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, rare pyrite nodules, loose, clean, fair inferred and visible porosity. No fluorescence.
		Trace	VOLCANICS: cavings, as above.
2780	2785	5	COAL: dusky brown, earthy, silty in part grading to CARBONACEOUS SILTSTONE, moderately hard, sub blocky, uneven, woody texture.
		10	CLAYSTONE 1: 5%, light grey to light bluish grey, silty, hard, blocky. CLAYSTONE 2: 5%, off white to light brownish grey, soft to firm, amorphous to sub blocky.
		25	SILTSTONE: as above.
		60	SANDSTONE: as above. No fluorescence.
		Trace	VOLCANICS: cavings, as above.
2785	2790	10	CLAYSTONE 1: 5%, light grey to light bluish grey, silty, hard, blocky. CLAYSTONE 2: 5%, off white to light brownish grey, soft to firm, amorphous to sub blocky.
		15	SILTSTONE: as above.
		75	SANDSTONE: clear to translucent, rare very pale orange, medium to dominantly very coarse, common fractured quartz grains, moderately well sorted, sub angular to sub rounded, weak pyrite cement, rare pyrite nodules, loose, clean, fair inferred and visible porosity. No fluorescence.
2790	2795	10	CLAYSTONE 1: 5%, light grey to light bluish grey, silty, hard, blocky. CLAYSTONE 2: 5%, off white to light brownish grey, soft to firm, amorphous to sub blocky.
		30	SILTSTONE: as above.
		60	SANDSTONE: clear to translucent, medium to very coarse, common fractured quartz grains, poorly sorted, sub angular, weak pyrite cement, rare pyrite nodules, loose, clean, poor to fair inferred and visible porosity. No fluorescence.
2795	2800	5	CLAYSTONE: light grey to light bluish grey, silty, hard, blocky.
		25	SILTSTONE: pale brown to moderate brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		70	SANDSTONE: clear to translucent, coarse to dominantly very coarse, occasionally fractured quartz grains, moderately well sorted, sub angular to sub rounded, loose, clean, fair inferred and visible porosity. No fluorescence.
2800	2804 **TD**	10	CLAYSTONE: light grey to light blueish grey, silty, hard, blocky.
		20	SILTSTONE: moderate brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.

Bream A19A Lithology / Show Descriptions

Interval (m) From	To	%	Lithology / Show Description
		70	SANDSTONE: clear to translucent, medium to very coarse, common fractured quartz grains, poorly sorted, sub angular, weak pyrite cement, rare pyrite nodules, loose, clean, poor to fair inferred and visible porosity. No fluorescence. **BMA A19A reached a TD of 2804.0 mMDRT = 2020.9 mTVDRT (-1988.1 mTVDSS) at 1440 hrs on 28 November 2005.** CBU. Made wiper Trip to shoe. Start circulating at bottom at 2235 hrs on 28 November 2005. Trip gas 91 units at 2325 hrs, 28 November 2005. Last circulation on bottom at 0015 hrs, 29 November 2005. Total circulating time for last circulation on bottom = 1 hrs 40 minutes. Start POOH at 0020 hrs, 29 November 2005 for Reeves Wireline Logging Run #1. Bit on Surface at 10:15 hrs 29 November 2005. At 03:35 hrs, 30 November 2005, start Reeves Logging at logging speed (0.1 metre/second) from 2801.0 mMDRT to 2480.5 mMDRT. At 04:55 hrs, 30 November 2005, at Tripping speed (0.2 metre/second) from 2480.5 mMDRT to 1474.35 mMDRT. At 07:20 hrs, 30 November 2005, at Logging speed (0.1 metre/second) from 1474.35 mMDRT to 1388.0 mMDRT. At 07:40 hrs, 30 November 2005, at normal Tripping speed from 1388.0 mMDRT to surface. At surface at 1330 hrs, 30 November 2005. Bottom of casing window at 1434.0 mMDRT.

APPENDIX 4a

BREAM A19A

Mud Log

MASTERLOG
BMA A19A

GENERAL	SURFACE POSITON	HOLE / CASING INFO	DATE / DEPTH	ENGINEERS
Country : AUSTRALIA	GDA Co-ord X : 147 46 19.968 E	8-1/2" Hole to 2804.0m MDRT	Spud Date : 24-11-2005	Steve Oades
Permit : VIC L13	GDA Co-ord Y : 38 29 58.893 S		Total Depth Date : 28-11-2005	Mark Smith
Field : Bream	MGA Co-ord X : 567336.12mE	10-3/4" Csg Shoe at 1434.0m MDRT	Total Depth : 2804.0m MDRT	
Basin : GIPPSLAND	MGA Co-ord Y : 5738458.22mN	7" Production Csg at 2799.0m MDRT	True Vertical Depth : 2020.94m TVDRT	
Well Type : DEVELOPMENT	RT to MSL : 32.82m		Log Scale : 1/ 500	
Rig Name : NABORS 453	RT to Sea Bed : 92.25m			

ABBREVIATIONS

MW	Mud Weight	WOB	Weight on Bit (klbs)
FV	Funnel Viscosity	RPM	Rotations Per Min
PV	Plastic Viscosity	FLW	Flow Rate (gpm)
YP	Yield Point	SPP	Pump Pressure (psi)
Gel	Gel Strength	RR	Re-Run Bit
WL	Water Loss	TG	Trip Gas
KCl	Potassium Chloride	CG	Connection Gas
Cl	Chlorides	BG	Background Gas
Incl	Inclination	DGP	Drilled Gas Peak
Az	Azimuth	MM	Mud Motor

LITHOLOGY LEGEND

CLAYSTONE, MARL, BRYOZOA, CARB FRAGMENT
SILTSTONE, LIMESTONE, RADIOLARITES, QUARTZITE
SST: F - V FINE, DOLOMITE, ECHINOIDS, INTRUSIVES
SST: MEDIUM, CHERT, CORALS, GLAUCONITE
SST: COARSE, CONGLOMERATE, FORAMINIFERA, PYRITE
SHALE, COAL, LITHIC FRAGMENT, CEMENT

ENGINEERING LEGEND

CASING SHOE, WIRELINE LOGS
LINER HANGER, MDT POINTS:
BIT CHANGE, PRESSURE ONLY
DEVIA. SURVEY, SAMPLE
SWC UNRECOV, SEAL FAILURE
SIDEWALL CORE, TIGHT
CORE

ROP (m/hr) 500 50 5 .5
WOB (tons) 50 25 0
MWD Gamma Ray (api) 0 100 200
DEPTH (m) (TVD)
CUTTINGS LITHOLOGY % 0 100
RESERVAL GAS DATA
C1 C2 C3 iC4 nC4 iC5 nC5 TG
Total Gas in Units Chromatograph in PPM
.5 5 50 500 5K 100 1K 10K 100K 1000K
CUT FLUOR good fair poor
DIRECT FLR good fair poor
LITHOLOGY DESCRIPTIONS and REMARKS

1420
1430
1440
(976)
1450
1460
(985.9)
1470

WOB:25-45
TDRPM:0
MMRPM:151
SPP:1550
FLW:520

WOB:20-25
TDRPM:60

Tie in Survey:1436.00mMD (974.07mTVD)
60.30°inc 253.28°az

BIT #1RR 8 1/2"
Security XS4
Jets: 3x24
In : 1434.0m MDRT
Out : 1475.0m MDRT
Run : 41.0m
Hrs : 5.5
Cond: 1-1-WT-A-E-E-E-1/16-NO-PR

100 % C1

PREVIOUS WELL HISTORY
Plugged & Abandoned in November, 2005.
10-3/4" Surface Csg 1434.0m MDRT
7" Production Csg cut and pulled from 1495.0m MDRT
Kick-off plug at 1401.0m MDRT

Bream A19A kick-off at 05:00 hours on 24-11-2005 from 1436.0m MDRT

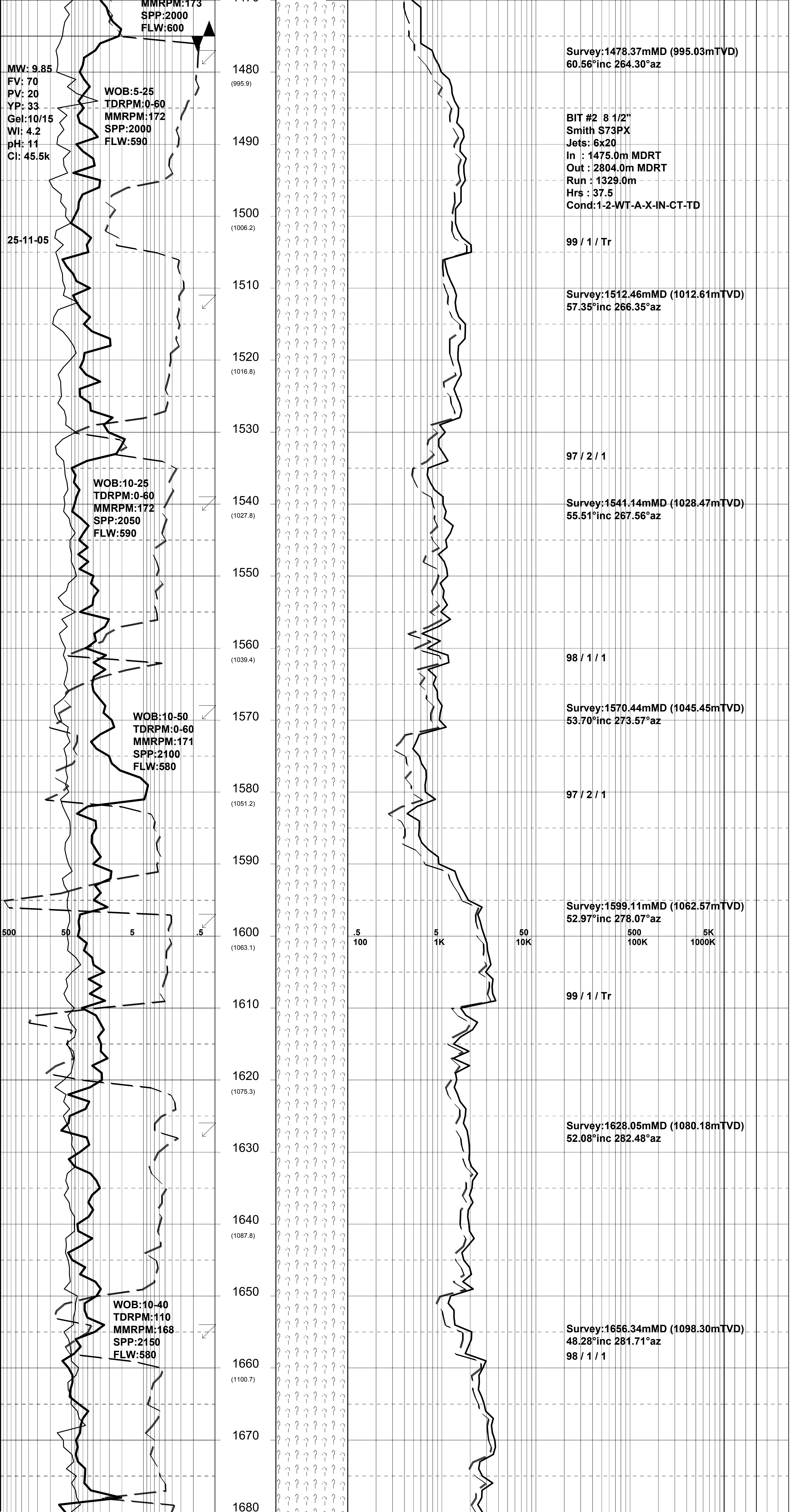
Drill with KCl/Glycol/PHPA mud system.

PIT at 1434.0m MDRT 973.1m TVDRT 514 psi 9.9 ppg EMW:13.0 ppg

No H2S or CO2 Detected

Lakes Entrance 1454.5m MDRT 983.2m TVDRT (-950.4m TVDSS)

CALCAREOUS CLAYSTONE:med gy-med dk gy,slty,mod calc,tr dissem pyr, tr foss frag,rr glauc,frm-mod hd, sbblky-blky.



sbblky-blky.

CALCAREOUS CLAYSTONE:med gy-med dk gy,slty,mod calc,tr dissem pyr, tr foss frag,rr glauc,frm-mod hd, sbblky-blky.

CALCAREOUS CLAYSTONE:med gy-med dk gy,slty,mod calc,tr dissem pyr, tr foss frag,rr glauc,frm-mod hd, sbblky-blky.

CALCAREOUS CLAYSTONE:med gy-med dk gy,slty,mod calc,tr dissem pyr, tr foss frag,rr glauc,frm-mod hd, sbblky-blky.

CALCAREOUS CLAYSTONE:med gy-med dk gy,slty,mod calc,tr dissem pyr, tr foss frag,rr glauc,frm-mod hd, sbblky-blky.

CALCAREOUS CLAYSTONE:med gy-med dk gy,slty,mod calc,tr dissem pyr, tr foss frag,rr glauc,frm-mod hd, sbblky-blky.

CALCAREOUS CLAYSTONE:med gy-med dk gy,slty,mod calc,tr dissem pyr,rr foss frag,frm-mod hd,sbblky-blky.

CALCAREOUS CLAYSTONE:med gy-med dk gy,slty,mod calc,tr dissem pyr,rr foss frag,frm-mod hd,sbblky-blky.

CALCAREOUS CLAYSTONE:lt gy-med gy,slty,mod calc,tr dissem pyr, rr foss frag,frm-mod hd,sbblky-blky. sbblky-blky.

1690

1700
(1127.8)

1710

1720
(1141.8)

1730

1740
(1156.4)

1750

1760
(1171.6)

1770

1780
(1187.1)

1790

1800
(1202.8)

1810

1820
(1218.8)

1830

1840
(1234.8)

1850

1860
(1250.9)

1870

1880
(1267.2)

1890

WOB:10-35
TDRPM:110
MMRPM:170
SPP:2250
FLW:590

WOB:5-10
TDRPM:110
MMRPM:172
SPP:2510
FLW:590

MW: 9.90
FV: 69
PV: 26
YP: 42
Gel:11/19
WI: 2.9
pH: 8.9
Cl: 46.0k

26-11-05

500 50 5 .5

.5 5 50 500 5K
100 1K 10K 100K 1000K

Survey:1685.20mMD (1117.54mTVD)
48.06°inc 281.14°az

99 / 1 / Tr

Survey:1713.81mMD (1137.30mTVD)
44.58°inc 282.85°az

98 / 1 / 1

Survey:1742.37mMD (1158.07mTVD)
42.09°inc 285.32°az

98 / 1 / 1 / Tr

Survey:1771.22mMD (1180.13mTVD)
38.18°inc 285.68°az

98 / 1 / 1 / Tr

Survey:1800.06mMD (1202.89mTVD)
37.61°inc 285.36°az

97 / 2 / 1 / Tr

Survey:1828.75mMD (1225.74mTVD)
36.76°inc 285.25°az

Survey:1857.65mMD (1249.03mTVD)
35.84°inc 284.67°az

96 / 1 / 1 / 2 / Tr

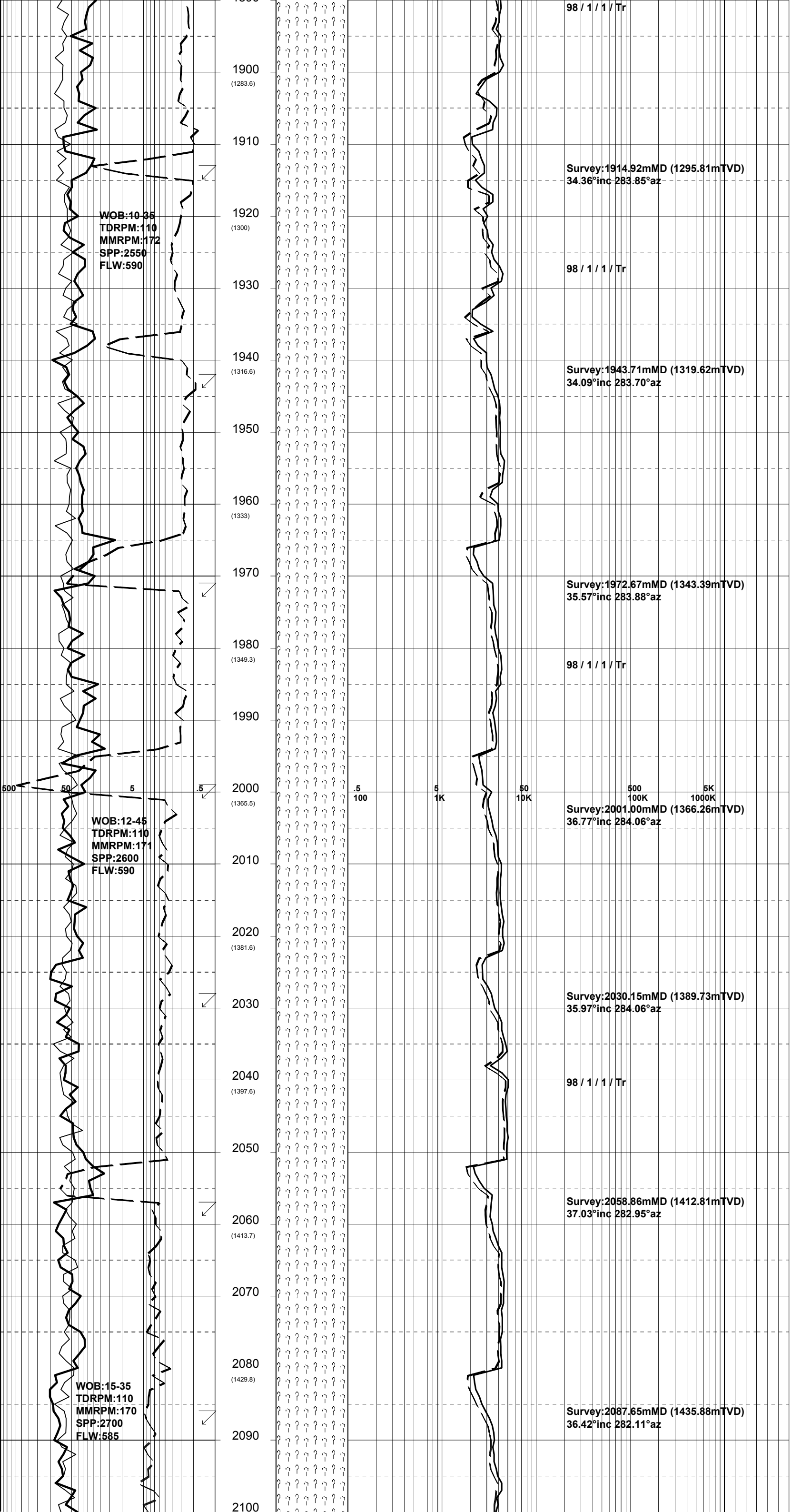
Survey:1886.53mMD (1272.52mTVD)
35.35°inc 284.85°az

CALCAREOUS CLAYSTONE:lt gy-med gy,slty,mod calc,tr dissem pyr, rr foss frag,frm-mod hd,sbblky-blky.

CALCAREOUS CLAYSTONE:lt gy-med gy,slty,mod calc,tr dissem pyr, rr foss frag,frm-mod hd,sbblky-blky.

CALCAREOUS CLAYSTONE:lt gy-med gy,slty,mod calc,tr dissem pyr, rr foss frag,frm-mod hd,sbblky-blky.

CALCAREOUS CLAYSTONE:lt gy-med gy,slty,mod calc,tr dissem pyr, rr foss frag,frm-mod hd,sbblky-blky.



CALCAREOUS CLAYSTONE:lt gy-med gy,slty,mod calc,tr dissem pyr, rr foss frag,frm-mod hd,sbblky-blky.

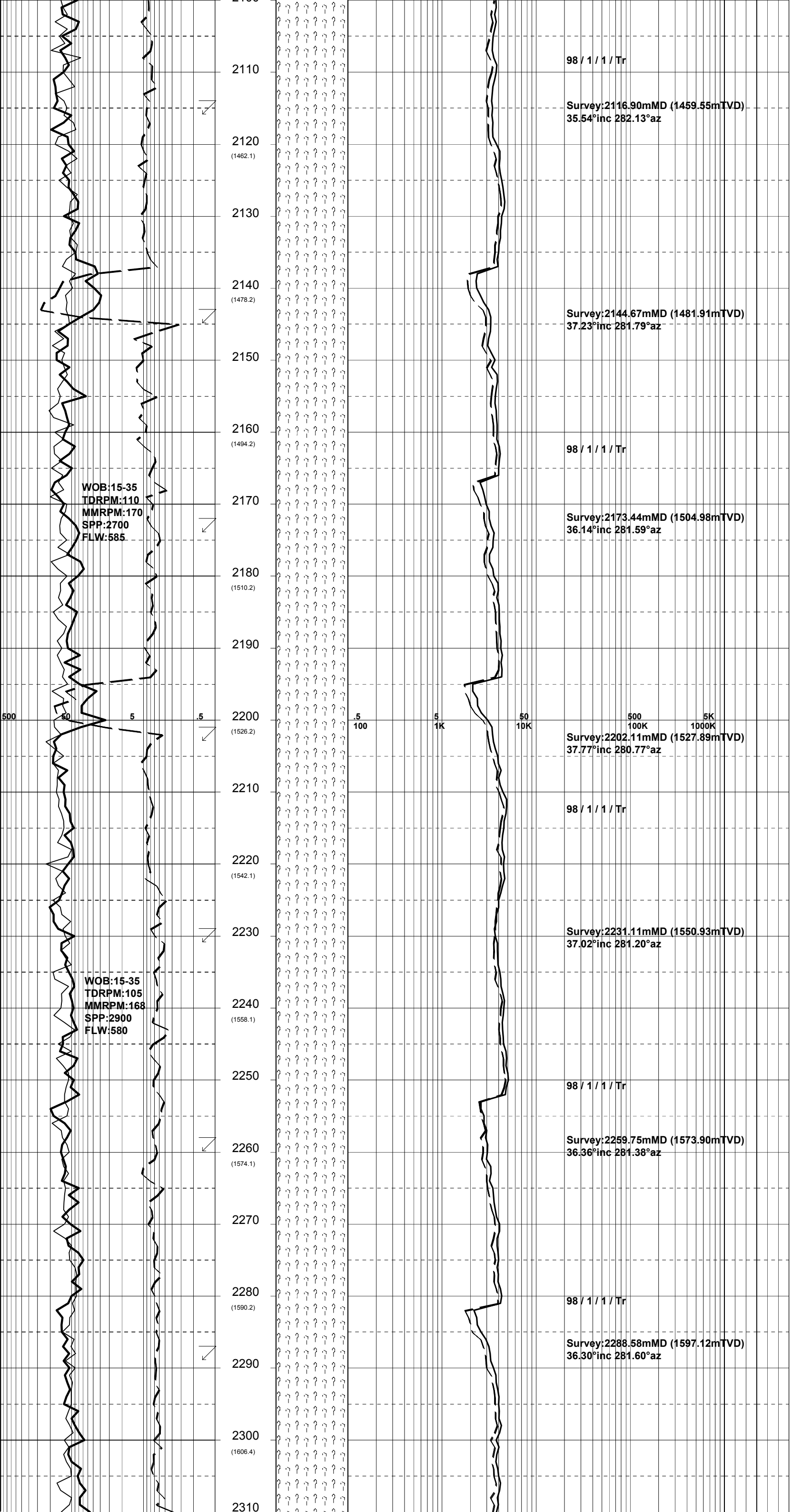
CALCAREOUS CLAYSTONE:lt gy-med lt gy,slty,mod calc,rr dissem pyr,rr foss frag,rr ooid,frm-mod hd, sbblky-blky.

CALCAREOUS CLAYSTONE:lt gy-med lt gy,slty,mod calc,rr dissem pyr,rr foss frag,rr ooid,frm-mod hd, sbblky-blky.

CALCAREOUS CLAYSTONE:lt gy-med lt gy,occ lt bn gy,slty,mod calc, rr dissem pyr,rr foss frag,rr ooid, frm-mod hd,sbblky-blky.

CALCAREOUS CLAYSTONE:lt gy-med lt gy,occ lt bn gy,slty,mod calc, rr dissem pyr,rr foss frag,rr ooid,rr gastropods,frm-mod hd,sbblky-blky.

CALCAREOUS CLAYSTONE:med lt gy-med gy,slty,mod calc,rr dissem pyr, rr foss frag,rr ooid,frm-mod hd, sbblky-blky.



CALCAREOUS CLAYSTONE:lt gy-med lt gy,occ lt bn gy,slty,mod calc, rr dissem pyr,rr foss frag,rr ooid, frm-mod hd,sbblky-blky.

CALCAREOUS CLAYSTONE:lt gy-med lt gy,occ lt bn gy,slty,mod calc, rr dissem pyr,rr foss frag,rr ooid, rr glauc,frm-mod hd,sbblky-blky.

CALCAREOUS CLAYSTONE:med gy-lt bn gy,slty,mod calc,rr dissem pyr, rr foss frag,rr ooid,frm-mod hd, sbblky-blky.

CALCAREOUS CLAYSTONE:lt bn-gy-med gy,slty,mod calc,rr dissem pyr, rr foss frag,rr ooid,frm-mod hd, sbblky-blky.

CALCAREOUS CLAYSTONE:lt bn-gy-med gy,slty,mod calc,rr dissem pyr, rr foss frag,rr ooid,frm-mod hd, sbblky-blky.

MW: 9.90
FV: 66
PV: 25
YP: 43
Gel:12/21
WI: 3.4
pH: 8.9
Cl: 41k

WOB:11-40
TDRPM:105
MMRPM:168
SPP:3010
FLW:580

WOB:13-50
TDRPM:105
MMRPM:168
SPP:3010
FLW:580

500 50 5 .5

27-11-05

2320 (1622.6)
2330
2340 (1638.9)
2350
2360 (1655.3)
2370
2380 (1671.8)
2390
2400 (1688.2)
2410
2420 (1704.5)
2430
2440 (1720.8)
2450
2460 (1737)
2470
2480 (1753.3)
2490
2500 (1769.5)
2510
2520

.5 5 50 500 5K
100 1K 10K 100K 1000K

Survey:2317.40mMD (1620.47mTVD)
35.51°inc 281.06°az

98 / 1 / 1 / Tr

Survey:2346.23mMD (1644.02mTVD)
34.94°inc 282.32°az

98 / 1 / 1 / Tr

Survey:2374.98mMD (1667.66mTVD)
34.42°inc 282.31°az

Survey:2403.55mMD (1691.13mTVD)
35.11°inc 282.88°az

97 / 2 / 1 / Tr

Survey:2432.17mMD (1714.41mTVD)
36.05°inc 282.98°az

97 / 2 / 1 / Tr

Survey:2460.56mMD (1737.48mTVD)
35.22°inc 283.04°az

97 / 2 / 1 / Tr

Survey:2489.45mMD (1760.95mTVD)
36.11°inc 283.93°az

Survey:2518.32mMD (1784.40mTVD)
35.25°inc 284.65°az

CALCAREOUS CLAYSTONE:lt bn-gy-med gy,slty,mod calc,rr dissem pyr, rr foss frag,rr ooid,frm-mod hd, sbblky-blky.

CALCAREOUS CLAYSTONE:lt bn-gy-med gy,slty,mod calc,rr dissem pyr, rr foss frag,rr ooid,frm-mod hd, sbblky-blky.

CALCAREOUS CLAYSTONE:lt gy, mnr lt bnsh gy,slty,mod calc,tr ooid, rr foss frag,rr dissem pyr,frm-mod hd, sbblky-blky.

CALCAREOUS CLAYSTONE:lt-med gy,mnr lt bnsh gy,slty,mod calc,tr ooid, rr foss frag,rr dissem pyr,frm-mod hd, sbblky-blky.

CALCAREOUS CLAYSTONE:lt gy-med gy,mnr lt bnsh gy,slty i/p,mod calc,tr ooid,tr foss frag,tr dissem pyr,tr pyr lam,rr nod pyr,frm-mod hd, sbblky-blky.

CALCAREOUS CLAYSTONE:lt gy-med gy,mnr lt bnsh gy,slty i/p,mod calc,tr ooid,tr foss frag,tr dissem pyr,tr pyr lam,rr nod pyr,frm-mod hd, sbblky-blky.

95 / 3 / 1 / 1

CALCAREOUS CLAYSTONE:lt bn gy-med gy,slty,mod calc,rr ooid, rr foss frag,rr dissem pyr,tr glauc, frm-mod hd,sbblky-blky.

2530

2540
(1802)

WIPER TRIP TO SHOE

Survey:2546.76mMD (1807.52mTVD)
36.00°inc 283.55°az

2550

CALCAREOUS CLAYSTONE:lt bn gy-med gy,slty,mod calc,rr ooid, rr foss frag,rr dissem pyr,tr glauc, frm-mod hd,sbblky-blky.

2560
(1818.3)

2570

WOB:9-10
TDRPM:105
MMRPM:171
SPP:3200
FLW:590

Survey:2575.01mMD (1830.50mTVD)
35.10°inc 283.73°az

2580
(1834.6)

CALCAREOUS CLAYSTONE:lt bn gy-med gy,slty,mod calc,rr ooid,rr foss frag,rr dissem pyr,frm-mod hd, sbblky-blky.

92 / 5 / 2 / 1

2590

28-11-05

500 50 5 .5 .5 5 50 500 5K
100 1K 10K 100K 1000K

2600
(1851)

Top of Latrobe
2601.0m MDRT 1851.9m TVDRT
(-1819.1m TVDSS)

Survey:2603.28mMD (1853.73mTVD)
34.42°inc 283.46°az

CALCAREOUS CLAYSTONE:lt bnsh gy-med gy,slty,mod calc, rr glauc,rr foss frag, frm-mod hd,sbblky-blky.
CLAYSTONE:lt olv bn-dsky yel, non calc,sft-frm,amor-sbblky.

MW: 10.10
FV: 72
PV: 27
YP: 42
Gel:14/22
Wl: 3.2
pH: 8.9
Cl: 41k

2610

88 / 6 / 4 / 1 / 1

SANDSTONE:wh-pa gy,vf-f, mod wl srt,sa-sr,com pel glauc, com glauc mtx,hd agg,ti- v pr inf & vis por, no fluor.

2620
(1867.6)

SILTSTONE:pl yelsh bn, v aren g/t vf SST,tr micmic, tr glauc,frm-mod hd,sbblky.

2630

Survey:2632.06mMD (1877.56mTVD)
33.78°inc 283.24°az

CLAYSTONE:med gy-lt bnsh gy, slty,mod calc,tr dissem pyr, rr nod pyr,frm-mod hd, sbblky-blky.

2640
(1884.2)

80 / 8 / 6 / 4 / 2

SILTSTONE:mod bn-pl bn,mnr pl yelsh bn,tr pel glauc,tr micmic,frm-mod hd,sbblky.

SANDSTONE:wh-pl gy,vf-f,mod wl srt,sa-sr,mod sil cmt,wk glauc mtx,hd agg,ti-v pr inf & vis por,no fluor.

2650

WOB:9-16
TDRPM:105
MMRPM:171
SPP:3200
FLW:590

VOLCANICS:pl gn-gy gn,dom chlorite, xln,occ hd,com bit crushed rock flour.

2660
(1900.8)

Survey:2661.17mMD (1901.80mTVD)
33.44°inc 283.32°az

SILTSTONE:mod bn-pl bn,occ pl yelsh bn,com-abdt pel glauc,tr micmic,frm-mod hd,sbblky.

SANDSTONE:wh-pl gn,vf-f,mod wl srt,sa-sr,mod sil cmt,wk glauc mtx,hd agg,ti-v pr inf & vis por,no fluor.

2670

TCC (N-1 Reservoir)
2679.0m MDRT 1916.7m TVDRT
(-1883.9m TVDSS)

86 / 7 / 4 / 2 / 1

2680
(1917.5)

SANDSTONE:wh-lt gy,vf-f,mod wl srt,sa-sr,mod sil cmt,com micropyr, mtx,hd agg,ti-v pr inf & vis por, no fluor.

Survey:2690.17mMD (1925.99mTVD)
33.53°inc 282.75°az

Base of Waste Rock
2686.5m MDRT 1922.9m TVDRT
(-1890.1m TVDSS)

2690

SANDSTONE:clr-trnsl,med-v crs,dom crs,mod wl srt,sa-sr,wk pyr cmt, tr pyr nod,dom lse,cln,fr inf por & vis por,no fluor.

85 / 7 / 5 / 2 / 1

2700
(1934.2)

VOLCANICS:pl gn-gy gn,occ gy bn, dom chlorite,xln,occ hd,com bit crushed rock flour.

SANDSTONE:clr-trnsl,med-v crs,dom crs,mod wl srt,sa-sr,wk-mod pyr cmt, tr pyr nod,dom lse,cln,fr-gd inf & vis por,no fluor.

82 / 8 / 5 / 3 / 2

2710

COAL:dsky bn-bn blk,slty g/t CARB SLTST,ea,mod hd,sbblky,tr qtz incl.

Survey:2718.85mMD (1949.85mTVD)
33.87°inc 282.07°az

CLAYSTONE:lt gy-lt bl gy,sli calc, slty,mod hd-hd,blky.

SILTSTONE:pl bn-mod bn,aren g/t vf SST,tr pel glauc,tr micmic,frm-mod hd,sbblky.

WOB:6-12
TDRPM:110
MMRPM:171
SPP:3200
FLW:590

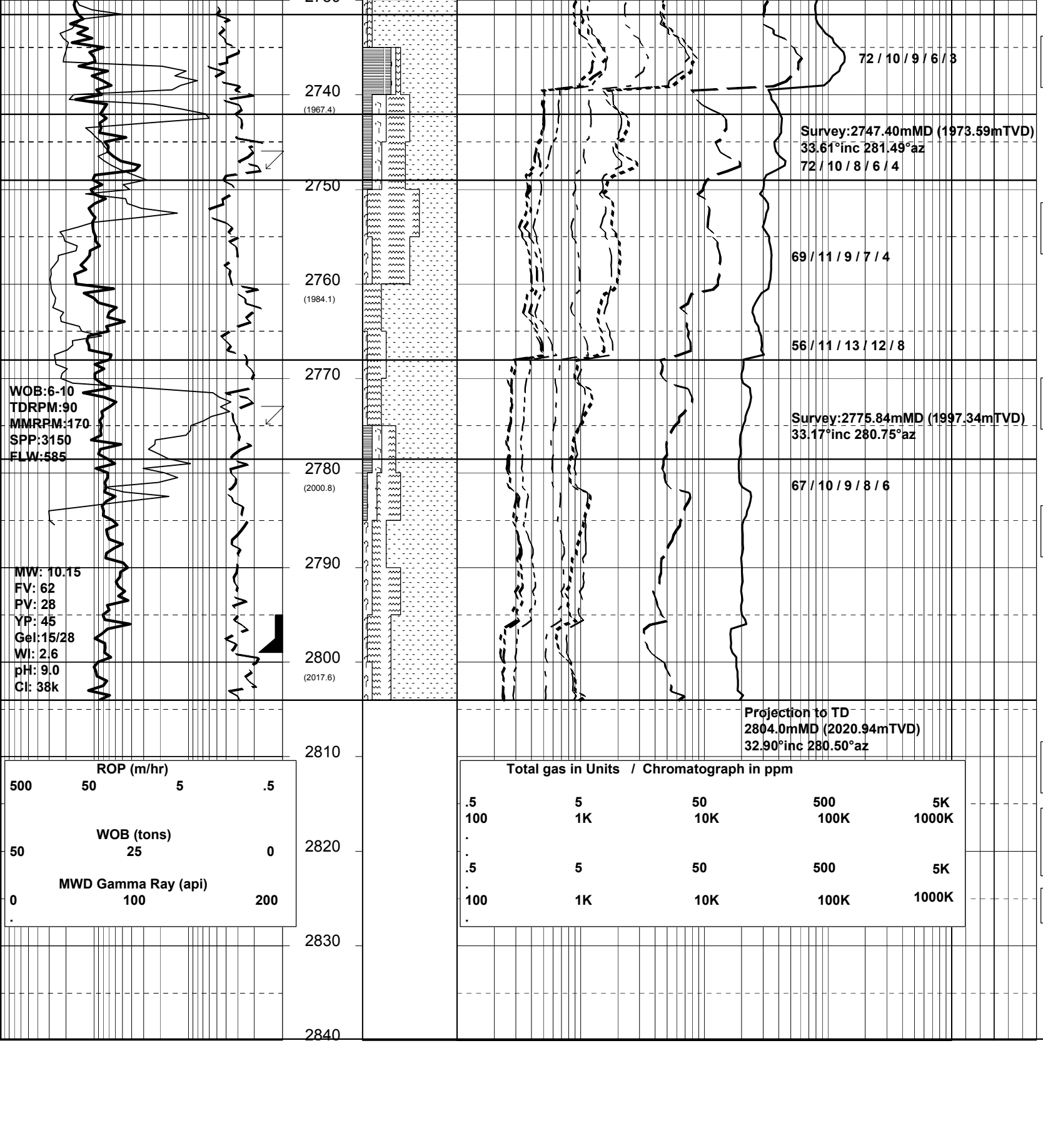
2720
(1950.8)

77 / 9 / 7 / 5 / 2

CBF2 horizon (Cobalt sand)
2731.5m MDRT 1960.4m TVDRT
(-1927.6m TVDSS)

2730

SANDSTONE:clr-trnsl,f-occ v crs, dom f-med,mod wl srt,sa-sr,wk pyr



cmt,rr nod pyr,dom lse,gen cln,pr-fr inf & vis por,no fluor.

CBF1
2742.0m MDRT 1969.1m TVDRT (-1936.3m TVDSS)

COAL:bn blk,slty g/t CARB SLTST, ea,brit,sbblky,unevn,wdy tex,tr qtz incl.

SANDSTONE:clr-trnsl,rr v pl bl,crs-dom v crs,mod wl srt,sa-sr,com frac qtz grn,wk pyr cmt,tr nod pyr,lse, cln,fr inf & vis por,no fluor.

CBSB (base of Cobalt sand)
2749.0m MDRT 1974.9m TVDRT (-1942.1m TVDSS)

SILTSTONE:pl bn-mod bn,aren g/t vf SST,tr glauc,tr micmic, frm-mod hd,sbblky.

SANDSTONE:clr-trnsl,rr gy pnk,f-rr crs,dom f,mod wl srt,sa-sr, wk pyr cmt,rr nod pyr,lse, cln,pr inf & vis por,no fluor.

PKSB (base of Pink sand)
2768.0m MDRT 1990.8m TVDRT (-1958.0m TVDSS)

SANDSTONE:clr-trnsl,v pl org,med-v crs,dom crs-v crs,wk pyr cmt,rr nod pyr,lse,cln,fr-gd inf & vis por,no fluor.

MVSB
2778.5m MDRT 1999.6m TVDRT (-1966.8m TVDSS)

COAL:bn blk,sbvit,brit,sbblky, unevn.

SILTSTONE:mod bn-dk yel bn,aren g/t vf SST,tr micmic,frm-mod hd, sbblky.

SANDSTONE:clr-trnsl,crs-dom v crs, occ frac qtz grn,mod wl srt,sa-sr, cln,lse,fr inf & vis por, no fluor.

Bream A19A reached Total Depth of 2804.0m MDRT 2020.9m TVDRT at 14:40 hours on 28-11-2005

Run Precision Energy Services compact shuttle logging from 2801.0m MDRT to 2480.5m MDRT MCG-MDN-MPD-MDL-MSS-MAI

7" Production Casing shoe set at 2799.0m MDRT

APPENDIX 4b

BREAM A19A

Well Completion Log

ESSO AUSTRALIA RESOURCES PTY LTD.

WELL COMPLETION LOG
Scale – 1:200
BREAM A-19A

Gippsland Basin, Victoria
Concession: VIC/L13

POST-DRILL LOCATION:	Latitude:	38º 30' 6.668" S	**COMPILED BY:**	Sheryl Sazenis
	Longitude:	147º 45' 15.253" E		
Top of Latrobe	MGA X:	565766.60 mE	**DRAFTED BY:**	Arnaldo Ribeiro
	MGA Y:	5738231.56 mN		
	Depth	2600.5m MDRT	**DRILLED BY:**	Nabors Rig 453
		1851.4m TVDRT		
		(-1818.6mTVDSS)	**Datum:**	GDA94 (GRS80)
ELEVATION:	G.L.:	-59.40 m	**Projection:**	MGA/ UTM Zone 55 (S)
	R.T.:	32.82 m		
	Water Depth:	59.40 m	**TOTAL DEPTH:**	2804.0 mMDRT / 2020.9 mTVDRT
DATES:	Spudded:	24/11/2005	**PLUGGED BACK T.D.:**	2771.0m MDRT
	Rig Released:	10/12/2005		
	I.P. Established:	24/12/2005	**CLASSIFICATION:**	Development
	(Initial production)			
			STATUS:	Cased and Completed

SERVICE COMPANIES:

DRILLING CONTRACTOR:	International Sea Drilling Limited (Nabors Rig 453)	PRODUCTION TESTING:	n/a
MWD/DIRECT. DRLG:	Schlumberger Anadrill	DIVERS:	n/a
GYRO SURVEYING:	SDI	MUD LOGGING:	Geoservices Overseas S.A.
CORING:	n/a	PRESSURE RECORDING:	n/a
PIPE CONVEYED LOGGING:	Precision(Reeves Compact Shuttle Logging System)	WELL VELOCITY SURVEY:	n/a
CEMENTING:	Halliburton	MUD ENGINEERING:	Halliburton- Baroid
CASING:	Weatherford	LINER:	n/a

LEGEND

2.7m NOS
Ø = 17%
Sw = 32%

No Rec.
CORE
Rec.

PERFORATED INTERVAL

PLUG

LOG ANALYSIS DATA
NS - Net Sand
NOS - Net Oil Sand
NGS - Net Gas Sand
Sw - Water Saturation

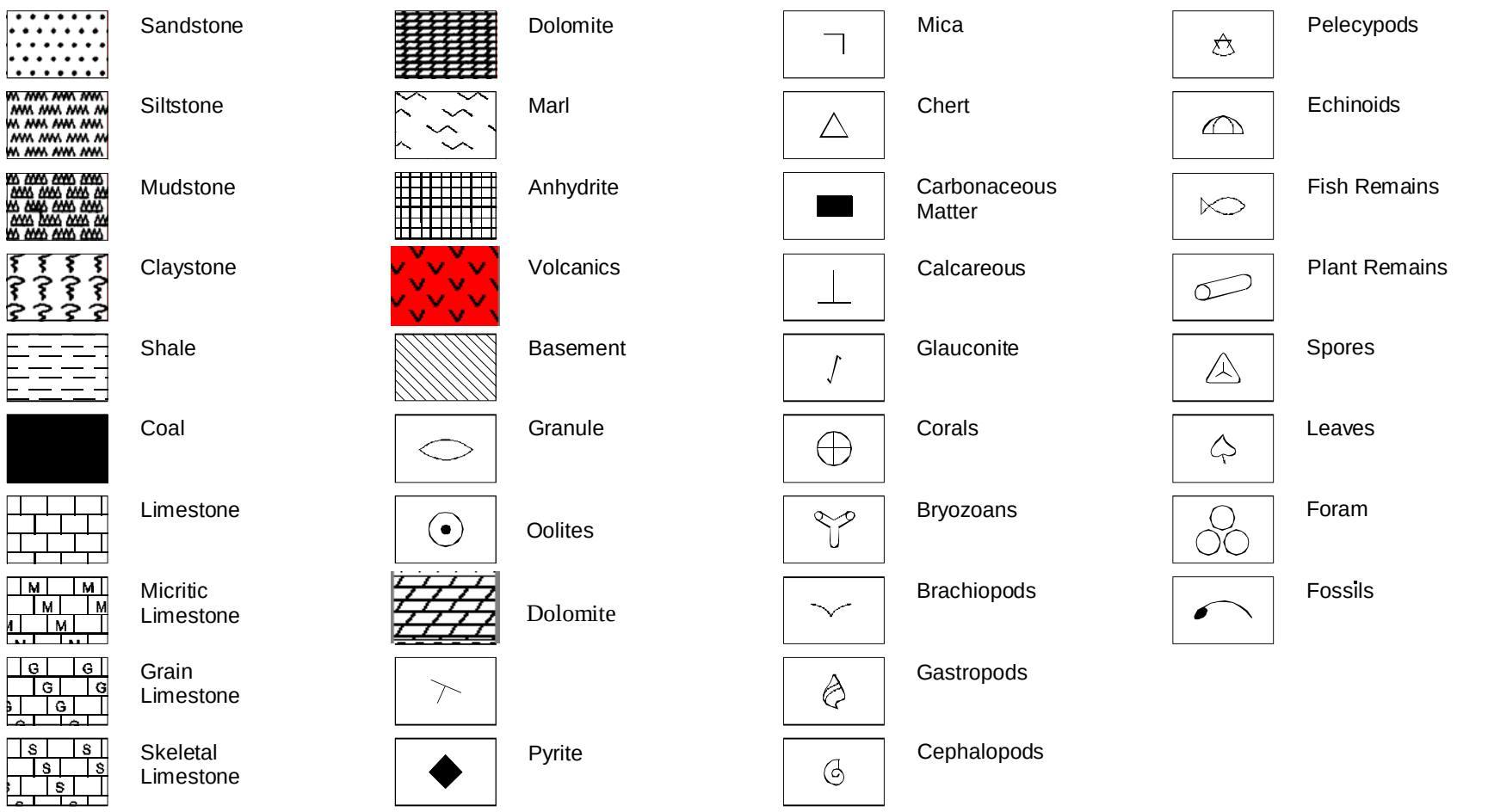
MUD DATA
Ø - Porosity
Snd - Sand
MW - Mud Weight
FV - Funnel Velocity
PV - Plastic Velocity
YP - Yield Point
Gel - Gel Strength
pH - Acidity/Alkalinity
WL - Water Loss
Cl - Chloride
Ca - Calcium
Sol - Solids
H2O - Water
Oil -Oil

SHOW OR STAIN
HYDROCARBON CUT
FLUORESCENCE
GAS SHOW
OIL PRODUCTIVE
GAS PRODUCTIVE
INTERPRETED OIL PRODUCTION
INTERPRETED GAS PRODUCTION
INTERPRETED WATER PRODUCTION
WATER PRODUCTIVE
CONDENSATE PRODUCTION
INTEPRETED CONDENSATE BEARING
DSTG DST WITH GAS RECOVERED
DSTO DST WITH OIL RECOVERED
SURVEY POINT
13-3/8" CASING SHOE
MUD

SST RECOVERED SIDE WALL CORE LITHOLOGY
SST - Sandstone CLST - Claystone
SLST - Siltstone LMST - Limestone
MST - Mudstone ML - Marl
SH - Shale COAL - Coal

SIDE WALL CORE - NO RECOVERY
FIT
P2/11 MDT/RFT PRETEST RUN/SEAT NUMBER
S11/2 MDT/RFT SAMPLE RUN/SAMPLE NUMBER
P2/40 MDT VERTICAL/HORIZONTAL PERMEABILITY TEST
PACKER
BRIDGE PLUG

LITHOLOGICAL SYMBOLS



LOGGING AND SURVEYING

Anadrill Schlumberger	Interval (mMDRT)	Reeves	Interval (mMDRT)
MWD (Directional & GR) – 3 Runs	1401.0 mMDRT - 2804 mMDRT	MCG-MDN-MPD-MSS-MDL – 1 Run	2801.0 mMDRT- 2480.5 mMDRT

WELL DATA

Date	22 November 2005- 23 November 2005	23 November 2005- 24 November 2005	25 November 2005- 29 November 2005	29 November 2005- 30 November 2005
Run	MWD # 1	MWD # 2	MWD # 3	Wireline Run #1 on shuttle
Log	Powerpulse Directional & GR	Powerpulse Directional & GR	Powerpulse Directional & GR	MCG-MDN-MPD-MSS-MDL
Depth Driller	1401.0 mMDRT	1475.0 mMDRT	2804.0 mMDRT	2804.0 mMDRT
Depth Logger	1401.0 mMDRT	1475.0 mMDRT	2804.0 mMDRT	2804.0 mMDRT
Bottom Log Interval	1401.0 mMDRT	1475.0 mMDRT	2804.0 mMDRT	2801.0 mMDRT
Top Log Interval	1401.0 mMDRT	1436.0 mMDRT	1475.0 mMDRT	2480.5 mMDRT
Casing Driller	1434.0 mMDRT	1434.0 mMDRT	1434.0 mMDRT	1434.0 mMDRT
Casing Logger	1434.0 mMDRT	1434.0 mMDRT	1434.0 mMDRT	1434.0 mMDRT
Casing Size	10.75"	10.75"	10.75"	10.75"
Casing Weight	40.5 ppf	40.5 ppf	40.5 ppf	40.5 ppf
Bit Size	8.5"	8.5"	8.5"	8.5"
Type of Fluid in Hole	KCl/PHPA/GLYCOL	KCl/PHPA/GLYCOL	KCl/PHPA/GLYCOL	KCl/PHPA/GLYCOL
Density	N/A ppg	9.80 ppg	10.10 ppg	10.15 ppg
Rm @ Measured Temp.	N/A	N/A	N/A	0.228
Rmf @ Measured Temp.	N/A	N/A	N/A	0.091
Rmc @ Measured Temp.	N/A	N/A	N/A	0.359
Max. Recorded Temp.	N/A °C	50.2°C	79.0°C	70.60°C
Equipment / Location	Sale	Sale	Sale	Sale
Recorded By	A.Qadar / R.Burns	A.Qadar / R.Burns	L.Johnston / R.Burns	R.Tench / B.Moss
Witnessed By	Trevor Lobo	Trevor Lobo	Trevor Lobo	Trevor Lobo

CORES

From (mMDRT)	To (mMDRT)	Rec %

PERFORATIONS

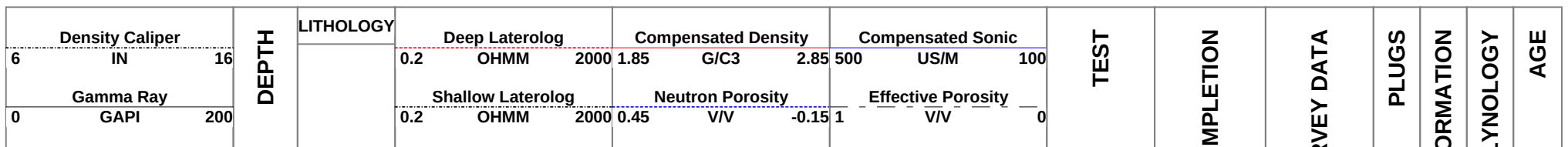
From (mMDRT)	To (mMDRT)	Gun Type
2709.5	2711.0	Wireline HSD
2690.5	2692.5	Wireline HSD

CASING

Size	Set @ (mMDRT)	SX Cmt	Formation
10. 75"	1433.6	---	Gippsland Limestone
7”	2799.0	528	Latrobe Group

PLUGS

From (mMDRT)	To (mMDRT)	SXCmt
2771.0	2799.0	--



Bulk Vol Water
1 V/V 0

mMDRT
(mTVDSS)

2400

2425
(-1675.8)

2450
(-1696.1)

2475

CO

MUD / SUR

FO

PAL

10 3/4"

1433.6m

2314.0
MW 9.9ppg
FV 66sec/qt
PV 25cP
YP 43
pH 8.9

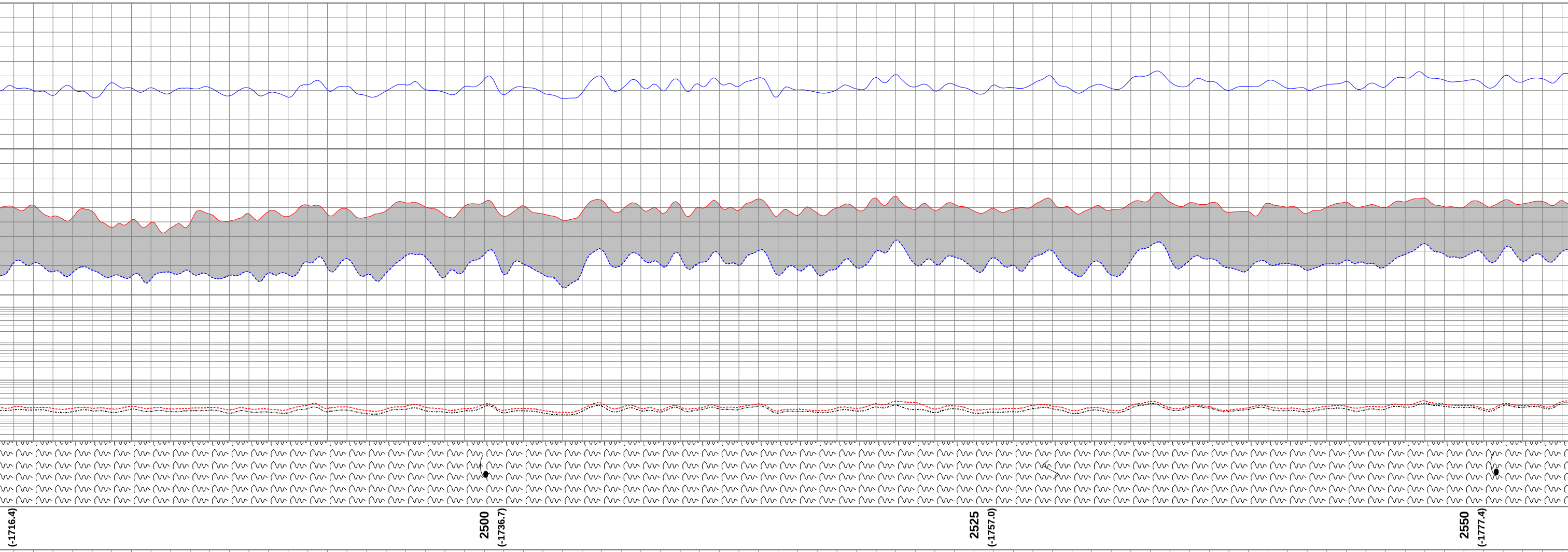
2432.17
ANG 36.05
DIR 282.98
(-1681.58)

OLIGOCENE - MIOCENE

LAKES ENTRANCE FM

2489.45
ANG 36.11
DIR 283.93
(-1728.13)

2546.76
ANG 36.00
DIR 283.55
(-1774.69)



(-1716.4)

2500
(-1736.7)

2525
(-1757.0)

2550
(-1777.4)

2575
(-1797.7)

2600
(-1818.2)

Top of Latrobe (TOL)
2600.5m MDRT
(-1818.6m TVDSS)

Top Intra-Gurn Sand
2612m MDRT
(-1828.1m TVDSS)

Gas Bearing
3.9 MD Net
3.3 TVD Net
∅ = 14.4%
Sw= 13.1%

2625
(-1838.9)

2575.01
ANG 35.10
DIR 283.73
(-1797.68)

2606.0
MW **10.1ppg**
FV **72sec/qt**
PV **27cP**
YP **42**
pH **8.9**

2603.28
ANG 34.42
DIR 283.46
(-1820.90)

2632.06

2650
(-1859.7)

2675
(-1880.5)

TCC (N-1 Reservoir)
2680.8m MDRT
(-1885.4m TVDSS)

YESB/Base of Waste Rock
2685m MDRT
(-1888.9m TVDSS)

Gas Bearing
4.8 MD Net
4.0 TVD Net
∅ = 13.3%
Sw= 48.6%

CGOC 2692.3m MDRT
(-1894.9m TVDSS)

OWC 2696m MDRT
(-1898m TVDSS)

newRdF2
2695.9m MDRT
(-1897.9m TVDSS)

Gas Bearing
2.0 MD Net
1.7 TVD Net
∅ = 17.5%
Sw= 25.1%

2690.5m

Oil Bearing
3.7 MD Net
3.1 TVD Net
∅ = 24.7%
Sw= 17.0%

2692.5 m

Residual Oil & Gas
∅ = 25.3 %
Sw=78.3 %

2700
(-1901.3)

newRdSb
2707.4m MDRT
(-1907.5m TVDSS)

new GnF2
2709.8m MDRT
(-1909.5m TVDSS)

LPO
2712.2m MDRT
(-1907.9m TVDSS)

Oil Bearing
3.0 MD Net
2.5 TVD Net
∅ = 23.5%
Sw= 34.3%

2709.5 m

2711.0 m

Residual Oil & Gas
∅ = 16.9 %

2661.17
ANG 33.44
DIR 283.32
(-1844.74)

2690.17
ANG 33.53
DIR 282.75
(-1893.17)

2661.17
ANG 33.44
DIR 283.32
(-1868.98)

LATROBE GROUP

PALEOCENE - EARLY EOCENE

Sw=77.8 %
Water Bearing
∅ = 23.1 %
Sw=99.8 %

2725
(-1922.1)

newGnSb
2728.8m MDRT
(-1925.3m TVDSS)

newCbF2
2731.7m MDRT
(-1927.7m TVDSS)

newCbF1
2736.8m MDRT
(-1932m TVDSS)

Water Bearing
∅ = 13.7 %
Sw=100.0 %

newCbSb
2744.2m MDRT
(-1938.1m TVDSS)

Water Bearing
∅ = 16.7 %
Sw=100.0 %

2718.85
ANG 33.87
DIR 282.07
(-1917.03)

newPkF2
2749.9m MDRT
(-1942.9m TVDSS)

Water Bearing
∅ = 12.4 %
Sw=100.0 %

2750
(-1942.9)

newPkF1
2753.2m MDRT
(-1945.6m TVDSS)

Water Bearing
∅ = 23.5 %
Sw=100.0 %

2747.40
ANG 33.61
DIR 281.49
(-1940.77)

newPkSb
2765m MDRT
(-1955.5m TVDSS)

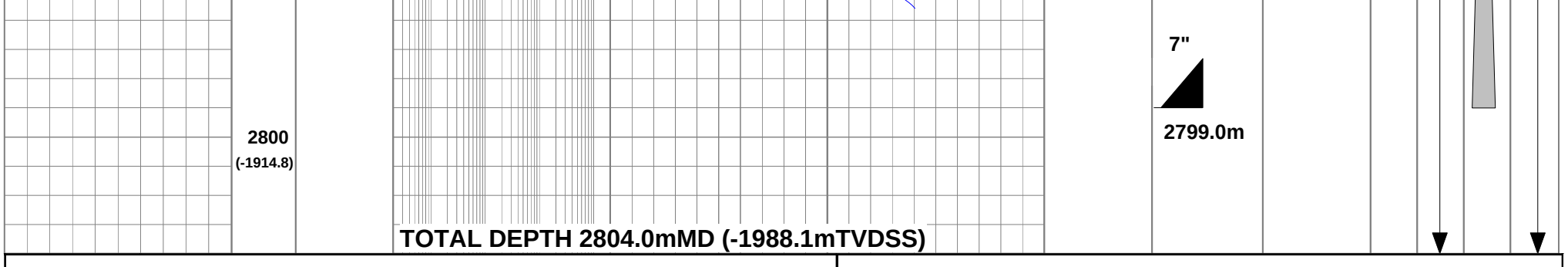
newMvF2
2774.2m MDRT
(-1963.1m TVDSS)

2775
(-1963.8)

newMvSB
2778.5m MDRT
(-1966.7m TVDSS)

2775.84
ANG 33.17
DIR 280.75
(-1964.51)

2790.0
MW 10.15ppg
FV 62sec/qt
PV 28cP
YP 45
pH 9.0



GRGC	Gamma Ray
CLDC	Density Caliper
DSLL	Shallow Laterolog
DGLL	Groningen Deep Laterlog
DEN	Compensated Density
NPRL	Limestone Neutron Porosity
DT35	Compensated Sonic
PIGN	Effective Porosity
VUWA	Bulk Volume Water

Bream A19A
Initial Production Date: 24/12/2005
Production Zone Bream N-1
Initial Total Liquid Rate 330 kL/day,
Oil rate 330 kl/day, 0%watercut.