

WELL COMPLETION REPORT
WEST KINGFISH W20A
GIPPSLAND BASIN, VICTORIA

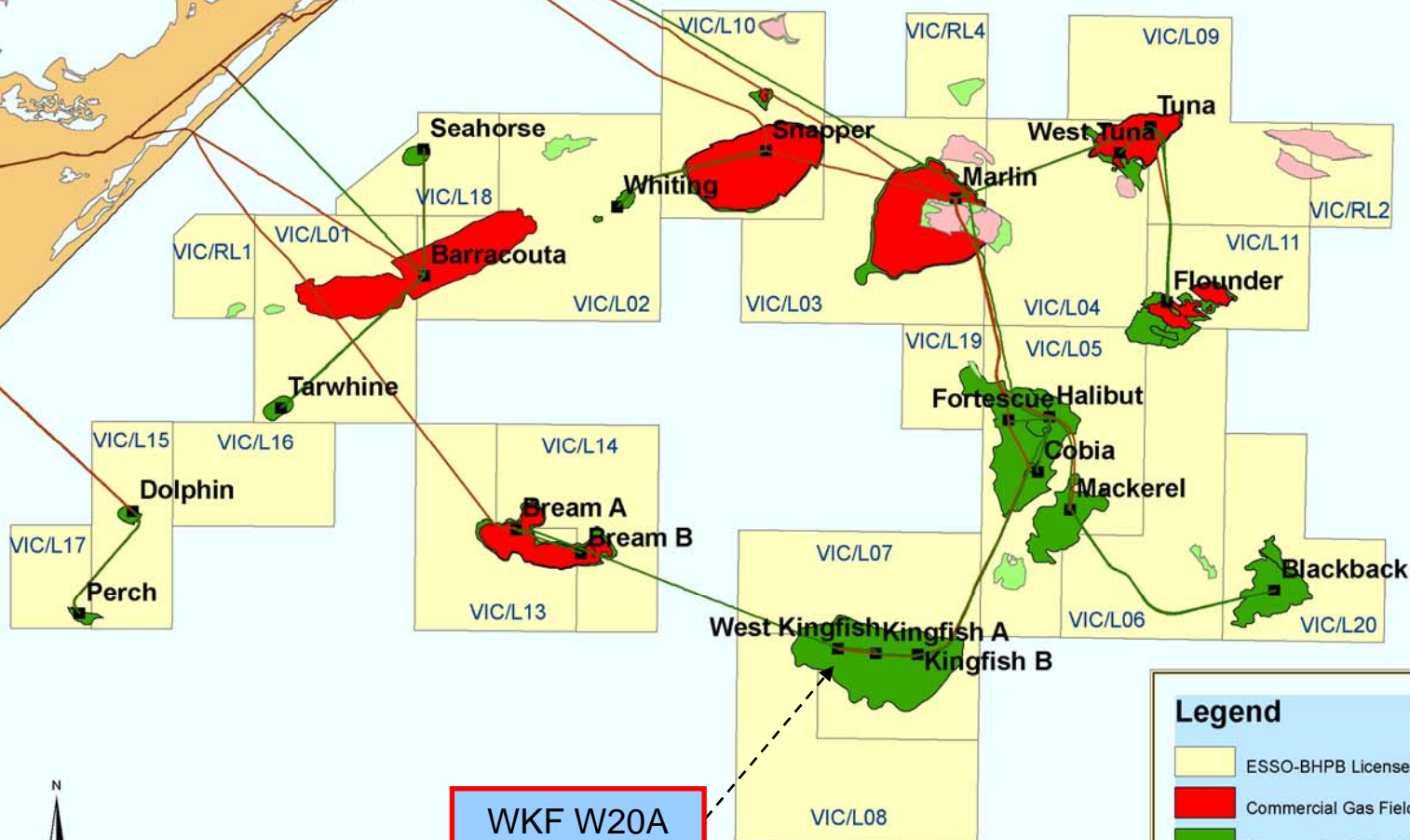
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October 2006

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I. WEST KINGFISH FIELD LOCATION MAP



WKF W20A
(VIC/L7)

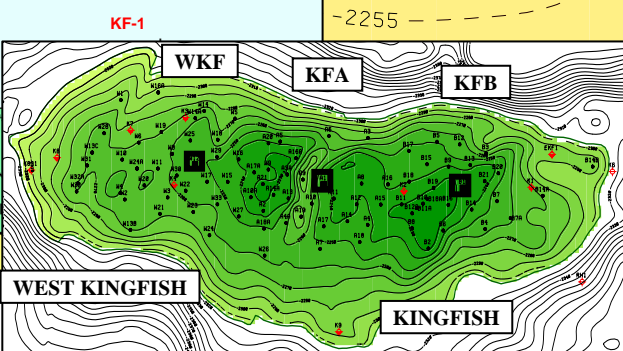
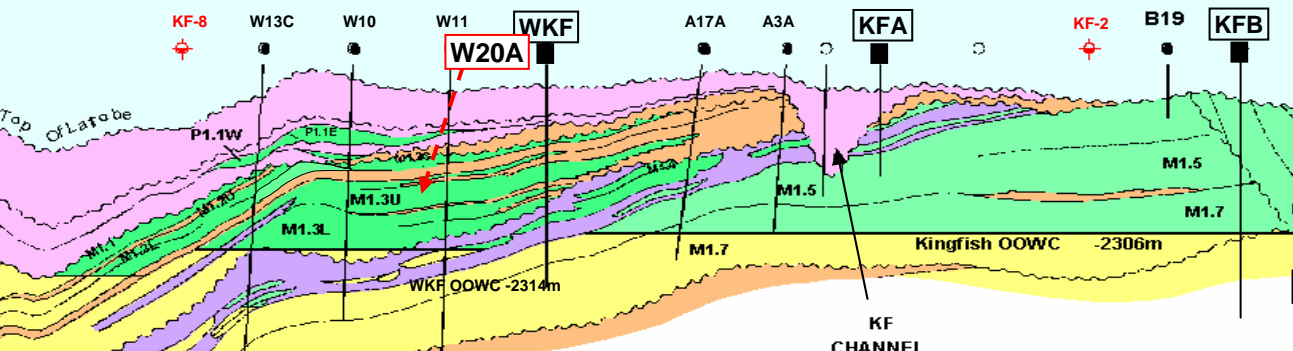
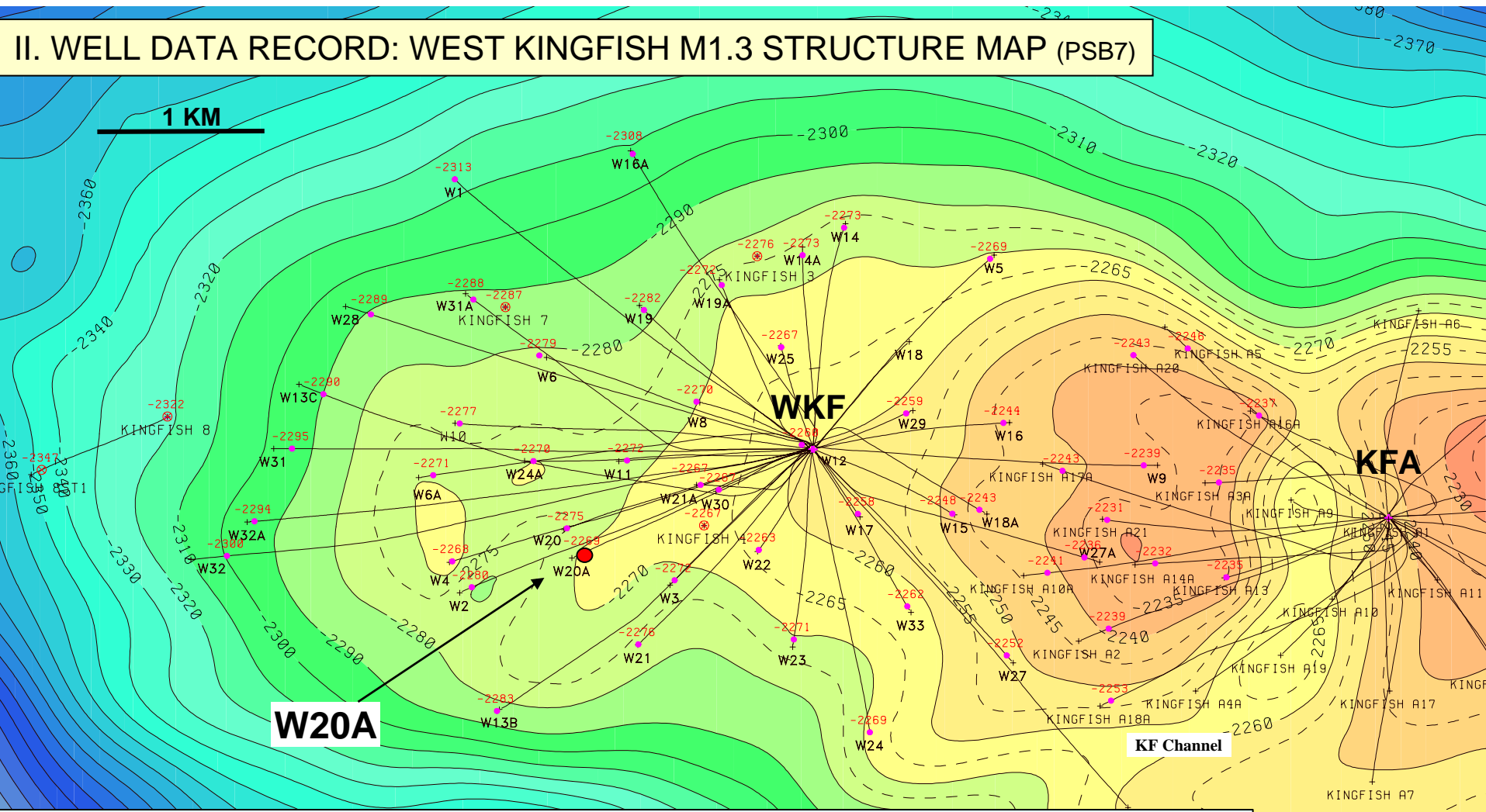
Legend

- ESSO-BHPB License Blocks & Retention Release Areas
- Commercial Gas Fields
- Commercial Oil Fields
- Static Gas Fields
- Static Oil Fields
- Gas Pipeline
- Oil Pipeline

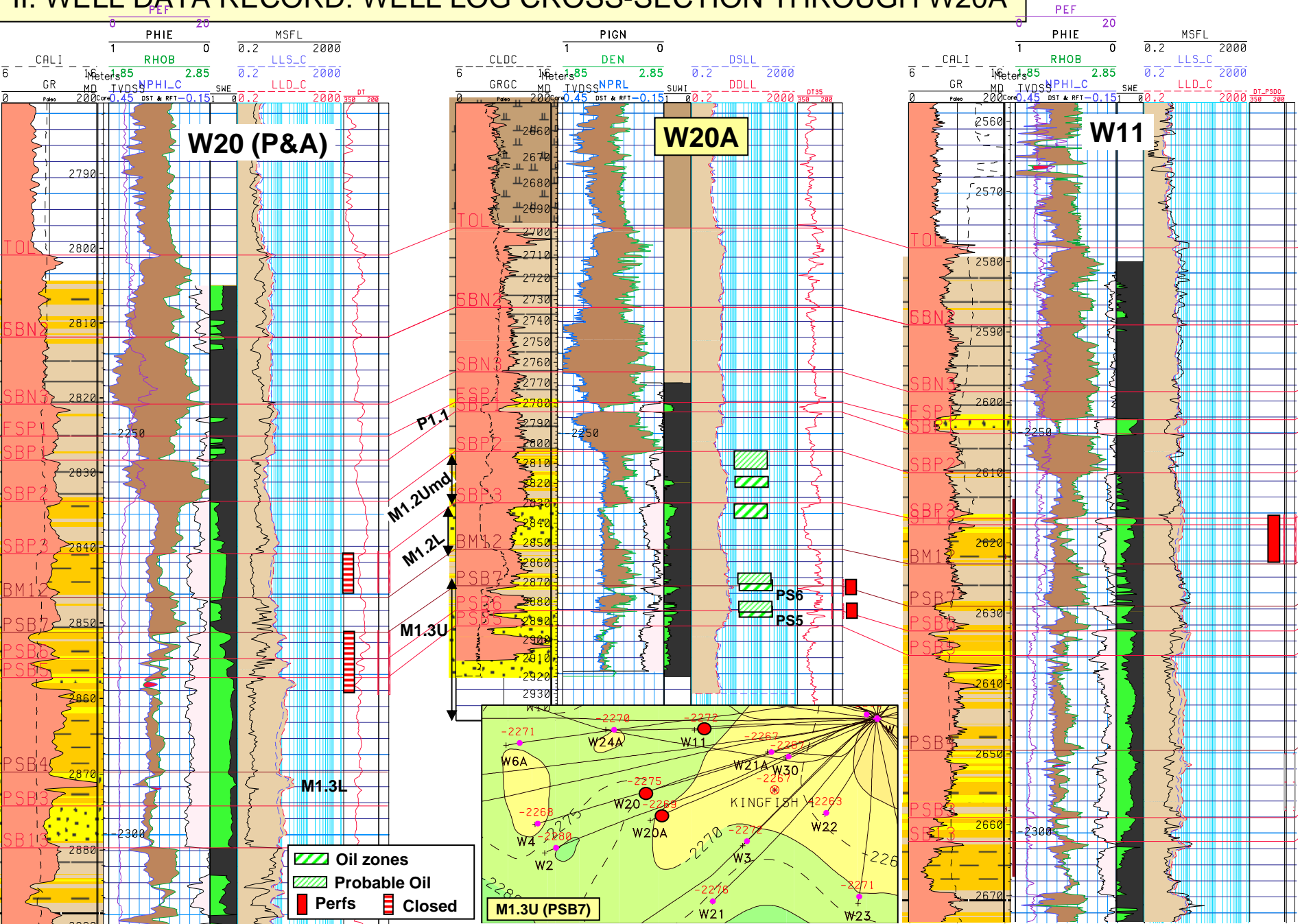


0 2.5 5 10 15 20 25 Kilometers

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



II. WELL DATA RECORD: WELL LOG CROSS-SECTION THROUGH W20A



II. WELL DATA RECORD - W20A (cont'd)

LOCATION

Field	West Kingfish	Conductor #20 Surface Coordinates	
Well Name	W20A (Loc D)	(MGA94) X	596264.97m E
Conductor Number	Slot 20	(MGA94) Y	5727806.70m N
State	Victoria	Latitude	38° 35' 34.835" S
Permit/Licence	Vic/L7	Longitude	148° 06' 19.406" E
Geological Basin	Gippsland	Perforations (driller)	2868.5 – 2877.0m MDRT
Top of Latrobe	2698.5m MDRT		2301.7 – 2303.8m TVDRT
	2257.9m TVDRT		(-2268.3 – 2270.4m TVDSS)
	(-2224.5m TVDSS)		2881.0 – 2888.5m MDRT
(MGA94) X	595063.7m E		2304.8 – 2306.6m TVDRT
(MGA94) Y	5727263.8m N		(-2271.3 – 2273.2m TVDSS)
Latitude	38° 35' 52.911" S	Datum	GDA94 (Geocentric Datum of Australia)
Longitude	148° 05' 30.022" E	Spheroid	GRS80 (Geodetic Ref. System 1980)
		Projection	UTM (Universal Transverse Mercator)
		Map Grid / Zone	MGA Zone 55
		Central Meridian	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	75.0 deg in Latrobe
Max Well Angle	78.2 deg
Total Depth	2946.0m MDRT
	2319.4m TVDRT
	(-2285.9m TVDSS)
Plug Back Depth	2916.5m MDRT

DATES

Skid Rig	10/05/2006
Kicked Off	12/05/2006
Development Rig Days	22.11
NPT Days	0.88
Rig Released	01/06/2006
I.P. Established	12/06/2006

MISCELLANEOUS

Operator	Esso Australia Pty Ltd	Contractor	International Sea Drilling Ltd
Esso Interest	50%	Rig Name	Nabors Rig 453
Licensee	Esso/BHPBilliton	Equipment Type	Platform
Other JV Interest	50% (BHPB)	Completion Type	Single
Overriding Royalty	2.5% (Weekes)	Completion Size	2-7/8"
Drilling AFE No.	L0501F652		

WELL CLASSIFICATION

Before Drilling	Oil Development	After Drilling	Cased & Completed - Oil well
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II. WELL DATA RECORD - W20A (cont.)

CASING RECORD

Type	Size (Inches)	Weight (lb/ft)	Grade	Thread	Depth (mMDRT)
Conductor *	22				173
Surface *	10¾	40.5	K-55	BTC	675.0
Production	7	26.0	L-80	Vam Top HC	2946.0
Tubing	2⅞	6.4	13Cr-80	Vam Ace	2769.8

* 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	725	Gascon 30 gal / 10 bbl HALAD 413L 30 gal / 10 bbl NF-5 0.25 gal / 10bbl CFR-3L 4 gal / 10 bbl SCR-100L 6.0 gal / 10 bbl	90	152	15.8	2189.0 to 2946.0	2200

II. WELL DATA RECORD (cont.)	
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DRILLING PERFORMANCE

West Kingfish W20A - Final Well Report

GENERAL

Platform:	West Kingfish	Rig:	453	Reservoir:	M1.2 & M1.3 Upper
Well:	W20A	Well Slot:	20	RT-MSL (Rig453)	33.43
Drilling Complexity Index	3.2	Completion Complexity Index	2.8		

DEPTH		PERFORMANCE		MUD	
m MDRT	2,946	20" Cond. Hole	N/A	Max Wt (ppg)	9.8
m TVDRT	2,319.4	12-1/4" Surf. Hole	N/A	Type (Surf. Hole)	N/A
Vert. Section (m)	1,558.1	8-1/2" Prod. Hole	216m/day*	Type (Inter. Hole)	N/A
INCLINATION		6" Liner Hole	N/A	Type (Prod. Hole)	KCl/PPHA/Poly/Glycol
Max (deg) / Ave (deg)	78 / 28 then 75 through Latrobe	* time to drill interval, incl's Connections & NPT.		Type (Liner Hole)	N/A

(deg)	through Earth's		
Comments: New hole drilled: 675m to 2946mMDRT (2.271m MDRT drilled).			

TIME ANALYSIS

Start Date:	10/05/2006, 5:00hrs	Finish Date:	1/06/2006, 1100hrs		
Target Days (P10):	19.1	Total Days:	22.11	% Under Target:	15% over
AFE Days (P50):	21.4	NPT Days:	.88	% of Total Days:	4%
Supplementary AFE Days (P50):	N/A				

COSTS *(based on projected)*

AFE No.:	L0501G652	Revisions:	--	\$ per m	A \$2.32 k / metre (new hole)
\$ per day:	A\$ 239k/day	\$ per day (excl. T + L) * Equipment, LWD & Reeves	A\$ 200 k/day		A\$ 1.79 k / metre* * based on TD not new hole

	Equipment	Materials	Contracts	Allocations	Contingency	Total
AFE (Original)	945,000	849,000	2,809,422	982,078	214,500	A\$5,800,000
AFE (Supplement)						
Projected	1,019,300	460,000	3,068,200	503,000	221,000	A\$5,271,500

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

	<u>Size / Weight / Grade / Thread</u>	m MDRT	m TVDRT	PIT (ppg)
Conductor Casing *	22"	173	173	N/A
Surface Casing *	10-3/4", 40.5 ppf, K55, BTC	675	653	13.0 (PIT)
Prod Casing	7", 26.0 ppf, L80, Vam Top HC	2946	2319	N/A

Comments: * Pre-existing casing strings.

COMPLETION

	<u>Size / Weight / Grade / Thread</u>	mMDRT	mTVDR	Type
Completion	2 7/8", 6.4ppf, 13Cr80, Vam Ace	2769.8	2277	Single oil

	Upper Interval [m MDRT]	Upper Interval [m TVDRT]	Lower Interval [mMDRT]	Lower Interval [mTVDRT]	Gun Type
Perforation Interval:	2868.5 - 2877.0	2301.7 - 2303.8	2881.0 - 2888.5	2304.8 – 2306.6	MAXR

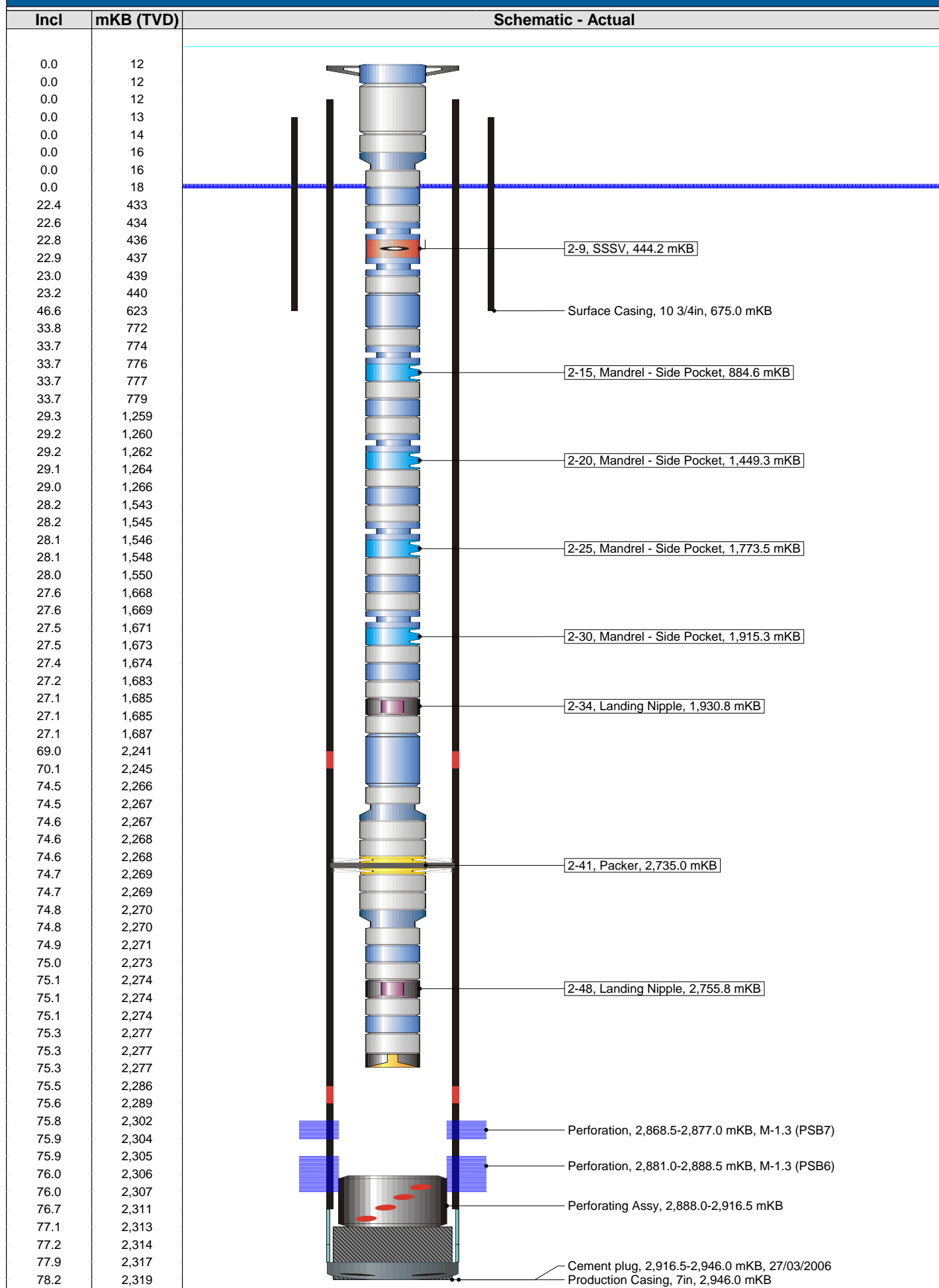
Comments:	Completion was 2 7/8" 13Cr80 with TR-SSSV and 3 SPMs for gas lift, and one packer set at 2735m MDRT.
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ADDITIONAL

		Upper Interval [m MDRT]	Lower Interval [m MDRT]
Logs Run	GR-Resistivity-Density-Neutron-Sonic-Caliper	675	TD 2946

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

West Kingfish W20A: Existing Schematic



III. SAMPLES - W20A

The cuttings sampling programme for WEST KINGFISH W20A are detailed in the following table:

Interval	Formation	Sampling Details
KOP to 150 m above Top of Latrobe (prognosed at 2699m MDRT) 651.0 – 2550.0m 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 2699m MDRT) 2550.0 – 2700.0 mMDRT	Lakes Entrance Formation	Three sets of washed and oven dried cuttings at 10 m intervals.
Top of Latrobe (prognosed at 2699m MDRT) to Total Depth (TD) 2700.0 – 2946.0 mMDRT	Latrobe Group	Three sets of washed and oven dried cuttings at 5 m intervals.

Detailed cuttings descriptions for the interval 675.0 to 2946.0m MDRT (TD) are contained in Appendix 3a.

CONVENTIONAL CORING

No conventional cores were cut in WEST KINGFISH W20A.

SIDEWALL CORING

No sidewall core samples were shot in WEST KINGFISH W20A.

IV. LOGS AND SURVEYS - W20A

Survey/Log	Company	Top (m MDRT)	Bottom (m MDRT)
MWD Run 1, Powerpulse (Directional & GR)	Schlumberger/Anadrill	675.0	2511.0
MWD Run 2, Powerpulse (Directional & GR)	Schlumberger/Anadrill	2511.0	2890.0 (2871.9 bottom of log interval)
MWD Run 3, Powerpulse (Directional & GR)	Schlumberger/Anadrill	2871.9	2946.0 (2929.0 bottom of log interval)
MWD Run 4, (GR) Acquired because GR failed during Run 3	Schlumberger/Anadrill	2871.9	2946.0 (2929.0 bottom of log interval)
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)	675.0 (2478m top of Latrobe logging)	2943.0 (2926.2 bottom of log interval)

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

V. RESERVOIR & FORMATION TOPS - W20A

Horizon	m TVDSS			m MDRT	mTVT HC Column	
	Predicted Tops	ACTUAL	Diff. (m)		Predicted	ACTUAL
Base of Miocene High Velocity Channel	-1360.0	-1359.9	0.1 high	1598.0		
Lakes Entrance Formation	-2030.0	-2028.1	1.9 high	2361.5		
Top Latrobe (TOL)	-2229.0	-2224.5	4.5 high	2698.5		
N.asperus Sequence Boundary (SBN3)	-	-2242.4	-	2765.0		
Top of P1.1 (FSP1)	-2253.0	-2246.3	6.7 high	2780.0	-	Residual
Base of P1.1 (SBP1)	-2253.0	-2247.5	5.5 high	2784.8		
Top of M1.2UMD (SBP2)	-2258.0	-2252.4	5.6 high	2804.5	-	1.5* + 0.7
Top of M1.2L	-2265.0	-2258.9	6.1 high	2830.3	~4.5	1.6
OWC M1.2L		-2260.4		2836.5		
Base of M1.2L (BM12)	-2270.0	-2264.6	5.4 high	2853.7	-	0.3*(PS7)
Top of M1.3U PS6 sand (PSB7)	-2276.0	-2269.3	6.7 high	2872.4	-	0.3 + 0.4*
OWC PS6		-2269.6		2873.9		
Top of PS5 sand (PSB6)	-2279.0	-2272.4	6.6 high	2885.3	-	0.4
OWC PS5		-2272.8		2887.0		
Top of PS4 sand (PSB5)	-2282.0	-2274.3	7.7 high	2893.3	-	Residual
TOTAL DEPTH	-2292.0	-2285.9	6.1 high	2946.0		

* Probable oil.

Net pay thickness is based on 10% porosity cutoff because sands are thin or shaly yet productive.

OWC = Oil-Water Contact

VI. GEOLOGICAL ANALYSIS – WEST KINGFISH W20A

Objectives

The objective of West Kingfish W20A (predrill Location D) was to develop oil reserves in the low permeability M1.2L sand in the area between the wells W2 and W11 southwest of the platform. These two wells each produce from the M1.2L at ~50-70kl/day oil with flat oil rate and water cut trends, suggesting they will have long-life production tails. An additional well was proposed to achieve capture of reserves from this sand through greater well density and early production of oil that otherwise may not be accessed within platform life. Reservoir model studies indicated that an extra well in the vicinity of W20A could potentially capture an additional 0.5MBO from the reservoir. The sand in W20 is of similar character to that seen in the producers W2 and W11.

High clay content and bioturbation is believed to be responsible for the low permeability in this shoreface reservoir. The W11 cores show the section is highly burrowed and churned, with the result that clay is mixed throughout the reservoir. Permeability at W11 is mostly <10md (range ~0.5-230md) (overburden conditions). The reservoir has poor pressure support and the weak reservoir quality also makes the sand susceptible to damage by drilling and completion operations. The M1.2L sand in W20 is believed to have suffered damage by crossflow early in its history following commingling with the highly productive and well supported M1.3U sands.

W20 was initially perforated in the M1.2L in 1983 but had poor productivity (compared to typical production rates from WKF wells at the time), so the well was mostly shut in, until 1985 when M1.3U perforations were added. The well produced commingled, with excellent results from the M1.3, until late 2003, with the first onset of water occurring in 1992. Both sets of perforations have been open since 1985 providing the potential for crossflow from the M1.3U to the M1.2L due to the pressure difference. The GR log run as part of a PLT survey in November 1997 showed strong GR activation over the M1.3U and M1.2L perforations, when the well was at high WC of ~90%, suggesting that water and oil had cross-flowed in the past, with the potential for some formation damage in the low permeability M1.2 sand. The 1997 PLT log gave no indication of crossflow continuing to occur, so crossflow had ceased perhaps due to fines buildup clogging the reservoir. W20 subsequently had a mechanical problem in 2003 and was shut in for over two years before being plugged for redrilling. W20A was a replacement of W20, designed primarily to achieve effective capture from the M1.2L.

The redrill well was planned at a high angle of approximately 75 degrees to improve M1.2L productivity by increasing the measured length of reservoir intersected by the borehole to ~19m MD based on the 5mTVD sand seen at W20. The well was located a sufficient distance from W20 to overcome dumpflood or damage issues and it was also positioned on a low relief structural nose trending to the southwest which could provide a focus for improved oil drainage to the well.

While the possibility of oil in the M1.3U sands was recognised predrill based on oil production up dip at W30 and at W3, and the earlier recovery at W20 itself, this was not a major driver for the well, and was not included in the well justification.

Results

West Kingfish W20A is the second of the infill wells drilled by the small-capacity Rig 453 in 2006. The W20 well had been previously plugged and abandoned to the surface casing by the workover Rig 22. Rig 453 then kicked off W20A below the W20 existing surface casing on 12 May 2006 and drilled 8 ½" production hole to Total Depth of 2946m MDRT. A build section was made through the Lakes Entrance Formation so as the well drilled the Latrobe at the required high angle. The well was logged with Precision Energy Services' compact wireline tools on drillpipe (Shuttle system) and cased and completed (2 7/8" tubing). The well was handed over to production on 1 June 2006.

The Top of Latrobe was intersected at 2698.5m MDRT (-2224.5m TVDSS), 4.5mTVD high to prediction. The top of the objective M1.2L reservoir was intersected at 2830.3m MDRT (-2258.9m TVDSS), 6.1m TVD high to prediction, and the M1.3U PS6 sand was encountered at 2872.4mMD (-2269.3m TVDSS) 6.7m high.

VI. GEOLOGICAL ANALYSIS – WEST KINGFISH W20A

Continued:

The objective M1.2L sand is good quality in W20A with porosity 18% average through the sand. However, despite the well being structurally updip of W2, W20 and W11, only the top 1.6mTVD (6mMD) of the sand in W20A is interpreted as net oil, with the remaining 17mMD (4mTVD) of reservoir containing residual oil. It is possible that the downdip W2 (which produces at low water cut) may have swept some of the M1.2L oil in the area of W20A as a result of aquifer drive from the north. Several wells have watered out in the north, and water is sweeping into the southern area. Nevertheless, the best reservoir rock (20% porosity) is at the top of the M1.2L sand where the 1.6m oil is located, so it is expected that the well should produce effectively in the future from this interval.

In addition to the M1.2L oil zone, oil-bearing reservoir intervals are also interpreted in the shaly M1.2UMD section. Water saturations are high in the M1.2UMD zones, as in the M1.2L, and log interpretation is quite difficult. However the structural and geographic position of the well supports interpretation of oil in these shaly sands. Small tubing (2 7/8") was run to assist the production of the poorer quality reservoirs, which may have high water cut and also limited pressure support.

Small M1.3U net oil zones were encountered in the thin but clean PS6 and PS5 sands, with 0.3m and 0.4mTVD net oil present. Each of these sands has an oil-water contact, with a residual oil section underlying the oil. Sand quality is good with 19% and 17.6% porosity and 45% and 55% Sw respectively in the oil intervals. There are also small intervals of probable oil in shalier sands in the lower parts of the M1.3U PS7 and PS6 sections.

A "bottoms-up" approach was considered suitable, and the well was initially perforated through the M1.3U oil-bearing zones. Initial oil rate was 52kl/D and water cut 88% and the well continues to produce steadily at this rate after 4 months.

The P1.1 sand was also encountered in the well, however the sand has been swept at this location as evidenced by the presence of residual oil.

APPENDIX 1a

WEST KINGFISH W20A

Survey Data



WKF W-20A Final Geodetic Survey

Report Date: May 25, 2006	Survey / DLS Computation Method: Minimum Curvature / Lubinski
Client: Esso Australia Pty Ltd	Vertical Section Azimuth: 245.690°
Field: Kingfish GDA 94	Vertical Section Origin: S 4.350 m, E 1.930 m
Structure / Slot: West Kingfish / 20	TVD Reference Datum: RKB
Well: 20	TVD Reference Elevation: 33.43 m relative to MSL
Borehole: WKF W-20A	Sea Bed / Ground Level Elevation: -76.130 m relative to MSL
UWI/API#:	Magnetic Declination: 13.249°
Survey Name / Date: WKF W-20A Final / May 15, 2006	Total Field Strength: 60125.403 nT
Tort / AHD / DDI / ERD ratio: 179.904° / 1564.18 m / 6.069 / 0.674	Magnetic Dip: -69.063°
Grid Coordinate System: GDA94/MGA94 Zone 55	Declination Date: May 15, 2006
Location Lat/Long: S 38 35 34.835, E 148 6 19.406	Magnetic Declination Model: BGGM 2005
Location Grid N/E Y/X: N 5727806.701 m, E 596264.969 m	North Reference: Grid North
Grid Convergence Angle: -0.68957813°	Total Corr Mag North -> Grid North: +13.939°
Grid Scale Factor: 0.99971412	Local Coordinates Referenced To: Structure Reference Point

*NS and EW are local offsets with respect to top of No. 1 conductor (reference point)

Northings & Eastings are absolute grid coordinates.

Comments	Measured Depth (m)	Inclination (deg)	Azimuth (deg)	TVD (m)	Vertical Section (m)	NS (m)	EW (m)	DLS (deg/30 m)	Northing (m)	Easting (m)	Latitude	Longitude
Tie-In	0.00	0.00	0.00	0.00	0.00	-4.35	1.93	0.00	5727806.70	596264.97	S 38 35 34.835	E 148 6 19.406
	24.53	0.00	0.00	24.53	0.00	-4.35	1.93	0.00	5727806.70	596264.97	S 38 35 34.835	E 148 6 19.406
	30.00	0.01	75.86	30.00	0.00	-4.35	1.93	0.05	5727806.70	596264.97	S 38 35 34.835	E 148 6 19.406
	54.53	0.05	75.86	54.53	-0.01	-4.35	1.94	0.05	5727806.70	596264.98	S 38 35 34.835	E 148 6 19.407
	59.53	0.08	73.94	59.53	-0.02	-4.35	1.95	0.18	5727806.71	596264.99	S 38 35 34.835	E 148 6 19.407
	60.00	0.08	73.79	60.00	-0.02	-4.35	1.95	0.01	5727806.71	596264.99	S 38 35 34.835	E 148 6 19.407
	64.53	0.08	72.33	64.53	-0.03	-4.34	1.96	0.01	5727806.71	596264.99	S 38 35 34.835	E 148 6 19.407
	69.53	0.06	74.32	69.53	-0.03	-4.34	1.96	0.12	5727806.71	596265.00	S 38 35 34.835	E 148 6 19.407
	74.53	0.06	75.88	74.53	-0.04	-4.34	1.97	0.01	5727806.71	596265.01	S 38 35 34.835	E 148 6 19.408
	79.53	0.06	77.41	79.53	-0.04	-4.34	1.97	0.01	5727806.71	596265.01	S 38 35 34.835	E 148 6 19.408
	84.53	0.06	78.95	84.53	-0.05	-4.34	1.98	0.01	5727806.71	596265.02	S 38 35 34.834	E 148 6 19.408
	89.53	0.08	73.92	89.53	-0.05	-4.34	1.98	0.13	5727806.71	596265.02	S 38 35 34.834	E 148 6 19.408
	90.00	0.08	73.57	90.00	-0.05	-4.34	1.98	0.03	5727806.71	596265.02	S 38 35 34.834	E 148 6 19.408
	94.53	0.10	70.89	94.53	-0.06	-4.33	1.99	0.14	5727806.72	596265.03	S 38 35 34.834	E 148 6 19.409
	99.53	0.14	67.07	99.53	-0.07	-4.33	2.00	0.24	5727806.72	596265.04	S 38 35 34.834	E 148 6 19.409
	104.53	0.19	65.01	104.53	-0.09	-4.32	2.01	0.30	5727806.73	596265.05	S 38 35 34.834	E 148 6 19.409
	109.53	0.23	63.73	109.53	-0.10	-4.32	2.03	0.24	5727806.73	596265.07	S 38 35 34.834	E 148 6 19.410
	114.53	0.29	47.86	114.53	-0.13	-4.30	2.05	0.56	5727806.75	596265.09	S 38 35 34.833	E 148 6 19.411
	119.53	0.35	38.84	119.53	-0.15	-4.28	2.07	0.47	5727806.77	596265.11	S 38 35 34.833	E 148 6 19.412
	120.00	0.35	38.42	120.00	-0.15	-4.28	2.07	0.16	5727806.77	596265.11	S 38 35 34.833	E 148 6 19.412
	124.53	0.38	34.62	124.53	-0.18	-4.26	2.09	0.26	5727806.79	596265.12	S 38 35 34.832	E 148 6 19.412
	129.53	0.45	28.68	129.53	-0.21	-4.23	2.10	0.49	5727806.82	596265.14	S 38 35 34.831	E 148 6 19.413
	134.53	0.54	20.72	134.53	-0.24	-4.19	2.12	0.68	5727806.86	596265.16	S 38 35 34.830	E 148 6 19.414
	139.53	0.77	2.28	139.53	-0.27	-4.13	2.13	1.86	5727806.92	596265.17	S 38 35 34.828	E 148 6 19.414
	144.53	0.86	354.14	144.53	-0.30	-4.06	2.13	0.88	5727806.99	596265.17	S 38 35 34.825	E 148 6 19.414
	149.53	0.97	347.66	149.53	-0.32	-3.98	2.12	0.91	5727807.07	596265.16	S 38 35 34.823	E 148 6 19.414
	150.00	0.97	347.16	150.00	-0.32	-3.97	2.11	0.54	5727807.08	596265.15	S 38 35 34.823	E 148 6 19.413
	154.53	1.02	342.51	154.53	-0.33	-3.90	2.09	0.63	5727807.15	596265.13	S 38 35 34.820	E 148 6 19.413
	159.53	1.07	337.85	159.53	-0.34	-3.81	2.06	0.59	5727807.24	596265.10	S 38 35 34.817	E 148 6 19.411
	164.53	1.12	331.23	164.53	-0.34	-3.73	2.02	0.82	5727807.32	596265.06	S 38 35 34.815	E 148 6 19.410
	169.53	1.28	302.00	169.52	-0.31	-3.65	1.95	3.75	5727807.40	596264.99	S 38 35 34.812	E 148 6 19.407
	174.53	1.40	301.80	174.52	-0.24	-3.59	1.85	0.72	5727807.46	596264.89	S 38 35 34.810	E 148 6 19.402
	179.53	1.54	296.64	179.52	-0.16	-3.53	1.74	1.16	5727807.52	596264.78	S 38 35 34.808	E 148 6 19.398
	180.00	1.59	295.21	179.99	-0.16	-3.52	1.73	4.05	5727807.53	596264.77	S 38 35 34.808	E 148 6 19.397
	184.53	2.11	285.02	184.52	-0.05	-3.48	1.59	4.06	5727807.57	596264.63	S 38 35 34.807	E 148 6 19.392
	189.53	2.48	281.95	189.51	0.11	-3.43	1.40	2.34	5727807.62	596264.44	S 38 35 34.805	E 148 6 19.384
	194.53	3.35	272.72	194.51	0.33	-3.40	1.14	5.91	5727807.65	596264.18	S 38 35 34.804	E 148 6 19.373
	199.53	3.86	270.49	199.50	0.61	-3.39	0.83	3.17	5727807.66	596263.87	S 38 35 34.804	E 148 6 19.360
	204.53	4.70	267.00	204.48	0.95	-3.40	0.46	5.27	5727807.65	596263.50	S 38 35 34.805	E 148 6 19.345
	209.53	5.50	266.05	209.46	1.37	-3.43	0.01	4.83	5727807.62	596263.05	S 38 35 34.806	E 148 6 19.326
	210.00	5.60	265.95	209.93	1.41	-3.43	-0.03	6.41	5727807.62	596263.01	S 38 35 34.806	E 148 6 19.325
	214.53	6.61	265.13	214.44	1.86	-3.47	-0.51	6.71	5727807.58	596262.53	S 38 35 34.807	E 148 6 19.305
	219.53	7.59	263.19	219.40	2.45	-3.53	-1.13	6.05	5727807.52	596261.91	S 38 35 34.810	E 148 6 19.279
	224.53	8.75	260.52	224.35	3.13	-3.64	-1.83	7.32	5727807.42	596261.21	S 38 35 34.813	E 148 6 19.250
	229.53	9.30	258.75	229.29	3.89	-3.78	-2.60	3.70	5727807.27	596260.44	S 38 35 34.818	E 148 6 19.219
	234.53	9.89	256.77	234.22	4.71	-3.95	-3.42	4.06	5727807.10	596259.63	S 38 35 34.824	E 148 6 19.185
	239.53	10.10	256.31	239.14	5.56	-4.16	-4.26	1.35	5727806.90	596258.78	S 38 35 34.831	E 148 6 19.150
	240.00	10.12	256.29	239.60	5.64	-4.18	-4.34	1.30	5727806.88	596258.70	S 38 35 34.832	E 148 6 19.147

244.53	10.29	256.12	244.06	6.43	-4.37	-5.12	1.14	5727806.68	596257.92	S 38 35 34.838	E 148 6 19.115
249.53	10.41	256.00	248.98	7.31	-4.58	-5.99	0.73	5727806.47	596257.05	S 38 35 34.846	E 148 6 19.079
254.53	10.58	255.99	253.90	8.21	-4.80	-6.87	1.02	5727806.25	596256.17	S 38 35 34.853	E 148 6 19.042
259.53	10.82	256.04	258.81	9.12	-5.03	-7.78	1.44	5727806.02	596255.27	S 38 35 34.861	E 148 6 19.005
264.53	10.97	256.35	263.72	10.05	-5.25	-8.69	0.97	5727805.80	596254.35	S 38 35 34.868	E 148 6 18.968
269.53	11.14	256.58	268.63	10.99	-5.48	-9.63	1.05	5727805.57	596253.42	S 38 35 34.876	E 148 6 18.929
270.00	11.16	256.59	269.09	11.08	-5.50	-9.71	1.28	5727805.55	596253.33	S 38 35 34.877	E 148 6 18.926
274.53	11.38	256.72	273.53	11.95	-5.70	-10.58	1.47	5727805.35	596252.47	S 38 35 34.884	E 148 6 18.890
279.53	11.66	257.18	278.43	12.93	-5.93	-11.55	1.77	5727805.12	596251.50	S 38 35 34.891	E 148 6 18.850
284.53	11.85	257.37	283.32	13.93	-6.15	-12.54	1.16	5727804.90	596250.50	S 38 35 34.899	E 148 6 18.809
289.53	12.22	257.30	288.21	14.95	-6.38	-13.56	2.22	5727804.67	596249.49	S 38 35 34.907	E 148 6 18.767
294.53	12.33	257.68	293.10	15.99	-6.61	-14.60	0.82	5727804.44	596248.45	S 38 35 34.915	E 148 6 18.724
299.53	13.03	256.83	297.98	17.07	-6.85	-15.67	4.35	5727804.20	596247.38	S 38 35 34.923	E 148 6 18.680
300.00	13.05	256.82	298.44	17.17	-6.88	-15.77	1.28	5727804.17	596247.27	S 38 35 34.924	E 148 6 18.676
304.53	13.27	256.75	302.85	18.18	-7.11	-16.77	1.46	5727803.94	596246.27	S 38 35 34.932	E 148 6 18.635
309.53	13.60	256.51	307.71	19.32	-7.38	-17.90	2.01	5727803.67	596245.14	S 38 35 34.941	E 148 6 18.588
314.53	13.75	256.26	312.57	20.49	-7.66	-19.05	0.97	5727803.39	596243.99	S 38 35 34.950	E 148 6 18.541
319.53	14.17	255.90	317.42	21.67	-7.95	-20.22	2.57	5727803.10	596242.82	S 38 35 34.960	E 148 6 18.492
324.53	14.27	256.02	322.27	22.88	-8.25	-21.42	0.63	5727802.80	596241.63	S 38 35 34.970	E 148 6 18.443
329.53	14.59	255.75	327.11	24.11	-8.55	-22.62	1.96	5727802.50	596240.42	S 38 35 34.981	E 148 6 18.394
330.00	14.62	255.74	327.56	24.22	-8.58	-22.74	1.92	5727802.47	596240.31	S 38 35 34.982	E 148 6 18.389
334.53	14.86	255.63	331.95	25.36	-8.87	-23.86	1.60	5727802.19	596239.19	S 38 35 34.991	E 148 6 18.343
339.53	15.19	255.93	336.77	26.63	-9.19	-25.11	2.03	5727801.87	596237.94	S 38 35 35.002	E 148 6 18.291
344.53	15.42	255.80	341.60	27.93	-9.51	-26.39	1.40	5727801.54	596236.66	S 38 35 35.013	E 148 6 18.238
349.53	15.68	255.91	346.41	29.25	-9.84	-27.69	1.57	5727801.22	596235.36	S 38 35 35.024	E 148 6 18.185
354.53	15.78	256.05	351.23	30.59	-10.16	-29.01	0.64	5727800.89	596234.04	S 38 35 35.035	E 148 6 18.131
359.53	16.15	255.85	356.03	31.94	-10.50	-30.34	2.24	5727800.56	596232.71	S 38 35 35.047	E 148 6 18.076
360.00	16.18	255.87	356.49	32.07	-10.53	-30.47	1.95	5727800.52	596232.58	S 38 35 35.048	E 148 6 18.070
364.53	16.46	256.02	360.83	33.32	-10.84	-31.70	1.88	5727800.21	596231.35	S 38 35 35.058	E 148 6 18.020
369.53	16.73	256.22	365.62	34.73	-11.18	-33.09	1.66	5727799.87	596229.96	S 38 35 35.070	E 148 6 17.963
374.53	16.91	256.19	370.41	36.15	-11.53	-34.49	1.08	5727799.53	596228.56	S 38 35 35.082	E 148 6 17.905
379.53	17.27	256.05	375.19	37.59	-11.88	-35.92	2.17	5727799.17	596227.13	S 38 35 35.094	E 148 6 17.846
384.53	17.38	256.38	379.96	39.06	-12.23	-37.37	0.89	5727798.82	596225.68	S 38 35 35.106	E 148 6 17.786
389.53	17.93	256.04	384.73	40.55	-12.60	-38.84	3.36	5727798.46	596224.21	S 38 35 35.118	E 148 6 17.726
390.00	17.96	256.03	385.17	40.69	-12.63	-38.98	1.92	5727798.42	596224.07	S 38 35 35.119	E 148 6 17.720
394.53	18.27	255.94	389.48	42.08	-12.97	-40.35	2.06	5727798.08	596222.71	S 38 35 35.131	E 148 6 17.664
399.53	18.49	256.23	394.22	43.63	-13.35	-41.88	1.43	5727797.70	596221.18	S 38 35 35.144	E 148 6 17.600
404.53	19.00	256.04	398.96	45.21	-13.74	-43.44	3.08	5727797.32	596219.62	S 38 35 35.157	E 148 6 17.536
409.53	19.36	256.27	403.68	46.82	-14.13	-45.03	2.21	5727796.93	596218.02	S 38 35 35.170	E 148 6 17.471
414.53	19.84	256.14	408.39	48.47	-14.53	-46.66	2.89	5727796.53	596216.39	S 38 35 35.184	E 148 6 17.403
419.53	20.25	256.02	413.09	50.16	-14.94	-48.32	2.47	5727796.11	596214.73	S 38 35 35.198	E 148 6 17.335
420.00	20.32	255.99	413.53	50.32	-14.98	-48.48	4.52	5727796.07	596214.57	S 38 35 35.199	E 148 6 17.328
424.53	20.99	255.76	417.77	51.89	-15.37	-50.03	4.47	5727795.68	596213.02	S 38 35 35.213	E 148 6 17.265
429.53	21.10	256.03	422.44	53.66	-15.81	-51.77	0.88	5727795.25	596211.28	S 38 35 35.227	E 148 6 17.193
434.53	21.80	255.61	427.09	55.46	-16.26	-53.55	4.30	5727794.80	596209.51	S 38 35 35.243	E 148 6 17.120
439.53	22.32	255.35	431.72	57.31	-16.73	-55.36	3.17	5727794.33	596207.69	S 38 35 35.259	E 148 6 17.045
444.53	22.80	255.43	436.34	59.20	-17.21	-57.22	2.89	5727793.84	596205.84	S 38 35 35.275	E 148 6 16.968
449.53	23.20	255.35	440.94	61.12	-17.70	-59.11	2.41	5727793.35	596203.95	S 38 35 35.292	E 148 6 16.891
450.00	23.25	255.34	441.38	61.31	-17.75	-59.29	3.20	5727793.30	596203.77	S 38 35 35.293	E 148 6 16.883
454.53	23.73	255.23	445.53	63.09	-18.21	-61.04	3.19	5727792.85	596202.02	S 38 35 35.309	E 148 6 16.811
459.53	24.47	255.03	450.09	65.10	-18.73	-63.01	4.47	5727792.32	596200.05	S 38 35 35.327	E 148 6 16.730
464.53	24.76	255.03	454.64	67.16	-19.27	-65.02	1.74	5727791.78	596198.04	S 38 35 35.345	E 148 6 16.647
469.53	25.31	254.93	459.17	69.25	-19.82	-67.06	3.31	5727791.24	596195.99	S 38 35 35.363	E 148 6 16.563
474.53	25.96	254.71	463.68	71.38	-20.39	-69.15	3.94	5727790.67	596193.91	S 38 35 35.383	E 148 6 16.477
479.53	26.39	254.71	468.16	73.56	-20.97	-71.28	2.58	5727790.09	596191.78	S 38 35 35.402	E 148 6 16.389
480.00	26.43	254.71	468.59	73.77	-21.02	-71.48	2.55	5727790.03	596191.58	S 38 35 35.404	E 148 6 16.381
484.53	26.78	254.76	472.64	75.77	-21.56	-73.44	2.32	5727789.50	596189.62	S 38 35 35.422	E 148 6 16.300
489.53	27.51	254.60	477.09	78.02	-22.16	-75.64	4.40	5727788.90	596187.42	S 38 35 35.443	E 148 6 16.210
494.53	27.79	254.72	481.51	80.31	-22.77	-77.88	1.71	5727788.28	596185.19	S 38 35 35.463	E 148 6 16.118
499.53	28.78	254.17	485.92	82.66	-23.41	-80.16	6.14	5727787.65	596182.90	S 38 35 35.485	E 148 6 16.024
504.53	29.00	254.40	490.29	85.04	-24.06	-82.48	1.48	5727786.99	596180.58	S 38 35 35.507	E 148 6 15.928
509.53	29.73	254.13	494.65	87.47	-24.73	-84.84	4.45	5727786.33	596178.22	S 38 35 35.530	E 148 6 15.831
510.00	29.74	254.16	495.06	87.70	-24.79	-85.07	1.14	5727786.27	596178.00	S 38 35 35.532	E 148 6 15.822
514.53	29.79	254.46	498.99	89.92	-25.40	-87.23	1.04	5727785.66	596175.83	S 38 35 35.552	E 148 6 15.732
519.53	30.94	253.85	503.31	92.42	-26.09	-89.66	7.14	5727784.97	596173.40	S 38 35 35.576	E 148 6 15.632
524.53	31.23	253.96	507.59	94.98	-26.81	-92.15	1.77	5727784.25	596170.92	S 38 35 35.600	E 148 6 15.530
529.53	31.64	254.09	511.86	97.56	-27.52	-94.65	2.49	5727783.53	596168.42	S 38 35 35.624	E 148 6 15.427

1682.43	30.24	244.31	1466.48	727.96	-305.69	-660.73	0.29	5727505.44	595602.49	S 38 35 44.865	E 148 5 52.174
1711.73	29.39	244.52	1491.91	742.53	-311.98	-673.87	0.88	5727499.15	595589.36	S 38 35 45.074	E 148 5 51.634
1740.32	28.62	245.05	1516.91	756.39	-317.89	-686.41	0.85	5727493.25	595576.82	S 38 35 45.270	E 148 5 51.119
1769.67	28.24	245.59	1542.72	770.36	-323.73	-699.11	0.47	5727487.42	595564.13	S 38 35 45.464	E 148 5 50.597
1798.67	27.48	245.37	1568.36	783.91	-329.35	-711.44	0.79	5727481.79	595551.80	S 38 35 45.651	E 148 5 50.091
1827.64	29.57	244.90	1593.81	797.74	-335.17	-723.99	2.18	5727475.98	595539.26	S 38 35 45.845	E 148 5 49.575
1855.91	29.01	245.48	1618.47	811.57	-340.97	-736.55	0.67	5727470.18	595526.71	S 38 35 46.038	E 148 5 49.059
1884.87	28.52	245.00	1643.85	825.51	-346.81	-749.20	0.56	5727464.34	595514.05	S 38 35 46.232	E 148 5 48.539
1913.53	27.59	244.89	1669.14	838.99	-352.52	-761.41	0.97	5727458.63	595501.85	S 38 35 46.422	E 148 5 48.037
1942.40	26.83	244.54	1694.82	852.19	-358.15	-773.35	0.81	5727453.00	595489.91	S 38 35 46.609	E 148 5 47.547
1971.75	27.82	244.37	1720.89	865.66	-363.96	-785.50	1.02	5727447.19	595477.76	S 38 35 46.802	E 148 5 47.047
2000.01	27.44	244.07	1745.93	878.76	-369.66	-797.30	0.43	5727441.49	595465.96	S 38 35 46.992	E 148 5 46.563
2028.99	26.94	244.59	1771.71	892.00	-375.40	-809.24	0.57	5727435.76	595454.03	S 38 35 47.183	E 148 5 46.072
2057.82	29.28	244.92	1797.14	905.58	-381.19	-821.53	2.44	5727429.97	595441.75	S 38 35 47.375	E 148 5 45.567
2086.13	28.98	244.47	1821.87	919.36	-387.08	-833.98	0.39	5727424.08	595429.29	S 38 35 47.571	E 148 5 45.055
2114.27	28.28	244.27	1846.56	932.84	-392.91	-846.14	0.75	5727418.25	595417.14	S 38 35 47.765	E 148 5 44.556
2143.80	27.40	244.34	1872.68	946.62	-398.89	-858.57	0.89	5727412.27	595404.72	S 38 35 47.963	E 148 5 44.045
2171.65	28.15	244.42	1897.32	959.60	-404.51	-870.27	0.81	5727406.66	595393.02	S 38 35 48.150	E 148 5 43.565
2201.22	28.95	246.24	1923.29	973.73	-410.40	-883.11	1.20	5727400.77	595380.18	S 38 35 48.346	E 148 5 43.037
2230.09	28.34	245.38	1948.63	987.57	-416.07	-895.74	0.77	5727395.10	595367.56	S 38 35 48.535	E 148 5 42.518
2258.89	27.57	245.72	1974.07	1001.07	-421.66	-908.03	0.82	5727389.51	595355.27	S 38 35 48.721	E 148 5 42.013
2287.33	30.20	247.14	1998.97	1014.80	-427.15	-920.62	2.87	5727384.03	595342.68	S 38 35 48.904	E 148 5 41.495
2316.69	31.70	246.61	2024.15	1029.90	-433.08	-934.50	1.56	5727378.10	595328.80	S 38 35 49.101	E 148 5 40.925
2345.46	34.08	245.32	2048.30	1045.52	-439.44	-948.77	2.59	5727371.73	595314.54	S 38 35 49.313	E 148 5 40.338
2373.81	35.28	245.70	2071.62	1061.65	-446.13	-963.45	1.29	5727365.05	595299.87	S 38 35 49.536	E 148 5 39.735
2402.35	37.26	246.37	2094.63	1078.53	-452.99	-978.88	2.12	5727358.19	595284.44	S 38 35 49.764	E 148 5 39.101
2431.27	40.90	245.77	2117.07	1096.76	-460.38	-995.54	3.80	5727350.80	595267.79	S 38 35 50.010	E 148 5 38.416
2459.03	42.82	245.66	2137.75	1115.28	-468.00	-1012.42	2.08	5727343.18	595250.91	S 38 35 50.264	E 148 5 37.722
2488.00	45.39	245.34	2158.55	1135.44	-476.36	-1030.77	2.67	5727334.82	595232.57	S 38 35 50.542	E 148 5 36.968
2517.61	49.71	246.31	2178.53	1157.29	-485.30	-1050.69	4.44	5727325.89	595212.65	S 38 35 50.840	E 148 5 36.149
2546.73	55.95	247.91	2196.11	1180.47	-494.31	-1072.07	6.56	5727316.88	595191.28	S 38 35 51.140	E 148 5 35.270
2575.77	60.70	246.52	2211.36	1205.17	-503.89	-1094.84	5.06	5727307.31	595168.51	S 38 35 51.459	E 148 5 34.334
2604.45	64.45	246.50	2224.57	1230.62	-514.03	-1118.18	3.92	5727297.17	595145.18	S 38 35 51.797	E 148 5 33.374
2633.12	67.90	248.28	2236.15	1256.83	-524.11	-1142.39	3.99	5727287.09	595120.97	S 38 35 52.133	E 148 5 32.379
2661.54	70.43	248.39	2246.25	1283.36	-533.91	-1167.08	2.67	5727277.29	595096.30	S 38 35 52.461	E 148 5 31.364
2690.06	72.05	247.45	2255.43	1310.34	-544.06	-1192.10	1.94	5727267.14	595071.28	S 38 35 52.800	E 148 5 30.335
2719.33	74.27	244.91	2263.91	1338.35	-555.38	-1217.72	3.37	5727255.83	595045.67	S 38 35 53.177	E 148 5 29.282
2747.50	74.93	244.96	2271.39	1365.51	-566.88	-1242.32	0.70	5727244.33	595021.07	S 38 35 53.559	E 148 5 28.271
2776.37	75.40	244.92	2278.78	1393.41	-578.71	-1267.60	0.49	5727232.51	594995.80	S 38 35 53.952	E 148 5 27.232
2805.15	75.49	245.23	2286.01	1421.27	-590.44	-1292.86	0.33	5727220.77	594970.55	S 38 35 54.343	E 148 5 26.194
2833.96	75.62	245.27	2293.20	1449.16	-602.13	-1318.20	0.14	5727209.10	594945.22	S 38 35 54.731	E 148 5 25.153
2862.67	75.70	245.06	2300.31	1476.98	-613.81	-1343.44	0.23	5727197.42	594919.98	S 38 35 55.120	E 148 5 24.115
2889.43	76.06	246.10	2306.84	1502.93	-624.54	-1367.07	1.20	5727186.69	594896.36	S 38 35 55.477	E 148 5 23.144
2919.19	77.19	245.82	2313.72	1531.88	-636.33	-1393.51	1.17	5727174.90	594869.92	S 38 35 55.869	E 148 5 22.057
2926.49	77.73	245.56	2315.31	1539.01	-639.26	-1400.01	2.45	5727171.97	594863.43	S 38 35 55.967	E 148 5 21.790
2946.00	78.20	245.25	2319.37	1558.09	-647.21	-1417.36	0.86	5727164.03	594846.09	S 38 35 56.231	E 148 5 21.077

Projected to TD

Survey Type: Definitive Survey

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

Surveying Prog:

MD From (m)

0.00

109.56

674.53

MD To (m)

109.56

674.53

2946.00

EOU Freq

Act-Stns

Act-Stns

Act-Stns

Survey Tool Type

SLB_CNSG+CASING-Depth Only

SLB_CNSG+CASING

SLB_MWD-STD

Borehole -> Survey

WKF W-20A -> WKF W-20A Final

WKF W-20A -> WKF W-20A Final

WKF W-20A -> WKF W-20A Final

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

APPENDIX 1b

WEST KINGFISH W20A

Survey Data Listing

Report Date:	13 September 2006
Well:	West Kingfish W20A
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' 34.834", E 148 6' 19.406"
Location Grid N/E:	N 5727806.701 m, E 596264.969 m
Survey Azimuth Reference:	Grid North

*Dnorth and Deast are with respect to top of conductor W20, whereas NS and EW offsets on Anadrill/Schlumberger survey data are with respect to No. 1 conductor. Northings and Eastings are absolute grid coordinates.

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
0	0	360	0	33.43	0	0	5727806.70	596264.97
5	0	0	5	28.43	0	0	5727806.70	596264.97
10	0	0	10	23.43	0	0	5727806.70	596264.97
15	0	0	15	18.43	0	0	5727806.70	596264.97
20	0	0	20	13.43	0	0	5727806.70	596264.97
25	0	6.52	25	8.43	0	0	5727806.70	596264.97
30	0.01	75.86	30	3.43	0	0	5727806.70	596264.97
35	0.02	75.86	35	-1.57	0	0	5727806.70	596264.97
40	0.03	75.86	40	-6.57	0	0	5727806.70	596264.98
45	0.03	75.86	45	-11.57	0	0.01	5727806.70	596264.98
50	0.04	75.86	50	-16.57	0	0.01	5727806.70	596264.98
55	0.05	75.68	55	-21.57	0	0.01	5727806.70	596264.98
60	0.08	73.79	60.00	-26.57	0.01	0.02	5727806.71	596264.99
65	0.08	72.52	65.00	-31.57	0.01	0.03	5727806.71	596265.00
70	0.06	74.47	70.00	-36.57	0.01	0.03	5727806.71	596265.00
75	0.06	76.02	75.00	-41.57	0.01	0.04	5727806.71	596265.01
80	0.06	77.55	80.00	-46.57	0.01	0.04	5727806.71	596265.01
85	0.06	78.48	85.00	-51.57	0.01	0.05	5727806.71	596265.02
90	0.08	73.57	90.00	-56.57	0.01	0.05	5727806.71	596265.03
95	0.10	70.53	95.00	-61.57	0.02	0.06	5727806.72	596265.03
100	0.14	66.88	100.00	-66.57	0.02	0.07	5727806.72	596265.04
105	0.19	64.89	105.00	-71.57	0.03	0.08	5727806.73	596265.06
110	0.24	62.24	110.00	-76.57	0.03	0.10	5727806.73	596265.07
115	0.30	47.01	115.00	-81.57	0.05	0.12	5727806.75	596265.09
120	0.35	38.42	120.00	-86.57	0.07	0.14	5727806.77	596265.11
125	0.39	34.06	125.00	-91.57	0.09	0.16	5727806.79	596265.13
130	0.46	27.93	130.00	-96.57	0.13	0.18	5727806.83	596265.15
135	0.56	18.99	135.00	-101.57	0.17	0.19	5727806.87	596265.16
140	0.78	3.05	140.00	-106.57	0.22	0.20	5727806.92	596265.17
145	0.87	353.53	145.00	-111.57	0.30	0.20	5727806.99	596265.17
150	0.97	347.16	150.00	-116.57	0.38	0.18	5727807.08	596265.16
155	1.02	342.07	155.00	-121.57	0.46	0.16	5727807.16	596265.13
160	1.07	337.23	160.00	-126.57	0.55	0.13	5727807.25	596265.10
165	1.14	328.48	165.00	-131.57	0.63	0.09	5727807.33	596265.06
170	1.29	301.98	169.99	-136.56	0.70	0.01	5727807.40	596264.98
175	1.41	301.31	174.99	-141.56	0.76	-0.09	5727807.46	596264.88
180	1.59	295.21	179.99	-146.56	0.82	-0.20	5727807.52	596264.77
185	2.14	284.73	184.99	-151.56	0.88	-0.36	5727807.58	596264.62
190	2.56	281.08	189.98	-156.55	0.92	-0.56	5727807.62	596264.42
195	3.40	272.51	194.98	-161.55	0.95	-0.81	5727807.65	596264.16
200	3.94	270.16	199.97	-166.54	0.96	-1.13	5727807.66	596263.84
205	4.78	266.91	204.95	-171.52	0.95	-1.51	5727807.65	596263.46
210	5.60	265.95	209.93	-176.50	0.92	-1.96	5727807.62	596263.01
215	6.70	264.95	214.90	-181.47	0.87	-2.50	5727807.57	596262.48
220	7.70	262.94	219.86	-186.43	0.81	-3.12	5727807.51	596261.85
225	8.80	260.35	224.81	-191.38	0.70	-3.83	5727807.40	596261.14
230	9.36	258.56	229.75	-196.32	0.56	-4.60	5727807.26	596260.37

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
235	9.91	256.73	234.68	-201.25	0.38	-5.42	5727807.08	596259.55
240	10.12	256.29	239.60	-206.17	0.17	-6.27	5727806.87	596258.70
245	10.30	256.11	244.52	-211.09	-0.04	-7.13	5727806.66	596257.84
250	10.43	256.00	249.44	-216.01	-0.25	-8.00	5727806.45	596256.97
255	10.60	255.99	254.36	-220.93	-0.47	-8.89	5727806.23	596256.09
260	10.83	256.07	259.27	-225.84	-0.70	-9.79	5727806.00	596255.18
265	10.99	256.37	264.18	-230.75	-0.92	-10.71	5727805.78	596254.26
270	11.16	256.59	269.09	-235.66	-1.15	-11.64	5727805.55	596253.33
275	11.41	256.76	273.99	-240.56	-1.37	-12.59	5727805.33	596252.38
280	11.68	257.20	278.89	-245.46	-1.60	-13.57	5727805.10	596251.40
285	11.88	257.36	283.78	-250.35	-1.82	-14.56	5727804.88	596250.41
290	12.23	257.34	288.67	-255.24	-2.05	-15.58	5727804.65	596249.39
295	12.40	257.60	293.56	-260.13	-2.28	-16.62	5727804.42	596248.35
300	13.05	256.82	298.44	-265.01	-2.53	-17.70	5727804.17	596247.28
305	13.30	256.73	303.30	-269.87	-2.79	-18.80	5727803.91	596246.17
310	13.61	256.49	308.17	-274.74	-3.06	-19.94	5727803.64	596245.03
315	13.79	256.23	313.02	-279.60	-3.34	-21.09	5727803.36	596243.89
320	14.18	255.91	317.88	-284.45	-3.63	-22.26	5727803.07	596242.71
325	14.30	255.99	322.72	-289.29	-3.93	-23.45	5727802.77	596241.52
330	14.62	255.74	327.56	-294.13	-4.23	-24.66	5727802.47	596240.31
335	14.89	255.66	332.40	-298.97	-4.55	-25.90	5727802.15	596239.08
340	15.21	255.92	337.23	-303.80	-4.86	-27.16	5727801.84	596237.82
345	15.44	255.81	342.05	-308.62	-5.19	-28.44	5727801.51	596236.54
350	15.69	255.92	346.87	-313.44	-5.52	-29.74	5727801.18	596235.23
355	15.81	256.03	351.68	-318.25	-5.84	-31.05	5727800.86	596233.92
360	16.18	255.87	356.49	-323.06	-6.18	-32.39	5727800.52	596232.58
365	16.49	256.04	361.28	-327.85	-6.52	-33.75	5727800.18	596231.22
370	16.75	256.22	366.07	-332.64	-6.86	-35.14	5727799.84	596229.83
375	16.94	256.18	370.86	-337.43	-7.21	-36.55	5727799.49	596228.42
380	17.28	256.08	375.64	-342.21	-7.56	-37.98	5727799.14	596227.00
385	17.43	256.35	380.41	-346.98	-7.91	-39.42	5727798.79	596225.55
390	17.96	256.03	385.18	-351.75	-8.28	-40.90	5727798.42	596224.07
395	18.29	255.97	389.93	-356.50	-8.65	-42.41	5727798.05	596222.56
400	18.54	256.21	394.67	-361.24	-9.03	-43.94	5727797.67	596221.03
405	19.03	256.06	399.40	-365.97	-9.42	-45.50	5727797.28	596219.47
410	19.41	256.26	404.13	-370.70	-9.81	-47.10	5727796.89	596217.87
415	19.88	256.13	408.83	-375.40	-10.21	-48.73	5727796.49	596216.24
420	20.32	255.99	413.53	-380.10	-10.63	-50.40	5727796.07	596214.57
425	21.00	255.79	418.21	-384.78	-11.06	-52.11	5727795.64	596212.86
430	21.17	255.99	422.87	-389.44	-11.50	-53.85	5727795.20	596211.12
435	21.85	255.59	427.53	-394.10	-11.95	-55.63	5727794.75	596209.34
440	22.37	255.36	432.16	-398.73	-12.42	-57.45	5727794.28	596207.52
445	22.84	255.42	436.77	-403.34	-12.90	-59.31	5727793.80	596205.66
450	23.25	255.34	441.38	-407.94	-13.40	-61.20	5727793.30	596203.77
455	23.80	255.21	445.96	-412.53	-13.90	-63.13	5727792.80	596201.84
460	24.50	255.03	450.52	-417.09	-14.43	-65.11	5727792.27	596199.86
465	24.81	255.02	455.07	-421.64	-14.97	-67.12	5727791.73	596197.85
470	25.37	254.91	459.59	-426.16	-15.52	-69.17	5727791.18	596195.80
475	26.00	254.71	464.10	-430.67	-16.09	-71.26	5727790.61	596193.71
480	26.43	254.71	468.59	-435.16	-16.67	-73.39	5727790.03	596191.58
485	26.85	254.74	473.06	-439.63	-17.26	-75.56	5727789.44	596189.42
490	27.54	254.61	477.50	-444.07	-17.86	-77.76	5727788.84	596187.21
495	27.88	254.67	481.93	-448.50	-18.48	-80.00	5727788.22	596184.97
500	28.80	254.19	486.33	-452.90	-19.12	-82.29	5727787.58	596182.69
505	29.07	254.37	490.71	-457.28	-19.77	-84.61	5727786.93	596180.36
510	29.74	254.16	495.06	-461.63	-20.44	-86.98	5727786.26	596177.99
515	29.90	254.40	499.40	-465.97	-21.11	-89.37	5727785.59	596175.60
520	30.97	253.86	503.71	-470.28	-21.80	-91.81	5727784.90	596173.17
525	31.27	253.97	507.99	-474.56	-22.52	-94.29	5727784.18	596170.68

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
530	31.71	254.06	512.26	-478.82	-23.24	-96.80	5727783.46	596168.18
535	32.41	253.79	516.49	-483.06	-23.97	-99.35	5727782.73	596165.63
540	33.09	253.72	520.70	-487.27	-24.73	-101.94	5727781.97	596163.03
545	33.29	253.94	524.88	-491.45	-25.49	-104.57	5727781.21	596160.40
550	34.06	253.71	529.04	-495.61	-26.26	-107.23	5727780.44	596157.74
555	34.71	253.61	533.17	-499.74	-27.06	-109.94	5727779.64	596155.03
560	35.00	253.74	537.27	-503.84	-27.86	-112.68	5727778.84	596152.29
565	35.79	253.50	541.35	-507.92	-28.68	-115.46	5727778.02	596149.51
570	36.22	253.53	545.39	-511.96	-29.51	-118.28	5727777.19	596146.69
575	36.91	253.44	549.41	-515.98	-30.36	-121.13	5727776.34	596143.84
580	37.38	253.42	553.39	-519.97	-31.22	-124.03	5727775.48	596140.94
585	38.05	253.34	557.35	-523.92	-32.09	-126.96	5727774.61	596138.01
590	38.55	253.33	561.27	-527.84	-32.98	-129.93	5727773.72	596135.04
595	39.23	253.23	565.16	-531.74	-33.88	-132.93	5727772.82	596132.04
600	39.78	253.15	569.02	-535.59	-34.80	-135.98	5727771.89	596128.99
605	40.11	253.41	572.86	-539.43	-35.73	-139.05	5727770.97	596125.92
610	40.82	253.17	576.66	-543.23	-36.66	-142.16	5727770.04	596122.81
615	41.78	253.05	580.42	-546.99	-37.62	-145.31	5727769.08	596119.66
620	42.40	253.04	584.13	-550.70	-38.60	-148.52	5727768.10	596116.45
625	43.00	253.00	587.80	-554.37	-39.59	-151.76	5727767.11	596113.21
630	43.50	252.86	591.44	-558.01	-40.59	-155.04	5727766.11	596109.94
635	43.83	253.19	595.06	-561.63	-41.60	-158.34	5727765.10	596106.63
640	44.16	253.20	598.66	-565.23	-42.60	-161.66	5727764.09	596103.31
645	44.82	253.31	602.22	-568.79	-43.61	-165.02	5727763.09	596099.96
650	45.51	253.16	605.75	-572.32	-44.64	-168.41	5727762.06	596096.56
655	45.77	253.43	609.24	-575.81	-45.66	-171.84	5727761.04	596093.14
660	46.09	253.29	612.72	-579.29	-46.69	-175.28	5727760.01	596089.70
665	46.27	253.34	616.18	-582.75	-47.73	-178.73	5727758.97	596086.24
670	46.46	253.30	619.63	-586.20	-48.77	-182.20	5727757.93	596082.77
675	46.56	253.06	623.08	-589.65	-49.81	-185.67	5727756.89	596079.30
680	47.22	251.26	626.50	-593.07	-50.93	-189.14	5727755.77	596075.83
685	47.87	249.46	629.88	-596.45	-52.18	-192.60	5727754.52	596072.37
690	48.52	247.65	633.22	-599.79	-53.55	-196.06	5727753.15	596068.91
695	49.18	245.85	636.52	-603.09	-55.04	-199.51	5727751.66	596065.47
700	49.83	244.05	639.77	-606.35	-56.66	-202.94	5727750.04	596062.03
705	50.49	242.25	642.98	-609.55	-58.40	-206.36	5727748.30	596058.62
710	50.65	241.37	646.15	-612.72	-60.23	-209.76	5727746.47	596055.21
715	50.54	241.01	649.33	-615.90	-62.09	-213.14	5727744.61	596051.83
720	50.43	240.65	652.51	-619.08	-63.97	-216.51	5727742.73	596048.46
725	50.32	240.29	655.70	-622.27	-65.87	-219.86	5727740.83	596045.11
730	50.20	239.93	658.89	-625.47	-67.79	-223.19	5727738.91	596041.78
735	50.09	239.58	662.10	-628.67	-69.72	-226.51	5727736.98	596038.46
740	49.49	239.32	665.33	-631.89	-71.66	-229.80	5727735.04	596035.17
745	48.82	239.08	668.60	-635.16	-73.60	-233.05	5727733.10	596031.93
750	48.14	238.84	671.91	-638.48	-75.53	-236.25	5727731.17	596028.72
755	47.47	238.60	675.27	-641.84	-77.45	-239.42	5727729.25	596025.55
760	46.79	238.36	678.67	-645.24	-79.36	-242.54	5727727.34	596022.43
765	46.12	238.13	682.11	-648.68	-81.27	-245.62	5727725.43	596019.35
770	45.43	237.91	685.60	-652.17	-83.17	-248.66	5727723.53	596016.31
775	44.75	237.69	689.13	-655.70	-85.05	-251.66	5727721.65	596013.31
780	44.07	237.47	692.70	-659.27	-86.93	-254.61	5727719.77	596010.36
785	43.39	237.25	696.32	-662.89	-88.79	-257.52	5727717.91	596007.45
790	42.71	237.03	699.97	-666.54	-90.64	-260.39	5727716.06	596004.58
795	42.02	236.94	703.66	-670.24	-92.48	-263.21	5727714.22	596001.76
800	41.33	237.05	707.40	-673.97	-94.29	-266.00	5727712.41	595998.97
805	40.64	237.16	711.17	-677.74	-96.07	-268.75	5727710.63	595996.22
810	39.95	237.27	714.99	-681.56	-97.82	-271.47	5727708.88	595993.50
815	39.26	237.37	718.84	-685.41	-99.54	-274.15	5727707.16	595990.82
820	38.56	237.48	722.73	-689.30	-101.23	-276.80	5727705.47	595988.17

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
825	37.88	237.54	726.66	-693.23	-102.89	-279.41	5727703.81	595985.57
830	37.21	237.51	730.62	-697.19	-104.53	-281.98	5727702.17	595982.99
835	36.54	237.48	734.62	-701.19	-106.14	-284.51	5727700.56	595980.47
840	35.87	237.45	738.66	-705.23	-107.73	-287.00	5727698.97	595977.98
845	35.19	237.42	742.73	-709.30	-109.29	-289.45	5727697.41	595975.53
850	34.52	237.39	746.83	-713.40	-110.83	-291.85	5727695.87	595973.12
855	34.34	237.35	750.96	-717.52	-112.36	-294.23	5727694.34	595970.74
860	34.22	237.30	755.09	-721.66	-113.88	-296.60	5727692.82	595968.37
865	34.10	237.26	759.22	-725.79	-115.39	-298.96	5727691.31	595966.01
870	33.99	237.21	763.37	-729.94	-116.91	-301.32	5727689.79	595963.66
875	33.87	237.17	767.51	-734.09	-118.42	-303.66	5727688.28	595961.31
880	33.77	237.12	771.67	-738.24	-119.93	-306.00	5727686.77	595958.97
885	33.72	237.07	775.83	-742.40	-121.44	-308.33	5727685.26	595956.64
890	33.67	237.02	779.99	-746.56	-122.95	-310.66	5727683.75	595954.32
895	33.63	236.98	784.15	-750.72	-124.46	-312.98	5727682.24	595951.99
900	33.58	236.93	788.31	-754.88	-125.96	-315.30	5727680.74	595949.67
905	33.53	236.88	792.48	-759.05	-127.47	-317.61	5727679.23	595947.36
910	33.43	237.04	796.65	-763.22	-128.98	-319.93	5727677.72	595945.05
915	33.27	237.38	800.83	-767.40	-130.47	-322.24	5727676.23	595942.74
920	33.12	237.71	805.01	-771.58	-131.94	-324.54	5727674.76	595940.43
925	32.96	238.05	809.20	-775.77	-133.39	-326.85	5727673.31	595938.12
930	32.81	238.39	813.40	-779.97	-134.82	-329.16	5727671.88	595935.81
935	32.65	238.73	817.61	-784.18	-136.23	-331.46	5727670.47	595933.51
940	32.57	238.87	821.82	-788.39	-137.62	-333.77	5727669.08	595931.20
945	32.53	238.88	826.03	-792.61	-139.01	-336.07	5727667.69	595928.90
950	32.49	238.89	830.25	-796.82	-140.40	-338.37	5727666.30	595926.60
955	32.45	238.91	834.47	-801.04	-141.79	-340.67	5727664.91	595924.30
960	32.42	238.92	838.69	-805.26	-143.17	-342.97	5727663.53	595922.01
965	32.38	238.93	842.91	-809.48	-144.55	-345.26	5727662.15	595919.71
970	32.31	238.81	847.14	-813.71	-145.94	-347.55	5727660.76	595917.42
975	32.24	238.69	851.36	-817.93	-147.32	-349.83	5727659.38	595915.14
980	32.17	238.57	855.59	-822.16	-148.71	-352.11	5727657.99	595912.87
985	32.10	238.45	859.83	-826.40	-150.10	-354.37	5727656.60	595910.60
990	32.04	238.33	864.07	-830.63	-151.49	-356.63	5727655.21	595908.34
995	31.96	238.26	868.30	-834.88	-152.88	-358.89	5727653.82	595906.08
1000	31.86	238.28	872.55	-839.12	-154.27	-361.14	5727652.43	595903.84
1005	31.77	238.31	876.80	-843.37	-155.66	-363.38	5727651.04	595901.59
1010	31.67	238.33	881.05	-847.62	-157.04	-365.61	5727649.66	595899.36
1015	31.57	238.36	885.31	-851.88	-158.41	-367.84	5727648.29	595897.13
1020	31.48	238.39	889.57	-856.14	-159.78	-370.07	5727646.92	595894.90
1025	31.38	238.39	893.84	-860.41	-161.15	-372.29	5727645.55	595892.68
1030	31.28	238.37	898.11	-864.68	-162.51	-374.50	5727644.19	595890.47
1035	31.18	238.35	902.38	-868.95	-163.87	-376.71	5727642.83	595888.26
1040	31.08	238.32	906.66	-873.23	-165.23	-378.91	5727641.47	595886.06
1045	30.98	238.30	910.95	-877.52	-166.58	-381.10	5727640.12	595883.87
1050	30.88	238.28	915.24	-881.81	-167.93	-383.29	5727638.77	595881.68
1055	30.93	238.57	919.53	-886.10	-169.28	-385.47	5727637.42	595879.50
1060	31.04	239.02	923.82	-890.39	-170.61	-387.68	5727636.09	595877.30
1065	31.15	239.46	928.10	-894.67	-171.93	-389.89	5727634.77	595875.08
1070	31.26	239.90	932.38	-898.95	-173.24	-392.13	5727633.46	595872.84
1075	31.37	240.34	936.65	-903.22	-174.53	-394.38	5727632.17	595870.59
1080	31.48	240.78	940.91	-907.48	-175.81	-396.65	5727630.89	595868.32
1085	31.45	240.73	945.18	-911.75	-177.09	-398.93	5727629.61	595866.04
1090	31.41	240.62	949.44	-916.01	-178.36	-401.20	5727628.34	595863.77
1095	31.36	240.51	953.71	-920.28	-179.64	-403.47	5727627.06	595861.50
1100	31.32	240.40	957.98	-924.55	-180.93	-405.73	5727625.77	595859.24
1105	31.27	240.29	962.26	-928.83	-182.21	-407.99	5727624.49	595856.98
1110	31.23	240.18	966.53	-933.10	-183.50	-410.24	5727623.20	595854.73
1115	31.20	240.26	970.81	-937.38	-184.79	-412.49	5727621.91	595852.48

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1120	31.18	240.34	975.08	-941.65	-186.07	-414.74	5727620.63	595850.23
1125	31.15	240.42	979.36	-945.93	-187.35	-416.99	5727619.35	595847.99
1130	31.12	240.50	983.64	-950.21	-188.62	-419.23	5727618.08	595845.74
1135	31.10	240.57	987.92	-954.49	-189.89	-421.48	5727616.81	595843.49
1140	30.98	241.02	992.21	-958.78	-191.16	-423.73	5727615.54	595841.24
1145	30.72	241.99	996.50	-963.07	-192.38	-425.98	5727614.32	595838.99
1150	30.47	242.96	1000.80	-967.37	-193.56	-428.24	5727613.14	595836.73
1155	30.22	243.94	1005.12	-971.69	-194.69	-430.49	5727612.01	595834.48
1160	29.97	244.91	1009.45	-976.02	-195.77	-432.75	5727610.93	595832.22
1165	29.71	245.89	1013.79	-980.36	-196.81	-435.01	5727609.89	595829.96
1170	29.42	246.44	1018.13	-984.70	-197.80	-437.27	5727608.90	595827.70
1175	29.10	246.73	1022.50	-989.07	-198.77	-439.51	5727607.93	595825.46
1180	28.77	247.03	1026.87	-993.44	-199.72	-441.74	5727606.97	595823.24
1185	28.45	247.33	1031.26	-997.83	-200.65	-443.94	5727606.05	595821.03
1190	28.13	247.63	1035.66	-1002.23	-201.56	-446.13	5727605.14	595818.84
1195	27.81	247.92	1040.08	-1006.65	-202.45	-448.30	5727604.25	595816.67
1200	27.92	248.01	1044.50	-1011.07	-203.32	-450.46	5727603.37	595814.51
1205	28.09	248.06	1048.92	-1015.49	-204.20	-452.64	5727602.50	595812.33
1210	28.27	248.12	1053.32	-1019.89	-205.08	-454.83	5727601.61	595810.14
1215	28.44	248.17	1057.72	-1024.29	-205.97	-457.04	5727600.73	595807.94
1220	28.61	248.22	1062.12	-1028.69	-206.86	-459.25	5727599.84	595805.72
1225	28.79	248.20	1066.50	-1033.07	-207.74	-461.48	5727598.96	595803.49
1230	29.02	247.67	1070.88	-1037.45	-208.65	-463.72	5727598.05	595801.25
1235	29.25	247.13	1075.25	-1041.82	-209.59	-465.97	5727597.11	595799.01
1240	29.48	246.60	1079.61	-1046.18	-210.55	-468.22	5727596.15	595796.75
1245	29.71	246.06	1083.95	-1050.52	-211.55	-470.48	5727595.15	595794.49
1250	29.94	245.52	1088.29	-1054.86	-212.57	-472.75	5727594.13	595792.23
1255	29.99	245.19	1092.62	-1059.19	-213.61	-475.02	5727593.09	595789.95
1260	29.85	245.08	1096.95	-1063.53	-214.66	-477.28	5727592.04	595787.69
1265	29.71	244.97	1101.30	-1067.87	-215.71	-479.53	5727590.99	595785.44
1270	29.56	244.86	1105.64	-1072.21	-216.76	-481.77	5727589.94	595783.20
1275	29.42	244.75	1109.99	-1076.56	-217.80	-484.00	5727588.90	595780.97
1280	29.28	244.64	1114.35	-1080.92	-218.85	-486.21	5727587.85	595778.76
1285	29.06	244.63	1118.72	-1085.29	-219.90	-488.42	5727586.80	595776.56
1290	28.81	244.68	1123.09	-1089.66	-220.93	-490.60	5727585.77	595774.37
1295	28.55	244.72	1127.48	-1094.05	-221.96	-492.77	5727584.74	595772.20
1300	28.29	244.77	1131.88	-1098.45	-222.97	-494.92	5727583.73	595770.05
1305	28.03	244.82	1136.28	-1102.85	-223.98	-497.06	5727582.72	595767.92
1310	27.82	244.86	1140.70	-1107.27	-224.97	-499.17	5727581.73	595765.80
1315	28.06	244.85	1145.12	-1111.69	-225.97	-501.30	5727580.73	595763.68
1320	28.30	244.84	1149.53	-1116.10	-226.97	-503.43	5727579.73	595761.54
1325	28.53	244.83	1153.93	-1120.49	-227.98	-505.59	5727578.72	595759.39
1330	28.77	244.83	1158.31	-1124.88	-229.00	-507.75	5727577.70	595757.22
1335	29.01	244.82	1162.69	-1129.26	-230.03	-509.94	5727576.67	595755.03
1340	29.23	244.81	1167.06	-1133.63	-231.07	-512.14	5727575.63	595752.83
1345	29.39	244.78	1171.42	-1137.99	-232.11	-514.36	5727574.59	595750.62
1350	29.55	244.76	1175.77	-1142.34	-233.16	-516.58	5727573.54	595748.39
1355	29.71	244.74	1180.12	-1146.69	-234.21	-518.82	5727572.49	595746.16
1360	29.87	244.72	1184.46	-1151.03	-235.27	-521.06	5727571.43	595743.91
1365	30.03	244.70	1188.79	-1155.36	-236.34	-523.32	5727570.36	595741.65
1370	30.05	244.68	1193.12	-1159.69	-237.41	-525.58	5727569.29	595739.39
1375	29.84	244.65	1197.45	-1164.02	-238.48	-527.84	5727568.22	595737.13
1380	29.62	244.62	1201.79	-1168.36	-239.54	-530.08	5727567.16	595734.89
1385	29.41	244.59	1206.14	-1172.71	-240.60	-532.30	5727566.10	595732.67
1390	29.19	244.56	1210.50	-1177.07	-241.65	-534.51	5727565.05	595730.46
1395	28.98	244.53	1214.87	-1181.44	-242.69	-536.71	5727564.01	595728.26
1400	29.04	244.68	1219.25	-1185.82	-243.73	-538.89	5727562.97	595726.08
1405	29.25	244.92	1223.61	-1190.18	-244.77	-541.10	5727561.93	595723.87
1410	29.47	245.17	1227.97	-1194.54	-245.80	-543.32	5727560.90	595721.65

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1415	29.69	245.41	1232.32	-1198.89	-246.83	-545.56	5727559.87	595719.41
1420	29.91	245.66	1236.66	-1203.23	-247.86	-547.82	5727558.84	595717.15
1425	30.12	245.90	1240.99	-1207.56	-248.89	-550.10	5727557.81	595714.87
1430	29.93	245.92	1245.32	-1211.89	-249.91	-552.39	5727556.79	595712.58
1435	29.73	245.94	1249.65	-1216.22	-250.92	-554.66	5727555.78	595710.31
1440	29.53	245.95	1254.00	-1220.57	-251.93	-556.92	5727554.77	595708.06
1445	29.33	245.97	1258.36	-1224.93	-252.93	-559.16	5727553.77	595705.81
1450	29.12	245.98	1262.72	-1229.29	-253.93	-561.39	5727552.77	595703.58
1455	28.89	246.00	1267.09	-1233.66	-254.91	-563.60	5727551.79	595701.37
1460	28.60	246.04	1271.47	-1238.05	-255.89	-565.80	5727550.81	595699.17
1465	28.31	246.08	1275.87	-1242.44	-256.86	-567.98	5727549.84	595696.99
1470	28.02	246.13	1280.28	-1246.85	-257.81	-570.14	5727548.89	595694.84
1475	27.73	246.17	1284.70	-1251.27	-258.76	-572.27	5727547.94	595692.70
1480	27.44	246.21	1289.13	-1255.70	-259.69	-574.39	5727547.01	595690.58
1485	27.37	246.16	1293.57	-1260.14	-260.62	-576.49	5727546.08	595688.48
1490	27.53	246.02	1298.01	-1264.58	-261.55	-578.60	5727545.15	595686.37
1495	27.70	245.88	1302.44	-1269.01	-262.50	-580.72	5727544.20	595684.25
1500	27.86	245.74	1306.86	-1273.43	-263.45	-582.84	5727543.25	595682.13
1505	28.02	245.60	1311.28	-1277.85	-264.42	-584.98	5727542.28	595679.99
1510	28.19	245.46	1315.69	-1282.26	-265.40	-587.12	5727541.30	595677.85
1515	28.13	245.40	1320.10	-1286.67	-266.38	-589.27	5727540.32	595675.70
1520	27.99	245.37	1324.51	-1291.08	-267.36	-591.41	5727539.34	595673.57
1525	27.86	245.33	1328.93	-1295.50	-268.33	-593.54	5727538.37	595671.44
1530	27.72	245.30	1333.35	-1299.92	-269.31	-595.65	5727537.39	595669.32
1535	27.59	245.26	1337.78	-1304.35	-270.28	-597.76	5727536.42	595667.21
1540	27.47	245.22	1342.21	-1308.78	-271.25	-599.86	5727535.45	595665.11
1545	27.66	245.05	1346.65	-1313.21	-272.22	-601.96	5727534.48	595663.01
1550	27.86	244.87	1351.07	-1317.64	-273.20	-604.07	5727533.49	595660.91
1555	28.05	244.69	1355.49	-1322.06	-274.20	-606.19	5727532.50	595658.78
1560	28.25	244.52	1359.90	-1326.46	-275.22	-608.32	5727531.48	595656.65
1565	28.45	244.34	1364.30	-1330.87	-276.24	-610.46	5727530.46	595654.51
1570	28.54	244.18	1368.69	-1335.26	-277.28	-612.61	5727529.42	595652.36
1575	28.40	244.07	1373.08	-1339.65	-278.32	-614.75	5727528.38	595650.22
1580	28.27	243.96	1377.48	-1344.06	-279.36	-616.89	5727527.34	595648.09
1585	28.13	243.84	1381.89	-1348.46	-280.40	-619.01	5727526.30	595645.96
1590	27.99	243.73	1386.30	-1352.87	-281.44	-621.12	5727525.26	595643.85
1595	27.86	243.62	1390.72	-1357.29	-282.47	-623.22	5727524.22	595641.75
1600	28.07	243.68	1395.14	-1361.71	-283.51	-625.31	5727523.19	595639.66
1605	28.54	243.88	1399.54	-1366.11	-284.56	-627.44	5727522.14	595637.53
1610	29.01	244.07	1403.93	-1370.50	-285.62	-629.60	5727521.08	595635.37
1615	29.47	244.27	1408.29	-1374.86	-286.68	-631.80	5727520.02	595633.17
1620	29.94	244.47	1412.63	-1379.20	-287.75	-634.03	5727518.95	595630.94
1625	30.41	244.66	1416.95	-1383.52	-288.83	-636.30	5727517.87	595628.67
1630	30.45	244.67	1421.26	-1387.83	-289.91	-638.59	5727516.79	595626.38
1635	30.46	244.65	1425.58	-1392.15	-291.00	-640.88	5727515.70	595624.09
1640	30.46	244.63	1429.89	-1396.45	-292.08	-643.17	5727514.62	595621.80
1645	30.46	244.62	1434.19	-1400.76	-293.17	-645.46	5727513.53	595619.51
1650	30.47	244.60	1438.50	-1405.07	-294.26	-647.75	5727512.44	595617.22
1655	30.47	244.58	1442.81	-1409.38	-295.35	-650.04	5727511.35	595614.93
1660	30.42	244.53	1447.12	-1413.69	-296.43	-652.33	5727510.27	595612.64
1665	30.38	244.48	1451.44	-1418.01	-297.52	-654.62	5727509.18	595610.36
1670	30.34	244.43	1455.75	-1422.32	-298.61	-656.90	5727508.09	595608.08
1675	30.30	244.38	1460.07	-1426.64	-299.70	-659.17	5727507.00	595605.80
1680	30.26	244.33	1464.39	-1430.95	-300.79	-661.44	5727505.91	595603.53
1685	30.17	244.33	1468.70	-1435.28	-301.88	-663.71	5727504.82	595601.26
1690	30.02	244.36	1473.03	-1439.60	-302.97	-665.97	5727503.73	595599.00
1695	29.88	244.40	1477.36	-1443.93	-304.05	-668.22	5727502.65	595596.75
1700	29.73	244.44	1481.70	-1448.27	-305.12	-670.46	5727501.58	595594.51
1705	29.59	244.47	1486.05	-1452.62	-306.19	-672.70	5727500.51	595592.28

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
1710	29.44	244.51	1490.40	-1456.97	-307.25	-674.92	5727499.45	595590.05
1715	29.30	244.58	1494.76	-1461.33	-308.31	-677.13	5727498.39	595587.84
1720	29.17	244.67	1499.12	-1465.69	-309.35	-679.34	5727497.35	595585.63
1725	29.03	244.77	1503.49	-1470.06	-310.39	-681.54	5727496.31	595583.43
1730	28.90	244.86	1507.86	-1474.43	-311.42	-683.73	5727495.28	595581.24
1735	28.76	244.95	1512.24	-1478.81	-312.44	-685.91	5727494.26	595579.06
1740	28.63	245.04	1516.63	-1483.20	-313.46	-688.09	5727493.24	595576.89
1745	28.56	245.14	1521.02	-1487.59	-314.47	-690.26	5727492.23	595574.71
1750	28.49	245.23	1525.41	-1491.98	-315.47	-692.42	5727491.23	595572.55
1755	28.43	245.32	1529.81	-1496.38	-316.47	-694.59	5727490.23	595570.38
1760	28.37	245.41	1534.21	-1500.78	-317.46	-696.75	5727489.24	595568.22
1765	28.30	245.50	1538.61	-1505.18	-318.44	-698.91	5727488.26	595566.06
1770	28.23	245.59	1543.01	-1509.58	-319.42	-701.06	5727487.28	595563.91
1775	28.10	245.55	1547.42	-1513.99	-320.40	-703.21	5727486.30	595561.76
1780	27.97	245.51	1551.83	-1518.40	-321.37	-705.35	5727485.33	595559.62
1785	27.84	245.47	1556.25	-1522.82	-322.34	-707.48	5727484.36	595557.49
1790	27.71	245.44	1560.67	-1527.24	-323.31	-709.60	5727483.39	595555.37
1795	27.58	245.40	1565.10	-1531.67	-324.28	-711.71	5727482.42	595553.26
1800	27.58	245.35	1569.54	-1536.11	-325.24	-713.81	5727481.46	595551.16
1805	27.94	245.27	1573.96	-1540.53	-326.21	-715.92	5727480.49	595549.05
1810	28.30	245.19	1578.37	-1544.94	-327.20	-718.06	5727479.50	595546.91
1815	28.66	245.11	1582.77	-1549.34	-328.20	-720.23	5727478.50	595544.75
1820	29.02	245.02	1587.15	-1553.72	-329.22	-722.41	5727477.48	595542.56
1825	29.38	244.94	1591.51	-1558.08	-330.25	-724.62	5727476.45	595540.35
1830	29.52	244.95	1595.86	-1562.43	-331.30	-726.85	5727475.40	595538.12
1835	29.42	245.05	1600.22	-1566.79	-332.34	-729.08	5727474.36	595535.89
1840	29.33	245.15	1604.57	-1571.14	-333.37	-731.31	5727473.33	595533.67
1845	29.23	245.26	1608.93	-1575.51	-334.40	-733.53	5727472.30	595531.45
1850	29.13	245.36	1613.30	-1579.87	-335.41	-735.74	5727471.29	595529.23
1855	29.03	245.46	1617.67	-1584.24	-336.42	-737.95	5727470.28	595527.02
1860	28.94	245.41	1622.04	-1588.61	-337.43	-740.15	5727469.27	595524.82
1865	28.86	245.33	1626.42	-1592.99	-338.44	-742.35	5727468.26	595522.62
1870	28.77	245.25	1630.80	-1597.37	-339.45	-744.54	5727467.25	595520.43
1875	28.69	245.16	1635.19	-1601.76	-340.45	-746.72	5727466.25	595518.25
1880	28.60	245.08	1639.58	-1606.15	-341.46	-748.90	5727465.24	595516.08
1885	28.52	245.00	1643.97	-1610.54	-342.47	-751.06	5727464.23	595513.91
1890	28.35	244.98	1648.36	-1614.93	-343.48	-753.22	5727463.22	595511.75
1895	28.19	244.96	1652.77	-1619.34	-344.48	-755.37	5727462.22	595509.61
1900	28.03	244.94	1657.18	-1623.75	-345.48	-757.50	5727461.22	595507.47
1905	27.87	244.92	1661.59	-1628.16	-346.47	-759.62	5727460.23	595505.35
1910	27.70	244.90	1666.02	-1632.59	-347.46	-761.73	5727459.24	595503.24
1915	27.55	244.87	1670.45	-1637.02	-348.44	-763.83	5727458.26	595501.14
1920	27.42	244.81	1674.88	-1641.45	-349.42	-765.92	5727457.28	595499.05
1925	27.29	244.75	1679.32	-1645.89	-350.40	-768.00	5727456.30	595496.97
1930	27.16	244.69	1683.77	-1650.34	-351.38	-770.07	5727455.32	595494.91
1935	27.02	244.63	1688.22	-1654.79	-352.36	-772.12	5727454.34	595492.85
1940	26.89	244.57	1692.68	-1659.25	-353.33	-774.17	5727453.37	595490.80
1945	26.92	244.52	1697.14	-1663.71	-354.30	-776.21	5727452.40	595488.76
1950	27.09	244.50	1701.59	-1668.16	-355.28	-778.26	5727451.42	595486.71
1955	27.26	244.47	1706.04	-1672.61	-356.26	-780.32	5727450.44	595484.65
1960	27.42	244.44	1710.48	-1677.05	-357.25	-782.39	5727449.45	595482.58
1965	27.59	244.41	1714.92	-1681.49	-358.25	-784.48	5727448.45	595480.50
1970	27.76	244.38	1719.35	-1685.92	-359.25	-786.57	5727447.45	595478.40
1975	27.78	244.34	1723.77	-1690.34	-360.26	-788.67	5727446.44	595476.30
1980	27.71	244.28	1728.19	-1694.76	-361.27	-790.77	5727445.43	595474.20
1985	27.64	244.23	1732.62	-1699.19	-362.28	-792.86	5727444.42	595472.11
1990	27.57	244.18	1737.05	-1703.62	-363.29	-794.95	5727443.41	595470.03
1995	27.51	244.12	1741.49	-1708.06	-364.30	-797.03	5727442.40	595467.94
2000	27.44	244.07	1745.92	-1712.49	-365.30	-799.10	5727441.40	595465.87

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2005	27.35	244.16	1750.36	-1716.93	-366.31	-801.17	5727440.39	595463.80
2010	27.27	244.25	1754.80	-1721.37	-367.31	-803.24	5727439.39	595461.73
2015	27.18	244.34	1759.25	-1725.82	-368.30	-805.30	5727438.40	595459.67
2020	27.10	244.43	1763.70	-1730.27	-369.28	-807.35	5727437.42	595457.62
2025	27.01	244.52	1768.15	-1734.72	-370.26	-809.41	5727436.43	595455.57
2030	27.02	244.60	1772.61	-1739.18	-371.24	-811.46	5727435.46	595453.52
2035	27.43	244.66	1777.06	-1743.63	-372.22	-813.52	5727434.48	595451.45
2040	27.83	244.72	1781.48	-1748.06	-373.21	-815.62	5727433.49	595449.35
2045	28.24	244.77	1785.90	-1752.47	-374.21	-817.74	5727432.49	595447.23
2050	28.65	244.83	1790.29	-1756.86	-375.23	-819.90	5727431.47	595445.07
2055	29.05	244.89	1794.67	-1761.24	-376.25	-822.08	5727430.45	595442.89
2060	29.26	244.89	1799.04	-1765.61	-377.29	-824.29	5727429.41	595440.68
2065	29.20	244.81	1803.40	-1769.97	-378.33	-826.50	5727428.37	595438.47
2070	29.15	244.73	1807.77	-1774.34	-379.37	-828.71	5727427.33	595436.27
2075	29.10	244.65	1812.14	-1778.70	-380.41	-830.91	5727426.29	595434.07
2080	29.04	244.57	1816.51	-1783.08	-381.45	-833.10	5727425.25	595431.87
2085	28.99	244.49	1820.88	-1787.45	-382.49	-835.29	5727424.21	595429.68
2090	28.88	244.44	1825.25	-1791.82	-383.53	-837.47	5727423.17	595427.50
2095	28.76	244.41	1829.63	-1796.20	-384.57	-839.65	5727422.12	595425.32
2100	28.63	244.37	1834.02	-1800.59	-385.61	-841.81	5727421.09	595423.16
2105	28.51	244.34	1838.41	-1804.98	-386.65	-843.97	5727420.05	595421.00
2110	28.39	244.30	1842.81	-1809.38	-387.68	-846.11	5727419.02	595418.86
2115	28.26	244.27	1847.21	-1813.78	-388.71	-848.25	5727417.99	595416.72
2120	28.11	244.28	1851.62	-1818.18	-389.74	-850.38	5727416.96	595414.59
2125	27.96	244.30	1856.03	-1822.60	-390.76	-852.50	5727415.94	595412.48
2130	27.81	244.31	1860.45	-1827.02	-391.77	-854.60	5727414.93	595410.37
2135	27.66	244.32	1864.87	-1831.44	-392.78	-856.70	5727413.92	595408.27
2140	27.51	244.33	1869.31	-1835.88	-393.78	-858.79	5727412.92	595406.18
2145	27.43	244.34	1873.74	-1840.31	-394.78	-860.86	5727411.92	595404.11
2150	27.57	244.36	1878.18	-1844.75	-395.78	-862.94	5727410.92	595402.03
2155	27.70	244.37	1882.61	-1849.18	-396.78	-865.04	5727409.92	595399.94
2160	27.84	244.39	1887.03	-1853.60	-397.79	-867.14	5727408.91	595397.84
2165	27.97	244.40	1891.45	-1858.02	-398.80	-869.25	5727407.90	595395.73
2170	28.11	244.42	1895.86	-1862.43	-399.82	-871.37	5727406.88	595393.61
2175	28.24	244.63	1900.27	-1866.84	-400.83	-873.50	5727405.87	595391.48
2180	28.38	244.93	1904.67	-1871.24	-401.85	-875.64	5727404.85	595389.33
2185	28.51	245.24	1909.07	-1875.64	-402.85	-877.80	5727403.85	595387.17
2190	28.65	245.55	1913.46	-1880.03	-403.84	-879.98	5727402.86	595385.00
2195	28.78	245.86	1917.85	-1884.42	-404.83	-882.17	5727401.87	595382.81
2200	28.92	246.16	1922.22	-1888.80	-405.81	-884.37	5727400.89	595380.60
2205	28.87	246.13	1926.60	-1893.17	-406.79	-886.58	5727399.91	595378.39
2210	28.76	245.98	1930.98	-1897.55	-407.77	-888.78	5727398.93	595376.19
2215	28.66	245.83	1935.37	-1901.94	-408.75	-890.98	5727397.95	595374.00
2220	28.55	245.68	1939.76	-1906.33	-409.73	-893.16	5727396.97	595371.81
2225	28.45	245.53	1944.15	-1910.72	-410.72	-895.33	5727395.98	595369.64
2230	28.34	245.38	1948.55	-1915.12	-411.70	-897.49	5727395.00	595367.48
2235	28.21	245.44	1952.95	-1919.52	-412.69	-899.65	5727394.01	595365.32
2240	28.08	245.50	1957.36	-1923.93	-413.67	-901.79	5727393.03	595363.18
2245	27.94	245.56	1961.78	-1928.35	-414.64	-903.93	5727392.06	595361.04
2250	27.81	245.62	1966.20	-1932.77	-415.61	-906.06	5727391.09	595358.91
2255	27.67	245.67	1970.62	-1937.19	-416.57	-908.18	5727390.13	595356.79
2260	27.67	245.78	1975.05	-1941.62	-417.52	-910.29	5727389.18	595354.68
2265	28.14	246.03	1979.47	-1946.04	-418.48	-912.43	5727388.22	595352.54
2270	28.60	246.27	1983.87	-1950.44	-419.44	-914.60	5727387.26	595350.37
2275	29.06	246.52	1988.25	-1954.82	-420.40	-916.81	5727386.30	595348.16
2280	29.52	246.77	1992.61	-1959.18	-421.37	-919.06	5727385.33	595345.92
2285	29.98	247.02	1996.95	-1963.52	-422.35	-921.34	5727384.35	595343.63
2290	30.34	247.09	2001.27	-1967.84	-423.32	-923.66	5727383.38	595341.32
2295	30.59	247.00	2005.58	-1972.15	-424.31	-925.99	5727382.39	595338.98

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2300	30.85	246.91	2009.88	-1976.45	-425.31	-928.34	5727381.39	595336.63
2305	31.10	246.82	2014.17	-1980.74	-426.32	-930.71	5727380.38	595334.27
2310	31.36	246.73	2018.44	-1985.02	-427.35	-933.09	5727379.35	595331.88
2315	31.61	246.64	2022.71	-1989.28	-428.38	-935.49	5727378.32	595329.49
2320	31.97	246.46	2026.96	-1993.53	-429.43	-937.90	5727377.27	595327.07
2325	32.39	246.24	2031.19	-1997.76	-430.50	-940.34	5727376.20	595324.63
2330	32.80	246.01	2035.40	-2001.97	-431.59	-942.80	5727375.11	595322.17
2335	33.21	245.79	2039.60	-2006.17	-432.70	-945.29	5727374.00	595319.68
2340	33.63	245.56	2043.77	-2010.34	-433.84	-947.80	5727372.86	595317.17
2345	34.04	245.34	2047.92	-2014.49	-434.99	-950.33	5727371.71	595314.64
2350	34.27	245.38	2052.06	-2018.63	-436.17	-952.88	5727370.53	595312.09
2355	34.48	245.45	2056.19	-2022.76	-437.34	-955.45	5727369.36	595309.52
2360	34.70	245.51	2060.30	-2026.87	-438.52	-958.03	5727368.18	595306.94
2365	34.91	245.58	2064.41	-2030.98	-439.70	-960.63	5727367.00	595304.34
2370	35.12	245.65	2068.50	-2035.07	-440.88	-963.24	5727365.82	595301.73
2375	35.36	245.73	2072.59	-2039.16	-442.07	-965.87	5727364.63	595299.10
2380	35.71	245.85	2076.66	-2043.23	-443.26	-968.52	5727363.44	595296.45
2385	36.06	245.96	2080.71	-2047.28	-444.46	-971.20	5727362.24	595293.78
2390	36.40	246.08	2084.74	-2051.31	-445.66	-973.90	5727361.04	595291.08
2395	36.75	246.20	2088.76	-2055.33	-446.87	-976.62	5727359.83	595288.35
2400	37.10	246.31	2092.75	-2059.32	-448.08	-979.37	5727358.62	595285.60
2405	37.59	246.32	2096.73	-2063.30	-449.29	-982.15	5727357.41	595282.83
2410	38.22	246.21	2100.68	-2067.25	-450.53	-984.96	5727356.17	595280.01
2415	38.85	246.11	2104.59	-2071.16	-451.79	-987.81	5727354.91	595277.16
2420	39.48	246.00	2108.46	-2075.03	-453.07	-990.69	5727353.63	595274.28
2425	40.11	245.90	2112.30	-2078.88	-454.38	-993.62	5727352.32	595271.36
2430	40.74	245.80	2116.11	-2082.68	-455.71	-996.57	5727350.99	595268.40
2435	41.16	245.76	2119.89	-2086.46	-457.05	-999.56	5727349.65	595265.41
2440	41.50	245.74	2123.64	-2090.21	-458.41	-1002.57	5727348.29	595262.40
2445	41.85	245.72	2127.38	-2093.95	-459.78	-1005.60	5727346.92	595259.37
2450	42.20	245.70	2131.09	-2097.66	-461.15	-1008.65	5727345.55	595256.32
2455	42.54	245.68	2134.78	-2101.35	-462.54	-1011.73	5727344.16	595253.25
2460	42.91	245.65	2138.46	-2105.03	-463.94	-1014.82	5727342.76	595250.16
2465	43.35	245.59	2142.11	-2108.68	-465.35	-1017.93	5727341.35	595247.04
2470	43.79	245.54	2145.73	-2112.30	-466.78	-1021.07	5727339.92	595243.90
2475	44.24	245.48	2149.32	-2115.90	-468.22	-1024.23	5727338.48	595240.74
2480	44.68	245.43	2152.89	-2119.46	-469.67	-1027.41	5727337.03	595237.56
2485	45.12	245.37	2156.43	-2123.01	-471.14	-1030.62	5727335.56	595234.35
2490	45.68	245.41	2159.95	-2126.52	-472.63	-1033.86	5727334.07	595231.11
2495	46.41	245.57	2163.42	-2129.99	-474.12	-1037.13	5727332.58	595227.84
2500	47.14	245.73	2166.84	-2133.41	-475.62	-1040.45	5727331.08	595224.52
2505	47.87	245.90	2170.22	-2136.79	-477.13	-1043.82	5727329.57	595221.16
2510	48.60	246.06	2173.55	-2140.12	-478.65	-1047.22	5727328.05	595217.75
2515	49.33	246.22	2176.83	-2143.40	-480.17	-1050.67	5727326.52	595214.30
2520	50.22	246.44	2180.07	-2146.64	-481.71	-1054.17	5727324.99	595210.81
2525	51.29	246.72	2183.23	-2149.80	-483.25	-1057.72	5727323.45	595207.25
2530	52.36	246.99	2186.32	-2152.89	-484.79	-1061.33	5727321.91	595203.64
2535	53.44	247.27	2189.33	-2155.90	-486.34	-1065.01	5727320.36	595199.96
2540	54.51	247.54	2192.28	-2158.84	-487.89	-1068.74	5727318.81	595196.23
2545	55.58	247.81	2195.14	-2161.71	-489.45	-1072.53	5727317.25	595192.44
2550	56.48	247.75	2197.93	-2164.50	-491.01	-1076.38	5727315.69	595188.60
2555	57.30	247.51	2200.66	-2167.23	-492.61	-1080.25	5727314.09	595184.72
2560	58.12	247.27	2203.33	-2169.90	-494.23	-1084.15	5727312.47	595180.82
2565	58.94	247.04	2205.94	-2172.51	-495.89	-1088.08	5727310.81	595176.89
2570	59.76	246.80	2208.49	-2175.06	-497.58	-1092.04	5727309.12	595172.94
2575	60.57	246.56	2210.98	-2177.55	-499.30	-1096.02	5727307.40	595168.95
2580	61.25	246.52	2213.41	-2179.98	-501.04	-1100.03	5727305.66	595164.95
2585	61.91	246.51	2215.79	-2182.36	-502.79	-1104.06	5727303.91	595160.91
2590	62.56	246.51	2218.12	-2184.69	-504.56	-1108.12	5727302.14	595156.85

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2595	63.21	246.51	2220.40	-2186.97	-506.33	-1112.20	5727300.37	595152.77
2600	63.87	246.50	2222.63	-2189.20	-508.12	-1116.30	5727298.58	595148.67
2605	64.52	246.53	2224.80	-2191.37	-509.91	-1120.43	5727296.79	595144.54
2610	65.12	246.84	2226.93	-2193.50	-511.70	-1124.59	5727295.00	595140.38
2615	65.72	247.16	2229.01	-2195.58	-513.48	-1128.77	5727293.22	595136.20
2620	66.32	247.47	2231.04	-2197.61	-515.24	-1132.99	5727291.46	595131.98
2625	66.92	247.78	2233.03	-2199.60	-516.99	-1137.23	5727289.71	595127.74
2630	67.52	248.09	2234.96	-2201.53	-518.72	-1141.51	5727287.98	595123.47
2635	68.07	248.29	2236.85	-2203.42	-520.44	-1145.81	5727286.26	595119.17
2640	68.51	248.31	2238.70	-2205.27	-522.16	-1150.12	5727284.54	595114.85
2645	68.96	248.33	2240.51	-2207.08	-523.88	-1154.45	5727282.82	595110.52
2650	69.40	248.35	2242.29	-2208.86	-525.60	-1158.79	5727281.10	595106.18
2655	69.85	248.36	2244.03	-2210.60	-527.33	-1163.15	5727279.37	595101.82
2660	70.29	248.38	2245.74	-2212.31	-529.07	-1167.52	5727277.63	595097.45
2665	70.63	248.28	2247.41	-2213.98	-530.81	-1171.90	5727275.89	595093.07
2670	70.91	248.11	2249.05	-2215.62	-532.56	-1176.28	5727274.14	595088.69
2675	71.19	247.95	2250.68	-2217.25	-534.33	-1180.67	5727272.37	595084.30
2680	71.48	247.78	2252.28	-2218.85	-536.12	-1185.06	5727270.58	595079.92
2685	71.76	247.62	2253.85	-2220.42	-537.92	-1189.45	5727268.78	595075.53
2690	72.05	247.45	2255.41	-2221.98	-539.74	-1193.84	5727266.96	595071.13
2695	72.42	247.02	2256.93	-2223.50	-541.58	-1198.23	5727265.12	595066.74
2700	72.80	246.59	2258.43	-2225.00	-543.46	-1202.62	5727263.24	595062.36
2701	72.88	246.50	2258.72	-2225.29	-543.84	-1203.49	5727262.86	595061.48
2702	72.96	246.41	2259.02	-2225.59	-544.22	-1204.37	5727262.48	595060.60
2703	73.03	246.33	2259.31	-2225.88	-544.61	-1205.24	5727262.09	595059.73
2704	73.11	246.24	2259.60	-2226.17	-544.99	-1206.12	5727261.71	595058.85
2705	73.18	246.15	2259.89	-2226.46	-545.38	-1207.00	5727261.32	595057.98
2706	73.26	246.07	2260.18	-2226.75	-545.77	-1207.87	5727260.93	595057.10
2707	73.33	245.98	2260.47	-2227.04	-546.15	-1208.75	5727260.55	595056.23
2708	73.41	245.89	2260.75	-2227.32	-546.55	-1209.62	5727260.15	595055.35
2709	73.49	245.81	2261.04	-2227.61	-546.94	-1210.49	5727259.76	595054.48
2710	73.56	245.72	2261.32	-2227.89	-547.33	-1211.37	5727259.37	595053.60
2711	73.64	245.63	2261.60	-2228.17	-547.73	-1212.24	5727258.97	595052.73
2712	73.71	245.55	2261.88	-2228.45	-548.12	-1213.12	5727258.58	595051.86
2713	73.79	245.46	2262.16	-2228.73	-548.52	-1213.99	5727258.18	595050.98
2714	73.87	245.37	2262.44	-2229.01	-548.92	-1214.86	5727257.78	595050.11
2715	73.94	245.29	2262.72	-2229.29	-549.32	-1215.74	5727257.38	595049.23
2716	74.02	245.20	2263.00	-2229.57	-549.73	-1216.61	5727256.97	595048.36
2717	74.09	245.11	2263.27	-2229.84	-550.13	-1217.48	5727256.57	595047.49
2718	74.17	245.03	2263.54	-2230.11	-550.54	-1218.35	5727256.16	595046.62
2719	74.24	244.94	2263.82	-2230.39	-550.94	-1219.23	5727255.76	595045.75
2720	74.29	244.91	2264.09	-2230.66	-551.35	-1220.10	5727255.35	595044.87
2721	74.31	244.91	2264.36	-2230.93	-551.76	-1220.97	5727254.94	595044.00
2722	74.33	244.91	2264.63	-2231.20	-552.17	-1221.84	5727254.53	595043.13
2723	74.36	244.92	2264.90	-2231.47	-552.58	-1222.71	5727254.12	595042.26
2724	74.38	244.92	2265.17	-2231.74	-552.99	-1223.59	5727253.71	595041.39
2725	74.40	244.92	2265.44	-2232.01	-553.39	-1224.46	5727253.31	595040.51
2726	74.43	244.92	2265.70	-2232.28	-553.80	-1225.33	5727252.90	595039.64
2727	74.45	244.92	2265.97	-2232.54	-554.21	-1226.20	5727252.49	595038.77
2728	74.47	244.93	2266.24	-2232.81	-554.62	-1227.08	5727252.08	595037.90
2729	74.50	244.93	2266.51	-2233.08	-555.03	-1227.95	5727251.67	595037.02
2730	74.52	244.93	2266.78	-2233.35	-555.44	-1228.82	5727251.26	595036.15
2731	74.54	244.93	2267.04	-2233.61	-555.84	-1229.69	5727250.86	595035.28
2732	74.57	244.93	2267.31	-2233.88	-556.25	-1230.57	5727250.45	595034.40
2733	74.59	244.93	2267.57	-2234.15	-556.66	-1231.44	5727250.04	595033.53
2734	74.61	244.94	2267.84	-2234.41	-557.07	-1232.32	5727249.63	595032.66
2735	74.64	244.94	2268.11	-2234.68	-557.48	-1233.19	5727249.22	595031.78
2736	74.66	244.94	2268.37	-2234.94	-557.89	-1234.06	5727248.81	595030.91
2737	74.68	244.94	2268.64	-2235.20	-558.30	-1234.93	5727248.40	595030.04

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2738	74.71	244.94	2268.90	-2235.47	-558.70	-1235.81	5727248.00	595029.16
2739	74.73	244.94	2269.16	-2235.73	-559.11	-1236.68	5727247.59	595028.29
2740	74.75	244.95	2269.43	-2235.99	-559.52	-1237.56	5727247.18	595027.41
2741	74.78	244.95	2269.69	-2236.26	-559.93	-1238.43	5727246.77	595026.54
2742	74.80	244.95	2269.95	-2236.52	-560.34	-1239.30	5727246.36	595025.67
2743	74.82	244.95	2270.21	-2236.78	-560.75	-1240.18	5727245.95	595024.79
2744	74.85	244.95	2270.47	-2237.04	-561.16	-1241.05	5727245.54	595023.92
2745	74.87	244.96	2270.74	-2237.30	-561.57	-1241.93	5727245.13	595023.04
2746	74.89	244.96	2271.00	-2237.57	-561.98	-1242.80	5727244.72	595022.17
2747	74.92	244.96	2271.26	-2237.83	-562.38	-1243.68	5727244.32	595021.29
2748	74.94	244.96	2271.52	-2238.09	-562.79	-1244.55	5727243.91	595020.42
2749	74.95	244.96	2271.78	-2238.35	-563.20	-1245.43	5727243.50	595019.54
2750	74.97	244.96	2272.04	-2238.61	-563.61	-1246.30	5727243.09	595018.67
2751	74.99	244.96	2272.30	-2238.86	-564.02	-1247.18	5727242.68	595017.79
2752	75.00	244.95	2272.55	-2239.12	-564.43	-1248.05	5727242.27	595016.92
2753	75.02	244.95	2272.81	-2239.38	-564.84	-1248.93	5727241.86	595016.04
2754	75.04	244.95	2273.07	-2239.64	-565.25	-1249.80	5727241.45	595015.17
2755	75.05	244.95	2273.33	-2239.90	-565.66	-1250.68	5727241.04	595014.29
2756	75.07	244.95	2273.59	-2240.16	-566.07	-1251.55	5727240.63	595013.42
2757	75.08	244.95	2273.84	-2240.41	-566.47	-1252.43	5727240.23	595012.54
2758	75.10	244.95	2274.10	-2240.67	-566.88	-1253.30	5727239.82	595011.67
2759	75.12	244.94	2274.36	-2240.93	-567.29	-1254.18	5727239.41	595010.79
2760	75.13	244.94	2274.61	-2241.18	-567.70	-1255.06	5727239.00	595009.92
2761	75.15	244.94	2274.87	-2241.44	-568.11	-1255.93	5727238.59	595009.04
2762	75.17	244.94	2275.13	-2241.70	-568.52	-1256.81	5727238.18	595008.17
2763	75.18	244.94	2275.38	-2241.95	-568.93	-1257.68	5727237.77	595007.29
2764	75.20	244.94	2275.64	-2242.21	-569.34	-1258.56	5727237.36	595006.41
2765	75.21	244.94	2275.89	-2242.46	-569.75	-1259.43	5727236.95	595005.54
2766	75.23	244.93	2276.15	-2242.72	-570.16	-1260.31	5727236.54	595004.66
2767	75.25	244.93	2276.40	-2242.97	-570.57	-1261.18	5727236.13	595003.79
2768	75.26	244.93	2276.66	-2243.23	-570.98	-1262.06	5727235.72	595002.91
2769	75.28	244.93	2276.91	-2243.48	-571.39	-1262.94	5727235.31	595002.03
2770	75.30	244.93	2277.17	-2243.74	-571.80	-1263.81	5727234.90	595001.16
2771	75.31	244.93	2277.42	-2243.99	-572.21	-1264.69	5727234.49	595000.28
2772	75.33	244.93	2277.67	-2244.24	-572.62	-1265.57	5727234.08	594999.41
2773	75.35	244.92	2277.93	-2244.50	-573.03	-1266.44	5727233.67	594998.53
2774	75.36	244.92	2278.18	-2244.75	-573.44	-1267.32	5727233.26	594997.65
2775	75.38	244.92	2278.43	-2245.00	-573.85	-1268.19	5727232.85	594996.78
2776	75.39	244.92	2278.68	-2245.26	-574.26	-1269.07	5727232.44	594995.90
2777	75.40	244.93	2278.94	-2245.51	-574.67	-1269.95	5727232.03	594995.02
2778	75.41	244.94	2279.19	-2245.76	-575.08	-1270.82	5727231.62	594994.15
2779	75.41	244.95	2279.44	-2246.01	-575.49	-1271.70	5727231.21	594993.27
2780	75.41	244.96	2279.69	-2246.26	-575.90	-1272.58	5727230.80	594992.39
2781	75.41	244.97	2279.95	-2246.51	-576.31	-1273.45	5727230.39	594991.52
2782	75.42	244.98	2280.20	-2246.77	-576.72	-1274.33	5727229.98	594990.64
2783	75.42	244.99	2280.45	-2247.02	-577.13	-1275.21	5727229.57	594989.76
2784	75.42	245.00	2280.70	-2247.27	-577.54	-1276.09	5727229.16	594988.89
2785	75.43	245.01	2280.95	-2247.52	-577.95	-1276.96	5727228.75	594988.01
2786	75.43	245.02	2281.20	-2247.77	-578.36	-1277.84	5727228.34	594987.13
2787	75.43	245.03	2281.45	-2248.03	-578.77	-1278.72	5727227.93	594986.26
2788	75.44	245.05	2281.71	-2248.28	-579.18	-1279.59	5727227.52	594985.38
2789	75.44	245.06	2281.96	-2248.53	-579.58	-1280.47	5727227.12	594984.50
2790	75.44	245.07	2282.21	-2248.78	-579.99	-1281.35	5727226.71	594983.62
2791	75.45	245.08	2282.46	-2249.03	-580.40	-1282.23	5727226.30	594982.74
2792	75.45	245.09	2282.71	-2249.28	-580.81	-1283.11	5727225.89	594981.87
2793	75.45	245.10	2282.96	-2249.53	-581.22	-1283.98	5727225.48	594980.99
2794	75.46	245.11	2283.21	-2249.78	-581.62	-1284.86	5727225.08	594980.11
2795	75.46	245.12	2283.47	-2250.03	-582.03	-1285.74	5727224.67	594979.23
2796	75.46	245.13	2283.72	-2250.29	-582.44	-1286.62	5727224.26	594978.35

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2797	75.46	245.14	2283.97	-2250.54	-582.85	-1287.50	5727223.85	594977.48
2798	75.47	245.15	2284.22	-2250.79	-583.25	-1288.37	5727223.45	594976.60
2799	75.47	245.16	2284.47	-2251.04	-583.66	-1289.25	5727223.04	594975.72
2800	75.47	245.17	2284.72	-2251.29	-584.07	-1290.13	5727222.63	594974.84
2801	75.48	245.19	2284.97	-2251.54	-584.47	-1291.01	5727222.23	594973.96
2802	75.48	245.20	2285.22	-2251.79	-584.88	-1291.89	5727221.82	594973.08
2803	75.48	245.21	2285.47	-2252.04	-585.28	-1292.77	5727221.42	594972.20
2804	75.49	245.22	2285.72	-2252.29	-585.69	-1293.65	5727221.01	594971.33
2805	75.49	245.23	2285.97	-2252.54	-586.10	-1294.52	5727220.60	594970.45
2806	75.49	245.23	2286.22	-2252.79	-586.50	-1295.40	5727220.20	594969.57
2807	75.50	245.23	2286.47	-2253.04	-586.91	-1296.28	5727219.79	594968.69
2808	75.50	245.23	2286.72	-2253.30	-587.32	-1297.16	5727219.38	594967.81
2809	75.51	245.24	2286.97	-2253.55	-587.72	-1298.04	5727218.98	594966.93
2810	75.51	245.24	2287.22	-2253.80	-588.13	-1298.92	5727218.57	594966.05
2811	75.52	245.24	2287.47	-2254.05	-588.53	-1299.80	5727218.17	594965.17
2812	75.52	245.24	2287.72	-2254.30	-588.94	-1300.68	5727217.76	594964.29
2813	75.53	245.24	2287.97	-2254.55	-589.34	-1301.56	5727217.36	594963.41
2814	75.53	245.24	2288.22	-2254.80	-589.75	-1302.44	5727216.95	594962.54
2815	75.53	245.24	2288.47	-2255.05	-590.15	-1303.32	5727216.55	594961.66
2816	75.54	245.25	2288.72	-2255.30	-590.56	-1304.20	5727216.14	594960.78
2817	75.54	245.25	2288.97	-2255.55	-590.96	-1305.08	5727215.74	594959.90
2818	75.55	245.25	2289.22	-2255.79	-591.37	-1305.95	5727215.33	594959.02
2819	75.55	245.25	2289.47	-2256.04	-591.78	-1306.83	5727214.92	594958.14
2820	75.56	245.25	2289.72	-2256.29	-592.18	-1307.71	5727214.52	594957.26
2821	75.56	245.25	2289.97	-2256.54	-592.59	-1308.59	5727214.11	594956.38
2822	75.57	245.25	2290.22	-2256.79	-592.99	-1309.47	5727213.71	594955.50
2823	75.57	245.25	2290.47	-2257.04	-593.40	-1310.35	5727213.30	594954.62
2824	75.58	245.26	2290.72	-2257.29	-593.80	-1311.23	5727212.89	594953.74
2825	75.58	245.26	2290.97	-2257.54	-594.21	-1312.11	5727212.49	594952.86
2826	75.58	245.26	2291.22	-2257.79	-594.62	-1312.99	5727212.08	594951.98
2827	75.59	245.26	2291.47	-2258.04	-595.02	-1313.87	5727211.68	594951.10
2828	75.59	245.26	2291.72	-2258.29	-595.43	-1314.75	5727211.27	594950.22
2829	75.60	245.26	2291.97	-2258.53	-595.83	-1315.63	5727210.87	594949.34
2830	75.60	245.26	2292.21	-2258.78	-596.24	-1316.51	5727210.46	594948.46
2831	75.61	245.27	2292.46	-2259.03	-596.64	-1317.39	5727210.06	594947.58
2832	75.61	245.27	2292.71	-2259.28	-597.05	-1318.27	5727209.65	594946.70
2833	75.62	245.27	2292.96	-2259.53	-597.45	-1319.15	5727209.25	594945.82
2834	75.62	245.27	2293.21	-2259.78	-597.86	-1320.03	5727208.84	594944.94
2835	75.62	245.26	2293.46	-2260.03	-598.26	-1320.91	5727208.44	594944.06
2836	75.63	245.26	2293.70	-2260.27	-598.67	-1321.79	5727208.03	594943.18
2837	75.63	245.25	2293.95	-2260.52	-599.08	-1322.67	5727207.62	594942.30
2838	75.63	245.24	2294.20	-2260.77	-599.48	-1323.55	5727207.22	594941.42
2839	75.63	245.23	2294.45	-2261.02	-599.89	-1324.43	5727206.81	594940.55
2840	75.64	245.23	2294.70	-2261.27	-600.29	-1325.31	5727206.41	594939.66
2841	75.64	245.22	2294.95	-2261.51	-600.70	-1326.19	5727206.00	594938.79
2842	75.64	245.21	2295.19	-2261.76	-601.11	-1327.07	5727205.59	594937.91
2843	75.65	245.20	2295.44	-2262.01	-601.51	-1327.95	5727205.19	594937.03
2844	75.65	245.20	2295.69	-2262.26	-601.92	-1328.82	5727204.78	594936.15
2845	75.65	245.19	2295.94	-2262.51	-602.33	-1329.70	5727204.37	594935.27
2846	75.65	245.18	2296.18	-2262.75	-602.73	-1330.58	5727203.97	594934.39
2847	75.66	245.17	2296.43	-2263.00	-603.14	-1331.46	5727203.56	594933.51
2848	75.66	245.17	2296.68	-2263.25	-603.55	-1332.34	5727203.15	594932.63
2849	75.66	245.16	2296.93	-2263.50	-603.95	-1333.22	5727202.75	594931.75
2850	75.66	245.15	2297.18	-2263.74	-604.36	-1334.10	5727202.34	594930.87
2851	75.67	245.15	2297.42	-2263.99	-604.77	-1334.98	5727201.93	594929.99
2852	75.67	245.14	2297.67	-2264.24	-605.18	-1335.86	5727201.52	594929.11
2853	75.67	245.13	2297.92	-2264.49	-605.58	-1336.74	5727201.12	594928.23
2854	75.68	245.12	2298.17	-2264.74	-605.99	-1337.62	5727200.71	594927.36
2855	75.68	245.12	2298.41	-2264.98	-606.40	-1338.50	5727200.30	594926.48

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2856	75.68	245.11	2298.66	-2265.23	-606.81	-1339.38	5727199.89	594925.60
2857	75.68	245.10	2298.91	-2265.48	-607.21	-1340.25	5727199.49	594924.72
2858	75.69	245.09	2299.15	-2265.72	-607.62	-1341.13	5727199.08	594923.84
2859	75.69	245.09	2299.40	-2265.97	-608.03	-1342.01	5727198.67	594922.96
2860	75.69	245.08	2299.65	-2266.22	-608.44	-1342.89	5727198.26	594922.08
2861	75.70	245.07	2299.90	-2266.47	-608.85	-1343.77	5727197.85	594921.20
2862	75.70	245.06	2300.14	-2266.71	-609.26	-1344.65	5727197.44	594920.32
2863	75.70	245.07	2300.39	-2266.96	-609.67	-1345.53	5727197.03	594919.45
2864	75.72	245.11	2300.64	-2267.21	-610.07	-1346.40	5727196.63	594918.57
2865	75.73	245.15	2300.88	-2267.45	-610.48	-1347.28	5727196.22	594917.69
2866	75.74	245.19	2301.13	-2267.70	-610.89	-1348.16	5727195.81	594916.81
2867	75.76	245.23	2301.38	-2267.95	-611.30	-1349.04	5727195.40	594915.93
2868	75.77	245.27	2301.62	-2268.19	-611.70	-1349.92	5727195.00	594915.05
2869	75.79	245.31	2301.87	-2268.44	-612.11	-1350.80	5727194.59	594914.17
2870	75.80	245.34	2302.11	-2268.68	-612.51	-1351.68	5727194.19	594913.29
2871	75.81	245.38	2302.36	-2268.93	-612.91	-1352.57	5727193.78	594912.41
2872	75.83	245.42	2302.60	-2269.17	-613.32	-1353.45	5727193.38	594911.52
2873	75.84	245.46	2302.85	-2269.42	-613.72	-1354.33	5727192.98	594910.64
2874	75.85	245.50	2303.09	-2269.66	-614.13	-1355.21	5727192.57	594909.76
2875	75.87	245.54	2303.34	-2269.91	-614.53	-1356.09	5727192.17	594908.88
2876	75.88	245.58	2303.58	-2270.15	-614.93	-1356.98	5727191.77	594907.99
2877	75.89	245.62	2303.82	-2270.40	-615.33	-1357.86	5727191.37	594907.11
2878	75.91	245.66	2304.07	-2270.64	-615.73	-1358.74	5727190.97	594906.23
2879	75.92	245.69	2304.31	-2270.88	-616.13	-1359.63	5727190.57	594905.34
2880	75.93	245.73	2304.55	-2271.13	-616.53	-1360.51	5727190.17	594904.46
2881	75.95	245.77	2304.80	-2271.37	-616.93	-1361.40	5727189.77	594903.57
2882	75.96	245.81	2305.04	-2271.61	-617.32	-1362.28	5727189.38	594902.69
2883	75.97	245.85	2305.28	-2271.85	-617.72	-1363.17	5727188.98	594901.81
2884	75.99	245.89	2305.53	-2272.09	-618.12	-1364.05	5727188.58	594900.92
2885	76.00	245.93	2305.77	-2272.34	-618.51	-1364.94	5727188.18	594900.03
2886	76.01	245.97	2306.01	-2272.58	-618.91	-1365.82	5727187.79	594899.15
2887	76.03	246.01	2306.25	-2272.82	-619.31	-1366.71	5727187.39	594898.26
2888	76.04	246.04	2306.49	-2273.06	-619.70	-1367.60	5727187.00	594897.37
2889	76.05	246.08	2306.73	-2273.30	-620.09	-1368.48	5727186.61	594896.49
2890	76.08	246.09	2306.97	-2273.54	-620.49	-1369.37	5727186.21	594895.60
2891	76.12	246.09	2307.21	-2273.78	-620.88	-1370.26	5727185.82	594894.71
2892	76.16	246.08	2307.45	-2274.02	-621.27	-1371.15	5727185.43	594893.83
2893	76.20	246.07	2307.69	-2274.26	-621.67	-1372.03	5727185.03	594892.94
2894	76.23	246.06	2307.93	-2274.50	-622.06	-1372.92	5727184.64	594892.05
2895	76.27	246.05	2308.17	-2274.74	-622.46	-1373.81	5727184.24	594891.16
2896	76.31	246.04	2308.41	-2274.98	-622.85	-1374.70	5727183.85	594890.27
2897	76.35	246.03	2308.64	-2275.21	-623.25	-1375.58	5727183.45	594889.39
2898	76.39	246.02	2308.88	-2275.45	-623.64	-1376.47	5727183.06	594888.50
2899	76.42	246.01	2309.11	-2275.68	-624.04	-1377.36	5727182.66	594887.61
2900	76.46	246.00	2309.35	-2275.92	-624.43	-1378.25	5727182.27	594886.72
2901	76.50	245.99	2309.58	-2276.15	-624.83	-1379.14	5727181.87	594885.83
2902	76.54	245.98	2309.81	-2276.38	-625.23	-1380.02	5727181.47	594884.95
2903	76.58	245.97	2310.05	-2276.62	-625.62	-1380.91	5727181.08	594884.06
2904	76.61	245.96	2310.28	-2276.85	-626.02	-1381.80	5727180.68	594883.17
2905	76.65	245.95	2310.51	-2277.08	-626.41	-1382.69	5727180.29	594882.28
2906	76.69	245.94	2310.74	-2277.31	-626.81	-1383.58	5727179.89	594881.39
2907	76.73	245.93	2310.97	-2277.54	-627.21	-1384.47	5727179.49	594880.50
2908	76.77	245.93	2311.20	-2277.77	-627.61	-1385.36	5727179.09	594879.62
2909	76.80	245.92	2311.43	-2278.00	-628.00	-1386.24	5727178.70	594878.73
2910	76.84	245.91	2311.66	-2278.23	-628.40	-1387.13	5727178.30	594877.84
2911	76.88	245.90	2311.88	-2278.45	-628.80	-1388.02	5727177.90	594876.95
2912	76.92	245.89	2312.11	-2278.68	-629.20	-1388.91	5727177.50	594876.06
2913	76.95	245.88	2312.34	-2278.91	-629.59	-1389.80	5727177.11	594875.17
2914	76.99	245.87	2312.56	-2279.13	-629.99	-1390.69	5727176.71	594874.28

MD	Angle	Direction	TVDRT	TVDSS	Dnorth	Deast	Northing	Easting
2915	77.03	245.86	2312.79	-2279.36	-630.39	-1391.58	5727176.31	594873.39
2916	77.07	245.85	2313.01	-2279.58	-630.79	-1392.47	5727175.91	594872.50
2917	77.11	245.84	2313.23	-2279.80	-631.19	-1393.36	5727175.51	594871.61
2918	77.14	245.83	2313.46	-2280.03	-631.59	-1394.25	5727175.11	594870.72
2919	77.18	245.82	2313.68	-2280.25	-631.99	-1395.14	5727174.71	594869.83
2920	77.25	245.79	2313.90	-2280.47	-632.39	-1396.03	5727174.31	594868.95
2921	77.32	245.76	2314.12	-2280.69	-632.79	-1396.92	5727173.91	594868.06
2922	77.40	245.72	2314.34	-2280.91	-633.19	-1397.81	5727173.51	594867.17
2923	77.47	245.68	2314.56	-2281.13	-633.59	-1398.70	5727173.11	594866.28
2924	77.55	245.65	2314.77	-2281.34	-633.99	-1399.58	5727172.71	594865.39
2925	77.62	245.61	2314.99	-2281.56	-634.40	-1400.47	5727172.30	594864.50
2926	77.69	245.58	2315.20	-2281.77	-634.80	-1401.36	5727171.90	594863.61
2927	77.74	245.55	2315.41	-2281.98	-635.20	-1402.25	5727171.50	594862.72
2928	77.77	245.54	2315.63	-2282.20	-635.61	-1403.14	5727171.09	594861.83
2929	77.79	245.52	2315.84	-2282.41	-636.01	-1404.03	5727170.69	594860.94
2930	77.81	245.50	2316.05	-2282.62	-636.42	-1404.92	5727170.28	594860.05
2931	77.84	245.49	2316.26	-2282.83	-636.82	-1405.81	5727169.87	594859.16
2932	77.86	245.47	2316.47	-2283.04	-637.23	-1406.70	5727169.47	594858.27
2933	77.89	245.46	2316.68	-2283.25	-637.64	-1407.59	5727169.06	594857.38
2934	77.91	245.44	2316.89	-2283.46	-638.04	-1408.48	5727168.66	594856.49
2935	77.94	245.42	2317.10	-2283.67	-638.45	-1409.37	5727168.25	594855.60
2936	77.96	245.41	2317.31	-2283.88	-638.86	-1410.26	5727167.84	594854.71
2937	77.98	245.39	2317.52	-2284.09	-639.27	-1411.15	5727167.43	594853.82
2938	78.01	245.38	2317.72	-2284.30	-639.67	-1412.04	5727167.03	594852.93
2939	78.03	245.36	2317.93	-2284.50	-640.08	-1412.93	5727166.62	594852.05
2940	78.06	245.35	2318.14	-2284.71	-640.49	-1413.82	5727166.21	594851.16
2941	78.08	245.33	2318.35	-2284.92	-640.90	-1414.70	5727165.80	594850.27
2942	78.10	245.31	2318.55	-2285.12	-641.31	-1415.59	5727165.39	594849.38
2943	78.13	245.30	2318.76	-2285.33	-641.71	-1416.48	5727164.99	594848.49
2944	78.15	245.28	2318.96	-2285.53	-642.12	-1417.37	5727164.58	594847.60
2945	78.18	245.27	2319.17	-2285.74	-642.53	-1418.26	5727164.17	594846.71
2946	78.20	245.25	2319.37	-2285.94	-642.94	-1419.15	5727163.76	594845.82

APPENDIX 2a

WEST KINGFISH W20A

Petrophysics Evaluation Summary

Esso Australia Pty Ltd.
Exploration Department

West Kingfish W20A
Petrophysics Report

Petrophysicist: A.A. Mills
October 2006

West Kingfish W20A Petrophysics Report

INTRODUCTION

West Kingfish W-20A is a directional well designed to develop oil reserves in the low permeability M1.2L sand in the area between the productive wells W-2 and W-11 in the Kingfish field.

West Kingfish W-20A was drilled to the Total Depth of 2946.0 mMDRT (2319.37 mTVDRT) in an 8½" production hole. The well was logged with the Precision Energy Services compact shuttle system on drillpipe while POOH. The logging suite run was MCG-MDN-MPD-MDL-MSS-MAI over the interval from 2943.0 mMDRT to 2478.8 mMDRT, and finally up to surface casing shoe at 675m.

The well was completed with 7" production casing run with the shoe at 2946.0 mMDRT and 2⅞" completion tubing run to a depth of 2769.8 mMDRT. Handed over to production at 11:00 hours on the 01st of June 2006.

The Precision logs were depth matched to the Schlumberger LWD GR log and analysed for porosity, water saturation and net pay over the interval 2770 - 2917 mMDRT.

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

DATA

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

Survey/Log	Suite	Company	Top (m MDRT)	Bottom (m MDRT)
MWD-GR (base log for depth matching)	2	Schlumberger	675.0	2929.0
Dual Laterolog (DDL, DSL), Gamma Ray (GRGC), Photo Density (PDPE, DEN), Caliper (CLDC), Compensated Neutron (NPRL) and Compensated Sonic (DT).	1	Precision	2478.8 (also extends to 675)	2943

Induction was also recorded in the Precision logs.

Deviation

The average well deviation over the reservoir interval was approximately 76° towards an average azimuth of 245°.

Mud Data

Mud Type: KCl/Glycol/PHPA
Mud Weight: 9.7 ppg
Rm: 0.108 @ 25 °C
Rmf: 0.087 @ 25 °C
Rmc: 0.152 @ 25 °C
KCL 8.0%
BHT: 91.0 °C (as measured by the Precision tools)

Hole Size

675 - 2946 mMDRT 8 ½ inches

Data Acquisition & Log Quality

Good quality Schlumberger D&M MWD/GR data and Precision shuttle data were acquired without incident. Hole conditions were good across the Latrobe reservoir intervals and enlarged 1-2" in the shaly intervals. Log quality was sufficient to perform analysis without significant depth alignment.

Data Processing

The PDPE curve was shifted -0.4 b/e to remove barite effect, before U was generated for lithology determination. U was generated using the equation:

$$U = (PDPE - 0.4) * (DEN + 0.1883) / 1.0704$$

This curve was then filtered over the interval 2987.5-2912m MDRT with a 3 point running filter to remove the effects of cyclical borehole.

West Kingfish W20A Petrophysics Report

INTERPRETATION

Logs Used

The primary logs used in the interpretation were the depth matched DDLL (deep resistivity), DT35 (compressional sonic), DEN (bulk density), PDPE (photo-electric effect) and NPRL (thermal neutron porosity). As no coal intervals were identified, the coal flag (Flag_coal) was set to zero. No hydrocarbon flag (Flag_rhoH) was required as oil is the only hydrocarbon present. A temperature log was created using the following data:

Depth (mMDRT)	Temperature (deg. C)
109.5	10
2936	101

The temperature at depth 109.5 mMDRT represents the temperature of the sea-bed and the temperature at 2936 mMDRT (first reading of the Precision logs) is the estimated formation temperature equal to BHT + 10 degC.

Radioactive reservoir sands are present in this well, particularly across the intervals 2805-30m and 2887-2910m MDRT. The GR is generally a poor clay indicator across these intervals. The approach taken here to adequately characterise the clay content was to use the U, DEN, NPRL and DT35 measurements, with heavy weighting towards DEN, NPRL, moderate towards U, and low weighting towards DT35.

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 30,000 ppm NaCl equivalent throughout the zone of interest.

Hydrocarbon Type Identification

A combination of resistivity, density-neutron logs, and mud log shows were used to determine fluid types present in the reservoirs. Fluid types in several zones remain indeterminate from log responses so that fluids have been inferred from mudlog shows and surrounding production. The following table lists the determination made using this process:

Zone	Top Depth mMD	Bottom Depth mMD	Fluid Type
P1.1 - ROS	2780.0	2784.5	Residual oil
M1.2U-1 ?OIL	2805.0	2813.5	Probable oil
M1.2U-2 OIL	2818.3	2821.4	Oil
M1.2L - OIL	2830.0	2836.5	Oil
M1.2L - ROS1	2836.5	2848.0	Residual Oil
M1.2L - ROS2	2848.0	2853.4	Residual Oil
PS7 - OIL	2868.2	2870.8	Probable oil
PS6-1 OIL	2872.3	2873.9	Oil
PS6-1 ROS	2873.9	2876.5	Residual Oil
PS6-2 ?OIL	2881.2	2883.5	Probable oil
PS5-1 OIL	2885.0	2887.0	Oil
PS5-2 ROS	2887.0	2893.0	Residual Oil
PS4 - ROS	2893.1	2914.0	Residual Oil

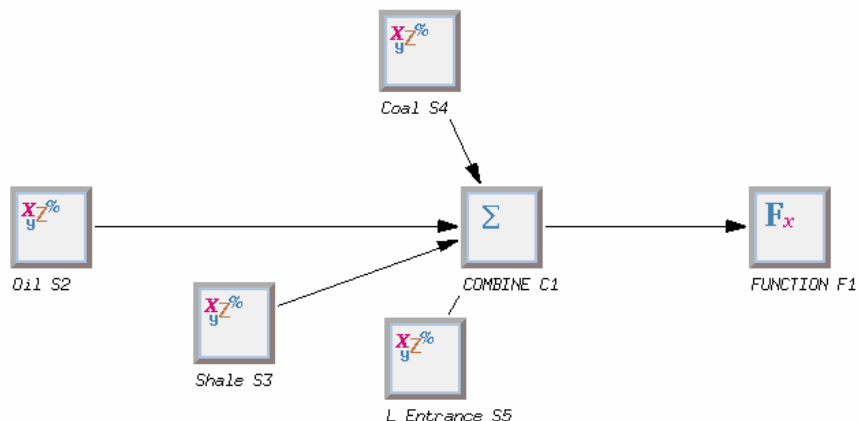
Clay Volume, Porosity and Water Saturation

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

West Kingfish W20A Petrophysics Report

ELAN+ MODEL

Elan+ Model and Module Configuration



ELAN Input Channels

	Compound Name Spec	WEST KINGFISH W20A
TEMP_CH	TEMP;*	TEMP@RES-NUC-DT:NUC-RES_FILT-FIN_24MA#
RHOB_IFAC_CH	IFRH;*	
NPHI_IFAC_CH	INPH;*	
RHOB_CH	DEN:BPB;*	DEN@RES-NUC-DT:NUC-RES_FILT-FIN_24MAY
NPHI_CH	NPRL:BPB;*	NPRL@RES-NUC-DT:NUC-RES_FILT-FIN_24MA
DT_CH	DT35:BPB;*	DT35@RES-NUC-DT:NUC-RES_FILT-FIN_24MA
U_CH	U;*	U@RES-NUC-DT:NUC-RES_FILT-FIN_24MAY06
CUDC_CH/RT_CH	DDLL:BPB;*	DDLL@RES-NUC-DT:NUC-RES_FILT-FIN_24MA
PRB2_CH	PRB2;*	
PRB3_CH	PRB3;*	
PRB4_CH	FLAG_COAL;*	FLAG_COAL@WELLEDIT;1 .WELLEDIT [A1681301]
PRB5_CH	PRB5;*	
M_CH	MXP;*	
N_CH	SXP;*	

West Kingfish W20A Petrophysics Report

ELAN Global Parameters

Reference Index	MD
Processing Interval	2770.0000(m) To 2920.0000(m)
Sampling Rate	0.3281(m)
Uncertainty Channel	FALSE
Clay Input	DRY
Special Fluids	IMMOVABLE_HYDROCARBON

ELAN Zone Definition

Name	Bottom To Top
M-1.2L & M-1.3U	2937.0999(m) To 2804.5000(m)
Gurnard	2804.5000(m) To 2770.0000(m)

ELAN Process Definition

Process	SOLVE2 "Oil"							
Equations	RHOB	NPHI	DT	U	CUDC_DWA	CT2		
Volumes	QUAR	ORTH	PYRI	ILLI	XWAT	UWAT	XOIL	UOIL
User Constraints	constraint(maxDolomite, DOLO<0)							
Constraint Zones	Bottom			Top				
UNDEFINED	2937.0999(m)				2770.0000(m)			

Constraints Applied

UNDEFINED	- IrreducibleXWater
UNDEFINED	- IrreducibleUWater
UNDEFINED	- WaterBaseMud_SXO_gt_SW

Process	SOLVE3 "Shale"				
Equations	RHOB	NPHI	CUDC_DWA		
Volumes	QUAR	GLAU	ILLI	XWAT	UWAT
Constraint Zones	Bottom				Top
UNDEFINED	2937.0999(m)		2770.0000(m)		

Process	SOLVE4 "Coal"							
Equations	RHOB							
Volumes	COAL							
Constraint Zones	Bottom			Top				
UNDEFINED	2937.0999(m)				2770.0000(m)			

Process	SOLVE5 "L_Entrance"							
Equations	RHOB							
Volumes	ILLI							
Constraint Zones	Bottom			Top				
UNDEFINED	2937.0999(m)				2770.0000(m)			

Process	COMBINE 1 "COMBINE"							
Order	SOL.2	SOL.3	SOL.4	SOL.5				

West Kingfish W20A Petrophysics Report

Combine Method

"Coarse Clast" 9636.1543 (m) Internal Average

"L Entrance " 8858.2676 (m) Sol.5

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	M-1.2L &M-1.3U	Gurnard
n*****	*****	*****
CXDC_XWAT (mS/m)	18.736	18.047
CXDC_XBWA (mS/m)	10.707	10.315
CUDC_UWAT (mS/m)	14.525	14.033
CUDC_UBWA (mS/m)	4.802	4.617
WCLP_ILLI (m3/m3)	0.135	0.135
CUDC_UNC_ZP (mS/m)	0.057	0.056
U_UNC_WM ()	0.600	0.300

ELAN Same Parameters

Parameter	Value	Parameter	Value
RHOB QUAR	2.650(g/cm3)	RHOB CALC	2.710(g/cm3)
RHOB DOLO	2.847(g/cm3)	RHOB ORTH	2.570(g/cm3)
RHOB PYRI	4.990(g/cm3)	RHOB GLAU	2.650(g/cm3)
RHOB ILLI	2.780(g/cm3)	RHOB KAOL	2.620(g/cm3)
RHOB COAL	1.200(g/cm3)	RHOB IGNE	3.000(g/cm3)
RHOB XWAT	1.000(g/cm3)	RHOB UWAT	0.985(g/cm3)
RHOB XOIL	0.700(g/cm3)	RHOB UOIL	0.700(g/cm3)
RHOB XGAS	-0.024(g/cm3)	RHOB UGAS	-0.024(g/cm3)
RHOB XBWA	0.964(g/cm3)	NPHI QUAR	-0.059(m3/m3)
NPHI CALC	0.000(m3/m3)	NPHI DOLO	0.032(m3/m3)
NPHI ORTH	-0.010(m3/m3)	NPHI PYRI	0.008(m3/m3)
NPHI GLAU	0.410(m3/m3)	NPHI ILLI	0.247(m3/m3)
NPHI KAOL	0.450(m3/m3)	NPHI COAL	0.450(m3/m3)
NPHI XWAT	1.000(m3/m3)	NPHI UWAT	0.950(m3/m3)
NPHI XOIL	0.600(m3/m3)	NPHI UOIL	0.600(m3/m3)
NPHI XGAS	0.147(m3/m3)	NPHI UGAS	0.147(m3/m3)
NPHI XBWA	1.000(m3/m3)	DT QUAR	55.500(us/m)
DT CALC	47.800(us/m)	DT DOLO	43.500(us/m)
DT ORTH	60.000(us/m)	DT PYRI	39.000(us/m)
DT GLAU	90.000(us/m)	DT ILLI	60.000(us/m)
DT KAOL	91.318(us/m)	DT COAL	121.920(us/m)
DT IGNE	16.916(us/m)	DT XWAT	0.000(us/m)
DT UWAT	220.000(us/m)	DT XOIL	0.000(us/m)

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DT_UOIL	240.000(us/m)	DT_XGAS	0.000(us/m)
DT_UGAS	289.865(us/m)	DT_XBWA	189.000(us/m)
U_QUAR	6.000()	U_CALC	14.100()
U_DOLO	9.100()	U_ORTH	8.700()
U_PYRI	82.060()	U_GLAU	16.500()
U_ILLI	9.900()	U_KAOL	5.100()
U_COAL	1.000()	U_XWAT	0.692()
U_UWAT	0.000()	U_XOIL	0.136()
U_UOIL	0.000()	U_XGAS	0.012()
U_UGAS	0.000()	U_XBWA	0.398()
CXDC_ILLI	-999.250(mS/m)	CXDC_KAOL	-999.250(mS/m)
CUDC_GLAU	-999.250(mS/m)	CUDC_ILLI	-999.250(mS/m)
CUDC_KAOL	-999.250(mS/m)	GR_QUAR	40.000(gAPI)
GR_CALC	11.000(gAPI)	GR_DOLO	3.000(gAPI)
GR_ORTH	200.000(gAPI)	GR_PYRI	0.000(gAPI)
GR_GLAU	150.000(gAPI)	GR_ILLI	220.000(gAPI)
GR_KAOL	98.000(gAPI)	GR_COAL	40.000(gAPI)
GR_IGNE	40.000(gAPI)	GR_XWAT	0.000(gAPI)
GR_UWAT	0.000(gAPI)	GR_XOIL	0.000(gAPI)
GR_UOIL	0.000(gAPI)	GR_XGAS	0.000(gAPI)
GR_UGAS	0.000(gAPI)	GR_XBWA	0.000(gAPI)
EX1_QUAR	0.000()	EX1_CALC	0.000()
EX1_ORTH	0.000()	EX1_PYRI	0.000()
EX1_ILLI	0.000()	EX1_COAL	0.000()
EX1_XWAT	0.000()	EX1_UWAT	0.000()
EX1_XOIL	0.000()	EX1_UOIL	0.000()
EX1_XGAS	0.000()	EX1_UGAS	0.000()
EX1_XBWA	0.000()	CT1_QUAR	0.000()
CT1_CALC	0.000()	CT1_DOLO	0.000()
CT1_ORTH	0.000()	CT1_PYRI	0.000()
CT1_GLAU	0.000()	CT1_ILLI	0.000()
CT1_KAOL	0.000()	CT1_COAL	0.000()
CT1_IGNE	0.000()	CT1_XWAT	0.000()
CT1_UWAT	0.000()	CT1_XOIL	0.000()
CT1_UOIL	0.000()	CT1_XGAS	1.000()
CT1_UGAS	-0.300()	CT1_XBWA	0.000()
CT2_QUAR	0.000()	CT2_CALC	0.000()
CT2_DOLO	0.000()	CT2_ORTH	0.000()
CT2_PYRI	0.000()	CT2_GLAU	0.000()
CT2_ILLI	0.000()	CT2_KAOL	0.000()
CT2_COAL	0.000()	CT2_IGNE	0.000()
CT2_XWAT	0.000()	CT2_UWAT	0.000()
CT2_XOIL	1.000()	CT2_UOIL	-0.300()
CT2_XGAS	0.000()	CT2_UGAS	0.000()
CT2_XBWA	0.000()	CT3_QUAR	-0.100()
CT3_CALC	0.000()	CT3_ORTH	1.000()
CT3_PYRI	0.000()	CT3_GLAU	0.000()
CT3_ILLI	0.000()	CT3_KAOL	0.000()
CT3_COAL	0.000()	CT3_XWAT	0.000()
CT3_UWAT	0.000()	CT3_XOIL	0.000()
CT3_UOIL	0.000()	CT3_XGAS	0.000()
CT3_UGAS	0.000()	CT3_XBWA	0.000()
CT4_QUAR	0.010()	CT4_CALC	0.000()
CT4_ORTH	0.000()	CT4_PYRI	-1.000()
CT4_GLAU	0.000()	CT4_ILLI	0.000()
CT4_COAL	0.000()	CT4_XWAT	0.000()
CT4_UWAT	0.000()	CT4_XOIL	0.000()
CT4_UOIL	0.000()	CT4_XGAS	0.000()
CT4_UGAS	0.000()	CT4_XBWA	0.000()

West Kingfish W20A Petrophysics Report

ARHOB_GLAU	2.960(g/cm ³)	ARHOB_ILLI	2.780(g/cm ³)
ARHOB_KAOL	2.620(g/cm ³)	WCLP_GLAU	0.156(m ³ /m ³)
WCLP_KAOL	0.058(m ³ /m ³)	CBWA_GLAU	-999.250(mS/m)
CBWA_ILLI	-999.250(mS/m)	CBWA_KAOL	-999.250(mS/m)
CECA_GLAU	0.233(meq/g)	CECA_ILLI	0.200(meq/g)
CECA_KAOL	0.090(meq/g)	RMF	0.160(ohm.m)
MST	61.880(degC)	RW	0.343(ohm.m)
RWT	-999.250(degC)	SALIN_ISOL	-999.250(ppk)
SALIN_PARA	-999.250(ppk)	SALIN_XWAT	12.924(ppk)
SALIN_UWAT	30.000(ppk)	SALIN_XIWA	-999.250(ppk)
SALIN_UIWA	-999.250(ppk)	SALIN_XOIL	0.000(ppk)
SALIN_UOIL	0.000(ppk)	SALIN_XGAS	0.000(ppk)
SALIN_UGAS	0.000(ppk)	SALIN_XSFL	-999.250(ppk)
SALIN_USFL	-999.250(ppk)	CT1_ZP	0.000()
CT2_ZP	0.000()	CT3_ZP	0.000()
CT4_ZP	0.000()	RHOB_UNC_ZP	0.027(g/cm ³)
NPHI_UNC_ZP	0.015(m ³ /m ³)	DT_UNC_ZP	2.250(us/m)
U_UNC_ZP	0.225()	CXDC_UNC_ZP	0.072(mS/m)
GR_UNC_ZP	2.250(gAPI)	EX1_UNC_ZP	0.015()
CT1_UNC_ZP	0.015()	CT2_UNC_ZP	0.015()
CT3_UNC_ZP	0.015()	CT4_UNC_ZP	0.015()
VOLS_UNC_ZP	0.015(m ³ /m ³)	RHOB_UNC_WM	1.000()
NPHI_UNC_WM	1.000()	DT_UNC_WM	0.300()
CXDC_UNC_WM	0.500()	CUDC_UNC_WM	0.670()
GR_UNC_WM	0.300()	EX1_UNC_WM	1.000()
CT1_UNC_WM	0.800()	CT2_UNC_WM	0.800()
CT3_UNC_WM	0.900()	CT4_UNC_WM	1.000()
VOLS_UNC_WM	1.000()	RHOB_IFAC_ZP	0.600()
NPHI_IFAC_ZP	0.400()	A_ZP	1.000()
N_ZP	2.000()	C_DWA	0.000()
M_DWA	2.000()	BVIRR	0.010(m ³ /m ³)

RESULTS AND DISCUSSION

Results of this analysis are generally consistent with field expectations. Most of the sands are shaly and have swept down to residual oil saturations of 20-30su. Conversely, sands which have been interpreted to still be oil bearing have calculated oil saturations which typically range from 40-60su.

The main exception to this observation is the M1.2U interval between about 2805-13m MDRT. This interval has a calculated water saturation of 100% ie no residual oil saturation in a shaly sandstone. In surrounding wells, this interval typically has high calculated water saturations of 60-80su, consistent with the bioturbated, shaly nature of this rock. Permeabilities in the basal, worst quality portion of this reservoir in the W11 core vary between 0.1-1mD, suggesting that the permeability in the better developed top of this unit would probably be about 10 mD. Valid MDT pretests have been conducted in this unit in other wells, such as W30 (Pretest 2).

Thus the calculated 100% Sw is inconsistent with mudlog gas shows, the existence of interpreted oil remaining in the M1.2U immediately below (2818-2821), and oil production from the same interval in the nearby W22 well. This high calculated water saturation is a direct consequence of the low resistivity measurement of 2-3 ohmm, and low calculated porosity of about 12-14pu.

Core across this reservoir interval in the W11, W12 & W24A wells indicate that the mineralogy includes a range of potentially conductive or shaly minerals such as pyrite, chlorite, glauconite and mica, which may contribute to the overestimation of water saturation. Without further direct evidence in this well, it is not possible to resolve the productivity of this interval, but on perforation, it is likely to produce oil at low rates.

West Kingfish W20A Petrophysics Report

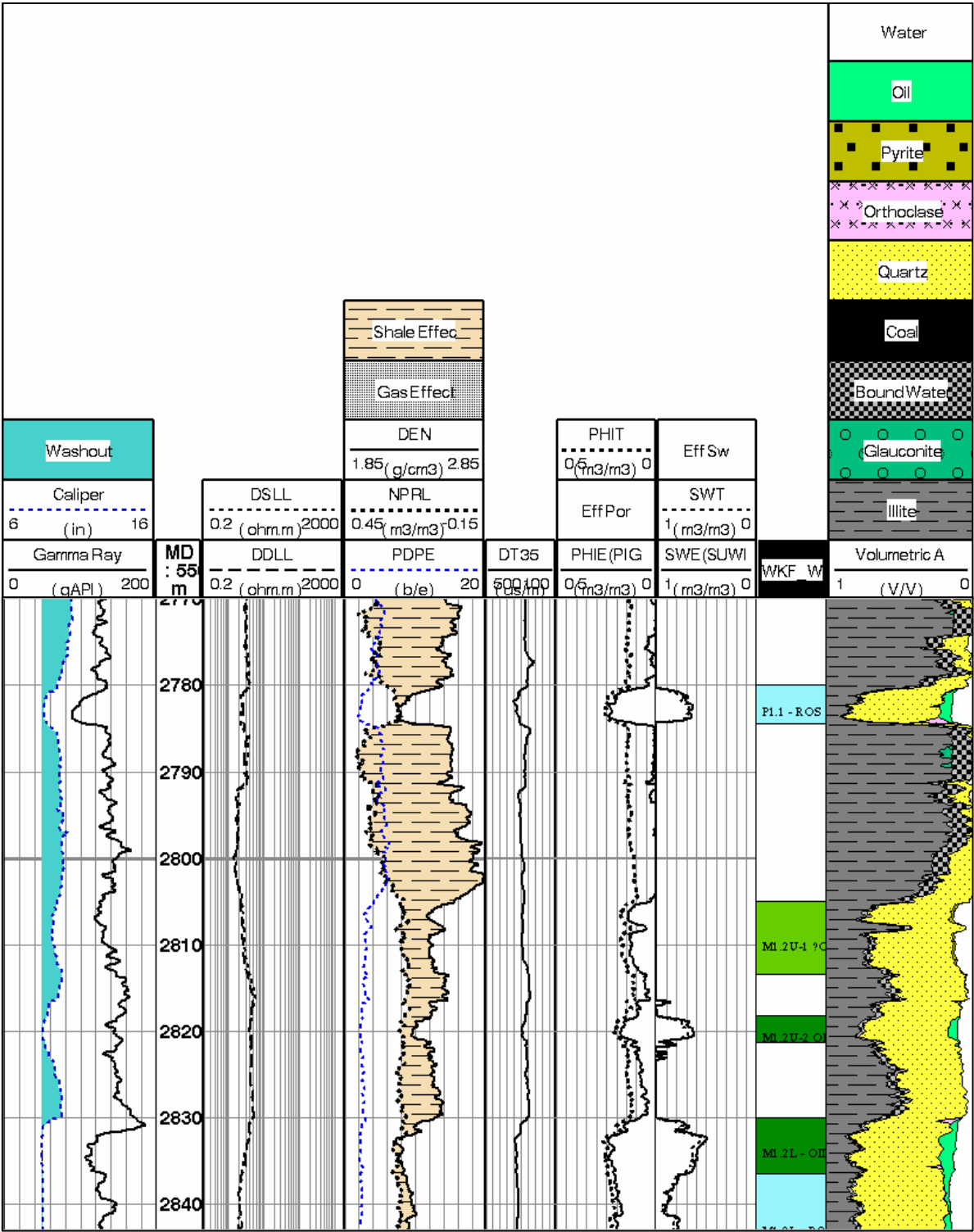


Figure 1 West Kingfish W20A summary plot of petrophysical analysis results 2770 – 2843m MDRT

West Kingfish W20A Petrophysics Report

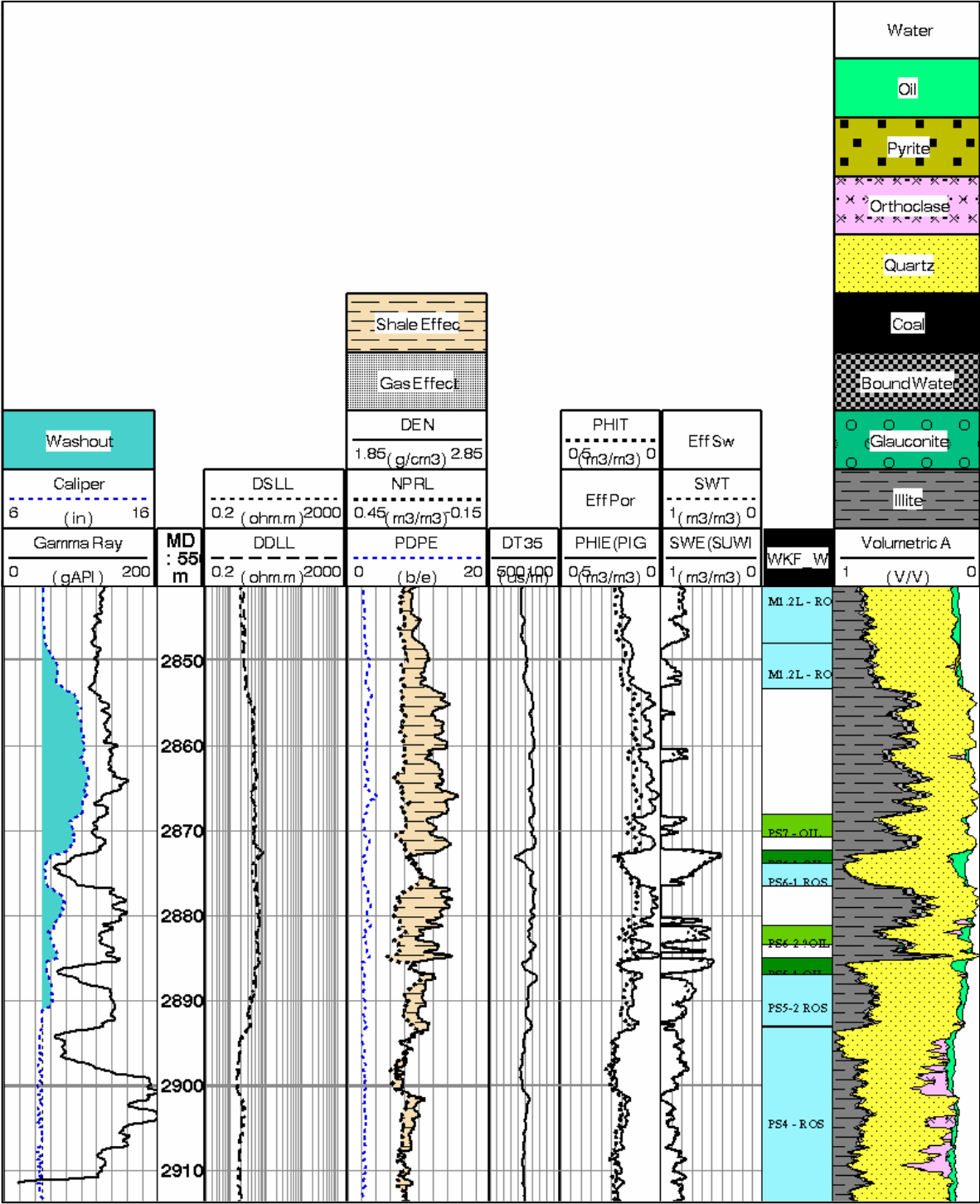


Figure 2 West Kingfish W20A summary plot of petrophysical analysis results 2841 – 2914m MDRT

West Kingfish W20A

Petrophysical Summary 2770 - 2914

Data Reference:

Average VCI, Phie, Swe are based on Phie cutoff.

Primary: MDRT

0.10 for all zones

(cutoff has been lowered from 0.12 to account for overperformance of WKf reservoirs)

	DEPTH				THICKNESS							AVERAGE PARAMETERS			
	Top		Bottom		Gross		Net Reservoir		Net Pay		N/G	Net Reservoir			
Zone	MD (m)	TVDSS (m)	Bottom MD (m)	TVDSS (m)	MD (m)	TVD (m)	MD (m)	TVD (m)	MD (m)	TVD (m)	Ratio	Clay Volume (m3/m3)	Porosity (m3/m3)	Water Saturation (m3/m3)	Comments
P1.1 - ROS	2780.0	2246.3	2784.5	2247.4	4.5	1.1	4.0	1.0	-	-	0.88	0.226	0.204	0.695	residual oil
M1.2U-1 ?OIL	2805.0	2252.5	2813.5	2254.7	8.5	2.1	6.1	1.5	6.1	1.5	0.72	0.307	0.124	*1	probable oil
M1.2U-2 OIL	2818.3	2255.9	2821.4	2256.6	3.1	0.8	2.8	0.7	2.8	0.7	0.92	0.273	0.154	0.687	oil
M1.2L - OIL	2830.0	2258.8	2836.5	2260.4	6.5	1.6	6.3	1.6	6.3	1.6	0.96	0.223	0.202	0.608	oil
M1.2L - ROS1	2836.5	2260.4	2848.0	2263.3	11.5	2.8	11.5	2.8	-	-	1.00	0.225	0.187	0.812	residual oil
M1.2L - ROS2	2848.0	2262.4	2853.4	2264.6	5.4	1.3	5.4	1.3	-	-	1.00	0.294	0.148	0.909	residual oil
PS7 - ?OIL	2868.2	2268.2	2870.8	2268.9	2.6	0.6	1.4	0.3	1.4	0.3	0.54	0.361	0.116	0.816	probable oil
PS6-1 OIL	2872.3	2269.2	2873.9	2269.6	1.6	0.4	1.3	0.3	1.3	0.3	0.84	0.168	0.190	0.454	oil
PS6-1 ROS	2873.9	2269.6	2876.5	2270.3	2.6	0.6	2.6	0.6	-	-	0.98	0.141	0.151	0.691	residual oil
PS6-2 ?OIL	2881.2	2271.4	2883.5	2272.0	2.3	0.6	1.5	0.4	1.5	0.4	0.65	0.368	0.139	0.562	probable oil
PS5-1 OIL	2885.0	2272.3	2887.0	2272.8	2.0	0.5	1.7	0.4	1.7	0.4	0.85	0.176	0.176	0.557	oil
PS5-2 ROS	2887.0	2272.8	2893.0	2274.2	6.0	1.4	5.7	1.3	-	-	0.94	0.270	0.141	0.762	residual oil
PS4 - ROS	2893.1	2274.3	2914.0	2279.1	20.9	4.8	20.9	4.8	-	-	1.00	0.168	0.204	0.842	residual oil

* M1.2U calculates an Sw of 100%, but is considered to be probable oil based on nearby production (W22) and the underlying M1.2U oil at 2818-21m ..

Suppression of resistivity by conductive minerals is the most likely cause of the high Sw

Table 1

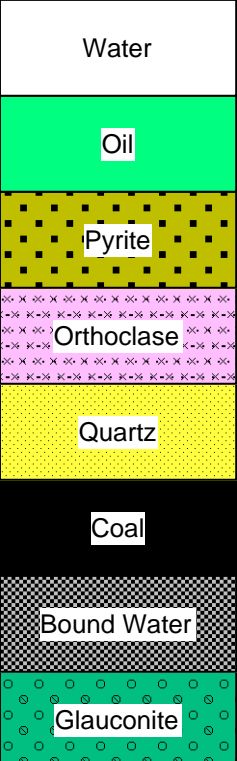
WEST KINGFISH W20A

Petrophysical Analysis

COMPANY: Esso Australia Pty. Ltd.
WELL: WEST KINGFISH W20A
FIELD: WEST KINGFISH
STATE: VIC
COUNTRY: Australia

PETROPHYSICIST: A. A. MILLS

Date Logged: <Date> Date Processed:
Well Location: <FL> <PROCESS_DATE>
Elevations: K.B. 33.43 m
Latitude: <LATI> D.F. <DF>
Longitude: <LONG> G.L. <GL>

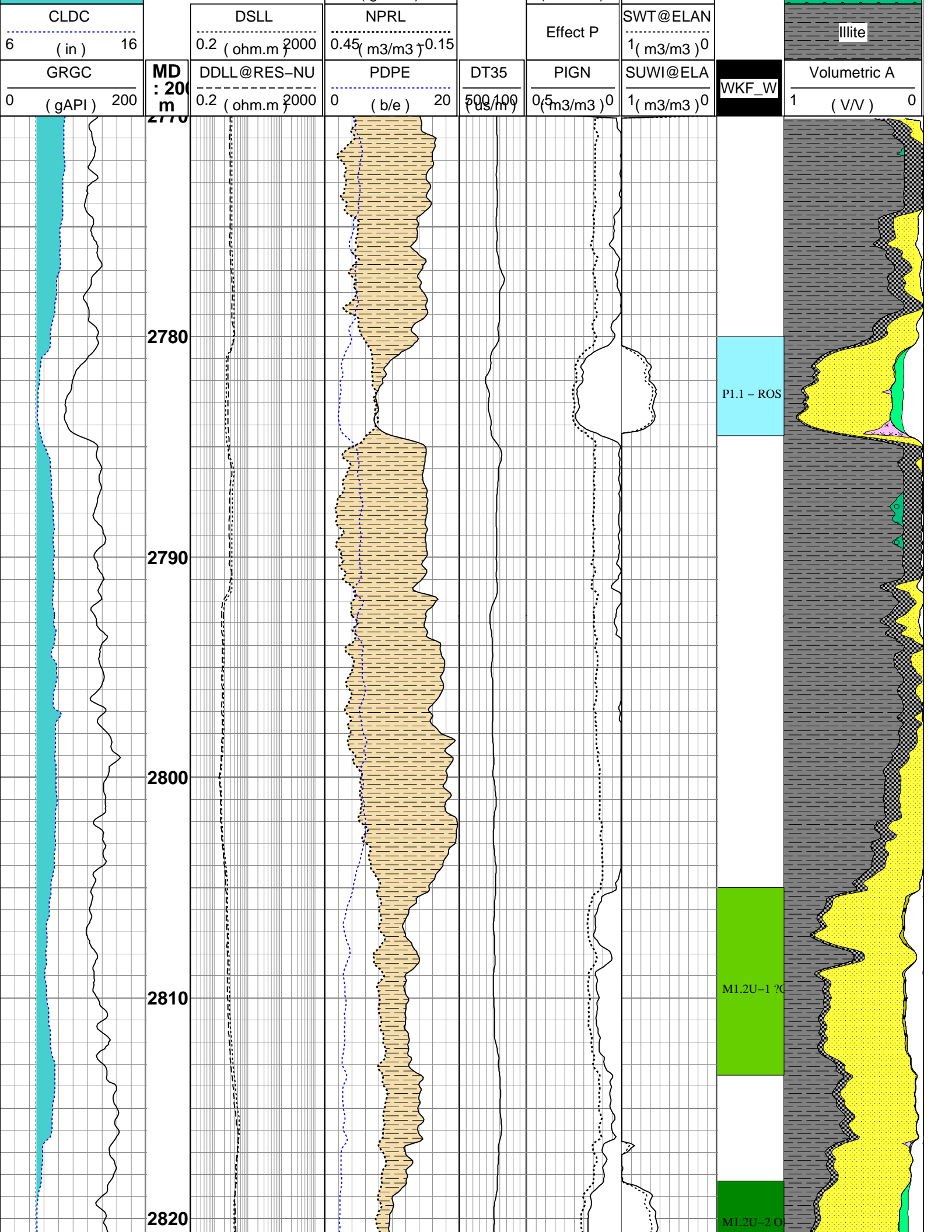


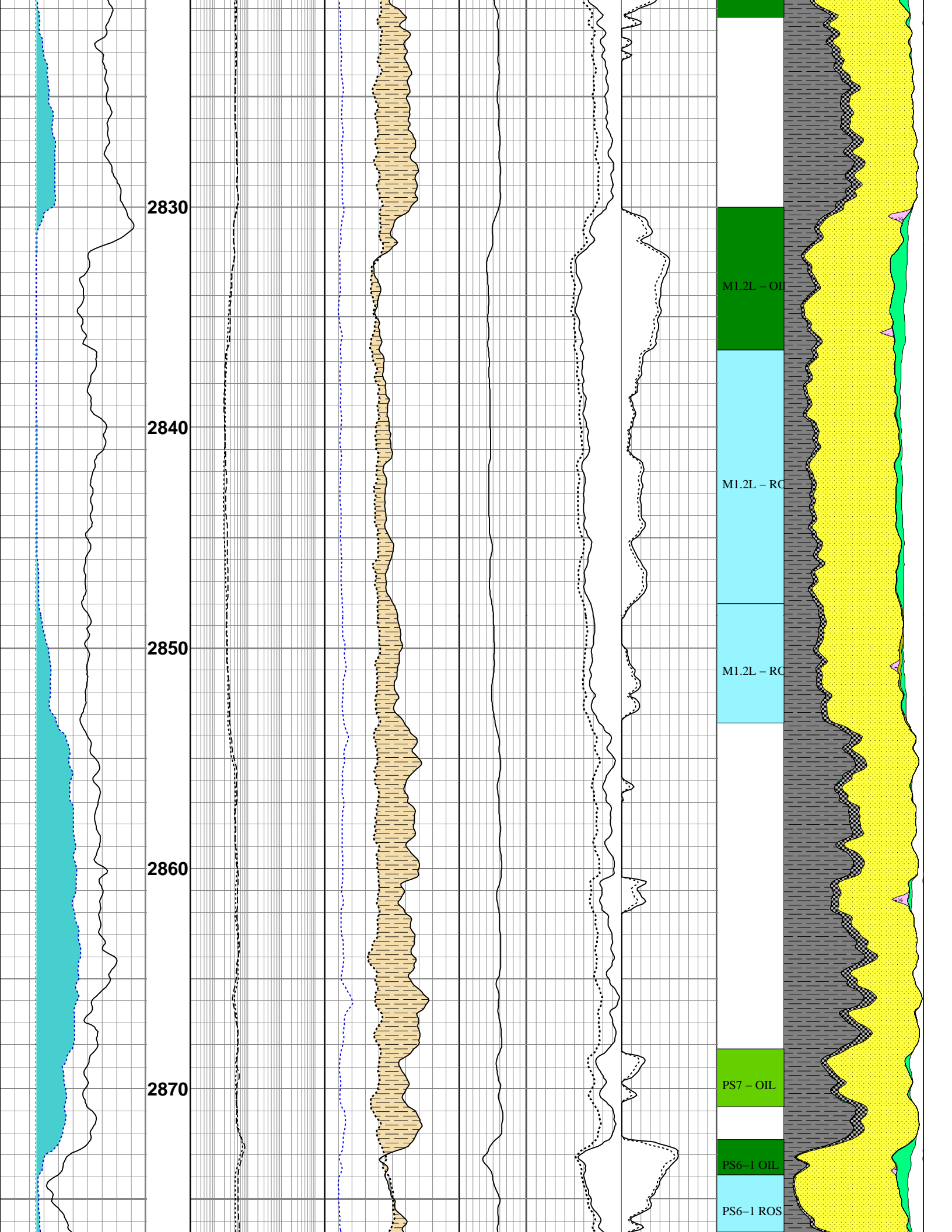
Effec Sw
lgp_Area

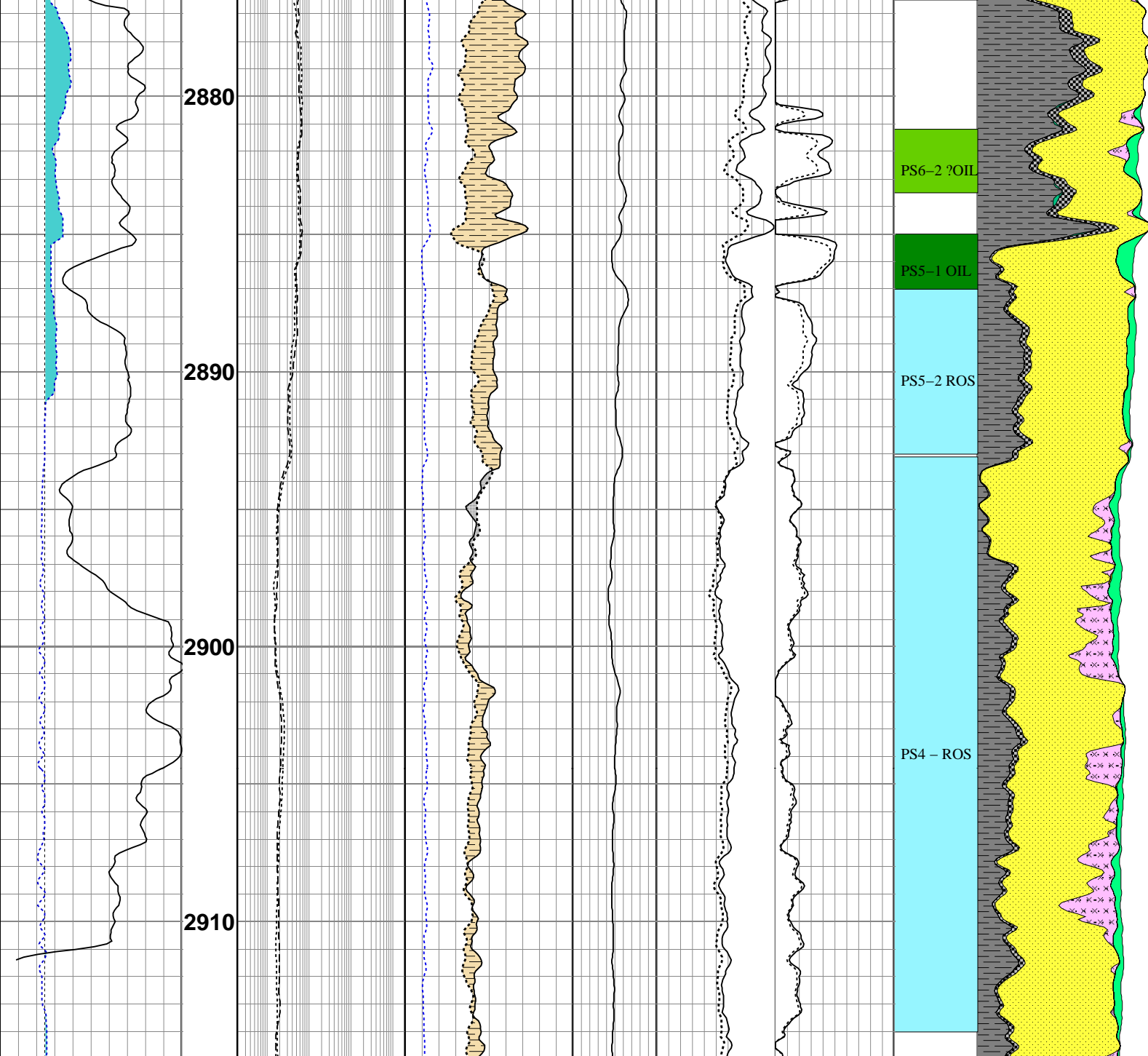
PHIT
0.5 (m3/m3) 0

Shale Effec
Gas Effect
DEN
1.85 (g/cm3) 2.85

Washout







APPENDIX 3a

WEST KINGFISH W20A

Lithology/Show Descriptions

West Kingfish W20A Lithology / Show Descriptions

Interval (m) From To	%	Lithology / Show Description
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Previous Well History:

SLOT 20: WKF W20 drilled in May 1983.
 13.5" hole to 675.0 mMDRT/623.1 mTVDRT.
 10.75" surface casing at 675.0 mMDRT/623.1 mTVDRT.
 8.5" hole to 2573.0 mMDRT/2396.0 mTVDRT, inclination at TD 13 degrees.
 7.0" Production liner at 2930.0 mMDRT/2388.0 mTVDRT, cut and pulled above 740.0 mMDRT.
 After setting an 80 metre cement plug above 740.0 mMDRT, WKF W20 was Plugged and Abandoned in November/December 2005.

RT to MSL = 33.43 metres
 Water depth = 76.13 metres
 RT to seafloor = 109.56 metres

Geologist (overnight 11 May 2006 on Kingfish A), on rig at 0845 hrs, 12 May 2006 at 675.0 mMDRT.

Start RIH at 0930 hrs, 12 May 2006.
 Tagged TOC at 1930 hrs 12 May 2006 at 628 .0 mMDRT and drilled hard cement to 660.0 mMDRT and soft cement from 660.0 mMDRT to 678.0 mMDRT at 2200 hrs on 12 May 2006.
 Controlled drilled cement to start kick-off of WKF_W20A at 678.0 mMDRT at 2230 hrs 12 May 2006, with a Smith S73PX PDC bit on steerable motor assembly.
 Samples from 678.0 showed an increasing percentage of new formation (Gippsland Limestone Calcilutite). At 685.0 mMDRT when 90% new formation was seen in the samples, stopped drilling for a PIT.

Perform PIT at 675.0 mMDRT (623.1 mTVDRT) / 328 psi/ 13.0 ppg EMW using 9.4 ppg mud, at 0330 hrs, 13 May 2006.

Drilled from 685.0 mMDRT to TD of 2946.0 mMDRT with a KCl/Glycol/PHPA mud system.

Bit Details:

BHA # 1, Bit # 1RR1.
 Size: 8.5", Manufacturer / Type: Smith S73PX, Serial #: JT6967R3.
 Jets: 20 x 6, TFA: 1.841 sq.in, Grading: **1-3-CT-G-X-1/16-CT/PN-BHA.**
 Krevs: 902.0, Top Drive RPM: 50-130 (+ 174-179 DHM RPM).
 Depth In: 675.0 mMDRT. Depth Out: 2511.0 mMDRT.
 Metres drilled: 1836.0 m, HOB: 82.79. Average ROP: 22.18 m/hr.
 Rotating: 1565.0 metres / Rotating HOB = 40.06, Average Rotating ROP = 39.07 m/hr.
 Steering: 321.0 metres / Steering HOB = 42.73 , Average Steering ROP = 7.51 m/hr.

30 metre spot samples from 690.0 to 2550.0 mMDRT.

628	660	100% firm hard cement.
660	678	100% soft to moderately hard cement.
	Trace	CALCILUTITE: Trace, very light grey, very calcareous.

West Kingfish W20A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
678	680	5	95% firm cement. CALCILUTITE: 5%, very light grey to light green grey, silty in part, trace fossil fragments, trace lithics, trace carbonaceous material, trace glauconite, soft to rare firm, amorphous to trace sub blocky. 12 May 2006 Midnight depth = 680.0 mMDRT / 626.4 mTVDR
680	682	35	65% firm hard cement. CALCILUTITE: 35%, very light grey to light green grey, silty in part, trace fossil fragments, trace lithics, trace carbonaceous material, trace glauconite, soft to rare firm, amorphous to trace sub blocky.
682	684	90	10% firm hard cement. CALCILUTITE: 90%, as above.
684	685	90	10% firm hard cement. CALCILUTITE: 90%, as above.
685	690	100	Trace, firm hard cement. CALCILUTITE: as above.
690	720	100	CALCILUTITE: very light grey to light green grey, silty in part, trace fossil fragments, trace lithics, trace carbonaceous material, trace glauconite, soft to rare firm, amorphous to trace sub blocky.
720	750	100	CALCILUTITE: as above, no glauconite.
750	780	100	CALCILUTITE: very light grey to light grey, silty in part, trace fossil fragments, trace lithics, trace carbonaceous material, soft to rare firm, amorphous to trace sub blocky.
780	810	100	CALCILUTITE: as above, common gastropods, trace glauconite,
810	840	100	CALCILUTITE: as above, trace gastropods, trace glauconite,
840	870	100	CALCILUTITE: as above.
870	900	100	CALCILUTITE: very light grey to light greenish grey, silty in part grading to minor CALCISILTITE, trace lithics, trace fossil fragments, trace gastropods, trace glauconite, trace carbonaceous material, soft to rare firm, sticky, dispersive, amorphous to sub blocky.
900	930	100	CALCILUTITE: as above, very silty grading to CALCISILTITE.
930	960	85	CALCILUTITE: very light grey to light greenish grey, silty in part grading to minor CALCISILTITE, trace lithics, trace fossil fragments, trace gastropods, trace glauconite, trace carbonaceous material, soft to rare firm, sticky, dispersive, amorphous to sub blocky.
		10	CALCISILTITE: light grey to light brownish grey, argillaceous in part grading to CALCILUTITE, trace micromicaceous, trace fossil fragments, firm, sub blocky to rare amorphous.
		5	SANDSTONE: clear to translucent, very fine to medium, poorly sorted, sub angular to sub rounded, trace pyrite nodules, clean, loose, fair inferred porosity. No fluorescence.
960	990	60	CALCILUTITE: as above.
		40	CALCISILTITE: as above.
990	1020	60	CALCILUTITE: as above.
		40	CALCISILTITE: as above.
1020	1050	10	CALCILUTITE: very light grey to light greenish grey, silty in part grading to minor CALCISILTITE, trace lithics, trace fossil fragments, trace gastropods, trace glauconite, trace carbonaceous material, soft to rare firm, sticky, dispersive, amorphous to sub blocky.

West Kingfish W20A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
		90	CALCISILTITE: light grey to light brownish grey, argillaceous in part grading to CALCILUTITE, trace micromicaceous, trace fossil fragments, firm, sub blocky to rare amorphous.
		Trace	CALCARENITE: Trace, medium grey to dark brownish grey, very fine to fine, moderately well sorted, sub angular to sub rounded, abundant pyrite cement, hard aggregates, tight visual and inferred porosity. No fluorescence.
1050	1080	10	CALCILUTITE: as above.
		90	CALCISILTITE: as above, trace grading to CALCARENITE.
1080	1110	10	CALCILUTITE: as above.
		90	CALCISILTITE: as above, trace grading to CALCARENITE.
			13 May 2006 Midnight depth = 1129.0 mMDRT / 982.8 mTVDRT.
1110	1140	100	CALCISILTITE: light olive grey to light brownish grey, argillaceous in part grading to CALCILUTITE, minor grading to CALCARENITE, trace glauconite, trace fossil fragments, firm, sub blocky.
1140	1170	100	CALCISILTITE: light brownish grey to light olive grey, argillaceous in part grading to CALCILUTITE, minor grading to CALCARENITE, trace glauconite, trace disseminated pyrite, trace fossil fragments, firm, sub blocky.
1170	1200	100	CALCISILTITE: light brownish grey to light olive grey, argillaceous in part grading to CALCILUTITE, trace carbonaceous matter, trace fossil fragments, firm to occasionally moderately hard, sub blocky to blocky in part.
1200	1230	100	CALCISILTITE: as above.
1230	1260	100	CALCISILTITE: as above.
		Trace	CALCARENITE: Trace, medium grey to dark brownish grey, very fine to fine, moderately well sorted, sub angular to sub rounded, abundant pyrite cement, hard aggregates, tight visual and inferred porosity. No fluorescence.
1260	1290	100	CALCISILTITE: as above.
1290	1320	100	CALCISILTITE: light olive grey to light brownish grey, argillaceous in part grading to CALCILUTITE, trace carbonaceous matter, trace fossil fragments, firm to occasionally moderately hard, sub blocky.
1320	1350	100	CALCISILTITE: as above.
1350	1380	100	CALCISILTITE: as above.
1380	1410	100	CALCISILTITE: generally as above.
1410	1440	100	CALCISILTITE: light olive grey to light brownish grey, argillaceous in part grading to CALCILUTITE, trace carbonaceous matter, trace glauconite, trace lithics, trace fossil fragments, firm to moderately hard, sub blocky.
1440	1470	100	CALCISILTITE: as above trace arenaceous grading to CALCARENITE.
			14 May 2006 Midnight depth = 1490.0 mMDRT / 1298.0 mTVDRT.
1470	1500	100	CALCISILTITE: as above, 1440 m sample.
1500	1530	100	CALCISILTITE: light olive grey to light brownish grey, argillaceous in part grading to CALCILUTITE, trace carbonaceous matter, trace glauconite, trace fossil fragments, firm to moderately hard, sub blocky.
1530	1560	100	CALCISILTITE: as above.
1560	1590	100	CALCISILTITE: as above.
			Base of High Velocity Channel at 1598.0 mMDRT / 1393.4 mTVDRT / -1360.0 mTVDSS

West Kingfish W20A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
1590	1620	100	CALCISILTITE: light olive grey to light brownish grey, argillaceous in part grading to CALCILUTITE, trace carbonaceous matter, trace disseminated pyrite, trace glauconite, trace fossil fragments, firm to moderately hard, sub blocky.
1620	1650	20	CALCILUTITE: very light grey to light grey, silty in part grading to CALCISILTITE, trace disseminated pyrite, trace pyrite nodules, trace glauconite, soft to firm, amorphous to sub blocky.
		80	CALCISILTITE: light olive grey to light brownish grey, argillaceous in part grading to CALCILUTITE, trace carbonaceous matter, trace disseminated pyrite, trace pyrite nodules, trace glauconite, trace fossil fragments, firm to moderately hard, sub blocky.
1650	1680	70	CALCILUTITE: as above.
		30	CALCISILTITE: as above.
1680	1710	90	CALCILUTITE: very light grey to light grey, silty in part grading to CALCISILTITE, trace disseminated pyrite, trace pyrite nodules, trace glauconite, soft to firm, amorphous to sub blocky.
		10	CALCISILTITE: light olive grey to light brownish grey, argillaceous in part grading to CALCILUTITE, trace carbonaceous matter, trace disseminated pyrite, trace pyrite nodules, trace glauconite, trace fossil fragments, firm to moderately hard, sub blocky.
1710	1740	100	CALCILUTITE: very light grey to light grey, silty in part grading to CALCISILTITE, trace disseminated pyrite, trace pyrite nodules, soft to firm, amorphous to sub blocky.
1740	1770	100	CALCILUTITE: as above.
1770	1800	100	CALCILUTITE: as above.
1800	1830	100	CALCILUTITE: light grey to medium light grey, silty in part grading to CALCISILTITE, trace disseminated pyrite, trace pyrite nodules, soft to firm, occasionally moderately hard, amorphous to sub blocky.
1830	1860	100	CALCILUTITE: as above, trace fossil fragments.
1860	1890	100	CALCILUTITE: as above.
1890	1920	100	CALCILUTITE: as above.
1920	1950	100	CALCILUTITE: medium light grey to occasionally light olive grey, silty in part grading to CALCISILTITE, trace disseminated pyrite, trace pyrite nodules, firm to moderately hard, occasionally amorphous to sub blocky.
			15 May 2006 Midnight depth = 1950.0 mMDRT / 1701.6 mTVDRT.
1950	1980	100	CALCILUTITE: light grey to medium light grey to occasionally light olive grey, silty in part grading to CALCISILTITE, trace disseminated pyrite, firm to moderately hard, occasionally soft, occasionally amorphous to sub blocky.
1980	2010	100	CALCILUTITE: as above, no fossil fragments.
2010	2040	100	CALCILUTITE: light grey to medium light grey to occasionally light olive grey, silty in part grading to CALCISILTITE, trace disseminated pyrite, trace fossil fragments, soft to firm, occasionally moderately hard, occasionally amorphous to sub blocky.
2040	2070	100	CALCILUTITE: as above.
2070	2100	100	CALCILUTITE: as above, trace pyrite nodules.
2100	2130	100	CALCILUTITE: as above + trace glauconite.
2130	2160	100	CALCILUTITE: as above.
2160	2190	100	CALCILUTITE: light grey to medium light grey to occasionally light olive grey, silty in part grading to CALCISILTITE, trace disseminated pyrite, trace pyrite nodules, trace fossil fragments, soft to firm, occasionally moderately hard, occasionally amorphous to sub blocky.
2190	2220	100	CALCILUTITE: as above, no pyrite nodules.

West Kingfish W20A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2220	2250	100	CALCILUTITE: light grey to medium light grey to occasionally light olive grey, silty in part grading to CALCISILTITE, trace disseminated pyrite, common pyrite nodules, trace glauconite, trace fossil fragments, soft to firm, occasionally moderately hard, occasionally amorphous to sub blocky.
2250	2280	100	CALCILUTITE: as above, trace pyrite nodules, no glauconite.
2280	2310	100	CALCILUTITE: light grey to medium light grey, light olive grey, silty in part grading to CALCISILTITE, trace disseminated pyrite, trace fossil fragments, soft to firm, occasionally moderately hard, occasionally amorphous to sub blocky. 16 May 2006 Midnight depth = 2338.0 mMDRT / 2042.1 mTVDRT.
2310	2340	100	CALCILUTITE: as above. Top of Lakes Entrance at 2361.5 mMDRT / 2061.5 mTVDRT / -2028.1 mTVDSS.
2340	2370	80	CALCILUTITE: light grey to medium light grey, light olive grey, silty in part grading to CALCISILTITE, trace disseminated pyrite, trace fossil fragments, soft to firm, occasionally moderately hard, occasionally amorphous to sub blocky.
		20	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.
2370	2400	30	CALCILUTITE: as above.
		70	CALCAREOUS CLAYSTONE: as above.
2400	2430	10	CALCILUTITE: as above.
		90	CALCAREOUS CLAYSTONE: as above.
2430	2460	100	CALCAREOUS CLAYSTONE: medium light grey to medium grey, occasionally light brownish grey, silty, moderately calcareous, trace micromicaceous, trace fossil fragments, firm to moderately hard, sub blocky.
2460	2490	100	CALCAREOUS CLAYSTONE: as above. 17 May 2006 Midnight depth = 2502.0 mMDRT / 2167.9 mTVDRT.
2502	B/U SPOT	100	CALCAREOUS CLAYSTONE: as above. 10 stand wiper trip to 2250.0 mMDRT while fixing Anadrill computer communication problems with Rig floor. RIH. Mud Pump discharge line seal failure. Circulate on bottom using Howco pump. Start drilling at 0700 hrs, 18 May 2006 from 2502.0 mMDRT.
2511	B/U SPOT	100	CALCAREOUS CLAYSTONE: medium light grey to medium grey, occasionally light brownish grey, silty, moderately calcareous, trace micromicaceous, trace fossil fragments, firm to moderately hard, sub blocky. Stop drilling at 2511.0 mMDRT (2174.3 mTVDRT) at 0900 hrs, after survey at 2488.00 showed a build of only 2.57 degrees/30 metres, much less than the planned 4.00 degree/30 metres build. CBU and start POOH at 1030 hrs to change the bit. 18 May 2006 Midnight depth = 2511.0 mMDRT / 2174.3 mTVDRT.

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Interval (m) From To		%	Lithology / Show Description
<p>RIH with new bit and BHA. Trip gas at 1435 hrs = 58 units. Circulate and condition the mud before drilling. On bottom drilling at 1645 hrs, 19 May 2006.</p> <p>Bit Details: BHA # 2, Bit # 2. Size: 8.5", Manufacturer: Smith GFi11YODVPD, Serial #: MR5166 Type: Tricone Insert. Jets: 32 x 2, 1 x 22. TFA: 1.330 sq.in, Grading: 4-4-WT-#3-E-E-F-2/16-NO-HR. Krevs: 251.0, Top Drive RPM: 90-110 (+ 178 DHM RPM). Depth In: 2511.0 mMDRT. Depth Out: 2890.0 mMDRT. Metres drilled: 379.0 m, HOB: 35.90 Average ROP: 10.56 m/hr. Rotating: 284.0 metres / Rotating HOB = 26.48, Average Rotating ROP = 10.72 m/hr. Steering: 95.0 metres / Steering HOB = 9.42, Average Steering ROP = 10.09 m/hr.</p>			
2490	2520 Logged After Trip	100	CALCAREOUS CLAYSTONE: medium light grey to medium grey, silty, moderately calcareous, trace micromicaceous, trace fossil fragments, firm to moderately hard, sub blocky.
Bagged 10 metre samples from 2550.0 mMDRT to 2690 mMDRT.			
2520	2550	100	CALCAREOUS CLAYSTONE: as above.
2550	2560	100	CALCAREOUS CLAYSTONE: medium light grey to medium grey, occasionally light brownish grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, firm to moderately hard, sub blocky.
19 May 2006 Midnight depth = 2559.0 mMDRT / 2202.6 mTVDRT.			
2560	2570	100	CALCAREOUS CLAYSTONE: as above, trace glauconite.
2570	2580	100	CALCAREOUS CLAYSTONE: light brownish grey to occasionally light medium grey, silty, moderately calcareous, trace micromicaceous, firm to moderately hard, sub blocky.
2580	2590	100	CALCAREOUS CLAYSTONE: as above.
2590	2600	100	CALCAREOUS CLAYSTONE: as above, trace pyrite nodules.
2600	2610	100	CALCAREOUS CLAYSTONE: light brownish grey to occasionally light medium grey, silty, moderately calcareous, trace micromicaceous, firm to moderately hard, sub blocky.
2610	2620	100	CALCAREOUS CLAYSTONE: light brownish grey to occasionally light medium grey, silty, moderately calcareous, trace micromicaceous, soft to moderately hard, amorphous to sub blocky.
2620	2630	100	CALCAREOUS CLAYSTONE: light brownish grey to light medium grey, silty, moderately calcareous, trace micromicaceous, trace fossil fragments, trace lithics, firm to moderately hard, sub blocky.
2630	2640	100	CALCAREOUS CLAYSTONE: as above.
2640	2650	100	CALCAREOUS CLAYSTONE: light brownish grey to light medium grey, silty, moderately calcareous, trace micromicaceous, trace disseminated pyrite, trace pyrite nodules, trace fossil fragments, trace lithics, firm to moderately hard, sub blocky.
2650	2660	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace micromicaceous, trace glauconite, trace disseminated pyrite, trace pyrite nodules, trace fossil fragments, trace lithics, firm to moderately hard, sub blocky.
2660	2670	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace micromicaceous, trace glauconite, trace pyrite nodules, trace fossil fragments, trace lithics, firm to moderately hard, sub blocky.

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Interval (m) From To		%	Lithology / Show Description
2670	2680	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace micromicaceous, trace fossil fragments, trace lithics, firm to moderately hard, sub blocky. Add Baracarb at 5 ppb to the mud system from 2682.0 mMDRT. (2252.3 mTVDRT/ -2218.9 mTVDSS). Baracarb seen in 2690.0 mMDRT sample.
2680	2690	100	CALCAREOUS CLAYSTONE: light brownish grey to medium grey, silty, moderately calcareous, trace micromicaceous, trace lithics, firm to moderately hard, sub blocky.
2690	2700	100	CALCAREOUS CLAYSTONE: 90%, light brownish grey to medium grey, silty, moderately calcareous, trace micromicaceous, trace lithics, firm to moderately hard, sub blocky. CLAYSTONE: 10%, off white to pale green, common glauconite pellets, trace pyrite nodules, soft to firm, amorphous, dispersive. Bagged 5 metre samples from 2700.0 mMDRT to TD (2946.0 mMDRT). Top of Latrobe at 2700.0 mMDRT (2258.3 mTVDRT / -2224.9 mTVDSS)
2700	2705	90	CALCAREOUS CLAYSTONE: 80%, light brownish grey to medium grey, silty, moderately calcareous, trace micromicaceous, trace lithics, firm to moderately hard, sub blocky. CLAYSTONE: 10%, off white to pale green, common glauconite pellets, soft to firm, amorphous, dispersive.
		10	SILTSTONE: olive grey to medium dark grey, common micromicaceous, trace disseminated pyrite, moderately hard to hard, sub blocky to blocky.
2705	2710	60	CALCAREOUS CLAYSTONE: 50%, as above. CLAYSTONE: 10%, as above.
		30	SILTSTONE: as above.
		10	SANDSTONE: white to pale green, dominantly very fine to fine, moderately well sorted, sub angular to sub rounded, common glauconite matrix, hard aggregates, tight inferred and visual porosity. No fluorescence.
2710	2715	80	CALCAREOUS CLAYSTONE: 30%, as above. CLAYSTONE: 50%, as above.
		10	SILTSTONE: pale yellowish brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite, firm to occasionally moderately hard, sub blocky.
		10	SANDSTONE: as above. No fluorescence.
2715	2720	75	CALCAREOUS CLAYSTONE: 10%, light brownish grey to medium grey, silty, moderately calcareous, trace micromicaceous, trace lithics, firm to moderately hard, sub blocky. CLAYSTONE: 60%, very light grey to light greenish grey, trace glauconite, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to sub blocky, dispersive.
		20	SILTSTONE: pale yellowish brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		5	SANDSTONE: as above. No fluorescence.
2720	2725	65	CALCAREOUS CLAYSTONE: Trace, as above, cavings. CLAYSTONE: as above.
		30	SILTSTONE: as above.

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Interval (m) From To		%	Lithology / Show Description
2725	2730	5	SANDSTONE: as above. No fluorescence.
		65	CLAYSTONE: very light grey to light greenish grey, trace glauconite, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to sub blocky, dispersive.
		30	SILTSTONE: pale brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		5	SANDSTONE: as above. No fluorescence.
2730	2735		20 May 2006 Midnight depth = 2732.0 mMDRT / 2268.1 mTVDR.
		55	CLAYSTONE: very light grey to light greenish grey, trace glauconite, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to sub blocky, dispersive.
		40	SILTSTONE: as above.
		5	SANDSTONE: as above. No fluorescence.
2735	2740	35	CLAYSTONE: very light grey to light greenish grey, trace glauconite, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to sub blocky, dispersive.
		50	SILTSTONE: pale brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		15	SANDSTONE: light grey to occasionally off-white to pale green, dominantly very fine to fine, moderately well sorted, sub angular to sub rounded, common micropyrrite cement, common pyrite nodules, weak glauconite matrix, hard aggregates, tight inferred and visual porosity. No fluorescence.
2740	2745	35	CLAYSTONE: dusky yellow to light olive brown, light greenish grey, trace glauconite, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to sub blocky, dispersive.
		50	SILTSTONE: as above.
		15	SANDSTONE: as above. No fluorescence.
2745	2750	60	CLAYSTONE: as above.
		30	SILTSTONE: pale brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		10	SANDSTONE: as above. No fluorescence.
2750	2755	60	CLAYSTONE: dusky yellow to light olive brown, light greenish grey, trace glauconite, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to sub blocky, dispersive.
		30	SILTSTONE: as above.
		10	SANDSTONE: light grey to occasionally off-white to pale green, dominantly very fine to fine, moderately well sorted, sub angular to sub rounded, common micropyrrite cement, common pyrite nodules, weak glauconite matrix, hard aggregates, tight inferred and visual porosity. No fluorescence.

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Interval (m) From To		%	Lithology / Show Description
2755	2760	55	CLAYSTONE: as above.
		40	SILTSTONE: pale brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		5	SANDSTONE: as above. No fluorescence.
2760	2765	60	CLAYSTONE: as above.
		40	SILTSTONE: as above.
		Trace	SANDSTONE: as above. No fluorescence.
2765	2770	65	CLAYSTONE: dusky yellow to light olive brown, light greenish grey, trace glauconite, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to sub blocky, dispersive.
		30	SILTSTONE: as above.
		5	SANDSTONE: clear to translucent, trace very pale orange, medium to dominantly coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, weak siliceous cement, dominantly loose, generally clean, poor to fair inferred and visual porosity. No fluorescence.
2770	2775	60	CLAYSTONE: as above.
		30	SILTSTONE: pale brown to moderate yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		10	SANDSTONE: clear to translucent, trace very pale orange, dominantly very coarse to medium, moderately well sorted, sub angular to sub rounded, weak pyrite cement, weak siliceous cement, dominantly loose, generally clean, poor to fair inferred and visual porosity. No fluorescence.
2775	2780	70	CLAYSTONE: dusky yellow to light olive brown, light greenish grey, trace glauconite, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to sub blocky, dispersive.
		25	SILTSTONE: pale brown to dark yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, trace glauconite, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		5	SANDSTONE: clear to translucent, fine to very coarse, poorly sorted, sub angular to sub rounded, weak pyrite cement, weak siliceous cement, trace pyrite nodules, dominantly loose, generally clean, poor to fair inferred and visual porosity. No fluorescence.
2780	2785		FSP1 (Top of P1.1) at 2780.5 mMDRT (2279.8 mTVDRT / -2246.4 mTVDSS)
		60	CLAYSTONE: dusky yellow to light olive brown, minor light greenish grey, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to sub blocky, dispersive.
		15	SILTSTONE: as above.
		25	SANDSTONE: clear to translucent, fine to coarse, poorly sorted, sub angular to sub rounded, weak pyrite cement, weak siliceous cement, trace pyrite nodules, dominantly loose, generally clean, fair inferred and visual porosity. FLUORESCENCE: Trace, dull pinpoint pale yellowish green fluorescence, no direct cut, no crush cut.
2785	2790	60	CLAYSTONE: as above.
		20	SILTSTONE: as above.

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Interval (m) From To		%	Lithology / Show Description
2790	2795	20	SANDSTONE: as above. FLUORESCENCE: Trace, dull pinpoint pale yellowish green fluorescence, very slow crush cut, thin film residue.
		60	CLAYSTONE: as above.
		30	SILTSTONE: medium light grey to medium grey, minor pale brown as above, abundant micropyrte, trace very fine pyrite nodules, trace micromicaceous, argillaceous grading to Claystone, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		10	SANDSTONE: as above. FLUORESCENCE: Trace, dull pinpoint pale yellowish green fluorescence, no direct cut, no crush cut.
2795	2800	20	CLAYSTONE: dusky yellow to light olive brown, minor light greenish grey, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to sub blocky, dispersive.
		70	SILTSTONE: as above.
		10	SANDSTONE: 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 visual porosity. No fluorescence.
			Top of SBP2 (Top of M1.2 U) at 2804.5 mMDRT (2285.8 mTVDRT / -2252.4 mTVDSS)
2800	2805	10	CLAYSTONE: as above.
		85	SILTSTONE: as above.
		5	SANDSTONE: 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 and visual porosity. No fluorescence.
2805	2810	10	CLAYSTONE: as above.
		80	SILTSTONE: medium light grey to medium grey, minor pale brown, abundant micropyrte, trace very fine pyrite nodules, trace micromicaceous, argillaceous grading to Claystone, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		10	SANDSTONE: clear to translucent, dominantly very coarse to medium, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair inferred and visual porosity. No fluorescence.
2810	2815	5	CLAYSTONE: dusky yellow to light olive brown, minor light greenish grey, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to sub blocky, dispersive.
		80	SILTSTONE: as above.
		15	SANDSTONE: clear to translucent, medium to dominantly coarse, moderately well sorted, sub angular to sub rounded, moderate pyrite cement, trace pyrite nodules, dominantly loose, occasionally hard aggregates, generally clean, fair inferred and visual porosity. No fluorescence.
2815	2820	5	CLAYSTONE: as above.
		65	SILTSTONE: as above.
		30	SANDSTONE: clear to translucent, fine to very coarse, poorly sorted, sub angular to sub rounded, moderate pyrite cement, trace pyrite nodules, dominantly loose, occasionally hard aggregates, generally clean, poor inferred and visual porosity. No fluorescence.

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Interval (m) From To		%	Lithology / Show Description
2820	2825	50	CLAYSTONE: off white to very light grey, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to occasionally sub blocky.
		35	SILTSTONE: medium light grey to medium grey, minor pale brown, abundant micropyrte, trace very fine pyrite nodules, trace micromicaceous, argillaceous grading to Claystone, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		15	SANDSTONE: 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 visual porosity. No fluorescence.
2825	2830	50	CLAYSTONE: as above.
		40	SILTSTONE: as above.
		10	SANDSTONE: 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 and visual porosity. No fluorescence. Top of SBP3 (Top of M1.2L) at 2831.0 mMDRT (2292.5 mTVDRT / -2259.1 mTVDSS)
2830	2835	40	CLAYSTONE: as above.
		30	SILTSTONE: medium light grey to medium grey, minor pale brown, abundant micropyrte, trace very fine pyrite nodules, trace micromicaceous, argillaceous grading to Claystone, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		30	SANDSTONE: clear to translucent, coarse to dominantly very coarse, moderately well sorted, sub angular to sub rounded, moderate pyrite cement, trace pyrite nodules, dominantly loose, trace very fine siliceous cemented aggregates, generally clean, poor to fair inferred and visual porosity. FLUORESCENCE: Trace, dull to moderately bright pinpoint pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green ring residue.
2835	2840	40	CLAYSTONE: off white to very light grey, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to occasionally sub blocky.
		20	SILTSTONE: as above.
		40	SANDSTONE: as above. FLUORESCENCE: Trace, dull to moderately bright pinpoint pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green ring residue.
2840	2845	30	CLAYSTONE: as above.
		20	SILTSTONE: medium light grey to medium grey, minor pale brown, abundant micropyrte, trace very fine pyrite nodules, trace micromicaceous, argillaceous grading to Claystone, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		50	SANDSTONE: clear to translucent, dominantly very coarse to coarse, moderately well sorted, sub angular to sub rounded, moderate pyrite cement, trace pyrite nodules, dominantly loose, trace very fine siliceous cemented aggregates, generally clean, poor to fair inferred and visual porosity. FLUORESCENCE: 10%, moderately bright spotted pale yellowish green fluorescence, moderately fast blooming direct cut, thin dull pale green ring residue.
2845	2850	30	CLAYSTONE: as above.
		10	SILTSTONE: as above.
		60	SANDSTONE: as above. FLUORESCENCE: 15%, moderately bright spotted pale yellowish green fluorescence, slow blooming direct cut, thin dull pale green ring residue. BM12 at 2853.5 mMDRT (2298.0 mTVDRT / -2264.6 mTVDSS)

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Interval (m) From To		%	Lithology / Show Description
2850	2855	40	CLAYSTONE: off white to very light grey, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to occasionally sub blocky.
		20	SILTSTONE: medium light grey to medium grey, minor pale brown to dark yellowish brown, abundant micropyrte, trace very fine pyrite nodules, trace micromicaceous, argillaceous grading to Claystone, minor arenaceous grading to very fine Sandstone, common rock flour, inferred moderately hard to hard, sub fissile to sub blocky.
		40	SANDSTONE: clear to translucent, dominantly very coarse to medium, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, common very fine siliceous cemented aggregates, common rock flour, poor to fair inferred and visual porosity. FLUORESCENCE: 5%, moderately bright spotted pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green ring residue.
2855	2860	60	CLAYSTONE: as above.
		30	SILTSTONE: as above.
		10	SANDSTONE: clear to translucent, dominantly very coarse to medium, moderately well sorted, sub angular to sub rounded, moderate pyrite cement, trace pyrite nodules, trace very fine siliceous cemented aggregates, trace rock flour, dominantly loose, poor to fair inferred and visual porosity. FLUORESCENCE: 3%, moderately bright spotted pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green ring residue.
2860	2865	50	CLAYSTONE: as above.
		35	SILTSTONE: as above.
		15	SANDSTONE: as above. FLUORESCENCE: 3%, moderately bright spotted pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green ring residue.
2865	2870	60	CLAYSTONE: off white to very light grey, minor light olive brown, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to occasionally sub blocky.
		35	SILTSTONE: pale brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, minor medium light grey to medium grey with abundant micropyrte, trace micromicaceous, argillaceous grading to Claystone, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		5	SANDSTONE: as above. Trace fluorescence from cavings. Top of PSB7 (Top of M1.3 U) at 2872.5 mMDRT (2302.7 mTVDRT / -2269.3 mTVDSS)
2870	2875	45	CLAYSTONE: as above.
		50	SILTSTONE: as above.
		5	SANDSTONE: as above. No fluorescence.
2875	2880	25	CLAYSTONE: as above.
		25	SILTSTONE: as above.
		50	SANDSTONE: clear to translucent, medium to very coarse, dominantly coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair inferred and visual porosity. FLUORESCENCE: 3%, moderately bright pinpoint yellowish green fluorescence, very slow blooming direct cut, thin pale green ring residue.

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Interval (m) From To		%	Lithology / Show Description
2880	2885	20	CLAYSTONE: off white to very light grey, minor light olive brown, trace micromicaceous, common bit crushed rock flour, soft to firm, amorphous to occasionally sub blocky.
		75	SILTSTONE: pale brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, minor medium light grey to medium grey with abundant micropyrte, trace micromicaceous, argillaceous grading to Claystone, common rock flour, firm to moderately hard, sub fissile to sub blocky.
		5	SANDSTONE: clear to translucent, medium to very coarse, dominantly coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair inferred and visual porosity. FLUORESCENCE: 1%, moderately bright pinpoint yellowish green fluorescence, very slow blooming direct cut, thin pale green ring residue. PSB6 at 2885.0 mMDRT (2305.8 mTVDRT / -2272.4 mTVDSS)
2885	2890	30	CLAYSTONE: medium light grey to brownish grey, minor off white to very light grey, trace micromicaceous, common bit crushed rock flour, moderately hard to hard, blocky, minor soft to firm, amorphous to occasionally sub blocky as above.
		30	SILTSTONE: as above.
		40	SANDSTONE: as above. Trace fluorescence from cavings. POOH at 2890.0 mMDRT to change the bit and mud motor. RIH with new bit and BHA with Mud motor with no bend. Trip gas at 2015 hrs, 22 May 2006 = 162 units. Circulate and condition the mud before drilling. On bottom drilling at 1900 hrs, 22 May 2006. Bit Details: BHA # 3, Bit # 3RR1, Type: PDC. Size: 8.5", Manufacturer: Smith S73PX, Serial #: JT6968A Jets: 6 x 22. TFA: 2.227 sq.in, Grading: 2-4-WT-A-X-IN-CT/ER-TD. Krevs: 61.0, Top Drive RPM: 110-120 (+ 180 DHM RPM). Depth In: 2511.0 mMDRT. Depth Out: 2890.0 mMDRT. Metres drilled: 56.0 m, HOB: 3.5. Average ROP: 16.0 m/hr. To maintain the concentration at 5 ppb, Baracarb added to the mud system at 2900.0 mMDRT (2309.5 mTVDRT/ -2276.1 mTVDSS). Samples from 2905.0 mMDRT to TD heavily contaminated with Baracarb. Top of PSB5 (Top of PS4 sand) at 2893.5 mMDRT (2307.7 mTVDRT / -2274.3 mTVDSS)
2890	2895	35	CLAYSTONE: medium light grey to brownish grey, minor off white to very light grey, trace micromicaceous, common bit crushed rock flour, moderately hard to hard, blocky, minor soft to firm, amorphous to occasionally sub blocky as above.
		15	SILTSTONE: pale brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub fissile to sub blocky.
		50	SANDSTONE: clear to translucent, medium to very coarse, dominantly coarse, moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, fair inferred and visual porosity. FLUORESCENCE: 3%, moderately bright spotted pale yellowish green fluorescence, slow blooming direct cut, thin dull pale green ring residue.

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Interval (m) From To		%	Lithology / Show Description
2895	2900	40	CLAYSTONE: as above.
		25	SILTSTONE: as above.
		35	SANDSTONE: as above. FLUORESCENCE: Trace, moderately bright spotted pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green ring residue.
2900	2905	10	CLAYSTONE: medium light grey to brownish grey, trace micromicaceous, moderately hard to hard, blocky, minor off white to very light grey, soft to firm, amorphous to occasionally sub blocky.
		10	SILTSTONE: pale brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub fissile to sub blocky.
		80	SANDSTONE: clear to translucent, medium to very coarse, dominantly coarse, (with fine to very fine Baracarb contamination) moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, poor inferred and visual porosity. FLUORESCENCE: 5%, moderately bright spotted pale yellowish green fluorescence, slow blooming direct cut, thin dull pale green ring residue.
2905	2910	10	CLAYSTONE: as above.
		Trace	SILTSTONE: pale brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub fissile to sub blocky.
		90	SANDSTONE: as above, rare very coarse with weak pyrite cement. FLUORESCENCE: Trace, moderately bright spotted pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green ring residue.
2910	2915	30	CLAYSTONE: medium light grey to brownish grey, moderately hard to hard, blocky.
		20	SILTSTONE: as above.
		50	SANDSTONE: as above. FLUORESCENCE: 10%, moderately bright spotted pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green ring residue.
2915	2920	40	CLAYSTONE 1: 20%, medium light grey to brownish grey, moderately hard to hard, blocky. CLAYSTONE 2: 20%, very light grey to pale orange, soft to firm, common rock flour, amorphous.
		20	SILTSTONE: as above.
		40	SANDSTONE: clear to translucent, medium to very coarse, dominantly coarse, (with fine to very fine Baracarb contamination) moderately well sorted, sub angular to sub rounded, weak pyrite cement, trace pyrite nodules, dominantly loose, generally clean, poor inferred and visual porosity. FLUORESCENCE: 3%, moderately bright patchy pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green ring residue.
2920	2925	60	CLAYSTONE 1: 20%, as above. CLAYSTONE 2: 40%, as above.
		10	SILTSTONE: pale brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub fissile to sub blocky.
		30	SANDSTONE: as above, abundant argillaceous matrix. FLUORESCENCE: 10%, moderately bright, patchy to even, pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green ring residue.
2925	2930	70	CLAYSTONE 1: 30%, as above. CLAYSTONE 2: 40%, as above.
		10	SILTSTONE: as above.

West Kingfish W20A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
2930	2935	20	SANDSTONE: as above, occasionally very coarse grains with pyrite cement. FLUORESCENCE: 10%, moderately bright, patchy to even, pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green ring residue.
		65	CLAYSTONE 1: 40%, medium light grey to brownish grey, moderately hard to hard, blocky. CLAYSTONE 2: 25%, very light grey to pale orange, soft to firm, common rock flour, amorphous.
		20	SILTSTONE: light brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub fissile to sub blocky.
		15	SANDSTONE: clear to translucent, dominantly coarse to very coarse, (with fine to very fine Baracarb contamination) moderately well sorted, sub angular to sub rounded, weak pyrite cement on coarse grains, common aggregates, abundant off white argillaceous matrix, poor inferred and visual porosity. FLUORESCENCE: 10%, moderately bright, patchy to even, pale yellowish green fluorescence, very slow weak blooming direct cut, thin dull pale green ring residue.
2935	2940	60	CLAYSTONE 1: 40%, as above. CLAYSTONE 2: 20%, as above.
		20	SILTSTONE: as above.
		20	SANDSTONE: as above.
			FLUORESCENCE: 10%, moderately bright, patchy to even, pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green ring residue.
2940	2945	75	CLAYSTONE 1: 45%, as above. CLAYSTONE 2: 30%, as above.
		10	SILTSTONE: as above.
		15	SANDSTONE: clear to translucent, coarse to dominantly very coarse, (with fine to very fine Baracarb contamination) moderately well sorted, sub angular to sub rounded, weak pyrite cement on coarse grains, common pyrite nodules, dominantly loose, generally clean, fair inferred and visual porosity. FLUORESCENCE: 5%, moderately bright, patchy to even, pale yellowish green fluorescence, very slow blooming direct cut, thin dull pale green ring residue.
2945	2946	70	CLAYSTONE 1: 35%, medium light grey to brownish grey, moderately hard to hard, blocky. CLAYSTONE 2: 35%, very light grey to pale orange, soft to firm, common rock flour, amorphous.
		TD	
		10	SILTSTONE: pale brown to pale yellowish brown, very arenaceous grading to very fine Sandstone, trace micromicaceous, firm to moderately hard, sub fissile to sub blocky.
		20	SANDSTONE: clear to translucent, coarse to dominantly very coarse, (with fine to very fine Baracarb contamination) moderately well sorted, sub angular to sub rounded, weak pyrite cement on coarse grains, common pyrite nodules, dominantly loose, generally clean, fair inferred and visual porosity. FLUORESCENCE: as above.

West Kingfish W20A Lithology / Show Descriptions

Interval (m) From To		%	Lithology / Show Description
			WKF W20A reached a TD of 2946.0 mMDRT = 2319.4 mTVDRT (-2286.4 mTVDSS) at 2330 hrs on 22 May 2006.
			Circulate 3 x BU. 5 Stand Wiper Trip to 2805.0 mMDRT.
			Start circulating at bottom from 0300 hrs, on 23 May 2006. Last circulation on bottom at 0430 hrs, 23 May 2006. Total circulating time for last circulation on bottom = 1 hr 30 minutes.
			Start POOH at 0432 hrs, 23 May 2006, for Reeves Wireline Logging Run #1.
			Bit on Surface at 1500 hrs, 23 May 2006. Rig up/JSA for Reeves Logging at 1530 hrs, 23 May 2006.
			Tag bottom at 0535 hrs, 24 May 2006.
			At 0625 hrs, 24 May 2006, start Reeves Logging at Logging speed. (0.1 metre/second) from 2943.0 mMDRT to 2478.8 mMDRT.
			At 0815 hrs, 24 May 2006, at twice Logging speed (0.2 metre/second) from 2478.8 mMDRT to casing shoe at 675.0 mMDRT.
			At 1300 hrs, 24 May 2006, start POOH at Tripping speed from 675.0 mMDRT to surface.

APPENDIX 4a

WEST KINGFISH W20A

Mud Log







































MASTERLOG

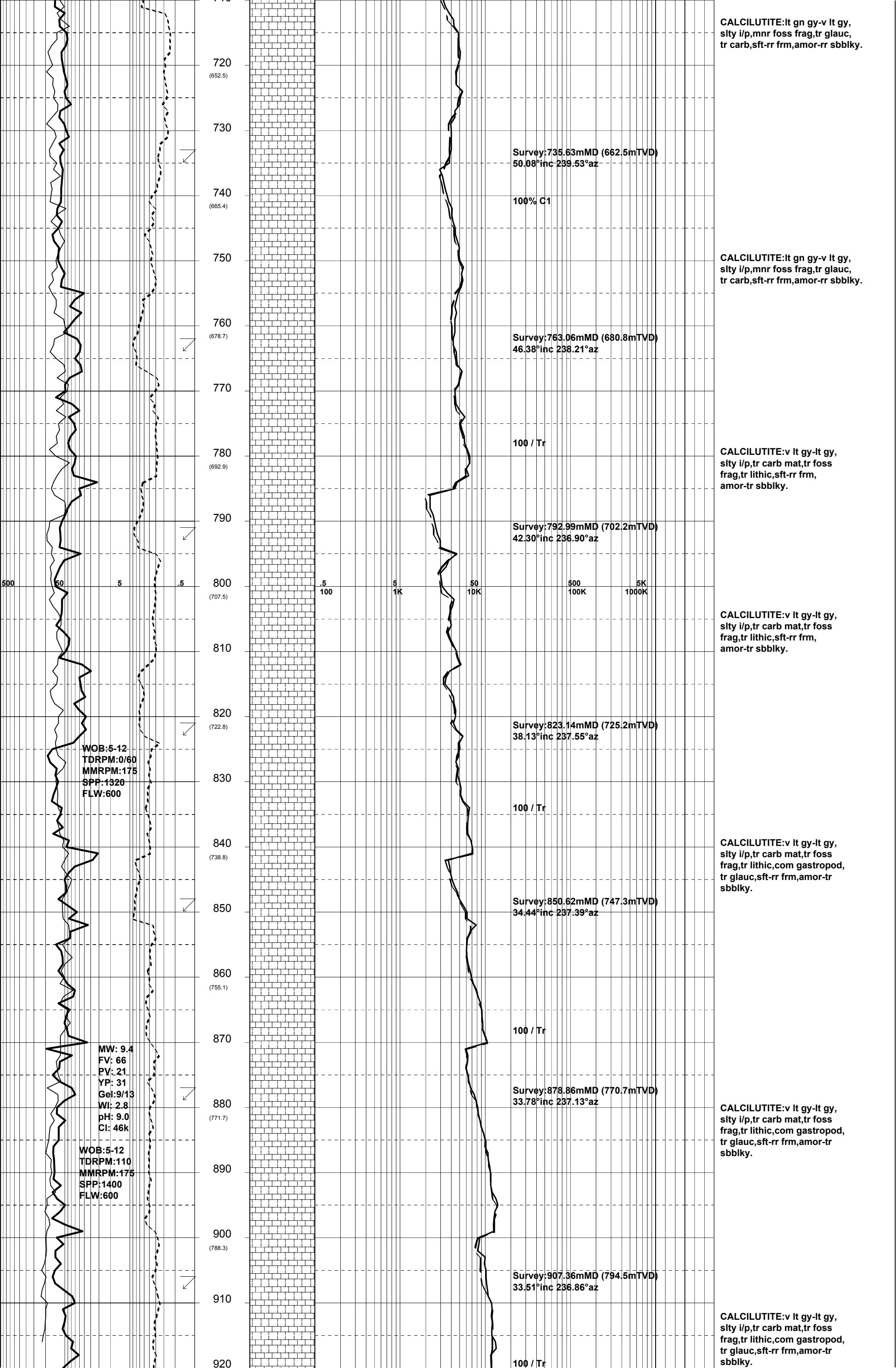
WKF W-20A

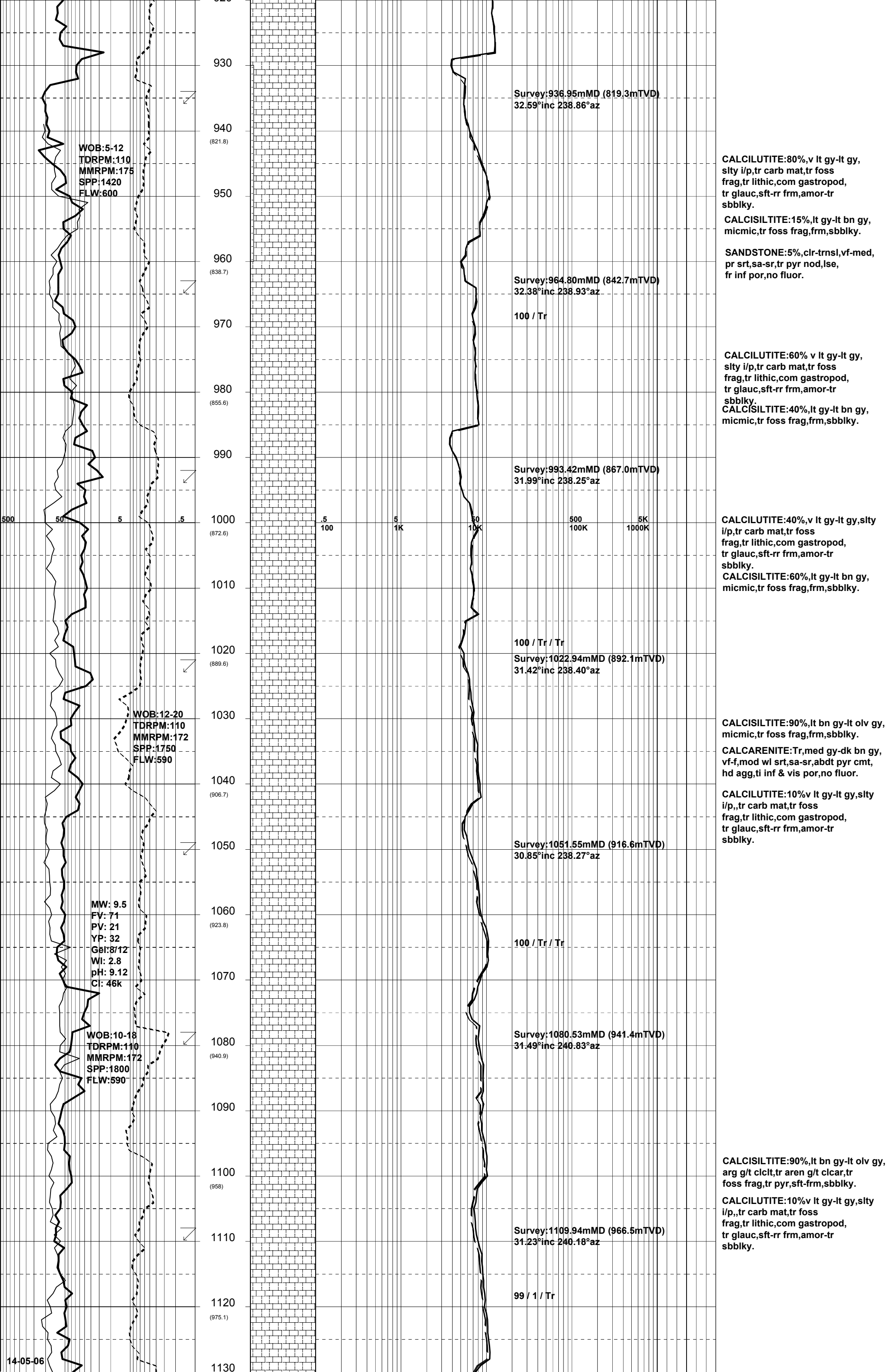


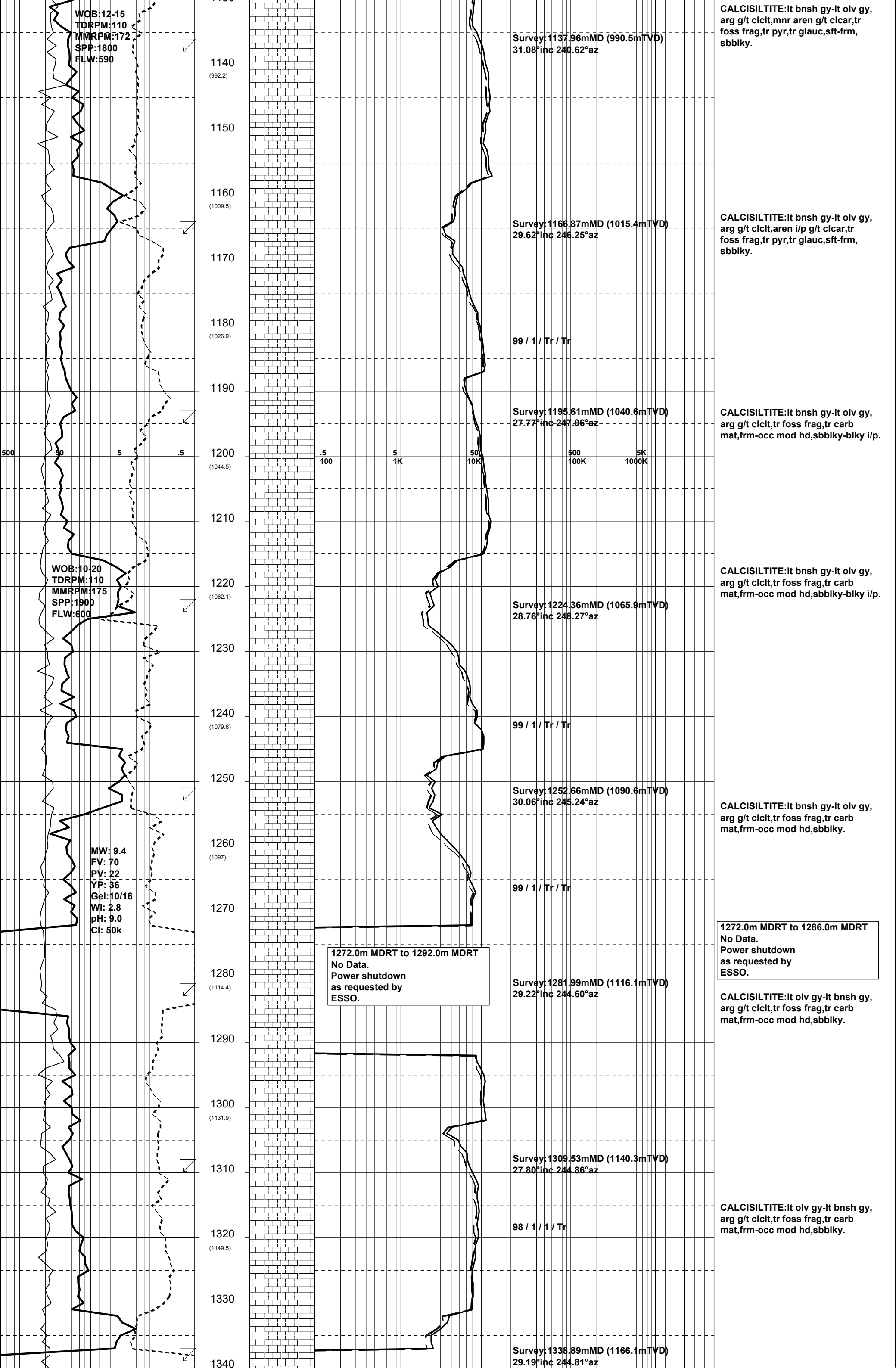
GENERAL	SURFACE POSITON	HOLE / CASING INFO	DATE / DEPTH	ENGINEERS
Country : AUSTRALIA Permit : VIC L7 Field : Kingfish Basin : GIPPSLAND Well Type : DEVELOPMENT Rig Name : NABORS 453	Longitude : 148 06 19.406E Latitude : 38 35 34.835S MGA Co-ord X : 596264.97mE MGA Co-ord Y : 5727806.70mN RT to MSL : 33.43m RT to Sea Bed : 109.56m	8-1/2" Hole to 2946.0m MDRT 10-3/4" Csg Shoe at 675.0m MDRT 7" Production Csg at 2946.0m MDRT	Spud Date : 12-05-2006 Total Depth Date : 22-05-2006 Total Depth : 2946.0m MDRT True Vertical Depth : 2319.37m TVDRT Log Scale : 1/ 500	Steve Oades Mark Smith Noel Elliott

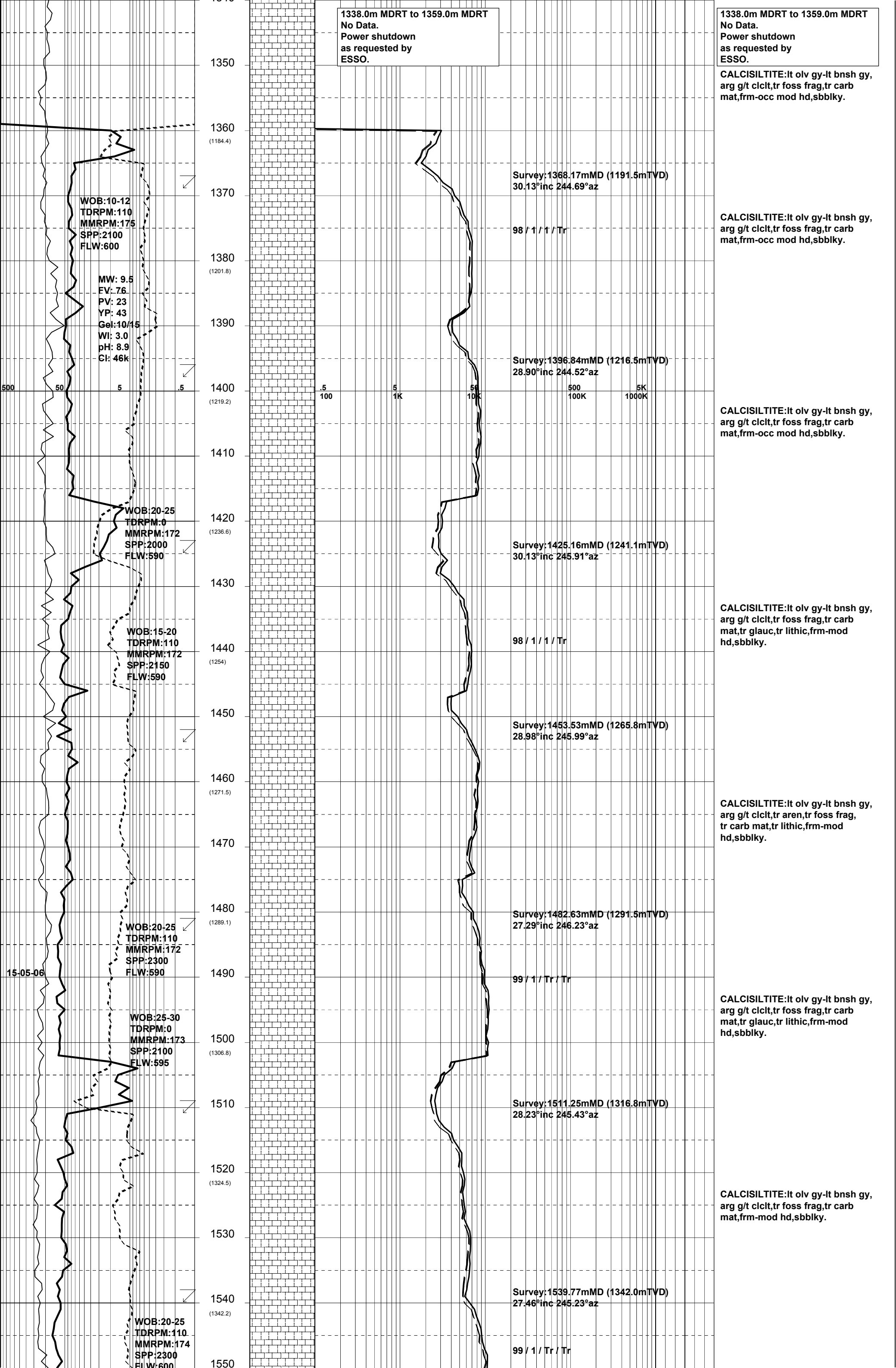
ABBREVIATIONS		LITHOLOGY LEGEND				ENGINEERING LEGEND	
MW Mud Weight	WOB Weight on Bit (klbs)	 CLAYSTONE	 MARL	 BRYOZOA	 CARB FRAGMENT	 CASING SHOE	 WIRELINE LOGS
FV Funnel Viscosity	RPM Rotations Per Min	 SILTSTONE	 LIMESTONE	 RADIOLARITES	 QUARTZITE	 LINER HANGER	MDT POINTS:
PV Plastic Viscosity	FLW Flow Rate (gpm)	 SST: F - V FINE	 DOLOMITE	 ECHINOIDS	 INTRUSIVES	 BIT CHANGE	 PRESSURE ONLY
YP Yield Point	SPP Pump Pressure (psi)	 SST: MEDIUM	 CHERT	 CORALS	 GLAUCONITE	 DEVIA. SURVEY	 SAMPLE
Gel Gel Strength	RR Re-Run Bit	 SST: COARSE	 CONGLOMERATE	 FORAMINIFERA	 PYRITE	 SWC UNRECOV	 SEAL FAILURE
WL Water Loss	TG Trip Gas	 SHALE	 COAL	 LITHIC FRAGMENT	 CEMENT	 SIDEWALL CORE	 TIGHT
KCl Potassium Chloride	CG Connection Gas					 CORE	
Cl Chlorides	BG Background Gas						
Incl Inclination	DGP Drilled Gas Peak						
Az Azimuth	MM Mud Motor						

ROP (m/hr)			DEPTH (m) (TVD)	CUTTINGS LITHOLOGY	RESERVAL GAS DATA					CUT FLUOR	DIRECT FLR	LITHOLOGY DESCRIPTIONS and REMARKS				
500	50	5			.5											
WOB (tons)					C1	C2	C3	TG								
50	25	0		iC4	nC4	iC5										
MWD Gamma Ray (api)				%	Total Gas in Units Chromatograph in PPM					good	poor					
0	100	200		0	100	100	5	1K	50	10K	500	100K	5K	1000K		
			660													<div>PREVIOUS WELL HISTORY Plugged & Abandoned in November/December, 2005. 10-3/4" Surface Csg 675.0m MDRT 7" Production Csg cut and pulled from 740.0m MDRT Kick-off plug at 628.0m MDRT</div> <div>West Kingfish W-20A kick-off at 22:30 hours on 12-05-2006 from 678.0m MDRT</div> <div>Drill with KCl/Glycol/PHPA mud system.</div> <div>PIT at 686.0m MDRT 630.7m TVDRT 382 psi 9.4 ppg EMW:13.0 ppg</div> <div>No H2S or CO2 Detected</div> <div>CALCILUTITE:lt gn gy-v lt gy, slty i/p,mnr foss frag,tr glauc, tr carb,sft-rr frm,amor-tr sbblky.</div>
			670													
			680													
MW: 9.2 FV: 51 PV: 10 YP: 12 Gel: 7/9 WI: 4.5 pH: 9.8 Cl: 45k 13-05-06			680 (626.5)			Tie in Survey:674.53mMD (622.75mTVD) 46.50°inc 253.23°az BIT #1RR 8 1/2" Smith \$73PX Jets: 6x20 In : 675.0m MDRT Out : 2511.0m MDRT Run : 1836.0m Hrs : 62.9 Cond: 1-3-CT-G-X- 1/16-CT/PN-BHA 100% C1										
WOB:5-12 TDRPM:0/60 MMRPM:175 SPP:1150 FLW:600			690													
			700 (640.3)													
			710													
						Survey:706.79mMD (644.1mTVD) 50.72°inc 241.60°az										









1338.0m MDRT to 1359.0m MDRT
No Data.
Power shutdown
as requested by
ESSO.

1338.0m MDRT to 1359.0m MDRT
No Data.
Power shutdown
as requested by
ESSO.

CALCISILTITE:lt olv gy-lt bnsh gy,
arg g/t clclt,tr foss frag,tr carb
mat,frm-occ mod hd,sbblky.

CALCISILTITE:lt olv gy-lt bnsh gy,
arg g/t clclt,tr foss frag,tr carb
mat,frm-occ mod hd,sbblky.

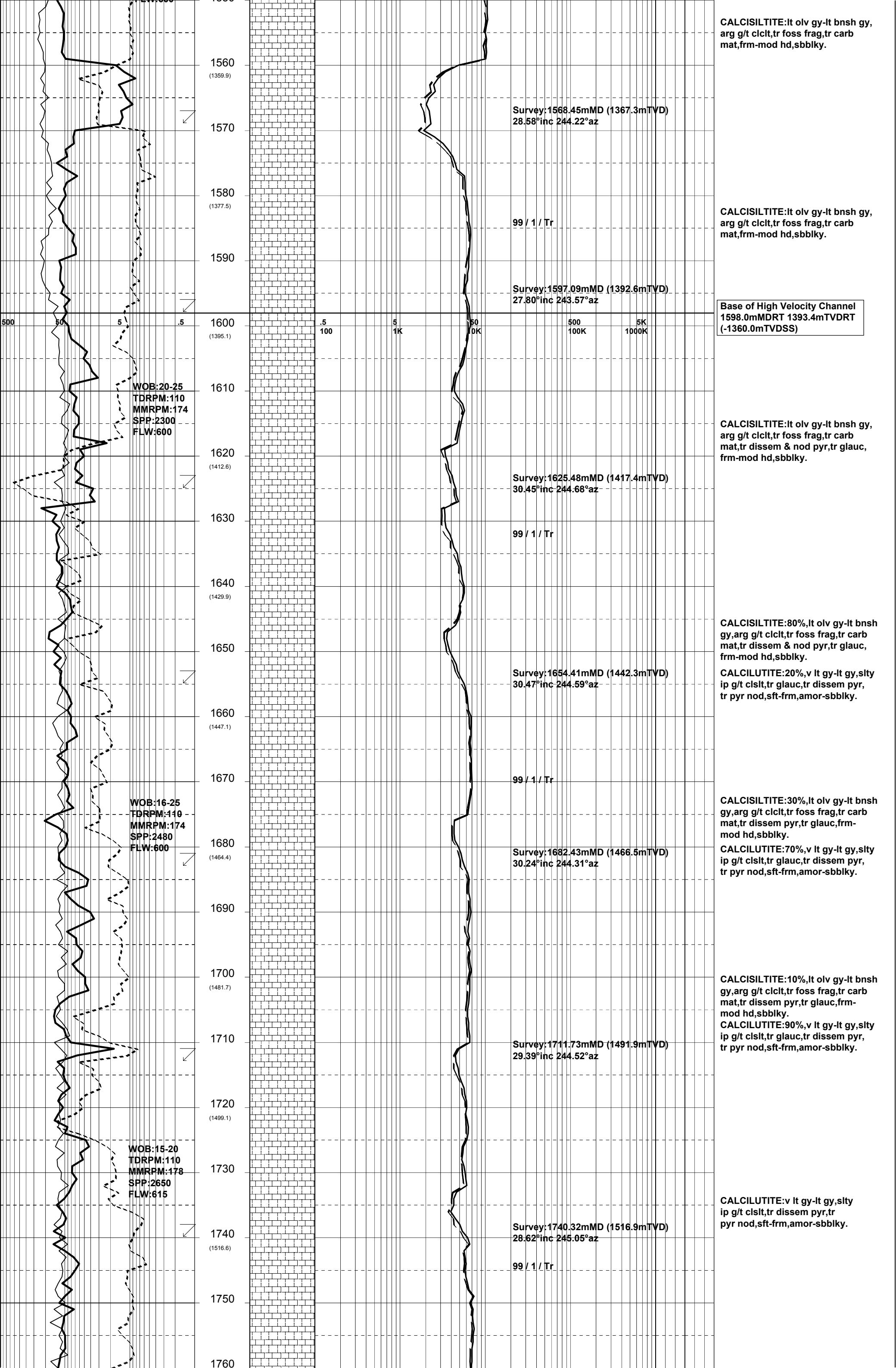
CALCISILTITE:lt olv gy-lt bnsh gy,
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mat,frm-occ mod hd,sbblky.

CALCISILTITE:lt olv gy-lt bnsh gy,
arg g/t clclt,tr foss frag,tr carb
mat,tr glauc,tr lithic,frm-mod
hd,sbblky.

CALCISILTITE:lt olv gy-lt bnsh gy,
arg g/t clclt,tr aren,tr foss frag,
tr carb mat,tr lithic,frm-mod
hd,sbblky.

CALCISILTITE:lt olv gy-lt bnsh gy,
arg g/t clclt,tr foss frag,tr carb
mat,tr glauc,tr lithic,frm-mod
hd,sbblky.

CALCISILTITE:lt olv gy-lt bnsh gy,
arg g/t clclt,tr foss frag,tr carb
mat,frm-mod hd,sbblky.



CALCISILTITE:lt olv gy-lt bnsh gy, arg g/t clclt, tr foss frag, tr carb mat, frm-mod hd, sbblky.

Survey:1568.45mMD (1367.3mTVD)
28.58°inc 244.22°az

CALCISILTITE:lt olv gy-lt bnsh gy, arg g/t clclt, tr foss frag, tr carb mat, frm-mod hd, sbblky.

Survey:1597.09mMD (1392.6mTVD)
27.80°inc 243.57°az

Base of High Velocity Channel
1598.0mMDRT 1393.4mTVDRT
(-1360.0mTVDSS)

WOB:20-25
TDRPM:110
MMRPM:174
SPP:2300
FLW:600

CALCISILTITE:lt olv gy-lt bnsh gy, arg g/t clclt, tr foss frag, tr carb mat, tr dissep pyr, tr glauc, frm-mod hd, sbblky.

Survey:1625.48mMD (1417.4mTVD)
30.45°inc 244.68°az

99 / 1 / Tr

CALCISILTITE:80%,lt olv gy-lt bnsh gy, arg g/t clclt, tr foss frag, tr carb mat, tr dissep pyr, tr glauc, frm-mod hd, sbblky.

CALCILUTITE:20%,v lt gy-lt gy, slty ip g/t clslt, tr glauc, tr dissep pyr, tr pyr nod, sft-frm, amor-sbblky.

Survey:1654.41mMD (1442.3mTVD)
30.47°inc 244.59°az

99 / 1 / Tr

CALCISILTITE:30%,lt olv gy-lt bnsh gy, arg g/t clclt, tr foss frag, tr carb mat, tr dissep pyr, tr glauc, frm-mod hd, sbblky.

CALCILUTITE:70%,v lt gy-lt gy, slty ip g/t clslt, tr glauc, tr dissep pyr, tr pyr nod, sft-frm, amor-sbblky.

Survey:1682.43mMD (1466.5mTVD)
30.24°inc 244.31°az

CALCISILTITE:10%,lt olv gy-lt bnsh gy, arg g/t clclt, tr foss frag, tr carb mat, tr dissep pyr, tr glauc, frm-mod hd, sbblky.

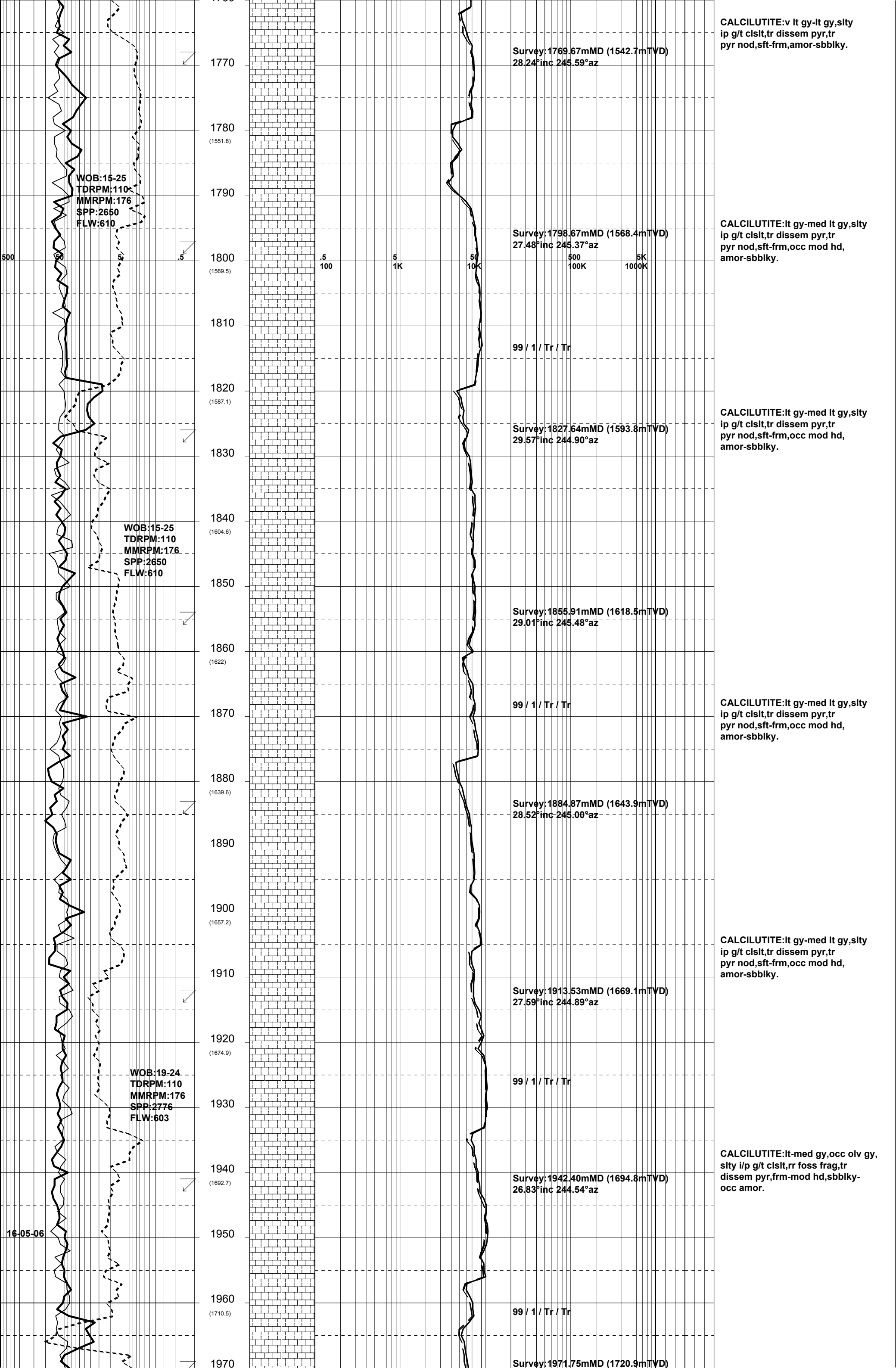
CALCILUTITE:90%,v lt gy-lt gy, slty ip g/t clslt, tr glauc, tr dissep pyr, tr pyr nod, sft-frm, amor-sbblky.

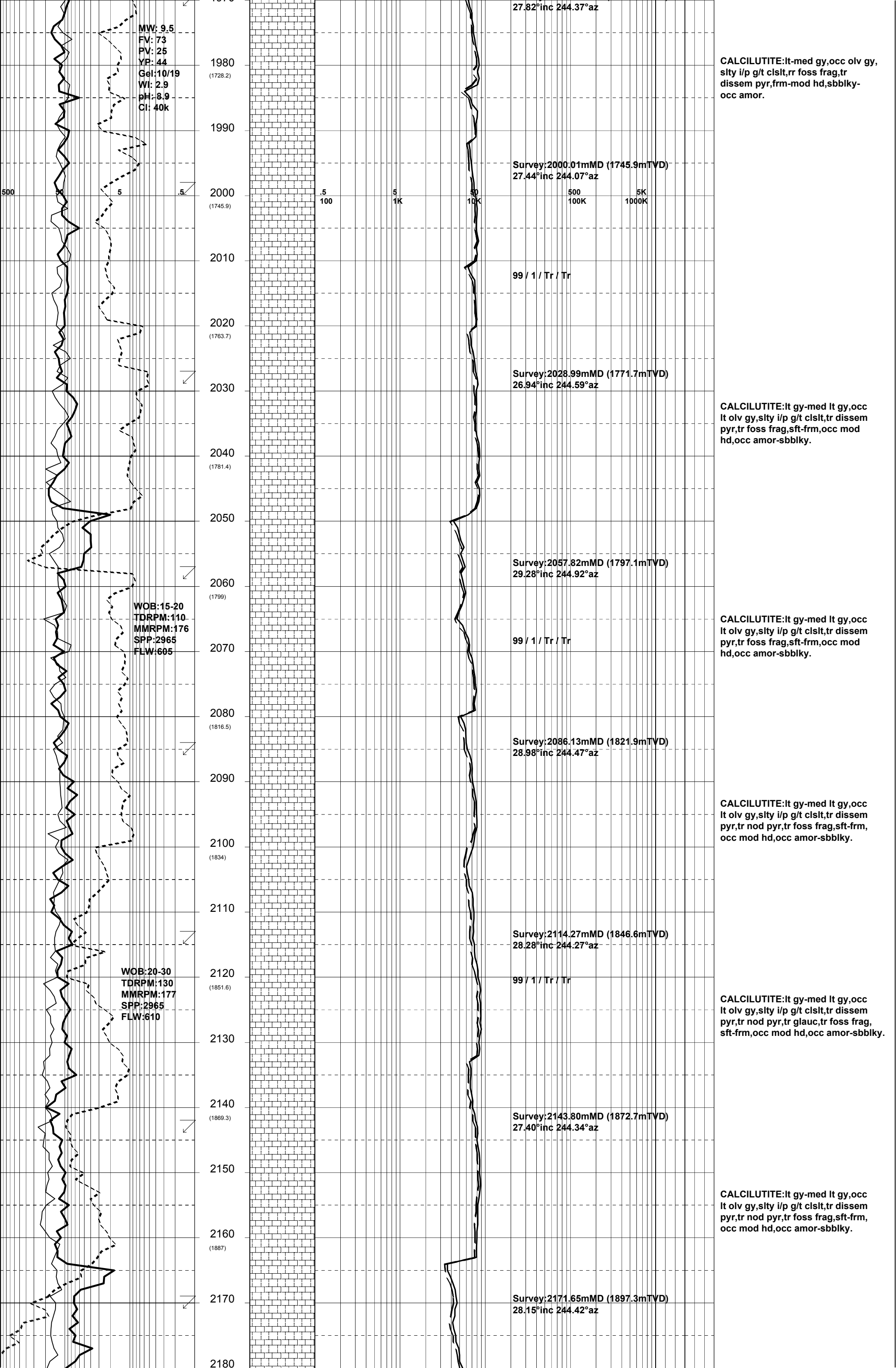
Survey:1711.73mMD (1491.9mTVD)
29.39°inc 244.52°az

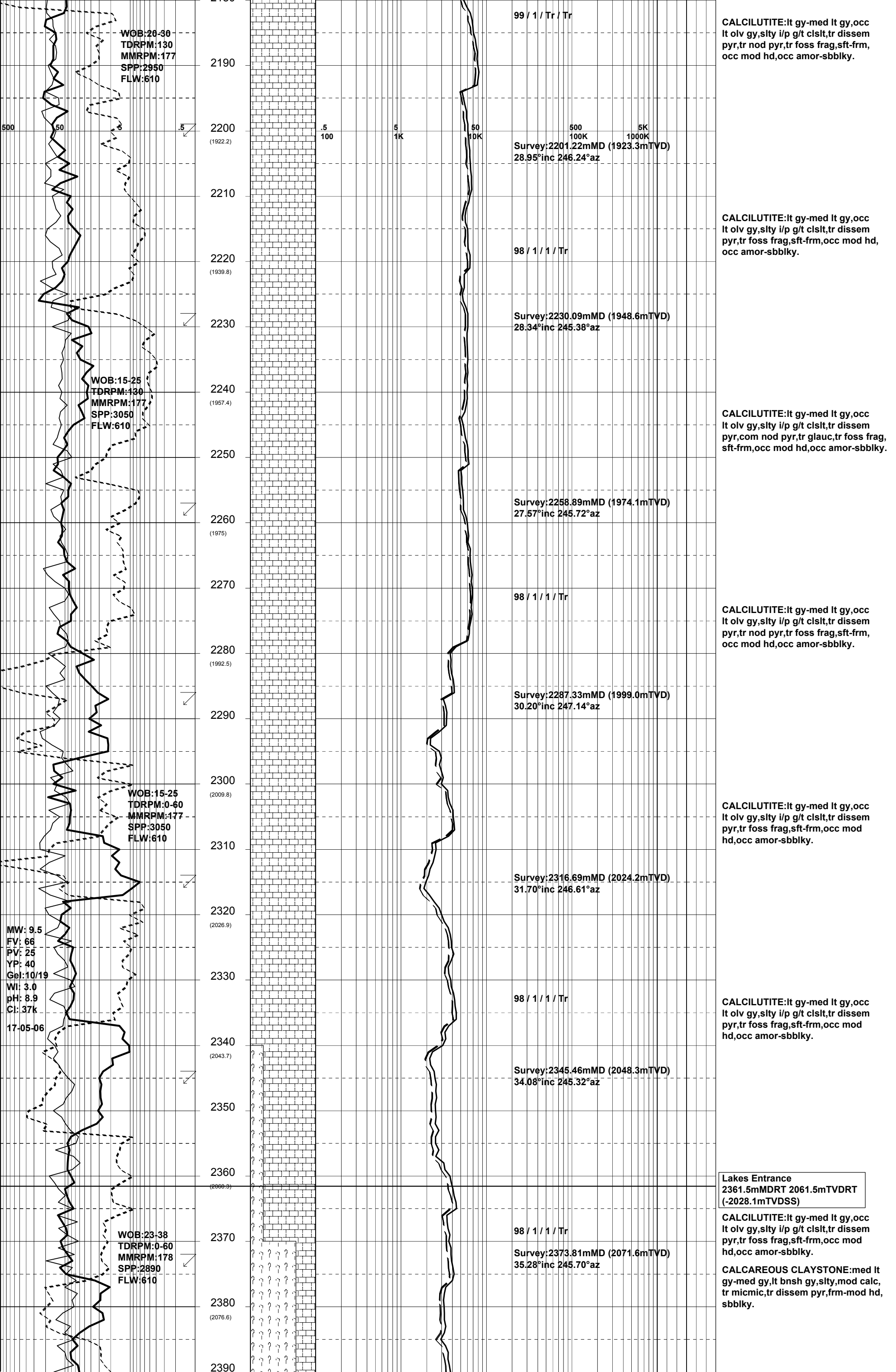
CALCILUTITE:v lt gy-lt gy, slty ip g/t clslt, tr dissep pyr, tr pyr nod, sft-frm, amor-sbblky.

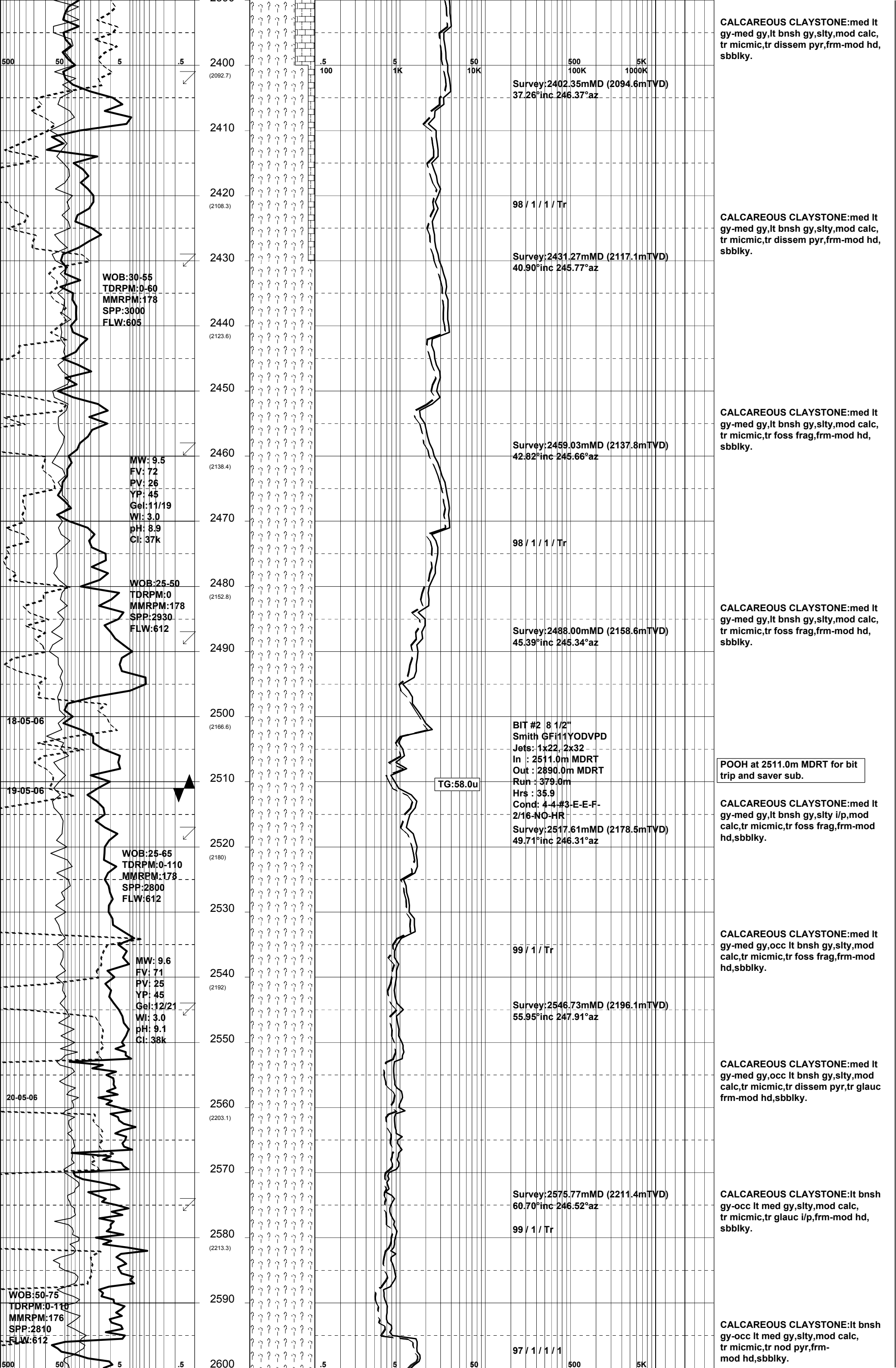
Survey:1740.32mMD (1516.9mTVD)
28.62°inc 245.05°az

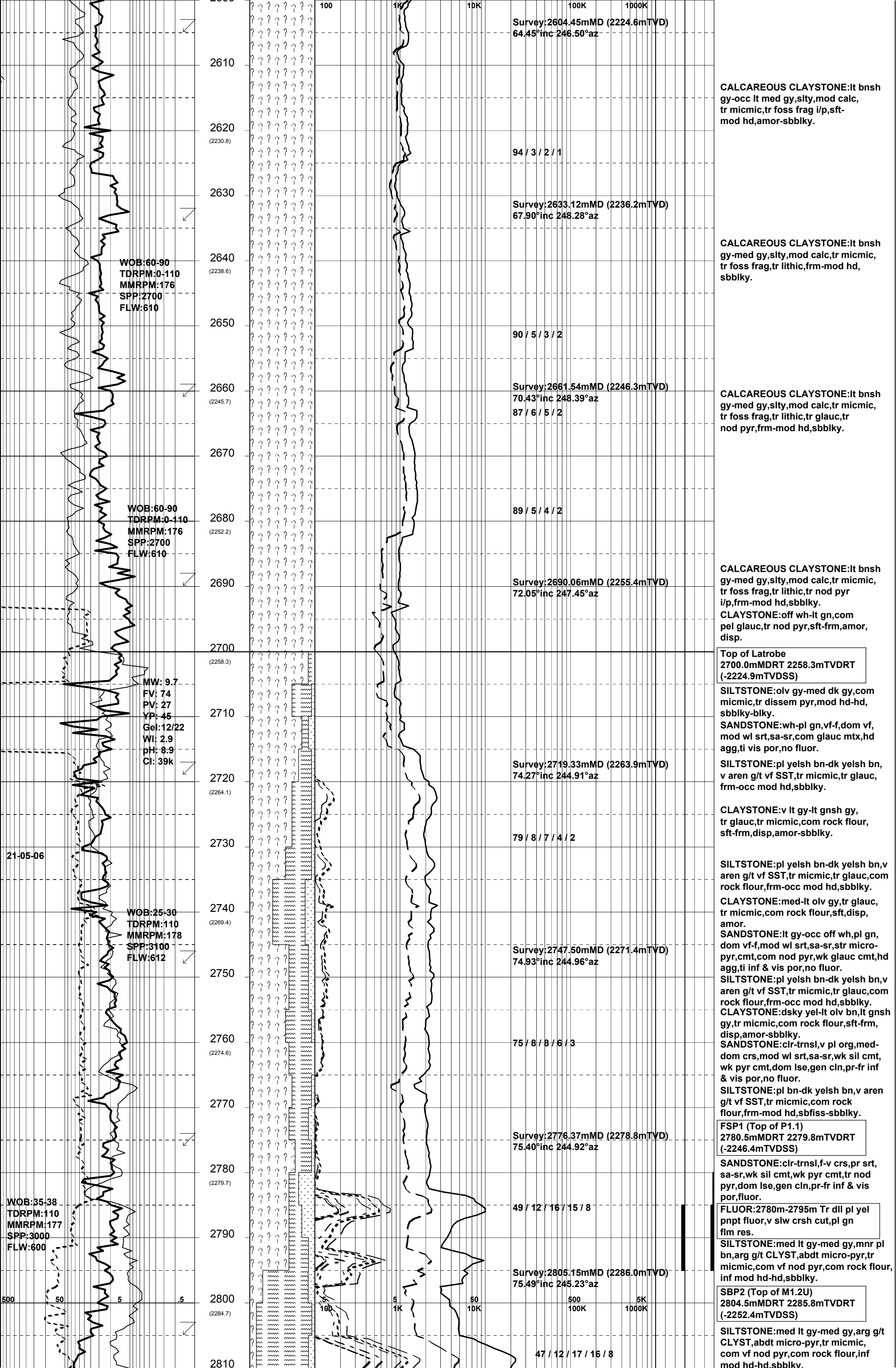
99 / 1 / Tr

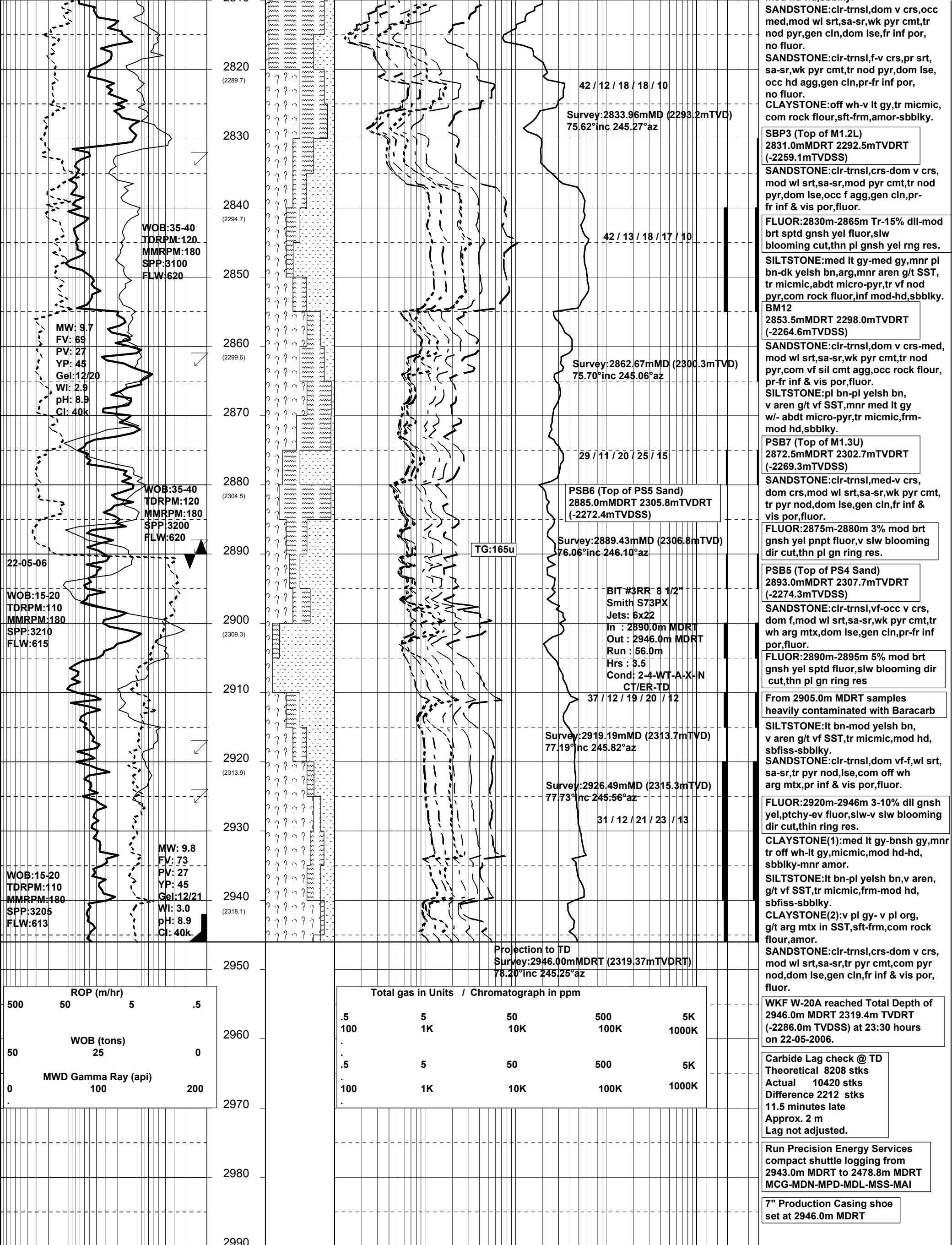












APPENDIX 4b

WEST KINGFISH W20A

Well Completion Log

WELL COMPLETION LOG
Scale – 1:200



WEST KINGFISH W20A










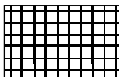

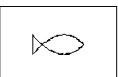
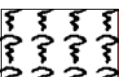

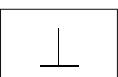
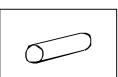
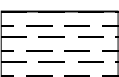

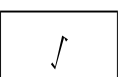


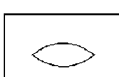
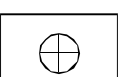

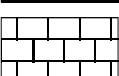
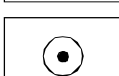
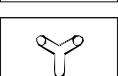
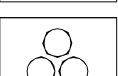
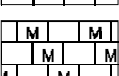
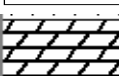
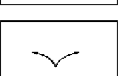

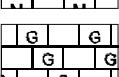
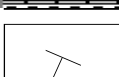

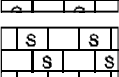
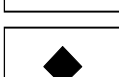
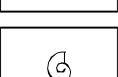
Gippsland Basin, Victoria
Concession: VIC/L7

POST-DRILL LOCATION: <i>Top of Latrobe</i>	Latitude:	38° 35' 52.911" S	COMPILED BY:	Sheryl Sazenis
	Longitude:	148° 05' 30.022" E	DRAFTED BY:	Arnaldo Ribeiro
	MGA X:	595063.67 mE		
	MGA Y:	5727263.81 mN		
	ELEVATION:	Depth:	2698.5 mMDRT 2257.9 mTVDRT (-2224.5 mTVDSS)	DRILL RIG:
G.L.:		-76.13 m	Datum:	GDA94
R.T.:		33.43 m	Spheroid:	GRS80
Water Depth:		76.13 m	Projection:	UTM
			Map Grid/Cent.Meridian	MGA Zone 55/147 deg E
			TOTAL DEPTH:	2946.0 mMDRT / 2319.4 mTVDRT
DATES:	Spudded:	12/05/2006	PLUGGED BACK T.D.:	2916.5m MDRT
	Rig Released:	01/06/2006	CLASSIFICATION:	Oil Development
	I.P. Established:	12/06/2006		
	<i>(Initial production)</i>			
SERVICE COMPANIES:			STATUS:	Cased and Completed – Oil Well
DRILLING CONTRACTOR:	International Sea Drilling Limited (Nabors Rig 453)			
MWD/DIRECT. DRLG:	Schlumberger Anadrill			
GYRO SURVEYING:	SDI (Scientific Drilling Int.)		PRODUCTION TESTING:	n/a
CORING:	n/a		DIVERS:	n/a
PIPE CONVEYED	Precision Energy Services (Reeves Compact		MUD LOGGING:	Geoservices Overseas S.A.
LOGGING:	Shuttle Logging System)		PRESSURE RECORDING:	n/a
CEMENTING:	Halliburton		WELL VELOCITY SURVEY:	n/a
CASING:	Weatherford		MUD ENGINEERING:	Halliburton- Baroid
			LINER:	n/a

LEGEND

2.7m NOS Ø = 17% Sw = 32%		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	
No Rec.		MUD DATA		GAS PRODUCTIVE	
CORE		Ø - Porosity		INTERPRETED OIL PRODUCTION	
Rec.		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 DST WITH GAS RECOVERED	
		pH - Acidity/Alkalinity		DSTO DST WITH OIL RECOVERED	
		WL - Water Loss		SURVEY POINT	
		Cl - Chloride		13-3/8" CASING SHOE	
		Ca - Calcium		MUD	
		Sol - Solids			
		H2O - Water			
		Oil -Oil			
←SST		RECOVERED SIDE WALL CORE LITHOLOGY			
		SST - Sandstone CLST - Claystone			
		SLST - Siltstone LMST - Limestone			
		MST - Mudstone ML - Marl			
		SH - Shale COAL - Coal			
←		SIDE WALL CORE - NO RECOVERY			
←		FIT			
←P2/11		MDT/RFT PRETEST RUN/SEAT NUMBER			
←S11/2		MDT/RFT SAMPLE RUN/SAMPLE NUMBER			
←P2/40		MDT VERTICAL/HORIZONTAL PERMEABILITY TEST			
		PACKER			
□		BRIDGE PLUG			

LITHOLOGICAL SYMBOLS

	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				Gastropods		
	Skeletal Limestone		Pyrite		Cephalopods		

LOGGING AND SURVEYING			
Anadrill Schlumberger	Interval (mMDRT)	Reeves	Interval (mMDRT)
MWD (Directional & GR) – 4 Runs	675.0m MDRT - 2929.0m MDRT	MCG-MDN-MPD-MSS-MDL-MAI - 1 Run (GR-Neutron-Density-Sonic-Dual Laterolog-Induction)	2943.0m MDRT- 2478.8.0m MDRT

WELL DATA				
Date	12 May 2006 - 18 May 2006	19 May 2006 - 21 May 2006	22 May 2006 - 23 May 2006	23 May 2006 - 24 May 2006
Run	MWD # 1	MWD # 2	MWD # 3	Wireline Run #1 on shuttle
Log	Powerpulse Directional & GR	Powerpulse Directional & GR	Powerpulse Directional & GR	MCG-MDN-MPD-MSS-MDL
Depth Driller	2511.0m MDRT	2890.0m MDRT	2946.0m MDRT	2946.0m MDRT
Depth Logger	2511.0m MDRT	2890.0m MDRT	2946.0m MDRT	2943.0m MDRT
Bottom Log Interval	2511.0m MDRT	2871.9m MDRT	2929.0m MDRT	2943.0m MDRT
Top Log Interval	675.0m MDRT	2511.0m MDRT	2871.9m MDRT	2478.8m MDRT
Casing Driller	675.0m MDRT	675.0m MDRT	675.0m MDRT	675.0m MDRT
Casing Logger	675.0m MDRT	675.0m MDRT	675.0m MDRT	675.0m MDRT
Casing Size	10 .75"	10 .75"	10 .75"	10 .75"
Casing Weight	40.5 ppf	40.5 ppf	40.5 ppf	40.5 ppf
Bit Size	8.5"	8.5"	8.5"	8.5"
Type of Fluid in Hole	KCI/PHPA/GLYCOL	KCI/PHPA/GLYCOL	KCI/PHPA/GLYCOL	KCI/PHPA/GLYCOL
Density	9.50 ppg	9.70 ppg	9.80 ppg	9.80 ppg
Rm @ Measured Temp.	N/A	N/A	N/A	0.108
Rmf @ Measured Temp.	N/A	N/A	N/A	0.087
Rmc @ Measured Temp.	N/A	N/A	N/A	0.152
Max. Recorded Temp.	79.89°C	81.56°C	N/A due to tool failure.	91.0°C
Equipment / Location	Sale	Sale	Sale	Sale
Recorded By	B. Pattarakorn / C.Skiba	B. Pattarakorn / C.Skiba	B. Pattarakorn / C.Skiba	B.Moss / R. Tench
Witnessed By	Trevor Lobo	Trevor Lobo	Trevor Lobo	Trevor Lobo

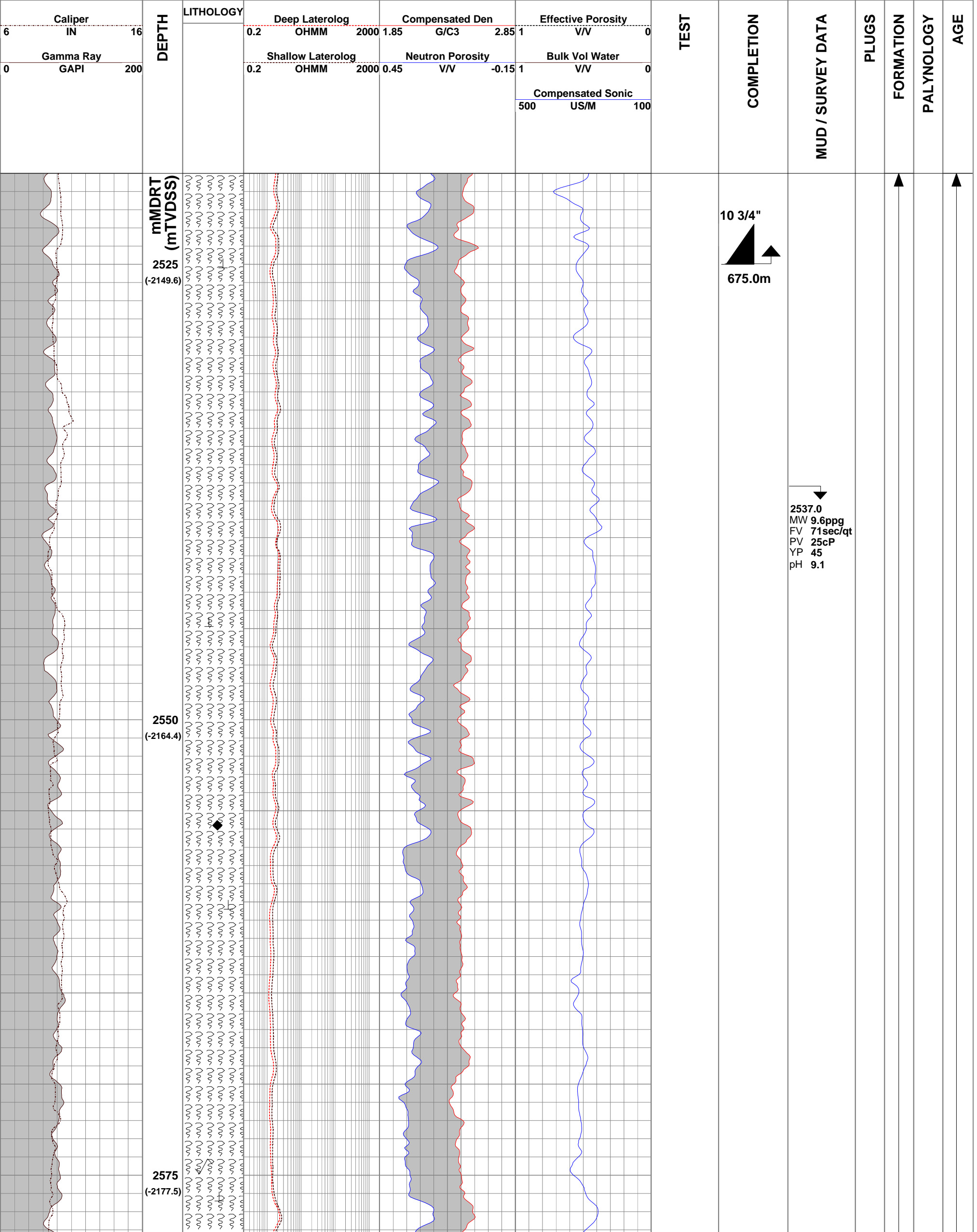
WELL DATA				
Date	24 May 2006 - 25 May 2006			
Run	MWD # 4			
Log	Powerpulse Directional & GR			
Depth Driller	2946.0m MDRT			
Depth Logger	2946.0m MDRT			
Bottom Log Interval	2929.0m MDRT			
Top Log Interval	2871.9m MDRT			
Casing Driller	675.0m MDRT			
Casing Logger	675.0m MDRT			
Casing Size	10 .75"			
Casing Weight	40.5 ppf			
Bit Size	8.5"			
Type of Fluid in Hole	KCI/PHPA/GLYCOL			
Density	9.80 ppg			
Rm @ Measured Temp.	N/A			
Rmf @ Measured Temp.	N/A			
Rmc @ Measured Temp.	N/A			
Max. Recorded Temp.	83.56°C			
Equipment / Location	Sale			
Recorded By	B. Pattarakorn / C.Skiba			
Witnessed By	Trevor Lobo			

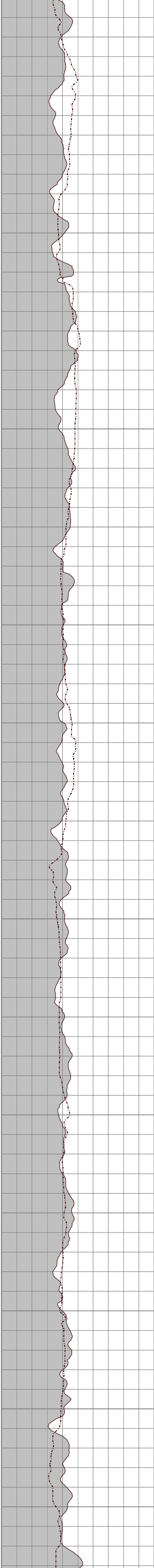
MWD Run #4 acquired at TD because GR failed during Run #3

CORES			PERFORATIONS		
From (mMDRT)	To (mMDRT)	Rec %	From (mMDRT)	To (mMDRT)	Gun Type
			2868.5	2877.0	MaxR
			2881.0	2888.5	MaxR

CASING				PLUGS		
Size	Set @ (mMDRT)	SX Cmt	Formation	From (mMDRT)	To (mMDRT)	SXCmt
10.75"	675.0*	---	Gippsland Limestone			
7"	2946.0	725	Latrobe Group	2946	2916.5 (PBTD)	

* Pre-existing W20 Casing

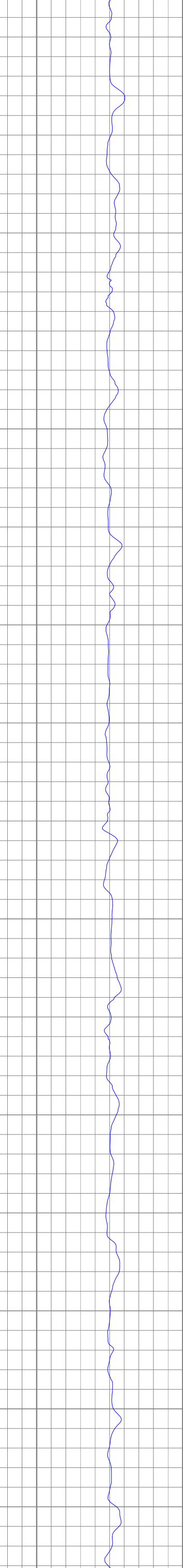
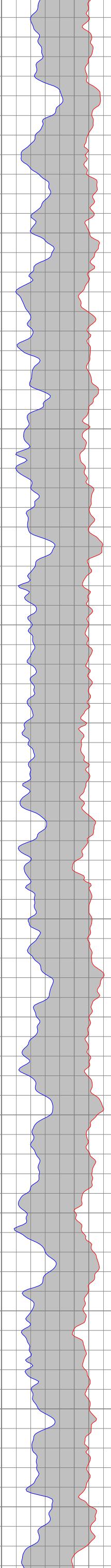
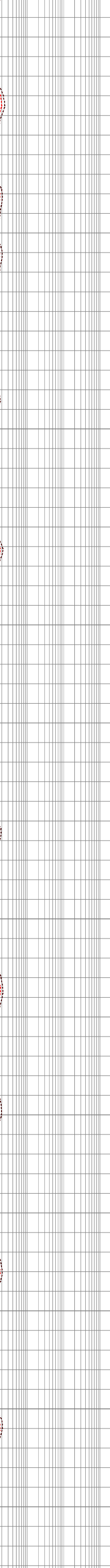
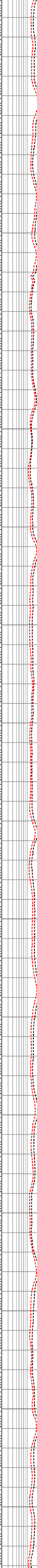




2600
(-2189.1)

2625
(-2199.4)

2650
(-2208.7)

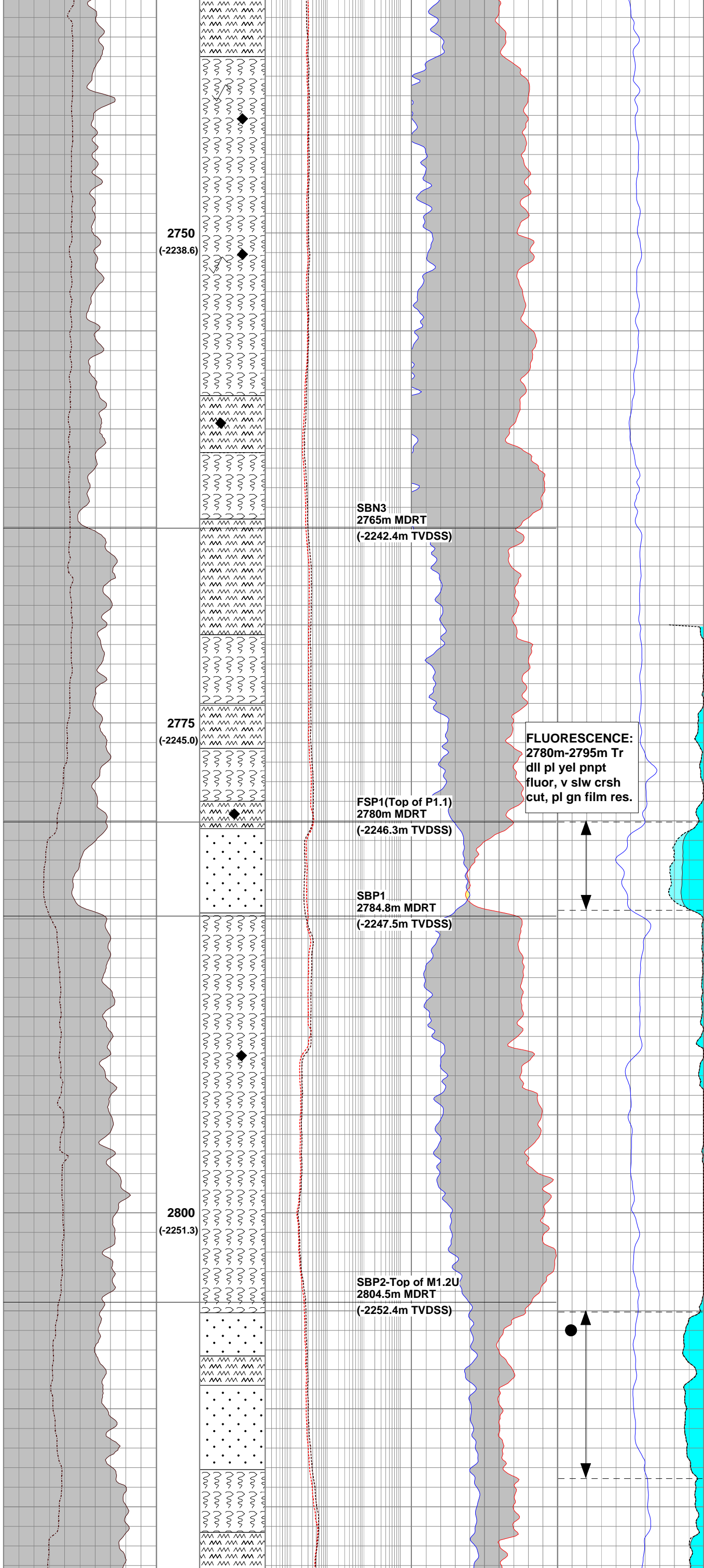


2604.45
ANG 64.45
DIR 246.50
(-2191.14)

2633.12
ANG 67.90
DIR 248.28
(-2202.72)

LAKES ENTRANCE FM

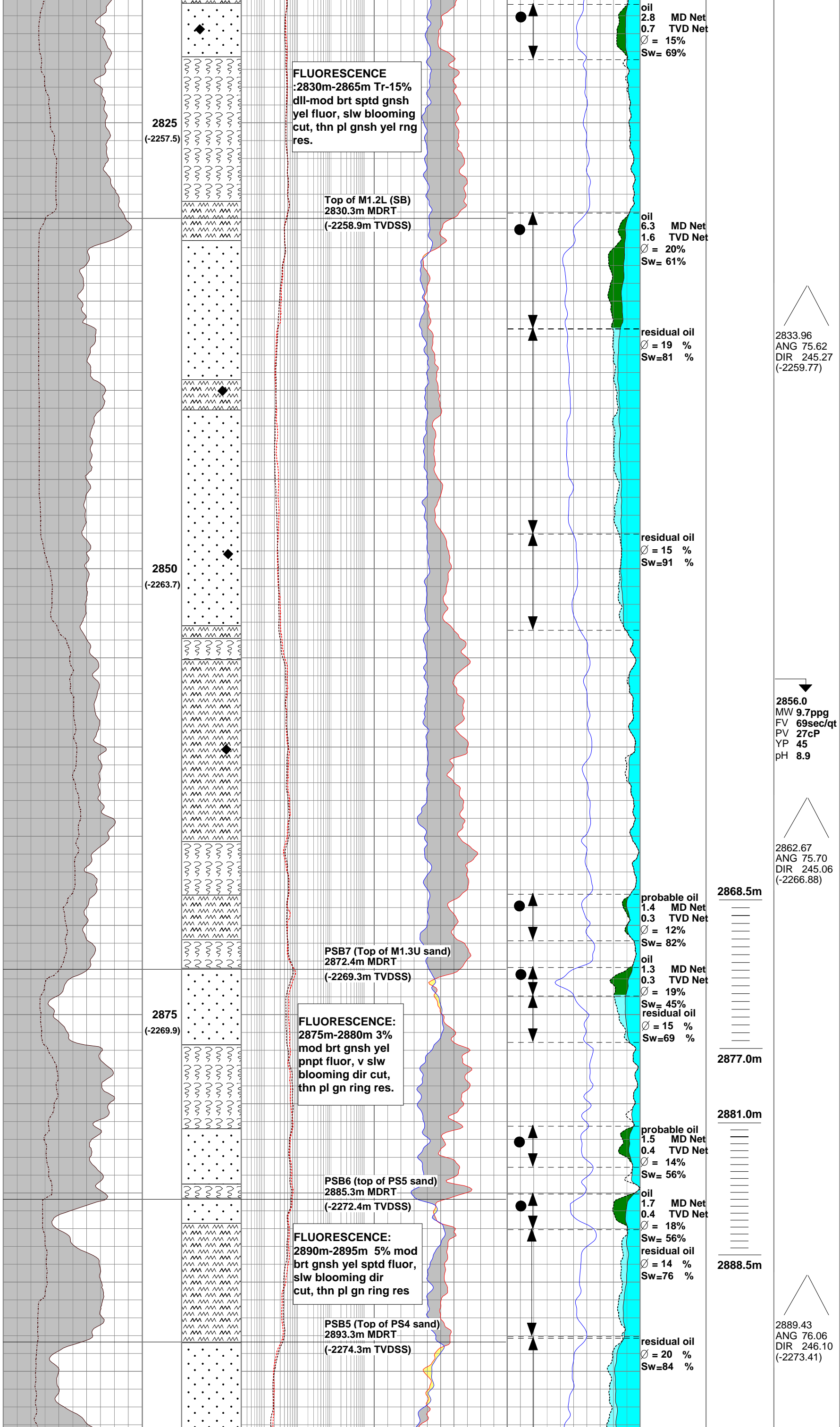
OLIGOCENE - MIOCENE



2747.50
ANG 74.93
DIR 244.96
(-2237.96)

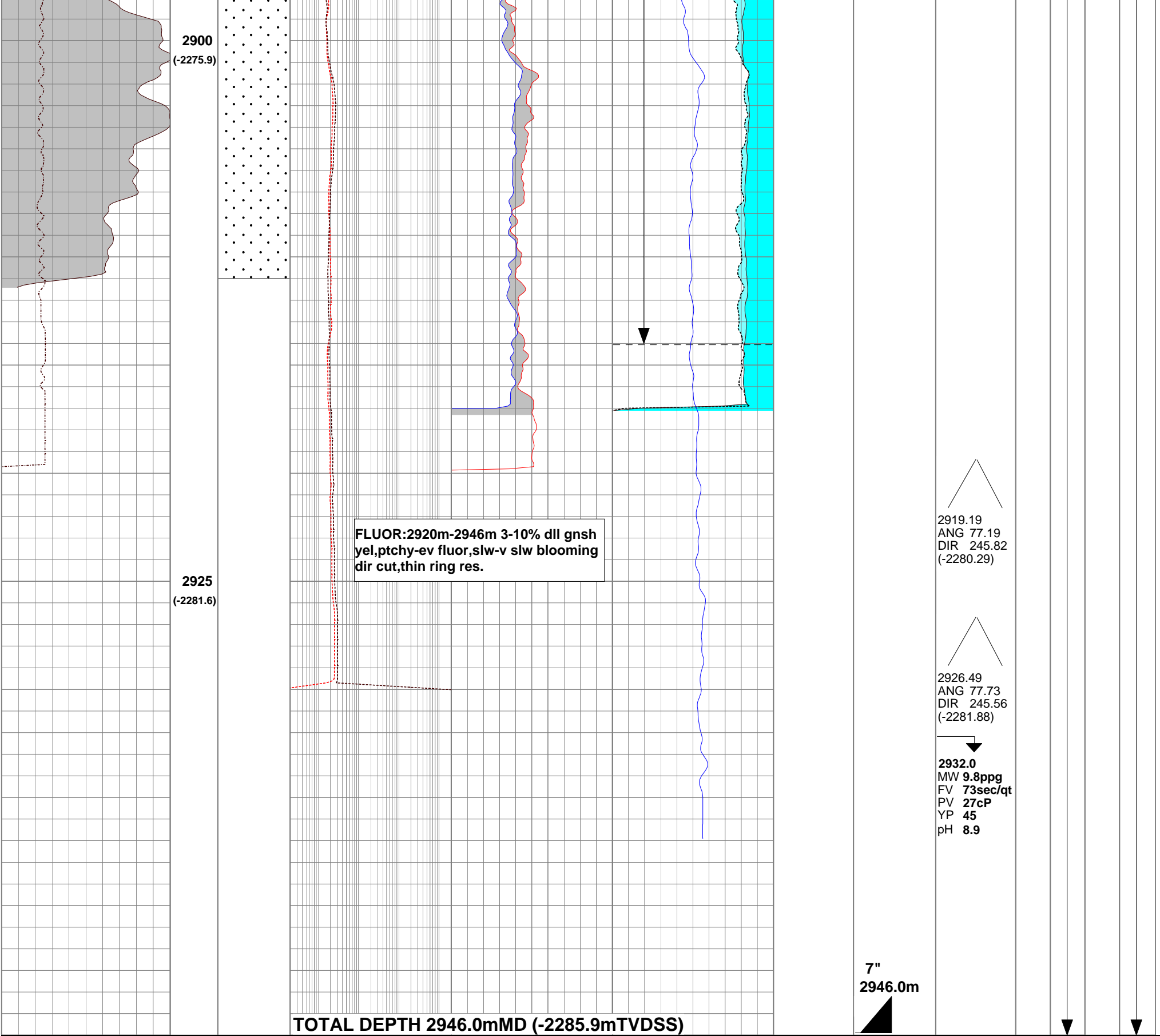
2776.37
ANG 75.40
DIR 244.92
(-2245.35)

2805.15
ANG 75.49
DIR 245.23
(-2252.58)



LATROBE GROUP

PALEOCENE - EARLY EO



West Kingfish W20A
Initial Production Date: 12/06/2006
Production Zone: M1.3U
Initial Total Liquid Rate 434.0 kL/day
Initial water cut: 88%
Initial Oil rate: 52 kL/day