

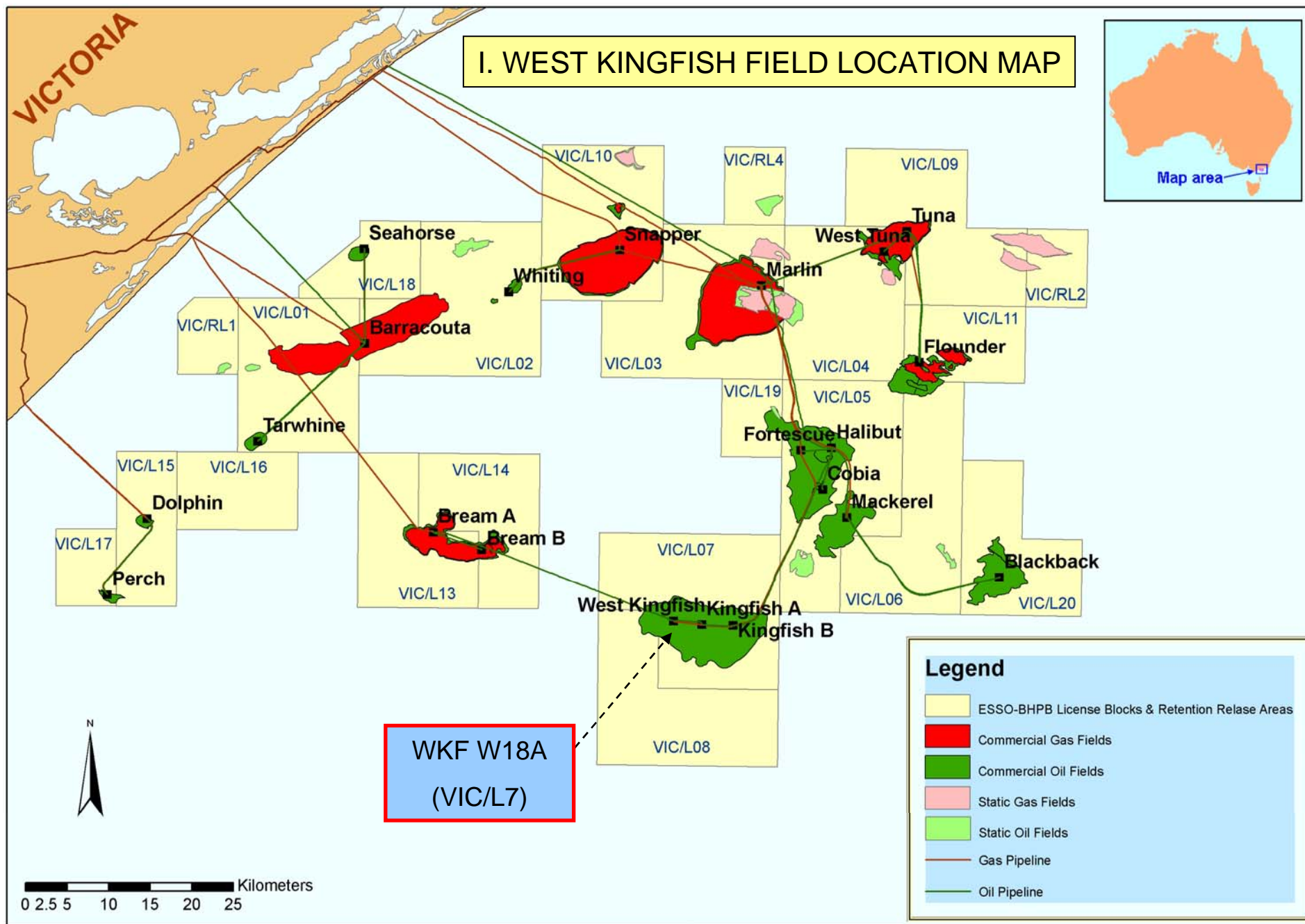
WELL COMPLETION REPORT
WEST KINGFISH W18A
GIPPSLAND BASIN, VICTORIA

Author: Mike Hordern
Compiler: Sheryl Sazenis
September 2006

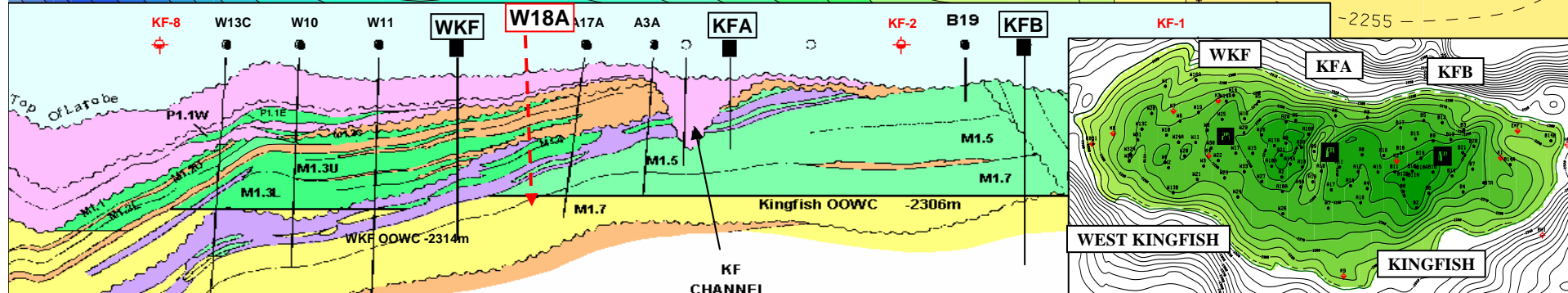
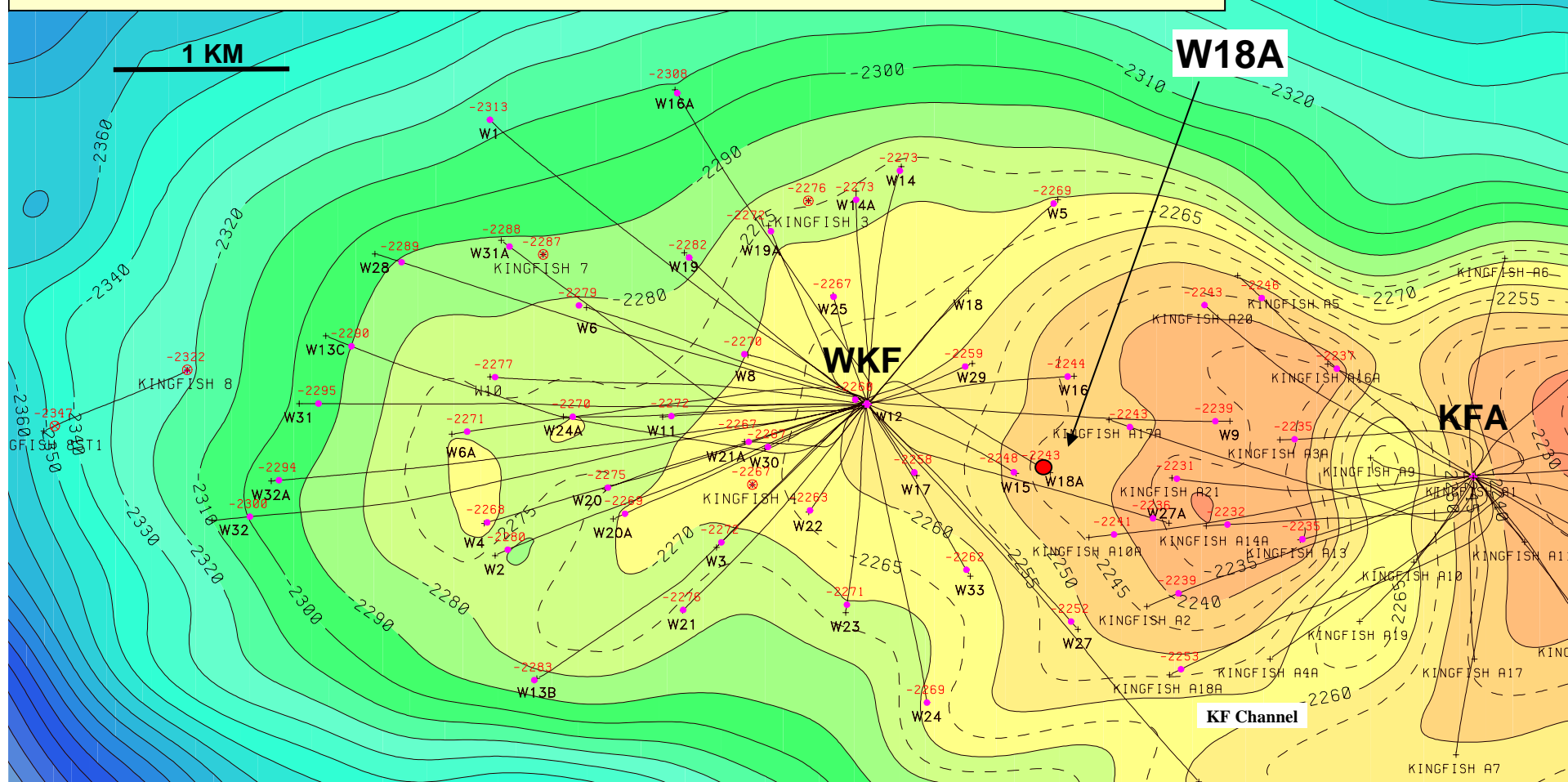
CONTENTS

WEST KINGFISH W18A

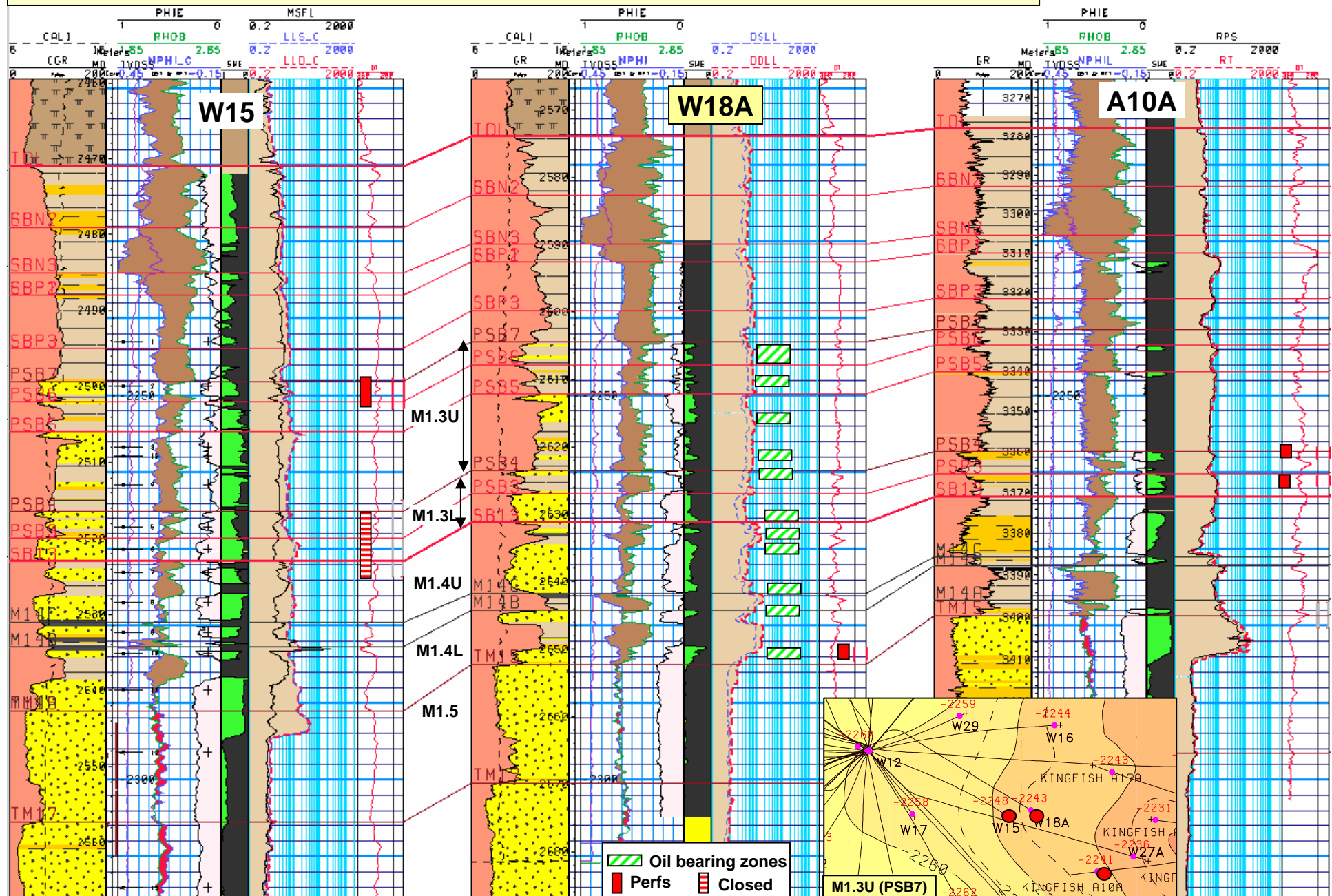
I. WEST KINGFISH FIELD LOCATION MAP	1
II. WELL DATA RECORD:	
WEST KINGFISH M1.3 STRUCTURE MAP (PSB7)	2
STRUCTURAL CROSS-SECTION THROUGH W18A	3
LOCATION	4
ELEVATIONS & DEPTHS	4
MISCELLANEOUS	4
WELL CLASSIFICATION	4
CASING RECORD	5
CEMENTING RECORD	5
DRILLING PERFORMANCE	6
<i>WEST KINGFISH W18A - Final Well Report</i>	6
COMPLETION SCHEMATIC	7
III. SAMPLES	8
CONVENTIONAL CORING	8
SIDEWALL CORING	8
IV. LOGS AND SURVEYS	9
V. RESERVOIR & FORMATION TOPS	10
VI. GEOLOGICAL ANALYSIS - WEST KINGFISH W18A	11
VII. APPENDICES	
1. Survey Data & Listing	
1a. Survey Data	
1b. MD-TVD Survey Data Listing	
2. Petrophysics	
2a. Petrophysics Evaluation Summary	
3. Sample Descriptions	
3a. Lithology/Show Descriptions	
4. Logs	
4a. Mud Log	
4b. Well Completion Log	



II. WELL DATA RECORD: WEST KINGFISH M1.3 STRUCTURE MAP (PSB7)



II. WELL DATA RECORD: WELL LOG CROSS-SECTION THROUGH W18A



II. WELL DATA RECORD (cont'd)

LOCATION

Field	West Kingfish
Well Name	W18A (Loc A)
Conductor Number	Slot 18
State	Victoria
Licence	Vic/L7
Geological Basin	Gippsland
Top of Latrobe	2574.0m MDRT 2249.7m TVDRT -2216.3m TVDSS
(MGA94) X	597244.08m E
(MGA94) Y	5727457.04m N
Latitude	38° 35' 45.79" S
Longitude	148° 07' 00.05" E

Conductor #18 Surface Coordinates

(MGA94) X	596279.97m E
(MGA94) Y	5727808.15m N
Latitude	38° 35' 34.782" S
Longitude	148° 06' 20.025" E

Perforations

2649.0 – 2651.0m MDRT 2315.6 – 2317.3m TVDRT (-2282.2 -2283.9mTVDSS)
--

Datum

GDA94 (Geocentric Datum of Australia)

Spheroid

GRS80 (GeodeticRef.System1980) UTM (Universal Transverse Mercator)
--

Projection

Map Grid / Zone Central Meridian

MGA Zone 55 147 deg E

ELEVATIONS & DEPTHS

Water Depth	76.13 m
Main Deck Rel to MSL	25.12m
RT Relative to MSL	33.43m
Average Well Angle	33 deg
Max Well Angle	36 deg
Total Depth	2710.0m MDRT 2369.1m TVDRT -2335.7m TVDSS
Plug Back Depth	2668m MDRT

DATES

Skid Rig	20/04/2006
Kicked Off	24/04/2006
Development Rig Days	20
NPT Days	4.25
Rig Released	10/05/2006
I.P. Established	22/05//2006

MISCELLANEOUS

Operator	Esso Australia Pty Ltd
Esso Interest	50%
Licensee	Esso/BHPBilliton
Other JV Interest	50% (BHPB)
Overriding Royalty	2.5% (Weekes)
Drilling AFE No.	L0501G651

Contractor	International Sea Drilling Ltd
Rig Name	Nabors Rig 453
Equipment Type	Platform
Completion Type	Single
Completion Size	2-7/8"

WELL CLASSIFICATION

Before Drilling	Oil Development	After Drilling	Cased & Completed - Oil well
------------------------	-----------------	-----------------------	------------------------------

II. WELL DATA RECORD (cont.)

CASING RECORD

Type	Size (Inches)	Weight (lb/ft)	Grade	Thread	Depth (mMDRT)
Conductor *	22				173
Surface *	10 ³ / ₄	40.5	K-55	BTC	651
Production	7	26.0	L-80	Vam Top HC	2702.9
Tubing	2 ⁷ / ₈	6.4	13Cr-80	Vam Ace	2579.8

* Pre-existing W18 casing strings

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	CLASS "G	720	Gascon 20 gal / 10 bbl HALAD 413L 30 gal / 10 bbl NF-5 0.25gal / 10bbl CFR-3L 4 gal / 10 bbl SCR-100L 5.0 gal / 10 bbl	90	150	15.8	2000.0 to 2710.0	3000

II. WELL DATA RECORD (cont.)

DRILLING PERFORMANCE

West Kingfish W18A - Final Well Report

GENERAL

Platform:	West Kingfish	Rig:	453	Reservoir:	M1.3 & M1.4
Well:	W18A	Well Slot:	18	RT-MSL (Rig 453)	33.43 m
Drilling Complexity Index	3.2	Completion Complexity Index	2.8		

TOTAL DEPTH		PERFORMANCE		MUD	
m MDRT	2,710	20" Cond. Hole	N/A	Max Wt (ppg)	10.1
m TVDRT	2,369	12-1/4" Surf. Hole	N/A	Type (Surf. Hole)	N/A
Vert. Section (m)	1,090.35	8-1/2" Prod. Hole	365m/day	Type (Inter. Hole)	N/A
INCLINATION		6" Liner Hole	N/A	Type (Prod. Hole)	KCI/PHPA/Poly/Glycol
Max (deg) / Ave (deg)	36 / 33	* time to drill interval, incl's Connections & NPT.		Type (Liner Hole)	N/A

Comments: New hole drilled: 655m to 2710mMDRT (2,055m MDRT drilled, 8 1/2" hole size).

TIME ANALYSIS

Start Date:	20/04/2006, 5:00hrs	Finish Date:	10/05/2006, 0500hrs		
Target Days (P10):	19.41	Total Days:	20	% Under Target:	3% over
AFE Days (P50):	21.9	NPT Days:	4.25	% of Total Days:	21.3%
Supplementary AFE Days (P50):	N/A				

COSTS (based on projected)

AFE No.:	L0501G651	Revisions:	--	\$ per m	A \$2.38 k / metre (new hole)
\$ per day:	A\$ 232 k/day	\$ per day (excl. T + L) * Equipment, LWD & Reeves	A\$ 200 k/day		A\$ 1.81 k / metre* * based on TD not new hole

	Equipment	Materials	Contracts	Allocations	Contingency	Total
AFE (Original)	868,000	638,156	2,993,158	982,078	218,608	A\$5,700,000
AFE (Supplement)						
Projected	947,977	376,380	2,558,696	823,006	200,000	A\$4,906,059

CASING (all depths herein are based on Rig 453 elevations: RT-MSL=33.43m)

	Size / Weight / Grade / Thread	m MDRT	m TVDRT	PIT (ppg)
Conductor Casing *	22"	173	173	N/A
Surface Casing *	10-3/4", 40.5 ppf, K55, BTC	651	624	13.0 (PIT)
Prod Casing	7", 26.0 ppf, L80, Vam Top HC	2702.90	2362.9	N/A

Comments: * Pre-existing casing strings.

COMPLETION

	Size / Weight / Grade / Thread	MMDRT	MTVDRT	Type
Completion	2 7/8", 6.4ppf, 13Cr80, Vam Ace	2579.84	2254.8	Single oil

	Upper Interval [m MDRT]	Upper Interval [m TVDRT]	Lower Interval [mMDRT]	Lower Interval [mTVDRT]	Gun Type
Perforation Interval:	2649.0-2651.0	2315.6-2317.3	NA	NA	MAXR

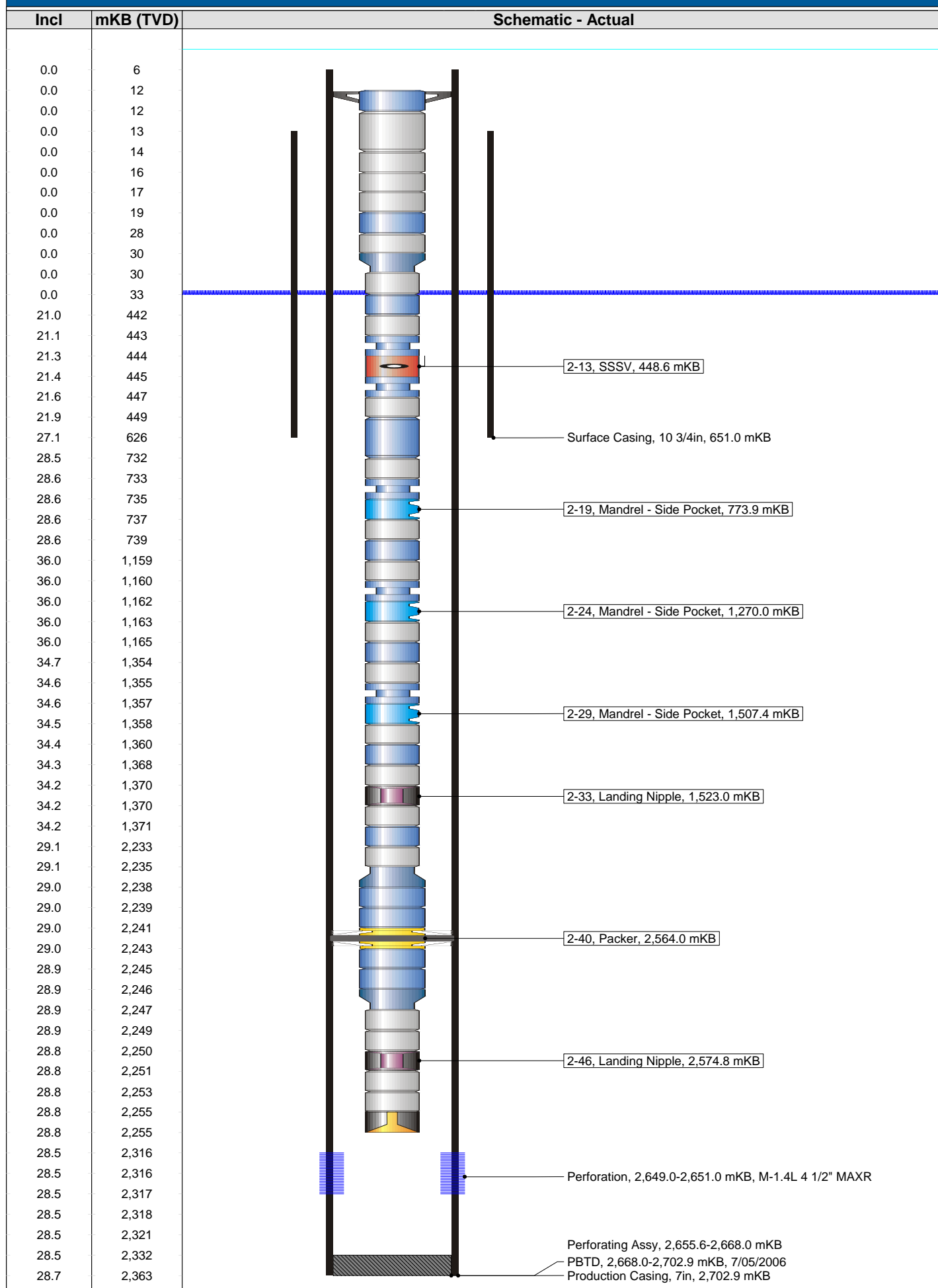
Comments: Completion was 2 7/8" 13Cr80 with TR-SSSV and 3 SPMs for gas lift, and one packer set at 2564m MDRT.

ADDITIONAL

		Upper Interval [m MDRT]	Lower Interval [m MDRT]
Logs Run	GR-Resistivity-Density-Neutron-Sonic-Caliper	651	2710

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

West Kingfish W18A: Existing Schematic



III. SAMPLES

The cuttings sampling programme for WEST KINGFISH W18A are detailed in the following table:

Interval	Formation	Sampling Details
KOP to 150 m above Top of Latrobe (prognosed at 2577.6m MDRT) 651.0 – 2430.0m MDRT	Gippsland Limestone & Lakes Entrance	Cuttings samples for description only at 30 m intervals.
150 m above Top of Latrobe to Top of Latrobe (prognosed at 2577.6m MDRT) 2430.0 – 2570.0 mMDRT	Lakes Entrance Formation	Three sets of washed and oven dried cuttings at 10 m intervals.
Top of Latrobe (prognosed at 2577.6m MDRT) to Total Depth (TD) 2570.0 – 2710.0 mMDRT	Latrobe Group	Three sets of washed and oven dried cuttings at 5 m intervals.

Detailed cuttings descriptions for the interval 651.0 to 2710.0m MDRT (TD) are contained in Appendix 3a.

CONVENTIONAL CORING

No conventional cores were cut in WEST KINGFISH W18A.

SIDEWALL CORING

No sidewall core samples were shot in WEST KINGFISH W18A.

IV. LOGS AND SURVEYS

Survey/Log	Company	Top (m MDRT)	Bottom (m MDRT)
MWD Run 1, Powerpulse (Directional & GR)	Schlumberger/Anadrill	651.0	2710.0 (bottom of log interval 2690.5)
Run 1: Drillpipe conveyed Logging: MCG-MDN-MPD- MSS-MDL -MAI	Precision Energy Services compact logging (wireline tools run on drillpipe (Shuttle System, memory mode)	651.0	2707.0 (bottom of log interval 2691.8)

(Precision logs = Compact GR- Dual Neutron - Photo Density - Sonic - Dual Laterolog
Resistivity - Induction Resistivity)

V. RESERVOIR & FORMATION TOPS

Horizon	m TVDSS			m MDRT	mTVT HC Column	
	Predicted Tops	ACTUAL	Diff. (m)		Predicted	ACTUAL
Base of Miocene High Velocity Channel	-1430	-1434.8	-4.8 low	1642.0		
Lakes Entrance Formation	-1925	-1922.3	2.7 high	2226.0		
Top of Latrobe (TOL)	-2220	-2216.3	3.7 high	2574.0		
Top of Coarse Clastics (TCC) M1.2 (SBP2)	-2236	-2232.6	3.4 high	2592.6		
Top of M1.3U PS6 sand (PSB7)	-2246	-2243.1	2.9 high	2604.5	0.6	0.9 *
PS5 sand (PSB6)	-2248	-2246.0	2.0 high	2607.8	0.6	0.4 *
PS4 sand (PSB5)	-2252	-2249.8	2.2 high	2612.2	2.2	0.2 +1.4 *
Top of M1.3L PS3 sand (PSB4)	-2262	-2259.7	2.3 high	2623.5	(decline analysis)	0.5
PS2 sand (PSB3)	~(-2265)	-2262.8	(2.2 high)	2627.0	"	1.3
Base M1.3 /Top M1.4U	-2268	-2266.6	1.4 high	2631.3	NPred	0.4
OWC M1.2U		-2270.5		2635.8	"	1.1
LOW OIL M1.2U		-2275.7		2641.6	"	0.9
M1.4C coal/ Top M1.4L	-2276	-2275.7	0.3 high	2641.7		
OWC M1.2L		-2278.9		2645.3	"	0.9
OWC M1.2L		-2284.9		2652.2	"	2.1
Top M1.5	-2288	-2284.9	3.1 high	2652.2		
Top M1.7	-2302	-2300.4	1.6 high	2669.8		
Total Depth (TD)	-2330	-2335.7	-5.7 low	2710.0		

* Probable oil.

Net pay thickness in M1.3 (thin zones, thin shaly sands) based on 10% porosity cutoff. For cleaner M1.4 sands a 12% cutoff was used.

VI. GEOLOGICAL ANALYSIS – WEST KINGFISH W18A

Objectives

West Kingfish W18A (predrill Location A) is the first in a series of infill development wells drilled in 2006 from the West Kingfish platform using the small capacity Nabors Rig 453 drill rig. W18A was targeted updip of the existing W15 well east of the platform, to capture oil reserves in the West Kingfish M1.3Upper (M1.3U) and M1.3Lower (M1.3L) reservoirs which might otherwise not be recovered by W15 alone before WKF platform life-end.

W15 had produced from the M1.3L for many years, and over recent years had a relatively flat oil rate (~140kl/d) and flat water cut trend. Decline analysis of the M1.3L production trend suggested the well might continue to produce for an extended period from that zone and therefore the well would not be able to adequately capture oil from the M1.3U reservoirs before platform life-end. An additional well could assist in capturing reserves from both zones, in particular the M1.3U. Cased hole resistivity logs (SFRT) were run in W15 in July 2005 to confirm the presence of remaining oil in the M1.3U and derisk the drilling of the proposed well. The SFRT log suggested that oil remained in the PS6, PS5 and lower PS4 sections of the M1.3U as well as in small sands in the M1.3L and deeper, while other sands were swept.

The tubing in W15 subsequently failed and W15 was worked over in October 2005 to restore production. A tandem completion was installed with sliding sleeve over the M1.3U (PS6) zone for reserves capture and to further establish the oil potential of this zone. The well has performed particularly well since that time so the M1.3U zone has been kept open. W18A was drilled as originally intended to produce from either/or both of the M1.3U and M1.3L zones in the future.

Results

The W18 well had been previously plugged and abandoned to the surface casing by the workover Rig 22 prior to mobilisation of Rig 453. Rig 453 then kicked off W18A below the W18 existing surface casing on 24 April 2006 and drilled 8 ½" production hole to Total Depth of 2710m MDRT. The well was logged with Precision compact wireline tools on drillpipe (Shuttle system) and cased and completed (2 7/8" tubing). The well was handed over to production on 10 May 2006.

The Top of Latrobe was intersected at 2574m MDRT (-2216.3m TVDSS), 3.7mTVD high to prediction. The top of the objective M1.3U reservoir PS6 sand (PSB7 correlation horizon) was intersected at 2604.5m MDRT (-2243.1m TVDSS), 2.9m TVD high to prediction. Although oil-bearing, the PS6 sand was poorer quality than the channel-like sand seen at W15, with 0.9mTVD net pay and average porosity of 11%. The zone is 5m TVD updip of W15.

Very thin oil zones were encountered throughout the M1.3U, M1.3L and M1.4 sections, with a total of 10mTVD net oil pay interpreted (2.9m in M1.3U (PS6-PS4), 1.8m in M1.3L (PS3-PS2), 2.4m in M1.4U and 3.0mTVD in M1.4L). The thicker, better quality M1.3 sands appear to be largely swept (eg PS4, PS2) while oil is present in the thin PS6, PS5 and PS3 sands. Oil also appears to be "hanging up" below thin siltstones in the basal part of the better quality swept sands, and as thin "ceiling oil" at the tops of M1.4 sands. Water saturations are high in many of these zones and log interpretation is difficult. However the well is structurally updip of W15 where good oil production has occurred, strongly supporting the presence of oil in the PS6, PS5, PS3 sands, and encouraging for their later production even though the sands are very thin.

2 7/8" tubing was selected for the well, as the smaller size was considered suitable for these small zones which may have high water cut. A "bottoms-up" approach was adopted to capture reserves from the numerous intervals, with the small M1.4L oil zone, just above the top of the massive M1.5 sand, perforated initially. This zone has 2.1mTVD net pay, with average porosity 17% and water saturation 53%. The initial oil rate from the zone was 312kl/d and, although rate has since dropped substantially, the M1.4L zone has performed commendably given its size.

APPENDIX 1a

WEST KINGFISH W18A **Survey Data**



WKF W-18A Final Geodetic Survey

Report Date: May 1, 2006	Survey / DLS Computation Method: Minimum Curvature / Lubinski
Client: Esso Australia Pty Ltd	Vertical Section Azimuth: 111.180°
Field: Kingfish GDA 94	Vertical Section Origin: S 2.900 m, E 16.930 m
Structure / Slot: West Kingfish / 18	TVD Reference Datum: RKB
Well: 18	TVD Reference Elevation: 33.43 m relative to MSL
Borehole: WKF W-18A	Sea Bed / Ground Level Elevation: -77.100 m relative to MSL
UWI/API#:	Magnetic Declination: 13.248°
Survey Name / Date: WKF W-18A Final / April 26, 2006	Total Field Strength: 60126.979 nT
Tort / AHD / DDI / ERD ratio: 125.499° / 1218.54 m / 5.759 / 0.514	Magnetic Dip: -69.063°
Grid Coordinate System: GDA94/MGA94 Zone 55	Declination Date: April 26, 2006
Location Lat/Long: S 38 35 34.782, E 148 6 20.025	Magnetic Declination Model: BGGM 2005
Location Grid N/E Y/X: N 5727808.151 m, E 596279.965 m	North Reference: Grid North
Grid Convergence Angle: -0.68968520°	Total Corr Mag North -> Grid North: +13.938°
Grid Scale Factor: 0.99971415	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	-2.90	16.93	0.00	5727808.15	596279.97	S 38 35 34.782	E 148 6 20.025
	24.53	0.00	0.00	24.53	0.00	-2.90	16.93	0.00	5727808.15	596279.97	S 38 35 34.782	E 148 6 20.025
	30.00	0.01	97.40	30.00	0.00	-2.90	16.93	0.05	5727808.15	596279.97	S 38 35 34.782	E 148 6 20.025
	60.00	0.08	97.40	60.00	0.02	-2.90	16.95	0.07	5727808.15	596279.99	S 38 35 34.782	E 148 6 20.026
	90.00	0.16	97.40	90.00	0.08	-2.91	17.02	0.08	5727808.14	596280.05	S 38 35 34.782	E 148 6 20.029
	108.33	0.20	97.40	108.33	0.14	-2.92	17.07	0.07	5727808.13	596280.11	S 38 35 34.783	E 148 6 20.031
	118.33	0.10	102.00	118.33	0.17	-2.92	17.10	0.30	5727808.13	596280.13	S 38 35 34.783	E 148 6 20.032
	120.00	0.09	94.23	120.00	0.17	-2.92	17.10	0.29	5727808.13	596280.14	S 38 35 34.783	E 148 6 20.032
	128.33	0.10	51.70	128.33	0.18	-2.92	17.11	0.25	5727808.13	596280.15	S 38 35 34.783	E 148 6 20.033
	138.33	0.30	31.40	138.33	0.19	-2.89	17.13	0.63	5727808.16	596280.17	S 38 35 34.782	E 148 6 20.034
	148.33	0.50	14.00	148.33	0.19	-2.83	17.16	0.70	5727808.22	596280.19	S 38 35 34.780	E 148 6 20.035
	150.00	0.52	13.34	150.00	0.19	-2.81	17.16	0.37	5727808.24	596280.20	S 38 35 34.779	E 148 6 20.035
	158.33	0.60	10.60	158.33	0.17	-2.73	17.18	0.30	5727808.32	596280.21	S 38 35 34.776	E 148 6 20.035
	168.33	0.80	333.60	168.33	0.11	-2.62	17.16	1.45	5727808.43	596280.19	S 38 35 34.773	E 148 6 20.034
	173.33	0.60	333.30	173.33	0.07	-2.56	17.13	1.20	5727808.49	596280.17	S 38 35 34.771	E 148 6 20.033
	180.00	0.86	345.53	180.00	0.01	-2.48	17.10	1.36	5727808.57	596280.14	S 38 35 34.768	E 148 6 20.032
	188.97	1.25	353.40	188.97	-0.07	-2.32	17.07	1.39	5727808.73	596280.11	S 38 35 34.763	E 148 6 20.031
	208.40	1.25	22.40	208.39	-0.17	-1.92	17.13	0.97	5727809.14	596280.17	S 38 35 34.750	E 148 6 20.033
	210.00	1.26	20.37	209.99	-0.17	-1.88	17.14	0.85	5727809.17	596280.18	S 38 35 34.749	E 148 6 20.033
	227.63	1.50	1.40	227.62	-0.25	-1.47	17.22	0.87	5727809.58	596280.25	S 38 35 34.736	E 148 6 20.036
	237.26	2.50	22.40	237.24	-0.29	-1.15	17.30	3.81	5727809.90	596280.33	S 38 35 34.725	E 148 6 20.040
	240.00	2.35	19.78	239.98	-0.29	-1.04	17.34	2.04	5727810.01	596280.38	S 38 35 34.722	E 148 6 20.041
	246.98	2.00	11.40	246.95	-0.31	-0.79	17.41	2.03	5727810.26	596280.45	S 38 35 34.713	E 148 6 20.044
	256.66	2.00	11.40	256.63	-0.37	-0.46	17.48	0.00	5727810.59	596280.52	S 38 35 34.703	E 148 6 20.047
	266.21	2.00	27.40	266.17	-0.38	-0.15	17.59	1.75	5727810.90	596280.63	S 38 35 34.692	E 148 6 20.051
	270.00	2.19	30.95	269.96	-0.36	-0.02	17.66	1.82	5727811.03	596280.69	S 38 35 34.688	E 148 6 20.054
	275.93	2.50	35.40	275.88	-0.31	0.18	17.79	1.82	5727811.23	596280.83	S 38 35 34.682	E 148 6 20.059
	285.61	3.25	42.90	285.55	-0.16	0.55	18.10	2.60	5727811.60	596281.14	S 38 35 34.670	E 148 6 20.072
	300.00	3.97	40.88	299.91	0.16	1.23	18.70	1.52	5727812.28	596281.74	S 38 35 34.647	E 148 6 20.096
	315.32	4.75	39.40	315.19	0.54	2.12	19.45	1.54	5727813.17	596282.49	S 38 35 34.618	E 148 6 20.127
	330.00	6.40	39.40	329.80	0.99	3.22	20.36	3.37	5727814.27	596283.39	S 38 35 34.582	E 148 6 20.164
	344.29	8.00	39.40	343.98	1.55	4.60	21.50	3.36	5727815.65	596284.53	S 38 35 34.537	E 148 6 20.210
	360.00	10.71	40.06	359.47	2.36	6.57	23.13	5.18	5727817.61	596286.16	S 38 35 34.473	E 148 6 20.277
	373.27	13.00	40.40	372.46	3.25	8.65	24.89	5.18	5727819.69	596287.92	S 38 35 34.404	E 148 6 20.348
	390.00	14.88	41.03	388.70	4.60	11.70	27.52	3.38	5727822.75	596290.55	S 38 35 34.304	E 148 6 20.455
	402.24	16.25	41.40	400.49	5.73	14.17	29.68	3.37	5727825.22	596292.72	S 38 35 34.223	E 148 6 20.544
	420.00	18.24	41.40	417.45	7.55	18.12	33.17	3.36	5727829.16	596296.20	S 38 35 34.094	E 148 6 20.686
	431.21	19.50	41.40	428.06	8.80	20.84	35.56	3.37	5727831.88	596298.59	S 38 35 34.005	E 148 6 20.783
	450.00	21.44	40.72	445.66	11.03	25.79	39.88	3.12	5727836.84	596302.91	S 38 35 33.843	E 148 6 20.959
	460.19	22.50	40.40	455.11	12.30	28.69	42.36	3.14	5727839.73	596305.39	S 38 35 33.748	E 148 6 21.060
	480.00	24.55	39.69	473.27	14.85	34.75	47.44	3.13	5727845.79	596310.47	S 38 35 33.549	E 148 6 21.267
	489.16	25.50	39.40	481.57	16.07	37.73	49.91	3.14	5727848.77	596312.94	S 38 35 33.451	E 148 6 21.368
	510.00	26.41	39.40	500.31	18.92	44.78	55.70	1.31	5727855.82	596318.72	S 38 35 33.221	E 148 6 21.603
	517.80	26.75	39.40	507.28	20.01	47.48	57.91	1.31	5727858.51	596320.94	S 38 35 33.132	E 148 6 21.693
	540.00	27.14	39.01	527.07	23.13	55.27	64.27	0.58	5727866.31	596327.29	S 38 35 32.877	E 148 6 21.952
	546.28	27.25	38.90	532.66	24.00	57.51	66.08	0.58	5727868.54	596329.10	S 38 35 32.804	E 148 6 22.026
	570.00	27.25	38.90	553.75	27.31	65.96	72.90	0.00	5727876.99	596335.92	S 38 35 32.527	E 148 6 22.303
	574.76	27.25	38.90	557.98	27.97	67.65	74.27	0.00	5727878.68	596337.28	S 38 35 32.472	E 148 6 22.359

600.00	27.47	38.90	580.40	31.50	76.68	81.55	0.26	5727887.71	596344.57	S 38 35 32.176	E 148 6 22.656
603.24	27.50	38.90	583.27	31.96	77.85	82.49	0.28	5727888.87	596345.51	S 38 35 32.138	E 148 6 22.694
630.00	27.27	38.90	607.03	35.70	87.42	90.22	0.26	5727898.45	596353.23	S 38 35 31.824	E 148 6 23.008
631.73	27.25	38.90	608.57	35.95	88.04	90.72	0.35	5727899.07	596353.73	S 38 35 31.804	E 148 6 23.029
641.22	27.25	38.90	617.01	37.27	91.42	93.44	0.00	5727902.45	596356.46	S 38 35 31.693	E 148 6 23.140
650.00	27.15	38.90	624.82	38.49	94.55	95.97	0.34	5727905.57	596358.98	S 38 35 31.591	E 148 6 23.242
677.29	25.84	48.83	649.25	43.15	103.31	104.36	5.07	5727914.33	596367.37	S 38 35 31.304	E 148 6 23.585
705.79	27.20	58.34	674.76	49.97	110.82	114.58	4.69	5727921.84	596377.59	S 38 35 31.056	E 148 6 24.003
734.66	27.59	67.73	700.41	58.81	116.82	126.39	4.50	5727927.84	596389.39	S 38 35 30.857	E 148 6 24.488
763.55	28.48	75.57	725.92	69.27	121.08	139.26	3.93	5727932.09	596402.26	S 38 35 30.714	E 148 6 25.018
792.17	28.76	81.91	751.05	80.83	123.75	152.68	3.20	5727934.76	596415.68	S 38 35 30.622	E 148 6 25.571
821.38	29.17	88.53	776.61	93.53	124.92	166.76	3.32	5727935.93	596429.75	S 38 35 30.579	E 148 6 26.152
850.14	29.30	96.36	801.71	106.81	124.32	180.77	3.99	5727935.33	596443.76	S 38 35 30.593	E 148 6 26.731
878.90	29.76	104.87	826.75	120.71	121.71	194.67	4.40	5727932.72	596457.65	S 38 35 30.672	E 148 6 27.307
907.77	30.16	113.67	851.77	135.09	116.95	208.24	4.58	5727927.97	596471.22	S 38 35 30.821	E 148 6 27.870
936.66	30.99	121.86	876.66	149.65	110.11	221.21	4.41	5727921.13	596484.19	S 38 35 31.038	E 148 6 28.409
965.20	31.13	122.65	901.11	164.10	102.25	233.66	0.45	5727913.27	596496.64	S 38 35 31.287	E 148 6 28.928
993.85	31.07	122.35	925.64	178.61	94.30	246.14	0.17	5727905.32	596509.11	S 38 35 31.540	E 148 6 29.448
1022.99	30.87	121.85	950.62	193.34	86.33	258.85	0.34	5727897.36	596521.81	S 38 35 31.794	E 148 6 29.976
1051.47	30.81	122.33	975.08	207.67	78.58	271.22	0.27	5727889.60	596534.18	S 38 35 32.041	E 148 6 30.491
1080.78	31.64	124.00	1000.14	222.53	70.26	283.93	1.23	5727881.29	596546.89	S 38 35 32.305	E 148 6 31.021
1109.53	30.58	124.33	1024.76	237.01	61.92	296.22	1.12	5727872.95	596559.18	S 38 35 32.571	E 148 6 31.533
1138.38	29.11	125.26	1049.78	250.96	53.73	308.01	1.60	5727864.76	596570.97	S 38 35 32.832	E 148 6 32.024
1166.92	29.16	126.00	1074.71	264.42	45.64	319.31	0.38	5727856.67	596582.26	S 38 35 33.090	E 148 6 32.495
1196.01	30.28	123.05	1099.97	278.45	37.47	331.19	1.90	5727848.51	596594.14	S 38 35 33.350	E 148 6 32.990
1224.46	32.85	120.89	1124.21	293.07	29.59	343.83	2.96	5727840.64	596606.77	S 38 35 33.600	E 148 6 33.516
1253.02	35.93	120.35	1147.78	308.99	21.38	357.71	3.25	5727832.43	596620.65	S 38 35 33.861	E 148 6 34.094
1281.83	36.00	120.26	1171.10	325.69	12.84	372.32	0.09	5727823.89	596635.25	S 38 35 34.132	E 148 6 34.701
1310.73	35.08	120.09	1194.61	342.28	4.40	386.84	0.96	5727815.45	596649.77	S 38 35 34.401	E 148 6 35.306
1339.46	34.07	120.22	1218.27	358.39	-3.79	400.94	1.06	5727807.26	596663.86	S 38 35 34.661	E 148 6 35.892
1368.30	32.82	120.02	1242.33	374.09	-11.77	414.68	1.31	5727799.29	596677.60	S 38 35 34.914	E 148 6 36.464
1397.13	34.56	121.68	1266.32	389.85	-19.97	428.41	2.05	5727791.09	596691.33	S 38 35 35.175	E 148 6 37.036
1425.68	34.08	122.48	1289.90	405.66	-28.52	442.05	0.69	5727782.54	596704.96	S 38 35 35.446	E 148 6 37.603
1454.41	35.88	120.92	1313.44	421.85	-37.17	456.06	2.10	5727773.89	596718.97	S 38 35 35.721	E 148 6 38.187
1483.17	35.52	120.82	1336.79	438.39	-45.78	470.47	0.38	5727765.28	596733.37	S 38 35 35.995	E 148 6 38.786
1511.94	34.40	121.12	1360.37	454.64	-54.26	484.60	1.18	5727756.80	596747.50	S 38 35 36.265	E 148 6 39.375
1540.48	33.96	121.23	1383.98	470.43	-62.56	498.32	0.47	5727748.51	596761.22	S 38 35 36.528	E 148 6 39.946
1568.16	33.89	121.31	1406.95	485.64	-70.58	511.52	0.09	5727740.49	596774.42	S 38 35 36.783	E 148 6 40.495
1597.84	34.00	121.74	1431.57	501.94	-79.25	525.65	0.27	5727731.83	596788.54	S 38 35 37.059	E 148 6 41.083
1626.44	34.06	122.94	1455.27	517.64	-87.81	539.17	0.71	5727723.27	596802.06	S 38 35 37.331	E 148 6 41.646
1655.47	33.35	122.81	1479.42	533.42	-96.55	552.70	0.74	5727714.53	596815.58	S 38 35 37.609	E 148 6 42.210
1684.29	32.57	122.88	1503.61	548.77	-105.06	565.88	0.81	5727706.02	596828.75	S 38 35 37.880	E 148 6 42.758
1712.75	34.62	121.14	1527.31	564.24	-113.40	579.23	2.39	5727697.69	596842.10	S 38 35 38.145	E 148 6 43.314
1741.58	34.03	121.10	1551.12	580.25	-121.80	593.15	0.61	5727689.29	596856.02	S 38 35 38.412	E 148 6 43.893
1770.37	33.37	121.00	1575.07	595.99	-130.04	606.83	0.69	5727681.05	596869.70	S 38 35 38.674	E 148 6 44.463
1799.19	32.91	121.02	1599.20	611.51	-138.15	620.34	0.48	5727672.94	596883.20	S 38 35 38.932	E 148 6 45.025
1828.02	32.25	121.30	1623.50	626.80	-146.19	633.62	0.70	5727664.91	596896.48	S 38 35 39.187	E 148 6 45.578
1856.41	34.79	121.14	1647.16	642.24	-154.31	647.03	2.69	5727656.78	596909.88	S 38 35 39.445	E 148 6 46.136
1885.36	34.24	121.38	1671.02	658.39	-162.82	661.05	0.59	5727648.27	596923.90	S 38 35 39.716	E 148 6 46.720
1914.08	33.79	121.20	1694.82	674.21	-171.17	674.78	0.48	5727639.93	596937.63	S 38 35 39.981	E 148 6 47.291
1942.95	33.31	121.21	1718.88	689.92	-179.43	688.43	0.50	5727631.67	596951.27	S 38 35 40.244	E 148 6 47.859
1971.76	32.72	121.72	1743.04	705.36	-187.63	701.82	0.68	5727623.48	596964.65	S 38 35 40.504	E 148 6 48.416
2000.39	32.20	121.75	1767.20	720.47	-195.71	714.88	0.55	5727615.40	596977.72	S 38 35 40.761	E 148 6 48.960
2029.14	34.24	120.51	1791.25	735.98	-203.85	728.37	2.24	5727607.26	596991.20	S 38 35 41.020	E 148 6 49.522
2057.81	33.64	120.70	1815.03	751.77	-212.00	742.15	0.64	5727599.11	597004.97	S 38 35 41.278	E 148 6 50.095
2086.42	32.72	120.69	1838.98	767.22	-219.99	755.61	0.96	5727591.12	597018.43	S 38 35 41.532	E 148 6 50.655
2115.23	32.16	120.83	1863.29	782.45	-227.89	768.89	0.59	5727583.22	597031.71	S 38 35 41.783	E 148 6 51.208
2143.94	34.19	120.20	1887.32	797.96	-235.87	782.42	2.15	5727575.25	597045.24	S 38 35 42.037	E 148 6 51.771
2172.45	33.69	119.96	1910.98	813.68	-243.85	796.20	0.54	5727567.27	597059.01	S 38 35 42.290	E 148 6 52.344
2201.40	33.24	119.91	1935.13	829.46	-251.81	810.03	0.47	5727559.31	597072.84	S 38 35 42.543	E 148 6 52.920
2230.08	32.77	119.88	1959.18	844.90	-259.60	823.57	0.49	5727551.53	597086.38	S 38 35 42.790	E 148 6 53.484
2258.89	33.48	120.39	1983.31	860.45	-267.50	837.19	0.79	5727543.62	597099.99	S 38 35 43.041	E 148 6 54.050
2287.54	35.00	121.92	2006.99	876.33	-275.85	850.98	1.83	5727535.28	597113.78	S 38 35 43.306	E 148 6 54.624
2316.43	34.51	121.50	2030.73	892.52	-284.50	864.99	0.57	5727526.63	597127.79	S 38 35 43.581	E 148 6 55.208
2345.03	33.90	121.65	2054.38	908.33	-292.92	878.69	0.65	5727518.21	597141.48	S 38 35 43.849	E 148 6 55.778
2373.72	33.24	121.13	2078.28	923.95	-301.18	892.23	0.75	5727509.95	597155.02	S 38 35 44.111	E 148 6 56.341
2402.58	32.75	121.01	2102.49	939.43	-309.30	905.69	0.51	5727501.84	597168.47	S 38 35 44.369	E 148 6 56.902

2431.16	32.06	120.84	2126.62	954.52	-317.17	918.83	0.73	5727493.97	597181.61	S 38 35 44.619	E 148 6 57.449
2459.55	31.85	120.84	2150.71	969.34	-324.87	931.73	0.22	5727486.27	597194.51	S 38 35 44.864	E 148 6 57.986
2488.57	30.77	120.37	2175.50	984.21	-332.55	944.71	1.14	5727478.60	597207.48	S 38 35 45.108	E 148 6 58.526
2517.22	29.85	120.29	2200.23	998.49	-339.85	957.19	0.96	5727471.30	597219.96	S 38 35 45.340	E 148 6 59.045
2546.10	29.24	120.43	2225.36	1012.55	-347.05	969.48	0.64	5727464.10	597232.24	S 38 35 45.568	E 148 6 59.556
2574.89	28.84	120.81	2250.53	1026.33	-354.17	981.51	0.46	5727456.99	597244.27	S 38 35 45.794	E 148 7 0.057
2603.37	28.65	120.13	2275.50	1039.85	-361.11	993.31	0.40	5727450.04	597256.07	S 38 35 46.015	E 148 7 0.548
2631.41	28.65	119.73	2300.11	1053.13	-367.82	1004.96	0.21	5727443.34	597267.71	S 38 35 46.228	E 148 7 1.033
2660.35	28.43	119.53	2325.53	1066.81	-374.65	1016.98	0.25	5727436.50	597279.73	S 38 35 46.445	E 148 7 1.533
2689.80	28.64	119.18	2351.40	1080.74	-381.55	1029.24	0.27	5727429.61	597291.99	S 38 35 46.664	E 148 7 2.043

Projected to TD 2710.00 28.78 118.95 2369.12 1090.35 -386.26 1037.72 0.26 5727424.90 597300.47 S 38 35 46.813 E 148 7 2.396

Survey Type: Definitive Survey

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

Surveying Prog:		EOU Freq		Survey Tool Type	Borehole -> Survey
MD From (m)	MD To (m)				
0.00	110.53	Act-Stns	SLB_MWD-STD-Depth Only		WKF W-18A -> WKF W-18A Final
110.53	173.33	Act-Stns	SLB_MWD-STD		WKF W-18A -> WKF W-18A Final
173.33	650.00	Act-Stns	SLB_MWD-POOR		WKF W-18A -> WKF W-18A Final
650.00	1828.02	Act-Stns	SLB_MWD-STD		WKF W-18A -> WKF W-18A Final
1828.02	1856.41	Act-Stns	SLB_UNKNOWN (default tool used)		WKF W-18A -> WKF W-18A Final
1856.41	2710.00	Act-Stns	SLB_MWD-STD		WKF W-18A -> WKF W-18A Final

**Italicized stations are NOT used in position calculations.*

APPENDIX 1b

WEST KINGFISH W18A
Survey Data Listing

Report Date:	13 September 2006
Well:	West Kingfish W18A
Structure / Slot:	NABORS Rig 453
TVD Reference Datum:	Drillsite Elevation
TVD Reference Elevation:	33.43 m relative to MSL
Sea Bed / Ground Level Elevation:	76.13 m relative to MSL
Grid Coordinate System:	GDA94/MGA94 Zone 55
Location Lat/Long:	S -38 35' 34.782", E 148 6' 20.025"
Location Grid N/E:	N 5727808.151 m, E 596279.973 m
Survey Azimuth Reference:	Grid North

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
0	0	360	0	33.43	0	0	5727808.15	596279.97
5	0	0	5	28.43	0	0	5727808.15	596279.97
10	0	0	10	23.43	0	0	5727808.15	596279.97
15	0	0	15	18.43	0	0	5727808.15	596279.97
20	0	0	20	13.43	0	0	5727808.15	596279.97
25	0	8.37	25	8.43	0	0	5727808.15	596279.97
30	0.01	97.40	30.00	3.43	0	0	5727808.15	596279.97
35	0.02	97.40	35.00	-1.57	0	0	5727808.15	596279.97
40	0.03	97.40	40.00	-6.57	0	0	5727808.15	596279.98
45	0.05	97.40	45.00	-11.57	0	0.01	5727808.15	596279.98
50	0.06	97.40	50.00	-16.57	0	0.01	5727808.15	596279.98
55	0.07	97.40	55.00	-21.57	0	0.02	5727808.15	596279.99
60	0.08	97.40	60.00	-26.57	0	0.02	5727808.15	596280.00
65	0.09	97.40	65.00	-31.57	0	0.03	5727808.15	596280.00
70	0.11	97.40	70.00	-36.57	-0.01	0.04	5727808.14	596280.01
75	0.12	97.40	75.00	-41.57	-0.01	0.05	5727808.14	596280.02
80	0.13	97.40	80.00	-46.57	-0.01	0.06	5727808.14	596280.03
85	0.15	97.40	85.00	-51.57	-0.01	0.07	5727808.14	596280.05
90	0.16	97.40	90.00	-56.57	-0.01	0.09	5727808.14	596280.06
95	0.17	97.40	95.00	-61.57	-0.01	0.10	5727808.14	596280.07
100	0.18	97.40	100.00	-66.57	-0.02	0.12	5727808.13	596280.09
105	0.19	97.40	105.00	-71.57	-0.02	0.13	5727808.13	596280.10
110	0.18	98.17	110.00	-76.57	-0.02	0.15	5727808.13	596280.12
115	0.13	100.47	115.00	-81.57	-0.02	0.16	5727808.13	596280.14
120	0.09	94.23	120.00	-86.57	-0.02	0.17	5727808.13	596280.14
125	0.10	68.70	125.00	-91.57	-0.02	0.18	5727808.13	596280.15
130	0.13	48.31	130.00	-96.57	-0.02	0.19	5727808.13	596280.16
135	0.23	38.16	135.00	-101.57	0.00	0.20	5727808.15	596280.17
140	0.33	28.49	140.00	-106.57	0.02	0.21	5727808.17	596280.18
145	0.43	19.79	145.00	-111.57	0.05	0.22	5727808.20	596280.19
150	0.52	13.34	150.00	-116.57	0.09	0.23	5727808.24	596280.20
155	0.57	11.70	155.00	-121.57	0.13	0.24	5727808.28	596280.22
160	0.63	16.78	160.00	-126.57	0.18	0.25	5727808.34	596280.22
165	0.73	35.28	165.00	-131.57	0.24	0.24	5727808.39	596280.22
170	0.73	333.50	170.00	-136.57	0.30	0.22	5727808.45	596280.19
175	0.67	336.36	175.00	-141.57	0.35	0.19	5727808.50	596280.17
180	0.86	345.53	180.00	-146.57	0.42	0.17	5727808.57	596280.14
185	1.08	349.92	185.00	-151.57	0.50	0.16	5727808.65	596280.13
190	1.25	354.94	190.00	-156.57	0.60	0.14	5727808.75	596280.11
195	1.25	2.40	194.99	-161.56	0.71	0.14	5727808.86	596280.11
200	1.25	9.86	199.99	-166.56	0.81	0.15	5727808.96	596280.12
205	1.25	17.33	204.99	-171.56	0.92	0.17	5727809.07	596280.15
210	1.26	20.37	209.99	-176.56	1.02	0.21	5727809.17	596280.19
215	1.33	14.99	214.99	-181.56	1.12	0.25	5727809.27	596280.22
220	1.40	9.61	219.99	-186.56	1.24	0.27	5727809.39	596280.24
225	1.46	4.23	224.99	-191.56	1.36	0.28	5727809.51	596280.26

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
230	1.75	6.57	229.99	-196.56	1.49	0.29	5727809.65	596280.27
235	2.27	17.47	234.98	-201.55	1.66	0.34	5727809.81	596280.31
240	2.35	19.78	239.98	-206.55	1.86	0.41	5727810.01	596280.38
245	2.10	13.78	244.97	-211.54	2.04	0.47	5727810.19	596280.44
250	2.00	11.40	249.97	-216.54	2.21	0.50	5727810.37	596280.48
255	2.00	11.40	254.97	-221.54	2.39	0.54	5727810.54	596280.51
260	2.00	17.00	259.96	-226.54	2.55	0.58	5727810.71	596280.55
265	2.00	25.37	264.96	-231.53	2.72	0.64	5727810.87	596280.61
270	2.19	30.95	269.96	-236.53	2.87	0.73	5727811.03	596280.70
275	2.45	34.70	274.95	-241.52	3.04	0.84	5727811.19	596280.81
280	2.82	38.55	279.95	-246.52	3.23	0.97	5727811.38	596280.95
285	3.20	42.43	284.94	-251.51	3.42	1.15	5727811.58	596281.12
290	3.47	42.28	289.93	-256.50	3.64	1.34	5727811.79	596281.32
295	3.72	41.58	294.92	-261.49	3.87	1.55	5727812.02	596281.53
300	3.97	40.88	299.91	-266.48	4.13	1.77	5727812.28	596281.75
305	4.22	40.40	304.90	-271.47	4.40	2.01	5727812.55	596281.98
310	4.48	39.91	309.88	-276.45	4.69	2.25	5727812.84	596282.22
315	4.73	39.43	314.87	-281.44	5.00	2.51	5727813.15	596282.48
320	5.28	39.40	319.85	-286.42	5.33	2.78	5727813.48	596282.76
325	5.84	39.40	324.83	-291.40	5.71	3.09	5727813.86	596283.06
330	6.40	39.40	329.80	-296.37	6.12	3.43	5727814.27	596283.40
335	6.96	39.40	334.76	-301.33	6.57	3.80	5727814.72	596283.77
340	7.52	39.40	339.72	-306.29	7.05	4.20	5727815.21	596284.17
345	8.12	39.43	344.68	-311.25	7.58	4.63	5727815.73	596284.60
350	8.98	39.64	349.62	-316.19	8.15	5.10	5727816.30	596285.07
355	9.85	39.85	354.56	-321.13	8.78	5.62	5727816.93	596285.60
360	10.71	40.06	359.48	-326.05	9.46	6.20	5727817.61	596286.17
365	11.57	40.19	364.38	-330.95	10.20	6.82	5727818.35	596286.79
370	12.44	40.32	369.27	-335.84	10.99	7.49	5727819.15	596287.47
375	13.19	40.47	374.15	-340.72	11.84	8.21	5727819.99	596288.19
380	13.76	40.65	379.01	-345.58	12.73	8.97	5727820.88	596288.94
385	14.32	40.84	383.86	-350.43	13.65	9.76	5727821.80	596289.73
390	14.88	41.03	388.70	-355.27	14.60	10.59	5727822.75	596290.56
395	15.44	41.18	393.52	-360.09	15.58	11.45	5727823.73	596291.42
400	16.00	41.33	398.34	-364.91	16.60	12.34	5727824.75	596292.31
405	16.56	41.40	403.14	-369.71	17.65	13.27	5727825.80	596293.24
410	17.12	41.40	407.92	-374.49	18.74	14.22	5727826.89	596294.20
415	17.68	41.40	412.69	-379.26	19.86	15.21	5727828.01	596295.19
420	18.24	41.40	417.45	-384.02	21.01	16.23	5727829.17	596296.21
425	18.80	41.40	422.19	-388.76	22.21	17.28	5727830.36	596297.26
430	19.36	41.40	426.92	-393.49	23.43	18.36	5727831.58	596298.34
435	19.89	41.26	431.63	-398.19	24.69	19.47	5727832.84	596299.45
440	20.41	41.08	436.32	-402.89	25.99	20.61	5727834.14	596300.58
445	20.92	40.90	441.00	-407.57	27.32	21.76	5727835.47	596301.73
450	21.44	40.72	445.66	-412.23	28.69	22.94	5727836.84	596302.92
455	21.96	40.56	450.31	-416.88	30.09	24.15	5727838.24	596304.12
460	22.48	40.41	454.93	-421.50	31.53	25.37	5727839.68	596305.35
465	23.00	40.23	459.55	-426.12	33.00	26.62	5727841.15	596306.60
470	23.52	40.05	464.14	-430.71	34.51	27.90	5727842.66	596307.87
475	24.03	39.87	468.71	-435.28	36.06	29.19	5727844.21	596309.16
480	24.55	39.69	473.27	-439.84	37.64	30.51	5727845.79	596310.48
485	25.07	39.53	477.81	-444.38	39.25	31.84	5727847.40	596311.82
490	25.54	39.40	482.33	-448.90	40.90	33.20	5727849.05	596313.17
495	25.76	39.40	486.84	-453.41	42.58	34.58	5727850.73	596314.55
500	25.97	39.40	491.34	-457.91	44.26	35.96	5727852.41	596315.93
505	26.19	39.40	495.83	-462.40	45.96	37.35	5727854.11	596317.33
510	26.41	39.40	500.31	-466.88	47.67	38.76	5727855.82	596318.73
515	26.63	39.40	504.78	-471.35	49.40	40.18	5727857.55	596320.15

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
520	26.79	39.36	509.25	-475.82	51.13	41.60	5727859.28	596321.58
525	26.88	39.27	513.71	-480.28	52.88	43.03	5727861.03	596323.01
530	26.96	39.19	518.17	-484.74	54.63	44.46	5727862.78	596324.44
535	27.05	39.10	522.62	-489.19	56.39	45.90	5727864.54	596325.87
540	27.14	39.01	527.08	-493.64	58.16	47.33	5727866.31	596327.30
545	27.23	38.92	531.52	-498.09	59.94	48.77	5727868.09	596328.74
550	27.25	38.90	535.97	-502.54	61.72	50.21	5727869.87	596330.18
555	27.25	38.90	540.41	-506.98	63.50	51.64	5727871.65	596331.62
560	27.25	38.90	544.86	-511.43	65.28	53.08	5727873.43	596333.05
565	27.25	38.90	549.30	-515.87	67.06	54.52	5727875.21	596334.49
570	27.25	38.90	553.75	-520.32	68.84	55.96	5727876.99	596335.93
575	27.25	38.90	558.19	-524.76	70.62	57.39	5727878.77	596337.36
580	27.30	38.90	562.64	-529.21	72.41	58.83	5727880.56	596338.80
585	27.34	38.90	567.08	-533.65	74.19	60.27	5727882.34	596340.24
590	27.38	38.90	571.52	-538.09	75.98	61.71	5727884.13	596341.69
595	27.43	38.90	575.96	-542.53	77.77	63.16	5727885.92	596343.13
600	27.47	38.90	580.40	-546.97	79.56	64.61	5727887.71	596344.58
605	27.48	38.90	584.83	-551.40	81.36	66.06	5727889.51	596346.03
610	27.44	38.90	589.27	-555.84	83.15	67.50	5727891.31	596347.48
615	27.40	38.90	593.71	-560.28	84.95	68.95	5727893.10	596348.92
620	27.36	38.90	598.15	-564.72	86.73	70.39	5727894.88	596350.37
625	27.31	38.90	602.59	-569.16	88.52	71.83	5727896.67	596351.81
630	27.27	38.90	607.03	-573.60	90.30	73.27	5727898.46	596353.25
635	27.25	38.90	611.48	-578.05	92.09	74.71	5727900.24	596354.68
640	27.25	38.90	615.92	-582.49	93.87	76.15	5727902.02	596356.12
645	27.21	38.90	620.37	-586.94	95.65	77.59	5727903.80	596357.56
650	27.15	38.90	624.82	-591.39	97.42	79.02	5727905.58	596358.99
655	26.91	40.72	629.27	-595.84	99.17	80.47	5727907.32	596360.44
660	26.67	42.54	633.74	-600.31	100.85	81.96	5727909.00	596361.93
665	26.43	44.36	638.21	-604.78	102.47	83.49	5727910.62	596363.46
670	26.19	46.18	642.70	-609.27	104.03	85.06	5727912.18	596365.03
675	25.95	48.00	647.19	-613.76	105.52	86.66	5727913.68	596366.63
680	25.97	49.73	651.69	-618.26	106.96	88.31	5727915.11	596368.28
685	26.21	51.40	656.18	-622.75	108.35	90.00	5727916.50	596369.98
690	26.45	53.07	660.67	-627.24	109.70	91.75	5727917.85	596371.73
695	26.69	54.74	665.14	-631.71	111.01	93.56	5727919.16	596373.53
700	26.92	56.41	669.61	-636.18	112.28	95.41	5727920.43	596375.39
705	27.16	58.08	674.06	-640.63	113.51	97.33	5727921.66	596377.30
710	27.26	59.71	678.51	-645.08	114.69	99.28	5727922.84	596379.25
715	27.32	61.34	682.95	-649.52	115.81	101.27	5727923.96	596381.25
720	27.39	62.96	687.40	-653.97	116.88	103.30	5727925.03	596383.27
725	27.46	64.59	691.84	-658.41	117.90	105.36	5727926.05	596385.33
730	27.53	66.21	696.28	-662.85	118.85	107.46	5727927.01	596387.43
735	27.60	67.82	700.71	-667.28	119.76	109.58	5727927.91	596389.56
740	27.75	69.18	705.14	-671.71	120.61	111.74	5727928.76	596391.72
745	27.91	70.54	709.56	-676.13	121.41	113.93	5727929.56	596393.90
750	28.06	71.89	713.98	-680.55	122.16	116.15	5727930.31	596396.12
755	28.22	73.25	718.39	-684.96	122.86	118.40	5727931.01	596398.37
760	28.37	74.61	722.79	-689.36	123.51	120.67	5727931.67	596400.64
765	28.49	75.89	727.19	-693.76	124.12	122.97	5727932.27	596402.94
770	28.54	77.00	731.59	-698.15	124.68	125.29	5727932.83	596405.26
775	28.59	78.11	735.98	-702.55	125.19	127.62	5727933.34	596407.60
780	28.64	79.21	740.37	-706.94	125.66	129.97	5727933.81	596409.94
785	28.69	80.32	744.76	-711.33	126.09	132.33	5727934.24	596412.30
790	28.74	81.43	749.14	-715.71	126.47	134.70	5727934.62	596414.67
795	28.80	82.55	753.53	-720.10	126.80	137.08	5727934.95	596417.05
800	28.87	83.68	757.91	-724.48	127.09	139.47	5727935.24	596419.44
805	28.94	84.82	762.29	-728.86	127.33	141.87	5727935.48	596421.84

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
810	29.01	85.95	766.66	-733.23	127.53	144.28	5727935.68	596424.25
815	29.08	87.08	771.03	-737.60	127.67	146.70	5727935.82	596426.68
820	29.15	88.22	775.40	-741.97	127.77	149.13	5727935.92	596429.10
825	29.19	89.52	779.77	-746.34	127.82	151.57	5727935.97	596431.54
830	29.21	90.88	784.14	-750.71	127.81	154.00	5727935.96	596433.98
835	29.23	92.24	788.50	-755.07	127.74	156.44	5727935.90	596436.41
840	29.25	93.60	792.87	-759.44	127.62	158.87	5727935.77	596438.85
845	29.28	94.96	797.23	-763.80	127.44	161.31	5727935.59	596441.28
850	29.30	96.32	801.59	-768.16	127.20	163.74	5727935.35	596443.71
855	29.38	97.80	805.95	-772.52	126.90	166.17	5727935.05	596446.14
860	29.46	99.28	810.31	-776.88	126.53	168.59	5727934.68	596448.56
865	29.54	100.76	814.66	-781.23	126.10	171.01	5727934.25	596450.98
870	29.62	102.24	819.01	-785.59	125.61	173.42	5727933.76	596453.40
875	29.70	103.72	823.36	-789.93	125.05	175.83	5727933.21	596455.80
880	29.78	105.21	827.70	-794.27	124.44	178.23	5727932.59	596458.20
885	29.84	106.73	832.04	-798.61	123.75	180.62	5727931.90	596460.59
890	29.91	108.25	836.38	-802.95	123.00	182.99	5727931.15	596462.96
895	29.98	109.78	840.72	-807.29	122.19	185.34	5727930.34	596465.32
900	30.05	111.30	845.05	-811.62	121.31	187.68	5727929.47	596467.65
905	30.12	112.83	849.38	-815.95	120.37	190.00	5727928.52	596469.97
910	30.22	114.30	853.70	-820.27	119.37	192.30	5727927.52	596472.27
915	30.37	115.72	858.02	-824.59	118.30	194.58	5727926.45	596474.55
920	30.51	117.14	862.33	-828.90	117.18	196.84	5727925.33	596476.82
925	30.66	118.55	866.64	-833.21	115.99	199.09	5727924.14	596479.06
930	30.80	119.97	870.94	-837.51	114.74	201.31	5727922.89	596481.29
935	30.94	121.39	875.23	-841.80	113.43	203.52	5727921.58	596483.49
940	31.01	121.95	879.52	-846.09	112.07	205.70	5727920.23	596485.68
945	31.03	122.09	883.81	-850.38	110.71	207.89	5727918.86	596487.86
950	31.06	122.23	888.09	-854.66	109.34	210.07	5727917.49	596490.04
955	31.08	122.37	892.37	-858.94	107.96	212.25	5727916.11	596492.22
960	31.10	122.51	896.65	-863.22	106.57	214.43	5727914.72	596494.40
965	31.13	122.64	900.93	-867.51	105.18	216.61	5727913.33	596496.58
970	31.12	122.60	905.22	-871.78	103.79	218.78	5727911.94	596498.76
975	31.11	122.55	909.50	-876.07	102.40	220.96	5727910.55	596500.93
980	31.10	122.50	913.78	-880.35	101.01	223.14	5727909.16	596503.11
985	31.09	122.44	918.06	-884.63	99.62	225.31	5727907.77	596505.29
990	31.08	122.39	922.34	-888.91	98.24	227.49	5727906.39	596507.47
995	31.06	122.33	926.62	-893.19	96.86	229.67	5727905.01	596509.65
1000	31.03	122.24	930.91	-897.48	95.48	231.85	5727903.63	596511.82
1005	30.99	122.16	935.19	-901.76	94.11	234.03	5727902.26	596514.00
1010	30.96	122.07	939.48	-906.05	92.74	236.21	5727900.89	596516.18
1015	30.92	121.99	943.77	-910.34	91.38	238.39	5727899.53	596518.36
1020	30.89	121.90	948.06	-914.63	90.02	240.57	5727898.17	596520.54
1025	30.87	121.88	952.35	-918.92	88.66	242.75	5727896.81	596522.72
1030	30.86	121.97	956.64	-923.21	87.31	244.92	5727895.46	596524.90
1035	30.84	122.05	960.93	-927.50	85.95	247.10	5727894.10	596527.07
1040	30.83	122.14	965.23	-931.80	84.59	249.27	5727892.74	596529.24
1045	30.82	122.22	969.52	-936.09	83.22	251.44	5727891.37	596531.41
1050	30.81	122.31	973.81	-940.38	81.85	253.60	5727890.00	596533.58
1055	30.91	122.53	978.11	-944.68	80.48	255.77	5727888.63	596535.74
1060	31.05	122.82	982.39	-948.96	79.09	257.93	5727887.24	596537.91
1065	31.19	123.10	986.67	-953.24	77.69	260.10	5727885.84	596540.07
1070	31.33	123.39	990.95	-957.52	76.26	262.27	5727884.41	596542.24
1075	31.48	123.67	995.22	-961.79	74.82	264.44	5727882.97	596544.41
1080	31.62	123.96	999.48	-966.05	73.37	266.62	5727881.52	596546.59
1085	31.48	124.05	1003.74	-970.31	71.90	268.78	5727880.05	596548.76
1090	31.30	124.11	1008.01	-974.58	70.44	270.94	5727878.59	596550.91
1095	31.12	124.16	1012.28	-978.85	68.99	273.09	5727877.14	596553.06

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1100	30.93	124.22	1016.57	-983.14	67.54	275.22	5727875.69	596555.19
1105	30.75	124.28	1020.86	-987.43	66.10	277.34	5727874.25	596557.31
1110	30.56	124.35	1025.16	-991.73	64.66	279.44	5727872.81	596559.41
1115	30.30	124.51	1029.47	-996.04	63.23	281.53	5727871.38	596561.50
1120	30.05	124.67	1033.79	-1000.36	61.81	283.60	5727869.96	596563.57
1125	29.79	124.83	1038.13	-1004.70	60.38	285.65	5727868.54	596565.62
1130	29.54	124.99	1042.47	-1009.04	58.97	287.68	5727867.12	596567.65
1135	29.28	125.15	1046.83	-1013.40	57.56	289.69	5727865.71	596569.66
1140	29.11	125.30	1051.19	-1017.76	56.15	291.68	5727864.30	596571.65
1145	29.12	125.43	1055.56	-1022.13	54.75	293.66	5727862.90	596573.63
1150	29.13	125.56	1059.93	-1026.50	53.33	295.64	5727861.48	596575.61
1155	29.14	125.69	1064.30	-1030.87	51.92	297.62	5727860.07	596577.59
1160	29.15	125.82	1068.67	-1035.23	50.49	299.60	5727858.64	596579.57
1165	29.16	125.95	1073.03	-1039.60	49.06	301.57	5727857.21	596581.54
1170	29.28	125.69	1077.40	-1043.97	47.63	303.54	5727855.78	596583.52
1175	29.47	125.18	1081.75	-1048.32	46.21	305.54	5727854.36	596585.51
1180	29.66	124.67	1086.10	-1052.67	44.80	307.56	5727852.95	596587.54
1185	29.86	124.17	1090.44	-1057.01	43.40	309.61	5727851.55	596589.58
1190	30.05	123.66	1094.78	-1061.35	42.01	311.68	5727850.16	596591.66
1195	30.24	123.15	1099.10	-1065.67	40.63	313.78	5727848.78	596593.75
1200	30.64	122.75	1103.41	-1069.98	39.25	315.90	5727847.40	596595.88
1205	31.09	122.37	1107.70	-1074.27	37.87	318.07	5727846.02	596598.04
1210	31.54	121.99	1111.98	-1078.55	36.49	320.27	5727844.64	596600.24
1215	32.00	121.61	1116.23	-1082.80	35.10	322.50	5727843.25	596602.48
1220	32.45	121.23	1120.46	-1087.03	33.72	324.78	5727841.87	596604.75
1225	32.91	120.88	1124.67	-1091.24	32.32	327.09	5727840.47	596607.06
1230	33.45	120.79	1128.85	-1095.42	30.92	329.44	5727839.07	596609.41
1235	33.99	120.69	1133.01	-1099.58	29.50	331.83	5727837.65	596611.80
1240	34.53	120.60	1137.14	-1103.71	28.07	334.25	5727836.22	596614.22
1245	35.07	120.50	1141.25	-1107.82	26.62	336.70	5727834.77	596616.68
1250	35.60	120.41	1145.33	-1111.90	25.16	339.20	5727833.31	596619.17
1255	35.93	120.34	1149.38	-1115.95	23.68	341.72	5727831.83	596621.69
1260	35.95	120.33	1153.43	-1120.00	22.19	344.25	5727830.34	596624.23
1265	35.96	120.31	1157.48	-1124.05	20.71	346.79	5727828.86	596626.76
1270	35.97	120.30	1161.52	-1128.09	19.23	349.32	5727827.38	596629.30
1275	35.98	120.28	1165.57	-1132.14	17.75	351.86	5727825.90	596631.83
1280	36.00	120.27	1169.62	-1136.18	16.27	354.40	5727824.42	596634.37
1285	35.90	120.24	1173.66	-1140.23	14.79	356.93	5727822.94	596636.91
1290	35.74	120.21	1177.72	-1144.29	13.31	359.46	5727821.47	596639.43
1295	35.58	120.18	1181.78	-1148.35	11.85	361.98	5727820.00	596641.95
1300	35.42	120.15	1185.85	-1152.42	10.39	364.49	5727818.54	596644.46
1305	35.26	120.12	1189.93	-1156.50	8.94	366.99	5727817.09	596646.96
1310	35.10	120.09	1194.01	-1160.58	7.49	369.48	5727815.64	596649.45
1315	34.93	120.11	1198.11	-1164.68	6.05	371.96	5727814.20	596651.94
1320	34.75	120.13	1202.21	-1168.78	4.62	374.44	5727812.77	596654.41
1325	34.58	120.15	1206.33	-1172.90	3.19	376.89	5727811.34	596656.87
1330	34.40	120.18	1210.45	-1177.02	1.77	379.34	5727809.92	596659.31
1335	34.23	120.20	1214.58	-1181.15	0.35	381.78	5727808.50	596661.75
1340	34.05	120.22	1218.71	-1185.28	-1.06	384.20	5727807.09	596664.17
1345	33.83	120.18	1222.86	-1189.43	-2.47	386.61	5727805.68	596666.59
1350	33.61	120.15	1227.02	-1193.59	-3.86	389.01	5727804.29	596668.99
1355	33.40	120.11	1231.19	-1197.76	-5.25	391.40	5727802.91	596671.37
1360	33.18	120.08	1235.37	-1201.94	-6.62	393.78	5727801.53	596673.75
1365	32.96	120.04	1239.56	-1206.13	-7.99	396.14	5727800.16	596676.11
1370	32.92	120.12	1243.76	-1210.33	-9.35	398.49	5727798.80	596678.46
1375	33.22	120.41	1247.95	-1214.52	-10.72	400.84	5727797.43	596680.81
1380	33.53	120.69	1252.12	-1218.69	-12.12	403.21	5727796.03	596683.18
1385	33.83	120.98	1256.29	-1222.86	-13.54	405.59	5727794.61	596685.56

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1390	34.13	121.27	1260.43	-1227.00	-14.99	407.98	5727793.16	596687.95
1395	34.43	121.56	1264.56	-1231.13	-16.46	410.38	5727791.69	596690.36
1400	34.51	121.76	1268.68	-1235.25	-17.95	412.79	5727790.21	596692.77
1405	34.43	121.90	1272.81	-1239.38	-19.44	415.20	5727788.71	596695.17
1410	34.34	122.04	1276.93	-1243.50	-20.93	417.59	5727787.22	596697.57
1415	34.26	122.18	1281.06	-1247.63	-22.43	419.98	5727785.72	596699.95
1420	34.18	122.32	1285.20	-1251.77	-23.93	422.36	5727784.22	596702.33
1425	34.09	122.46	1289.34	-1255.91	-25.43	424.73	5727782.72	596704.70
1430	34.35	122.25	1293.47	-1260.04	-26.94	427.10	5727781.21	596707.07
1435	34.66	121.97	1297.59	-1264.16	-28.44	429.50	5727779.71	596709.47
1440	34.98	121.70	1301.70	-1268.27	-29.95	431.92	5727778.20	596711.90
1445	35.29	121.43	1305.79	-1272.36	-31.45	434.38	5727776.70	596714.35
1450	35.60	121.16	1309.86	-1276.43	-32.96	436.85	5727775.19	596716.83
1455	35.87	120.92	1313.92	-1280.49	-34.46	439.36	5727773.69	596719.33
1460	35.81	120.90	1317.97	-1284.54	-35.97	441.87	5727772.18	596721.84
1465	35.75	120.88	1322.03	-1288.60	-37.47	444.38	5727770.68	596724.35
1470	35.68	120.87	1326.09	-1292.66	-38.97	446.88	5727769.18	596726.85
1475	35.62	120.85	1330.15	-1296.72	-40.46	449.38	5727767.69	596729.36
1480	35.56	120.83	1334.21	-1300.78	-41.95	451.88	5727766.20	596731.85
1485	35.45	120.84	1338.28	-1304.85	-43.44	454.38	5727764.71	596734.35
1490	35.25	120.89	1342.36	-1308.93	-44.93	456.86	5727763.22	596736.83
1495	35.06	120.94	1346.45	-1313.02	-46.41	459.33	5727761.74	596739.30
1500	34.86	121.00	1350.55	-1317.12	-47.88	461.79	5727760.27	596741.76
1505	34.67	121.05	1354.65	-1321.22	-49.35	464.23	5727758.80	596744.20
1510	34.48	121.10	1358.77	-1325.34	-50.81	466.66	5727757.34	596746.63
1515	34.35	121.13	1362.90	-1329.47	-52.27	469.08	5727755.88	596749.05
1520	34.28	121.15	1367.03	-1333.60	-53.73	471.49	5727754.42	596751.46
1525	34.20	121.17	1371.16	-1337.73	-55.19	473.90	5727752.96	596753.87
1530	34.12	121.19	1375.30	-1341.87	-56.64	476.30	5727751.51	596756.27
1535	34.04	121.21	1379.44	-1346.01	-58.09	478.69	5727750.06	596758.67
1540	33.97	121.23	1383.58	-1350.15	-59.54	481.09	5727748.61	596761.06
1545	33.95	121.24	1387.73	-1354.30	-60.99	483.47	5727747.16	596763.45
1550	33.94	121.26	1391.88	-1358.45	-62.44	485.86	5727745.71	596765.83
1555	33.92	121.27	1396.03	-1362.60	-63.89	488.24	5727744.26	596768.22
1560	33.91	121.29	1400.18	-1366.75	-65.34	490.63	5727742.82	596770.60
1565	33.90	121.30	1404.33	-1370.90	-66.78	493.01	5727741.37	596772.98
1570	33.90	121.34	1408.48	-1375.05	-68.23	495.39	5727739.92	596775.37
1575	33.92	121.41	1412.63	-1379.20	-69.69	497.77	5727738.46	596777.75
1580	33.93	121.48	1416.78	-1383.35	-71.14	500.16	5727737.01	596780.13
1585	33.95	121.55	1420.92	-1387.49	-72.60	502.54	5727735.55	596782.51
1590	33.97	121.63	1425.07	-1391.64	-74.07	504.91	5727734.09	596784.89
1595	33.99	121.70	1429.22	-1395.79	-75.53	507.29	5727732.62	596787.26
1600	34.00	121.83	1433.36	-1399.93	-77.00	509.67	5727731.15	596789.64
1605	34.02	122.04	1437.51	-1404.08	-78.48	512.04	5727729.67	596792.02
1610	34.03	122.25	1441.65	-1408.22	-79.97	514.41	5727728.18	596794.38
1615	34.04	122.46	1445.80	-1412.37	-81.47	516.77	5727726.68	596796.75
1620	34.05	122.67	1449.94	-1416.51	-82.98	519.13	5727725.18	596799.11
1625	34.06	122.88	1454.08	-1420.65	-84.49	521.49	5727723.66	596801.46
1630	33.97	122.92	1458.22	-1424.80	-86.01	523.83	5727722.14	596803.81
1635	33.85	122.90	1462.37	-1428.94	-87.53	526.18	5727720.62	596806.15
1640	33.73	122.88	1466.53	-1433.10	-89.04	528.51	5727719.11	596808.48
1645	33.61	122.86	1470.69	-1437.26	-90.54	530.84	5727717.61	596810.81
1650	33.48	122.83	1474.86	-1441.43	-92.04	533.16	5727716.11	596813.13
1655	33.36	122.81	1479.03	-1445.60	-93.53	535.47	5727714.62	596815.45
1660	33.23	122.82	1483.21	-1449.78	-95.02	537.78	5727713.13	596817.75
1665	33.09	122.83	1487.40	-1453.97	-96.50	540.08	5727711.65	596820.05
1670	32.96	122.85	1491.59	-1458.16	-97.98	542.37	5727710.17	596822.34
1675	32.82	122.86	1495.79	-1462.36	-99.45	544.65	5727708.70	596824.62

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1680	32.69	122.87	1499.99	-1466.56	-100.92	546.92	5727707.23	596826.89
1685	32.62	122.84	1504.20	-1470.77	-102.38	549.18	5727705.77	596829.16
1690	32.98	122.53	1508.41	-1474.98	-103.85	551.46	5727704.30	596831.44
1695	33.34	122.23	1512.59	-1479.16	-105.31	553.77	5727702.84	596833.75
1700	33.70	121.92	1516.76	-1483.33	-106.78	556.11	5727701.37	596836.09
1705	34.06	121.61	1520.91	-1487.48	-108.24	558.48	5727699.91	596838.46
1710	34.42	121.31	1525.05	-1491.62	-109.71	560.88	5727698.44	596840.86
1715	34.57	121.14	1529.16	-1495.73	-111.18	563.31	5727696.97	596843.28
1720	34.47	121.13	1533.28	-1499.85	-112.64	565.74	5727695.51	596845.71
1725	34.37	121.12	1537.41	-1503.98	-114.11	568.16	5727694.04	596848.13
1730	34.27	121.12	1541.54	-1508.11	-115.56	570.57	5727692.59	596850.54
1735	34.16	121.11	1545.67	-1512.24	-117.02	572.97	5727691.14	596852.95
1740	34.06	121.10	1549.81	-1516.38	-118.47	575.38	5727689.69	596855.35
1745	33.95	121.09	1553.96	-1520.53	-119.91	577.77	5727688.24	596857.74
1750	33.84	121.07	1558.11	-1524.68	-121.35	580.16	5727686.80	596860.13
1755	33.72	121.05	1562.26	-1528.83	-122.78	582.54	5727685.37	596862.51
1760	33.61	121.04	1566.42	-1532.99	-124.21	584.91	5727683.94	596864.89
1765	33.49	121.02	1570.59	-1537.16	-125.64	587.28	5727682.51	596867.25
1770	33.38	121.00	1574.76	-1541.33	-127.06	589.64	5727681.09	596869.61
1775	33.30	121.00	1578.94	-1545.51	-128.47	592.00	5727679.68	596871.97
1780	33.22	121.01	1583.12	-1549.69	-129.88	594.35	5727678.27	596874.32
1785	33.14	121.01	1587.31	-1553.88	-131.29	596.69	5727676.86	596876.66
1790	33.06	121.01	1591.49	-1558.07	-132.70	599.03	5727675.45	596879.00
1795	32.98	121.02	1595.69	-1562.26	-134.10	601.37	5727674.05	596881.34
1800	32.89	121.03	1599.88	-1566.45	-135.51	603.70	5727672.64	596883.67
1805	32.78	121.08	1604.09	-1570.66	-136.90	606.02	5727671.25	596885.99
1810	32.66	121.12	1608.29	-1574.86	-138.30	608.33	5727669.85	596888.30
1815	32.55	121.17	1612.50	-1579.07	-139.69	610.64	5727668.46	596890.61
1820	32.43	121.22	1616.72	-1583.29	-141.09	612.94	5727667.06	596892.91
1825	32.32	121.27	1620.94	-1587.51	-142.47	615.22	5727665.68	596895.20
1830	32.43	121.29	1625.17	-1591.74	-143.86	617.51	5727664.29	596897.48
1835	32.87	121.26	1629.38	-1595.95	-145.26	619.81	5727662.89	596899.79
1840	33.32	121.23	1633.57	-1600.14	-146.68	622.15	5727661.47	596902.12
1845	33.77	121.20	1637.74	-1604.31	-148.11	624.51	5727660.04	596904.48
1850	34.22	121.18	1641.88	-1608.45	-149.56	626.90	5727658.59	596906.87
1855	34.66	121.15	1646.01	-1612.58	-151.02	629.32	5727657.13	596909.29
1860	34.72	121.17	1650.11	-1616.68	-152.50	631.76	5727655.65	596911.73
1865	34.63	121.21	1654.22	-1620.80	-153.97	634.19	5727654.18	596914.16
1870	34.53	121.25	1658.34	-1624.91	-155.44	636.62	5727652.71	596916.59
1875	34.44	121.29	1662.46	-1629.03	-156.91	639.04	5727651.24	596919.01
1880	34.34	121.34	1666.59	-1633.16	-158.38	641.45	5727649.77	596921.42
1885	34.25	121.38	1670.72	-1637.29	-159.84	643.86	5727648.31	596923.83
1890	34.17	121.35	1674.86	-1641.43	-161.31	646.26	5727646.84	596926.23
1895	34.09	121.32	1678.99	-1645.56	-162.77	648.65	5727645.38	596928.62
1900	34.01	121.29	1683.14	-1649.71	-164.22	651.04	5727643.93	596931.02
1905	33.93	121.26	1687.28	-1653.85	-165.67	653.43	5727642.48	596933.40
1910	33.85	121.23	1691.43	-1658.00	-167.12	655.81	5727641.03	596935.79
1915	33.77	121.20	1695.59	-1662.16	-168.56	658.19	5727639.59	596938.17
1920	33.69	121.20	1699.75	-1666.32	-170.00	660.57	5727638.15	596940.54
1925	33.61	121.20	1703.91	-1670.48	-171.43	662.94	5727636.72	596942.91
1930	33.53	121.21	1708.08	-1674.65	-172.87	665.30	5727635.28	596945.28
1935	33.44	121.21	1712.24	-1678.82	-174.30	667.66	5727633.85	596947.64
1940	33.36	121.21	1716.42	-1682.99	-175.72	670.02	5727632.43	596949.99
1945	33.27	121.25	1720.60	-1687.17	-177.15	672.36	5727631.00	596952.34
1950	33.17	121.33	1724.78	-1691.35	-178.57	674.71	5727629.58	596954.68
1955	33.06	121.42	1728.97	-1695.54	-179.99	677.04	5727628.16	596957.01
1960	32.96	121.51	1733.16	-1699.73	-181.41	679.36	5727626.74	596959.33
1965	32.86	121.60	1737.36	-1703.93	-182.84	681.68	5727625.32	596961.65

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1970	32.76	121.69	1741.56	-1708.13	-184.26	683.98	5727623.89	596963.95
1975	32.66	121.72	1745.77	-1712.34	-185.68	686.28	5727622.47	596966.25
1980	32.57	121.73	1749.98	-1716.55	-187.10	688.57	5727621.06	596968.55
1985	32.48	121.73	1754.20	-1720.77	-188.51	690.86	5727619.64	596970.83
1990	32.39	121.74	1758.42	-1724.99	-189.92	693.14	5727618.23	596973.11
1995	32.30	121.74	1762.64	-1729.21	-191.33	695.41	5727616.82	596975.39
2000	32.21	121.75	1766.87	-1733.44	-192.73	697.68	5727615.42	596977.65
2005	32.53	121.55	1771.09	-1737.66	-194.14	699.96	5727614.01	596979.93
2010	32.88	121.34	1775.30	-1741.87	-195.55	702.26	5727612.61	596982.24
2015	33.24	121.12	1779.49	-1746.06	-196.96	704.60	5727611.19	596984.57
2020	33.59	120.90	1783.66	-1750.23	-198.38	706.96	5727609.77	596986.93
2025	33.95	120.69	1787.82	-1754.39	-199.80	709.34	5727608.35	596989.32
2030	34.22	120.52	1791.96	-1758.53	-201.23	711.76	5727606.92	596991.73
2035	34.12	120.55	1796.10	-1762.67	-202.65	714.18	5727605.50	596994.15
2040	34.01	120.58	1800.24	-1766.81	-204.08	716.59	5727604.07	596996.56
2045	33.91	120.62	1804.39	-1770.96	-205.50	718.99	5727602.65	596998.97
2050	33.80	120.65	1808.54	-1775.11	-206.92	721.39	5727601.23	597001.36
2055	33.70	120.68	1812.70	-1779.27	-208.34	723.78	5727599.82	597003.75
2060	33.57	120.70	1816.86	-1783.43	-209.75	726.16	5727598.40	597006.13
2065	33.41	120.70	1821.03	-1787.60	-211.16	728.53	5727596.99	597008.51
2070	33.25	120.70	1825.21	-1791.78	-212.56	730.90	5727595.59	597010.87
2075	33.09	120.69	1829.39	-1795.96	-213.96	733.25	5727594.19	597013.22
2080	32.93	120.69	1833.58	-1800.15	-215.35	735.59	5727592.80	597015.56
2085	32.77	120.69	1837.79	-1804.36	-216.73	737.92	5727591.42	597017.89
2090	32.65	120.71	1841.99	-1808.56	-218.11	740.24	5727590.04	597020.22
2095	32.55	120.73	1846.20	-1812.78	-219.49	742.56	5727588.66	597022.53
2100	32.46	120.76	1850.42	-1816.99	-220.86	744.87	5727587.29	597024.84
2105	32.36	120.78	1854.64	-1821.21	-222.23	747.17	5727585.92	597027.14
2110	32.26	120.80	1858.87	-1825.44	-223.60	749.47	5727584.55	597029.44
2115	32.16	120.83	1863.10	-1829.67	-224.97	751.76	5727583.18	597031.73
2120	32.50	120.73	1867.32	-1833.89	-226.34	754.05	5727581.82	597034.02
2125	32.85	120.62	1871.53	-1838.10	-227.71	756.37	5727580.44	597036.35
2130	33.20	120.51	1875.72	-1842.30	-229.10	758.72	5727579.05	597038.69
2135	33.56	120.40	1879.90	-1846.47	-230.49	761.09	5727577.66	597041.06
2140	33.91	120.29	1884.06	-1850.63	-231.89	763.49	5727576.26	597043.46
2145	34.17	120.19	1888.20	-1854.77	-233.31	765.91	5727574.85	597045.88
2150	34.08	120.15	1892.34	-1858.91	-234.72	768.33	5727573.44	597048.31
2155	34.00	120.11	1896.48	-1863.05	-236.12	770.75	5727572.03	597050.73
2160	33.91	120.06	1900.63	-1867.20	-237.52	773.17	5727570.63	597053.14
2165	33.82	120.02	1904.78	-1871.35	-238.92	775.58	5727569.24	597055.56
2170	33.73	119.98	1908.94	-1875.51	-240.31	777.99	5727567.84	597057.96
2175	33.65	119.96	1913.10	-1879.67	-241.69	780.39	5727566.46	597060.37
2180	33.57	119.95	1917.26	-1883.83	-243.07	782.79	5727565.08	597062.76
2185	33.49	119.94	1921.43	-1888.00	-244.45	785.18	5727563.70	597065.16
2190	33.42	119.93	1925.60	-1892.17	-245.83	787.57	5727562.32	597067.55
2195	33.34	119.92	1929.78	-1896.35	-247.20	789.96	5727560.95	597069.93
2200	33.26	119.91	1933.95	-1900.53	-248.57	792.34	5727559.58	597072.31
2205	33.18	119.91	1938.14	-1904.71	-249.94	794.71	5727558.21	597074.68
2210	33.10	119.90	1942.33	-1908.90	-251.30	797.08	5727556.85	597077.05
2215	33.02	119.90	1946.52	-1913.09	-252.66	799.44	5727555.49	597079.42
2220	32.94	119.89	1950.71	-1917.28	-254.02	801.80	5727554.13	597081.78
2225	32.85	119.89	1954.91	-1921.48	-255.37	804.16	5727552.78	597084.13
2230	32.77	119.88	1959.11	-1925.68	-256.72	806.51	5727551.43	597086.48
2235	32.89	119.97	1963.31	-1929.88	-258.07	808.86	5727550.08	597088.83
2240	33.01	120.06	1967.51	-1934.08	-259.43	811.21	5727548.72	597091.18
2245	33.14	120.14	1971.70	-1938.27	-260.80	813.57	5727547.35	597093.54
2250	33.26	120.23	1975.88	-1942.45	-262.18	815.94	5727545.97	597095.91
2255	33.38	120.32	1980.06	-1946.63	-263.56	818.31	5727544.59	597098.28

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2260	33.54	120.45	1984.23	-1950.80	-264.96	820.69	5727543.19	597100.66
2265	33.80	120.72	1988.39	-1954.96	-266.37	823.07	5727541.78	597103.05
2270	34.07	120.98	1992.54	-1959.11	-267.80	825.47	5727540.35	597105.44
2275	34.33	121.25	1996.68	-1963.25	-269.25	827.87	5727538.90	597107.85
2280	34.60	121.52	2000.80	-1967.37	-270.73	830.29	5727537.42	597110.26
2285	34.87	121.78	2004.91	-1971.48	-272.22	832.72	5727535.93	597112.69
2290	34.96	121.88	2009.01	-1975.58	-273.74	835.15	5727534.41	597115.12
2295	34.87	121.81	2013.11	-1979.68	-275.25	837.58	5727532.90	597117.55
2300	34.79	121.74	2017.21	-1983.78	-276.75	840.01	5727531.40	597119.98
2305	34.70	121.67	2021.32	-1987.89	-278.25	842.43	5727529.90	597122.40
2310	34.62	121.59	2025.43	-1992.00	-279.74	844.85	5727528.41	597124.82
2315	34.53	121.52	2029.55	-1996.12	-281.23	847.27	5727526.92	597127.24
2320	34.43	121.52	2033.67	-2000.24	-282.71	849.68	5727525.44	597129.66
2325	34.33	121.54	2037.80	-2004.37	-284.18	852.09	5727523.97	597132.06
2330	34.22	121.57	2041.93	-2008.50	-285.66	854.49	5727522.49	597134.46
2335	34.11	121.60	2046.06	-2012.63	-287.13	856.88	5727521.02	597136.85
2340	34.01	121.62	2050.21	-2016.78	-288.60	859.27	5727519.55	597139.24
2345	33.90	121.65	2054.35	-2020.92	-290.06	861.64	5727518.09	597141.62
2350	33.79	121.56	2058.51	-2025.08	-291.52	864.01	5727516.63	597143.99
2355	33.67	121.47	2062.67	-2029.23	-292.97	866.38	5727515.18	597146.35
2360	33.56	121.38	2066.83	-2033.40	-294.42	868.74	5727513.73	597148.72
2365	33.44	121.29	2071.00	-2037.57	-295.85	871.10	5727512.30	597151.07
2370	33.33	121.20	2075.17	-2041.74	-297.28	873.45	5727510.87	597153.42
2375	33.22	121.12	2079.35	-2045.92	-298.70	875.80	5727509.45	597155.77
2380	33.13	121.10	2083.54	-2050.11	-300.11	878.14	5727508.04	597158.11
2385	33.05	121.08	2087.73	-2054.30	-301.52	880.48	5727506.63	597160.45
2390	32.96	121.06	2091.92	-2058.49	-302.93	882.81	5727505.22	597162.78
2395	32.88	121.04	2096.12	-2062.69	-304.33	885.14	5727503.82	597165.11
2400	32.79	121.02	2100.32	-2066.89	-305.73	887.46	5727502.42	597167.44
2405	32.69	121.00	2104.53	-2071.09	-307.12	889.78	5727501.03	597169.75
2410	32.57	120.97	2108.74	-2075.30	-308.51	892.09	5727499.64	597172.06
2415	32.45	120.94	2112.95	-2079.52	-309.89	894.40	5727498.26	597174.37
2420	32.33	120.91	2117.17	-2083.74	-311.27	896.70	5727496.88	597176.67
2425	32.21	120.88	2121.40	-2087.97	-312.64	898.99	5727495.51	597178.96
2430	32.09	120.85	2125.64	-2092.20	-314.01	901.27	5727494.15	597181.24
2435	32.03	120.84	2129.87	-2096.44	-315.37	903.55	5727492.78	597183.52
2440	31.99	120.84	2134.11	-2100.68	-316.73	905.82	5727491.43	597185.80
2445	31.96	120.84	2138.35	-2104.92	-318.08	908.10	5727490.07	597188.07
2450	31.92	120.84	2142.60	-2109.17	-319.44	910.37	5727488.71	597190.34
2455	31.88	120.84	2146.84	-2113.41	-320.79	912.64	5727487.36	597192.61
2460	31.83	120.83	2151.09	-2117.66	-322.15	914.90	5727486.00	597194.87
2465	31.65	120.75	2155.34	-2121.91	-323.49	917.16	5727484.66	597197.13
2470	31.46	120.67	2159.60	-2126.17	-324.83	919.41	5727483.32	597199.38
2475	31.28	120.59	2163.87	-2130.44	-326.16	921.65	5727481.99	597201.62
2480	31.09	120.51	2168.15	-2134.72	-327.47	923.88	5727480.68	597203.85
2485	30.90	120.43	2172.43	-2139.00	-328.78	926.10	5727479.37	597206.07
2490	30.72	120.37	2176.73	-2143.30	-330.08	928.31	5727478.07	597208.28
2495	30.56	120.35	2181.03	-2147.60	-331.36	930.51	5727476.79	597210.48
2500	30.40	120.34	2185.34	-2151.91	-332.65	932.70	5727475.50	597212.67
2505	30.24	120.32	2189.66	-2156.22	-333.92	934.87	5727474.23	597214.85
2510	30.08	120.31	2193.98	-2160.55	-335.19	937.04	5727472.96	597217.02
2515	29.92	120.30	2198.31	-2164.88	-336.45	939.20	5727471.70	597219.18
2520	29.79	120.30	2202.65	-2169.22	-337.71	941.35	5727470.44	597221.32
2525	29.69	120.33	2206.99	-2173.56	-338.96	943.49	5727469.19	597223.46
2530	29.58	120.35	2211.33	-2177.90	-340.21	945.63	5727467.94	597225.60
2535	29.47	120.38	2215.68	-2182.25	-341.46	947.75	5727466.70	597227.72
2540	29.37	120.40	2220.04	-2186.61	-342.70	949.87	5727465.45	597229.84
2545	29.26	120.42	2224.40	-2190.97	-343.94	951.98	5727464.21	597231.95

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2550	29.19	120.48	2228.76	-2195.33	-345.17	954.09	5727462.98	597234.06
2555	29.12	120.55	2233.13	-2199.70	-346.41	956.18	5727461.74	597236.16
2560	29.05	120.61	2237.50	-2204.07	-347.65	958.28	5727460.50	597238.25
2565	28.98	120.68	2241.87	-2208.44	-348.88	960.36	5727459.27	597240.34
2570	28.91	120.75	2246.25	-2212.82	-350.12	962.44	5727458.03	597242.42
2574	28.85	120.80	2249.75	-2216.32	-351.11	964.10	5727457.04	597244.08
2575	28.84	120.81	2250.62	-2217.19	-351.36	964.52	5727456.79	597244.49
2576	28.83	120.78	2251.50	-2218.07	-351.60	964.93	5727456.55	597244.90
2577	28.83	120.76	2252.38	-2218.95	-351.85	965.35	5727456.30	597245.32
2578	28.82	120.74	2253.25	-2219.82	-352.10	965.76	5727456.05	597245.73
2579	28.81	120.71	2254.13	-2220.70	-352.34	966.17	5727455.81	597246.15
2580	28.81	120.69	2255.01	-2221.57	-352.59	966.59	5727455.56	597246.56
2581	28.80	120.66	2255.88	-2222.45	-352.83	967.00	5727455.32	597246.98
2582	28.79	120.64	2256.76	-2223.33	-353.08	967.42	5727455.07	597247.39
2583	28.79	120.62	2257.63	-2224.20	-353.33	967.83	5727454.82	597247.80
2584	28.78	120.59	2258.51	-2225.08	-353.57	968.25	5727454.58	597248.22
2585	28.77	120.57	2259.39	-2225.96	-353.82	968.66	5727454.34	597248.63
2586	28.77	120.54	2260.26	-2226.83	-354.06	969.07	5727454.09	597249.05
2587	28.76	120.52	2261.14	-2227.71	-354.31	969.49	5727453.84	597249.46
2588	28.75	120.50	2262.02	-2228.59	-354.55	969.90	5727453.60	597249.88
2589	28.75	120.47	2262.89	-2229.46	-354.79	970.32	5727453.36	597250.29
2590	28.74	120.45	2263.77	-2230.34	-355.04	970.73	5727453.11	597250.71
2591	28.73	120.43	2264.65	-2231.22	-355.28	971.15	5727452.87	597251.12
2592	28.73	120.40	2265.52	-2232.09	-355.52	971.56	5727452.63	597251.53
2593	28.72	120.38	2266.40	-2232.97	-355.77	971.98	5727452.38	597251.95
2594	28.71	120.35	2267.28	-2233.85	-356.01	972.39	5727452.14	597252.36
2595	28.71	120.33	2268.16	-2234.72	-356.25	972.81	5727451.90	597252.78
2596	28.70	120.31	2269.03	-2235.60	-356.50	973.22	5727451.65	597253.19
2597	28.69	120.28	2269.91	-2236.48	-356.74	973.64	5727451.41	597253.61
2598	28.69	120.26	2270.79	-2237.36	-356.98	974.05	5727451.17	597254.02
2599	28.68	120.23	2271.66	-2238.23	-357.22	974.46	5727450.93	597254.44
2600	28.67	120.21	2272.54	-2239.11	-357.46	974.88	5727450.69	597254.85
2601	28.67	120.19	2273.42	-2239.99	-357.71	975.29	5727450.45	597255.27
2602	28.66	120.16	2274.30	-2240.87	-357.95	975.71	5727450.21	597255.68
2603	28.65	120.14	2275.17	-2241.74	-358.19	976.12	5727449.96	597256.10
2604	28.65	120.12	2276.05	-2242.62	-358.43	976.54	5727449.72	597256.51
2605	28.65	120.11	2276.93	-2243.50	-358.67	976.95	5727449.48	597256.92
2606	28.65	120.09	2277.81	-2244.38	-358.91	977.37	5727449.24	597257.34
2607	28.65	120.08	2278.68	-2245.25	-359.15	977.78	5727449.00	597257.75
2608	28.65	120.06	2279.56	-2246.13	-359.39	978.20	5727448.76	597258.17
2609	28.65	120.05	2280.44	-2247.01	-359.63	978.61	5727448.52	597258.58
2610	28.65	120.04	2281.32	-2247.89	-359.87	979.03	5727448.28	597259.00
2611	28.65	120.02	2282.19	-2248.76	-360.11	979.44	5727448.04	597259.41
2612	28.65	120.01	2283.07	-2249.64	-360.35	979.86	5727447.80	597259.83
2613	28.65	119.99	2283.95	-2250.52	-360.59	980.27	5727447.56	597260.24
2614	28.65	119.98	2284.83	-2251.40	-360.83	980.69	5727447.32	597260.66
2615	28.65	119.96	2285.70	-2252.27	-361.07	981.10	5727447.08	597261.07
2616	28.65	119.95	2286.58	-2253.15	-361.31	981.52	5727446.84	597261.49
2617	28.65	119.94	2287.46	-2254.03	-361.55	981.93	5727446.60	597261.91
2618	28.65	119.92	2288.34	-2254.91	-361.79	982.35	5727446.36	597262.32
2619	28.65	119.91	2289.22	-2255.78	-362.03	982.76	5727446.12	597262.74
2620	28.65	119.89	2290.09	-2256.66	-362.27	983.18	5727445.88	597263.15
2621	28.65	119.88	2290.97	-2257.54	-362.50	983.60	5727445.65	597263.57
2622	28.65	119.86	2291.85	-2258.42	-362.74	984.01	5727445.41	597263.98
2623	28.65	119.85	2292.72	-2259.30	-362.98	984.43	5727445.17	597264.40
2624	28.65	119.84	2293.60	-2260.17	-363.22	984.84	5727444.93	597264.82
2625	28.65	119.82	2294.48	-2261.05	-363.46	985.26	5727444.69	597265.23
2626	28.65	119.81	2295.36	-2261.93	-363.70	985.68	5727444.45	597265.65

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2627	28.65	119.79	2296.24	-2262.80	-363.94	986.09	5727444.21	597266.06
2628	28.65	119.78	2297.11	-2263.68	-364.17	986.51	5727443.98	597266.48
2629	28.65	119.76	2297.99	-2264.56	-364.41	986.92	5727443.74	597266.90
2630	28.65	119.75	2298.87	-2265.44	-364.65	987.34	5727443.50	597267.31
2631	28.65	119.74	2299.74	-2266.32	-364.89	987.76	5727443.26	597267.73
2632	28.65	119.73	2300.62	-2267.19	-365.13	988.17	5727443.02	597268.15
2633	28.64	119.72	2301.50	-2268.07	-365.36	988.59	5727442.79	597268.56
2634	28.63	119.71	2302.38	-2268.95	-365.60	989.00	5727442.55	597268.98
2635	28.62	119.71	2303.26	-2269.83	-365.84	989.42	5727442.31	597269.39
2636	28.62	119.70	2304.13	-2270.70	-366.08	989.84	5727442.07	597269.81
2637	28.61	119.69	2305.01	-2271.58	-366.31	990.25	5727441.84	597270.23
2638	28.60	119.68	2305.89	-2272.46	-366.55	990.67	5727441.60	597270.64
2639	28.59	119.68	2306.77	-2273.34	-366.79	991.08	5727441.36	597271.06
2640	28.58	119.67	2307.65	-2274.22	-367.03	991.50	5727441.13	597271.47
2641	28.58	119.66	2308.52	-2275.09	-367.26	991.92	5727440.89	597271.89
2642	28.57	119.66	2309.40	-2275.97	-367.50	992.33	5727440.65	597272.30
2643	28.56	119.65	2310.28	-2276.85	-367.74	992.75	5727440.42	597272.72
2644	28.55	119.64	2311.16	-2277.73	-367.97	993.16	5727440.18	597273.14
2645	28.55	119.64	2312.04	-2278.61	-368.21	993.58	5727439.94	597273.55
2646	28.54	119.63	2312.92	-2279.49	-368.45	993.99	5727439.71	597273.97
2647	28.53	119.62	2313.79	-2280.36	-368.68	994.41	5727439.47	597274.38
2648	28.52	119.62	2314.67	-2281.24	-368.92	994.82	5727439.23	597274.80
2649	28.52	119.61	2315.55	-2282.12	-369.15	995.24	5727439.00	597275.21
2650	28.51	119.60	2316.43	-2283.00	-369.39	995.65	5727438.76	597275.63
2651	28.50	119.59	2317.31	-2283.88	-369.62	996.07	5727438.53	597276.04
2652	28.49	119.59	2318.19	-2284.76	-369.86	996.48	5727438.29	597276.46
2653	28.49	119.58	2319.07	-2285.64	-370.10	996.90	5727438.06	597276.87
2654	28.48	119.57	2319.95	-2286.52	-370.33	997.31	5727437.82	597277.29
2655	28.47	119.57	2320.82	-2287.40	-370.57	997.73	5727437.58	597277.70
2656	28.46	119.56	2321.70	-2288.27	-370.80	998.14	5727437.35	597278.11
2657	28.46	119.55	2322.58	-2289.15	-371.04	998.56	5727437.11	597278.53
2658	28.45	119.55	2323.46	-2290.03	-371.27	998.97	5727436.88	597278.94
2659	28.44	119.54	2324.34	-2290.91	-371.51	999.39	5727436.64	597279.36
2660	28.43	119.53	2325.22	-2291.79	-371.74	999.80	5727436.41	597279.77
2661	28.43	119.52	2326.10	-2292.67	-371.98	1000.21	5727436.17	597280.19
2662	28.44	119.51	2326.98	-2293.55	-372.21	1000.63	5727435.94	597280.60
2663	28.45	119.50	2327.86	-2294.43	-372.45	1001.04	5727435.70	597281.02
2664	28.46	119.49	2328.74	-2295.31	-372.68	1001.46	5727435.47	597281.43
2665	28.46	119.47	2329.62	-2296.19	-372.92	1001.87	5727435.23	597281.85
2666	28.47	119.46	2330.50	-2297.07	-373.15	1002.29	5727435.00	597282.26
2667	28.48	119.45	2331.38	-2297.95	-373.38	1002.70	5727434.77	597282.68
2668	28.48	119.44	2332.25	-2298.82	-373.62	1003.12	5727434.53	597283.09
2669	28.49	119.43	2333.13	-2299.70	-373.85	1003.53	5727434.30	597283.51
2670	28.50	119.42	2334.01	-2300.58	-374.09	1003.95	5727434.06	597283.92
2671	28.51	119.40	2334.89	-2301.46	-374.32	1004.37	5727433.83	597284.34
2672	28.51	119.39	2335.77	-2302.34	-374.56	1004.78	5727433.59	597284.75
2673	28.52	119.38	2336.65	-2303.22	-374.79	1005.20	5727433.36	597285.17
2674	28.53	119.37	2337.53	-2304.10	-375.03	1005.61	5727433.12	597285.59
2675	28.53	119.36	2338.41	-2304.97	-375.26	1006.03	5727432.89	597286.00
2676	28.54	119.34	2339.28	-2305.85	-375.49	1006.45	5727432.66	597286.42
2677	28.55	119.33	2340.16	-2306.73	-375.73	1006.86	5727432.42	597286.84
2678	28.56	119.32	2341.04	-2307.61	-375.96	1007.28	5727432.19	597287.25
2679	28.56	119.31	2341.92	-2308.49	-376.20	1007.70	5727431.96	597287.67
2680	28.57	119.30	2342.80	-2309.37	-376.43	1008.11	5727431.72	597288.09
2681	28.58	119.28	2343.68	-2310.25	-376.66	1008.53	5727431.49	597288.50
2682	28.58	119.27	2344.55	-2311.12	-376.90	1008.95	5727431.25	597288.92
2683	28.59	119.26	2345.43	-2312.00	-377.13	1009.37	5727431.02	597289.34
2684	28.60	119.25	2346.31	-2312.88	-377.37	1009.78	5727430.78	597289.76

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2685	28.61	119.24	2347.19	-2313.76	-377.60	1010.20	5727430.55	597290.17
2686	28.61	119.23	2348.07	-2314.64	-377.83	1010.62	5727430.32	597290.59
2687	28.62	119.21	2348.94	-2315.51	-378.07	1011.04	5727430.08	597291.01
2688	28.63	119.20	2349.82	-2316.39	-378.30	1011.45	5727429.85	597291.43
2689	28.63	119.19	2350.70	-2317.27	-378.54	1011.87	5727429.61	597291.85
2690	28.64	119.18	2351.58	-2318.15	-378.77	1012.29	5727429.38	597292.26
2691	28.65	119.17	2352.45	-2319.02	-379.00	1012.71	5727429.15	597292.68
2692	28.66	119.15	2353.33	-2319.90	-379.24	1013.13	5727428.91	597293.10
2693	28.66	119.14	2354.21	-2320.78	-379.47	1013.55	5727428.68	597293.52
2694	28.67	119.13	2355.09	-2321.66	-379.70	1013.97	5727428.45	597293.94
2695	28.68	119.12	2355.96	-2322.53	-379.94	1014.38	5727428.21	597294.36
2696	28.68	119.11	2356.84	-2323.41	-380.17	1014.80	5727427.98	597294.78
2697	28.69	119.10	2357.72	-2324.29	-380.40	1015.22	5727427.75	597295.20
2698	28.70	119.09	2358.60	-2325.17	-380.64	1015.64	5727427.51	597295.62
2699	28.70	119.08	2359.47	-2326.04	-380.87	1016.06	5727427.28	597296.04
2700	28.71	119.06	2360.35	-2326.92	-381.11	1016.48	5727427.04	597296.46
2701	28.72	119.05	2361.23	-2327.80	-381.34	1016.90	5727426.81	597296.88
2702	28.72	119.04	2362.10	-2328.67	-381.57	1017.32	5727426.58	597297.30
2703	28.73	119.03	2362.98	-2329.55	-381.81	1017.74	5727426.34	597297.72
2704	28.74	119.02	2363.86	-2330.43	-382.04	1018.16	5727426.11	597298.14
2705	28.75	119.01	2364.74	-2331.30	-382.27	1018.58	5727425.88	597298.56
2706	28.75	119.00	2365.61	-2332.18	-382.50	1019.00	5727425.65	597298.98
2707	28.76	118.98	2366.49	-2333.06	-382.74	1019.43	5727425.41	597299.40
2708	28.77	118.97	2367.36	-2333.93	-382.97	1019.85	5727425.18	597299.82
2709	28.77	118.96	2368.24	-2334.81	-383.21	1020.27	5727424.95	597300.24
2710	28.78	118.95	2369.12	-2335.69	-383.44	1020.69	5727424.71	597300.66

APPENDIX 2a

WEST KINGFISH W18A
Petrophysics Evaluation Summary

Esso Australia Pty Ltd.
Exploration Department

West Kingfish W18A
Petrophysics Report

Petrophysicist: K.Kuttan
August 2006

West Kingfish W18A Petrophysical Analysis

West Kingfish W-18A was a directional well designed to capture M1.3 Upper and M1.3 Lower reserves unable to be accessed adequately by West Kingfish W15 well in the eastern part of the Kingfish field. West Kingfish W-18A was drilled from the abandoned West Kingfish W18 wellbore. The well was kicked off at 651m MDRT, and a 8.5 inch borehole was drilled from 651mMD to a total depth of 2710.0 mMDRT. The well was logged with Precision Energy Services's compact shuttle system. After completing the logging operations the well was completed with 7" production casing and 2 $\frac{7}{8}$ " tubing.

The Precision Energy Services Shuttle logs have been analysed for porosity, water saturation and net pay over the interval 2604-2675mMD.

Note that all depth 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)
Compact Gamma Ray - Compact Dual Neutron - Compact Photodensity - Compact Sonic - Compact Dual Laterolog- Compact Induction	1	Precision Energy Services	651	2707

Deviation

The well angle over the West Kingfish reservoirs was 28 degrees.

Mud Data

Mud Type : KCl/Glycol/PHPA
Mud Weight: 10.0 ppg
Rm: 0.12 @ 25 °C
Rmf: 0.104 @ 25 °C
Rmc: 0.174 @ 25 °C
BHT: 90.2 °C

Hole Size

651- 2710 mMDRT 8.5 inches

Data Acquisition & Log Quality

Except for the deep laterolog (DDL) all the logs were of acceptable quality. The problem with deep laterolog is related to the position of the active and passive bridges. The logging engineer inadvertently had placed the active and passive bridges in the wrong order resulting in the erroneous DDL data. However, the incorrect arrangement of the bridges did not affect the shallow laterolog or the induction measurements. It was not possible to rectify the incorrect DDL data and the error was only realised well after the logging operations had been completed.

Data Processing

Because of the shaly and thinly bedded nature of the upper West Kingfish reservoirs (PS6- M1.4U) a combination of unfiltered and filtered logs (both provided by Precision) as shown below were used in the interpretation. However, the unfiltered density log (DEN) was considered to be too "noisy" to be used in the interpretation. Hence a 3 point-equal-weighting filter was used to filter this log. Since the deep laterolog was

erroneous a combination of the shallow laterolog (DSL) and deep induction (RILD) was used as the final deep resistivity. The logic for generating the deep resistivity is as follows:

$R_{DEEP} = \text{if } ((DSL < RILD), RILD, DSL)$.

The new deep resistivity (R_{DEEP}), DSL, the filtered DEN and associated curves (photoelectric –PDPE, density correction-DCOR, calliper –CLDC), were depth matched to the gamma ray (GRGC) which had been depth matched and merged with the LWD gamma ray (GRM1). The neutron porosity log (NPRL) was depth matched to the filtered and GR-depth-matched DEN. Similarly, the compressional sonic log (DT35) was depth matched to the DEN.

No environmental corrections other than those applied in the field were applied to the final logs.

Logs	Status
GRGC	filtered
R_{DEEP}	Unfiltered
DSL	Unfiltered
DEN	3 point, equal weighting
NPRL	Unfiltered
PDPE	Unfiltered
DT35	Filtered

INTERPRETATION

Logs Used

The primary logs used in the interpretation were R_{DEEP} (deep resistivity), GRGC (compact gamma ray), DEN (bulk density), NPRL (thermal neutron porosity in LPU), DT35 (compressional sonic) and U (photoelectric effect). U was generated from the photoelectric curve PDPE using the following relationship:

$$U = (PDPE - 0.2) * ((DEN + 0.1883) / 1.0704).$$

In addition coal intervals were identified using a coal flag (Flag_coal). A temperature log was created using the following data:

Depth	Temperature (deg. C)
92.2	10
2691	100.2

The temperature at depth 92.2 mMD represents the temperature of the sea-bed and the temperature at 2691m mDRT (first reading of the Precision logs) is the estimated formation temperature –BHT +10 deg.

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 50,000 ppm NaCl equivalent. This salinity was used as the formation water salinity for all the sands.

Hydrocarbon Type Identification

In West Kingfish the only hydrocarbons to be found is oil

Shale Volume, Porosity and Water Saturation

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

ELAN+ MODEL

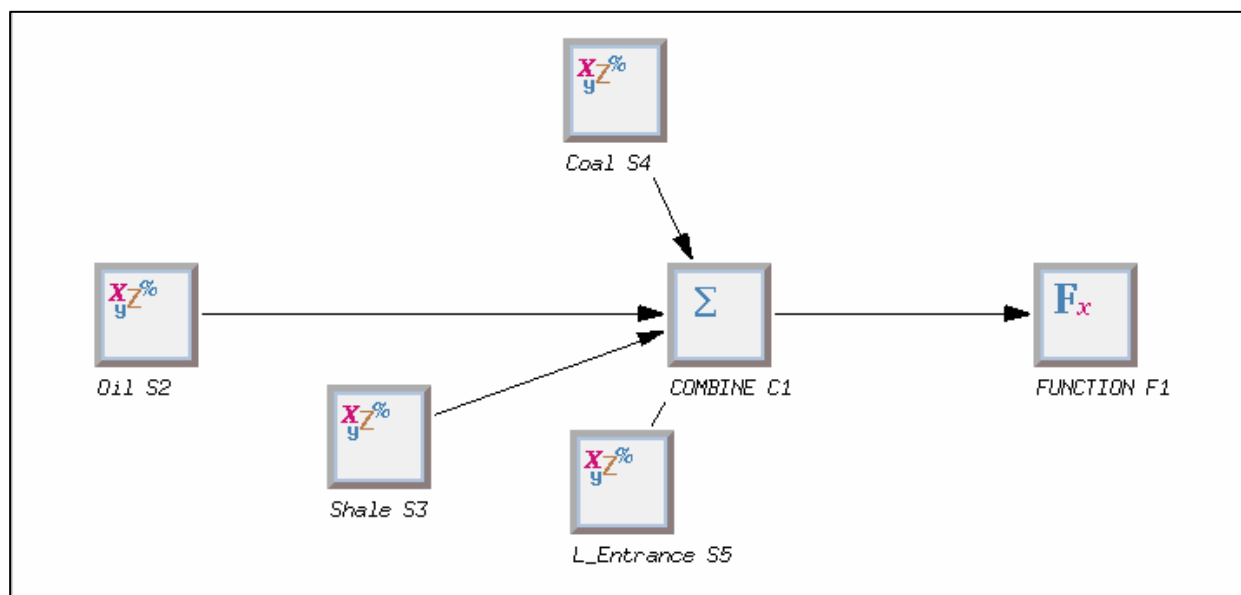


Figure 1: Elan + Model and Module Configuration

ELAN Input Channels

Log Curve Selector	Selector Options	
	Compound Name Spec	WEST KINGFISH W18A
TEMP_CH	TEMP;*	TEMP TEMP TEMP@ElanInput;4 [A1702236]
RHOB_IFAC_CH	IFRH;*	
NPHI_IFAC_CH	INPH;*	
RHOB_CH	DEN:BPB;*	DEN DEN DEN@ElanInput;8 [A1702217]
NPHI_CH	NPRL:BPB;*	NPRL NPRL NPRL@ElanInput;9 [A1702195]
DT_CH	DT35:BPB;*	DT35 DT35 DT35@ElanInput;7 [A1702207]
U_CH	U;*	U U U@ElanInput;2 [A1702227]
CUDC_CH/RT_CH	RDEEP;*	RDEEP RDEEP RDEEP@ElanInput;8 [A1702223]
GR_CH	GRGC:BPB;*	GRGC GRGC GRGC@ElanInput;8 [A1702230]
PRB2_CH	DEPT:BPB;*	
PRB3_CH	PRB3;*	
PRB4_CH	FLAG_COAL;*	FLAG_COAL FLAG_COAL FLAG_COAL@ElanInp
PRB5_CH	PRB5;*	
M_CH	MXP;*	

ELAN Global Parameters

Reference Index	MD
Processing Interval	2590.0000(m) To 2675.0000(m)
Sampling Rate	0.3281(m)
Uncertainty Channel	FALSE
Clay Input	DRY
Special Fluids	IMMOVABLE_HYDROCARBON

ELAN Zone Definition

Name	Bottom To Top
No GR	2634.0000(m) To 2590.0000(m)
Nl_useGR	2691.0000(m) To 2634.0000(m)

ELAN Process Definition

Process SOLVE2 "Oil"

Equations	RHOB	NPFI	DT	U	CUDC_DWA	GR	CT2	
Volumes	QUAR	ORTH	PYRI	ILLI	XWAT	UWAT	XOIL	UOIL

User Constraints constraint(maxDolomite, DOLO<0)

Constraint Zones Bottom Top

UNDEFINED 2691.0000(m) 2590.0000(m)

Constraints Applied

- UNDEFINED - IrreducibleXWater
- UNDEFINED - IrreducibleUWater
- UNDEFINED - WaterBaseMud_SXO_gt_SW

Process SOLVE3 "Shale"

Equations	RHOB	NPFI	CUDC_DWA	
Volumes	QUAR	ILLI	XWAT	UWAT

Constraint Zones Bottom Top

UNDEFINED 2691.0000(m) 2590.0000(m)

Process SOLVE4 "Coal"

Equations	RHOB
Volumes	COAL

Constraint Zones Bottom Top

UNDEFINED 2691.0000(m) 2590.0000(m)

Process SOLVE5 "L_Entrance"
Equations RHOB
Volumes ILLI

Constraint Zones Bottom Top
UNDEFINED 2691.0000(m) 2590.0000(m)

Process COMBINE 1 "COMBINE"

Order SOL.2 SOL.3 SOL.4 SOL.5

Combine Method

"L Entrance " 2580.0-2592.5(m) Sol.5
"Coarse Clast" 2592.5-2691.0(m) Internal Average

Probability Functions

probability(SOL.4, PRB4_CH)
prob3 = linear(ILLI_VOL.SOL.3, 0.3, 0, 0.5, 1)
probability(SOL.3, prob3)

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))
output(SWT, swt_cmp)

ELAN Different Parameters

Parameters		Nl_useGR	No GR		
n*****		*****	*****	*****	*****
CXDC_XWAT	(mS/m)	18.736	18.391		
CXDC_XBWA	(mS/m)	10.707	10.511		
CUDC_UWAT	(mS/m)	20.000	19.687		
CUDC_UBWA	(mS/m)	9.233	15.000		
CUDC_UNC_ZP	(mS/m)	0.067	0.067		
GR_UNC_WM	()	0.300	0.000		

RESULTS AND DISCUSSION (WEST KINGFISH W18A)

A summary of the petrophysical analysis is detailed in Table 1 and illustrated in Fig.2. In general the interpretation suggests the relatively better quality oil reservoirs appear to be swept. Oil appears to be “hanging-up” below thin siltstone interval and at the top of the thicker sand packages. In the upper West Kingfish reservoirs (PS6-PS2 sands) oil is present in thinly bedded interval although the quantitative interpretation suggests otherwise.

Interval 2604.7-2607.9 (PS6.1Oil)

The reservoir in this interval is probably thinly bedded and shaly and hence the poor resistivity and nuclear tool resolution. It is also possible the tool responses are being affected by other “conductive” minerals such as pyrite and glauconite. Given these uncertainties the calculated effective water saturation values are probably pessimistic. There is a high probability that this zone is oil bearing and therefore should be perforated at some future date when zones below have been depleted.

Interval 2608.2-2611.6 (PS5.1Oil)

The reservoirs in this interval are very similar to the PS6.1 and highly likely to be thinly bedded. Like the PS6.1 reservoirs, the calculated effective water saturations are pessimistic. They are most likely to be oil bearing and should be perforated.

Intervals 2612.2--2616.6(PS4.1Water? & PS4.2Oil)

The resistivity and density-neutron character of the uppermost part (2612.2-2612.6m) suggest that this zone could be water bearing as indicated by the increasing water saturation with increasing porosity. If it were water bearing then the calculated water saturation represents a relatively high residual oil saturation (average ROS of 38%). It is probable that the bottom part of the interval 2614.7-2616.6m is oil bearing, the oil being held up by poorer reservoir properties. This interval is worth considering as a potential perforation candidate.

Interval 2620-2622.3m (PS4.4Oil)

This reservoir in this interval is interpreted to be oil bearing. Although the calculated effective water saturation is indicative of oil, the porosity is low and it is not certain how productive this zone would be.

Interval 2623.5-2624.3m(PS3.0Oil)

On the basis of petrophysical analysis this zone could be easily discounted as an oil zone. However, oil production in the same zone in nearby down-dip wells would suggest that this zone should be oil productive. It is possible that the lack of resistivity response, could be due to the inability of the resistivity tools to resolve the bed. It is a zone that is definitely worth perforating.

Interval 2626.5-2629.5m(PS2.1Water)

This zone is definitely water bearing given the relatively good porosity and high effective water saturation.

Interval 2629.8-2631.3m(PS2.2Oil)

The calculated effective water saturation suggests that this zone is most likely to be oil bearing although it underlies a zone (PS2.2) that is clearly water bearing. It is postulated that this is oil lagging behind, with the vertical migration being hindered by the thin siltstone in the interval 2629.5-2629.8m.

Interval 2632.0-2632.9m(M1.4U.1Oil)

This is a thin sand that sits between two much thicker sands above and below it. Given the low water saturation is highly likely that it is oil bearing.

Interval 2634.4-2641.6m(M1.4U.2-M1.4U.4)

The interval 2634.4-2635.8m is probably oil bearing whereas the interval 2635.8-2639.6m is water bearing as indicated by the high water saturation. An OWC could be interpreted at 2635.8m. The interpretation suggests the lowermost part of the zone in the interval 2640.5-2641.6m is probably oil bearing. The thin siltstone from 2639.8-2640.5m could be preventing the oil from migrating up the sand. It is a zone worth perforating.

Interval 2644.3-2646.3m (M1.4L.1)

The uppermost part of this sand is interpreted to be oil bearing with an OWC at 2645.3m

Interval 2649.3-2675.0(M1.4L.2Oil-M1.5Water-M1.7Water)

The interpretation clearly indicates that the M1.4L.2 is oil bearing down to at least 2652.2m (interpreted OWC). This zone was perforated over the interval 2649.0-2651.0m and initially flowed 312 klo/d in May 2006. This zone has produced over 50K bbls of oil to date. Currently it is producing at 18 klo/d, 95% water cut.

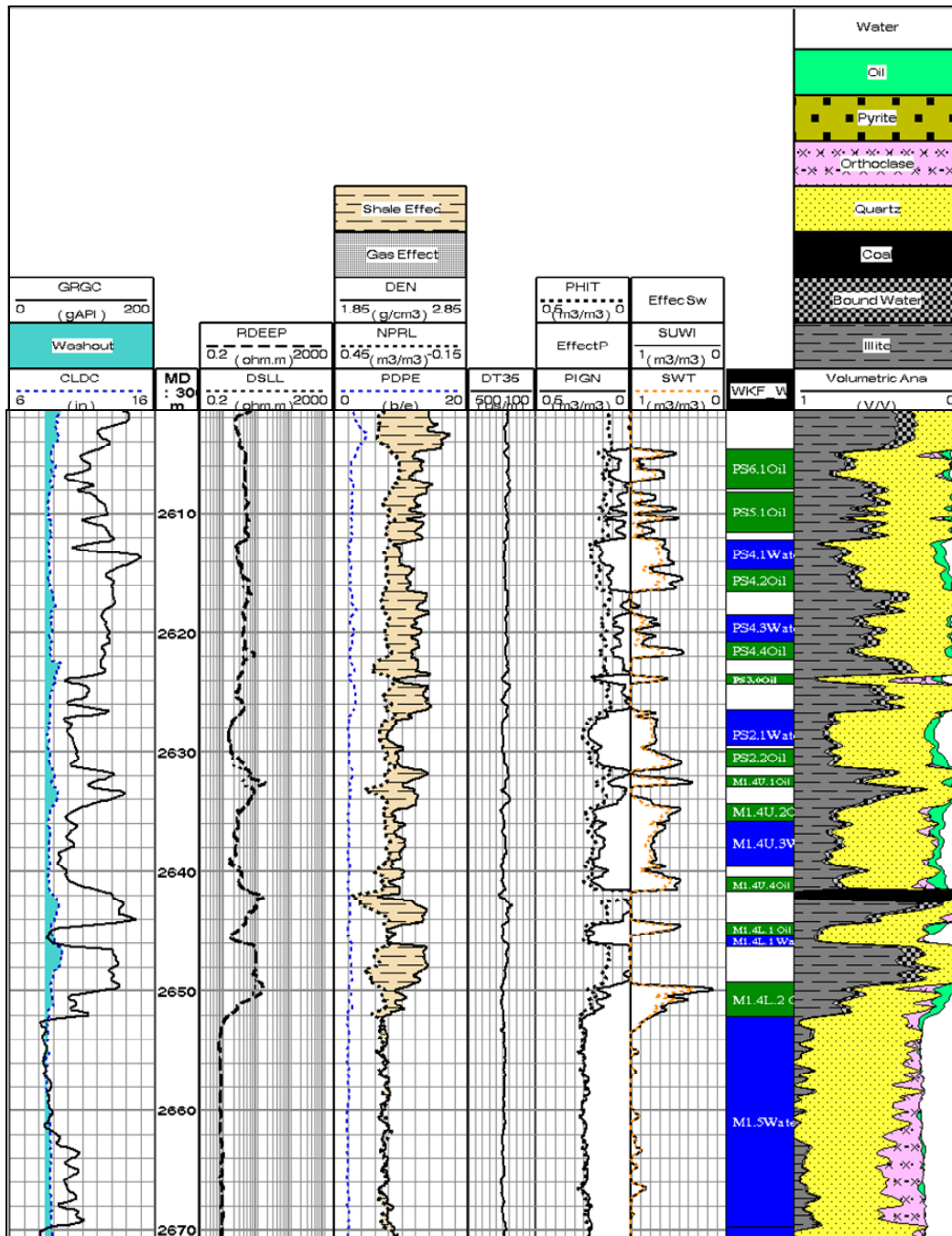


Fig. 2 West Kingfish W18A Interval 2604.7- 2675 mMD

West Kingfish W18A

Petrophysical Summary 2604 - 2675m MD

Depth Reference:

Mean VCL, Mean PHIE (or PIGN), Mean SWE (or SUWI) is based on a PHIE or PIGN cutoff:

Primary: mDKB

0.10 for oil & water between 2604.65 - 2632.92mMD

0.12 for oil & water between 2632.92 - 2675.0mMD

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
PS6.1Oil	2604.7	2243.2	2607.9	2246.1	3.3	2.9	0.31	0.28	0.113	0.62	Probably oil bearing	1.0	0.9
PS5.1Oil	2608.2	2246.3	2611.6	2249.3	3.4	3.0	0.12	0.36	0.112	0.54	Probably oil bearing	0.4	0.4
PS4.1Water?	2612.2	2249.8	2614.7	2252.0	2.5	2.2	0.92	0.29	0.156	0.62	Possibly water bearing, residual oil		
PS4.2Oil	2614.7	2252.0	2616.6	2253.7	1.9	1.7	0.83	0.40	0.112	0.56	Probably oil bearing	1.6	1.4
PS4.3Water	2618.5	2255.3	2620.8	2257.3	2.3	2.0	0.00						
PS4.4Oil	2620.8	2257.3	2622.3	2258.7	1.5	1.3	0.13	0.38	0.102	0.49	Oil bearing	0.2	0.2
PS3.0Oil	2623.5	2259.7	2624.3	2260.4	0.8	0.7	0.76	0.21	0.152	0.71	Oil bearing	0.6	0.5
PS2.1Water	2626.5	2262.4	2629.5	2265.0	3.0	2.6	0.97	0.24	0.186	0.76	Water bearing, residual oil		
PS2.2Oil	2629.8	2265.2	2631.3	2266.6	1.5	1.3	1.00	0.25	0.171	0.61	Oil bearing	1.5	1.3
M1.4U.1Oil	2632.0	2267.2	2632.9	2268.0	0.9	0.8	0.43	0.44	0.112	0.43	Oil bearing	0.4	0.4
M1.4U.2Oil	2634.4	2269.3	2635.8	2270.5	1.4	1.2	0.86	0.28	0.184	0.56	Oil bearing	1.2	1.1
M1.4U.3Water	2635.8	2270.5	2639.6	2273.9	3.8	3.3	1.00	0.27	0.166	0.73	Water bearing, residual oil		
M1.4U.4Oil	2640.5	2274.7	2641.6	2275.7	1.2	1.0	0.85	0.30	0.181	0.51	Oil bearing	1.0	0.9
M1.4L.1 Oil	2644.3	2278.0	2645.3	2278.9	1.1	0.9	1.00	0.21	0.195	0.63	Oil bearing	1.1	0.9
M1.4L.1 Water	2645.3	2278.9	2646.3	2279.7	0.9	0.8	0.83	0.18	0.206	1.01	Water bearing, residual oil		
M1.4L.2 Oil	2649.3	2282.4	2652.2	2284.9	2.9	2.6	0.82	0.33	0.171	0.53	Oil bearing	2.4	2.1
M1.5Water	2652.2	2284.9	2669.8	2300.4	17.6	15.5	1.00	0.07	0.238	0.97	Water bearing		
M1.7Water	2669.8	2300.4	2675.0	2305.0	5.2	4.6	1.00	0.03	0.218	1.00	Water bearing		

Table 1



ExxonMobil

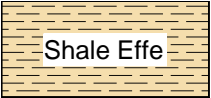
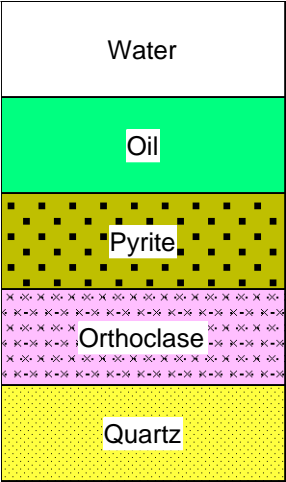
WEST KINGFISH W18A

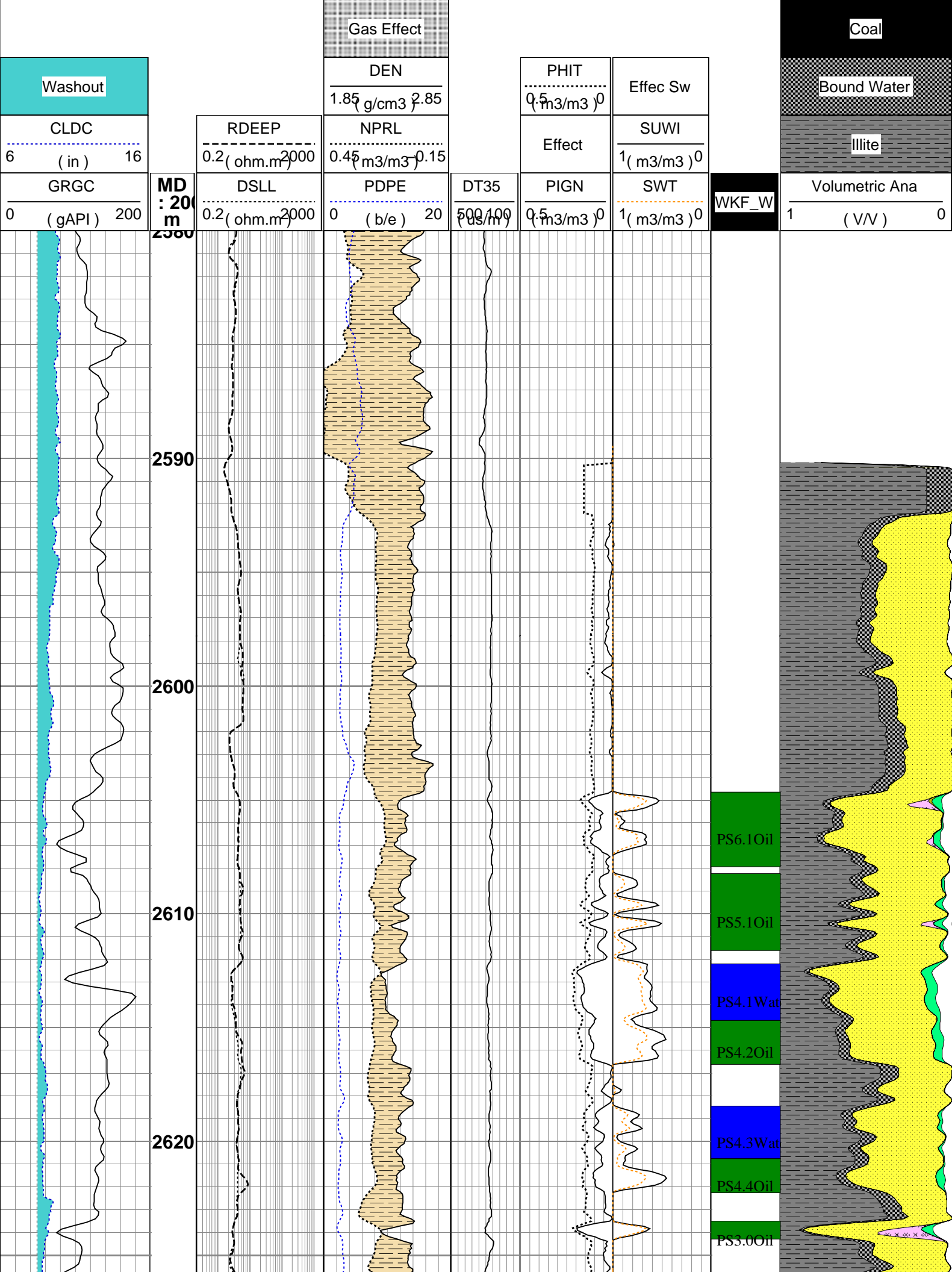
Petrophysical Analysis

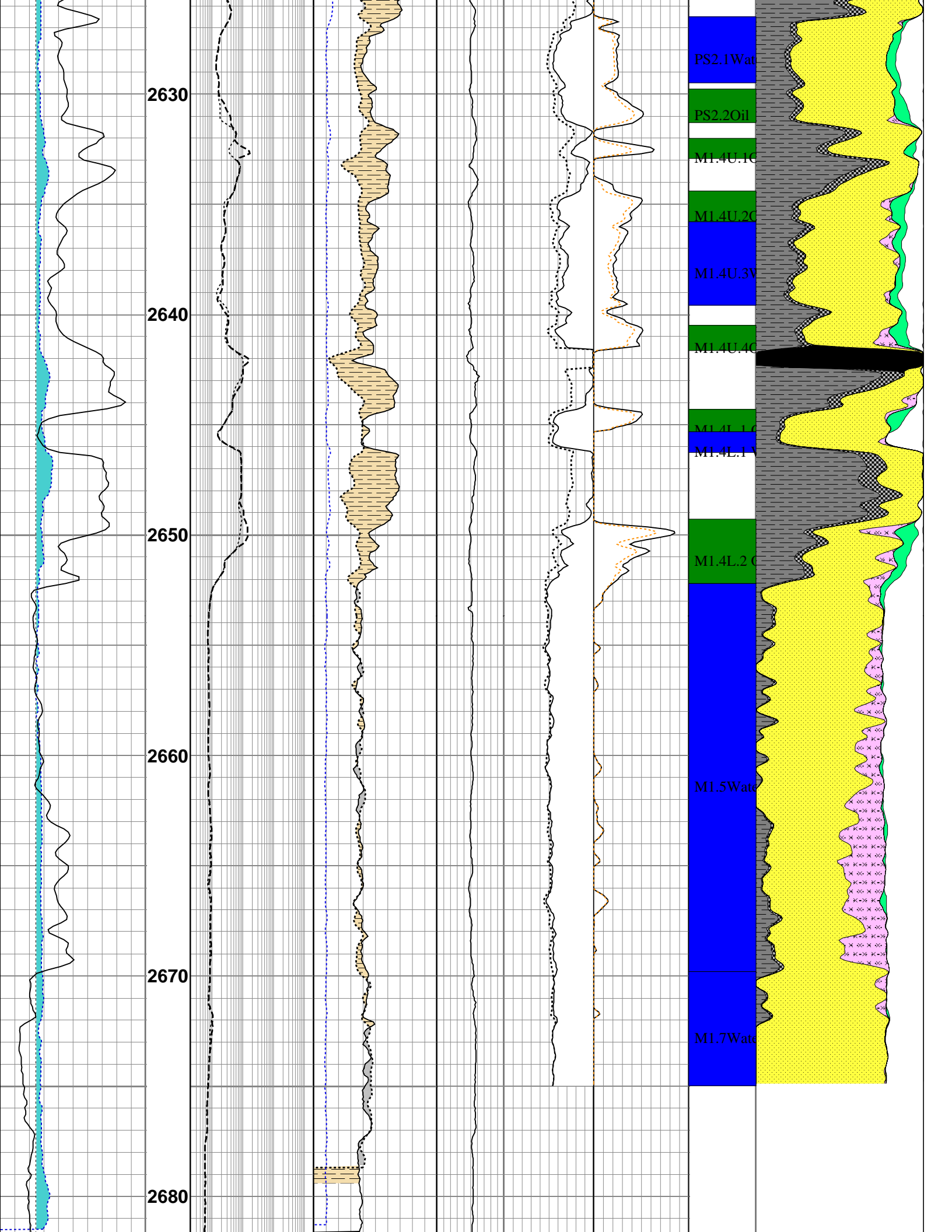
COMPANY: Esso Australia Pty. Ltd.
WELL: WEST KINGFISH W18A
BOREHOLE:
FIELD: WEST KINGFISH
STATE: VICTORIA
COUNTRY: AUSTRALIA

PETROPHYSICIST: KUMAR KUTTAN

Date Logged: 30-Apr-06 Date of Analysis: Sept 2006
Well Location: <FL>
Elevations: K.B. 33.43 m D.F. 76.13 m
Latitude: <LATI> G.L. 76.13 m
Longitude: <LONG>







[illegible]

APPENDIX 3a

WEST KINGFISH W18A
Lithology/Show Descriptions

West Kingfish W18A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
<p>Previous Well History:</p> <p>SLOT 18: WKF W18 drilled in November 1983. 13.5" hole to 651.0 mMDRT/624.0 mTVDRT. 10.75" surface casing at 651.0 mMDRT/624.0 mTVDRT. 9.875" hole to 2573.0 mMDRT/2396.0 mTVDRT, inclination at TD 13 degrees. 7.625" Production liner at 2573.0 mMDRT/2396.0 mTVDRT, cut and pulled above 721.0 mMDRT. After setting a 100 metre cement plug above 721.0 mMDRT, WKF W18 was Plugged and Abandoned in December 2005.</p> <p>Geologist on rig at 1545 hrs, 22 April 2006 at 615.0 mMDRT.</p> <p>Start RIH at 1630 hrs, 23 April 2006. Tagged TOC and drilled soft cement at 0000 hrs 24 April 2006 at 615.0 mMDRT and firm cement at 0025 hrs 24 April 2006 at 625.0 mMDRT. Drilled cement to the shoe at 651.0 mMDRT at 0230 hrs 24 April 2006 and casing clean.</p> <p>Kick-off West Kingfish W18A with a Smith S73PX PDC bit on steerable motor assembly at 651.0 mMDRT at 0330 hrs, 24 April 2006.</p> <p>Samples from 651.0 showed an increasing percentage of new formation (Gippsland Limestone Calcilutite). At 668.0 mMDRT when 85% new formation was seen in the samples, stopped drilling for a PIT.</p> <p>Perform PIT at 651.0 mMDRT (625.7 mTVDRT)/ 528 psi/ 13.6 ppg EMW using 8.8 ppg mud, at 0800 hrs, 24 April 2006.</p> <p>Drill ahead from 668.0 mMDRT to TD of 2710.0 mMDRT with a KCl/Glycol/PHPA mud system.</p> <p>Bit Details: BHA # 1, Bit # 1. Size: 8.5", Manufacturer / Type: Smith S73PX, Serial #: JT6967R3. Jets: 20 x 6, TFA: 1.841 sq.in, Grading: 0-0-NO-A-X-1-NO-TD. Krevs: 998.0, Top Drive RPM: 50-108 (+ 174 DHM RPM). Depth In: 651.0 mMDRT. Depth Out: 2710.0 mMDRT. Metres drilled: 2059.0 m, HOB: 57.00. Average ROP: 36.12 m/hr. Rotating: 1815.0 metres / Rotating HOB = 39.00, Average Rotating ROP = 46.54 m/hr. Steering: 244.0 metres / Steering HOB = 18.00 , Average Steering ROP = 13.56 m/hr.</p> <p>30 metre spot samples from 651.0 to 2430.0 mMDRT.</p>			
652	654		100% firm hard cement.
654	656		100% firm hard cement.
		Trace	CALCILUTITE: Trace, light grey to medium light grey, very calcareous, soft to firm.
656	658		99% firm hard cement.
		1	CALCILUTITE: 1%, light grey to medium light grey, very calcareous, soft to firm.

West Kingfish W18A Lithology / Show Descriptions

Interval (m)		%	Lithology / Show Description
From	To		
658	660		85% firm hard cement.
		15	CALCILUTITE: Trace, light grey to medium light grey, occasionally very light grey, silty in part grading to CALCISILTITE, soft to firm, sub blocky.
660	662		75% firm hard cement.
		25	CALCILUTITE: as above.
662	664		50% firm hard cement.
		50	CALCILUTITE: as above.
664	666		25% firm hard cement.
		75	CALCILUTITE: as above.
666	668		15% firm hard cement.
		85	CALCILUTITE: as above.
668	690	100	CALCILUTITE: light grey to medium light grey, occasionally very light grey, silty in part grading to CALCISILTITE, trace fossil fragments, trace lithics, trace carbonaceous material, soft to firm, sub blocky. Trace to 1% of firm hard cement.
690	720	100	CALCILUTITE: light grey to medium light grey, occasionally very light grey, silty in part grading to CALCISILTITE, trace fossil fragments, trace lithics, trace carbonaceous material, soft to firm, sub blocky.
720	750	100	CALCILUTITE: light grey to light greenish grey, silty in part grading to minor CALCISILTITE, trace fossil fragments, trace lithics, trace carbonaceous material, soft to firm, sticky, amorphous to sub blocky.
750	780	100	CALCILUTITE: as above, minor CALCISILTITE.
780	810	100	CALCILUTITE: pale olive to light greenish grey, silty in part grading to minor CALCISILTITE, trace glauconite, trace fossil fragments, trace lithics, trace carbonaceous material, soft to firm, sticky, amorphous to sub blocky.
810	840	100	CALCILUTITE: light grey to light greenish grey, silty in part grading to minor CALCISILTITE, trace fossil fragments, trace carbonaceous material, soft to firm, sticky, amorphous to sub blocky.
840	870	100	CALCILUTITE: as above.
870	900	100	CALCILUTITE: light grey to light greenish grey, silty in part grading to minor CALCISILTITE, trace lithics, trace fossil fragments, trace carbonaceous material, soft to firm, sticky, dispersive, amorphous to sub blocky.
900	930	100	CALCILUTITE: as above.
930	960	100	CALCILUTITE: as above.
960	990	90	CALCILUTITE: light grey to light greenish grey, silty in part grading to minor CALCISILTITE, trace lithics, trace fossil fragments, trace carbonaceous material, soft to firm, sticky, dispersive, amorphous to sub blocky.
		10	CALCISILTITE: light brownish grey to light olive grey, argillaceous in part grading to CALCILUTITE, trace fossil fragments, firm to moderately hard, occasionally soft, dispersive, amorphous to sub blocky.
990	1020	80	CALCILUTITE: light olive grey to light brownish grey, silty in part grading to minor CALCISILTITE, trace lithics, trace fossil fragments, trace carbonaceous material, soft to firm, dispersive, amorphous to sub blocky.
		20	CALCISILTITE: as above.
1020	1050	60	CALCILUTITE: as above.
		40	CALCISILTITE: as above.
1050	1080	20	CALCILUTITE: as above.
		80	CALCISILTITE: as above.
1080	1110	90	CALCILUTITE: as above.

West Kingfish W18A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
1110	1140	10	CALCISILTITE: light brownish grey to light olive grey, argillaceous in part grading to CALCILUTITE, trace fossil fragments, firm to moderately hard, occasionally soft, dispersive, amorphous to sub blocky.
		10	CALCILUTITE: light olive grey to light brownish grey, silty in part grading to minor CALCISILTITE, trace lithics, trace fossil fragments, trace carbonaceous material, soft to firm, dispersive, amorphous to sub blocky.
		90	CALCISILTITE: light brownish grey to light olive grey, argillaceous in part grading to CALCILUTITE, trace fossil fragments, firm to moderately hard, occasionally soft, dispersive, amorphous to sub blocky.
1140	1170	100	CALCISILTITE: as above.
1170	1200	100	CALCISILTITE: light brownish grey to light olive grey, argillaceous in part grading to CALCILUTITE, trace fossil fragments, trace carbonaceous material, firm to occasionally soft, sub blocky.
1200	1230	100	CALCISILTITE: light brownish grey to light olive grey, argillaceous in part grading to CALCILUTITE, trace fossil fragments, trace carbonaceous material, firm to occasionally soft, sub blocky.
1230	1260	100	CALCISILTITE: light brownish grey to light olive grey, argillaceous in part, trace fossil fragments, trace disseminated pyrite, trace carbonaceous material, firm to moderately hard, sub blocky.
1260	1290	100	CALCISILTITE: light brownish grey to light olive grey, argillaceous in part, trace fossil fragments, trace disseminated pyrite, trace carbonaceous material, trace lithics, firm to moderately hard, sub blocky.
1290	1320	100	CALCISILTITE: as above, trace glauconite.
1320	1350	100	CALCISILTITE: as above, trace disseminated pyrite.
1350	1380	100	CALCISILTITE: as above.
1380	1410	100	CALCISILTITE: as above.
1410	1440	100	CALCISILTITE: light brownish grey to pale brown, minor light olive grey, argillaceous in part, trace fossil fragments, trace disseminated pyrite, trace carbonaceous material, firm to moderately hard, sub blocky.
1440	1470	100	CALCISILTITE: as above.
1470	1500	100	CALCISILTITE: light brownish grey to pale brown, minor light olive grey, argillaceous in part, trace fossil fragments, trace disseminated pyrite, trace carbonaceous material, firm to moderately hard, sub blocky.
1500	1530	100	CALCISILTITE: as above.
1530	1560	100	CALCISILTITE: as above.
1560	1590	100	CALCISILTITE: light brownish grey to pale brown, argillaceous in part, trace fossil fragments, trace disseminated pyrite, trace carbonaceous material, firm to moderately hard, sub blocky.
1590	1620	100	CALCISILTITE: as above.
1620	1650	100	CALCISILTITE: as above, trace glauconite.
1650	1680	100	CALCISILTITE: as above.
1680	1710	100	CALCISILTITE: light olive grey to light brownish grey, argillaceous in part grading to CALCILUTITE, trace fossil fragments, trace disseminated pyrite, trace carbonaceous material, trace lithics, firm to moderately hard, sub blocky.
1710	1740	100	CALCISILTITE: as above.
1740	1770	100	CALCISILTITE: as above.
1770	1800	100	CALCISILTITE: as above.

West Kingfish W18A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
1800	1830	100	CALCILUTITE: light olive grey to light brownish grey, yellowish grey, rare greenish grey, silty in part grading to CALCISILTITE, trace fossil fragments, trace disseminated pyrite, trace carbonaceous material, trace lithics, firm to moderately hard, sub blocky.
1830	1860	100	CALCILUTITE: as above.
1860	1890	100	CALCILUTITE: light olive grey to light brownish grey, yellowish grey, rare greenish grey, silty in part grading to CALCISILTITE, trace fossil fragments, trace disseminated pyrite, trace lithics, firm to moderately hard, sub blocky.
1890	1920	100	CALCILUTITE: medium light grey to medium grey, rare light brownish grey, silty in part grading to CALCISILTITE, trace fossil fragments, trace disseminated pyrite, soft to firm occasionally moderately hard, sub blocky to minor amorphous.
1920	1950	100	CALCILUTITE: as above.
1950	1980	100	CALCILUTITE: as above, trace minor greenish grey, trace glauconite.
1980	2010	100	CALCILUTITE: medium light grey to medium grey, rare light brownish grey, silty in part grading to CALCISILTITE, trace fossil fragments, trace disseminated pyrite, soft to firm occasionally moderately hard, sub blocky to minor amorphous.
2010	2040	100	CALCILUTITE: as above.
2040	2070	100	CALCILUTITE: as above.
2070	2100	100	CALCILUTITE: medium light grey to medium grey, rare light brownish grey, silty in part grading to CALCISILTITE, trace fossil fragments, soft to firm occasionally moderately hard, sub blocky.
2100	2130	100	CALCILUTITE: medium light grey to occasionally medium grey, rare light brownish grey, occasionally silty, trace fossil fragments, trace disseminated pyrite, soft to firm occasionally moderately hard, sub blocky, rare amorphous.
2130	2160	100	CALCILUTITE: as above.
2160	2190	100	CALCILUTITE: light olive grey to light brownish grey, occasionally medium grey, silty grading to CALCISILTITE, trace fossil fragments, trace disseminated pyrite, soft to firm occasionally moderately hard, sub blocky, rare amorphous.
2190	2220	100	CALCILUTITE: as above.
			Top of Lakes Entrance at 2226.0 mMDRT (1955.7 mTVDRT / -1922.3 mTVDSS)
2220	2250	70	CALCILUTITE: light olive grey to light brownish grey, occasionally medium grey, silty grading to CALCISILTITE, trace fossil fragments, trace disseminated pyrite, soft to firm occasionally moderately hard, sub blocky, rare amorphous.
		30	CALCAREOUS CLAYSTONE: medium light grey to medium grey, light brownish grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky.
2250	2280	100	CALCAREOUS CLAYSTONE: medium grey to medium dark grey, light brownish grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky.
2280	2310	100	CALCAREOUS CLAYSTONE: as above.
2310	2340	100	CALCAREOUS CLAYSTONE: medium grey to medium dark grey, light brownish grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky.
2340	2370	100	CALCAREOUS CLAYSTONE: as above.
2370	2400	100	CALCAREOUS CLAYSTONE: as above.
			Bagged 10 metre samples from 2430.0 to 2570.0 mMDRT.
2400	2430	100	CALCAREOUS CLAYSTONE: medium grey to medium dark grey, light brownish grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky.
2430	2440	100	CALCAREOUS CLAYSTONE: as above.

West Kingfish W18A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2440	2450	100	CALCAREOUS CLAYSTONE: as above.
2450	2460	100	CALCAREOUS CLAYSTONE: light brownish grey, medium grey to medium dark grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky.
2460	2470	100	CALCAREOUS CLAYSTONE: as above.
2470	2480	100	CALCAREOUS CLAYSTONE: as above.
2480	2490	100	CALCAREOUS CLAYSTONE: light brownish grey, minor medium grey to medium dark grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky.
2490	2500	100	CALCAREOUS CLAYSTONE: as above.
2500	2510	100	CALCAREOUS CLAYSTONE: as above.
2510	2520	100	CALCAREOUS CLAYSTONE: as above. Add Baracarb to the mud system at 5 ppb at 2528.0 mMDRT (2209.6 mTVDRT/-2176.2 mTVDSS). Baracarb seen in 2540.0 mMDRT cuttings sample.
2520	2530	100	CALCAREOUS CLAYSTONE: light brownish grey, medium grey to medium dark grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, trace pyrite nodules, firm to moderately hard, sub blocky.
2530	2540	100	CALCAREOUS CLAYSTONE: as above.
2540	2550	100	CALCAREOUS CLAYSTONE: light brownish grey, light olive grey, minor medium dark grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky.
2550	2560	100	CALCAREOUS CLAYSTONE: as above.
2560	2570	100	CALCAREOUS CLAYSTONE: as above. Bagged 5 metre samples from 2470.0 to TD. Top of Latrobe at 2574.0 mMDRT (2249.8 mTVDRT / -2216.4 mTVDSS)
2570	2575	95	CALCAREOUS CLAYSTONE: light brownish grey to light olive grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky.
		5	SANDSTONE: white to pale green, dominantly very fine to fine, moderately well sorted, sub angular to sub rounded, common glauconite matrix, common very fine glauconite pellets, hard aggregates, common bit crushed rock flour, tight visible and inferred porosity. No fluorescence.
2575	2580	85	CALCAREOUS CLAYSTONE: light brownish grey to light olive grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky.
		5	SILTSTONE: light brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		10	SANDSTONE: as above. No fluorescence.
2580	2585	55	CALCAREOUS CLAYSTONE: 45%, light brownish grey to light olive grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky. CLAYSTONE: 10%, moderate yellowish brown, non calcareous, soft to firm, amorphous to sub blocky.
		20	SILTSTONE: light brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.

West Kingfish W18A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2585	2590	25	SANDSTONE: as above. No fluorescence.
		50	CALCAREOUS CLAYSTONE: 5%, as above. CLAYSTONE: 45%, as above.
		10	SILTSTONE: as above.
		40	SANDSTONE: white to pale green, medium light grey, dominantly very fine to fine, moderately well sorted, sub angular to sub rounded, common glauconite matrix, common very fine glauconite pellets, moderate micropyrte cement, moderate siliceous cement, common pyrite nodules, hard aggregates, common bit crushed rock flour, tight visible and inferred porosity. No fluorescence.
2590	2595		SBP2-Top Coarse Clastics at 2592.5 mMDRT (2266.0 mTVDRT / -2232.6 mTVDSS)
		55	CALCAREOUS CLAYSTONE: 5%, as above. CLAYSTONE: 50%, as above.
		10	SILTSTONE: as above.
		35	SANDSTONE: white to pale green, dominantly very fine to fine, moderately well sorted, sub angular to sub rounded, common glauconite matrix, common very fine glauconite pellets, hard aggregates, common bit crushed rock flour, tight visible and inferred porosity. No fluorescence.
2595	2600	45	CALCAREOUS CLAYSTONE: Trace, as above. CLAYSTONE: 45%, as above.
		15	SILTSTONE: light brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		40	SANDSTONE: 1: 35%, white to pale green, medium light grey, dominantly very fine to fine, moderately well sorted, sub angular to sub rounded, common glauconite matrix, common very fine glauconite pellets, moderate micropyrte cement, moderate siliceous cement, common pyrite nodules, hard aggregates, common bit crushed rock flour, tight visible and inferred porosity. No fluorescence.
			SANDSTONE: 2: 5%, clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair inferred porosity. No fluorescence.
2600	2605	35	CLAYSTONE: moderate yellowish brown, non calcareous, soft to firm, amorphous to sub blocky.
		20	SILTSTONE: as above.
		45	SANDSTONE: 1: 35%, white to pale green, medium light grey, dominantly very fine to fine, moderately well sorted, sub angular to sub rounded, common glauconite matrix, common very fine glauconite pellets, moderate micropyrte cement, moderate siliceous cement, common pyrite nodules, hard aggregates, common bit crushed rock flour, tight visible and inferred porosity. No fluorescence.
			SANDSTONE: 2: 5%, clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair inferred porosity. No fluorescence.
2605	2610		PSB7 (Top of 1.3U) at 2604.5 mMDRT (2276.5 mTVDRT / -2243.1 mTVDSS)
		20	CLAYSTONE: as above.

West Kingfish W18A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2610	2615	20	SILTSTONE: as above.
		60	SANDSTONE 1: 40%, as above. No fluorescence.
			SANDSTONE: 2: 20%, clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair to good inferred porosity.
			FLUORESCENCE: 2%, dull to moderately bright patchy pale yellowish green fluorescence, moderately fast blooming direct cut, thin dull pale green ring residue.
2615	2620	20	CLAYSTONE: moderate yellowish brown, non calcareous, soft to firm, amorphous to sub blocky.
		15	SILTSTONE: as above.
		65	SANDSTONE 1: 35%, as above. No fluorescence.
			SANDSTONE: 2: 30%, clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, moderate pyrite cement, common pyrite nodules, hard aggregates, occasionally loose, fair inferred and visible porosity.
2620	2625		FLUORESCENCE: 15%, dull to moderately bright, patchy, pale yellowish green fluorescence, moderately fast blooming direct cut, thin dull pale green ring residue.
		10	CLAYSTONE: medium grey to light bluish grey, non calcareous, moderately hard to hard, sub blocky.
		20	SILTSTONE: light brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		70	SANDSTONE 1: 50%, white to pale green, medium light grey, dominantly very fine to fine, moderately well sorted, sub angular to sub rounded, common glauconite matrix, common very fine glauconite pellets, moderate micropyrte cement, moderate siliceous cement, common pyrite nodules, hard aggregates, common bit crushed rock flour, tight visible and inferred porosity. No fluorescence.
2625	2630		SANDSTONE: 2: 20%, clear to translucent, medium to very coarse, poorly sorted, sub angular to sub rounded, moderate pyrite cement, common pyrite nodules, hard aggregates, occasionally loose, poor to fair inferred and visible porosity.
			FLUORESCENCE: 15%, dull to moderately bright, patchy, pale yellowish green fluorescence, moderately fast blooming direct cut, thick pale green ring residue.
			PSB4 (Top of 1.3L) at 2623.5 mMDRT (2293.2 mTVDR / -2259.8 mTVDSS)
		10	CLAYSTONE: as above.
		15	SILTSTONE: as above.
		75	SANDSTONE 1: 60%, as above. No fluorescence.
			SANDSTONE: 2: 15%, clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair to good inferred and visible porosity.
			FLUORESCENCE: Trace to 2%, as above, possible cavings.
		10	CLAYSTONE: as above.
		10	SILTSTONE: as above.

West Kingfish W18A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2630	2635	80	SANDSTONE 1: 40%, as above. No fluorescence. SANDSTONE: 2: 40%, clear to translucent, trace greyish pink, fine to 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. FLUORESCENCE: 15%, moderately bright, patchy, pale yellowish green fluorescence, moderately fast blooming direct cut, thick pale green ring residue. SB13 (Base of M1.3)) at 2632.0 mMDRT (2300.6 mTVDRT / -2267.2 mTVDSS)
		10	CLAYSTONE: medium grey to light bluish grey, non calcareous, moderately hard to hard, sub blocky.
		30	SILTSTONE: moderate brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, common micromicaceous, firm to moderately hard, sub blocky.
		60	SANDSTONE 1: 40%, white to pale green, medium light grey, dominantly very fine to fine, moderately well sorted, sub angular to sub rounded, common glauconite matrix, common very fine glauconite pellets, moderate micropyrte cement, moderate siliceous cement, common pyrite nodules, hard aggregates, common bit crushed rock flour, tight visible and inferred porosity. No fluorescence. SANDSTONE: 2: 20%, clear to translucent, fine to very coarse, poorly sorted, sub angular to sub rounded, moderate pyrite cement, common pyrite nodules, dominantly loose, generally clean, fair inferred and visible porosity. FLUORESCENCE: 15%, moderately bright, patchy, pale yellowish green fluorescence, moderately fast blooming direct cut, thick pale green ring residue.
2635	2640	10	CLAYSTONE: medium grey to light bluish grey, non calcareous, moderately hard to hard, sub blocky.
		30	SILTSTONE: as above.
		60	SANDSTONE 1: 30%, as above. No fluorescence. SANDSTONE: 2: 30%, clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair to good inferred and visible porosity. FLUORESCENCE: 20%, moderately bright, patchy, pale yellowish green fluorescence, moderately fast blooming direct cut, dull pale green film residue. M1.4C (Top of Coal) at 2641.5 mMDRT (2309.0 mTVDRT / -2275.6 mTVDSS)
2640	2645	5	COAL: brownish black, dull, firm to moderately hard, sub blocky, uneven, silty in part grading to CARBONACEOUS SILTSTONE.
		25	CLAYSTONE 1: 5%, medium grey to light bluish grey, non calcareous, moderately hard to hard, sub blocky. CLAYSTONE 2: 20%, off white to very pale orange, soft to firm, amorphous to sub blocky.
		30	SILTSTONE: as above.
		40	SANDSTONE 1: 20%, as above. No fluorescence. SANDSTONE: 2: 20%, clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair to good inferred and visible porosity. FLUORESCENCE: 10%, moderately bright, patchy, pale yellowish green fluorescence, moderately fast blooming direct cut, dull pale green film residue.

West Kingfish W18A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2645	2650	5	COAL: brownish black, dull, firm to moderately hard, sub blocky, uneven, silty in part grading to CARBONACEOUS SILTSTONE.
		10	CLAYSTONE 1: 5%, medium grey to light bluish grey, non calcareous, moderately hard to hard, sub blocky. CLAYSTONE 2: 5%, off white to very pale orange, soft to firm, amorphous to sub blocky.
		70	SILTSTONE: as above.
		15	SANDSTONE 1: 5%, white to pale green, medium light grey, dominantly very fine to fine, moderately well sorted, sub angular to sub rounded, common glauconite matrix, common very fine glauconite pellets, moderate micropyrte cement, moderate siliceous cement, common pyrite nodules, hard aggregates, common bit crushed rock flour, tight visible and inferred porosity. No fluorescence. SANDSTONE: 2: 10%, clear to translucent, fine to 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. FLUORESCENCE: 10%, moderately bright, patchy, pale yellowish green fluorescence, moderately fast blooming direct cut, dull thin pale green ring residue. TM15 (M 1.5 Top) at 2652.0 mMDRT (2318.3 mTVDRT / -2284.9 mTVDSS) Top Drive failure at 2652.0 mMDRT at 2345 hrs 28 April 2006. Midnight depth 28 April 2006 = 2652.0 mMDRT. Add Barablock to mud system at 4 ppb at 2652.0 mMDRT (2318.2 mTVDRT / -2284.8 mTVDSS)
2650	2655	40	CLAYSTONE: off white to very pale orange, soft to firm, amorphous to sub blocky, common rock flour.
		40	LAT Logged After Trip SILTSTONE: pale brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		20	SANDSTONE: clear to translucent, medium to 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.
2655	2660	30	CLAYSTONE: off white to very pale orange, soft to firm, amorphous to sub blocky, common rock flour.
		30	SILTSTONE: as above.
		40	SANDSTONE: clear to translucent, fine to dominantly medium, moderately well 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.
2660	2665	40	CLAYSTONE 1: 20%, medium light grey, non calcareous, moderately hard to hard, sub blocky. CLAYSTONE 2: 20%, off white to very pale orange, soft to firm, amorphous to sub blocky, common rock flour.
		30	SILTSTONE: as above.
		30	SANDSTONE: clear to translucent, very fine to medium dominantly fine, moderately well sorted, sub angular to sub rounded, trace white argillaceous matrix, dominantly loose, generally clean, poor to fair inferred and visible porosity. No fluorescence.
			TM17 (M 1.7 Top) at 2669.5 mMDRT (2333.6 mTVDRT / -2300.2 mTVDSS)

West Kingfish W18A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2665	2670	40	CLAYSTONE 1: 20%, medium light grey, non calcareous, moderately hard to hard, sub blocky. CLAYSTONE 2: 20%, off white to very pale orange, soft to firm, amorphous to sub blocky, common rock flour.
		20	SILTSTONE: pale brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		40	SANDSTONE: clear to translucent, fine to dominantly medium, moderately well sorted, sub angular to sub rounded, trace white argillaceous matrix, dominantly loose, generally clean, poor to fair inferred and visible porosity. FLUORESCENCE: Trace to 2%, dull, patchy, pale yellowish green fluorescence, moderately fast blooming direct cut, dull thin pale green ring residue
2670	2675	25	CLAYSTONE 1: 20%, as above. CLAYSTONE 2: 5%, as above.
		15	SILTSTONE: as above.
		60	SANDSTONE: clear to translucent, medium to dominantly very coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair inferred and visible porosity. FLUORESCENCE: 10%, moderately bright, patchy, pale yellowish green fluorescence, moderately fast blooming direct cut, dull thin pale green ring residue WKF OOWC at 2676.2 mMDRT (2339.4 mTVDR / -2306.0 mTVDS)
2675	2680	20	CLAYSTONE 1: 10%, as above. CLAYSTONE 2: 10%, as above.
		15	SILTSTONE: as above.
		65	SANDSTONE: clear to translucent, trace light greenish grey, dominantly medium to coarse, moderately well sorted, sub angular to dominantly sub rounded, loose, clean, fair to good inferred and visible porosity. FLUORESCENCE: 15%, moderately bright, patchy, pale yellowish green fluorescence, moderately fast blooming direct cut, moderately bright, thin pale green film residue
2680	2685	20	CLAYSTONE 1: 10%, as above. CLAYSTONE 2: 10%, as above.
		15	SILTSTONE: as above.
		65	SANDSTONE: clear to translucent, medium to very coarse, dominantly coarse, moderately well sorted, sub angular to dominantly sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair to good inferred and visible porosity. FLUORESCENCE: 10%, moderately bright, patchy, pale yellowish green fluorescence, moderately fast blooming direct cut, moderately bright, thin pale green film residue
2685	2690	20	CLAYSTONE 1: 10%, medium light grey to light bluish grey, non calcareous, moderately hard to hard, sub blocky. CLAYSTONE 2: 10%, off white to very pale orange, soft to firm, amorphous to sub blocky, common rock flour.
		10	SILTSTONE: pale yellowish brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		70	SANDSTONE: clear to translucent, medium to very coarse, dominantly medium, moderately well sorted, sub angular to dominantly sub rounded, weak pyrite cement, trace pyrite nodules, loose, clean, fair inferred and visible porosity. FLUORESCENCE: Trace to 2%, as above, possibly cavings.

West Kingfish W18A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2690	2695	20	CLAYSTONE 1: 10%, medium light grey to light bluish grey, non calcareous, moderately hard to hard, sub blocky.
			CLAYSTONE 2: 10%, off white to very pale orange, soft to firm, amorphous to sub blocky, common rock flour.
		15	SILTSTONE: as above.
		65	SANDSTONE: clear to translucent, medium to very coarse, dominantly medium, moderately well sorted, sub angular to dominantly sub rounded, weak pyrite cement, trace pyrite nodules, loose, clean, fair inferred and visible porosity.
			FLUORESCENCE: Trace, as above, possibly cavings.
2695	2700	20	CLAYSTONE 1: 10%, as above.
			CLAYSTONE 2: 10%, as above.
		10	SILTSTONE: as above.
		70	SANDSTONE: clear to translucent, rare greyish pink, medium to dominantly coarse, moderately well sorted, sub rounded to sub angular, weak pyrite cement, trace pyrite nodules, loose, clean, fair to good inferred and visible porosity.
			FLUORESCENCE: Trace to 2%, as above, possibly cavings.
2700	2705	20	CLAYSTONE 1: 10%, as above.
			CLAYSTONE 2: 10%, as above.
		10	SILTSTONE: as above.
		70	SANDSTONE: clear to translucent, dominantly fine to very coarse, moderately well sorted, sub rounded to sub angular, weak pyrite cement, trace pyrite nodules, loose, clean, poor to fair inferred and visible porosity.
			FLUORESCENCE: Trace to 2%, as above, possibly cavings.
2705	2710 TD	25	CLAYSTONE 1: 10%, medium light grey to light bluish grey, non calcareous, moderately hard to hard, sub blocky.
			CLAYSTONE 2: 15%, off white to very pale orange, soft to firm, amorphous to sub blocky, common rock flour.
		10	SILTSTONE: pale yellowish brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub blocky.
		65	SANDSTONE: clear to translucent, fine to dominantly very coarse, moderately well sorted, sub rounded to sub angular, weak pyrite cement, trace pyrite nodules, loose, clean, fair inferred and visible porosity.
			FLUORESCENCE: Trace to 2%, as above, possibly cavings.

West Kingfish W18A Lithology / Show Descriptions

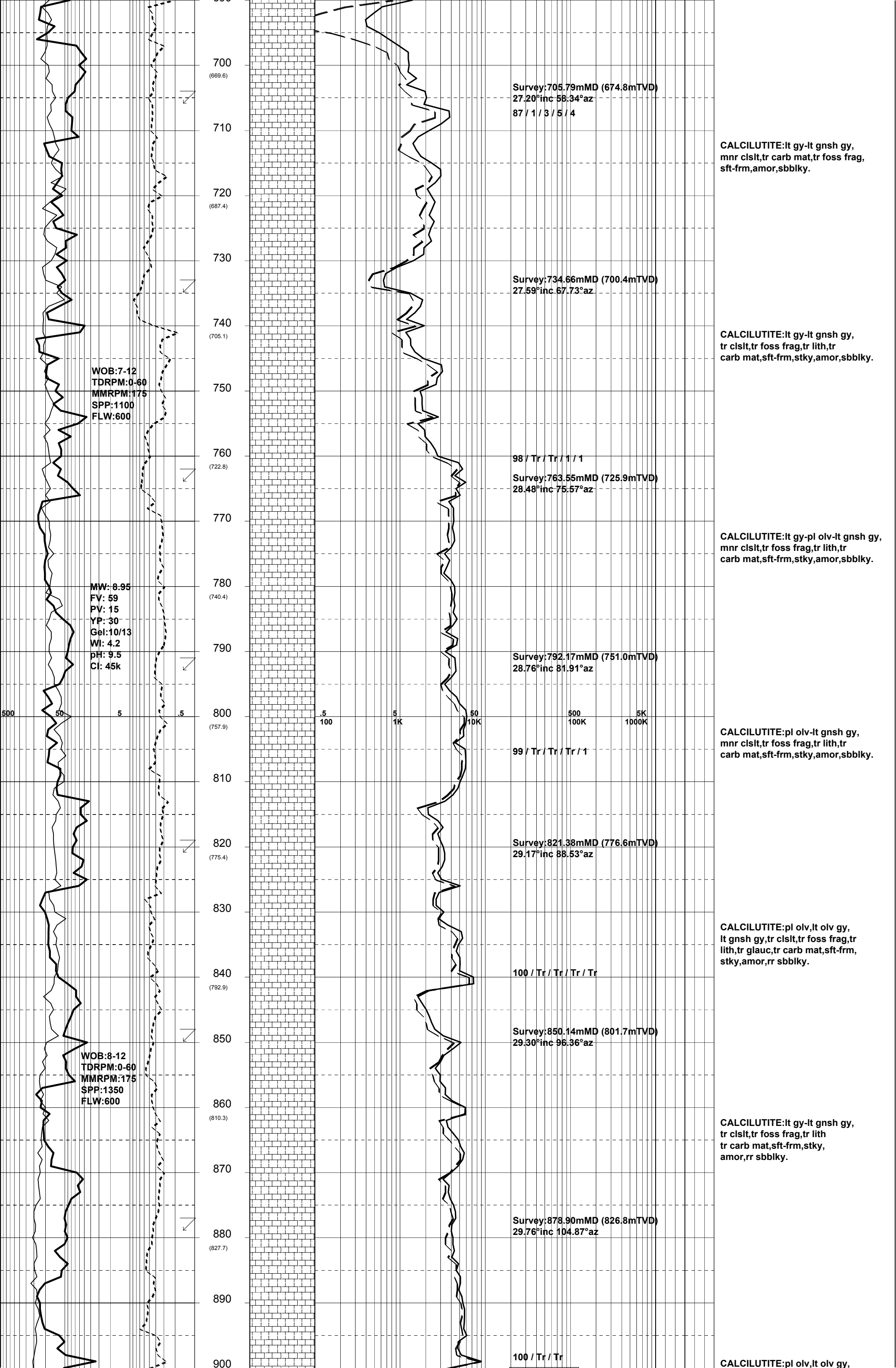
Interval (m) From To		%	Lithology / Show Description
			<p>WKF W18A reached a TD of 2710.0 mMDRT = 2369.1 mTVDRT (-2335.7 mTVDSS) at 1020 hrs on 29 April 2006.</p> <p>Circulate 3 x BU.</p> <p>Wiper Trip to shoe at 651.0 mMDRT.</p> <p>Trip Gas at 0705 hrs, 30 April 2006 = 8 units.</p> <p>Start circulating at bottom from 0450 hrs, on 30 April 2006.</p> <p>Last circulation on bottom at 0955 hrs, 30 April 2006.</p> <p>Total circulating time for last circulation on bottom = 4 hr 55 minutes.</p> <p>Start POOH at 1000 hrs, 30 April 2006, for Reeves Wireline Logging Run #1.</p> <p>Bit on Surface at 2000 hrs, 30 April 2006.</p> <p>Rig up/JSA for Reeves Logging at 2030 hrs, 30 April 2006.</p> <p>Tag bottom at 1330 hrs, 01 May 2006.</p> <p>At 1425 hrs, 01 May 2006, start Reeves Logging at Logging speed. (0.1 metre/second) from 2707.0 mMDRT to 2481.8 mMDRT.</p> <p>At 1525 hrs, 01 May 2006, at twice Logging speed (0.2 metre/second) from 2481.8 mMDRT to 1303.0 mMDRT.</p> <p>At 1855 hrs, 01 May 2006, start Reeves Logging at Logging speed. (0.1 metre/second) from 1303.0 mMDRT to 651.0 mMDRT.</p> <p>At 2145 hrs, 01 May 2006, at normal Tripping speed (0.3 metre/second) from 651.0 mMDRT to surface.</p> <p>At surface at 0030 hrs, 02 May 2006.</p> <p>Casing shoe at 651.0 mMDRT.</p>

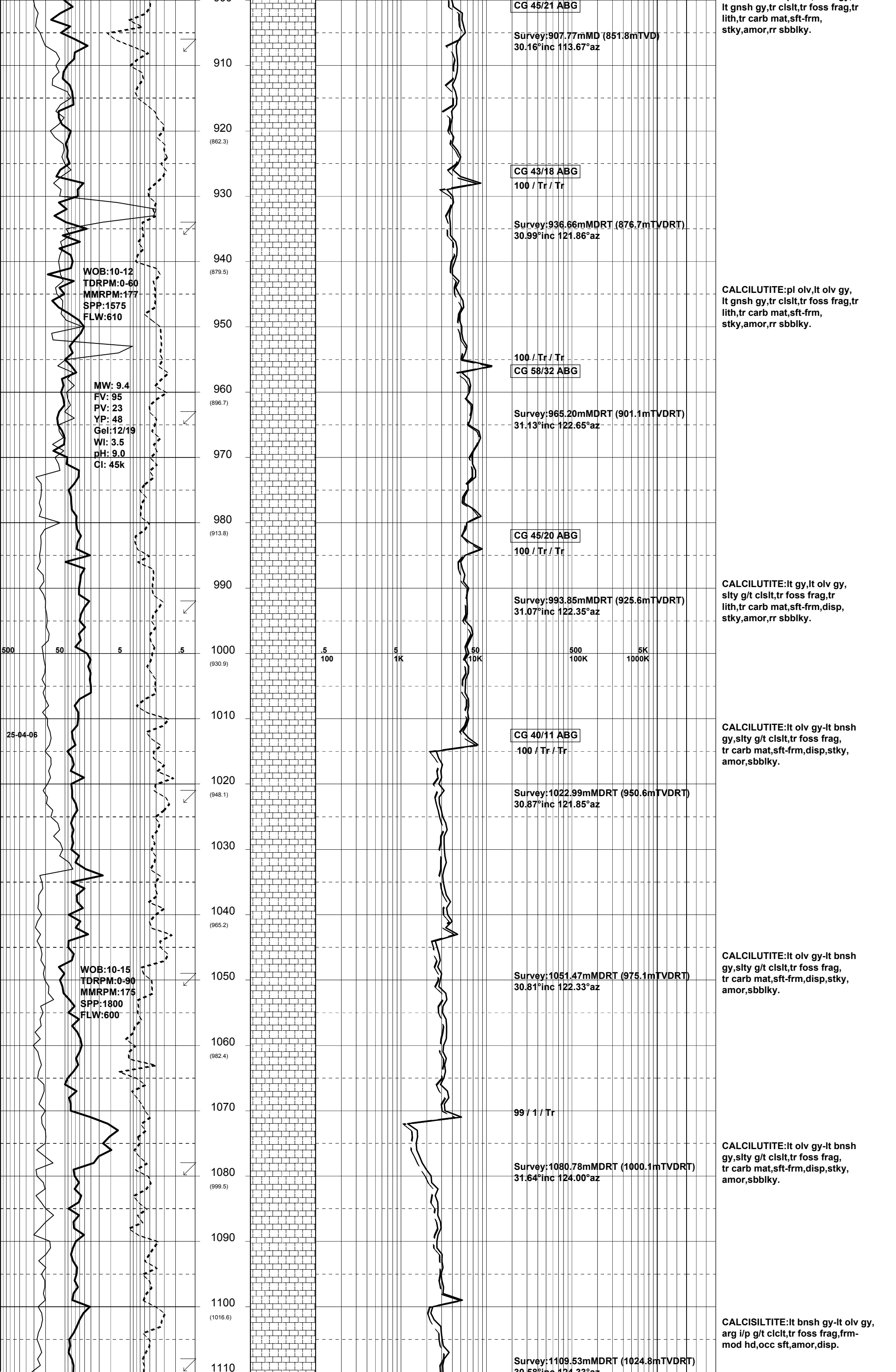
APPENDIX 4a

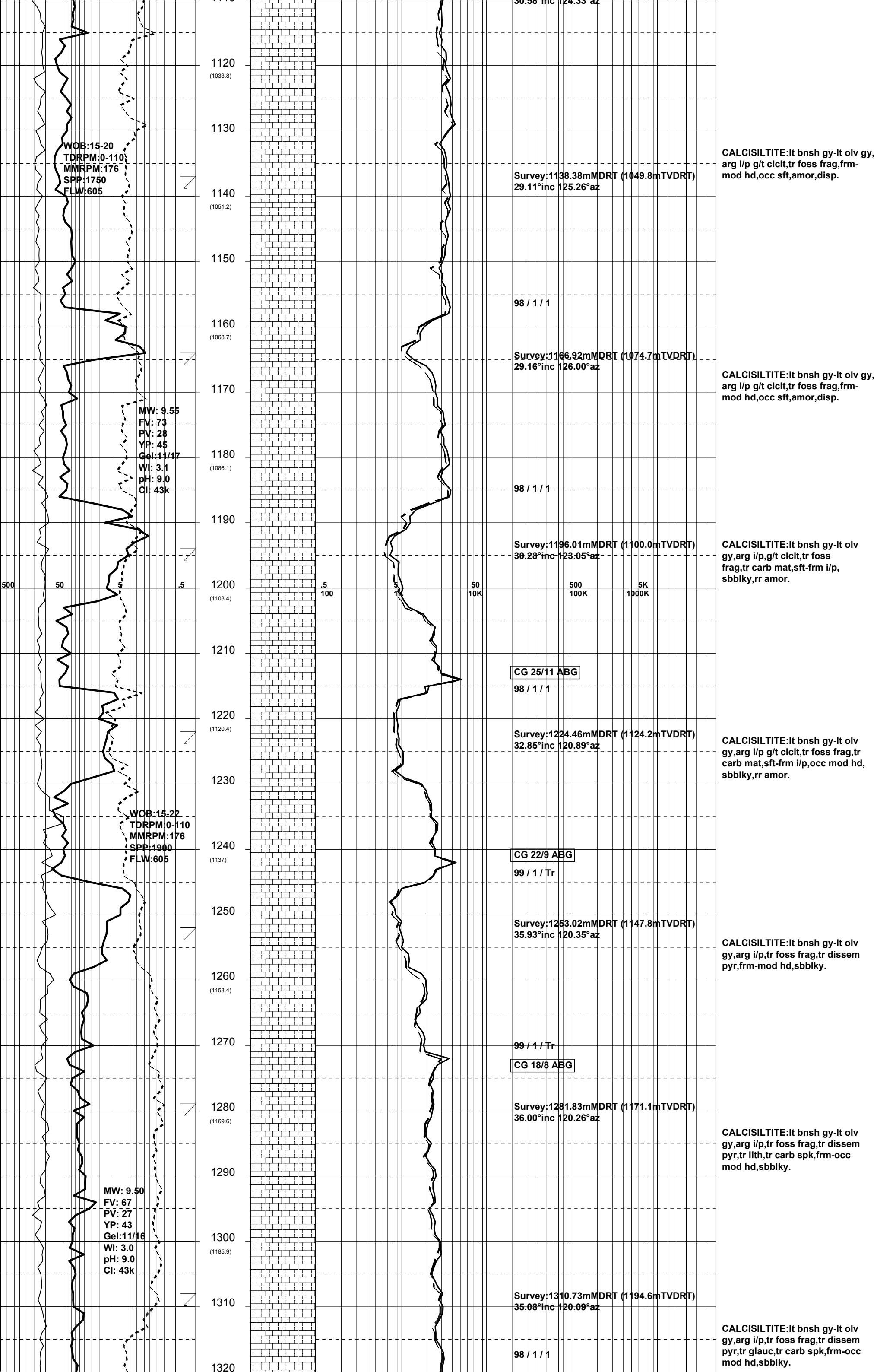
WEST KINGFISH W18A
Mud Log

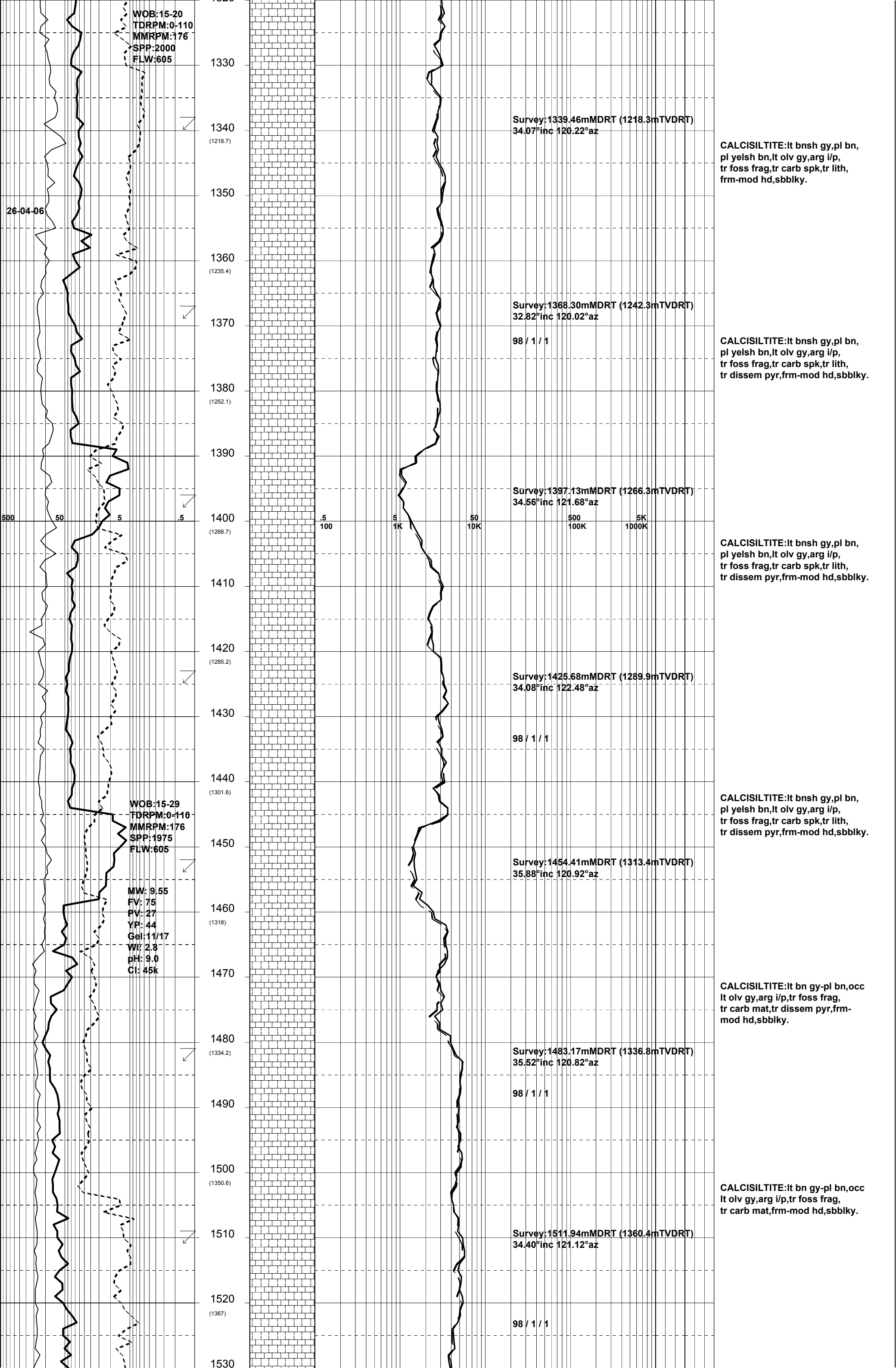


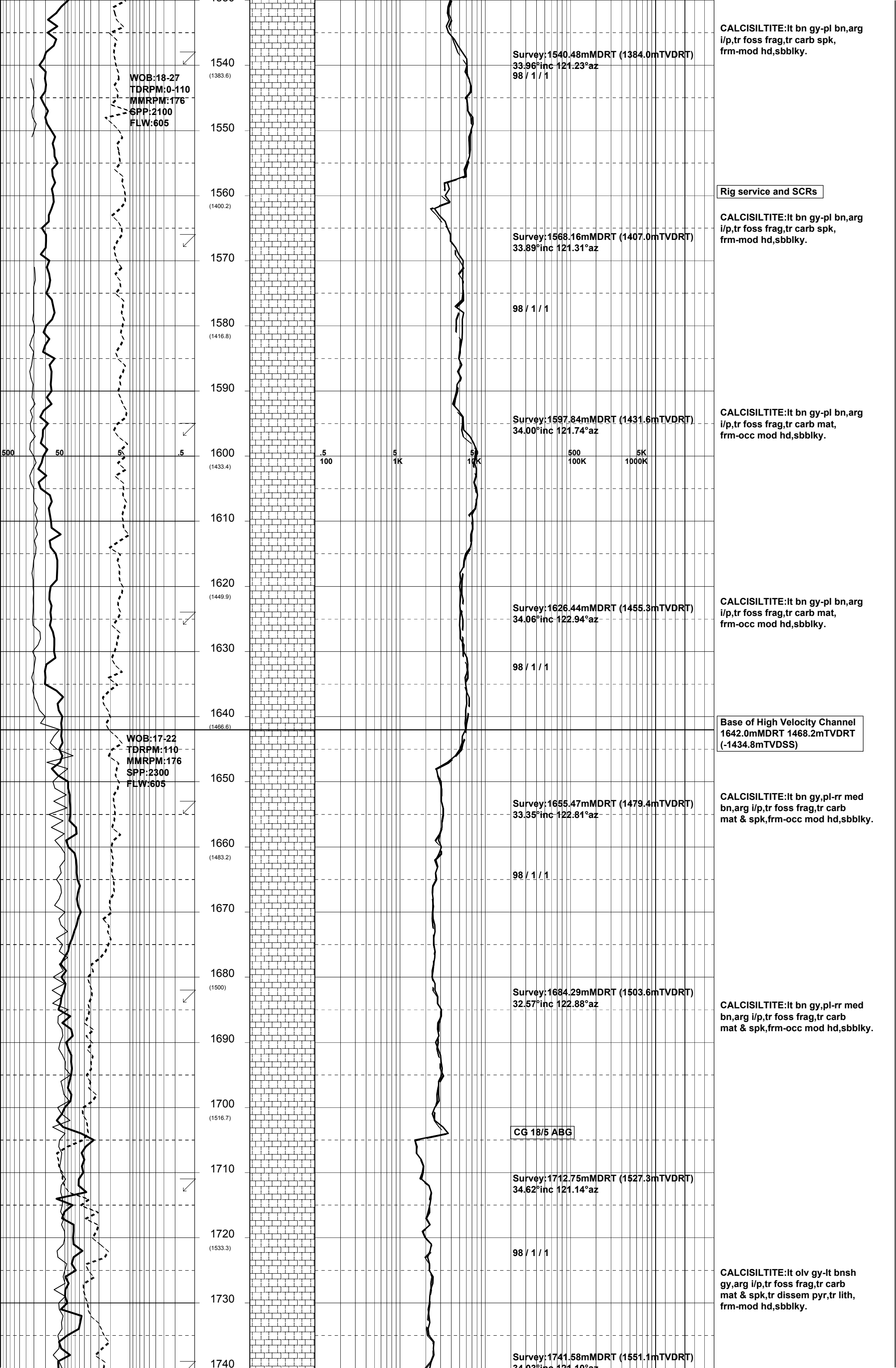
ROP (m/hr)		DEPTH (m) (TVD)	CUTTINGS LITHOLOGY	RESERVAL GAS DATA					CUT FLUOR	DIRECT FLR	LITHOLOGY DESCRIPTIONS and REMARKS			
500	50			5	.5	C1	C2	C3				iC4	iC5	TG
WOB (tons)				Total Gas in Units Chromatograph in PPM										
50	25	0	%	.5	5	50	500	5K	good	poor	good	poor		
MWD Gamma Ray (api)		0	0	100	100	1K	10K	100K	1000K					
24-04-06		640											PREVIOUS WELL HISTORY Plugged & Abandoned in December, 2005. 10-3/4" Surface Csg 651.0m MDRT 7" Production Csg cut and pulled from 721.0m MDRT Kick-off plug at 615.0m MDRT	
MW: 8.9 FV: 53 PV: 10 YP: 15 Gel: 7/9 WI: 5.5 pH: 9.5 CI: 44k		650											West Kingfish W-18A kick-off at 03:30 hours on 24-04-2006 from 651.0m MDRT	
WOB: 10-15 TDRPM: 0-60 MMRPM: 175 SPP: 900 FLW: 600		660 (633.8)											Drill with KCl/Glycol/PHPA mud system.	
		670											PIT at 651.0m MDRT 625.7m TVDRT 528 psi 8.8 ppg EMW: 13.6 ppg	
		680 (651.7)											No H2S or CO2 Detected	
		690											CALCILUTITE: lt gy-lt gnsh gy, mnr clst, tr carb mat, tr foss frag, sft frm, amor, sbblky.	











WOB:18-27
TDRPM:0-110
MMRPM:176
SPP:2100
FLW:605

WOB:17-22
TDRPM:110
MMRPM:176
SPP:2300
FLW:605

Survey:1540.48mMDRT (1384.0mTVDRT)
33.96°inc 121.23°az
98 / 1 / 1

Rig service and SCRs

CALCISILTITE:lt bn gy-pl bn,arg
i/p,tr foss frag,tr carb spk,
frm-mod hd,sbblky.

Survey:1568.16mMDRT (1407.0mTVDRT)
33.89°inc 121.31°az

98 / 1 / 1

CALCISILTITE:lt bn gy-pl bn,arg
i/p,tr foss frag,tr carb mat,
frm-occ mod hd,sbblky.

Survey:1597.84mMDRT (1431.6mTVDRT)
34.00°inc 121.74°az

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

CALCISILTITE:lt bn gy-pl bn,arg
i/p,tr foss frag,tr carb mat,
frm-occ mod hd,sbblky.

Survey:1626.44mMDRT (1455.3mTVDRT)
34.06°inc 122.94°az

98 / 1 / 1

Base of High Velocity Channel
1642.0mMDRT 1468.2mTVDRT
(-1434.8mTVDSS)

CALCISILTITE:lt bn gy,pl-rr med
bn,arg i/p,tr foss frag,tr carb
mat & spk,frm-occ mod hd,sbblky.

Survey:1655.47mMDRT (1479.4mTVDRT)
33.35°inc 122.81°az

98 / 1 / 1

CALCISILTITE:lt bn gy,pl-rr med
bn,arg i/p,tr foss frag,tr carb
mat & spk,frm-occ mod hd,sbblky.

Survey:1684.29mMDRT (1503.6mTVDRT)
32.57°inc 122.88°az

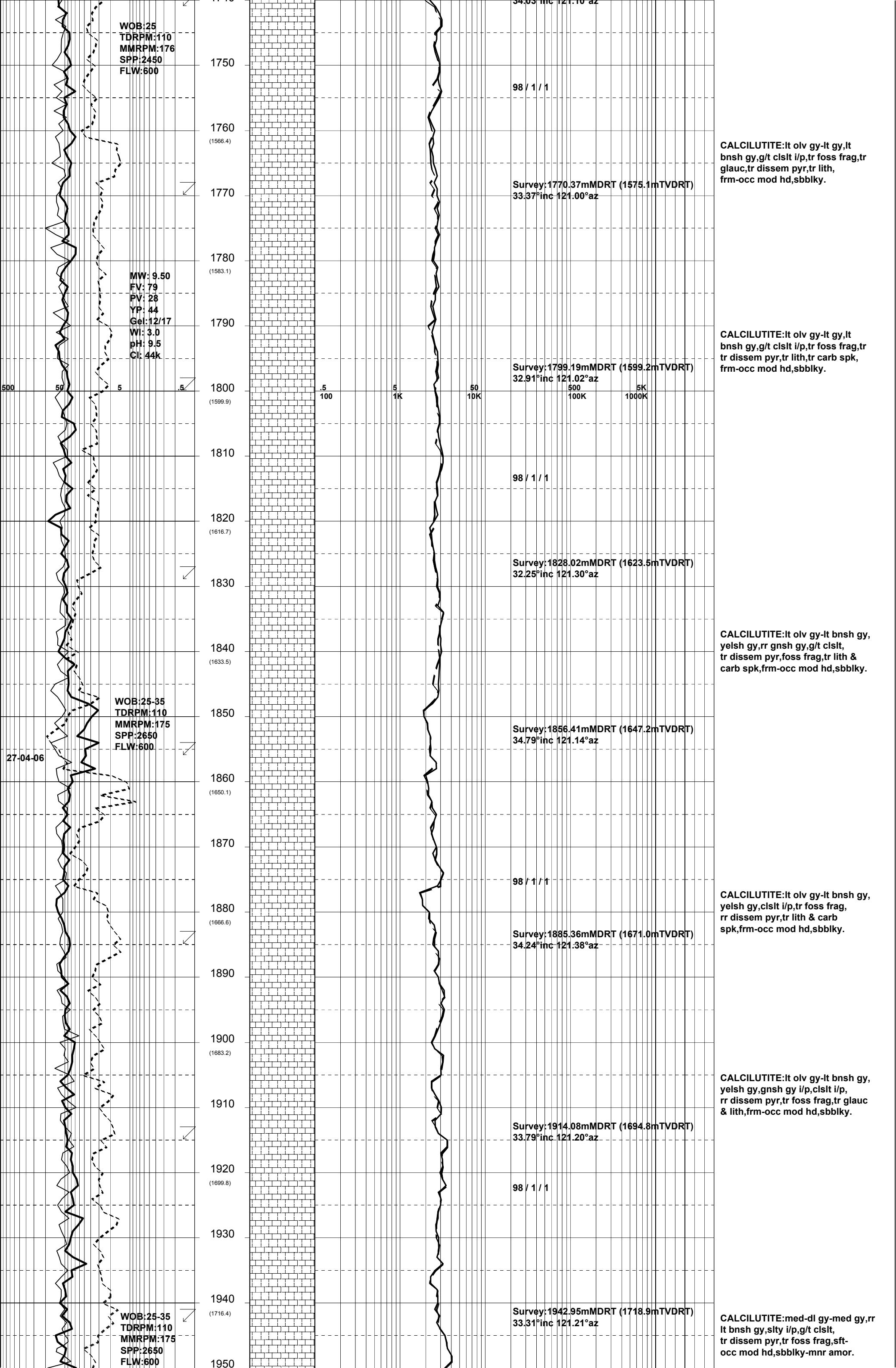
CG 18/5 ABG

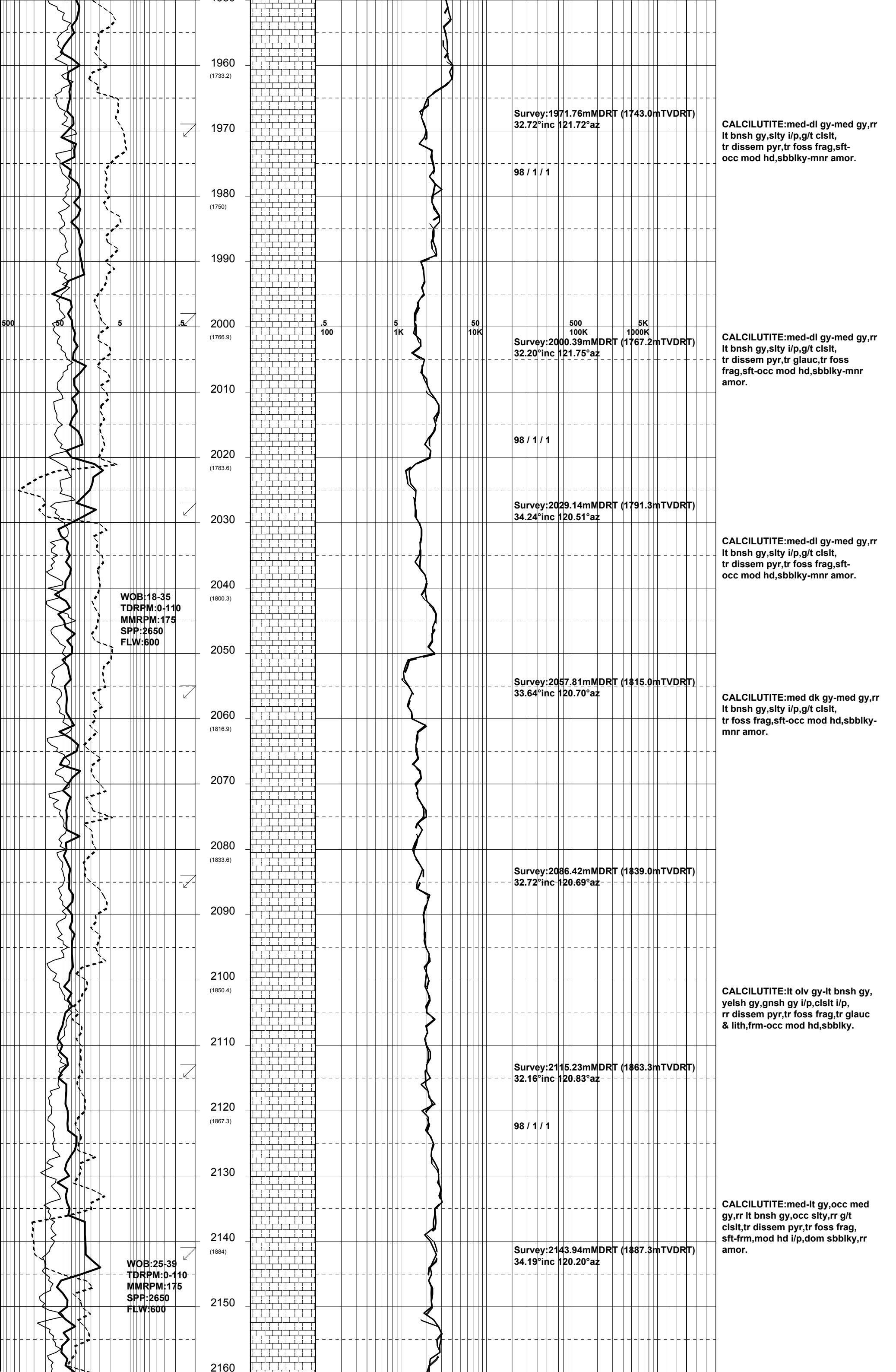
Survey:1712.75mMDRT (1527.3mTVDRT)
34.62°inc 121.14°az

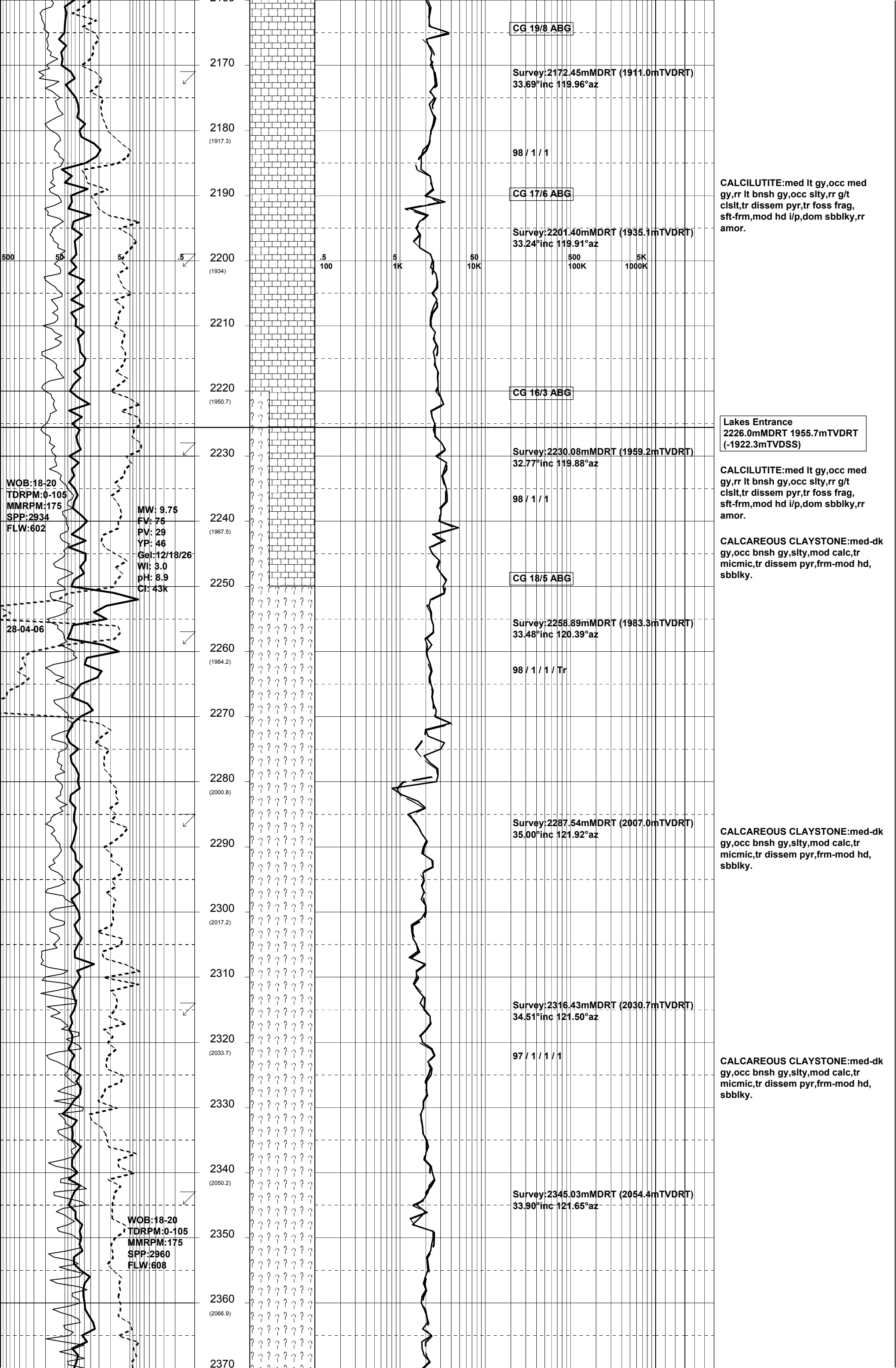
98 / 1 / 1

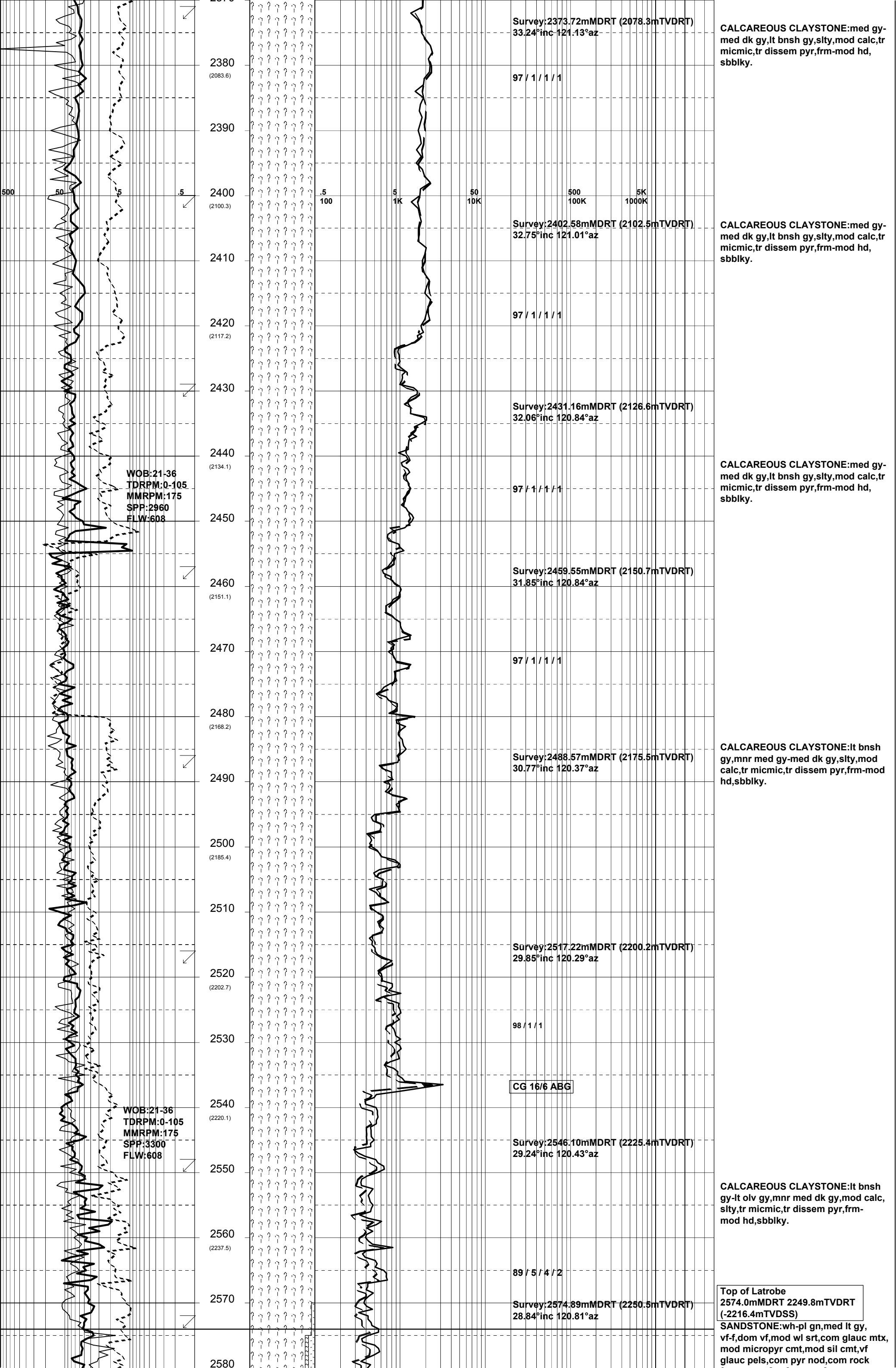
CALCISILTITE:lt olv gy-lt bnsh
gy,arg i/p,tr foss frag,tr carb
mat & spk,tr dissem pyr,tr lith,
frm-mod hd,sbblky.

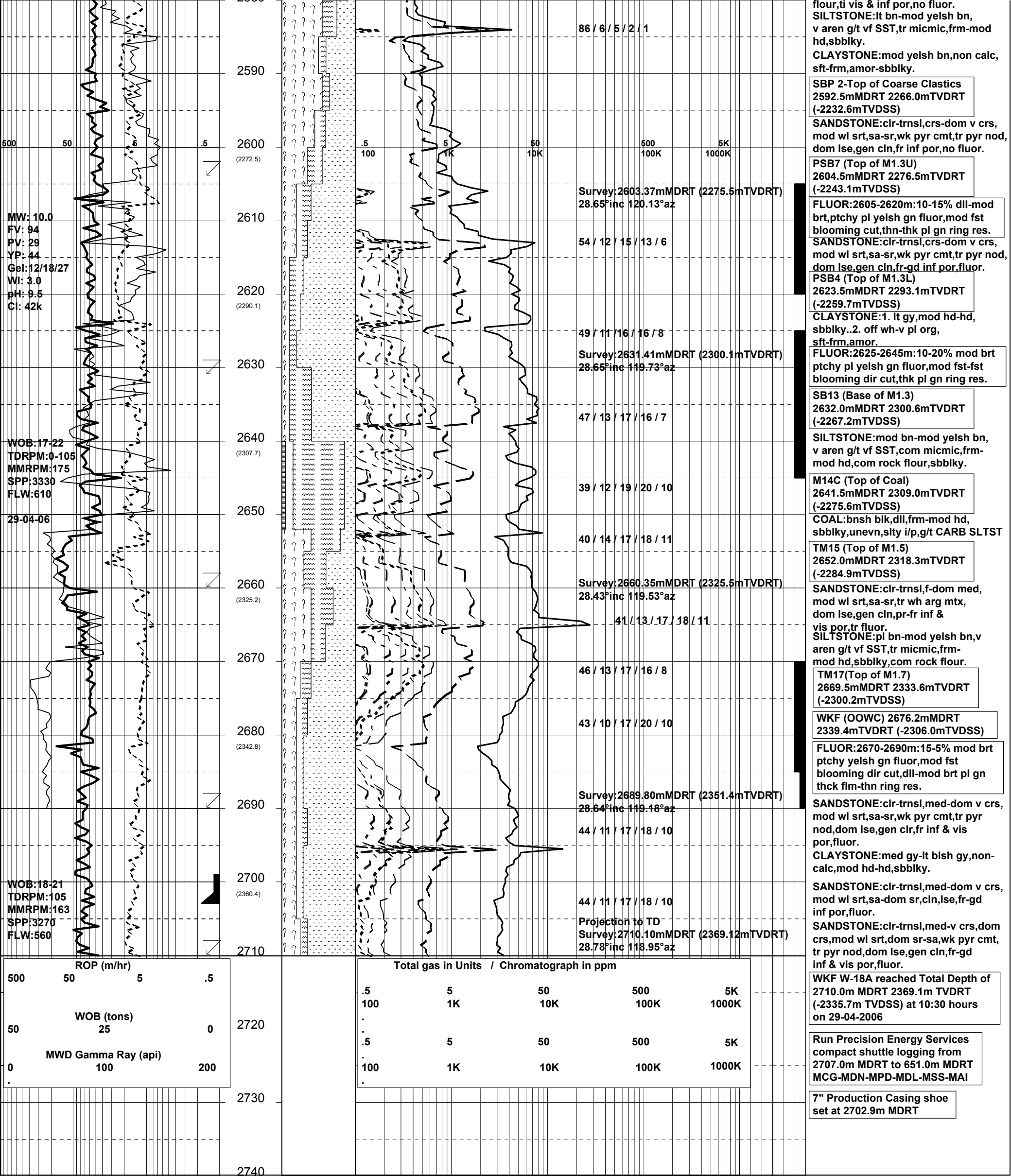
Survey:1741.58mMDRT (1551.1mTVDRT)
34.02°inc 121.10°az











APPENDIX 4b

WEST KINGFISH W18A
Well Completion Log

WELL COMPLETION LOG

Scale – 1:200

WEST KINGFISH W18A





















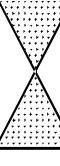





Gippsland Basin, Victoria

Concession: VIC/L7

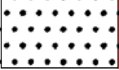

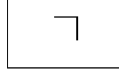






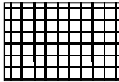

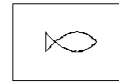
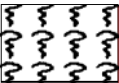

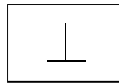
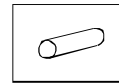
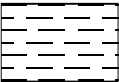

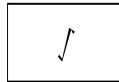



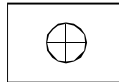
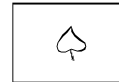
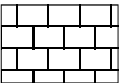
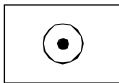
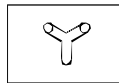
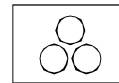
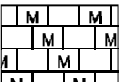
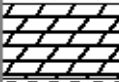
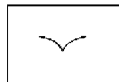

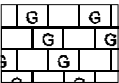


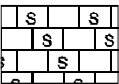
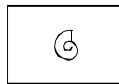


POST-DRILL LOCATION: <i>Top of Latrobe</i>	Latitude:	38° 35' 45.791" S	COMPILED BY:	Sheryl Sazenis
	Longitude:	148° 07' 00.048" E	DRAFTED BY:	Arnaldo Ribeiro
	MGA X:	597244.08 mE	DRILL RIG:	Nabors Rig 453
	MGA Y:	5727457.04 mN	Datum:	GDA94
ELEVATION:	Depth:	2574.0m MDRT 2249.7m TVDRT (-2216.3m TVDSS)	Spheroid:	GRS80
	G.L.:	-76.13 m	Projection:	UTM
	R.T.:	33.43 m above MSL	Map Grid/Cent.Meridian	MGA Zone 55/147 deg E
	Water Depth:	76.13 m	TOTAL DEPTH:	2710.0 mMDRT / 2369.1m TVDRT
DATES:	Spudded:	24/04/2006	PLUGGED BACK T.D.:	2668.0m MDRT
	Rig Released:	10/05/2006	CLASSIFICATION:	Oil Development
	I.P. Established:	22/05/2006	STATUS:	Cased and Completed
	<i>(Initial production)</i>		PRODUCTION TESTING:	n/a
SERVICE COMPANIES:	DRILLING CONTRACTOR:	International Sea Drilling Limited (Nabors Rig 453)	DIVERS:	n/a
	MWD/DIRECT. DRLG:	Schlumberger Anadrill	MUD LOGGING:	Geoservices Overseas S.A.
	GYRO SURVEYING:	SDI (Scientific drilling Int.)	PRESSURE RECORDING:	n/a
	CORING:	n/a	WELL VELOCITY SURVEY:	n/a
	PIPE CONVEYED LOGGING:	Precision Energy Services (Reeves Compact Shuttle Logging System)	MUD ENGINEERING:	Halliburton- Baroid
	CEMENTING:	Halliburton	LINER:	n/a
	CASING:	Weatherford		

LEGEND

<div>2.7m NOS </div> <div>Ø = 17%</div> <div>Sw = 32%</div>		LOG ANALYSIS DATA		 SHOW OR STAIN	
		NS - Net Sand		 HYDROCARBON CUT	
		NOS - Net Oil Sand		 FLUORESCENCE	
		NGS - Net Gas Sand		 GAS SHOW	
		Sw - Water Saturation		 OIL PRODUCTIVE	
<div> No Rec.</div> <div>CORE</div> <div>Rec.</div>		MUD DATA		 GAS PRODUCTIVE	
		Ø - Porosity		 INTERPRETED OIL PRODUCTION	
		Snd - Sand		 INTERPRETED GAS PRODUCTION	
		MW - Mud Weight		 INTERPRETED WATER PRODUCTION	
		FV - Funnel Velocity		 WATER PRODUCTIVE	
		PV - Plastic Velocity		 CONDENSATE PRODUCTION	
		YP - Yield Point		 INTEPRETED CONDENSATE BEARING	
		Gel - Gel Strength		 DSTG	
		pH - Acidity/Alkalinity		 DSTO	
		WL - Water Loss		 SURVEY POINT	
		Cl - Chloride		 13-3/8"	
		Ca - Calcium		 MUD	
		Sol - Solids			
		H2O - Water			
		Oil -Oil			
<div> No Rec.</div> <div>PERFORATED INTERVAL</div> <div>Rec.</div>		RECOVERED SIDE WALL CORE LITHOLOGY			
		SST - Sandstone			
		CLST - Claystone			
		SLST - Siltstone			
		LMST - Limestone			
		MST - Mudstone			
		ML - Marl			
		SH - Shale			
		COAL - Coal			
<div> No Rec.</div> <div>PLUG</div> <div>Rec.</div>		SIDE WALL CORE - NO RECOVERY			
		FIT			
<div> P2/11</div> <div>MDT/RFT PRETEST RUN/SEAT NUMBER</div>					
<div> S11/2</div> <div>MDT/RFT SAMPLE RUN/SAMPLE NUMBER</div>					
<div> P2/40</div> <div>MDT VERTICAL/HORIZONTAL PERMEABILITY TEST</div>					
<div></div> <div>PACKER</div>					
<div></div> <div>BRIDGE PLUG</div>					

LITHOLOGICAL SYMBOLS

	Sandstone		Dolomite		Mica		Pelecypods
	Siltstone		Marl		Chert		Echinoids
	Mudstone		Anhydrite		Carbonaceous Matter		Fish Remains
	Claystone		Volcanics		Calcareous		Plant Remains
	Shale		Basement		Glauconite		Spores
	Coal		Granule		Corals		Leaves
	Limestone		Oolites		Bryozoans		Foram
	Micritic Limestone		Dolomite		Brachiopods		Fossils
	Grain Limestone		Pyrite		Gastropods		
	Skeletal Limestone				Cephalopods		

LOGGING AND SURVEYING			
Anadrill Schlumberger	Interval (mMDRT)	Precision Energy Services Logging	Interval (mMDRT)
MWD (Directional & GR) – 1 Run	651.0m MDRT - 2690.5m MDRT	MCG-MDN-MPD-MSS-MDL-MAI – 1 Run (GR-Neutron-Density-Sonic-Dual Laterolog-Induction)	2707.0m MDRT- 651.0m MDRT

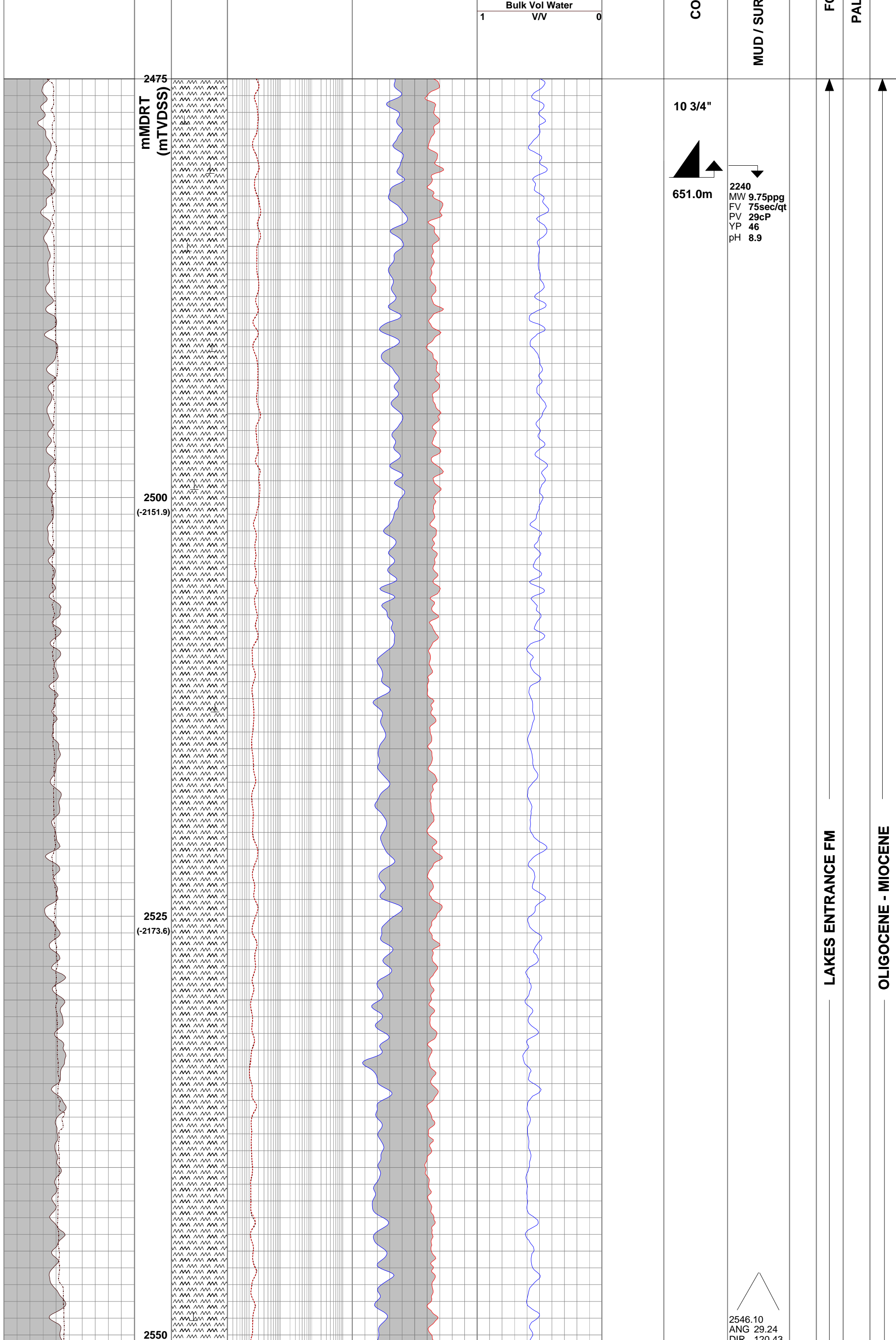
WELL DATA				
Date	23 April 2006 - 30 April 2006	30 April 2006 - 02 May 2006		
Run	MWD # 1	Wireline Run #1 on shuttle		
Log	Powerpulse Directional & GR	MCG-MDN-MPD-MSS-MDL-MAI		
Depth Driller	2710.0m MDRT	2710.0m MDRT		
Depth Logger	2710.0m MDRT	2710.0m MDRT		
Bottom Log Interval	2690.5m MDRT	2707.0m MDRT		
Top Log Interval	651.0m MDRT	651.0m MDRT		
Casing Driller	651.0m MDRT	651.0m MDRT		
Casing Logger	651.0m MDRT	651.0m MDRT		
Casing Size	10 .75"	10 .75"		
Casing Weight	40.5 ppf	40.5 ppf		
Bit Size	8.5"	8.5"		
Type of Fluid in Hole	KCl/PHPA/GLYCOL/Polymer	KCl/PHPA/GLYCOL/Polymer		
Density	10.05 ppg	10.05 ppg		
Rm @ Measured Temp.	N/A	0.120		
Rmf @ Measured Temp.	N/A	0.104		
Rmc @ Measured Temp.	N/A	0.174		
Max. Recorded Temp.	77.0°C	90.2°C		
Equipment / Location	Sale	Sale		
Recorded By	L.Johnston / R. Burns	B.Moss / R. Tench		
Witnessed By	Trevor Lobo	Trevor Lobo		

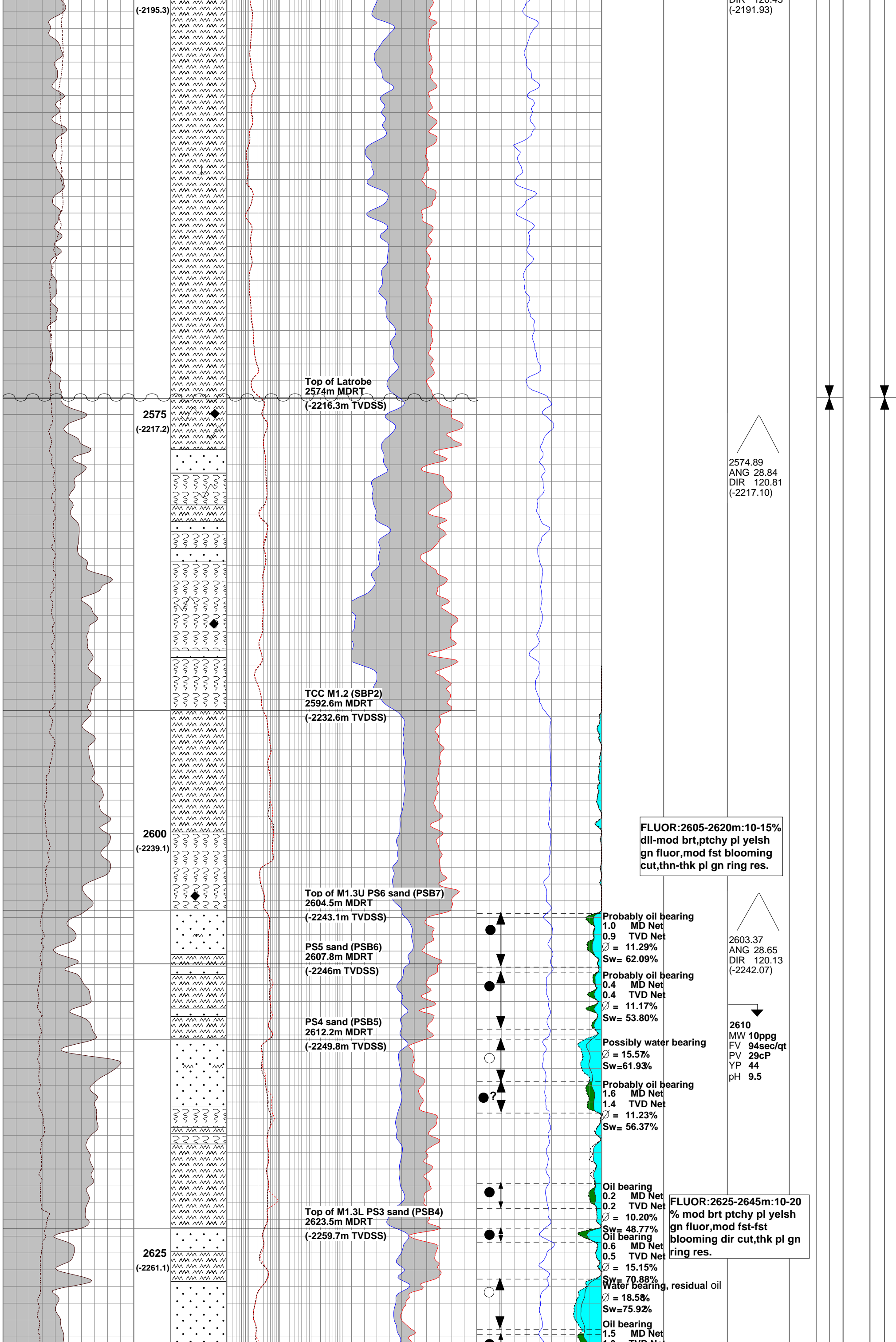
CORES			PERFORATIONS		
From (mMDRT)	To (mMDRT)	Rec %	From (mMDRT)	To (mMDRT)	Gun Type
			2649.0	2651.0	MaxR

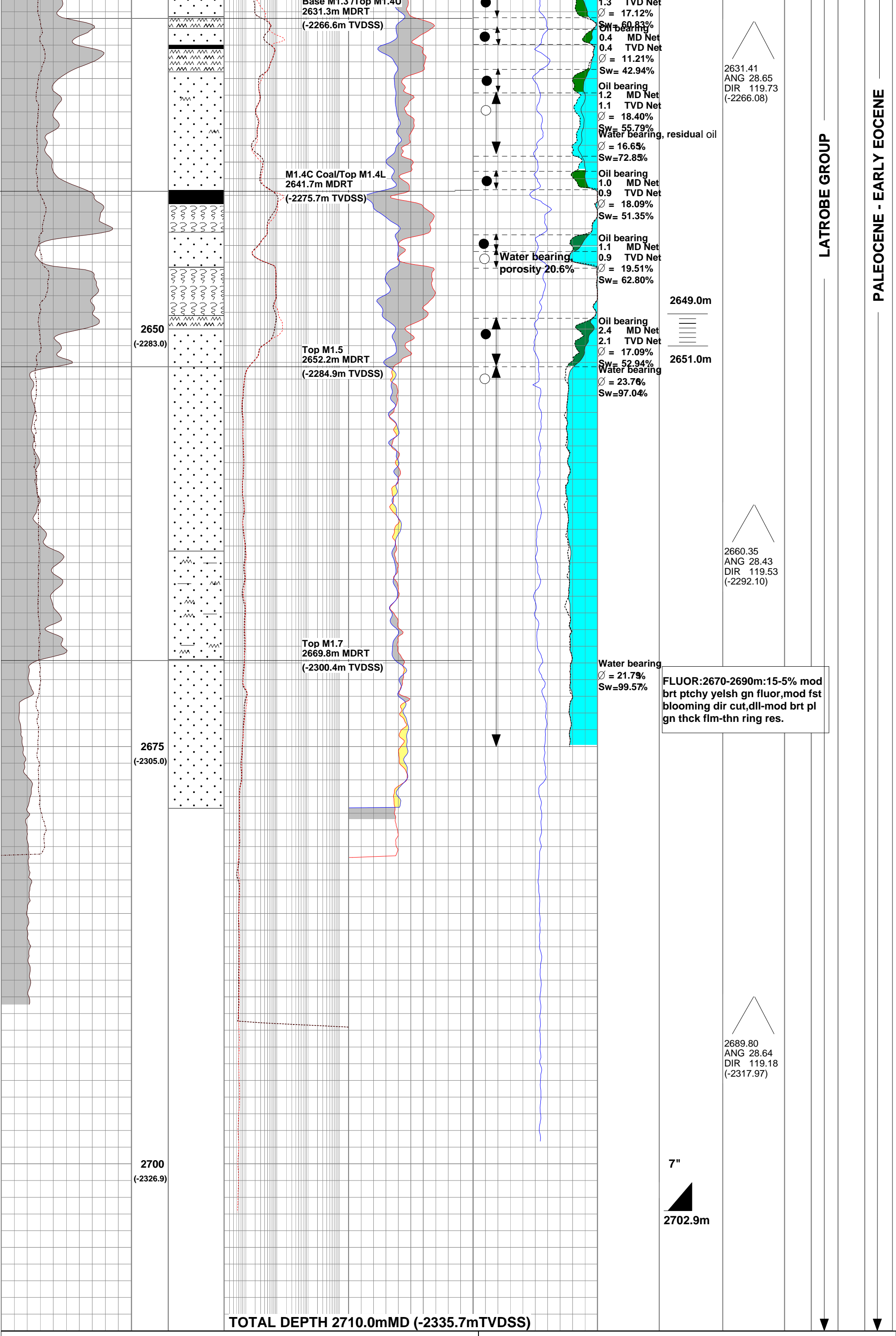
CASING				PLUGS		
Size	Set @ (mMDRT)	SX Cmt	Formation	From (mMDRT)	To (mMDRT)	SXCmt
10.75”	651.0*	---	Gippsland Limestone			
7”	2702.9	720	Latrobe Group	2702.9	2668(PBTD)	

* Pre-existing W18 surface casing.

Caliper			DEPTH	LITHOLOGY	Shallow Laterolog			Compensated Den			Compensated Sonic			TEST	MPLETION	VEY DATA	PLUGS	ORMATION	YNOLOGY	AGE
6	IN	16			0.2	OHMM	2000	1.85	G/C3	2.85	500	US/M	100							
Gamma Ray					Deep Induction			Neutron Porosity			Effective Porosity									
0	GAPI	200			0.2	OHMM	2000	0.45	V/V	-0.15	1	V/V	0							







	<div>West Kingfish W18A</div> <div>Initial Production Date: 22/05/2006</div> <div>Production Zone: M1.4L</div> <div>Initial Total Liquid Rate 410.7 kL/day)</div> <div>Initial water cut: 24%</div> <div>Initial Oil rate: 311.9 kL/day</div>
--	---